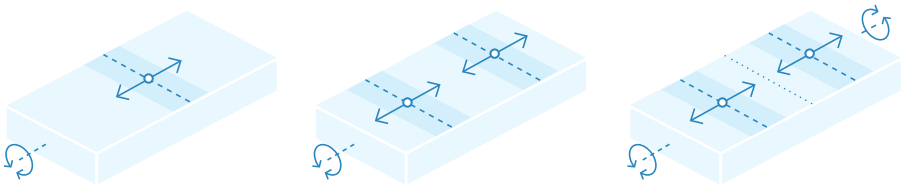
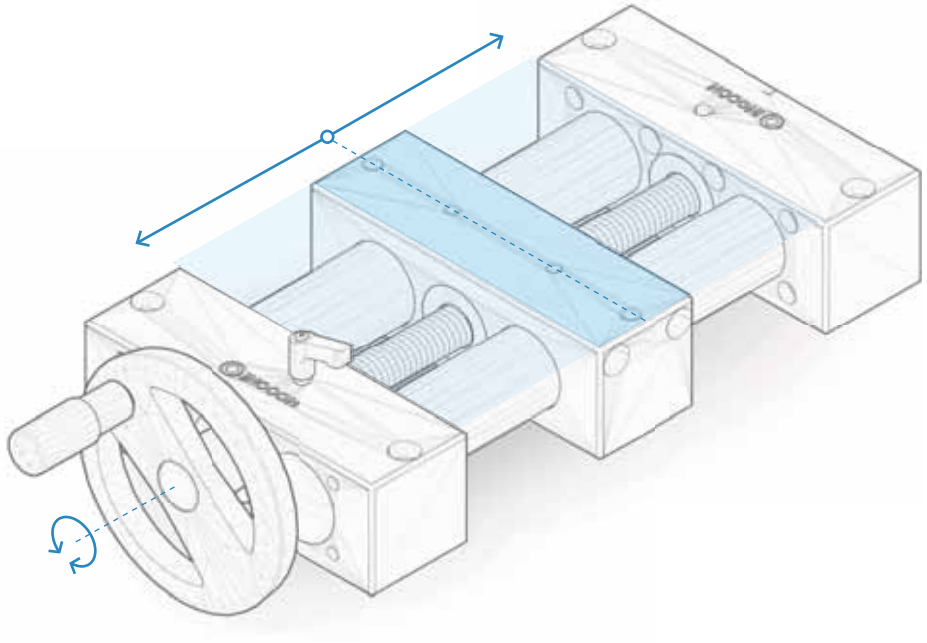




Double tube linear units

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:

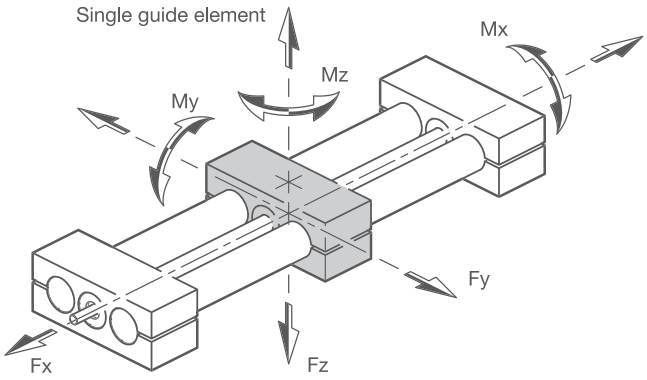
- **Linear units with one guide element:** the guide element is moved along the guide tubes by the spindle thread.
- **Linear units with two opposing guide elements:** two guide elements move symmetrically along the guide tubes due to different thread directions.
- **Linear units with two independent guide elements:** two guide elements move independently along the guide tubes due to separate spindles.

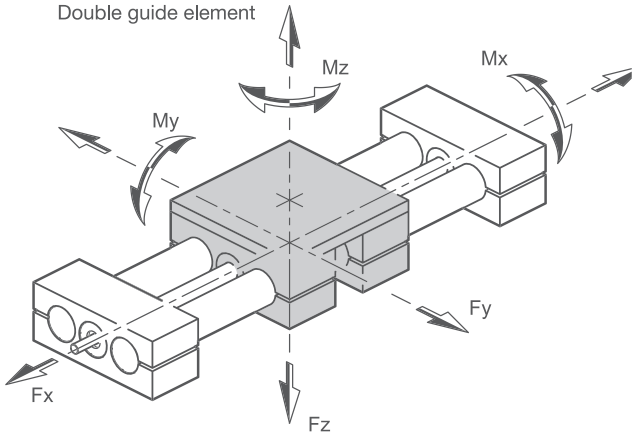
Possible accessories for the double tube linear units include hand wheels in various designs, position indicators and clamping plates for spindle clamping. The accessories are matched to the nominal diameter of the linear units and are found in group 2D.

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

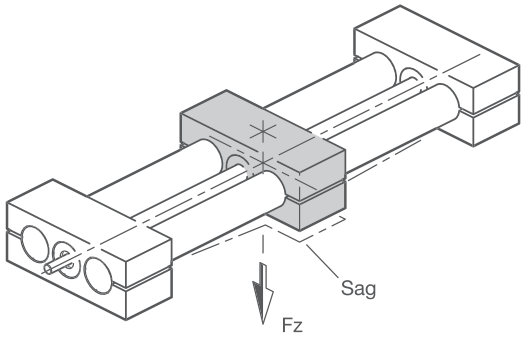
Linear unit nominal diameter	**Fx** in N	**Fy** in N			**Fz** in N			**Mx** in Nm	**My** in Nm	**Mz** in Nm
	l = 500	l = 500	l = 1000	l = 1500	l = 500	l = 1000	l = 1500			
18	425	215	110	-	105	80	-	22	35	40
30	850	1100	900	550	600	350	150	100	100	100
40	1100	3700	2800	1400	2100	600	180	150	140	170
50	1900	3850	2400	2100	3100	700	200	180	220	290
60	2700	6900	5700	5100	6300	2800	360	320	350	500

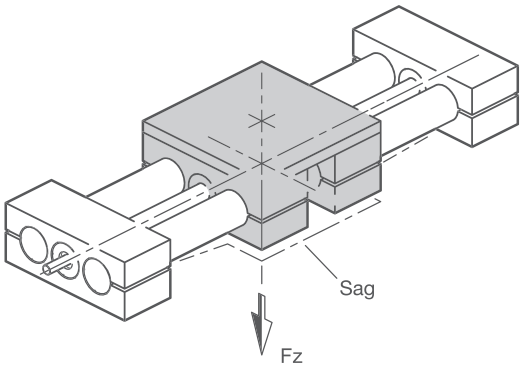
Double guide element

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

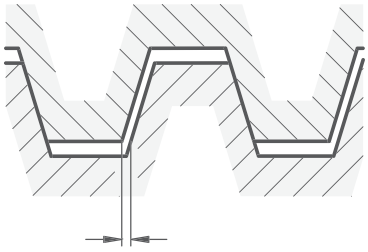
The repeatable precision indicates how precisely a position can be approached multiple times under the same conditions. In most cases, the repeatable precision is higher than the positioning precision because manufacturing tolerances have no influence on the repeatable precision. The trapezoidal and 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

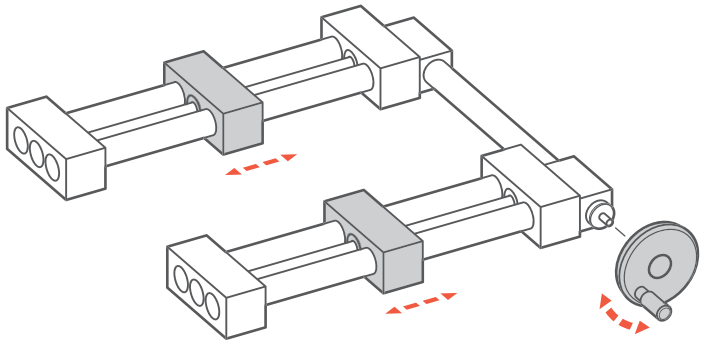
Ambient conditions

The linear units are designed for ambient temperatures from -20°C to +100°C. Large temperature fluctuations and condensing humidity should also be avoided.

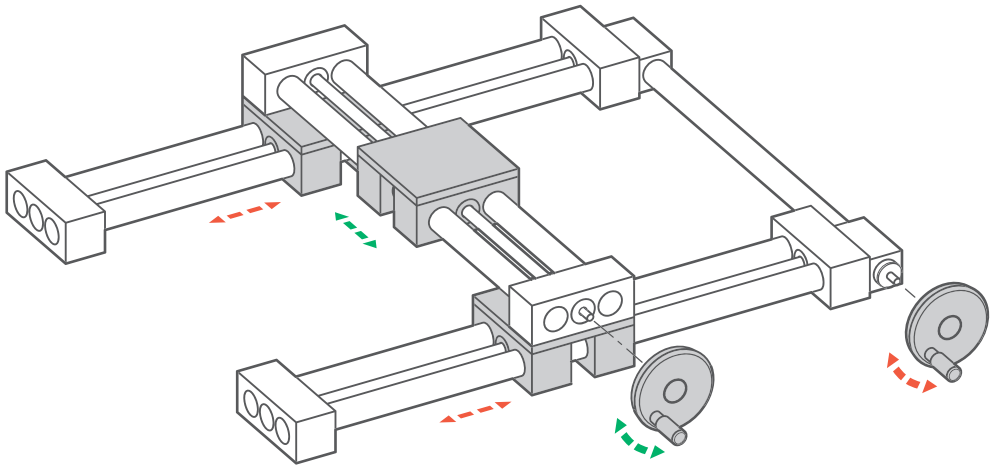
Safety device for vertical linear units

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.

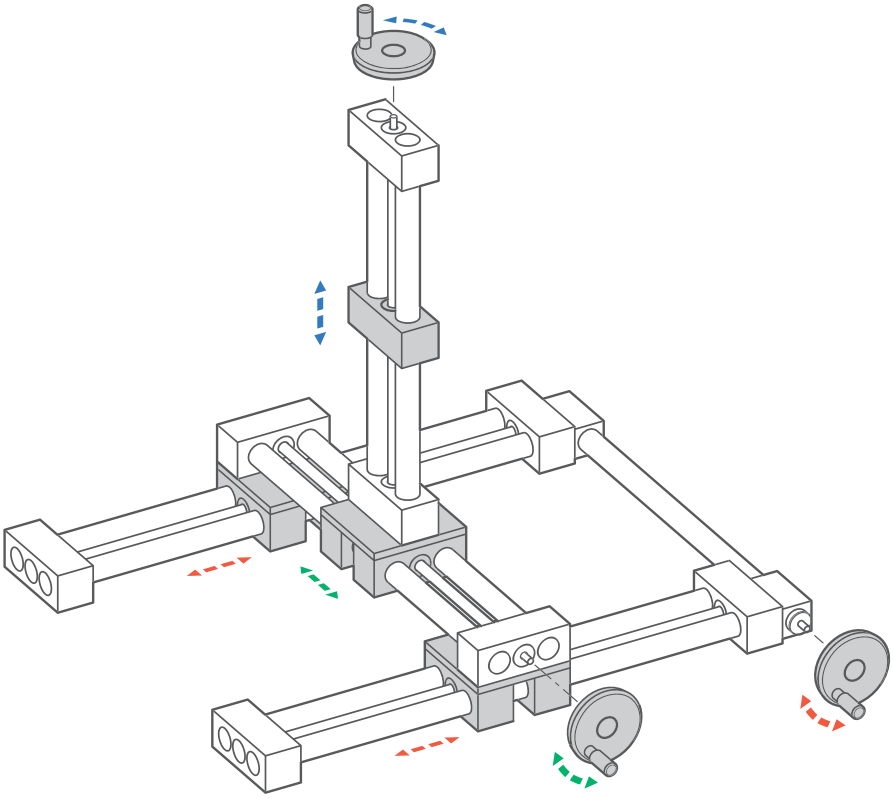
Multi-axis systems are assemblies comprised of multiple linear units. The use of angle gears and transfer units allows multiple linear units to move synchronously. To ensure smooth, even and low-wear movement of the linear units, they must be oriented exactly perpendicular or parallel to each other.



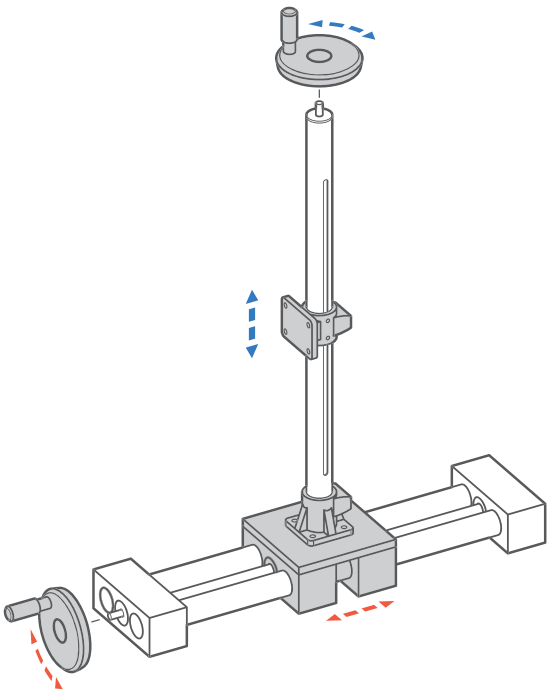
Multi-axis systems with adjustment in X direction



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

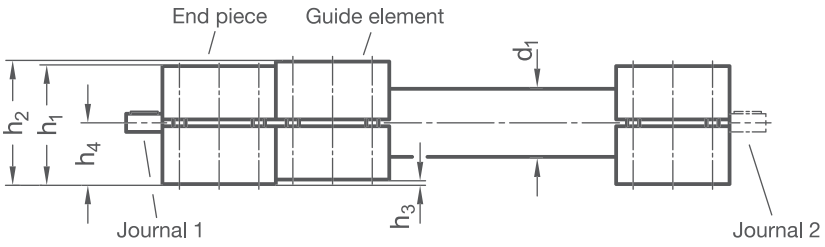
PRODUCT INFO

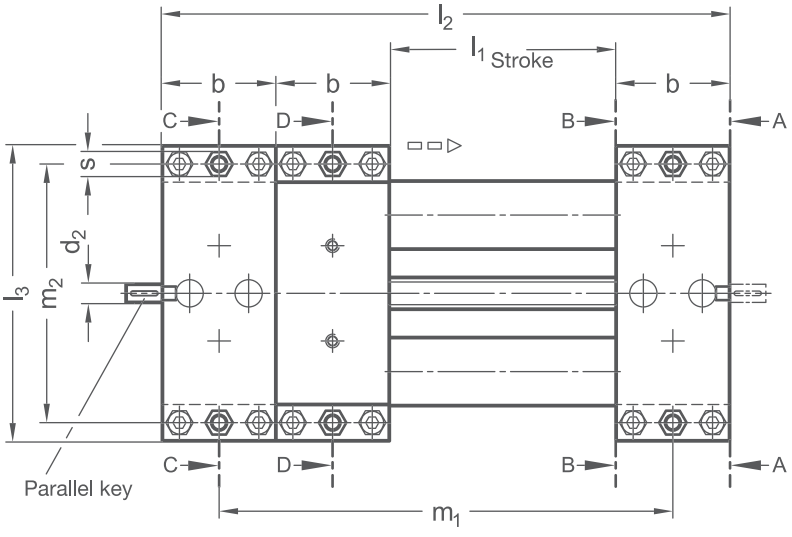
The guide tubes of the **double tube linear units VD1E** are made of chrome-plated steel or polished stainless steel precision tubes. The aluminum end pieces connect the tubes and form a solid linear guide together with the guide element. A continuous spindle with ball bearings on each side is installed 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.

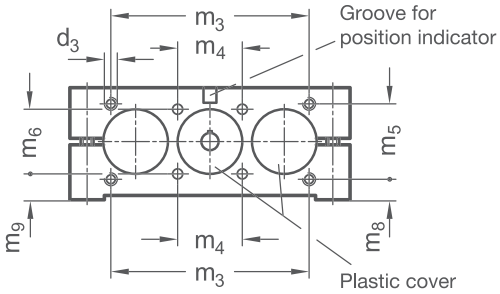
Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product

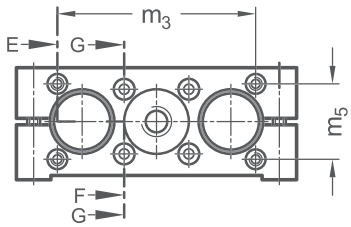




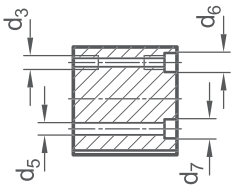
View **A-A**
(end piece outside)



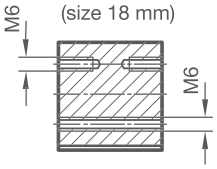
View **B-B**
(end piece inside)



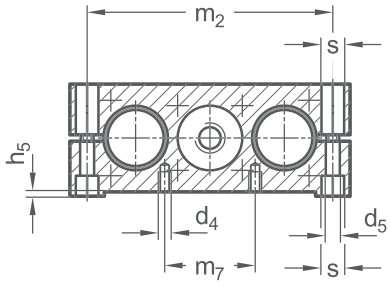
Sectional view **E-F**
(size 30 to 60 mm)



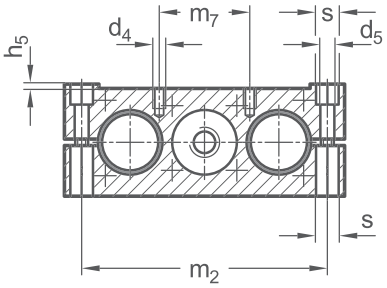
Sectional view **G-G**
(size 18 mm)



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

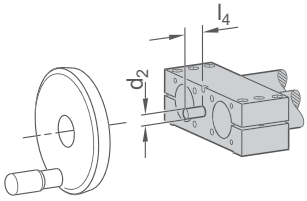
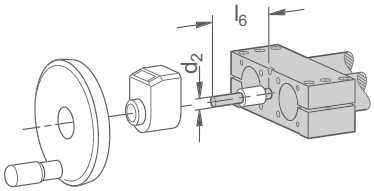
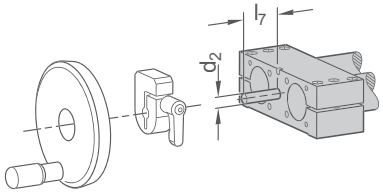
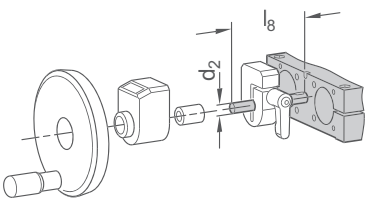
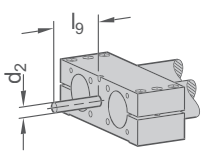
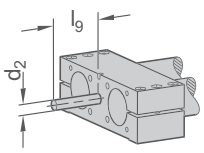
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, 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

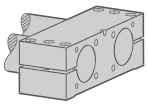
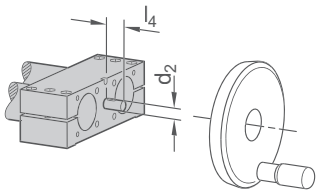
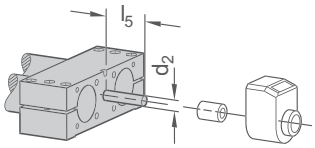
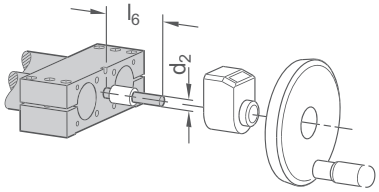
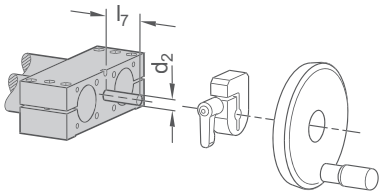
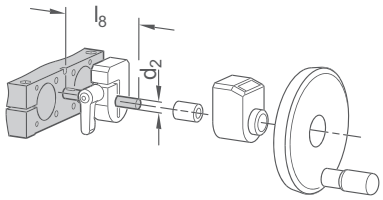
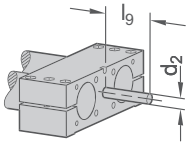
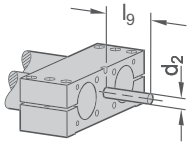
RH	Right-hand thread
LH	Left-hand thread

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

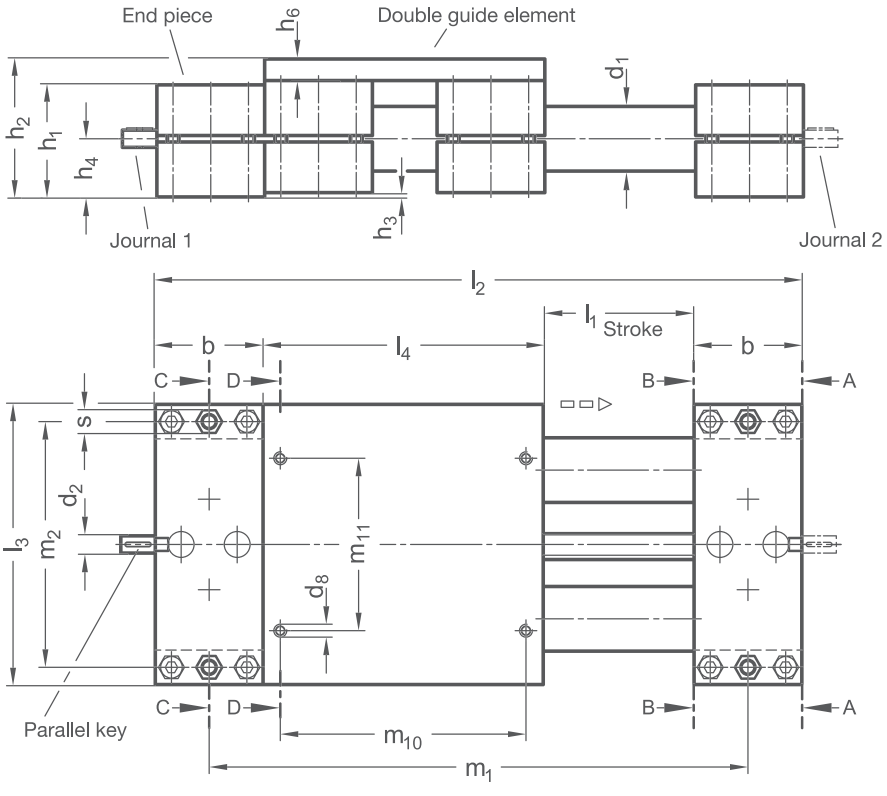
PRODUCT INFO

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.

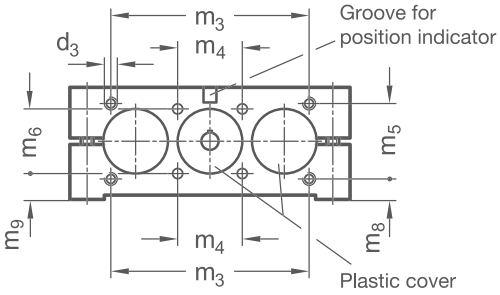
Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for higher loads. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself 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.

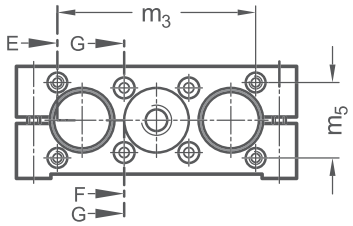
RoHS-compliant product



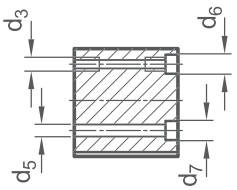
View **A-A**
(end piece outside)



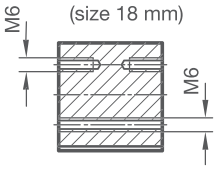
View **B-B**
(end piece inside)



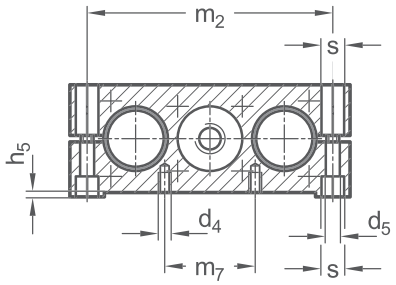
Sectional view **E-F**
(size 30 to 60 mm)



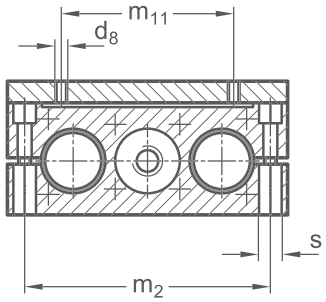
Sectional view **G-G**
(size 18 mm)



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

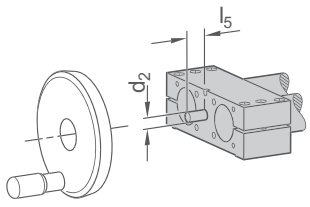
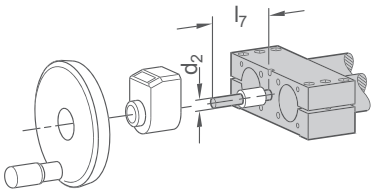
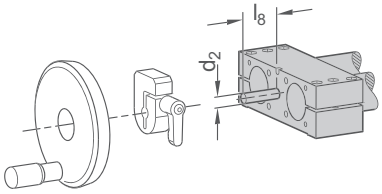
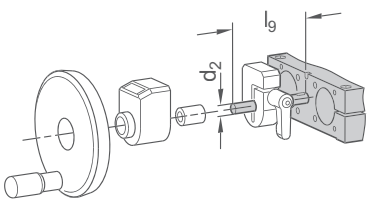
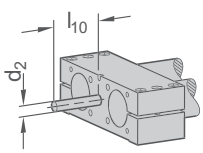
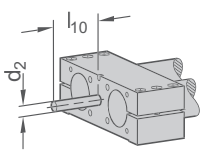
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, 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

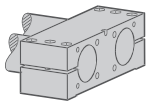
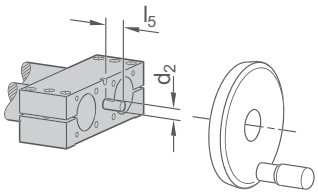
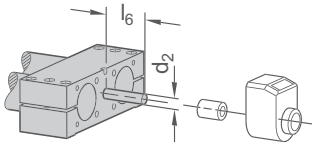
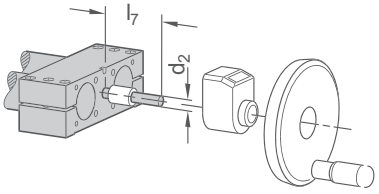
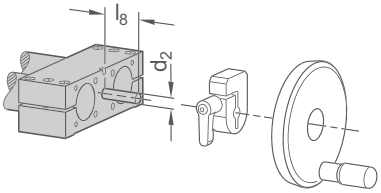
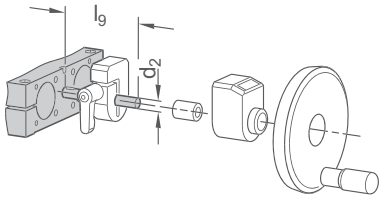
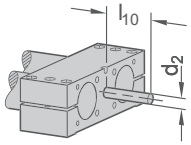
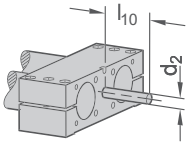
RH	Right-hand thread
LH	Left-hand thread

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

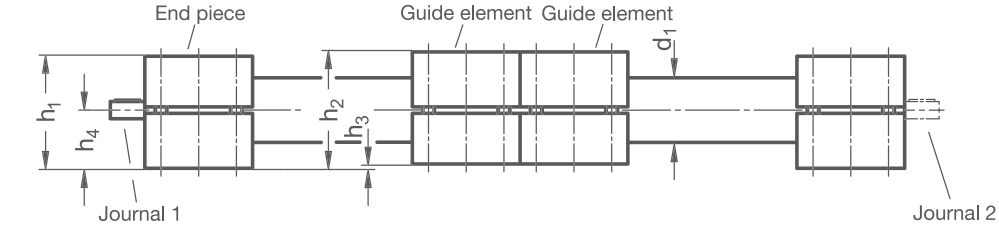
PRODUCT INFO

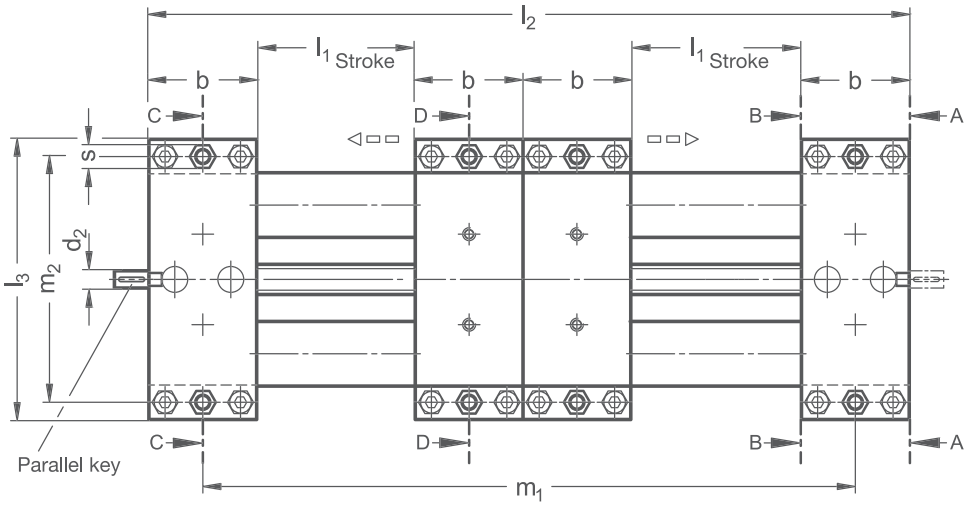
The guide tubes of the **double tube linear units VD2E** are made of chrome-plated steel or polished stainless steel precision tubes. The aluminum end pieces connect the tubes and form a solid linear guide together with the two guide elements.
A continuous spindle with ball bearings on both sides is 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.

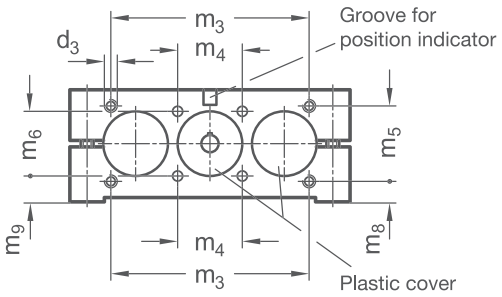
Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product

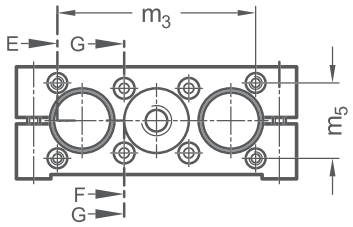




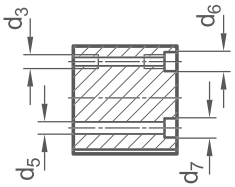
View **A-A**
(end piece outside)



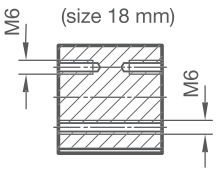
View **B-B**
(end piece inside)



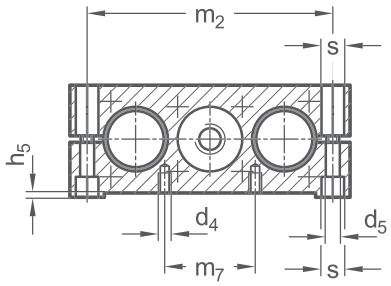
Sectional view **E-F**
(size 30 to 60 mm)



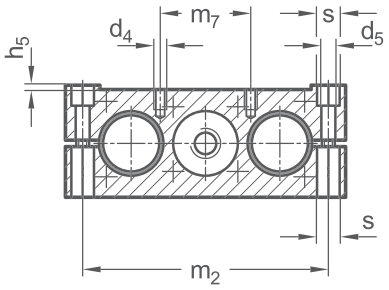
Sectional view **G-G**
(size 18 mm)



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

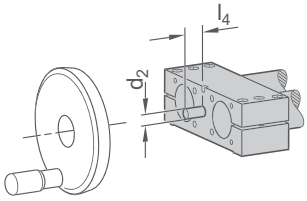
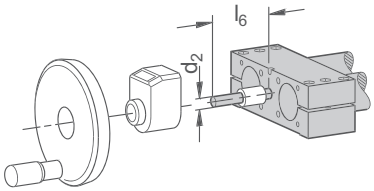
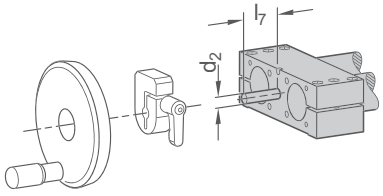
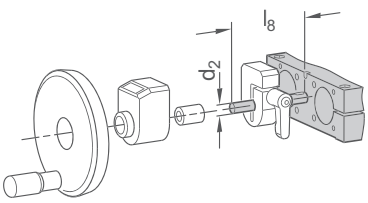
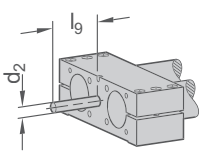
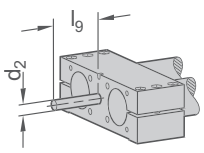
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, 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

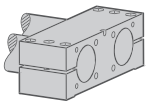
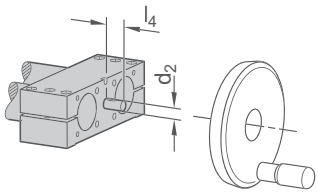
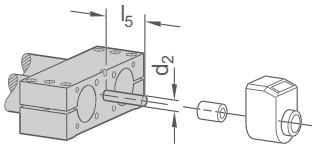
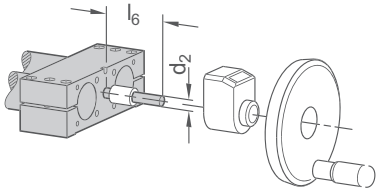
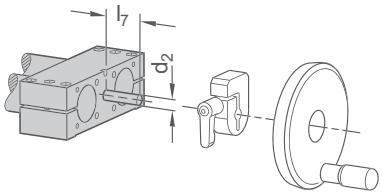
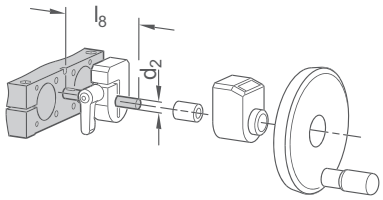
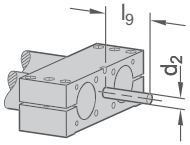
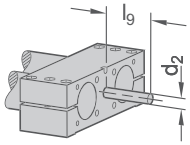
RH	Right-hand thread
LH	Left-hand thread

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

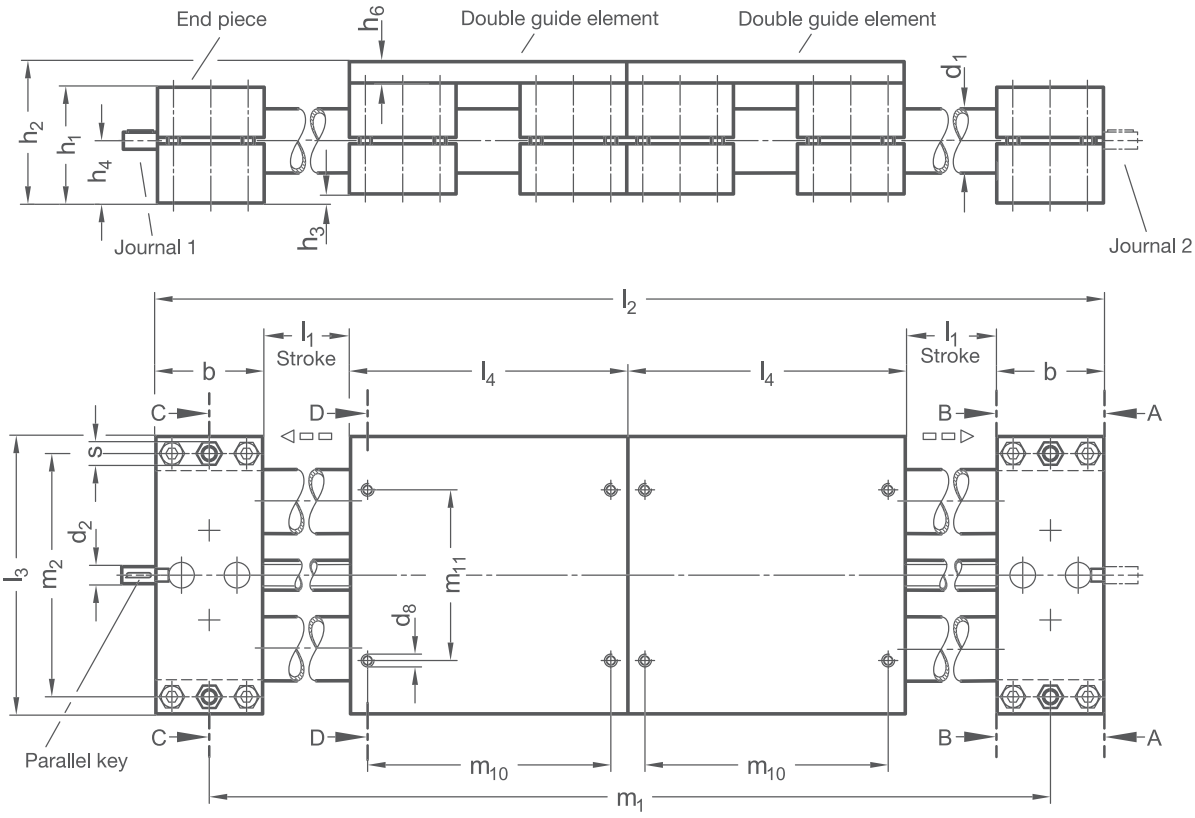
PRODUCT INFO

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.

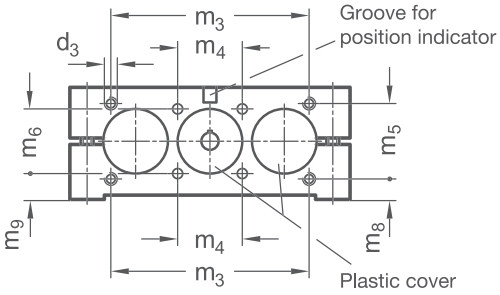
Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for higher loads. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself 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.

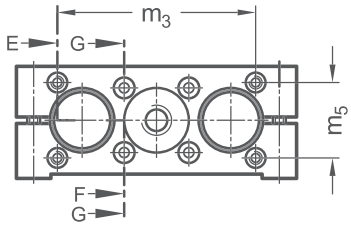
RoHS-compliant product



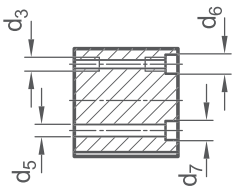
View **A-A**
(end piece outside)



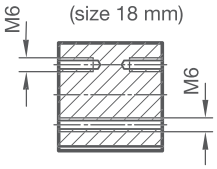
View **B-B**
(end piece inside)



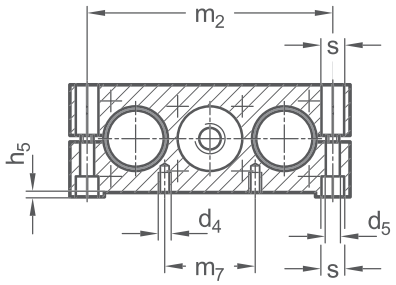
Sectional view **E-F**
(size 30 to 60 mm)



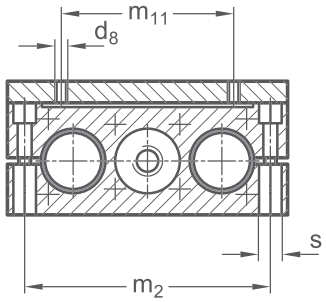
Sectional view **G-G**
(size 18 mm)



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

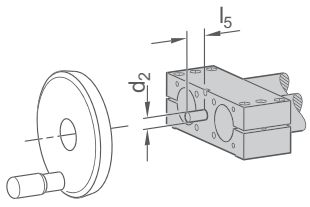
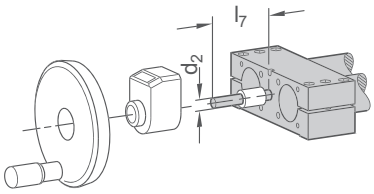
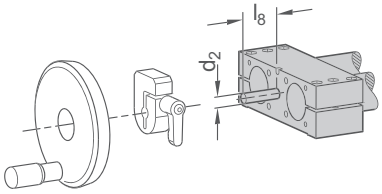
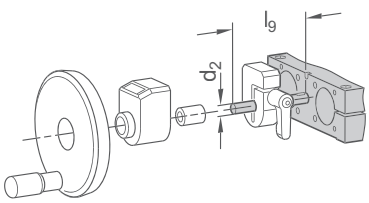
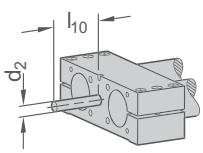
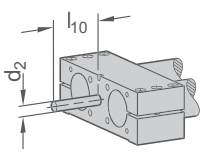
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, 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

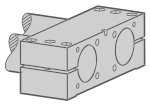
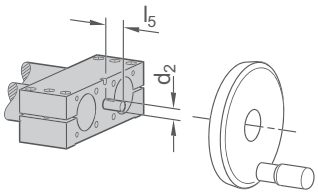
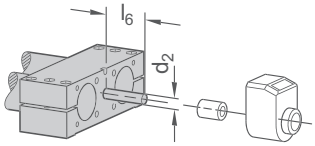
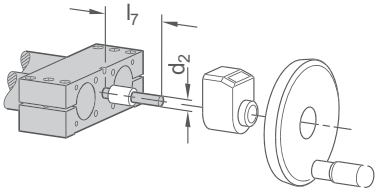
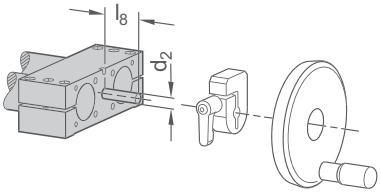
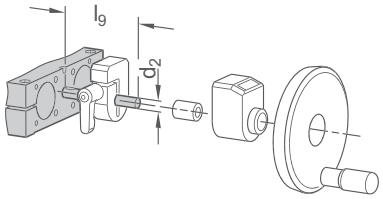
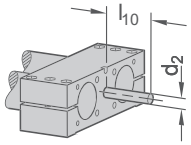
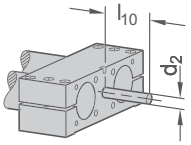
RH	Right-hand thread
LH	Left-hand thread

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

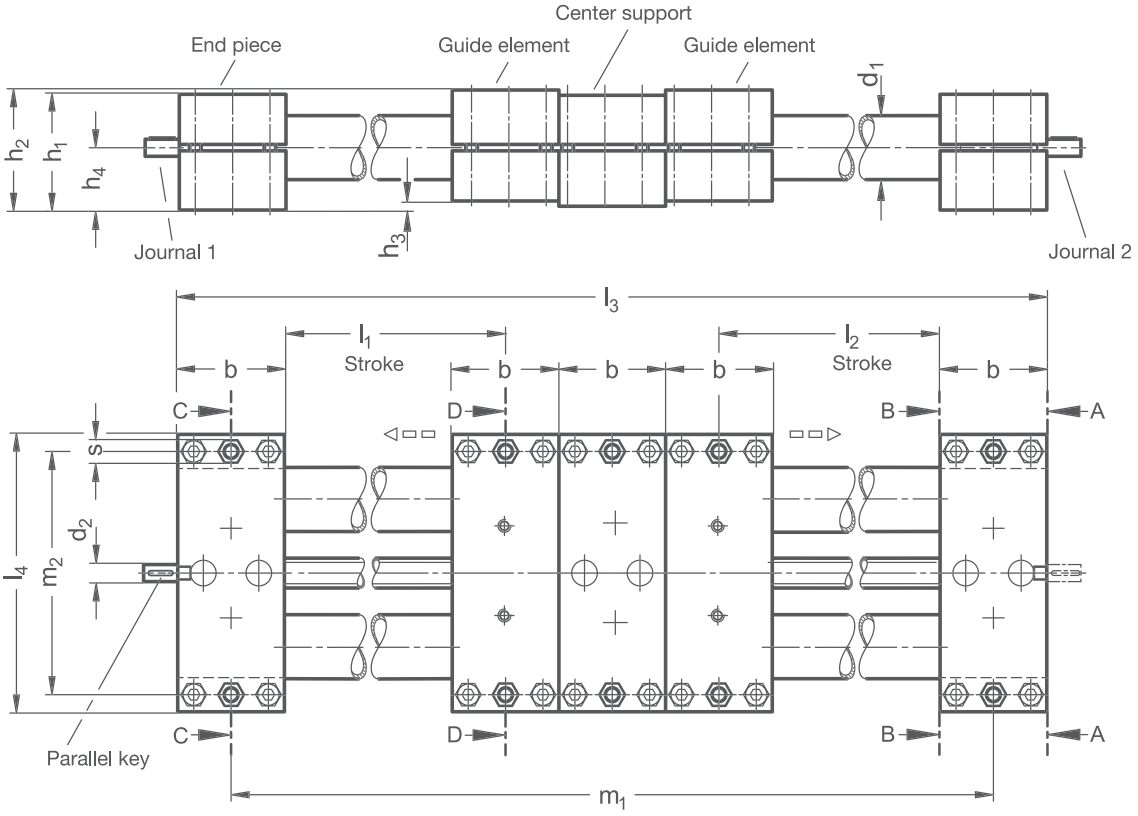
PRODUCT INFO

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.

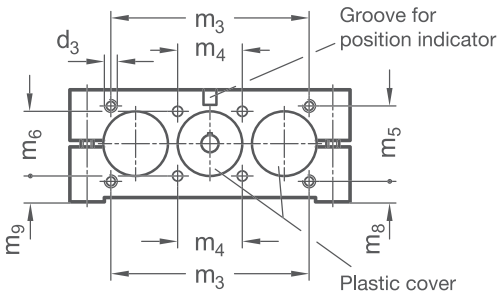
Double tube linear units have high torsional stiffness and can handle high weights and torques. Depending on the design, the part to be moved is fastened to the guide element or the guide element itself is installed at the place of use such that the entire linear unit moves together.

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.

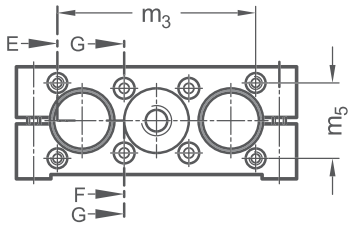
RoHS-compliant product



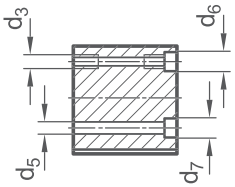
View **A-A**
(end piece outside)



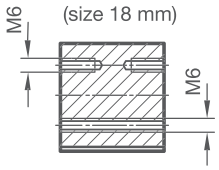
View **B-B**
(end piece inside)



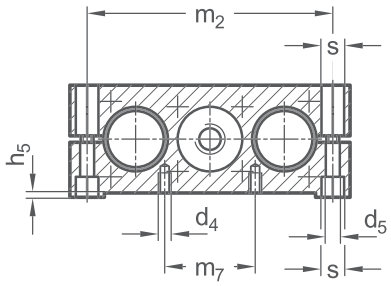
Sectional view **E-F**
(size 30 to 60 mm)



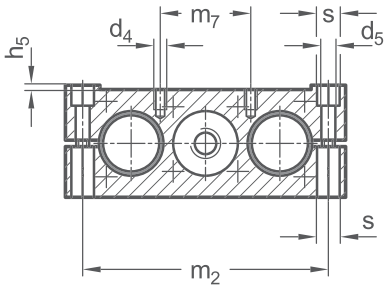
Sectional view **G-G**
(size 18 mm)



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

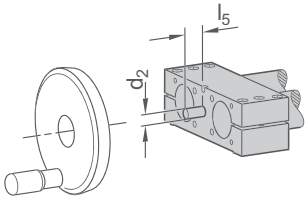
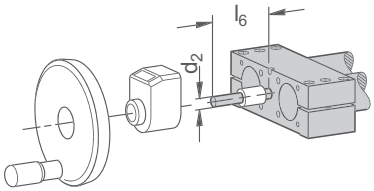
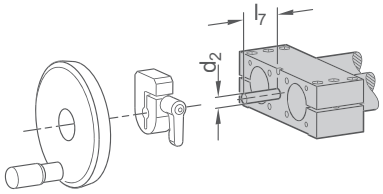
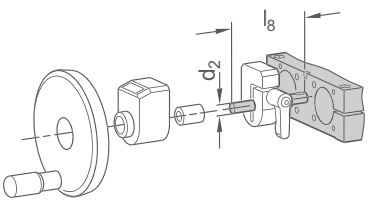
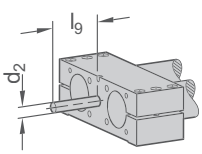
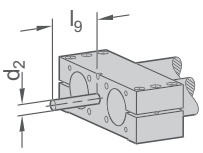
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined •Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, 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

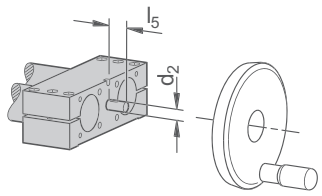
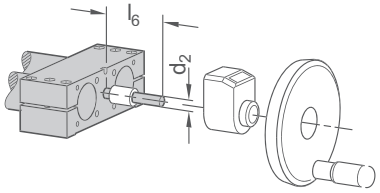
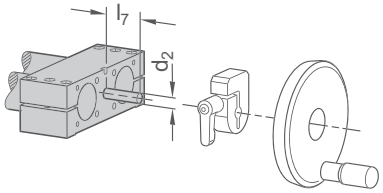
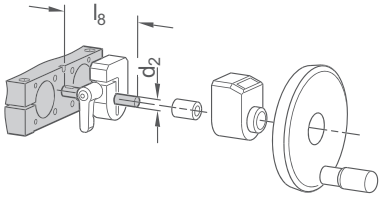
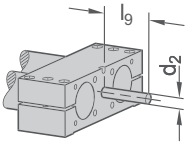
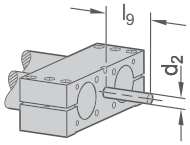
RH	Right-hand thread
LH	Left-hand thread

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

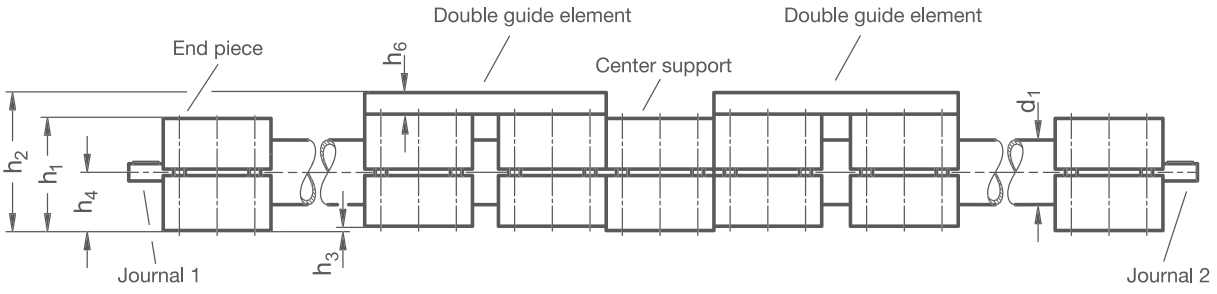
PRODUCT INFO

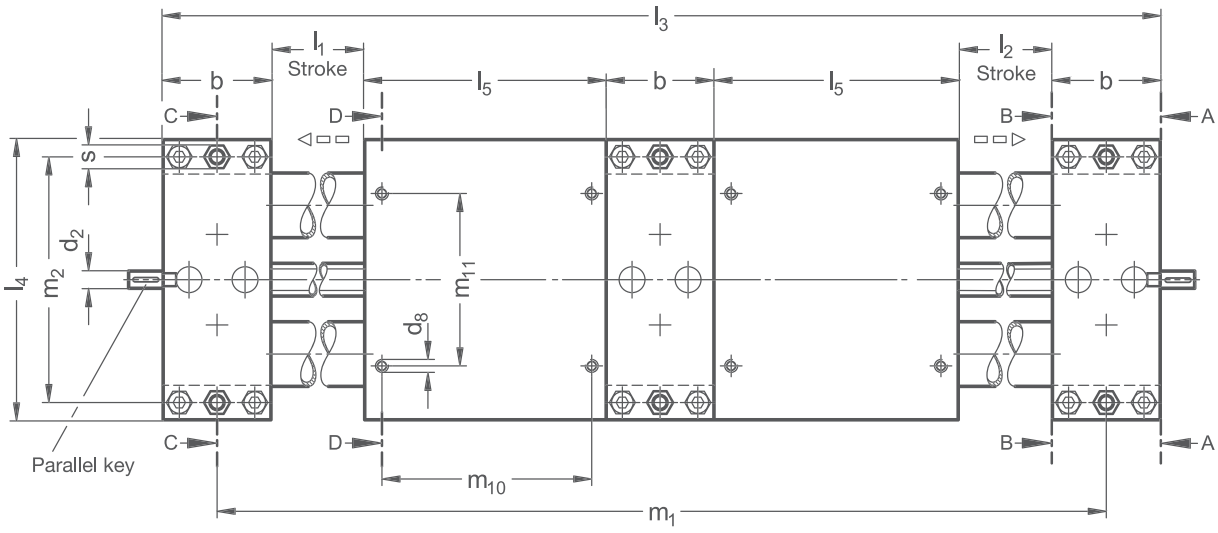
The guide tubes of the **double tube linear units VD3D** are made of chrome-plated steel or polished stainless steel precision tubes. The aluminum end pieces connect the tubes and form a solid linear guide together with the guide element. Two independent spindles with ball bearings on each side are installed 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.

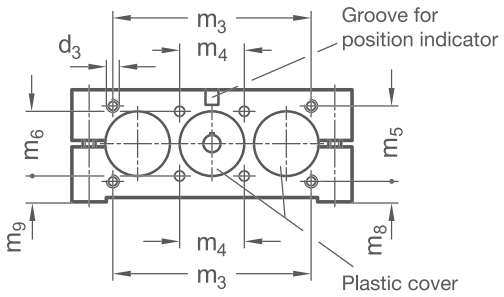
Possible accessories are already taken into account in the selection of the linear units according to the options given in the tables. This ensures, for example, that the journal lengths z_1 and z_2 are appropriate for attachment of the accessories. The accessories are not included with the linear units.

RoHS-compliant product

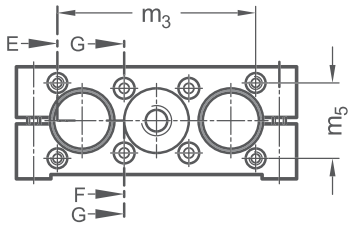




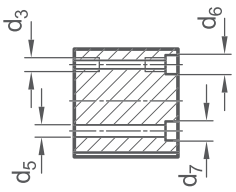
View **A-A**
(end piece outside)



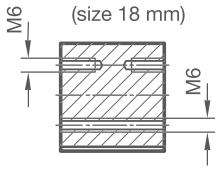
View **B-B**
(end piece inside)



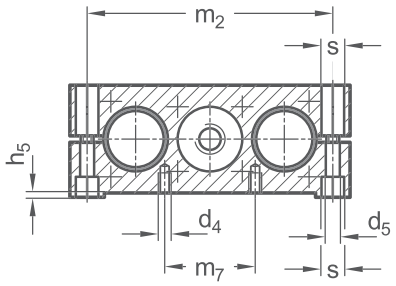
Sectional view **E-F**
(size 30 to 60 mm)



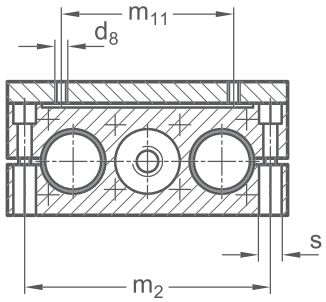
Sectional view **G-G**
(size 18 mm)



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

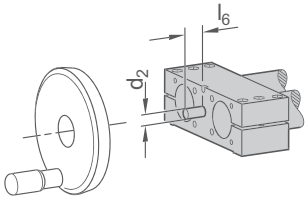
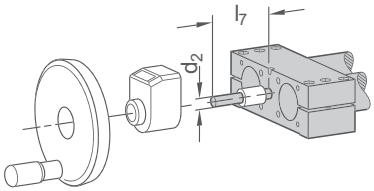
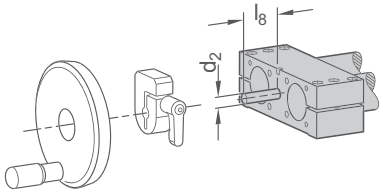
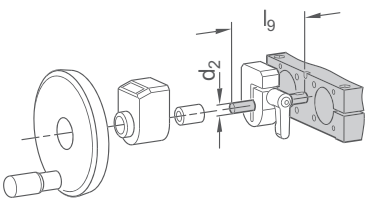
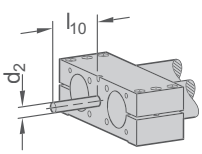
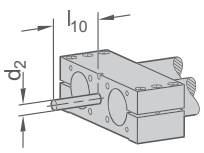
ST	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	STS	Aluminum - steel • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, powder-coated, 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

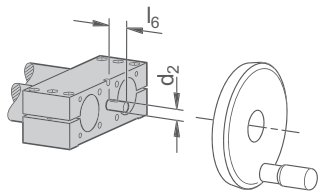
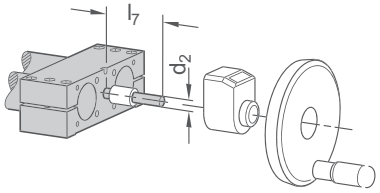
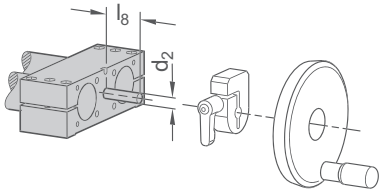
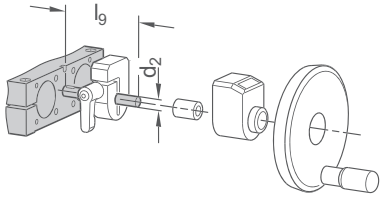
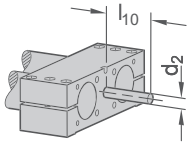
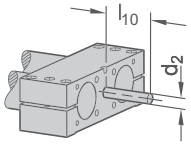
RH	Right-hand thread
LH	Left-hand thread

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.

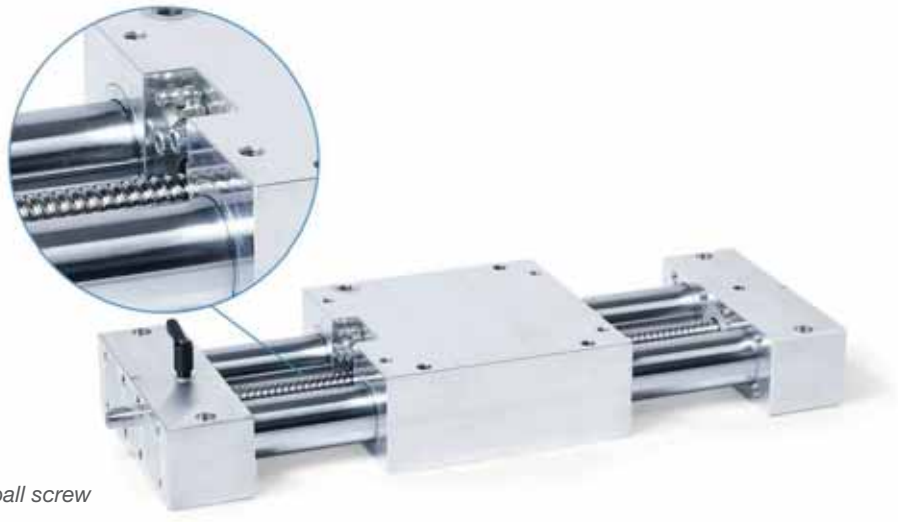
The center spindle with ball bearings on both sides can be designed as a trapezoidal or fine thread spindle or as a recirculating ball screw. The force transmission between the recirculating ball screw and the ball screw nut takes place via rolling elements. This makes it possible to adjust the ball 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

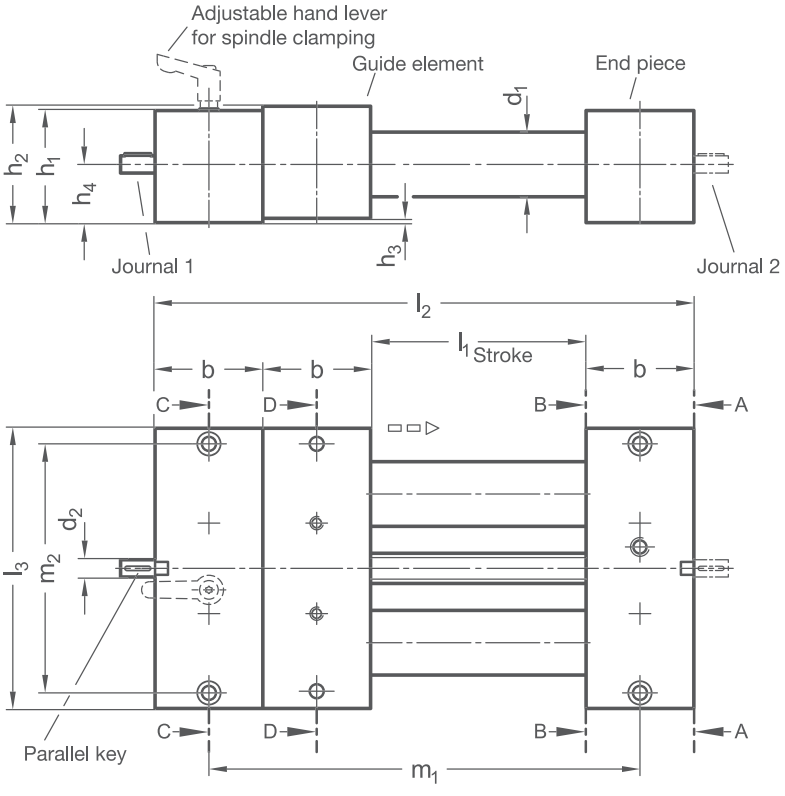
PRODUCT INFO

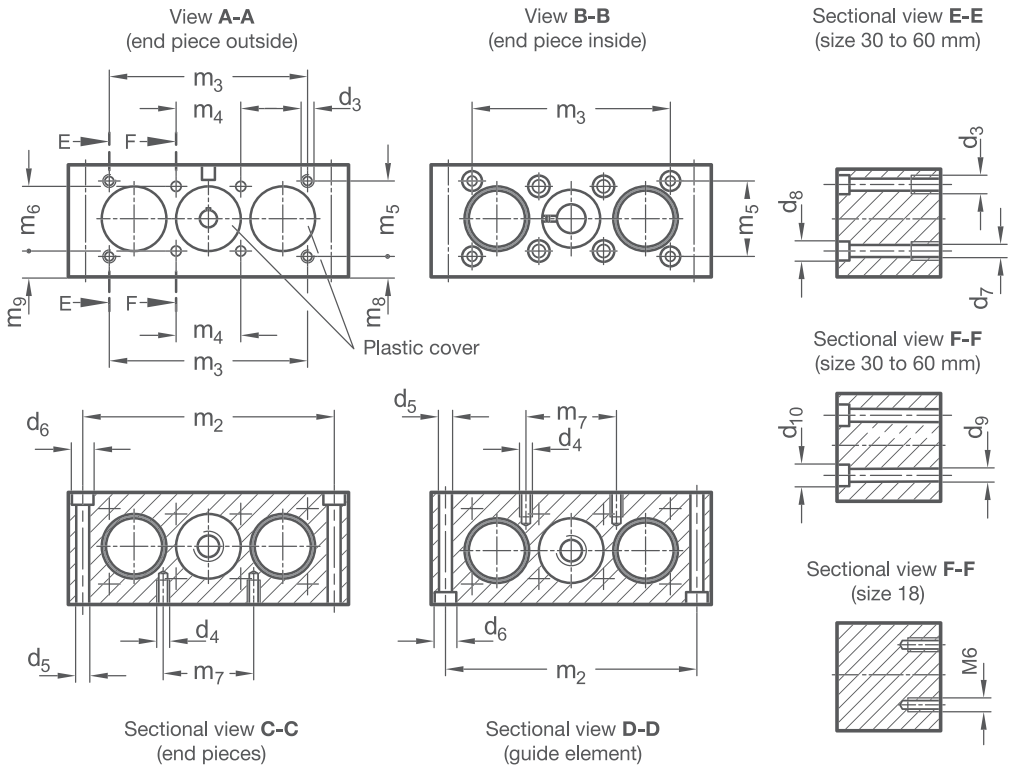
The round guides of the **precision double tube linear units PD1E** are available either as tubes or solid shafts. They are made of chrome-plated or hard-chrome-plated steel or polished stainless steel. The end pieces of aluminum connect the tubes or solid shafts and form a precise linear guide together 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

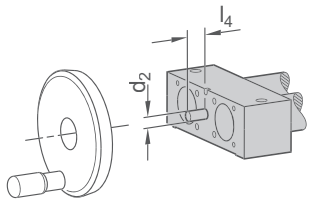
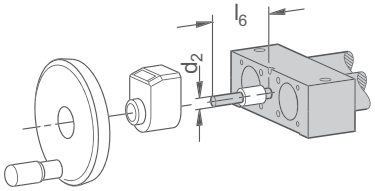
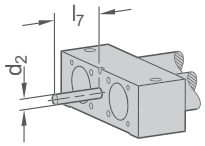
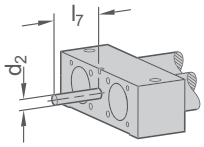
1ST	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	2ST	Double solid shaft roller slideway / trapezoidal lead screw (only for 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

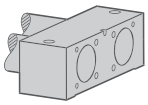
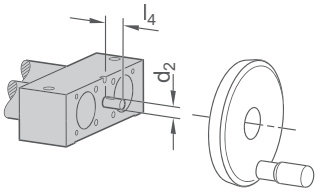
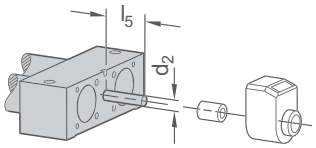
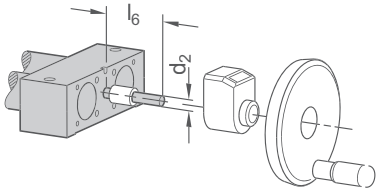
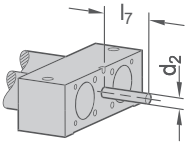
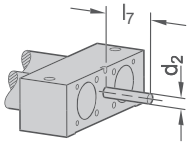
RH	Right-hand thread
RHK	Right-hand thread with clamping ring and hand lever for spindle clamping
LH	Left-hand thread
LHK	Left-hand thread with clamping ring and hand lever for spindle clamping

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

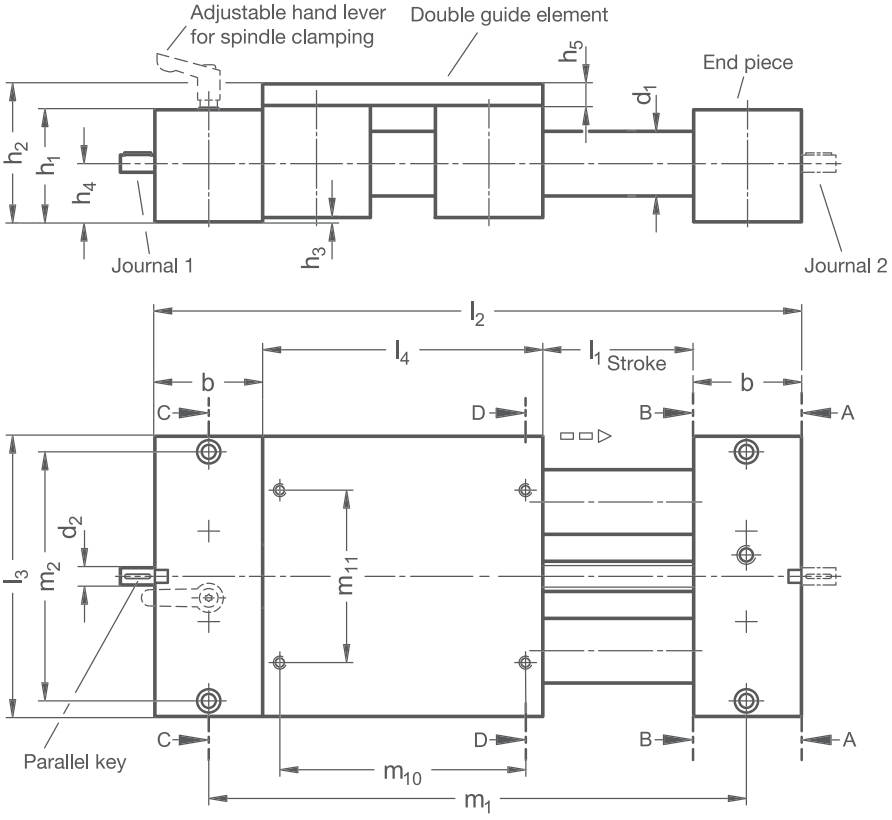
PRODUCT INFO

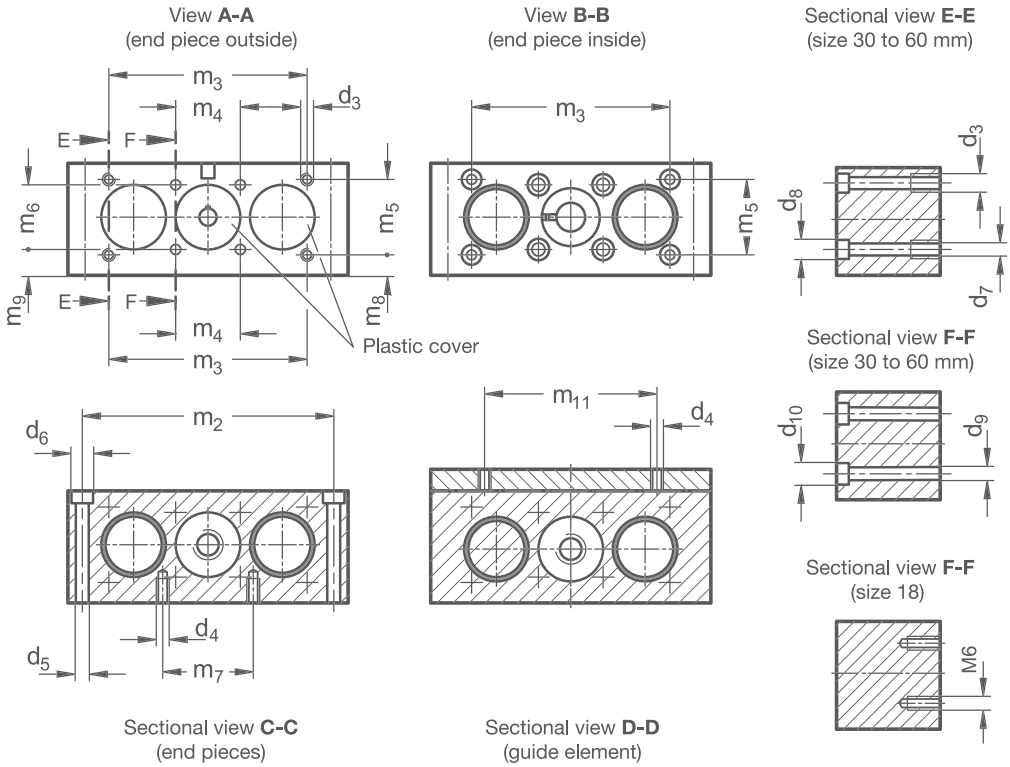
The guide tubes of the **precision double tube linear units PD1D** are made of chrome-plated steel or polished stainless steel precision tubes. The end pieces of aluminum connect the tubes and form a precise linear guide together with the guide element. The centered continuous spindle has trapezoidal 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

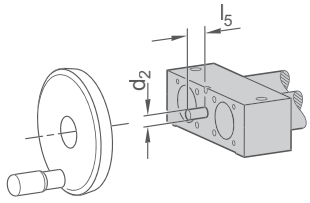
Spindle thread direction / clamping
r

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

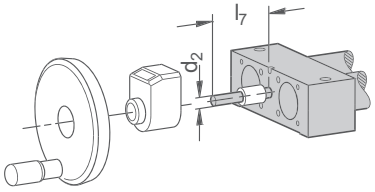
Journal
z_1

B	Journal for handwheel



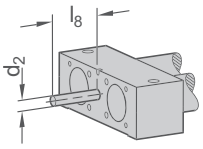
Journal length l_5

D	Journal for position indicator and handwheel (torque support required for d_1 =18)



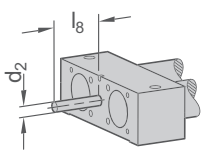
Journal length l_7

Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



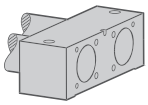
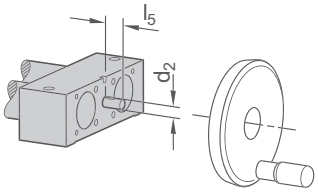
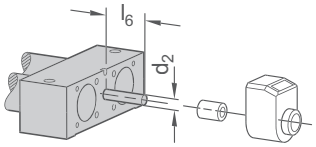
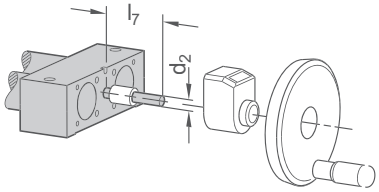
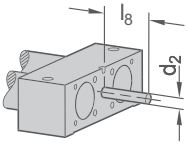
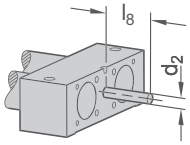
Journal length l_8

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

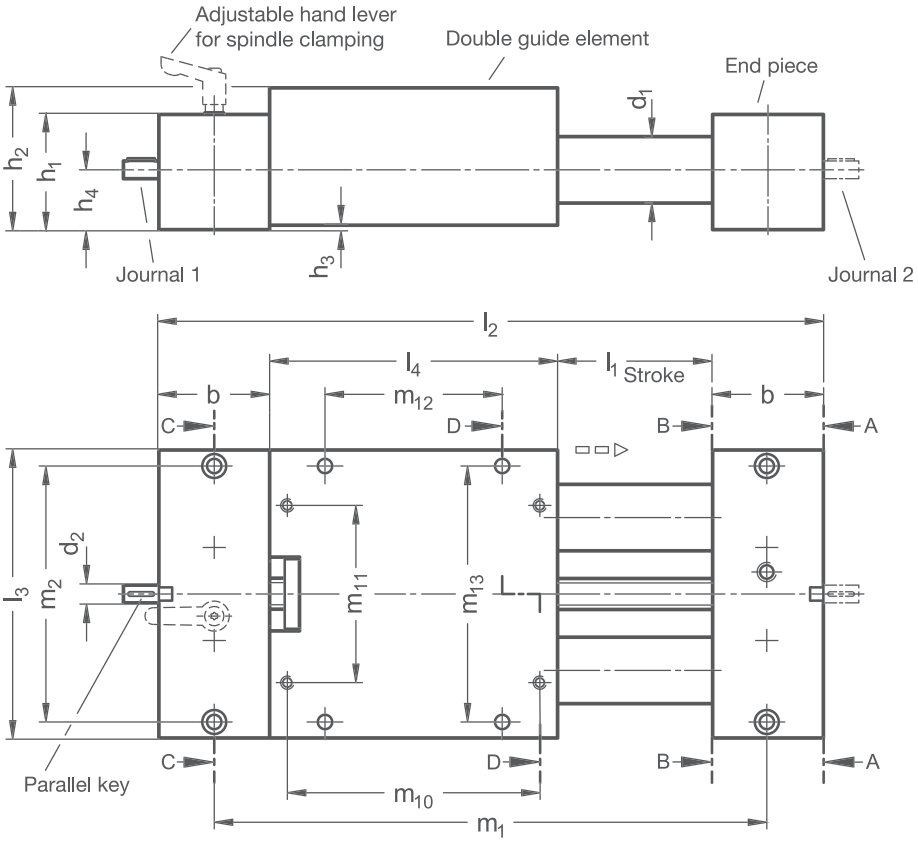
PRODUCT INFO

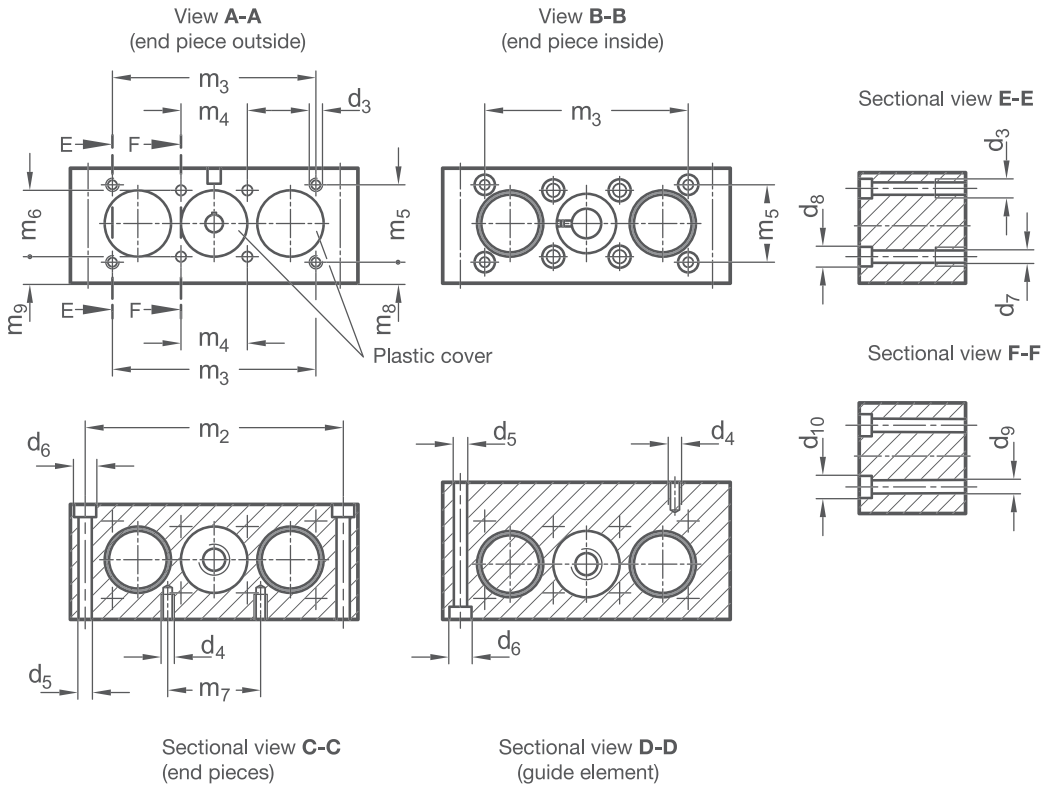
The round guides of the **precision double tube linear units PD1DK** are made of hard-chrome-plated steel or polished stainless steel solid shafts. The aluminum CNC end pieces connect the solid shafts and form a very precise linear guide together with the guide element. A continuous whirled or rolled 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

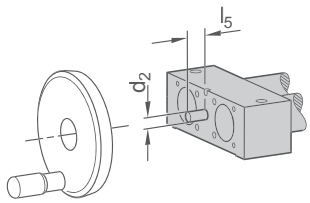
Spindle thread direction / clamping
r

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

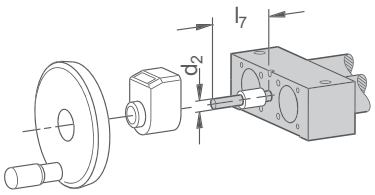
Journal
z_1

B	Journal for handwheel



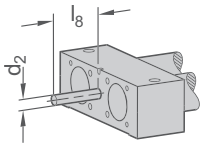
Journal length l_5

D	Journal for position indicator & handwheel (torque support required for d_1 =18)



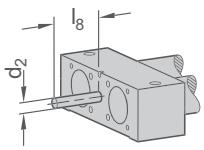
Journal length l_7

Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



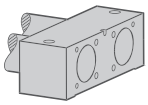
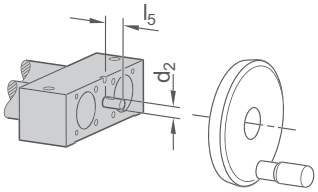
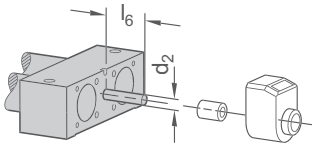
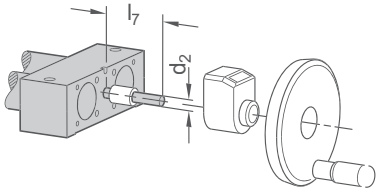
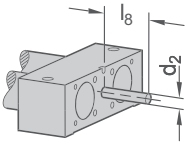
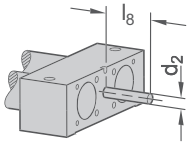
Journal length l_8

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

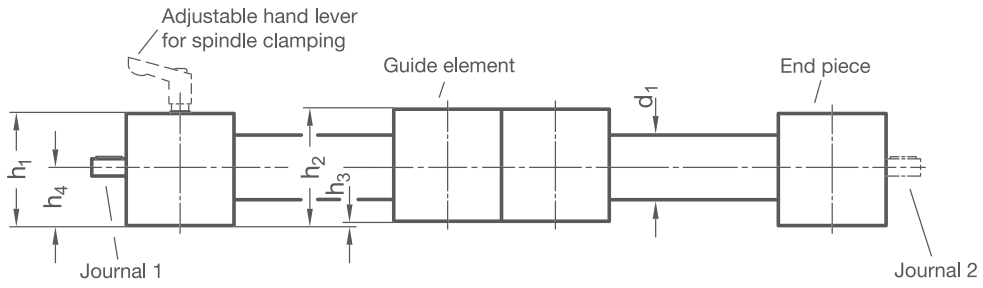
PRODUCT INFO

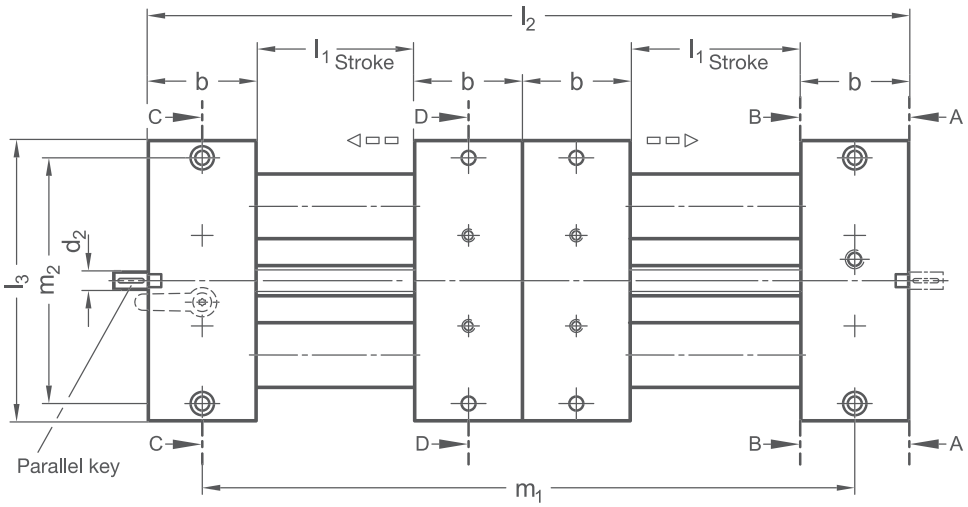
The round guides of the **precision double tube linear units PD2E** are available either as tubes or solid shafts. They are made of chrome-plated or hard-chrome-plated steel or polished stainless steel. The end pieces of aluminum connect the tubes or solid shafts and form a precise linear guide together 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.

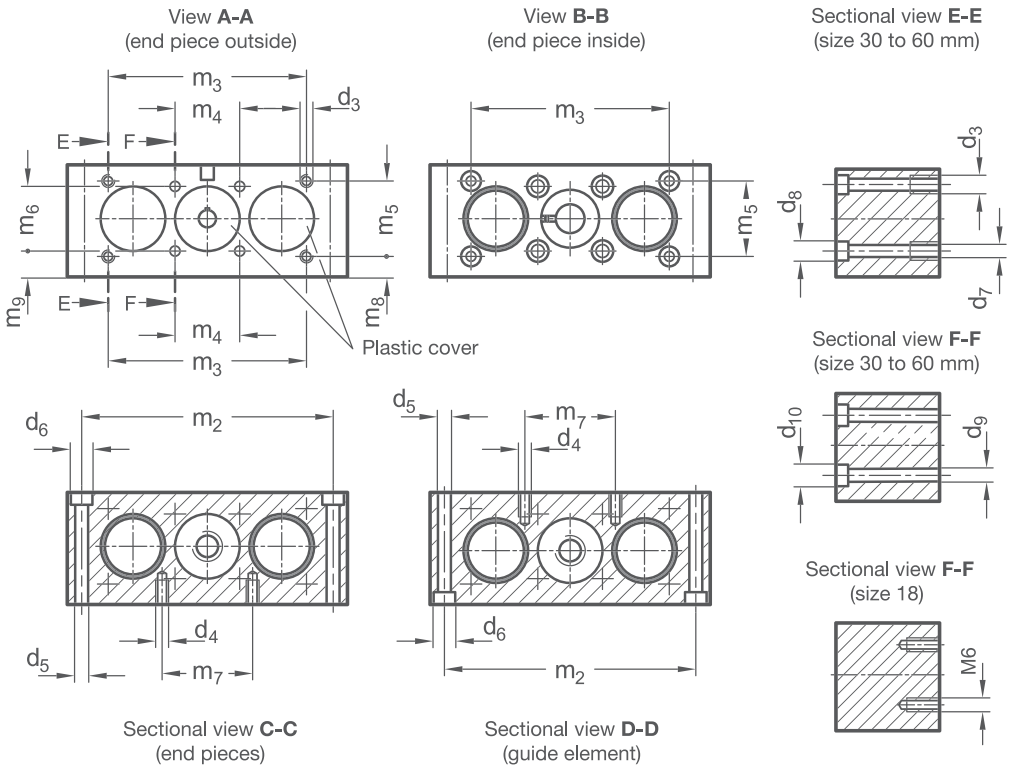
Double tube linear units have high torsional stiffness and can handle high weights and torques.

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

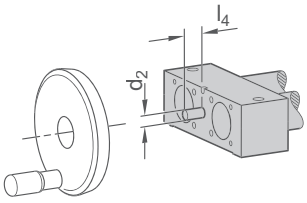
Spindle thread direction / clamping
r

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

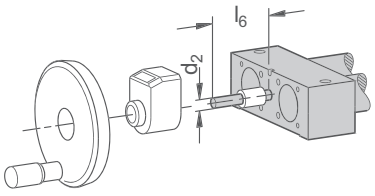
d_1	Spindle Ø	Spindle pitch **p**		Journal diameter d_2	Journal length B l_4	Journal length C l_5	Journal length D l_6	Individual journal length l_7
		Trapezoidal thread	Fine thread, metric					
18	10	3	1	6	16	30	46	16...46
25	14	4	1	8	16	36	52	16...67
30	14	4	1	8	16	36	52	16...67
40	20	4	1	12	17	42	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

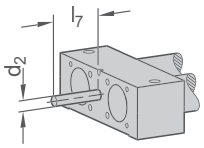
B	Journal for handwheel	D	Journal for position indicator & handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_7)



Journal length l_4

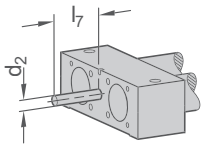


Journal length l_6



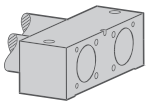
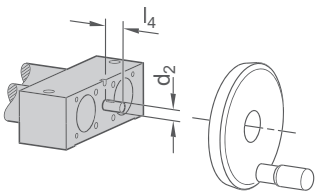
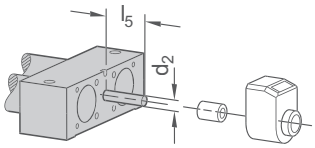
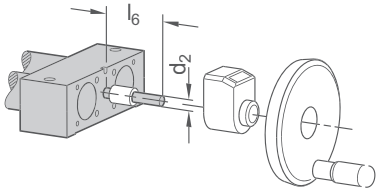
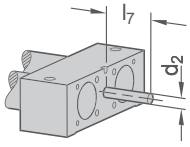
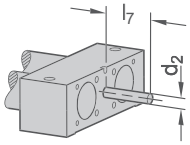
Journal length l_7

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

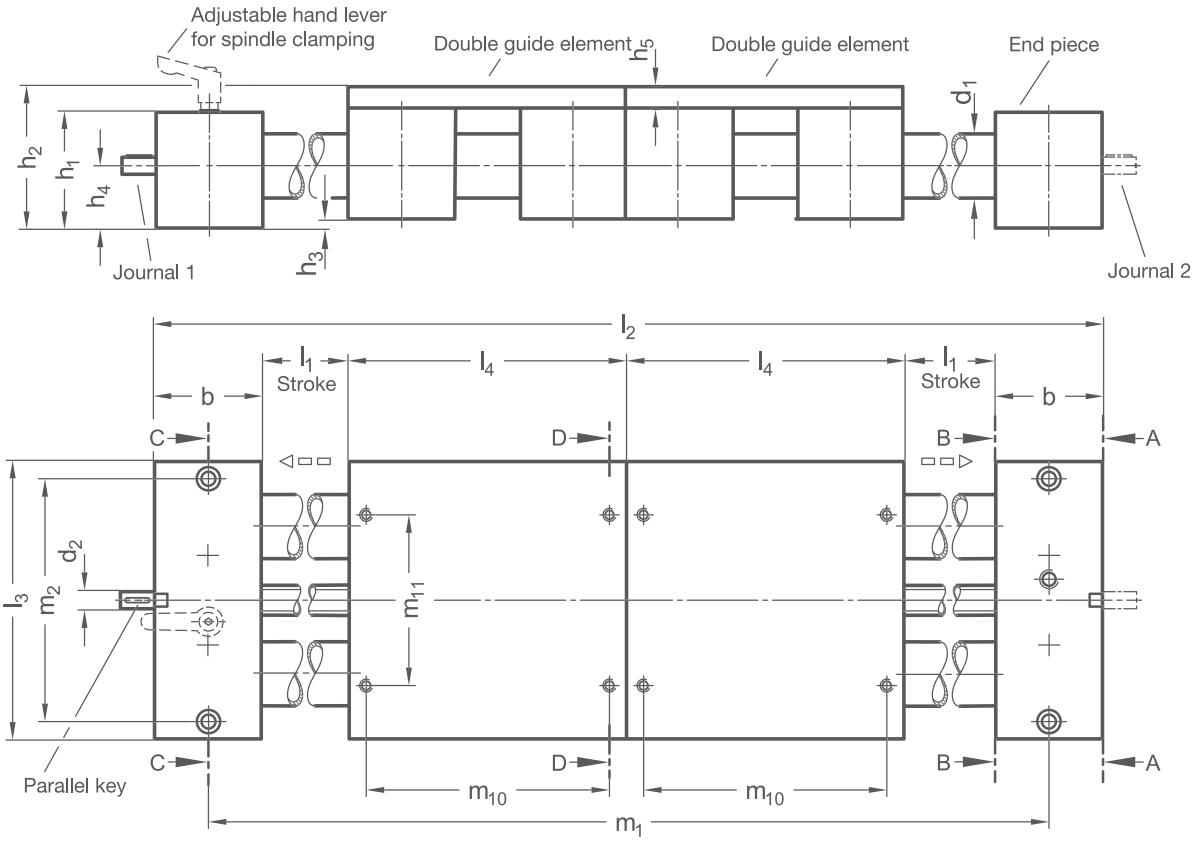
PRODUCT INFO

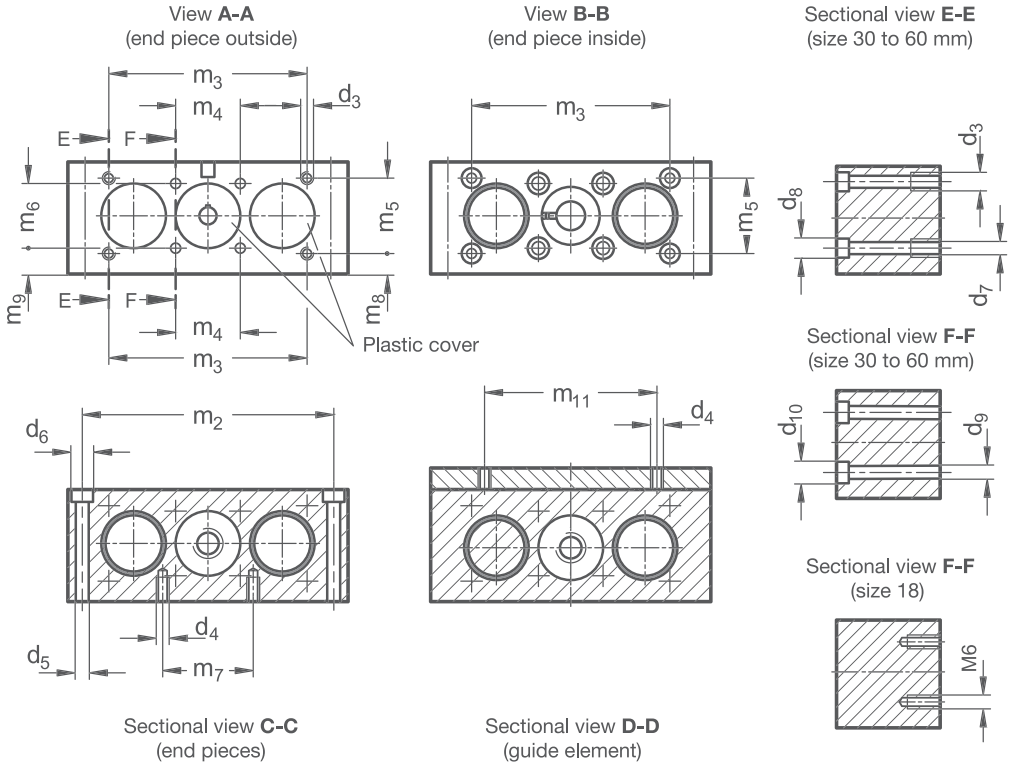
The guide tubes of the **precision double tube linear units PD2D** are made of chrome-plated steel or polished stainless steel precision tubes. The end pieces of aluminum connect the tubes and form a precise linear guide together with the guide elements. The centered continuous spindle has trapezoidal 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

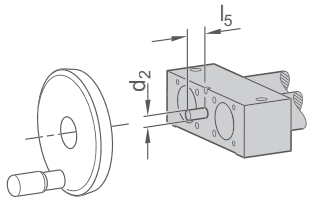
Spindle thread direction / clamping
r

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

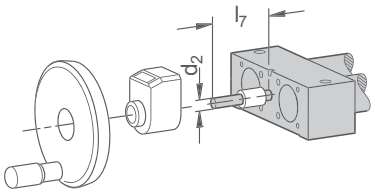
Journal
z_1

B	Journal for handwheel



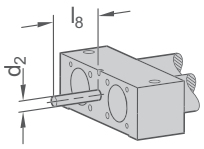
Journal length l_5

D	Journal for position indicator and handwheel (torque support required for d_1 =18)



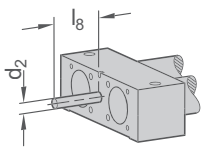
Journal length l_7

Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



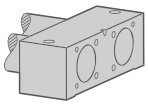
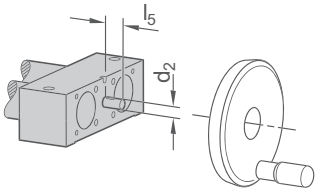
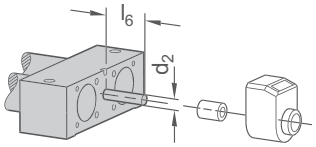
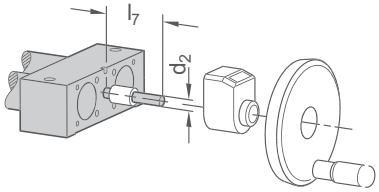
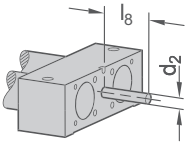
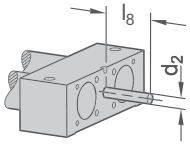
Journal length l_8

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

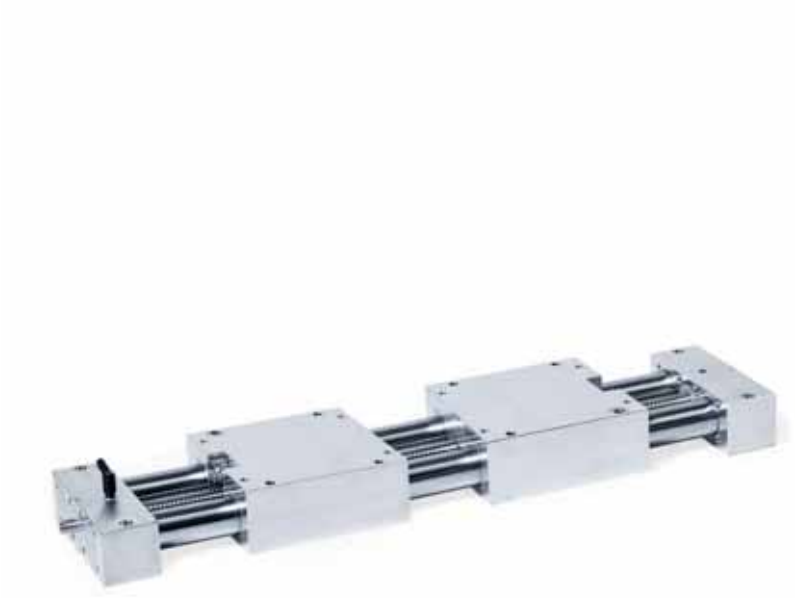
- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

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



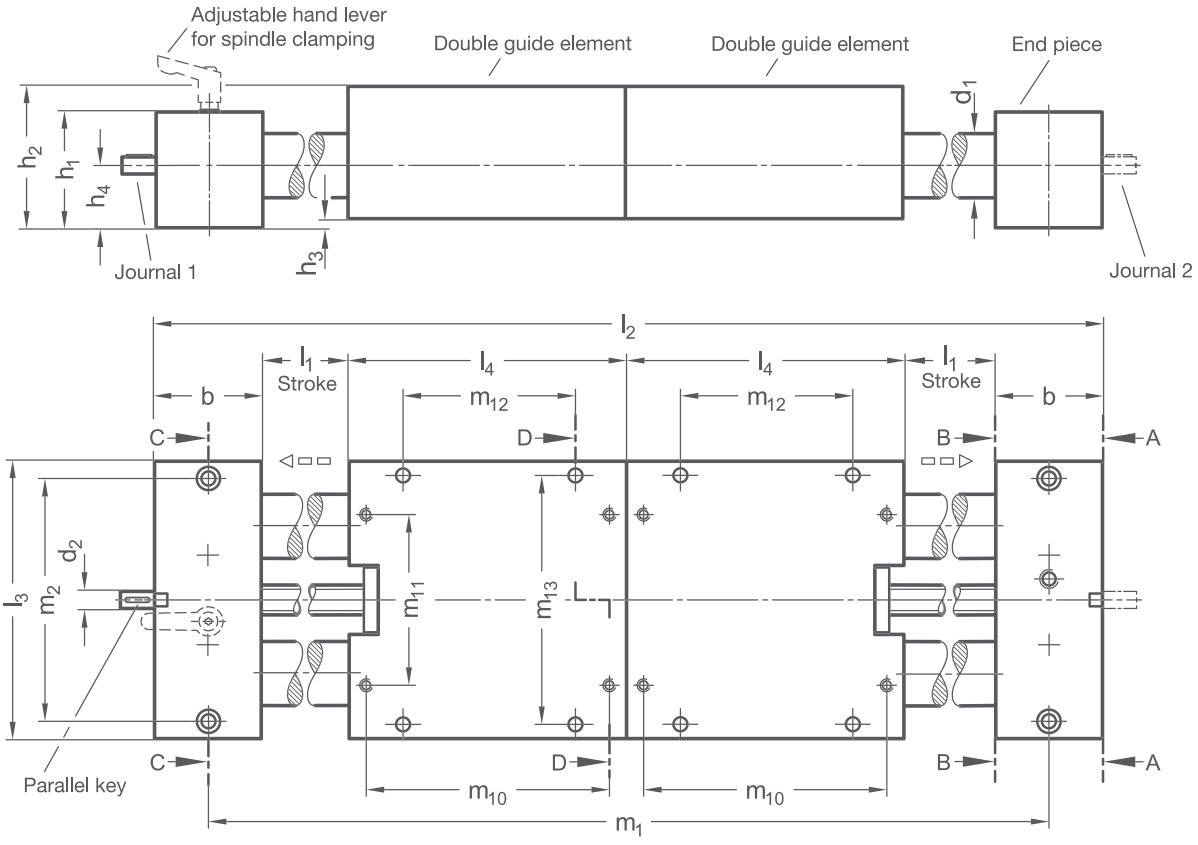
PRODUCT INFO

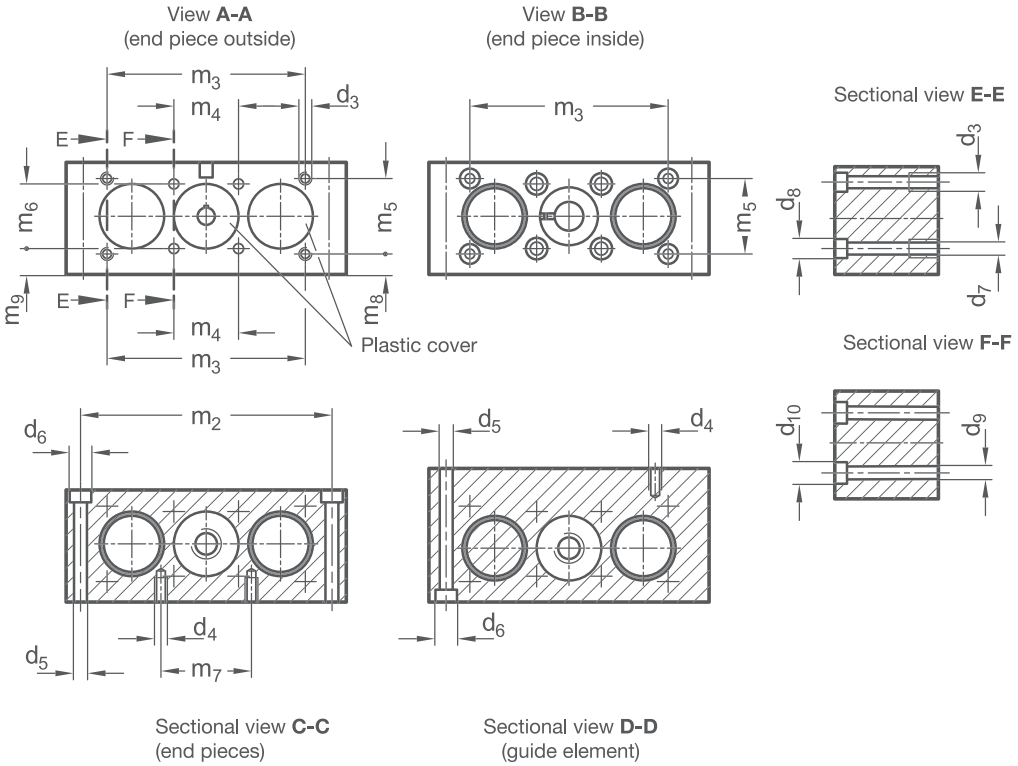
The round guides of the **precision double tube linear units PD2DK** are made of hard-chrome-plated steel or polished stainless steel solid shafts. The aluminum CNC end pieces connect the solid shafts and form a very precise linear guide together with the guide elements. A continuous whirled or rolled 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

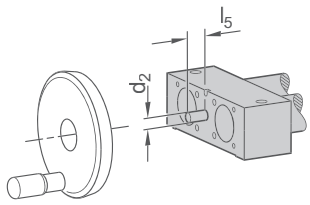
Spindle thread direction / clamping
r

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

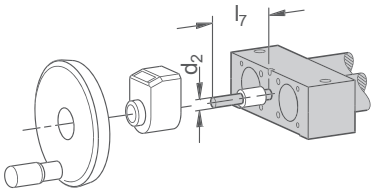
Journal
z_1

B	Journal for handwheel



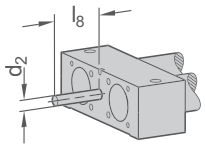
Journal length l_5

D	Journal for position indicator & handwheel (torque support required for d_1 =18)



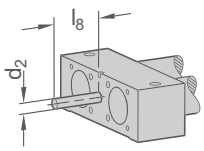
Journal length l_7

Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



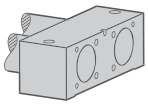
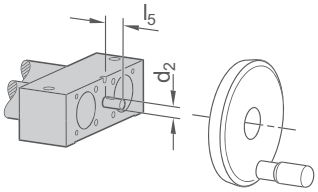
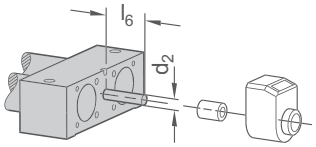
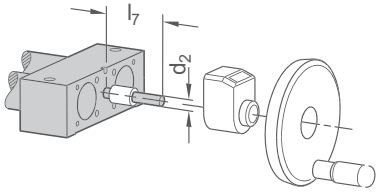
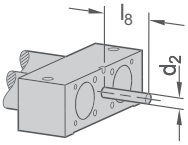
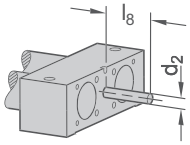
Journal length l_8

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

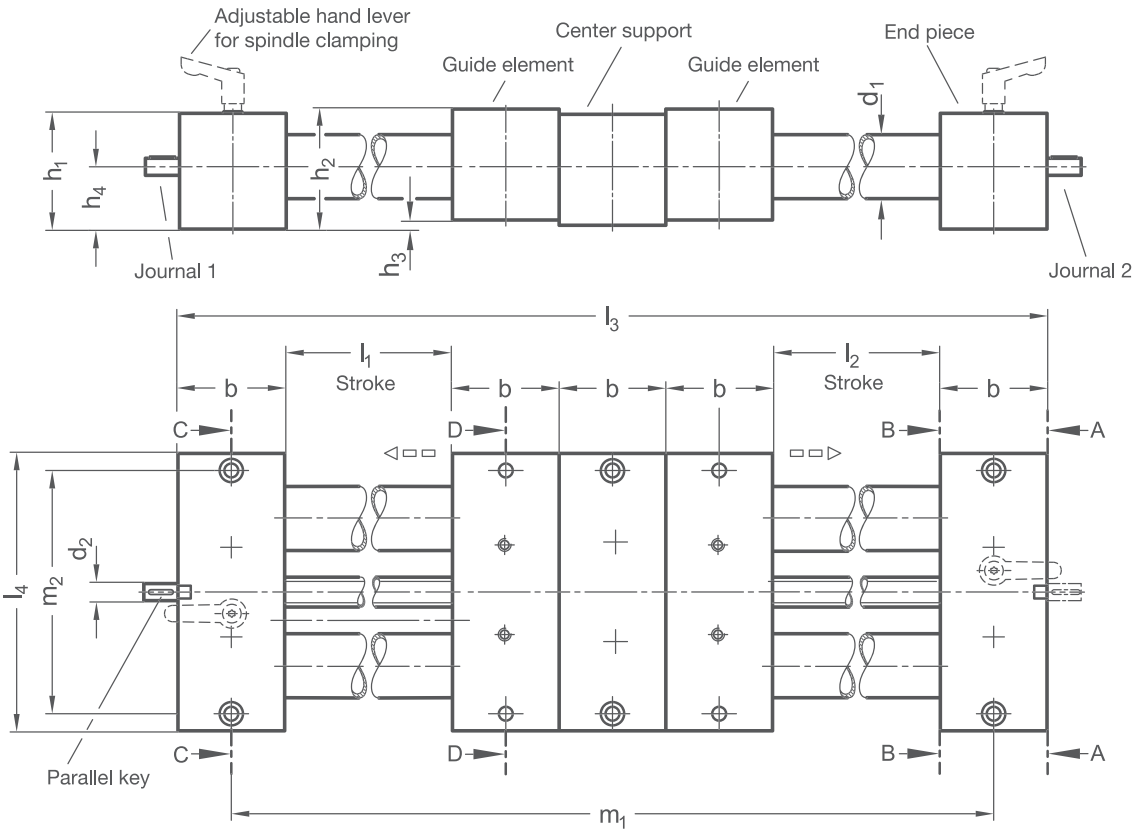
PRODUCT INFO

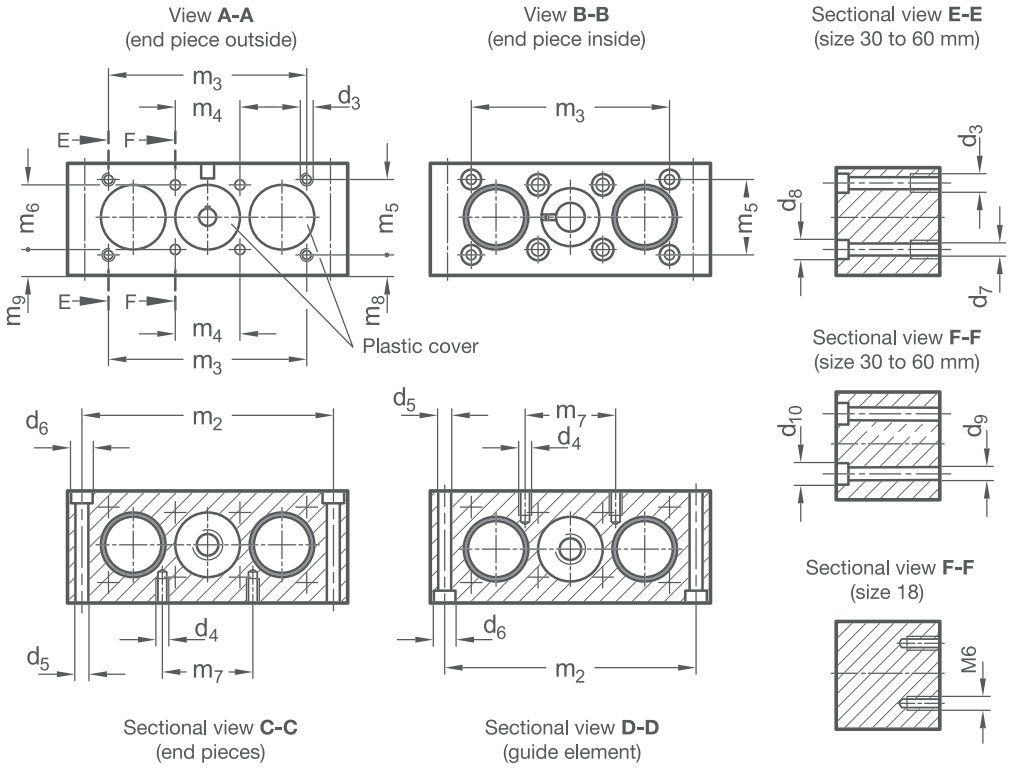
The round guides of the **precision double tube linear units PD3E** are available either as tubes or solid shafts. They are made of chrome-plated or hard-chrome-plated steel or polished stainless steel. The end pieces of aluminum connect the tubes or solid shafts and form a precise linear guide together 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

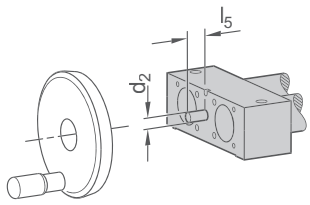
1ST	Double tube sliding guide / trapezoidal lead screw • Guide tubes: Steel, chrome-plated • End pieces / guide elements: Aluminum, bright. Assembly surfaces: Machined • Trapezoidal / fine thread spindle: Steel, with ball bearing	2ST	Double solid shaft roller slideway / trapezoidal lead screw (only for 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

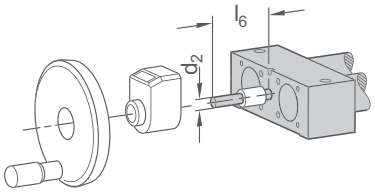
d_1	Spindle **Ø**	Spindle pitch **p_1** Trapezoidal thread	 Fine thread, metric	Spindle pitch **p_2** Trapezoidal thread	 Fine thread, metric	Journal-durchmesser **d_2**	Journal length B **l_5**	Journal length D **l_6**	Individual journal length **l_7**
18	10	3	1	3	1	6	16	46	16...46
25	14	4	1	4	1	8	16	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

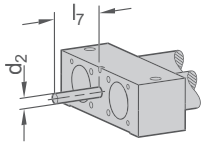
B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_7)



Journal length l_5

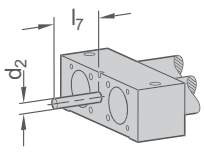


Journal length l_6



Journal length l_7

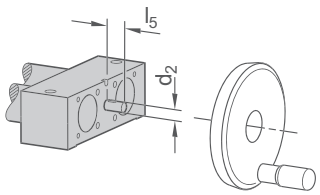
Hxx	Individual journal length without keyway (for xx, enter values from column l_7)



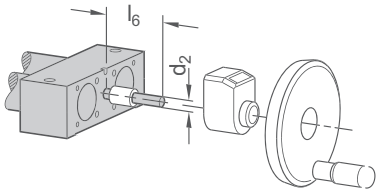
Journal length l_7

Journal
z_2

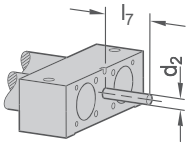
B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_7)



Journal length l_5

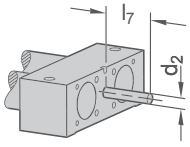


Journal length l_6



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

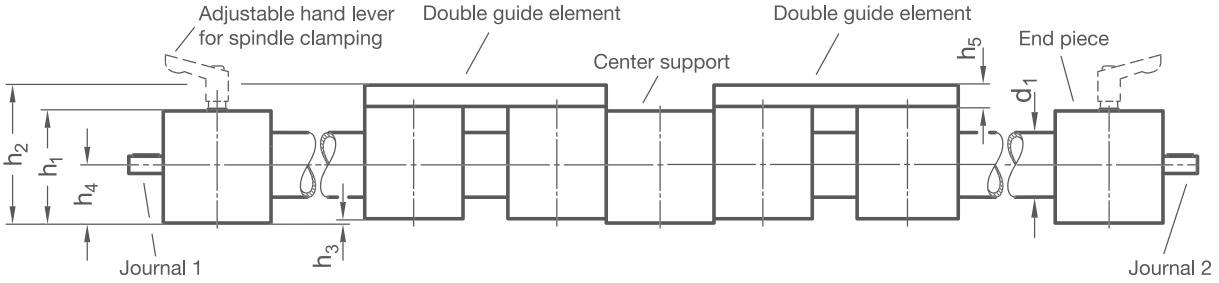
PRODUCT INFO

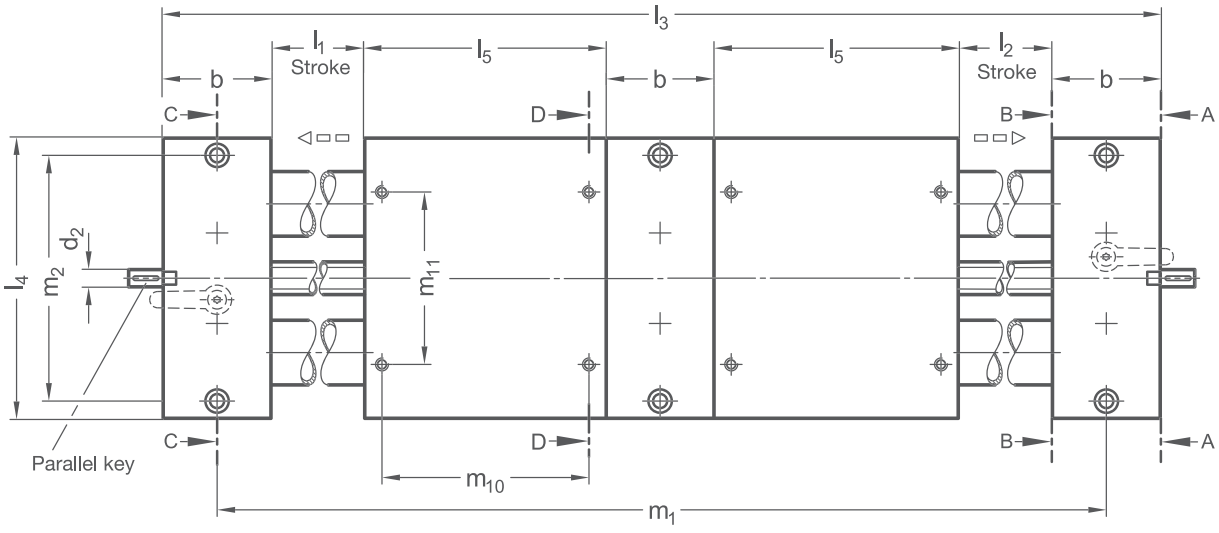
The guide tubes of the **precision double tube linear units PD3D** are made of chrome-plated steel or polished stainless steel precision tubes. The end pieces of aluminum connect the tubes and form a precise linear guide together with the guide elements. The centered independent spindles have trapezoidal 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.

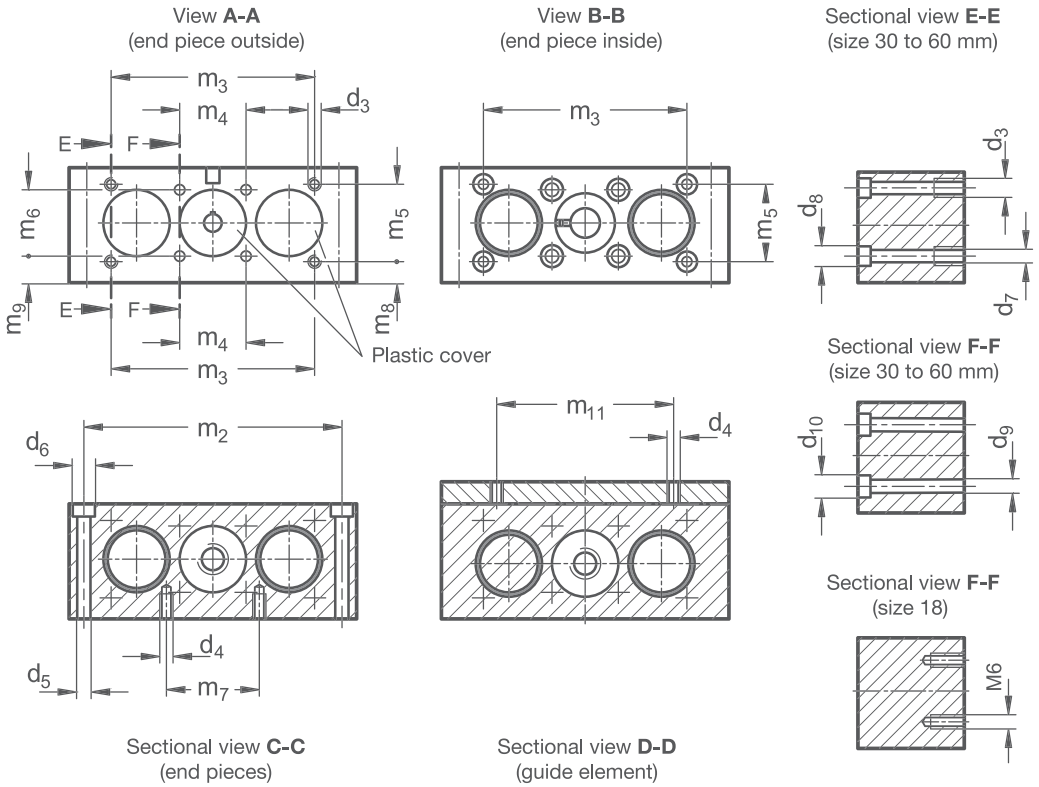
Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for even higher loads.

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

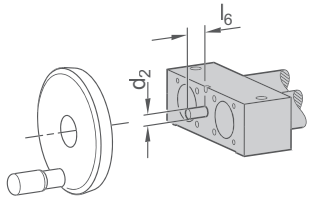
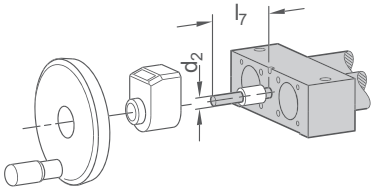
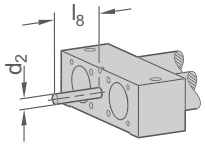
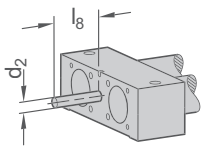
Version
a

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

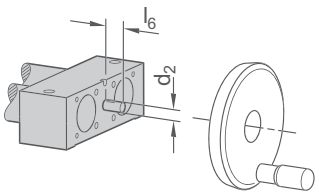
d_1	Spindle **Ø**	Spindle pitch **p_1**		Spindle pitch **p_2**		Journal diameter **d_2**	Journal length B **l_6**	Journal length D **l_7**	Individual journal length **l_8**
		Trapezoidal thread	Fine thread, metric	Trapezoidal thread	Fine thread, metric				
18	10	3	1	3	1	6	16	46	16...46
30	14	4	1	4	1	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

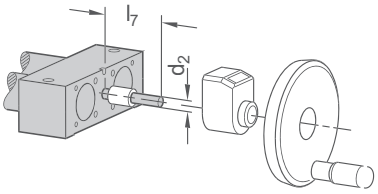
B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_8)
 Journal length l_6		 Journal length l_7		 Journal length l_8	
Hxx	Individual journal length without keyway (for xx, enter values from column l_8)				
 Journal length l_8					

Journal
z_2

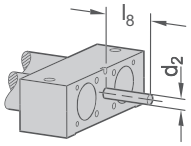
B	Journal for handwheel	D	Journal for position indicator and handwheel (torque support required for d_1 =18)	Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



Journal length l_6

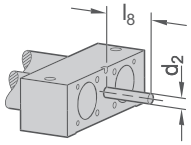


Journal length l_7



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

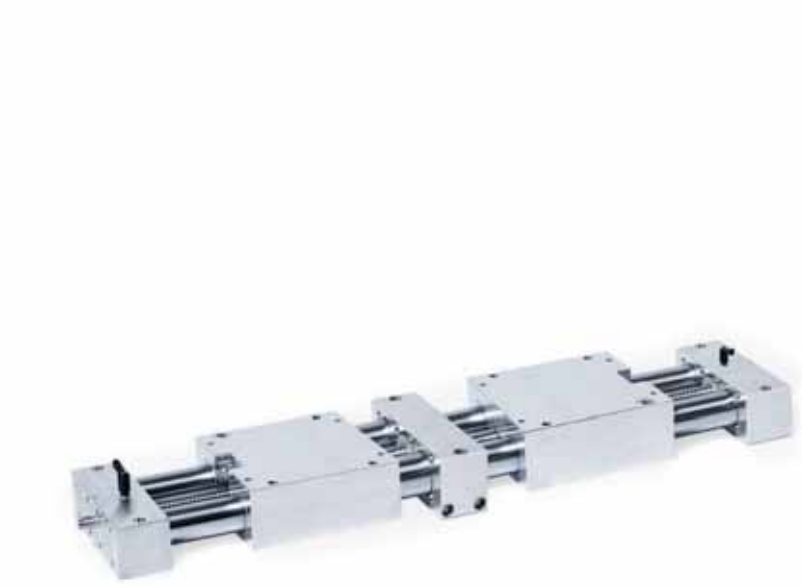
- Handwheels **VZH** → *see page 356*
- Position indicators **VZPM / VZPE** → *see page 358 / 360*
- Torque supports **VZDD** → *see page 368*
- Angle gears **YLD** → *see page 378*
- Transfer units **VA** → *see page 370*

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



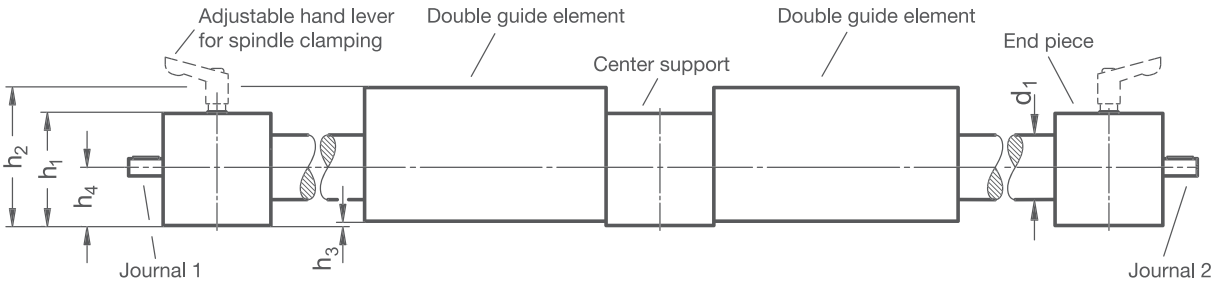
PRODUCT INFO

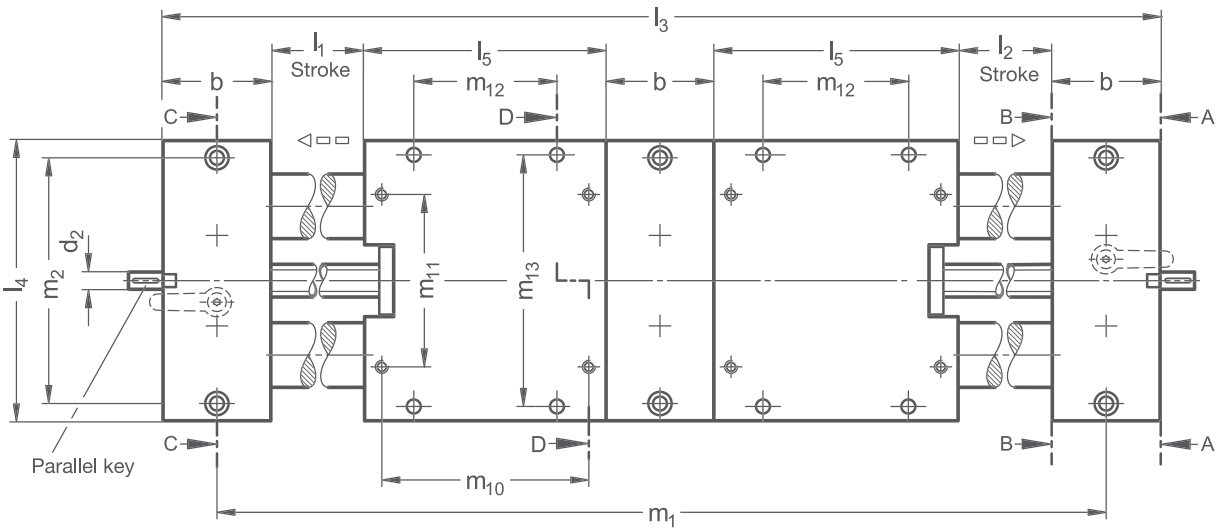
The round guides of the **precision double tube linear units PD3DK** are made of hard-chrome-plated steel or polished stainless steel solid shafts. The aluminum CNC end pieces connect the solid shafts and form a very precise linear guide together with the guide elements. Two independent whirled or rolled 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.

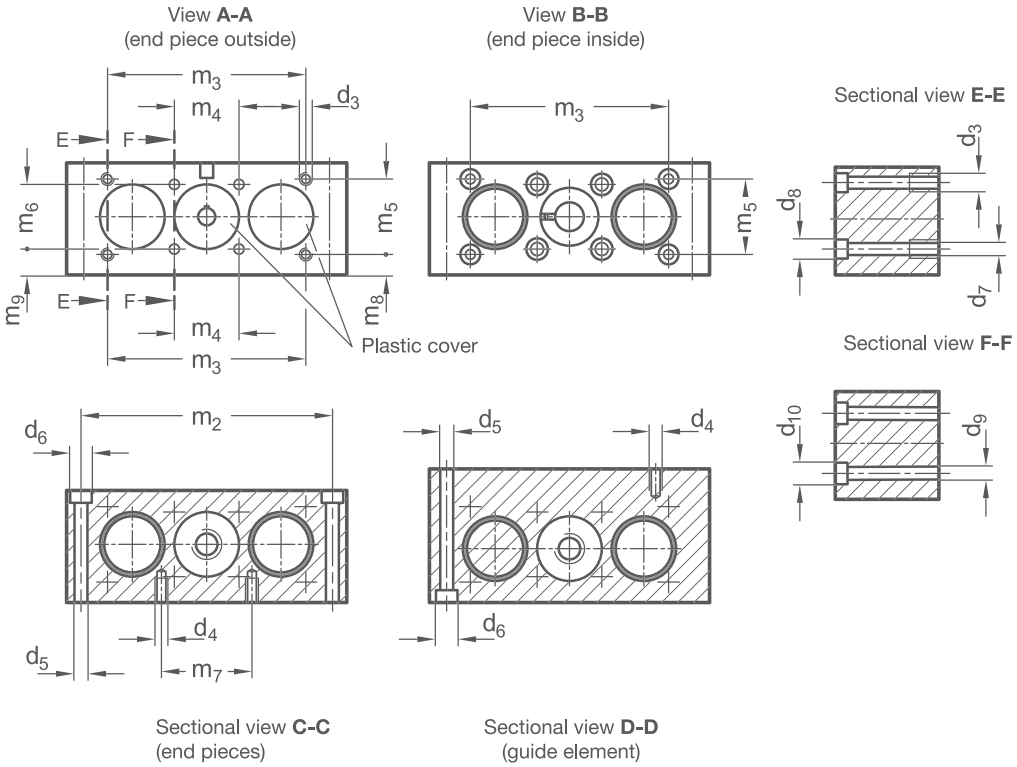
Double tube linear units have high torsional stiffness and can handle high weights and torques. The double guide element distributes the load among four guide points, allowing for even higher loads.

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

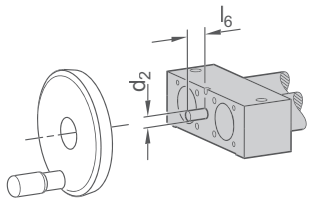
3ST	Double solid shaft roller slideway / ball screw • Solid guide shafts: Steel, polished and hard-chrome-plated • End pieces / guide elements: Aluminum, CNC-milled parts • ball screw: With ball bearing
3ED	Double solid shaft roller slideway / ball screw • Solid guide shafts: Stainless steel, induction-hardened 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

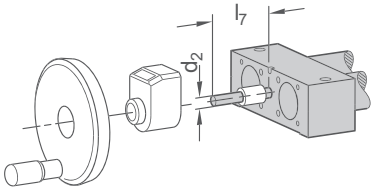
Journal
z_1

B	Journal for handwheel



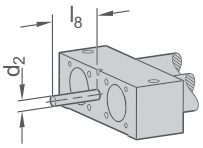
Journal length l_6

D	Journal for position indicator & handwheel (torque support required for d_1 =18)



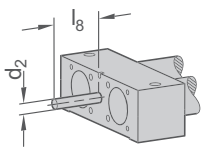
Journal length l_7

Gxx	Individual journal length with keyway (for xx, enter values from column l_8)



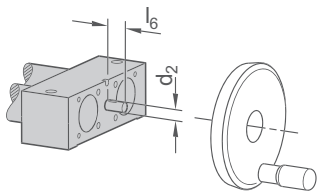
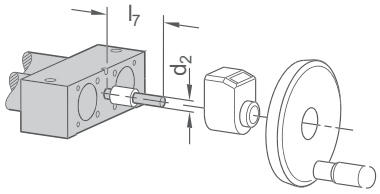
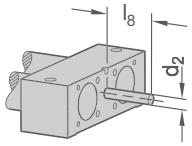
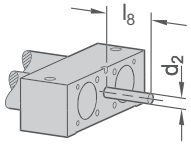
Journal length l_8

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