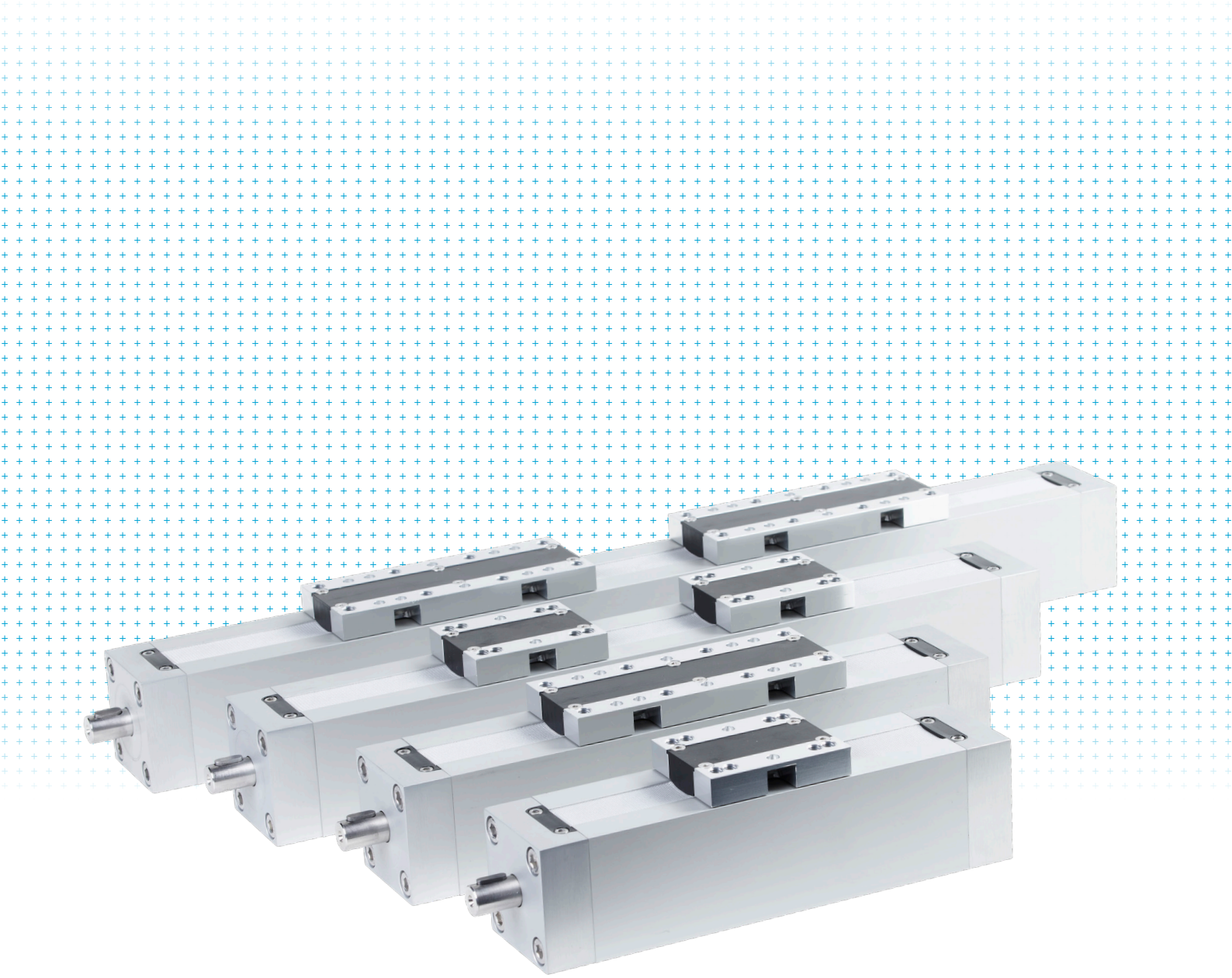
INOCON



Profile Linear Units

Innovative assembly components inocon.de

Profile Linear Units

Linear units have been a fixed part of the product selection for many years. A diverse range of designs plus various drive and kinematics options support countless different applications.

To cover an even wider range of scenarios, the selection has now been expanded with profile linear units. This new category is particularly suited for the automation of packaging systems. They also offer features that are extremely advantageous in many industrial applications.

The new profile linear units are based on precise and especially stable aluminum profiles that can be individually machined. Only a spindle drive is available for both profile diameters, 30 and 50.

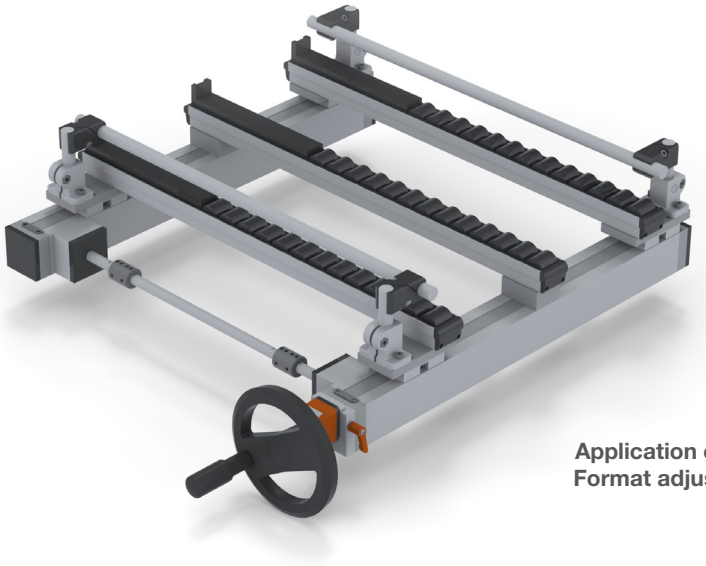
Depending on the chosen drive concept, additional guide element options are available with respect to the length, clamping capability and the quantity per linear unit.

In addition, the guide element's direction of movement can also be defined. For example, this allows two guide elements to move in the same direction, in opposite directions or independently of each other.

In the future, the majority of options listed will be available as standard for ordering via catalog data sheet or online configurator. Many applications can only be optimally implemented with a smart combination of two or more linear units. In such cases, complete solutions for complex movement tasks are available on request.

The information provided below represents an example selection of the options and possibilities.

We would be happy to advise you on specific solutions – contact us today!

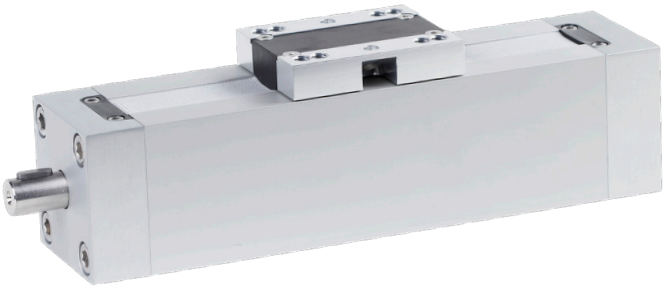


Application example
Format adjustment

Product properties

- **Aluminum guide profile, anodized, □30 / □50 mm, thick-walled**
- **Drive concept: Spindle**
- **Aluminum guide elements, with friction bearing**
- **Guide element clamping with wedge profile**
- **Profile cover, with positive connection, polyurethane FDA-compliant**
- **Positioning precision ± 0.2 mm**
- **Aluminum attachments, anodized**
- **Plastic attachments, polyamide, black**

Profil-Verstell-einheiten	**VP1S** with one guide element *p. 4* 	**VP2S** with one guide element *p. 8* 	
Zubehör	**Hand wheels** **VZH** *p. 12* 	**Mechanical position indicators** **VZPM** *p 14* 	**Electronical position indicators** **VZPE** *p. 16* 
	Clamping plates **VZK** *p. 18* 	**Torque supports** **VZDP** *p. 20* 	**Carriage clamping** **VZKP** *p. 22* 



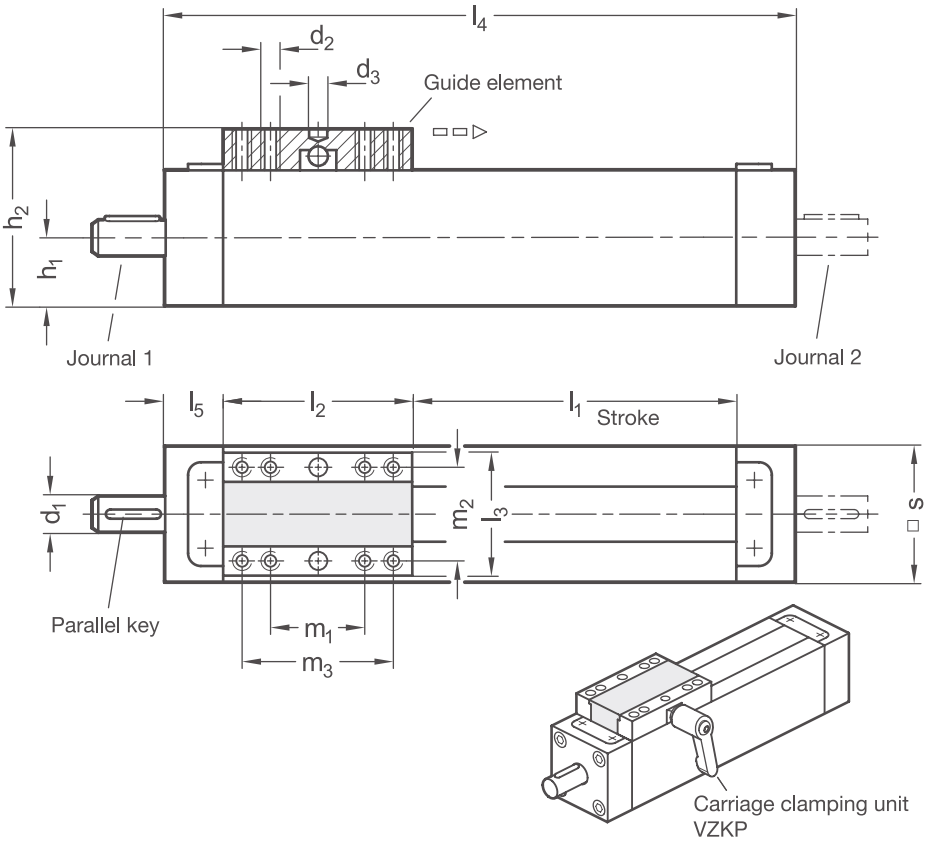
PRODUCT INFO

The housing of the **profile linear units VP1S** is made of aluminum profile.
The aluminum end pieces serve as bearing housings and close the linear profile units. A continuous spindle with ball bearings on each side is installed in the aluminum profil. The spindle nut transmits the linear movements to a linear unit connector along the guide groove.

Profile adjustment units can be individually equipped with mounting holes. You can choose between threaded holes for mounting from below or through-holes with flat countersunk holes for mounting from above. 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. Accessories are not included with the linear units and must be ordered separately.

RoHS-compliant product



s	Stroke max. l_1	d_1	d_2	d_3 H7	h_1	h_2	l_2 Type A	l_2 Type B	l_3	max. l_4	l_5	m_1	m_2	m_3 Type A	m_3 Type B
30	1000	8	M 5	4	15	39	40	84	29	1112	14	22	22	-	66
50	1500	12	M 6	5	25	62	60	120	49	1662	21	36	36	48	108

Material
w

ST	Steel • Housing / guide element atural anodized • Metric threaded spindle: Steel, with ball bearing • Spindle nut: POM • Belt clamping / guide element cover / sliding guides: Plastic
ED	Stainless steel • Housing / guide element atural anodized • Metric threaded spindle: Stainless steel AISI 303, with ball bearing • Spindle nut: POM • Belt clamping / guide element cover / sliding guides: Plastic

Type
t

A	Guide element short
B	Guide element long

Spindle thread direction
r

RH	Right-hand thread
LH	Left-hand thread

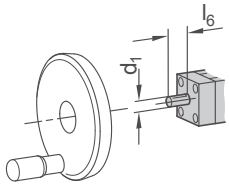
s	Spindle Ø	Spindle pitch **p** / Thread	Journal diameter d_1	Journal length B l_6	Journal length C l_7	Journal length D l_8	Journal length E l_9	Journal length F l_{10}	individual Journal length l_{11}
30	10	1,5	8	16	39	55	34	70	16...70
50	16	2	12	18	49	67	40	82	18...82

Accessories:

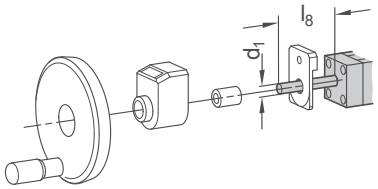
d_1	Torque support	Clamping plate	Position indicator		Handwheel
30	VZDP	VZK	VZPM	VZPE	VZH
50	VZDP	VZK	VZPM	VZPE	VZH

Zapfen
z_1

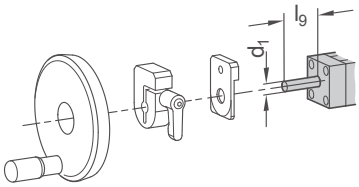
B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for clamping plate and handwheel



Journal length l_6

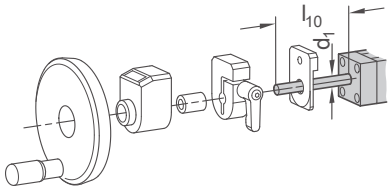


Journal length l_8

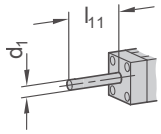


Journal length l_9

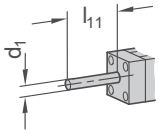
F	Journal for clamping plate, position indicator and handwheel	Gxx	Individual length with keyway (for xx enter value from column l_{11})	Hxx	Individual length without keyway (for xx enter value from column l_{11})



Journal length l_{10}



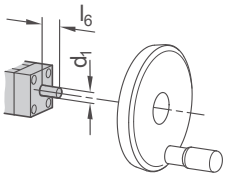
Journal length l_{11}



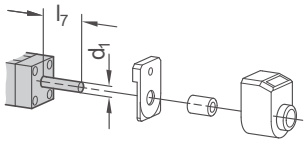
Journal length l_{11}

Zapfen
z_2

A	Without journal	B	Journal for handwheel	C	Journal for position indicator

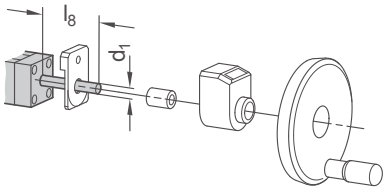


Journal length l_6

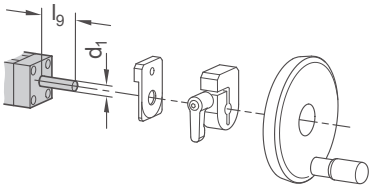


Journal length l_7

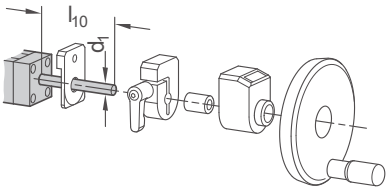
D	Journal for position indicator and handwheel	E	Journal for clamping plate and handwheel	F	Journal for clamping plate, position indicator and handwheel



Journal length l_8

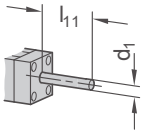


Journal length l_9

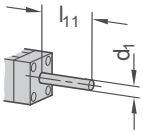


Journal length l_{10}

Gxx	Individual length with keyway (for xx enter value from column l_{11})	Hxx	Individual length without keyway (for xx enter value from column l_{11})



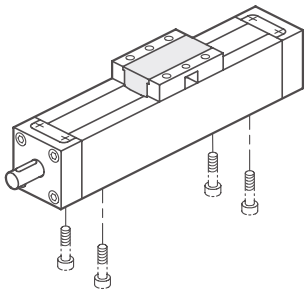
Journal length l_{11}

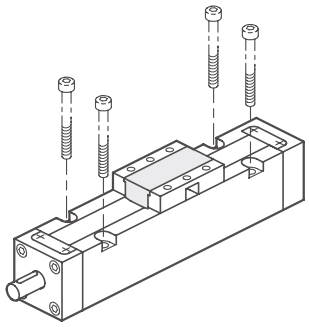


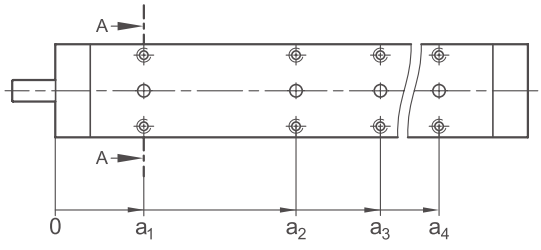
Journal length l_{11}

Mounting option
b

W	without mounting option		
U	from below (threaded hole)	O	from above (through-hole with flat counterbore)

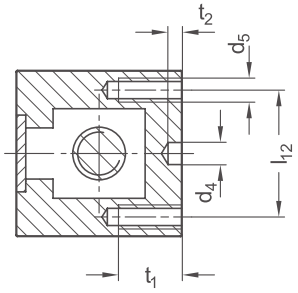


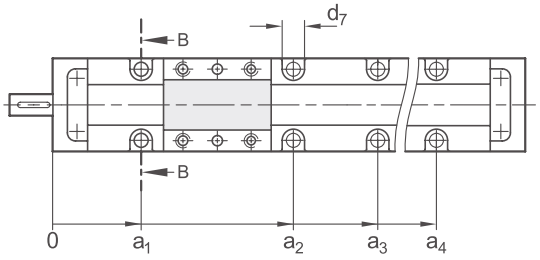




Fixing holes

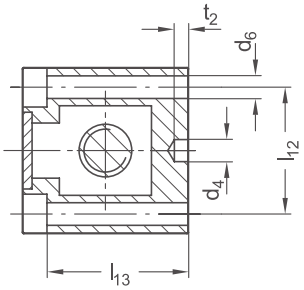
Sectional view A-A
(Mounting holes)





Fixing holes

Sectional view B-B
(Mounting holes)



s	d_4 H7	d_5	d_6	d_7	l_{12}	l_{13}	t_1	t_2
30	3	M 3	3,4	6,5	24	26,6	10	3
50	5	M 5	5,5	10	40	44,6	12	5

ORDER KEY

WITH MOUNTING HOLES

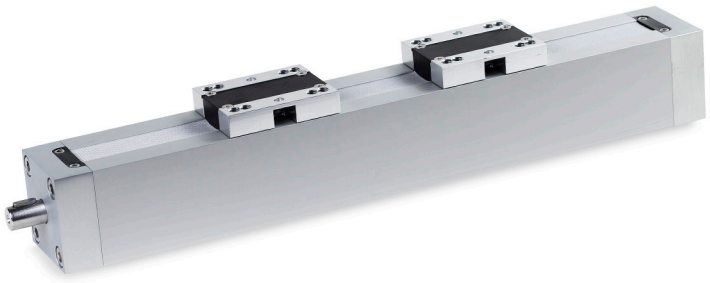
Name key | Supplemental key

VP1S - s - w - l_1 - t - r - p - z_1 - z_2 - b- a_1 - a_2 - a_3 - a_4

- Profile linear unit
- Outer diameter
- Material
- Stroke
- Type
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2
- Mounting option
- Mounting positions (only to be specified for mounting option U / O)

ACCESSORIES

- Handwheels **VZH** → *see catalog page 356*
- Position indicators **VZPM / VZPE** → *see page 358*
- Clamping plate **VZK** → *see page 362*
- Torque supports **VZDP**
- Carriage clamping unit **VZKP**



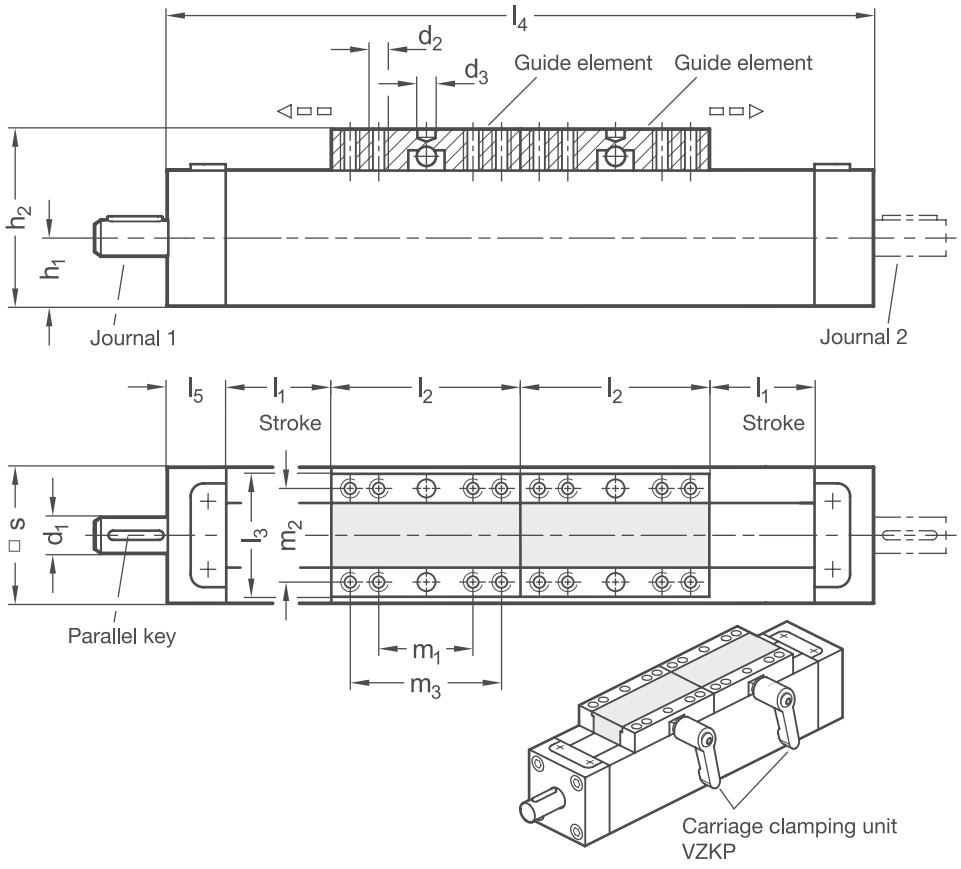
PRODUCT INFO

The housing of the **profile linear units VP2S** is made of aluminum profile.
The aluminum end pieces serve as bearing housings and close the linear profile units. A continuous spindle with ball bearings on each side is installed in the aluminum profil. The spindle nut positioned on it transmits the linear counter-rotating adjustment movement along the guide groove to a guide element.

Profile adjustment units can be individually equipped with mounting holes. You can choose between threaded holes for mounting from below or through-holes with flat countersunk holes for mounting from above. 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. Accessories are not included with the linear units and must be ordered separately.

RoHS-compliant product



s	Stroke max. l_1	d_1	d_2	d_3 H7	h_1	h_2	l_2 Type A	l_2 Type B	l_3	max. l_4	l_5	m_1	m_2	m_3 Type A	m_3 Type B
30	450	8	M 5	4	15	39	40	84	29	1096	14	22	22	-	66
50	700	12	M 6	5	25	62	60	120	49	1682	21	36	36	48	108

Material
w

ST	Steel • Housing / guide element atural anodized • Metric threaded spindle: Steel, with ball bearing • Spindle nut: POM • Belt clamping / guide element cover / sliding guides: Plastic
ED	Stainless steel • Housing / guide element atural anodized • Metric threaded spindle: Stainless steel AISI 303, with ball bearing • Spindle nut: POM • Belt clamping / guide element cover / sliding guides: Plastic

Type
t

A	Guide element short
B	Guide element long

Spindle thread direction
r

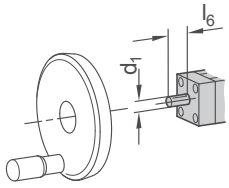
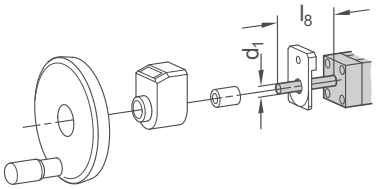
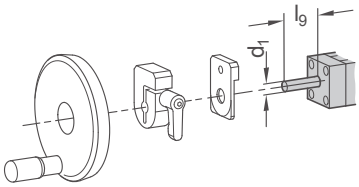
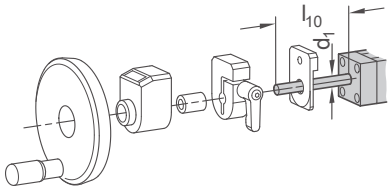
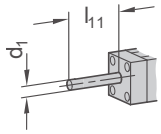
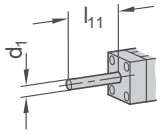
RH	Right-hand thread on journal z_1, left-hand thread on journal z_2
LH	Left-hand thread on journal z_1, right-hand thread on journal z_2

s	Spindle Ø	Spindle pitch **p** / Thread	Journal diameter d_1	Journal length B l_6	Journal length C l_7	Journal length D l_8	Journal length E l_9	Journal length F l_{10}	individual Journal length l_{11}
30	10	1,5	8	16	39	55	34	70	16...70
50	16	2	12	18	49	67	40	82	18...82

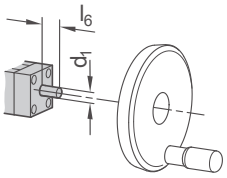
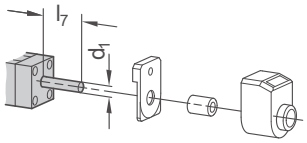
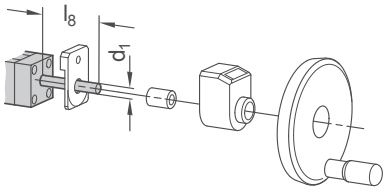
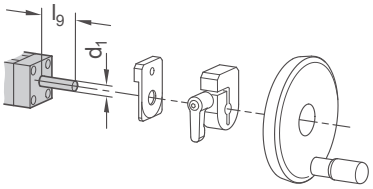
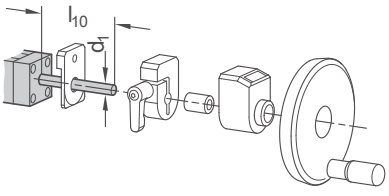
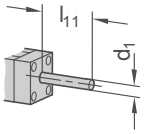
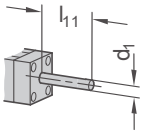
Accessories:

d_1	Torque support	Clamping plate	Position indicator		Handwheel
30	VZDP	VZK	VZPM	VZPE	VZH
50	VZDP	VZK	VZPM	VZPE	VZH

Zapfen
Z_1

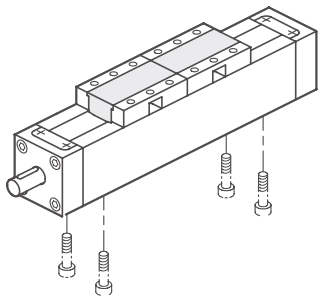
B	Journal for handwheel	D	Journal for position indicator and handwheel	E	Journal for clamping plate and handwheel
 Journal length l_6		 Journal length l_8		 Journal length l_9	
F	Journal for clamping plate, position indicator and handwheel	Gxx	Individual length with keyway (for xx enter value from column l_{11})	Hxx	Individual length without keyway (for xx enter value from column l_{11})
 Journal length l_{10}		 Journal length l_{11}		 Journal length l_{11}	

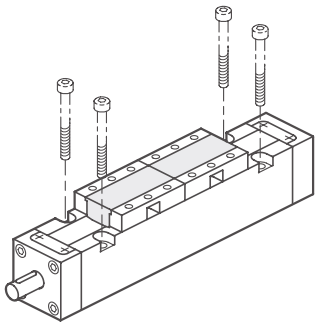
Zapfen
Z_2

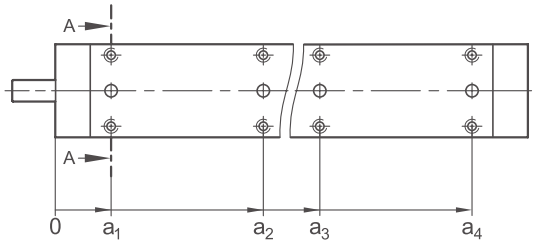
A	Without journal	B	Journal for handwheel	C	Journal for position indicator
		 Journal length l_6		 Journal length l_7	
D	Journal for position indicator and handwheel	E	Journal for clamping plate and handwheel	F	Journal for clamping plate, position indicator and handwheel
 Journal length l_8		 Journal length l_9		 Journal length l_{10}	
Gxx	Individual length with keyway (for xx enter value from column l_{11})	Hxx	Individual length without keyway (for xx enter value from column l_{11})		
 Journal length l_{11}		 Journal length l_{11}			

Mounting option
b

W	without mounting option		
U	from below (threaded hole)	O	from above (through-hole with flat counterbore)

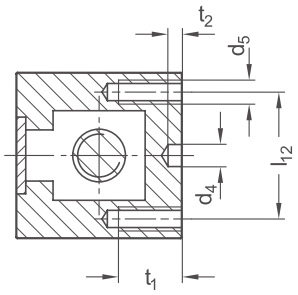


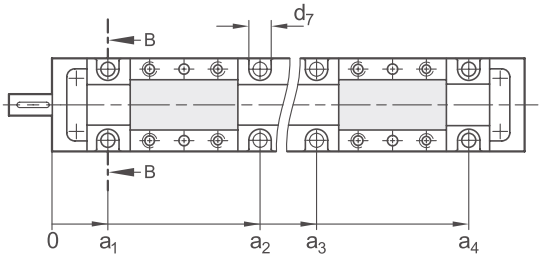




Fixing holes

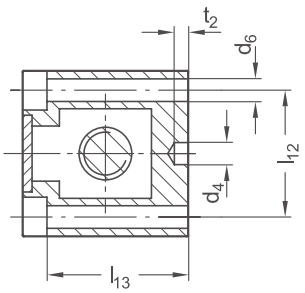
Sectional view A-A
(Mounting holes)





Fixing holes

Sectional view B-B
(Mounting holes)



s	d_4 H7	d_5	d_6	d_7	l_{12}	l_{13}	t_1	t_2
30	3	M 3	3,4	6,5	24	26,6	10	3
50	5	M 5	5,5	10	40	44,6	12	5

ORDER KEY

WITH MOUNTING HOLES

Name key | Supplemental key

VP2S - s - w - l_1 - t - r - p - z_1 - z_2 - b- a_1 - a_2 - a_3 - a_4

- Profile linear unit
- Outer diameter
- Material
- Stroke
- Type
- Spindle thread direction
- Spindle pitch
- Journal z_1
- Journal z_2
- Mounting option
- Mounting positions (only to be specified for mounting option U / O)

ACCESSORIES

- Handwheels **VZH** → *see catalog page 356*
- Position indicators **VZPM / VZPE** → *see page 358*
- Clamping plate **VZK** → *see page 362*
- Torque supports **VZDP**
- Carriage clamping unit **VZKP**

VZH Handwheels, for linear units and transfer units

PRODUCT INFO

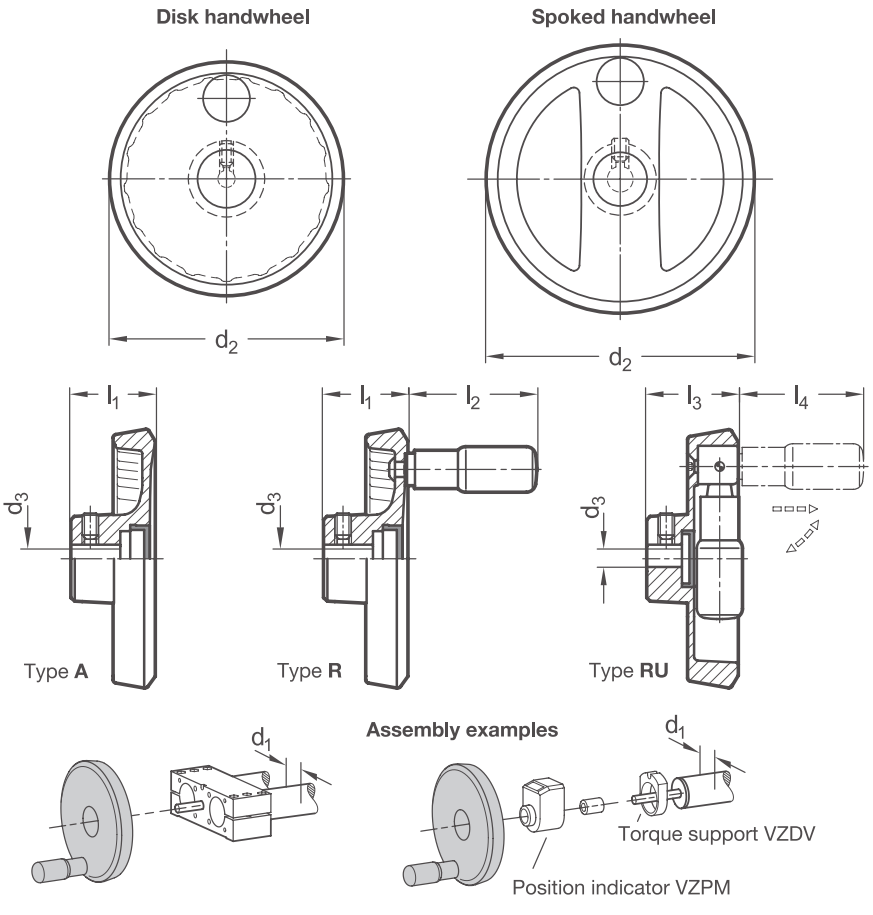
Handwheels VZH are intended for attachment to linear units as well as drive units and transfer units. The manual rotational movement is transmitted to the spindle or shaft via the keyway, resulting finally in a longitudinal movement of the guide element. A grub screw axially secures the hand wheel against the journal or spindle journal.

Dimensions such as outer diameter and hub bores are matched to the size of the respective linear, drive or transfer unit and can be found in the table. The smaller diameters are designed as disk handwheels and the larger diameters as spoked handwheels.

For each type, the handwheels can be ordered with or without revolving cylindrical handle as well as with a revolving retractable handle.

The handwheels are made of black powder-coated die-cast aluminum. The zinc-plated or black oxide-finished steel spindle parts allow the black plastic handles to rotate.

RoHS-compliant product



d_1 Linear unit nominal diameter	d_2 Disk handwheel	Spoked handwheel	d_3 H7	l_1 ≈	l_2 ≈	l_3 ≈	l_4 ≈
18	50	-	6	26	20	-	-
	80	-	6	26	43,5	-	-
25	63	-	8	27	20	-	-
	100	-	8	30	58	39	56,5
30	63	-	8	27	20	-	-
	100	-	8	30	58	39	56,5
40	100	-	12	30	58	39	56,5
	-	125	12	33,5	61,5	45	60,5
50	-	140	12	36,5	76,5	47	75,5
60	-	160	14	39,5	76,5	48	75,5

Type
t

A	Without handle
R	With rotating handle
RU	With rotating, retractable handle (only available for d_2 100-160)

Surface
o

2	Textured powder-coated, Black RAL 9005

FOR USE WITH

– Single tube linear units, round

– Single tube linear units, square

– Double tube linear units

– Profile linear units

– Drive and transfer units

– Angle gears

ORDER KEY

VZH - d_1 - d_2 - t - o

Handwheel
Linear unit nominal diameter
Handwheel diameter
Type
Surface

ON REQUEST

Plastic handwheels with Ø 50 for d_1 18

VZPM Position indicators for profile linear units, mechanical with adapter bushing

PRODUCT INFO

Position indicators VZPM indicate the distance travelled by profile linear units. They are mounted to the spindle journal of a linear unit using an adapter bushing and a grub screw.

The counter of the position indicator should be selected from the table based on the spindle thread pitch and direction and the size of the linear unit. Other options, such as installation orientation or housing color, can be defined in the article number.

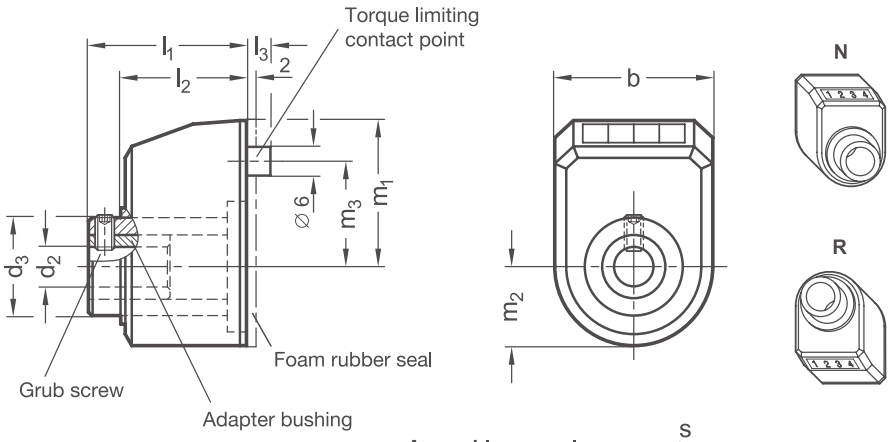
The polyamide housing is ultrasonically welded, making it especially sturdy, tight and compact. The position indicator is also temperature-resistant to 80 °C and resistant to oils and solvents. The foam rubber seal provides mechanical decoupling and also acts as a seal. The hollow shaft is made of black oxide-finished steel.

If the position indicator is attached to a profile linear unit, a torque support VZDP is required to prevent the position indicator from turning along.

As an alternative to the mechanical indicator system, a position indicator VZPE can also be used, which detects and displays the position electronically.

RoHS-compliant product

elesa
Original design DD52R, DD51, DD50



Linear unit nominal diameter **s**	Linear unit spindle pitch **p**	Counter **zw**	Display after one spindle turn	**b**	**d_2** H7	**d_3**	**l_1**	**l_2**	**l_3**	**m_1**	**m_2**	**m_3**	Grub screw	Max. speed rpm
30	1,5	001,5	0015	33	8	20	33	26	5,5	30,5	16,5	22	M 4	1500
30	3	003.0	0030	33	8	20	33	26	5,5	30,5	16,5	22	M 4	1500
50	2	0002.0	00020	48	12	29	37	30	6	43,5	23	30	M 5	625
50	4	0004.0	00040	48	12	29	37	30	6	43,5	23	30	M 5	625

Type
t

R	Numbers increase when turned clockwise
L	Numbers increase when turned counterclockwise

Hollow shaft / adapter bushing material
w

S	Steel black oxide-finished
E	Stainless steel, AISI 304

Installation orientation
e

N	Inclined, top
R	Inclined, bottom

Surface / material
o

G	Polyamide (PA), orange RAL 2004
O	Polyamide (PA), gray RAL 7035

FOR USE WITH

– Profile linear units
with torque supports VZDP

ORDER KEY

VZPM - s - p - t - w - e - o

Position indicator
Linear unit nominal diameter
Linear unit spindle pitch
Type
Hollow shaft / adapter bushing material
Installation orientation
Surface / Material

ON REQUEST

– Other / doubled thread pitches

VZPE | Position indicator, electronic with adapter bushing

PRODUCT INFO

Position indicators VZPE indicate the distance travelled by linear units. They are mounted to the spindle journal of a linear unit using an adapter bushing and a grub screw.

Position indicators are matched to the size of the linear unit in the table. The position indicators must be adjusted for the thread pitch and direction of the respective linear unit using the operating buttons. The energy supply is ensured by a long-life battery.

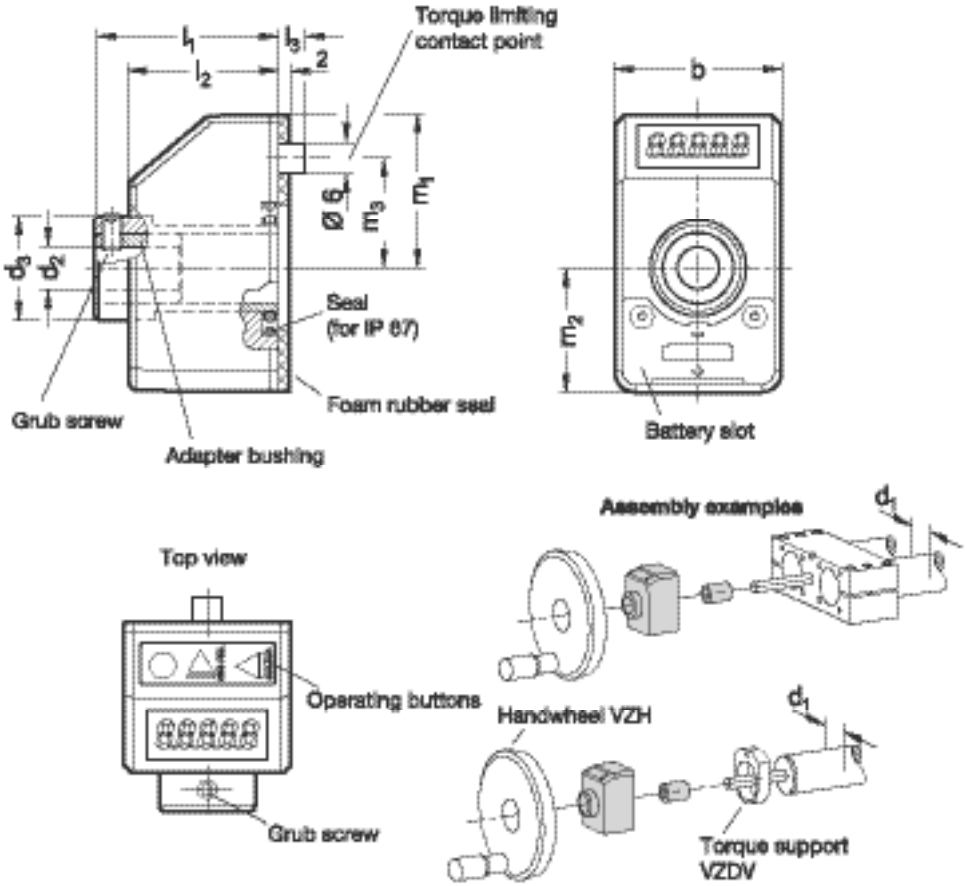
The polyamide housing is ultrasonically welded, making it especially sturdy, tight and compact. The position indicator is also temperature-resistant to 50 °C and resistant to oils and solvents. The foam rubber seal provides mechanical decoupling and also acts as a seal. The hollow shaft is made of stainless steel. In the IP 67 version, it is sealed with an NBR seal.

If the position indicator is attached to a single tube linear unit, a torque support VZDR or VZDV is required to prevent the position indicator from turning along.

RoHS-compliant product

elesa

Original design DD52R-E, DD51-E



Linear unit nominal diameter d_1	b	d_2 H7	d_3	l_1	l_2	l_3	m_1	m_2	m_3	Grub screw	LCD display	Max. speed rpm
30	33,5	8	19,5	34	28,5	5,5	30,5	25	22	M 4	5	1000
40	48	12	28,5	41	34	6	40	32,5	30	M 5	6	1000
50	48	12	28,5	41	34	6	40	32,5	30	M 5	6	1000
60	48	14	28,5	41	34	6	40	32,5	30	M 5	6	1000

Ambient conditions
u

1	Protection rating IP 65
2	Protection rating IP 67

Surface
o

GR	Polyamide (PA), orange RAL 2004
OR	Polyamide (PA), gray RAL 7035

FOR USE WITH

– Single tube linear units, round, with torque support VZDR

– Single tube linear units, square, with torque support VZDV

– Double tube linear units

– Profile linear units

ORDER KEY

VZPE - d_1 - u - o

Position indicator
Linear unit nominal diameter
Ambient conditions
Surface

ON REQUEST

– Position indicator with wireless data transmission

VZK Clamping plates

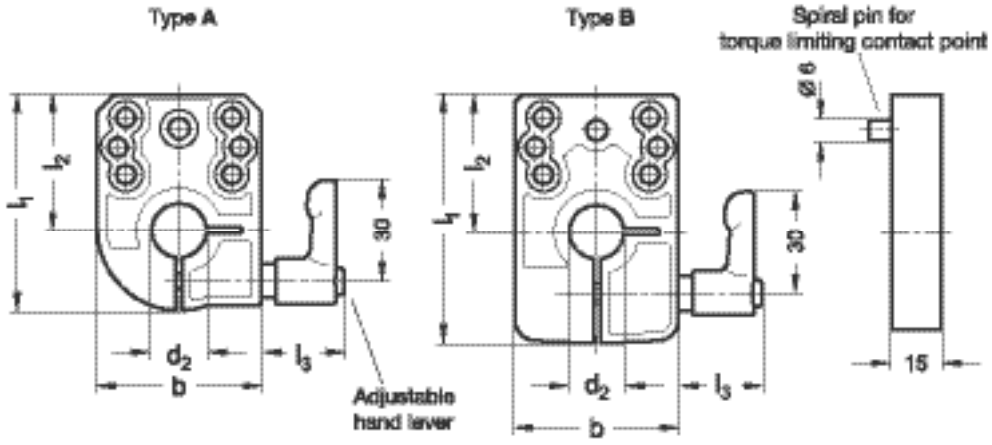
PRODUCT INFO

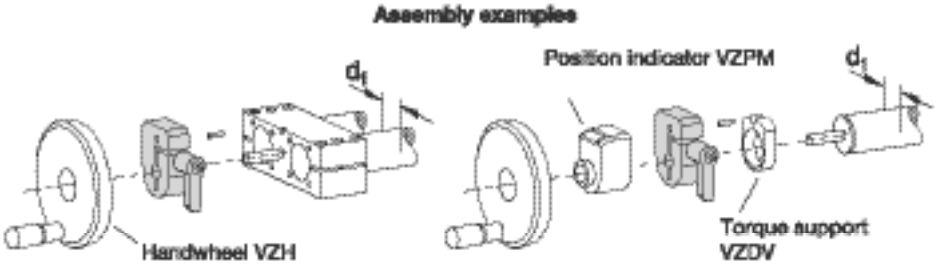
Clamping plates VZK can be used to clamp the spindles of linear units after completing a movement. The clamping bore diameter is sufficiently reduced by the adjustable hand lever that the spindle journal of the linear unit no longer turns, preventing accidental shifting of the established position.

The clamping plate must be chosen based on the size of the linear unit, as indicated in the table. A torque support VZDR / VZDV or VZDD is additionally needed for Ø 18 to install a clamping plate. The spiral pin establishes a positive connection between the clamping plate and the torque support to prevent turning along.

The clamping plates and adjustable hand levers are made of black powder-coated die-cast zinc, and the clamping threaded inserts are made of zinc-plated steel.

RoHS-compliant product





d_1 Linear unit nominal diameter	b	d_2	l_1		l_2		l_3	Combinable with position indicator	
			Type A	Type B	Type A	Type B		Type A	Type B
30	33	8	47	55	30,5	30,5	24,5	VZPM	VZPE
40	48	12	66,5	73	43	40,5	24,5	VZPM	VZPE
50	48	12	66,5	73	43	40,5	24,5	VZPM	VZPE
60	48	14	66,5	73	43	40,5	24,5	VZPM	VZPE

Type t	
A	For mechanical position indicators (also usable without position indicator, e. g. only with handwheel)
B	For electronic position indicators

FOR USE WITH

– Single tube linear units, round, with torque support VZDR

– Single tube linear units, square, with torque support VZDV

– Double tube linear units with torque support VZDD

ORDER KEY **VZK - d_1 - t**

Clamping plate
Linear unit nominal diameter
Type

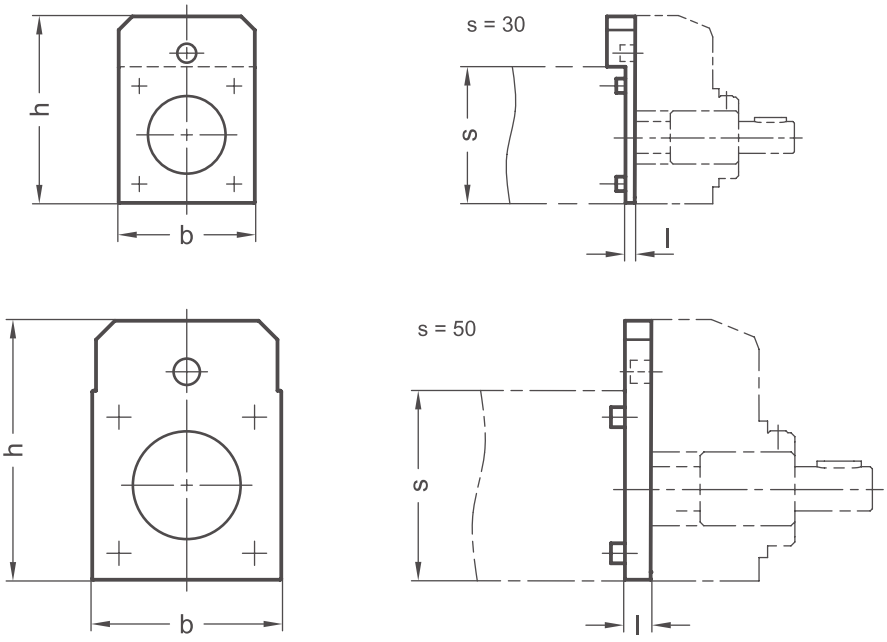
VZDP Torque supports for profile linear units

PRODUCT INFO

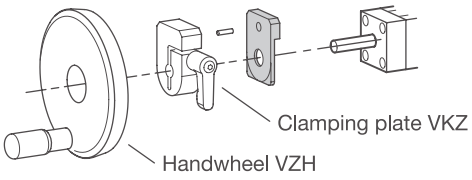
Torque supports VZDP are used together with profile linear units. They prevent the turning of clamping plates VZK and position indicators VZPM or VZPE attached as accessories.

The torque supports are made of thermoplastic (polyamide PA12) and are mounted to the end caps of the profile linear units. They fix the position indicator or clamping plate in place via the radial groove open on one side. The torque supports are fastened using the four pins that are driven into the screw heads of the end caps. Torque supports feature a bore on the face side, which prevents position indicators or clamping plates from rotating.

RoHS-compliant product



Mounting example



s Linear unit nominal diameter	**b**	**h**	**l**
30	33	47	3
50	50	68,5	7

Type
t

A	Fastening to the end cap

Color
o

S	Aluminum, black anodized

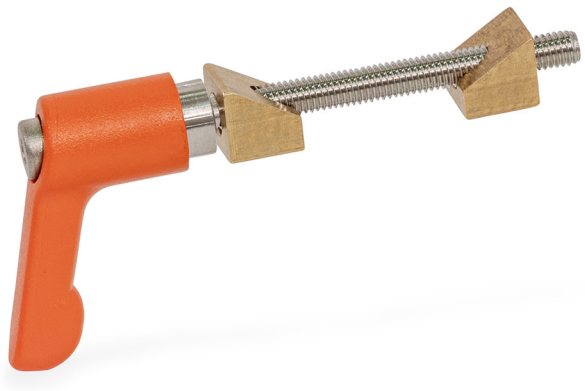
FOR USE WITH

– Profile linear units

ORDER KEY **VZDP - s - t - o**

Torque support
Linear unit nominal diameter
Type
Color

VZKP Carriage clamping units for profile linear units

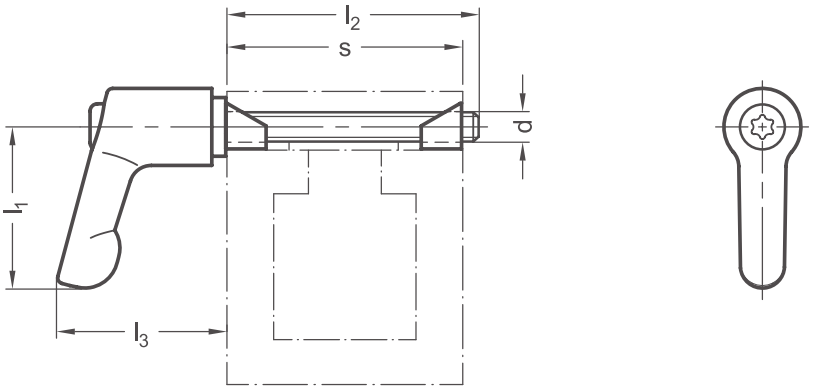


PRODUCT INFO

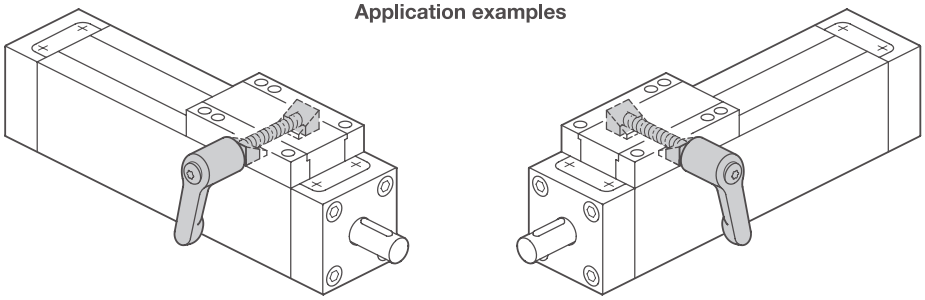
Carriage clamping units VZKP are used to clamp the spindles of linear units after adjustment. The thread of the adjustable hand lever clamps the wedge mechanism.

The resulting friction between the clamping wedges and the carriage guideway secures the carriage position efficiently and without backlash. Adjustable hand levers are made of powder-coated zinc die-cast, screw inserts installed here are made of turned stainless steel and the clamping wedges are made of brass.

RoHS-compliant product



Application examples



s Linear unit nominal diameter	l_1	**d**	l_2	l_3
30	22	M 4	32	23
50	30	M 5	50	31

Surface **o**	
OR	Textured powder-coated, Orange RAL 2004

FOR USE WITH

– Profile linear units

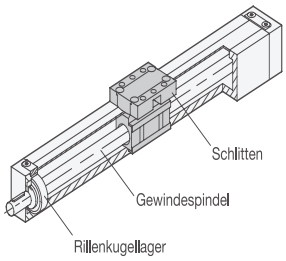
ORDER KEY **VZKP - s - l_1 - o**

Carriage clamping unit
Linear unit nominal diameter
Hand lever length
Surface

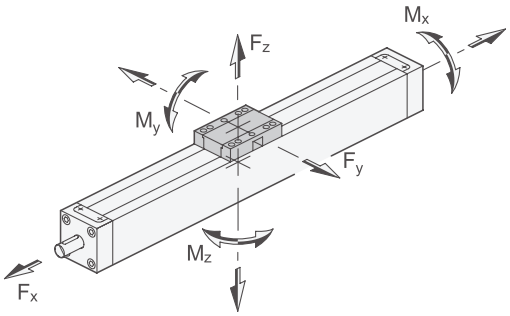
Technical information

Configurable linear profile units move and position one or more slides linearly via a spindle drive with ball bearings on both sides. Inside the guide profile, the slide is guided by a 4-fold plain bearing. The end pieces serve to limit the travel path and close off the front of the linear profile unit.

Profile linear units can be individually equipped with up to 4x2 fixing holes. You can choose between threaded holes for fixing from below and through-holes with flat countersunk holes for fixing from above.



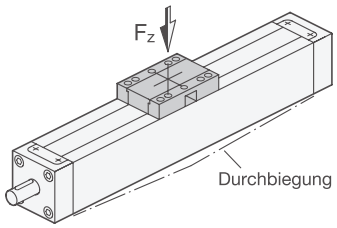
Loading data



⌀ Verstelleinheiten	Fx in N	Fy in N					Fz in N					Mx in Nm	My in Nm	Mz in Nm
		l=200	l=500	l=700	l=900	l=1000	l=200	l=500	l=700	l=900				
30	150	550	400	140	60	50	550	400	140	60	50	5	45	19
50	300	1660	1660	990	460	340	1660	1660	1660	820	600	25	107	29

Sag / elastic deformation

The maximum permissible forces and torques listed in the table result in elastic deformation of the linear unit. This amounts to approx. 0.3 mm for the specified values. The illustration shows this deformation as an example using the force Fz.



Positioning precision

The positioning accuracy specifies the deviation with which a position can be approached. The table shows the maximum deviation that can occur.

max. deviation
Lead screw
± 0,1 mm / 300 mm Hub

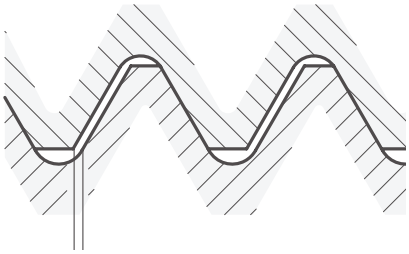
Repeatable precision

The repeat accuracy indicates how precisely a position can be approached several times under the same conditions. As a rule, the repeat accuracy is higher than the positioning accuracy, as manufacturing tolerances have no influence on the repeat accuracy. With the metric screw drives used, the repeatability accuracy is ±0.05 mm.

Backlash on reversal

The play between the thread flanks of the spindle and spindle nut creates a backlash when the direction of the drive rotation changes. Before the slide moves in the opposite direction, this play must be overcome.

This backlash prevents the spindle nut and spindle from jamming. For linear profile units, the backlash is 0.2 mm.



Self-braking

As the lead angle of metric lead screws is smaller than the friction angle, they are self-locking. It is not possible to move the carriage. The spindle can also be secured by an external spindle clamp using clamping plates or slide clamping.

Lifespan

Depending on the application, the service life of linear units depends on the expected ambient conditions.

The following factors have an influence on this:

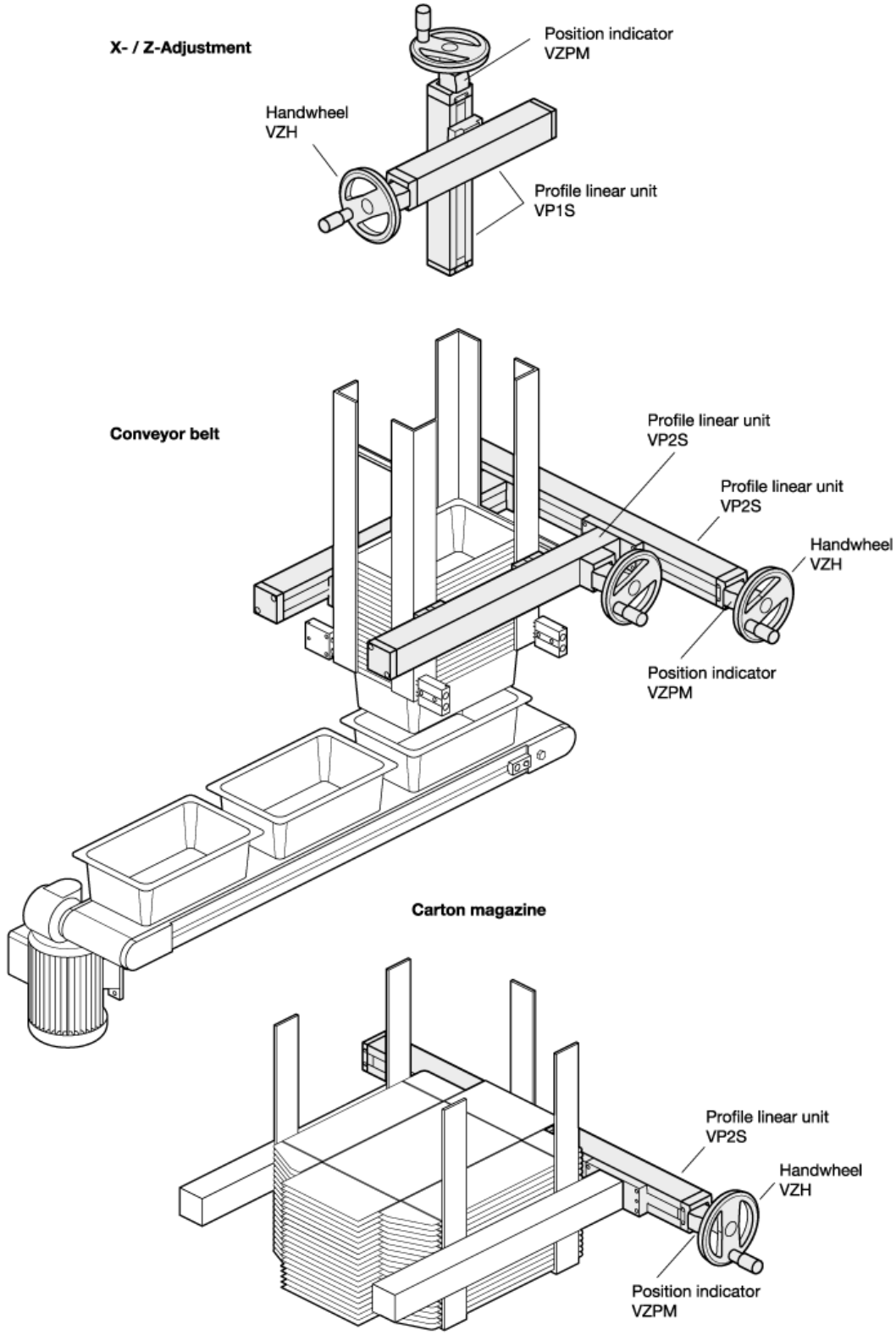
- Installation position
- Load to be moved
- Adjustment speed
- Adjustment frequency
- Ambient temperature
- Compliance with maintenance intervals

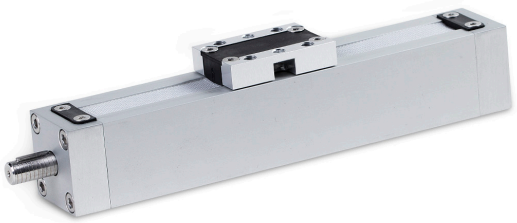
Ambient conditions

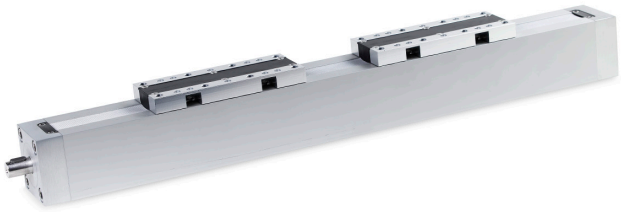
The linear units are designed for ambient temperatures from -20 °C to +100 °C. In general, large temperature fluctuations and condensing humidity should be avoided.

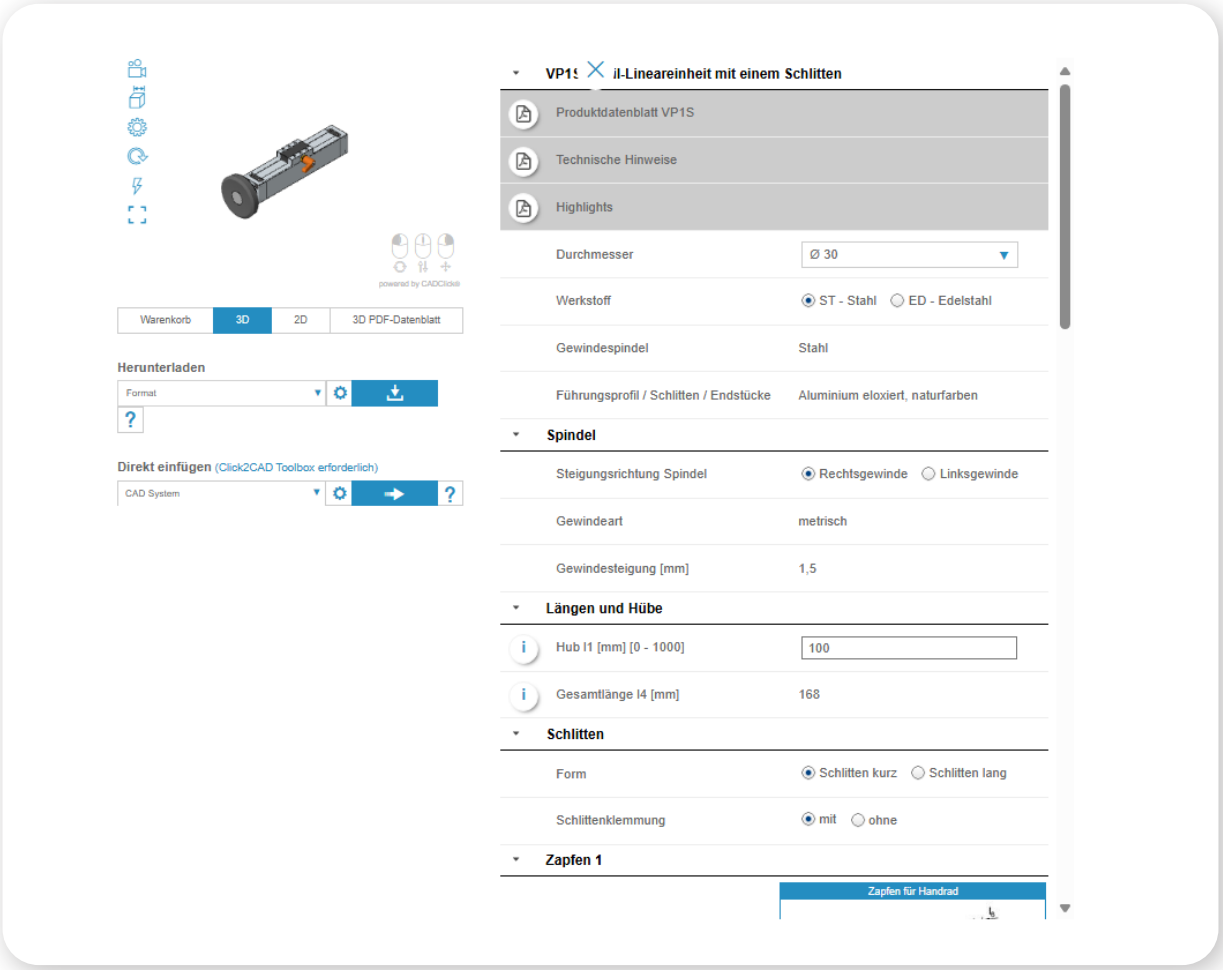
Configurable profile linear units

Examples of application





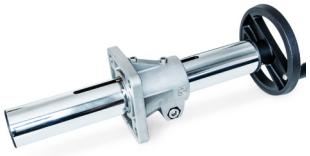




Simple online configuration and ordering at inocon.com

The new online configurator makes configuring your individual linear actuator incredibly easy while providing a complete overview of the various designs and possible accessories. When finished, you can even place an order directly from the configurator.

Innovative assembly components


INOCON GmbH
Industriestraße 31
53359 Rheinbach
Germany

Phone +49 2226-90987-0
Fax +49 2226-90987-99
info@inocon.de

inocon.de