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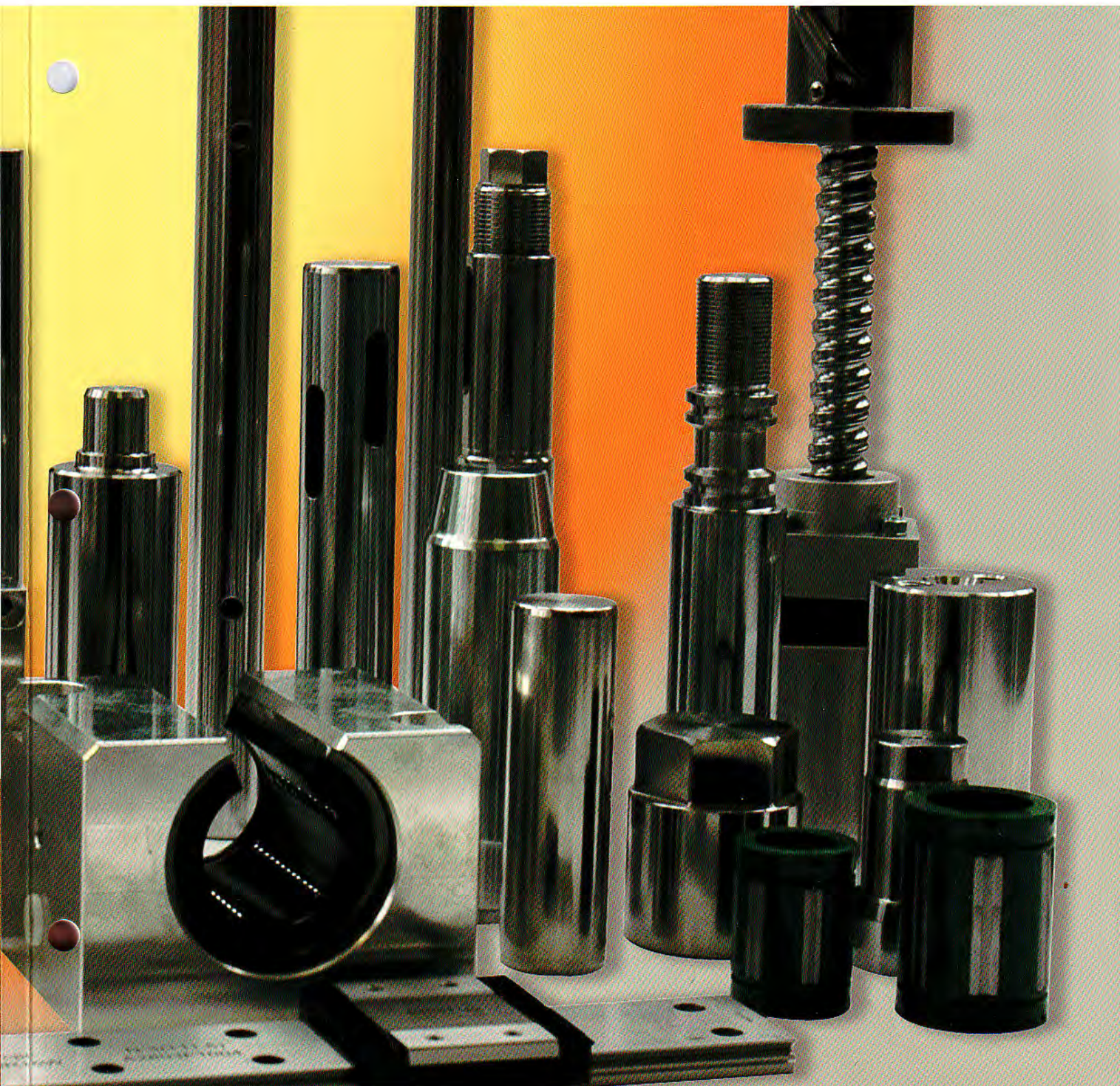
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**MiniTec**  
LINEARSYSTEM


*...save time!*

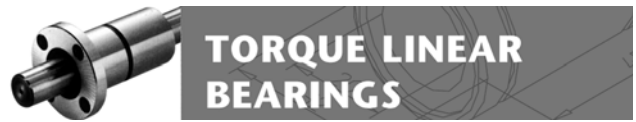


# LINEAR SYSTEM

Part. N° 95.0106/0

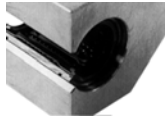
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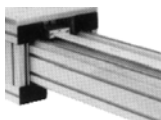
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198 Adjusting unit VEV 45 x 90 H
199 Adjusting unit VEV 45 x 90 F
199 Adjusting unit VEV 90

### Notes

## THE COMPLETE LINEAR SYSTEM

From individual components to an installation-ready module

MINITEC PROFILE ALIGNING RAILS



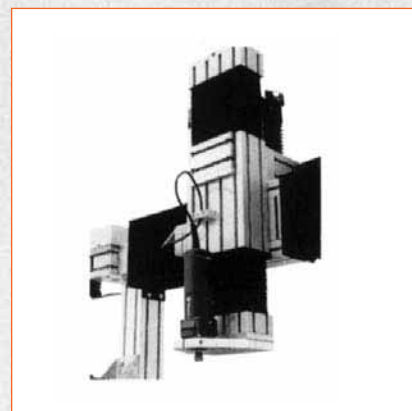
MINITEC BALL SCREW THREAD DRIVES



MINITEC UNISLIDES



MINITEC LINEAR MODULES



## MiniTec CAD Support

*Our CAD tools are the logical supplement to the hardware of our construction system. All planning and assembly requirements are comprehensively considered. The combination of components and software opens up the full potential for efficient, flexible, and modern machinery construction.*

Time is a key factor in modern and economic machine construction. The time expended for a construction affects the costs to a great extent as well as the speed of implementation. It is not unusual that the expenditure for calculation, design, operation scheduling, and assembly to amount to more than half of the total costs. The ergonomic design of all the components of our system and the ease of assembly with our power-lock fastener without drilling results in a significant saving of time.

Planning and operations scheduling often offer an even greater potential for saving time. A fundamental step forward with regard to planning and avoidance of errors are our MiniTec CADmenu for AutoCAD and MiniTec iCAD design tools with more than 50 formats for all other CAD systems. The design time is reduced by more than 60% with these tools compared with conventional designing.

All components are contained in 2D and 3D in the electronic catalog. Defined insertion points facilitate positioning in the drawing. Any processing and the connectors that may be required are displayed for each of the components and can be added if desired. A parts-list is automatically created in which the overmeasurements for panel elements are correctly calculated. Identical parts are summarized in an order list. The weight of the individual items and the total weight is displayed. The parts list can be generated in German, English, or French. Interfaces to Word and Excel enable the data-transfer to planning systems and the creation of documentations or the further processing of the data.

### MiniTec CADmenu for AutoCAD\* 2004 - 2008

Part N° 95.0858/0



- Design tool using AutoCAD commands
- Automated design modules for
  - Linear axes
  - Safety equipment
  - Conveyor belts
  - Roller belts
  - Workplaces

° Installation routine for AutoCAD 2002 can be downloaded from our website [www.minitec.de/cadsupport](http://www.minitec.de/cadsupport)

### MiniTec iCAD 3.5 for all CAD Systems

Part N° 95.0864/0



- Autonomous design tool that can also be used without a CAD system
- Direct interfaces to all common CAD systems such as Mechanical Desktop, ProEngineer, Solid Works, Solid-Edge, MegaCAD, etc.
- More than 50 data output formats in 2D and 3D
- Automated design module for linear axes, slide guides, conveyors, workplaces
- Latest version plus updates to download from [www.minitec.de](http://www.minitec.de)

\*AutoCAD is a registered trademark of AUTODESK, Inc. - Word and Excel are registered trademarks of Microsoft



LINEAR BEARINGS



# TECHNICAL DATA

## SPECIAL FEATURES

### 1. Compact Design

In our linear bearings, 4 to 6 rows of balls are spaced very closely. This ensures particularly high-precision movement under load from any direction.

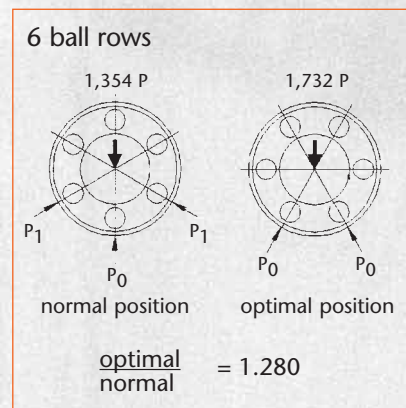
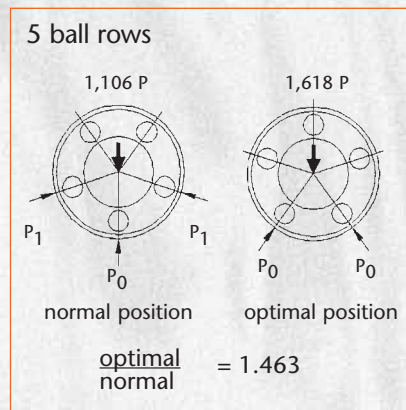
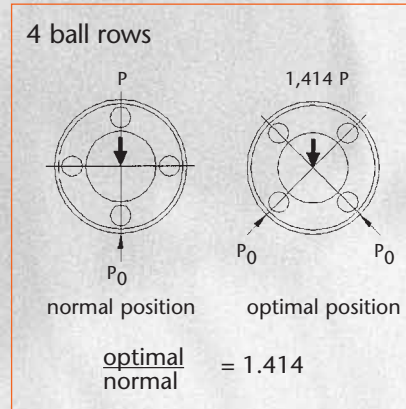
### 2. High Load Capacity

The exclusive use of quality-assured materials, in combination with mature designs, ensures optimal dynamic load ratings.

### 3. Highest Precision

The optimum operating play is one of the most critical points when using linear bearings. Our bearings are delivered with precisely determined bore tolerances.

values specified in the dimension tables are valid for a load direction through the ball peak position. When positioning the bearing in the optimal position, the effective dynamic load ratings may be increased by the following factors:



nearly zero is often necessary. For these extreme requirements, the tracks of the bearings are given a special finish. This gives them the lowest possible friction and slip/stretch-free movement. To achieve the bearing gap desired, the bearings are delivered in sorted bore tolerances in 2 µm steps. Upon request, both bearings and shafts can be provided already mounted with the radial gap required.

## LUBRICATION

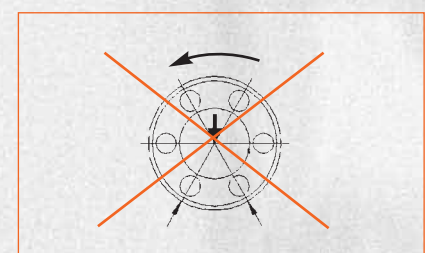
The right lubrication is an important prerequisite for a long service life, and for achievement of all the technical advantages of these linear bearings. The bearings are delivered with a corrosion-protective oil, which is normally sufficient for operation. For special requirements, grease lubrication is also possible. In this case, the amount of greases should be dosed so that the balls can move without hindrance. Grease leaking out can cause increased friction. For relubrication, we recommend DIN 51852 K2K lubrication greases.

## CAGE

The cages are made of heat-stabilised polyamide 6, which has proved outstanding due to its low friction and favourable dry-running characteristics. For applications at long-term temperatures of more than 100 °C, bearings with steel cages are available.

## NOTE

Movement (load orientation) only in linear direction, **not radially!**



## LIFETIME

### 1. Dynamic Basic Load

This value is the load under when at least 90% of a group of identical linear bearings can achieve a lifetime of 105 m. This lifetime is defined as the distance traversed until material fatigue in the balls, the outer rings, or the shaft.

The lifetime of a bearing is calculated as follows:

- L = lifetime
- C = dynamic load rating (N)
- F = resulting external forces

$$L = \frac{C}{F} \cdot 10^5$$

This relation only applies when using our shafts or the equivalent, and at temperatures of less than 100 °C.

### 2. Static Load Capacity

The static load capacity Co is the maximum permissible load under which no permanent deformation will occur in the shaft.

(1/1000 of the ball diameter.)

### 3. Load Direction

The effective dynamic load ratings depend on the orientation of the load with respect to the ball locations. The

## FRICITION

Each individual linear bearing is precisely measured before shipping, and tested for friction. Normally, linear bearings are mounted with a 2 µm radial gap. When used in electronic equipment, however, a radial play of

# SYSTEM OF NOMENCLATURE FOR LINEAR BEARINGS



**KB** → Bearing line and/or housing units

**F/K** → F = round flange  
K = square flange  
no specification = no flange

**B/S** → B = bearing coated  
S = stainless steel bearing  
no specification = 100Cr, 1.3505

**25** → Shaft Diameter

**G** → G = plastic cage  
no specification = steel cage

W = tandem version  
no specification = standard version ← **W**

UU = two-way seal  
no specification = no seal ← **UU**

OP = with cut-out for shaft support  
no specification = closed ← **OP**

AJ = bearing adjustable  
no specification = standard ← **AJ**

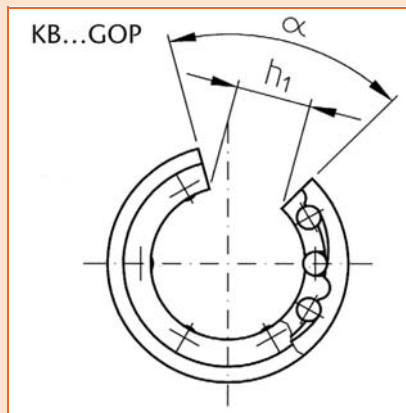
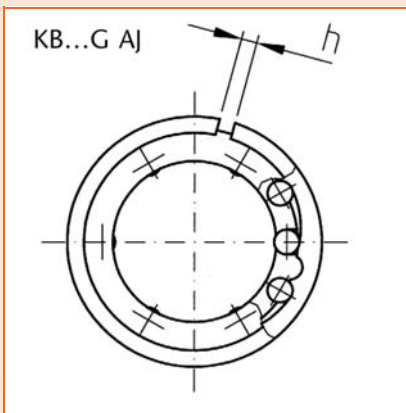
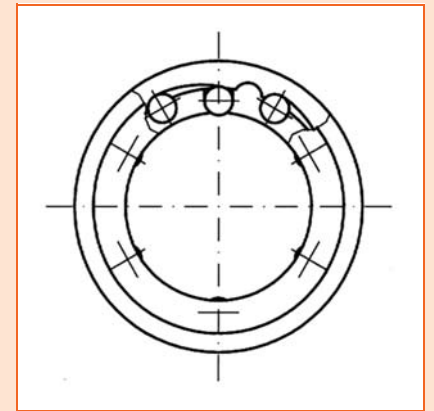
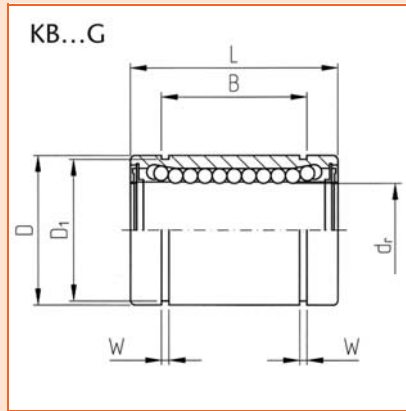
# STANDARD LINEAR BEARINGS

**KB...G**

**with resin retainer**

UU = seals on both sides  
 Also available in stainless version, material 1.4125  
 Designation: KBS...G

Shaft Ø mm	Designation									d <sub>r</sub>	
	Closed	Ball circuit	Weight kg	Adjustable	Ball circuit	Weight kg	Open	Ball circuit	Weight kg	mm	Tol.µm
5	KB 05 G KB 05 G UU	4	0,011	KB 05 G AJ KB 05 G UU AJ	4	0,01				5	+8/0
8	KB 08 G KB 08 G UU	4	0,02	KB 08 G AJ KB 08 G UU AJ	4	0,02				8	+8/0
12	KB 12 G KB 12 G UU	4	0,041	KB 12 G AJ KB 12 G UU AJ	4	0,04	KB 12 G OP KB 12 G UU OP	3	0,032	12	+8/0
16	KB 16 G KB 16 G UU	4	0,057	KB 16 G AJ KB 16 G UU AJ	4	0,056	KB 16 G OP KB 16 G UU OP	3	0,044	16	+9/-1
20	KB 20 G KB 20 G UU	5	0,091	KB 20 G AJ KB 20 G UU AJ	5	0,09	KB 20 G OP KB 20 G UU OP	4	0,075	20	+9/-1
25	KB 25 G KB 25 G UU	6	0,215	KB 25 G AJ KB 25 G UU AJ	6	0,212	KB 25 G OP KB 25 G UU OP	5	0,181	25	+11/-1
30	KB 30 G KB 30 G UU	6	0,325	KB 30 G AJ KB 30 G UU AJ	6	0,32	KB 30 G OP KB 30 G UU OP	5	0,272	30	+11/-1
40	KB 40 G KB 40 G UU	6	0,705	KB 40 G AJ KB 40 G UU AJ	6	0,694	KB 40 G OP KB 40 G UU OP	5	0,6	40	+13/-2
50	KB 50 G KB 50 G UU	6	1,13	KB 50 G AJ KB 50 G UU AJ	6	1,11	KB 50 G OP KB 50 G UU OP	5	0,97	50	+13/-2
60	KB 60 G KB 60 G UU	6	2,05	KB 60 G AJ KB 60 G UU AJ	6	2	KB 60 G OP KB 60 G UU OP	5	1,58	60	+13/-2



Major dimensions and tolerances												Eccentricity	Radial clearance	Basic load rating	
	D		L		B		W	D <sub>1</sub>	h	h <sub>1</sub>	α	μm	max. μm	dyn. C N	stat C <sub>0</sub> N
	mm	Tol. μm	mm	Tol. μm	mm	Tol. μm	mm	mm	mm	mm	°				
	12	0/-8	22	0/-200	14,5	0/-200	1,1	11,5	1			12	-3	206	265
	16	0/-8	25	0/-200	16,5	0/-200	1,1	15,2	1			12	-3	265	402
	22	0/-8	32	0/-200	22,9	0/-200	1,3	21	1,5	7,5	78°	12	-4	510	784
	26	0/-9	36	0/-200	24,9	0/-200	1,3	24,9	1,5	10	78°	12	-4	578	892
	32	0/-11	45	0/-200	31,5	0/-200	1,6	30,3	2	10	60°	15	-6	862	1370
	40	0/-11	58	0/-300	44,1	0/-300	1,85	37,5	2	12,5	60°	15	-6	980	1570
	47	0/-11	68	0/-300	52,1	0/-300	1,85	44,5	2	12,5	50°	15	-8	1570	2740
	62	0/-13	80	0/-300	60,6	0/-300	2,15	59	3	16,8	50°	17	-8	2160	4020
	75	0/-13	100	0/-300	77,6	0/-300	2,65	72	3	21	50°	17	-13	3820	7940
	90	0/-15	125	0/-400	101,7	0/-400	3,15	86,5	3	27,2	54°	20	-13	4700	9800

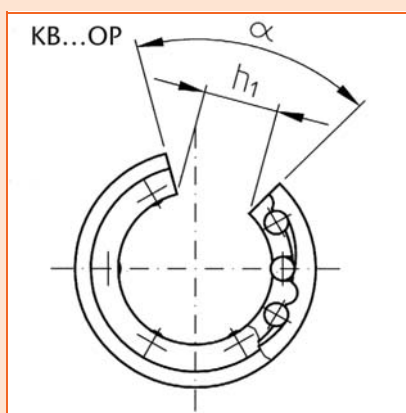
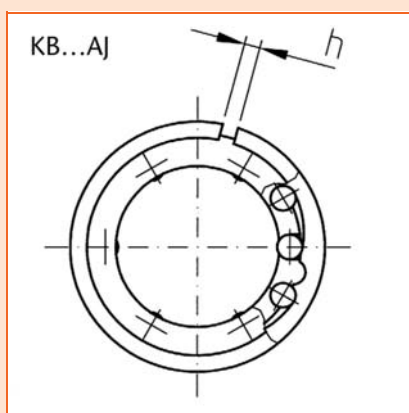
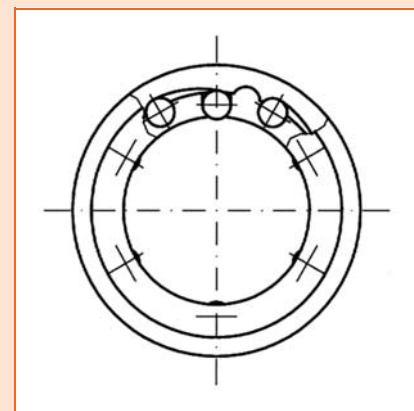
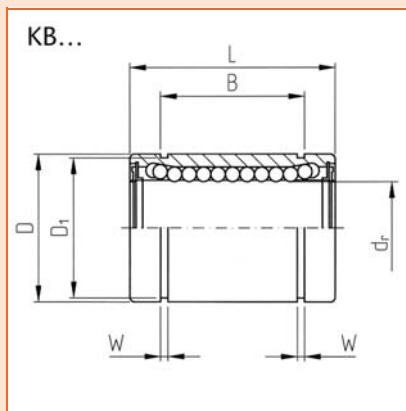
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UU = seals on both sides  
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 Designation: KBS...

Shaft Ø mm	Designation									d <sub>r</sub>	
	Closed	Ball circuit	Weight kg	Adjustable	Ball circuit	Weight kg	Open	Ball circuit	Weight kg	mm	Tol.µm
8	KB 08 KB 08 UU	4	0,022							8	+8/0
12	KB 12 KB 12 UU	4	0,045 0,044	KB 12 AJ KB 12 UU AJ	4	0,044 0,043	KB 12 OP KB 12 UU OP	3	0,035 0,034	12	+8/0
16	KB 16 KB 16 UU	4	0,06 0,059	KB 16 AJ KB 16 UU AJ	4	0,059 0,058	KB 16 OP KB 16 UU OP	3	0,048 0,047	16	+9/-1
20	KB 20 KB 20 UU	5	0,102 0,1	KB 20 AJ KB 20 UU AJ	5	0,1 0,098	KB 20 OP KB 20 UU OP	4	0,084 0,082	20	+9/-1
25	KB 25 KB 25 UU	6	0,235 0,232	KB 25 AJ KB 25 UU AJ	6	0,23 0,228	KB 25 OP KB 25 UU OP	5	0,195 0,193	25	+11/-1
30	KB 30 KB 30 UU	6	0,36 0,35	KB 30 AJ KB 30 UU AJ	6	0,355 0,345	KB 30 OP KB 30 UU OP	5	0,309 0,3	30	+11/-1
40	KB 40 KB 40 UU	6	0,77 0,752	KB 40 AJ KB 40 UU AJ	6	0,758 0,74	KB 40 OP KB 40 UU OP	5	0,665 0,645	40	+13/-2
50	KB 50 KB 50 UU	6	1,25 1,21	KB 50 AJ KB 50 UU AJ	6	1,23 1,19	KB 50 OP KB 50 UU OP	5	1,08 1,05	50	+13/-2
60	KB 60 KB 60 UU	6	2,22 2,16	KB 60 AJ KB 60 UU AJ	6	2,17 2,11	KB 60 OP KB 60 UU OP	5	1,9 1,85	60	+13/-2
80	KB 80 KB 80 UU	6	5,14 5,03	KB 80 AJ KB 80 UU AJ	6	5 4,93	KB 80 OP KB 80 UU OP	5	4,38 4,21	80	+16/-4



Major dimensions and tolerances												Eccentricity	Radial clearance	Basic load rating	
	D		L		B		W	D <sub>1</sub>	h	h <sub>1</sub>	α	μm	max. μm	dyn. C N	stat C <sub>0</sub> N
	mm	Tol. μm	mm	Tol. μm	mm	Tol. μm	mm	mm	mm	mm	°				
	16	0/-8	25	0/-200	16,5	0/-200	1,1	15,2	1			12	-3	265	402
	22	0/-8	32	0/-200	22,9	0/-200	1,3	21	1,5	7,5	78°	12	-4	510	784
	26	0/-9	36	0/-200	24,9	0/-200	1,3	24,9	1,5	10	78°	12	-4	578	892
	32	0/-11	45	0/-200	31,5	0/-200	1,6	30,3	2	10	60°	15	-6	862	1370
	40	0/-11	58	0/-300	44,1	0/-300	1,85	37,5	2	12,5	60°	15	-6	980	1570
	47	0/-11	68	0/-300	52,1	0/-300	1,85	44,5	2	12,5	50°	15	-8	1570	2740
	62	0/-13	80	0/-300	60,6	0/-300	2,15	59	3	16,8	50°	17	-8	2160	4020
	75	0/-13	100	0/-300	77,6	0/-300	2,65	72	3	21	50°	17	-13	3820	7940
	90	0/-15	125	0/-400	101,7	0/-400	3,15	86,5	3	27,2	54°	20	-13	4700	9800
	120	0/-15	165	0/-400	133,7	0/-400	4,15	116	3	36,3	54°	20	-20	7350	16000

# STANDARD LINEAR BEARINGS

**KBB...G**

**with resin retainer**

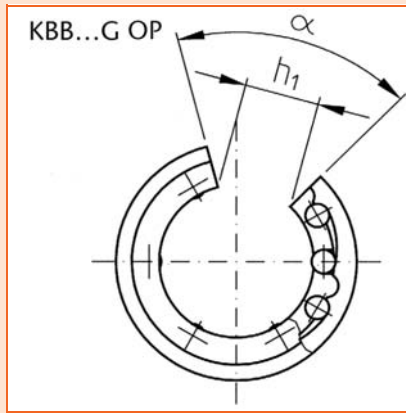
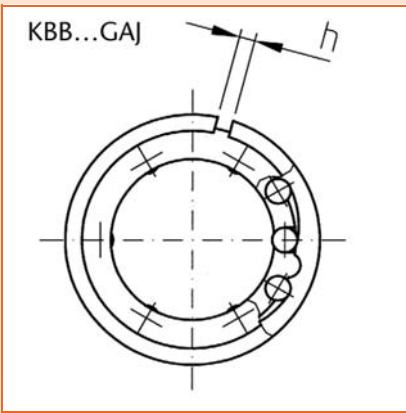
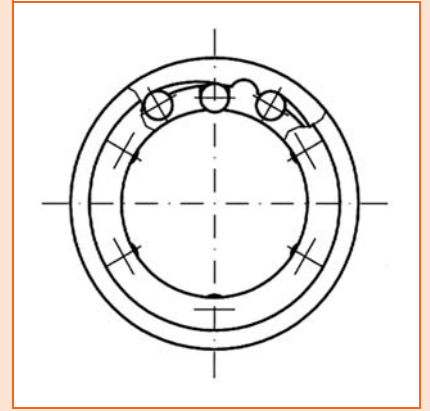
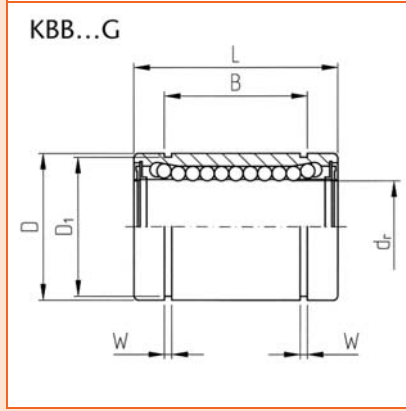
UU = seals on both sides

Thin film corrosion protection on Ni-base

Advantages: Cost-effective alternative opponent stainless steel version, no difference in load rating

Resistance: 96h in salt spray test against red rust

Shaft Ø mm	Designation									d <sub>r</sub>	
	Closed	Ball circuit	Weight kg	Adjustable	Ball circuit	Weight kg	Open	Ball circuit	Weight kg	mm	Tol.µm
5	KBB 05 G KBB 05 G UU	4	0,011	KBB 05 G AJ KBB 05 G UU AJ	4	0,01				5	+8/0
8	KBB 08 G KBB 08 G UU	4	0,02	KBB 08 G AJ KBB 08 G UU AJ	4	0,019				8	+8/0
12	KBB 12 G KBB 12 G UU	4	0,041	KBB 12 G AJ KBB 12 UU AJ	4	0,04	KBB 12 G OP KBB 12 G UU OP	3	0,032	12	+8/0
16	KBB 16 G KBB 16 G UU	5	0,057	KBB 16 G AJ KBB 16 UU AJ	5	0,056	KBB 16 G OP KBB 16 G UU OP	3	0,044	16	+9/-1
20	KBB 20 G KBB 20 G UU	5	0,091	KBB 20 G AJ KBB 20 UU AJ	5	0,09	KBB 20 G OP KBB 20 G UU OP	4	0,075	20	+9/-1
25	KBB 25 G KBB 25 G UU	6	0,215	KBB 25 G AJ KBB 25 UU AJ	6	0,212	KBB 25 G OP KBB 25 G UU OP	5	0,181	25	+11/-1
30	KBB 30 G KBB 30 G UU	6	0,325	KBB 30 G AJ KBB 30 UU AJ	6	0,32	KBB 30 G OP KBB 30 G UU OP	5	0,272	30	+11/-1
40	KBB 40 G KBB 40 G UU	6	0,705	KBB 40 G AJ KBB 40 UU AJ	6	0,694	KBB 40 G OP KBB 40 G UU OP	5	0,6	40	+13/-2
50	KBB 50 G KBB 50 G UU	6	1,13	KBB 50 G AJ KBB 50 UU AJ	6	1,1	KBB 50 G OP KBB 50 G UU OP	5	0,97	50	+13/-2



Major dimensions and tolerances

Major dimensions and tolerances												Eccentricity	Radial clearance	Basic load rating	
	D		L		B		W	D <sub>1</sub>	h	h <sub>1</sub>	α	μm	max. μm	dyn. C N	stat C <sub>0</sub> N
	mm	Tol. μm	mm	Tol. μm	mm	Tol. μm									
	12	0/-8	22	0/-200	14,5	0/-200	1,1	11,5	1			12	-3	69	147
	16	0/-8	25	0/-200	16,5	0/-200	1,1	15,2	1			12	-3	118	226
	22	0/-9	32	0/-200	22,9	0/-200	1,3	21	1,5	7,5	78°	12	-4	265	500
	26	0/-9	36	0/-200	24,9	0/-200	1,3	24,9	1,5	10	78°	12	-4	440	735
	32	0/-11	45	0/-200	31,5	0/-200	1,6	30,3	2	10	60°	15	-6	610	1010
	40	0/-11	58	0/-300	44,5	0/-300	1,85	37,5	2	12,5	60°	15	-6	1000	1960
	47	0/-11	68	0/-300	52,1	0/-300	1,85	44,5	2	12,5	50°	15	-8	1400	2500
	62	0/-13	80	0/-300	60,6	0/-300	2,15	59	3	16,8	50°	17	-8	2200	4100
	75	0/-13	100	0/-300	77,6	0/-300	2,65	72	3	21	50°	17	-13	4120	7110



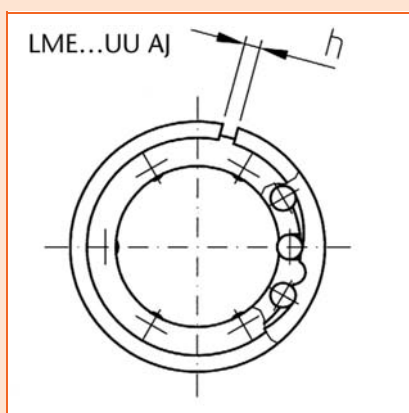
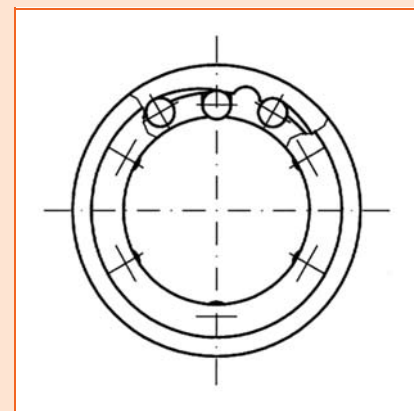
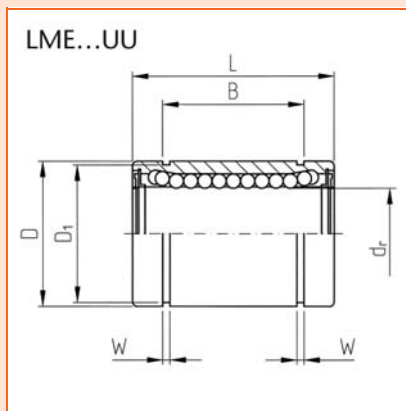
## STANDARD LINEAR BEARINGS

**LME...**

**with resin retainer**

MiniTec linear bearings in the LME series have been designed from the strictest of cost standpoints. The user thus has the possibility of creating extremely cost-effective bearings using existing housings, shaft brackets, supports, etc. That has the advantage that low-cost solutions require no special construction. At the same time, the need for duplicate inventory for accessories is eliminated. The connection dimensions and tolerances correspond to the standards introduced. The temperature range is limited to a maximum of 80 °C. The interior structure and fabrication of this bearing series have been optimised for cost-effectiveness, with no compromise in the quality of the materials used. The chromium steel balls used correspond to quality class III, the massive outer shell is made of material 100Cr6, material number 1.3505, and the cage of PA 66. For cost reasons, the design of unsealed and single-sided sealed bearings was omitted. All bearings in the LME series are always equipped with integrated axial seals on both sides. The sealing rings simultaneously serve to fasten the cage.

Shaft Ø mm	Designation										M
	Closed	Ball circuit	Weight kg	Adjustable	Ball circuit	Weight kg	mm	d <sub>r</sub> Tol.µm	mm	D Tol.µm	
5	LME 05 UU	4	0,011	LME 05 UU AJ	4	0,01	5	+8/0	12	0/-8	
8	LME 08 UU	4	0,02	LME 08 UU AJ	4	0,02	8	+8/0	16	0/-8	
12	LME 12 UU	4	0,041	LME 12 UU AJ	4	0,04	12	+8/0	22	0/-9	
16	LME 16 UU	5	0,057	LME 16 UU AJ	5	0,056	16	+9/-1	26	0/-9	
20	LME 20 UU	5	0,091	LME 20 UU AJ	5	0,09	20	+9/-1	32	0/-11	
25	LME 25 UU	6	0,215	LME 25 UU AJ	6	0,212	25	+11/-1	40	0/-11	
30	LME 30 UU	6	0,325	LME 30 UU AJ	6	0,32	30	+11/-1	47	0/-11	
40	LME 40 UU	6	0,705	LME 40 UU AJ	6	0,694	40	+13/-2	62	0/-13	
50	LME 50 UU	6	1,13	LME 50 UU AJ	6	1,11	50	+13/-2	75	0/-13	
60	LME 60 UU	6	2,22	LME 60 UU AJ	6	2	60	+13/-2	90	0/-15	



Major dimensions and tolerances									Eccentricity μm	Radial clearance max. μm	Basic load rating	
mm	L Tol. μm	mm	B Tol. μm	W mm	D <sub>1</sub> mm	h mm	dyn. C N	stat C <sub>0</sub> N				
22	0/-200	14,5	0/-200	1,1	11,5	1	12	-5	200	260		
25	0/-200	16,5	0/-200	1,1	15,2	1	12	-5	200	260		
32	0/-200	22,9	0/-200	1,3	21	1,5	12	-7	510	780		
36	0/-200	24,9	0/-200	1,3	24,9	1,5	12	-7	580	910		
45	0/-200	31,5	0/-200	1,6	30,3	2	15	-9	870	1390		
58	0/-300	44,1	0/-300	1,85	37,5	2	15	-9	990	1580		
68	0/-300	52,1	0/-300	1,85	44,5	2	15	-9	1580	2780		
80	0/-300	60,6	0/-300	2,15	59	3	17	-13	2170	4070		
100	0/-300	77,6	0/-300	2,65	72	3	17	-13	3860	8060		
125	0/-400	101,7	0/-400	3,15	86,5	3	20	-16	4750	10500		

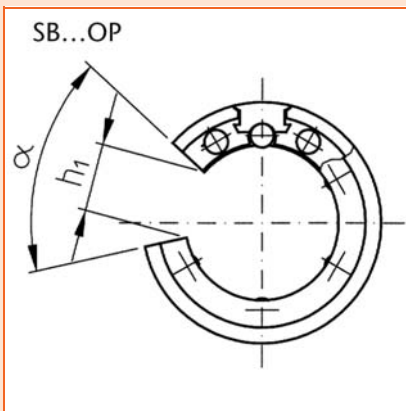
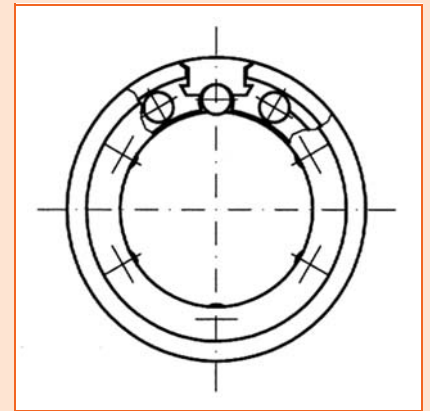
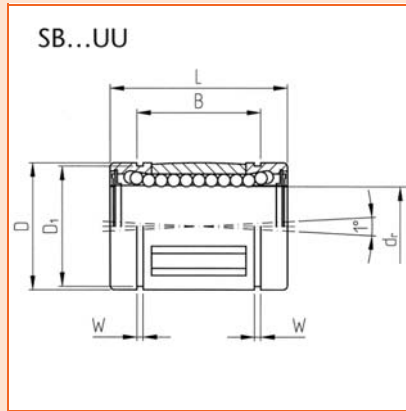
## SUPER LINEAR BEARINGS

**SB...**

**Resin retainer with ground surface load plate**

Advantage: Compension of misalignment +/- 30°  
 Higher load rating by lower weight  
 UU = seals on both sides

Shaft Ø mm	Designation									
	Closed	Ball circuit	Weight kg	Open	Ball circuit	Weight kg	mm	d <sub>r</sub> Tol.µm	D mm	
12	SB 12 SB 12 UU	5	0,021	SB 12 OP SB 12 UU OP	4	0,017	12	+8/0	22	
16	SB 16 SB 16 UU	5	0,043	SB 16 OP SB 16 UU OP	4	0,035	16	+9/-1	26	
20	SB 20 SB 20 UU	6	0,058	SB 20 OP SB 20 UU OP	5	0,048	20	+9/-1	32	
25	SB 25 SB 25 UU	6	0,123	SB 25 OP SB 25 UU OP	5	0,103	25	+11/-1	40	
30	SB 30 SB 30 UU	6	0,216	SB 30 OP SB 30 UU OP	5	0,177	30	+11/-1	47	
40	SB 40 SB 40 UU	6	0,333	SB 40 OP SB 40 UU OP	5	0,275	40	+13/-2	62	



Major dimensions and tolerances										Tragzahlen	
	mm	L Tol. μm	mm	B Tol. μm	W mm	D <sub>1</sub> mm	h <sub>1</sub> mm	α	dyn. C N	stat C <sub>0</sub> N	
	32	+/-200	22,9	0/-200	1,3	21	6,5	66°	1020	1290	
	36	+/-200	24,9	0/-200	1,3	24,9	9	68°	1250	1550	
	45	+/-200	31,5	0/-200	1,6	30,3	9	55°	2090	2630	
	58	+/-200	44,1	0/-300	1,85	37,5	11,5	57°	3780	4720	
	68	+/-200	52,1	0/-300	1,85	44,5	14	57°	5470	6810	
	80	+/-200	60,6	0/-300	2,15	59	19,5	56°	6590	8230	

# MINIATURE LINEAR BEARINGS

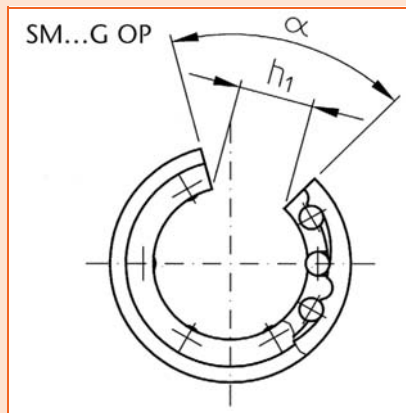
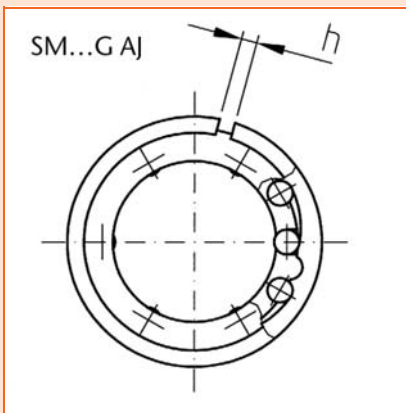
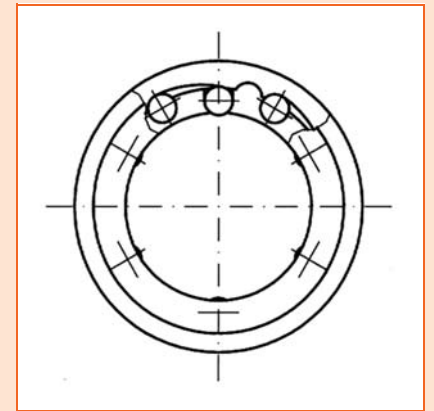
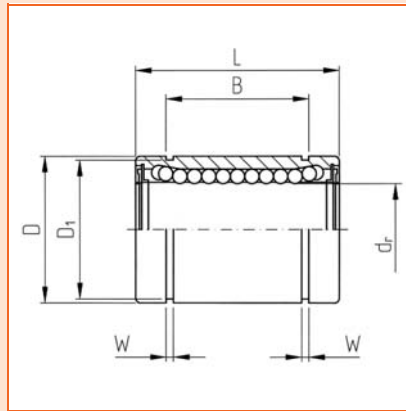
**SM..G**

**with resin retainer**

UU = seals on both sides  
 Also available in stainless version, material 1.4125.  
 Designation: SMS...G

Attention: Please see drill tolerance measure dr. This series is for high precision application for shafts of tolerance g6.  
 Standard shafts of tolerance h6 are suitable.

Shaft Ø mm	Designation									d <sub>f</sub>		
	Closed	Ball circuit	Weight g	Adjustable	Ball circuit	Weight g	Open	Ball circuit	Weight g	mm	Tol.µm high- precision	Tol.µm
3	SM 03 G SM 03 G UU	4	1,35							3	0/-5	0/-8
4	SM 04 G SM 04 G UU	4	1,9							4	0/-5	0/-8
5	SM 05 G SM 05 G UU	4	4							5	0/-5	0/-8
6	SM 06 G SM 06 G UU	4	7,6	SM 06 G AJ SM 06 G UU AJ	4	7,5				6	0/-6	0/-9
8	SM 08 SG SM 08 SG UU	4	10,4	SM 08 SG AJ SM 08 SG UU AJ	4	10				8	0/-6	0/-9
8	SM 08 G SM 08 G UU	4	15	SM 08 G AJ SM 08 G UU AJ	4	14,7				8	0/-6	0/-9
10	SM 10 G SM 10 G UU	4	29,5	SM 10 G AJ SM 10 G UU AJ	4	29	SM 10 G OP SM 10 G UU OP	3	30	10	0/-6	0/-9



Major dimensions and tolerances											Eccentricity		Radial clearance	Basic load rating		
	D		L		B		W	D <sub>1</sub>	h	h <sub>1</sub>	α	high-precision	standard	max. μm	dyn. C N	stat C <sub>0</sub> N
	mm	Tol. μm	mm	Tol. μm	mm	Tol. μm						μm	μm			
	7	0/-9	10	0/-120								4	8	-3	70	107
	8	0/-9	12	0/-120								4	8	-3	90	130
	10	0/-9	15	0/-120	10,2	0/-200	1,1	9,6				4	8	-3	170	210
	12	0/-11	19	0/-220	13,5	0/-200	1,1	11,5	1			8	12	-3	210	270
	15	0/-11	17	0/-220	11,5	0/-200	1,1	14,3	1			8	12	-3	180	220
	15	0/-11	24	0/-220	17,5	0/-200	1,1	14,3	1			8	12	-3	280	400
	19	0/-11	29	0/-200	22	0/-200	1,3	18	1	6,8	80°	8	12	-4	380	560

# LARGE LINEAR BEARINGS

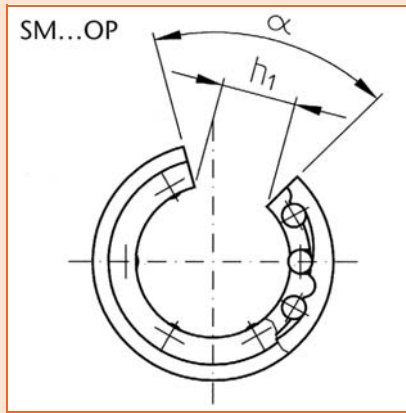
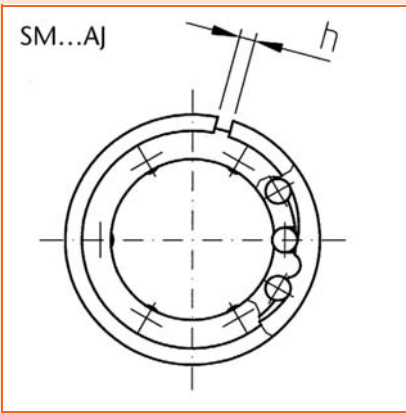
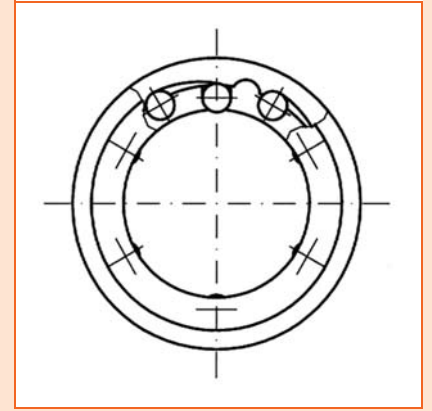
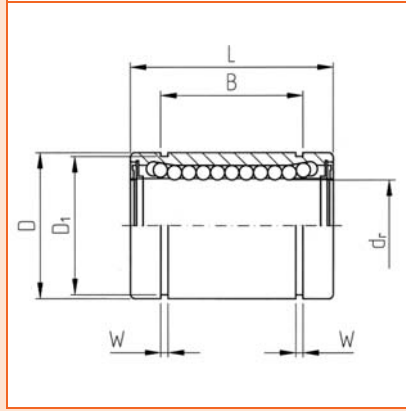
**SM...**

**with steel retainer**

UU = seals on both sides

Attention: Please see drill tolerance measure dr. This series is for high precision application for shafts of tolerance g6. Standard shafts of tolerance h6 are suitable.

Shaft Ø mm	Designation									d,		
	Closed	Ball circuit	Weight kg	Adjustable	Ball circuit	Weight kg	Open	Ball circuit	Weight kg	mm	Tol.µm high- precision	Tol.µm
80	SM 80 SM 80 UU	6	4,52	SM 80 AJ SM 80 UU AJ	6	4,4	SM 80 OP SM 80 UU OP	5	3,75	80	0/-9	0/-15
100	SM 100 SM 100 UU	6	8,6	SM 100 AJ SM 100 UU AJ	6	8,54	SM 100 OP SM 100 UU OP	5	7,2	100	0/-10	0/-20
120	SM 120 SM 120 UU	8	15	SM 120 AJ SM 120 UU AJ	8	14,9	SM 120 OP SM 120 UU OP	6	11,6	120	0/-10	0/-20
150	SM 150 SM 150 UU	8	20,25	SM 150 AJ SM 150 UU AJ	8	20,15	SM 150 OP SM 150 UU OP	6	15,7	150	0/-13	0/-25



Major dimensions and tolerances											Eccentricity		Eccentricity	Eccentricity		
	D		L		B		W	D <sub>1</sub>	h	h <sub>1</sub>	α	Eccentricity		max. μm	dyn. C N	stat C <sub>0</sub> N
	mm	Tol. μm	mm	Tol. μm	mm	Tol. μm						μm	μm			
												high-precision	standard			
	120	0/-22	140	0/-400	105,5	0/-400	4,15	116	3	40	50°	17	25	-20	7350	16000
	150	0/-25	200	0/-400	125,5	0/-400	4,15	145	3	50	50°	20	30	-20	14100	34800
	180	0/-25	200	0/-400	158,6	0/-400	4,15	175	3	85	80°	20	30	-25	16400	40000
	210	0/-29	240	0/-400	170,6	0/-400	5,15	204	3	105	80°	25	40	-25	21100	54300



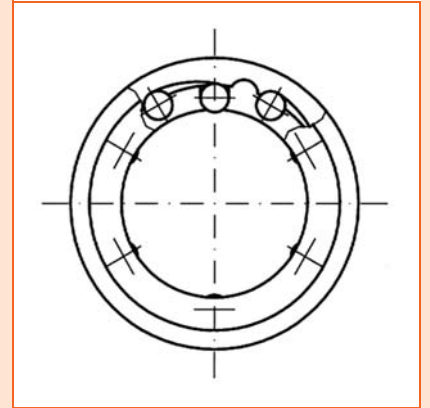
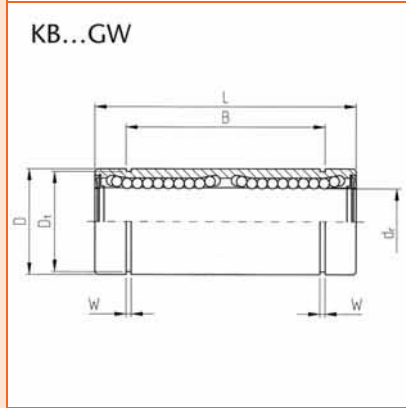
## TANDEM LINEAR BEARINGS

**KB...W**  
**KB...GW**

**with steel retainer**  
**with resin retainer**

UU = seals on both sides  
Also available in stainless version, material 1.4125.  
Designation: KBS...W, KBS...GW

Shaft Ø mm	Designation		Weight kg	Major dimensions and tolerances					
	Steel retainer	Resin retainer		mm	d <sub>r</sub> Tol.µm	mm	D Tol.µm		
8	KB 08 W	KB 08 GW	0,04	8	+9/-1	16	0/-9		
12	KB 12 W	KB 12 GW	0,08	12	+9/-1	22	0/-11		
16	KB 16 W	KB 16 GW	0,115	16	+11/-1	26	0/-11		
20	KB 20 W	KB 20 GW	0,18	20	+11/-1	32	0/-13		
25	KB 25 W	KB 25 GW	0,43	25	+13/-2	40	0/-13		
30	KB 30 W	KB 30 GW	0,615	30	+13/-2	47	0/-13		
40	KB 40 W	KB 40 GW	1,4	40	+16/-4	62	0/-15		
50	KB 50 W	KB 50 GW	2,32	50	+16/-4	75	0/-15		
60	KB 60 W	KB 60 GW	3,92	60	+16/-4	90	0/-20		



Major dimensions and tolerances						Eccentricity	Basic load rating			
mm	L	Tol. $\mu\text{m}$	mm	B	Tol. $\mu\text{m}$	W	mm	$\mu\text{m}$	dyn. C N	stat C <sub>0</sub> N
46		0/-300	33		0/-300	1,1		15	430	820
61		0/-300	45,8		0/-300	1,3		15	830	1600
68		0/-300	49,8		0/-300	1,3		15	940	1820
80		0/-300	61		0/-300	1,6		17	1400	2800
112		0/-400	82		0/-400	1,85		17	1600	3200
123		0/-400	104,2		0/-400	1,85		17	2550	5600
151		0/-400	121,2		0/-400	2,15		20	3500	8200
192		0/-400	155,2		0/-400	2,65		20	6200	16200
209		0/-400	170		0/-400	3,15		25	7600	32600

## FLANGE LINEAR BEARINGS

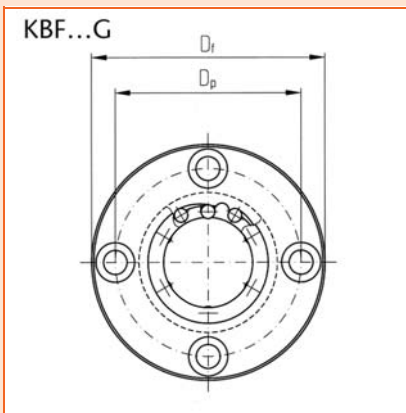
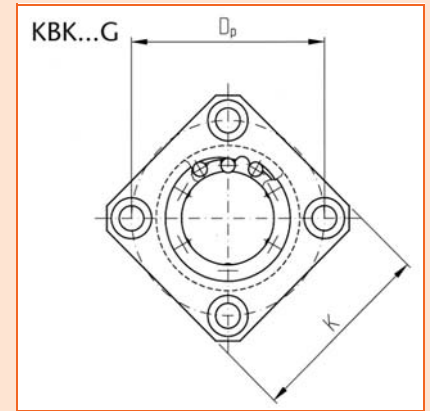
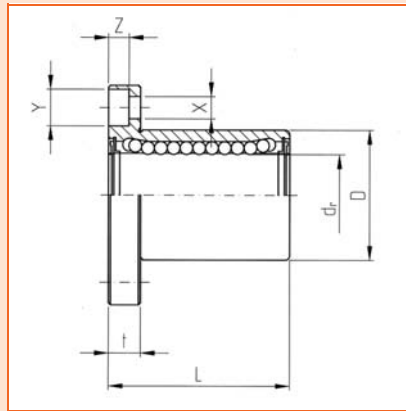
**KBF...**  
**KBF...G**  
**KBK..**  
**KBK...G**

**Circular flange with steel retainer**  
**Circular with resin retainer**  
**Square flange with steel retainer**  
**Square flange with resin retainer**

UU = seals on both sides  
 Also available in stainless version, material 1.4125.  
 Designation: KBSF, KBSK

Advantage: exact geometry, no housing necessary, easy assembly and changing, direct assembly in main frame possible.

Shaft Ø mm	Designation		Weight kg	Major dimensions and tolerances							
	Steel retainer	Resin retainer		d <sub>i</sub> mm	Tol.µm	D mm	Tol.µm	L mm	Tol.µm		
5		KBF 05 G KBK 05 G	0,02	5	+8/0	12	0/-13	22	0/-300		
8	KBF 08 KBK 08	KBF 08 G KBK 08 G	0,033	8	+8/0	16	0/-13	25	0/-300		
12	KBF 12 KBK 12	KBF 12 G KBK 12 G	0,064	12	+8/0	22	0/-16	32	0/-300		
16	KBF 16 KBK 16	KBF 16 G KBK 16 G	0,09	16	+9/-1	26	0/-16	36	0/-300		
20	KBF 20 KBK 20	KBF 20 G KBK 20 G	0,147	20	+9/-1	32	0/-19	45	0/-300		
25	KBF 25 KBK 25	KBF 25 G KBK 25 G	0,295	25	+11/-1	40	0/-19	58	0/-300		
30	KBF 30 KBK 30	KBF 30 G KBK 30 G	0,465	30	+11/-1	47	0/-19	68	0/-300		
40	KBF 40 KBK 40	KBF 40 G KBK 40 G	0,975	40	+13/-2	62	0/-22	80	0/-300		
50	KBF 50 KBK 50	KBF 50 G KBK 50 G	1,545	50	+13/-2	75	0/-22	100	0/-300		
60	KBF 60 KBK 60	KBF 60 G KBK 60 G	2,78	60	+13/-2	90	0/-25	125	0/-300		
80	KBF 80 KBK 80		5,92	80	+16/-4	120	0/-25	165	0/-300		



Major dimensions and tolerances								Eccentricity	Basic load rating	
K mm	D <sub>f</sub> mm	t mm	D <sub>p</sub> mm	X mm	Y mm	Z mm	μm	dyn. C N	stat C <sub>0</sub> N	
22	28	5	20	3,5	6	3,1	12	210	270	
25	32	5	24	3,5	6	3,1	12	270	410	
32	42	6	32	4,5	7,5	4,1	12	520	790	
35	46	6	36	4,5	7,5	4,1	12	590	910	
42	54	8	43	5,5	9	5,1	15	880	1400	
50	62	8	51	5,5	9	5,1	15	1000	1600	
60	76	10	62	6,6	11	6,1	15	1600	2800	
75	98	13	80	9	14	8,1	17	2200	4100	
88	112	13	94	9	14	8,1	17	3900	8100	
106	134	18	112	11	17	11,1	20	4800	10000	
136	164	18	142	11	17	11,1	20	7500	16300	

## TANDEM LINEAR BEARINGS WITH FLANGE

**KBF...W**  
**KBF...GW**  
**KBK..W**  
**KBK...GW**

**Circular flange with steel retainer**  
**Circular flange with resin retainer**  
**Square flange with steel retainer**  
**Square flange with resin retainer**

UU = seals on both sides

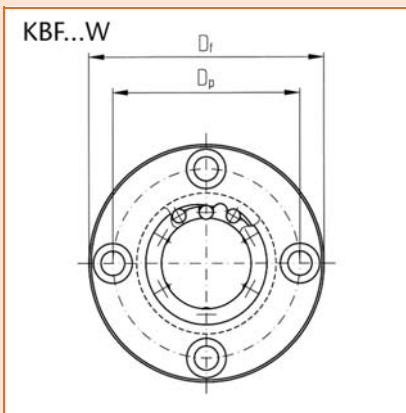
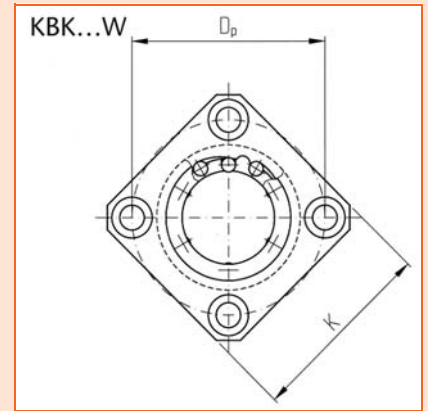
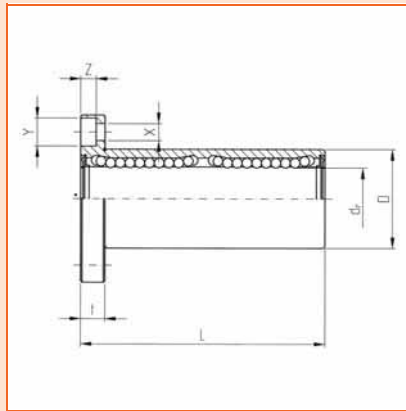
Also available in stainless version, material 1.4125.

Designation: KBSF...W, KBSK...W, KBSK...GW

Advantage: exact geometry, no housing necessary, easy assembly and changing, direct assembly in main frame possible, increased stiffness, load capacity and guiding accuracy.

This unit KBK...W is useful for very small installation space.

Shaft Ø mm	Designation		Weight kg	Major dimensions and tolerances							
	Steel retainer	Resin retainer		mm	d <sub>i</sub> Tol.µm	mm	D Tol.µm	mm	L Tol.µm		
8	KBF 08 W	KBF 08 GW	0,059	8	+9/-1	16	0/-13	46	+/-300		
	KBK 08 W	KBK 08 GW	0,051								
12	KBF 12 W	KBF 12 GW	0,11	12	+9/-1	22	0/-16	61	+/-300		
	KBK 12 W	KBK 12 GW	0,09								
16	KBF 16 W	KBF 16 GW	0,16	16	+11/-1	26	0/-16	68	+/-300		
	KBK 16 W	KBK 16 GW	0,135								
20	KBF 20 W	KBF 20 GW	0,26	20	+11/-1	32	0/-19	80	+/-300		
	KBK 20 W	KBK 20 GW	0,225								
25	KBF 25 W	KBF 25 GW	0,54	25	+13/-2	40	0/-19	112	+/-300		
	KBK 25 W	KBK 25 GW	0,5								
30	KBF 30 W	KBF 30 GW	0,815	30	+13/-2	47	0/-19	123	+/-300		
	KBK 30 W	KBK 30 GW	0,72								
40	KBF 40 W	KBF 40 GW	1,805	40	+16/-4	62	0/-22	151	+/-300		
	KBK 40 W	KBK 40 GW	1,6								
50	KBF 50 W	KBF 50 GW	2,82	50	+16/-4	75	0/-22	192	+/-300		
	KBK 50 W	KBK 50 GW	2,62								
60	KBF 60 W	KBF 60 GW	4,92	60	+16/-4	90	0/-25	209	+/-300		
	KBK 60 W	KBK 60 GW	4,48								



Major dimensions and tolerances								Eccentricity	Basic load rating	
K mm	D <sub>f</sub> mm	t mm	D <sub>p</sub> mm	X mm	Y mm	Z mm	μm	dyn. C N	stat C <sub>0</sub> N	
25	32	5	24	3,5	6	3,1	15	430	820	
32	31	6	32	4,5	7,5	4,1	15	830	1600	
35	46	6	36	4,5	7,5	4,1	15	940	1820	
42	54	8	43	5,5	9	5,1	17	1400	2800	
50	62	8	51	5,5	9	5,1	17	1600	3200	
60	76	10	62	6,6	11	6,1	17	2550	5600	
75	98	13	80	9	14	8,1	20	3500	8200	
88	112	13	94	9	14	8,1	20	6200	16200	
106	134	18	112	11	17	11,1	25	7700	20400	

## TANDEM LINEAR BEARINGS WITH CENTRIC FLANGE

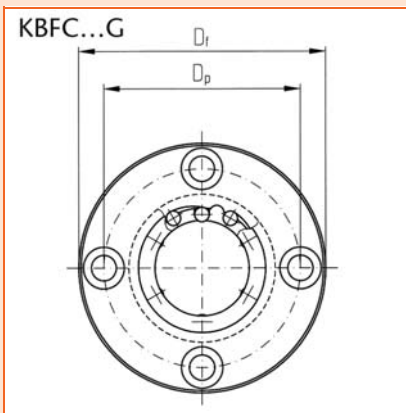
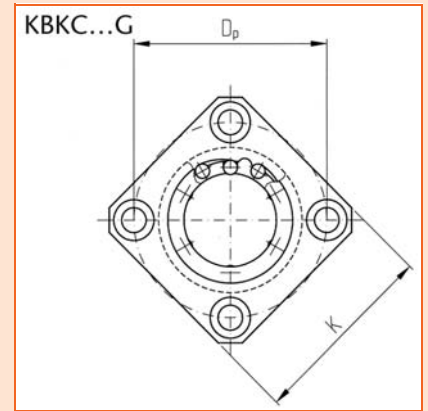
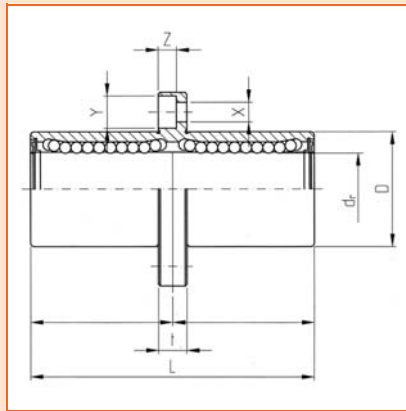
**KBFC...**  
**KBFC..G**  
**KBKC...**  
**KBKC...G**

**Circular flange with steel retainer**  
**Circular flange with resin retainer**  
**Square flange with steel retainer**  
**Square flange with resin retainer**

UU = seals on both sides  
 Also available in stainless version, material 1.4125.  
 Designation: KBSFC, KBSFC...G, KBSKC, KBSKC...G

Advantage: exact geometry, no housing necessary, easy assembly and changing, direct assembly in main frame possible, increased stiffness, load capacity and guiding accuracy.

Shaft Ø mm	Designation		Weight kg	Major dimensions and tolerances					
	Steel retainer	Resin retainer		d <sub>i</sub>	D	Tol. µm	L		
8	KBFC 08	KBFC 08 G	0,059	8	+9/-1	16	0/-13	46	+0/-300
	KBKC 08	KBKC 08 G	0,051						
12	KBFC 12	KBFC 12 G	0,11	12	+9/-1	22	0/-16	61	+0/-300
	KBKC 12	KBKC 12 G	0,09						
16	KBFC 16	KBFC 16 G	0,16	16	+11/-1	26	0/-16	68	+0/-300
	KBKC 16	KBKC 16 G	0,09						
20	KBFC 20	KBFC 20 G	0,135	20	+11/-1	32	0/-19	80	+0/-300
	KBKC 20	KBKC 20 G	0,225						
25	KBFC 25	KBFC 25 G	0,54	25	+13/-2	40	0/-19	112	+0/-300
	KBKC 25	KBKC 25 G	0,5						
30	KBFC 30	KBFC 30 G	0,815	30	+13/-2	47	0/-19	123	+0/-300
	KBKC 30	KBKC 30 G	0,72						
40	KBFC 40	KBFC 40 G	1,805	40	+16/-4	62	0/-22	151	+0/-300
	KBKC 40	KBKC 40 G	1,6						
50	KBFC 50	KBFC 50 G	2,82	50	+16/-4	75	0/-22	192	+0/-300
	KBKC 50	KBKC 50 G	2,62						
60	KBFC 60	KBFC 60 G	4,92	60	+16/-4	90	0/-25	209	+0/-300
	KBKC 60	KBKC 60 G	4,48						



Major dimensions and tolerances								Eccentricity	Basic load rating	
K Tol. $\mu\text{m}$	$D_f$ mm	t mm	$D_p$ mm	X mm	Y mm	Z mm	$\mu\text{m}$	dyn. C N	stat $C_o$ N	
25	32	5	24	3,5	6	3,1	15	430	820	
32	42	6	32	4,5	7,5	4,1	15	830	1600	
35	46	6	36	4,5	7,5	4,1	15	940	1820	
42	54	8	43	5,5	9	5,1	17	1400	2800	
50	62	8	51	5,5	9	5,1	17	1600	3200	
60	76	10	62	6,6	11	6,1	17	2550	5600	
75	98	13	80	9	14	8,1	20	3500	8200	
88	112	13	94	9	14	8,1	20	6200	16200	
106	134	18	112	11	17	11,1	20	7700	20400	



## FLANGE LINEAR BEARINGS

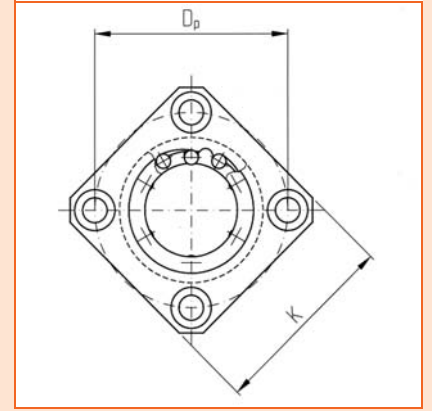
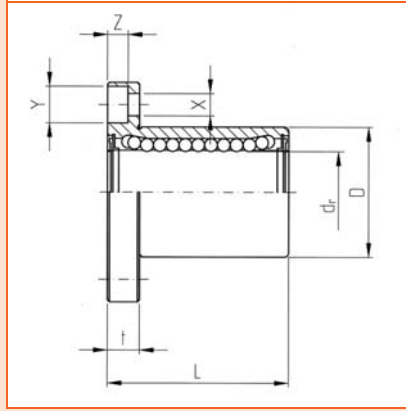
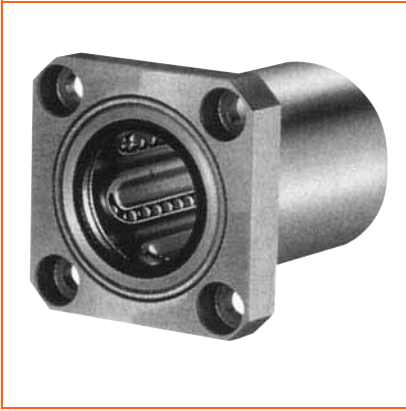
### LFK...GUU

**with resin retainer and seals on both sides**

Special ball bearing series with square flange LFK...GUU

This series is non DIN-Standard. By reducing on a few parts and manufacturing in mass production these bearings are cost efficient.

Shaft Ø mm	Designation	Weight kg	Major dimensions and tolerances			
			mm	d <sub>r</sub> Tol.µm	mm	D Tol.µm
20	LFK 20 G UU	0,145	20	0/-11	32	0/-16
25	LFK 25 G UU	0,3	25	0/-11	40	0/-16
30	LFK 30 G UU	0,46	30	0/-11	47	0/-11



	Flange									Basic load rating
	L mm	K mm	D <sub>f</sub> mm	t mm	D <sub>p</sub> mm	X mm	Y mm	Z mm	dyn. C N	stat C <sub>0</sub> N
	42	42	54	8	43	5,5	9	5,1	610	1010
	58	50	62	8	51	5,5	9	5,1	1000	1960
	68	60	76	10	62	6,6	11	6,1	1400	2500

## TANDEM LINEAR BEARING WITH SQUARE FLANGE

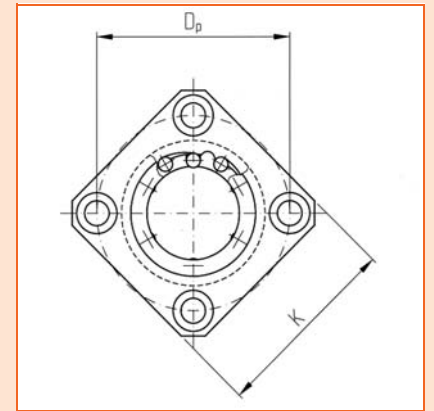
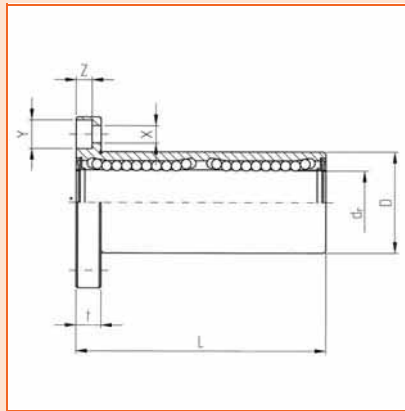
**LKWK...GUU**

**with resin retainer and seals on both sides**

Special series tandem bearing with square flange LFWK...GUU

These bearings are equal to standard bearings in material and quality.  
Please see differences in dimension and tolerance  $d_r$  and D.

Shaft Ø mm	Part No.	Weight kg	Major dimensions and tolerance			
			mm	$d_r$ Tol.µm	mm	D Tol.µm
20	LFWK 20 G UU	0,225	20	0/-12	32	0/-16
25	LFWK 25 G UU	0,475	25	0/-12	40	0/-16
30	LFWK 30 G UU	0,575	30	0/-12	45	0/-16



	Flange									Basic load rating	
	L mm	K mm	D <sub>f</sub> mm	t mm	D <sub>p</sub> mm	X mm	Y mm	Z mm	dyn. C N	stat C <sub>0</sub> N	
	80	42	54	8	43	5,5	9	5,1	1400	2750	
	112	50	62	8	51	5,5	9	5,1	1560	3140	
	112	58	74	10	60	6,6	11	6,1	2490	5490	

## COMPACT LINEAR BEARINGS

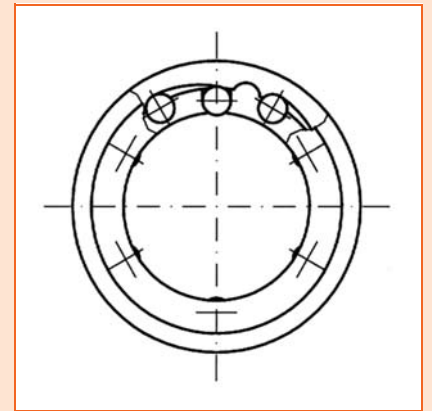
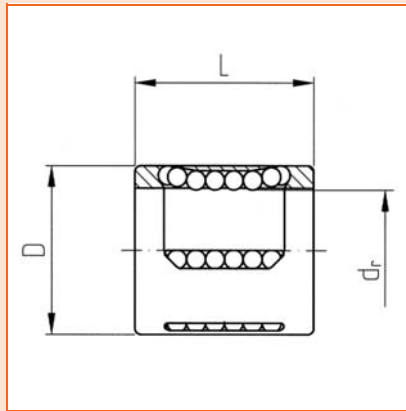
**KH...**

**Housing made of deep-drawing steel sheet, resin retainer**

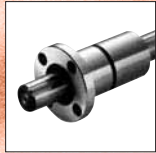
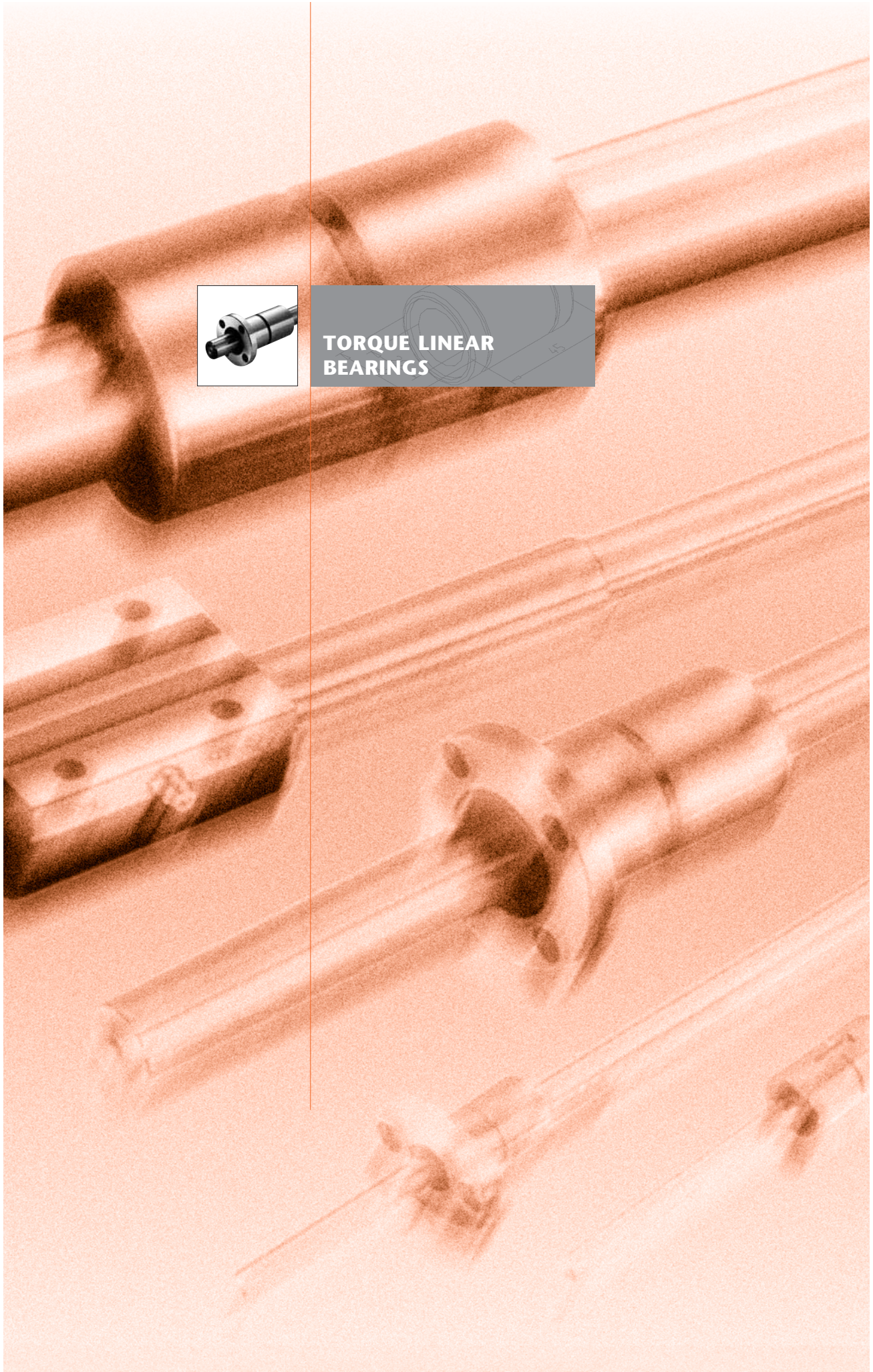
UU = seals on both sides

The specified basic load ratings are only valid for hardened shafts (62-66 HRC) and for grounded shafts

Designations	Dimensions		
	d <sub>r</sub> mm	D mm	L mm
KH 0622	6	12	22
KH 0824	8	15	24
KH 1026	10	17	26
KH 1228	12	19	28
KH 1428	14	21	28
KH 1630	16	24	30
KH 2030	20	28	30
KH 2540	25	35	40
KH 3050	30	40	50
KH 4060	40	52	60
KH 5070	50	62	70



	Weight	Basic load rating	
	kg	$C_{max}N$	$C_{o max}N$
	0,007	390	340
	0,012	440	290
	0,015	510	380
	0,019	630	520
	0,021	630	520
	0,028	820	630
	0,033	970	810
	0,066	2030	1700
	0,095	2860	2760
	0,182	4490	4540
	0,252	5610	6430



**TORQUE LINEAR  
BEARINGS**

## TECHNICAL DATA

### Construction and Characteristics

The torque ball bushing allows the establishment of a precision longitudinal track using two components: the bearing and a profiled shaft. Shafts for torque linear bearings: Material: Cf53, precision drawing and inductive hardening.

Both the bearing and the shaft have 3 or 4 ball tracks shaped like gothic arches, which form a 4-point contact with each load-bearing ball.

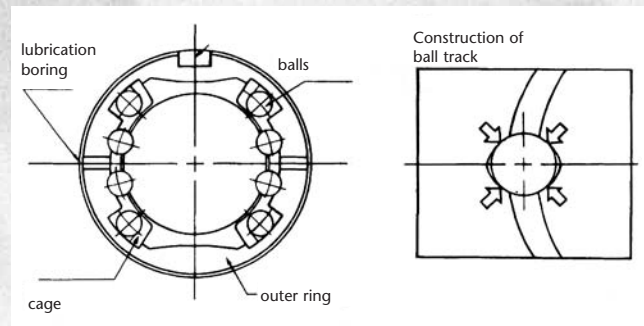
The construction of the tracks ensures a very precise movement of the bearing for loads from any direction. They are high-frequency hardened along their entire length. Due to the plastic cage and the robust construction, the noise and vibration of the bearing could be significantly reduced.

### Freedom from Play

The prestressing of the torque bushing permits the adjustment of the system free of play, thus increasing rigidity.

### Increased Dynamic Load Rating

The implementation of the ball tracks in the form of a gothic arch increases the contact surface of the balls. This has allowed the load capacity of the construction to be significantly increased.



### Seals

All torque ball bushings are delivered with seals on both sides which fit perfectly into the profile groove of the shafts. This results in a secure seal as well as a large lubrication space in the bearing. The bearings can be relubricated using the bearing nipples provided.

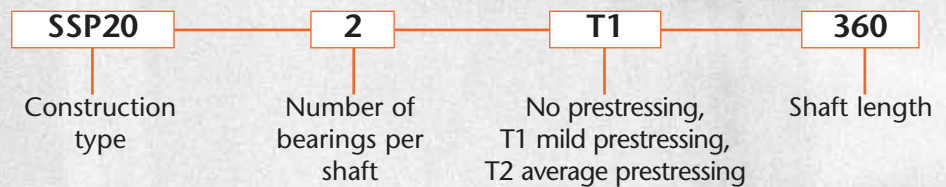
### Small Space Requirements

The outer diameter of the bearing has been kept to a minimum. The return of the balls was optimised from this standpoint.

### Radial Play

Of great significance for the precision and service life of the system in a given application is the selection of the right radial play. For unpaired units, the radial play cannot be definitely specified (increased radial play and/or increased prestressing are possible.) The value of the prestressing for the individual bearing sizes are given in the table.

### Designation of units:



### Example applications:

*Average prestressing T2*

Strong vibration, frequently changing load directions (welding machines, cutting tables.)

*Mild prestressing T1*

Mild vibrations, changing load directions (robot arms, XY tables, assembly machines.)

*No prestressing T0*

Very little vibration, load only from one direction (measurement equipment, packaging machines.)



## TECHNICAL DATA

pre-load	T0	T1	T2
Type	normal	light	medium
SSP 6 S	-2 ~ +1	-6 ~ -2	
SSP 8	-2 ~ +1	-6 ~ -2	
SSP 10 S	-3 ~ +1	-9 ~ -3	
SSP 20	-4 ~ +2	-12 ~ -4	-20 ~ -12
SSP 25	-4 ~ +2	-12 ~ -4	-20 ~ -12
SSP 30	-4 ~ +2	-12 ~ -4	-20 ~ -12
SSP 40	-6 ~ +3	-18 ~ -6	-30 ~ -18
SSP 50	-6 ~ +3	-18 ~ -6	-30 ~ -18

Dynamic load ratings and calculation of service life:

for torque load:

$$L = \left( \frac{f_T f_C}{f_W} \cdot \frac{C_T}{T} \right)^3 \cdot 50$$

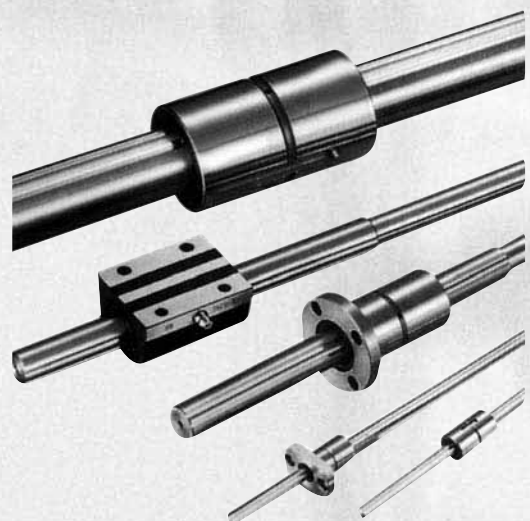
for radial load:

$$L = \left( \frac{f_T f_C}{f_W} \cdot \frac{C}{P} \right)^3 \cdot 50$$

in operating hours:

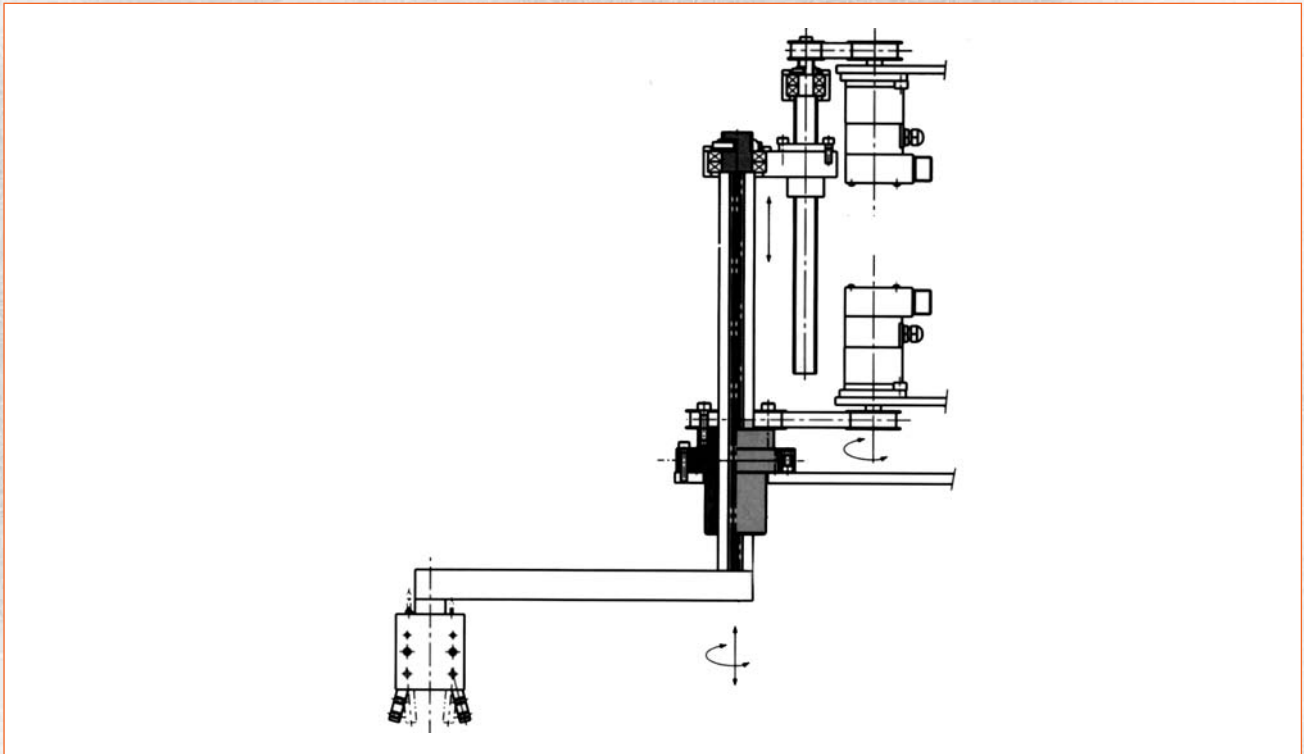
$$L_h = \frac{L \cdot 10^3}{2 \cdot L_s \cdot n_1 \cdot 60}$$

- L Service life (km)
- L<sub>h</sub> Lifetime in hours (h)
- f<sub>T</sub> Temperature coefficient (1 = up to 100 °C)
- f<sub>C</sub> Contact coefficient (number of bearings)
- f<sub>W</sub> Load coefficient  
(1-1.5 = no shock, V<sub>max</sub> up to 15 m/min  
1.5-2 = no shock, V<sub>max</sub> up to 60 m/min  
2-3.5 = shock load, V > 60 m/min)
- C<sub>T</sub> Dyn. torque (Nm)
- C Dynamic load rating (N)
- T Effective torque (Nm)
- P Effective radial load (N)
- L<sub>s</sub> Traversal (m)
- n<sub>1</sub> Number of movements/min



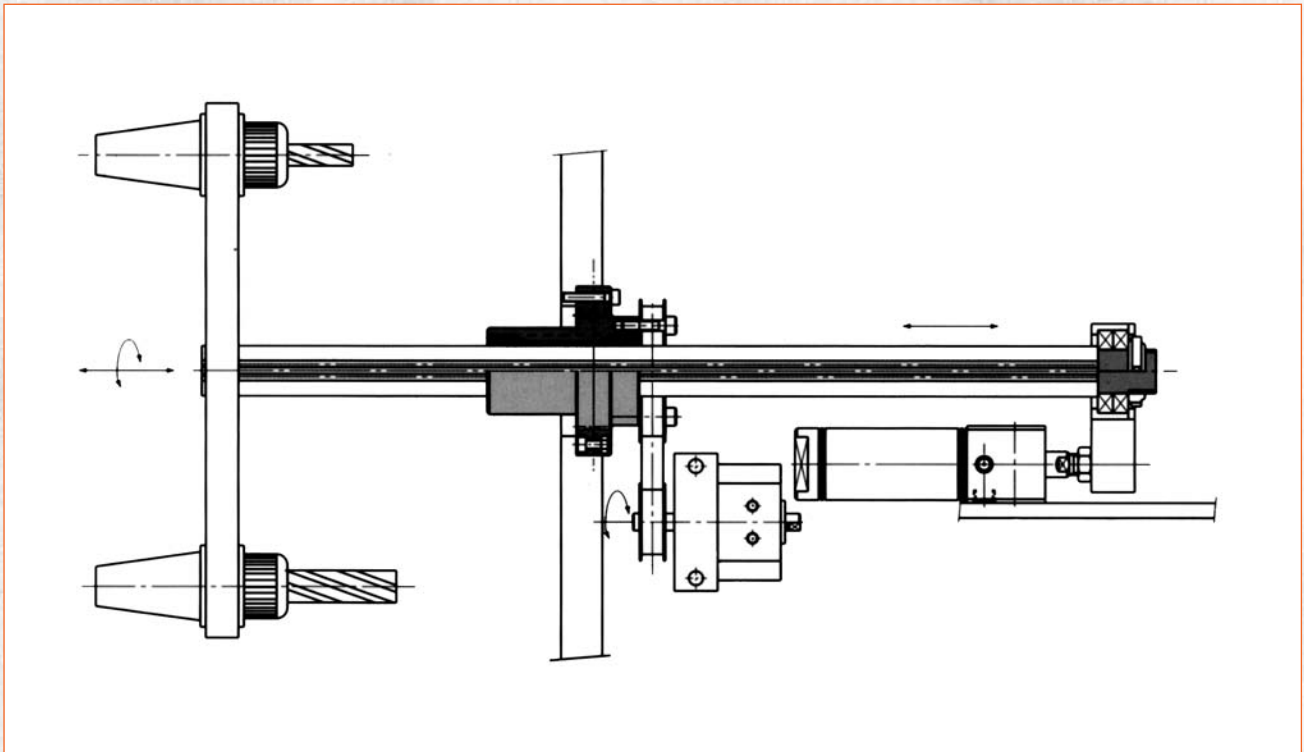
## EXAMPLE DEVELOPMENT

### Gripper System



Torque SPR for simultaneous linear and rotary movements

### Tool Changer

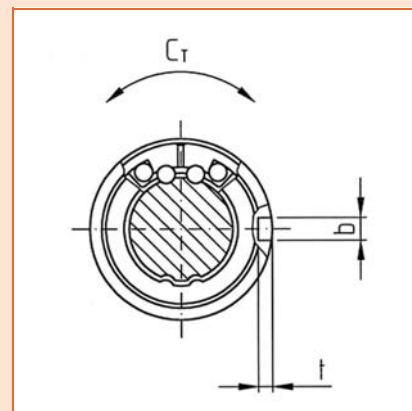
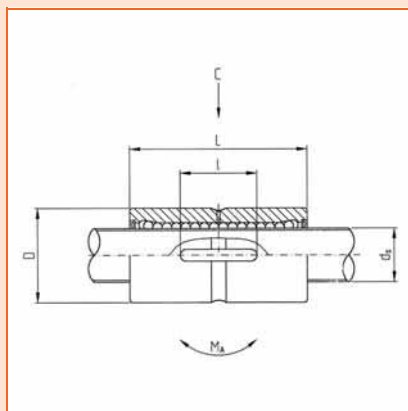


Torque SPR for simultaneous linear and rotary movements

## TORQUE LINEAR BEARING

### SSP...

Designation	Weight		Shaft length max mm	Dimensions					
	Bearing kg	Shaft kg/m		mm	D Tol.µm	mm	L Tol.µm	mm	b Tol.µm
SSP 06 S	0,019	0,21	400	14	0/-11	25	0/-2	2,5	+16/+6
SSP 08 S	0,023	0,38	500	16	0/-11	25	0/-2	2,5	+16/+6
SSP 10 S	0,054	0,6	600	21	0/-13	33	0/-2	3	+16/+6
SSP 20 C	0,2	2	5000	32	0/-16	60	0/-2	4	+24/+12
SSP 25 C	0,22	3,1	5000	37	0/-16	70	0/-3	5	+24/+2
SSP 30 C	0,35	4,8	5000	45	0/-16	80	0/-3	7	+30/+15
SSP 40 C	0,81	8,6	5000	60	0/-19	100	0/-3	10	+30/+15
SSP 50 C	1,5	13,1	5000	75	0/-19	112	0/-3	15	+36/+18

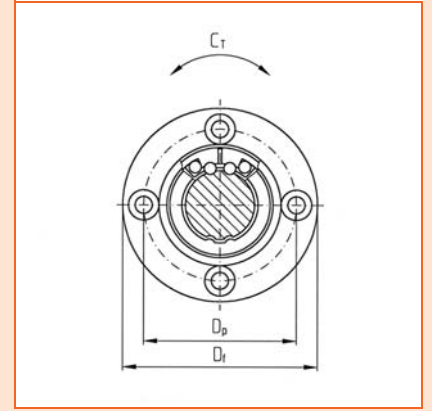
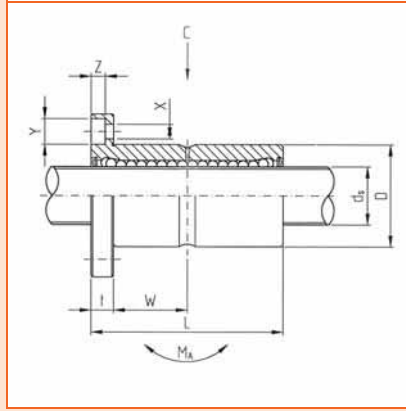
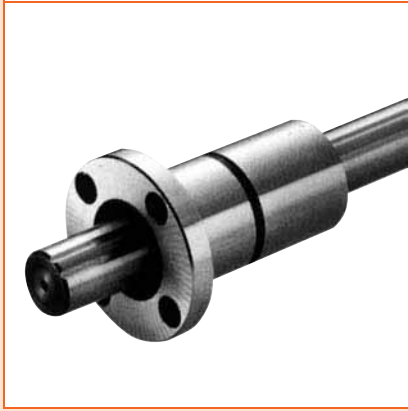


Dimensions					Basic torque rating		Basic load rating		Allowable static moment
	t +0,05 mm	l mm	mm	d <sub>s</sub> Tol. μm	dyn. C <sub>T</sub> Nm	stat. C <sub>OT</sub> Nm	dyn. CN	stat. C <sub>o</sub> N	M <sub>A</sub> Nm
	1,2	10,5	6	0/-12	1,5	2,4	1220	2280	5,1
	1,2	10,5	8	0/-15	2,1	3,7	1450	2870	7,4
	1,5	13	10	0/-15	4,4	8,2	2730	5070	18
	2,5	26	18,2	0/-21	83	133	7840	11300	63
	3	33	23	0/-21	162	239	12300	16100	104
	4	41	28	0/-21	289	412	18600	23200	181
	4,5	55	37,4	0/-25	637	882	30800	37500	358
	5	60	47	0/-25	1390	3180	46100	74200	696

## TORQUE LINEAR BEARING

### SSPF...

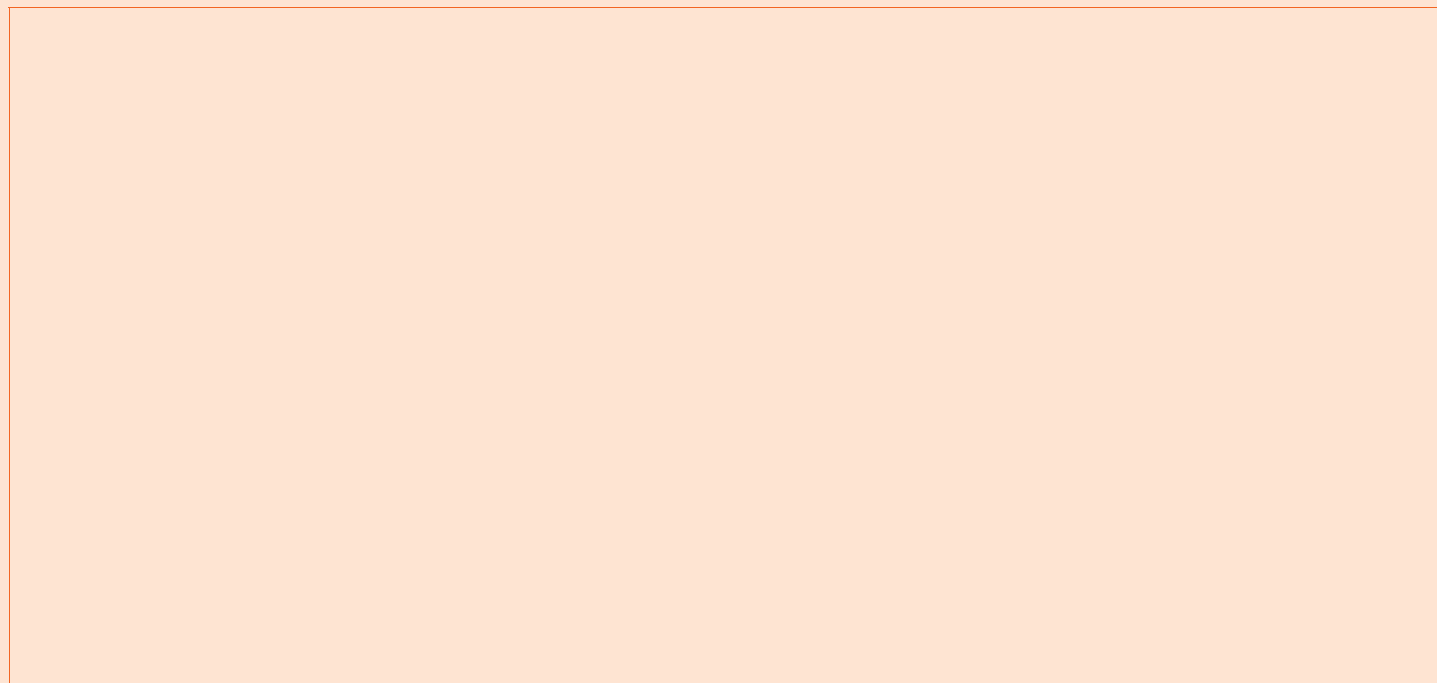
Designation	Weight		Shaft length max mm	Dimensions							
	Bearing kg	Shaft kg/m		mm	D Tol.µm	mm	L Tol.µm	D <sub>i</sub> mm	t mm		
SSPF 06 S	0,019	0,21	400	14	0/-11	25	0/-2	30	5		
SSPF 08 S	0,023	0,38	500	16	0/-11	25	0/-2	32	5		
SSPF 10 S	0,054	0,6	600	21	0/-13	33	0/-2	42	6		
SSPF 20 C	0,2	2	5000	32	0/-16	60	0/-2	51	7		
SSPF 25 C	0,22	3,1	5000	37	0/-16	70	0/-3	60	9		
SSPF 30 C	0,35	4,8	5000	45	0/-16	80	0/-3	70	10		
SSPF 40 C	0,81	8,6	5000	60	0/-19	100	0/-3	90	14		
SSPF 50 C	1,5	13,1	5000	75	0/-19	112	0/-3	113	16		
SSPF 60 C	3,3	19	5000	90	0/-22	127	0/-3	129	18		



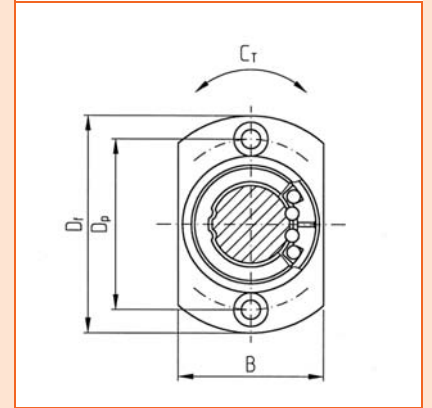
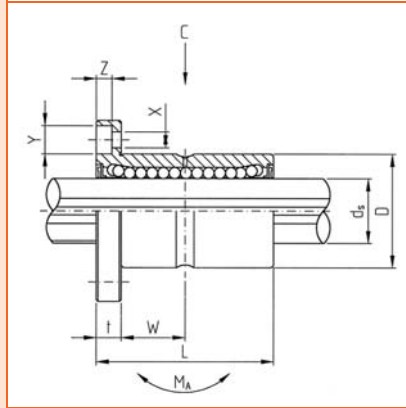
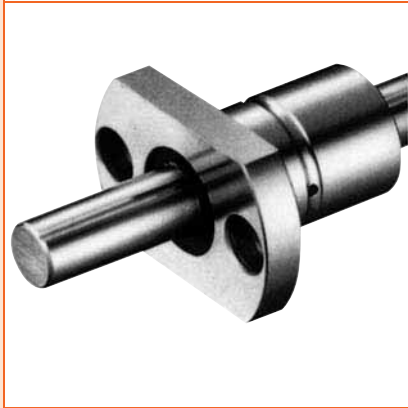
Dimensions								Basic torque rating		Basic load rating		Allowable static moment
	D <sub>p</sub> mm	X mm	Y mm	Z mm	W mm	d <sub>s</sub> mm	Tol. μm	dyn. C <sub>T</sub> Nm	stat. C <sub>OT</sub> Nm	dyn. CN	stat. C <sub>o</sub> N	M <sub>A</sub> Nm
	22	3,4	6,5	3,3	7,5	6	0/-12	1,5	2,4	1220	2280	5,1
	24	3,4	6,5	3,3	7,5	8	0/-15	2,1	3,7	1450	2870	7,4
	32	4,5	8	4,4	10,5	10	0/-15	4,4	8,2	2730	5070	18
	40	4,5	8	4,4	23	18,2	0/-21	83	133	7840	11300	63
	47	5,5	9	5,4	26	23	0/-21	162	239	12300	16100	104
	54	6,6	11	6,5	30	28	0/-21	289	312	18600	23200	181
	72	9	14	8,6	36	37,4	0/-25	637	882	30800	37500	358
	91	11	17,5	11	40	47	0/-25	1390	3180	46100	74200	696
	107	11	17,5	11	45,5	56,5	0/-30	2100	4800	46100	74200	696

# TORQUE LINEAR BEARING

**SSPT...**



Designation	Weight		Shaft length max mm	Dimensions							
	Bearing kg	Shaft kg/m		D mm	Tol.µm	L mm	Tol.µm	D <sub>i</sub> mm	B mm	t mm	
SSPT 06 S	0,029	0,21	400	14	0/-11	25	0/-2	30	18	5	
SSPT 08 S	0,035	0,38	500	16	0/-11	25	0/-2	32	21	5	
SSPT 10 S	0,075	0,6	600	21	0/-13	33	0/-2	42	25	6	



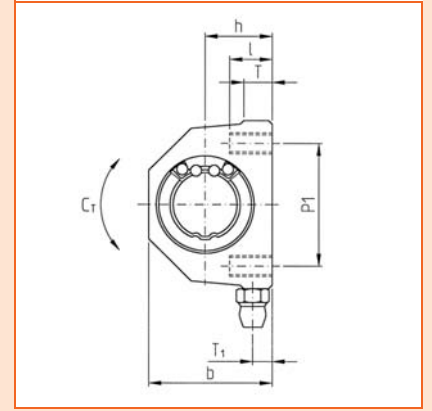
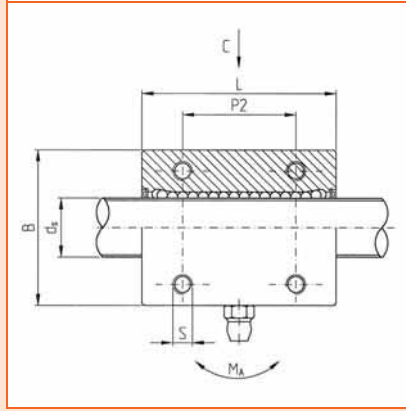
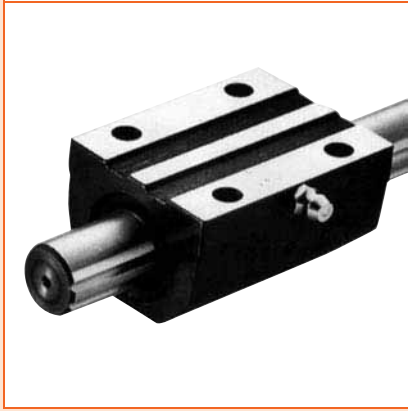
Dimensions								Basic torque rating		Basic load rating		Allowable static moment
	D <sub>p</sub> mm	X mm	Y mm	Z mm	W mm	mm	d <sub>s</sub> Tol. μm	dyn. C <sub>T</sub> Nm	stat. C <sub>OT</sub> Nm	dyn. CN	stat. C <sub>o</sub> N	M <sub>A</sub> Nm
	22	3,4	6,5	3,3	7,5	6	0/-12	1,5	2,4	1220	2280	5,1
	24	3,4	6,5	3,3	7,5	8	0/-15	2,1	3,7	1540	2870	7,4
	32	4,5	8	4,4	10,5	10	0/-15	4,4	8,2	2730	5070	18



## TORQUE LINEAR BEARING

### SSPB...

Designation	Weight		Shaft length max mm	Dimensions					
	Bearing kg	Shaft kg/m		h ±0,02 mm	B mm	L mm	b mm	T mm	
SSPB 20 C	0,55	2	5000	19	48	60	35	8	
SSPB 25 C	0,9	3,1	5000	22	60	70	41,5	10	
SSPB 30 C	1,4	4,8	5000	26	70	80	50	12	
SSPB 40 C	2,5	8,6	5000	32	86	100	63	15	



	Dimensions							Basic torque rating		Basic load rating		Allowable static moment
	$P_1$ mm	$P_2$ mm	$S$ mm	$l$ mm	$T_1$ mm	mm	$d_s$ Tol. $\mu$ m	dyn. $C_T$ Nm	stat. $C_{OT}$ Nm	dyn. CN	stat. $C_oN$	$M_A$ Nm
	35	35	M6	12	5,5	18,2	0/-21	83	133	7840	11300	63
	40	40	M8	12	6	23	0/-21	162	239	12300	16100	104
	50	50	M8	12	7	28	0/-21	289	412	18600	23200	181
	60	60	M10	15	8	37,4	0/-25	637	882	30800	37500	358

## TORQUE LINEAR BEARING

### SPR...

SPR rotation torque bearings can execute linear and rotary movements simultaneously. Particularly in robots, tool changers, and many handling tasks, rotation torque bearings can significantly reduce the number of guide components. Thus assembly is significantly simplified and belt drive faults which can arise from additional tolerances are effectively eliminated.

The rotary part of the SPR guide is implemented as cross roller bearings. This construction is characterised by very high load capacity and rigidity. The inner ring is integrated into the outer shell of the linear bearing. The smallest installation spaces and significant weight reduction are thus achieved. The ends of the torque shafts can be implemented according to specification, so that the unit is immediately ready for use.

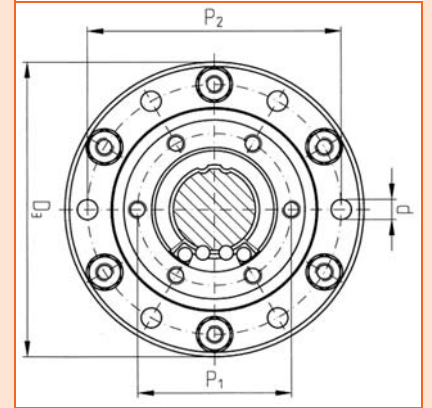
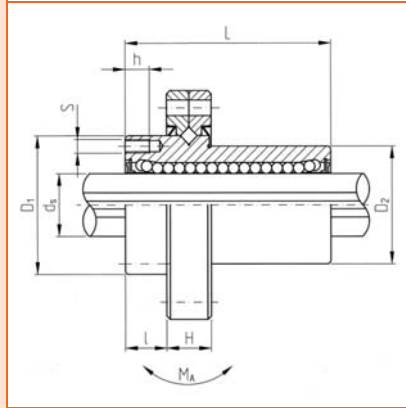
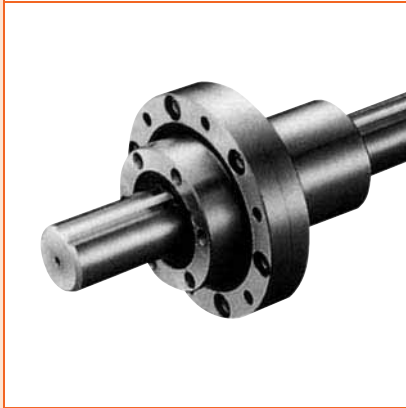
#### Assembly:

The rotary bearing is adjusted at the factory and ready to use. Severe blows can damage the precision and quiet operation of the bearing. Thus professional assembly of these precision units must therefore be ensured.

When using the flange in a housing collet, the depth of the elongation must be at least 60% of the surface. The collet boring must be carried out to tolerance H7. Only for very small loads and moments, the flange can also be screwed on directly. When inserting the torque shaft into the linear bearing, the correct match in position of tracks and ball rows must be ensured. The shaft should be aligned as exactly as possible with the boring of the bearing. Improper assembly can lead to the ball being forced out of the bearing.

Tightening of the fastening screws must be carried out evenly on a cross-wise basis, with the screw sizes and tightening torques found in the following table:

Designation	Weight		Shaft length max mm	Basic torque rating bearing								
	Bearing kg	Shaft kg/m		D <sub>1</sub> mm   d/μm		D <sub>2</sub> mm	L mm   Tol.μm		P <sub>1</sub> mm	S mm	h mm	dynamic basic torque rating C <sub>T</sub> Nm
SPR 20	0,45	2	5000	40	0/-25	34	60	0/-2	34	M4	7	83
SPR 25	0,75	3,1	5000	50	0/-25	40	70	0/-3	42	M5	8	162
SPR 30	1,25	4,8	5000	61	0/-30	47	80	0/-3	52	M6	10	289
SPR 40	2,3	8,6	5000	76	0/-30	62	100	0/-3	64	M6	10	637
SPR 50	3,1	13,1	5000	88	0/-35	75	112	0/-3	77	M8	13	1390
SPR 60	4,7	19	5000	102	0/-35	90	127	0/-3	90	M8	13	2100



Designation	Screws	Moment of tilt Nm
SPR20	M4	4
SPR25	M4	4
SPR30	M6	14
SPR40	M8	30
SPR50	M8	30
SPR60	M8	30

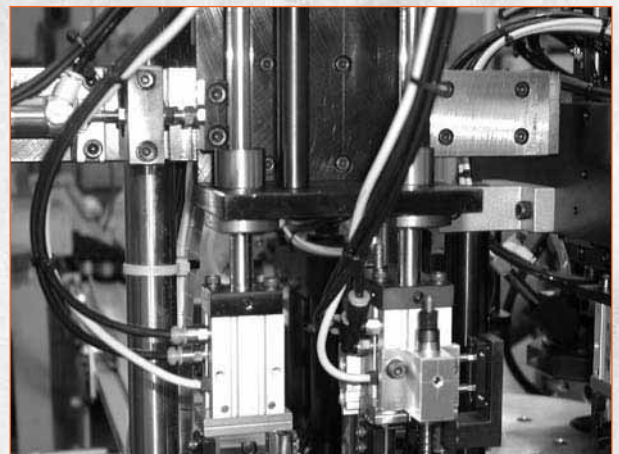
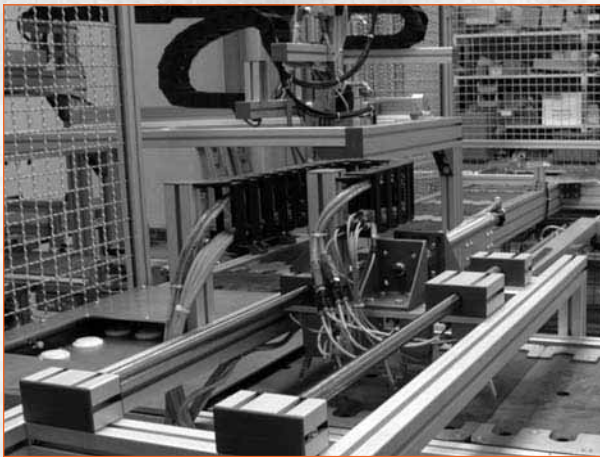
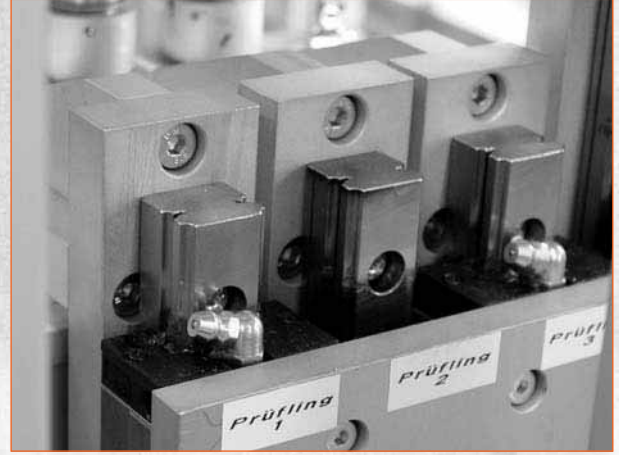
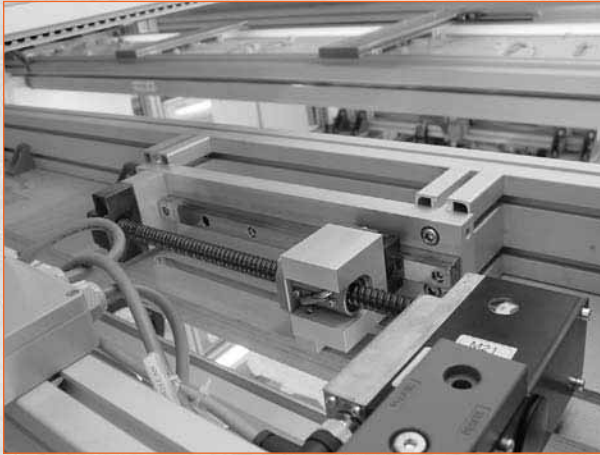
**Lubrication:**

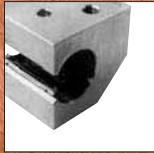
The SPR bearings are filled at the factory with Alvania 2 and are ready to use. Depending on the usage conditions, relubrication may be necessary. Under normal usage conditions, we recommend cleaning the shaft after every 1000 operating hours and lubricating it with Alvania 2.

**For high loads and extremely long use, the SPR guide can be implemented with a lubrication nipple.**

				Radial bearing								Shaft		Allowable static moment	Revolutions/min.
static basic torque rating	dynamic basic load rating	static basic load rating		I	H	D <sub>3</sub>		P <sub>2</sub>	d	dynamic basic load rating	static basic load rating	d <sub>s</sub>		M <sub>A</sub>	max
C N	C <sub>0</sub> N	mm		mm	mm	mm	Tol. μm	mm	mm	C <sub>R</sub> N	C <sub>OR</sub> N	mm	Tol. μm	Nm	1/min
133	7840	1130		12	13	66	0/-30	56	4,5	5900	7350	18,2	0/-21	63	1200
239	12300	16100		13	16	78	0/-30	68	4,5	9110	11500	23	0/-21	104	1000
412	18600	23200		17	17	100	0/-35	86	6,6	13200	18000	28	0/-21	181	800
882	30800	37500		23	20	120	0/-35	104	9	22800	32300	37,4	0/-25	358	800
3180	46100	74200		24	22	130	0/-40	114	9	27200	42100	47	0/-25	696	570
4800	58000	127400		25	25	150	0/-40	132	9	30000	48200	56,5	0/-30	1300	500

## EXAMPLES OF APPLICATIONS





## SLIDE UNITS

**GE...**  
**GE...AJ**  
**GE...OPAJ**

**closed**  
**slotted, adjustable**  
**open type for support, adjustable rail**

UU = seals on both sides

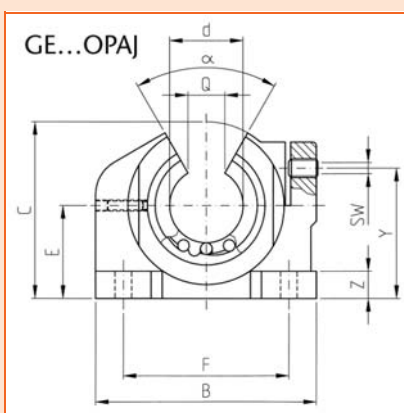
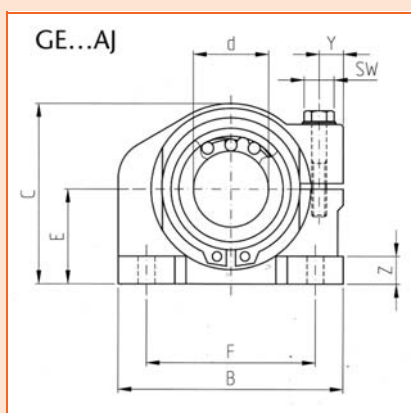
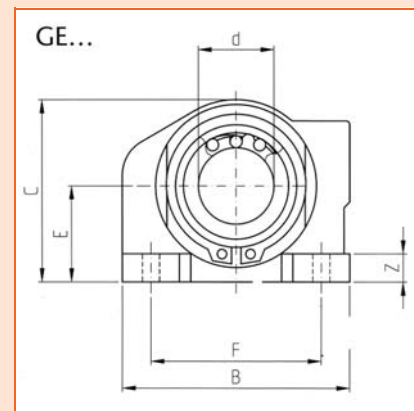
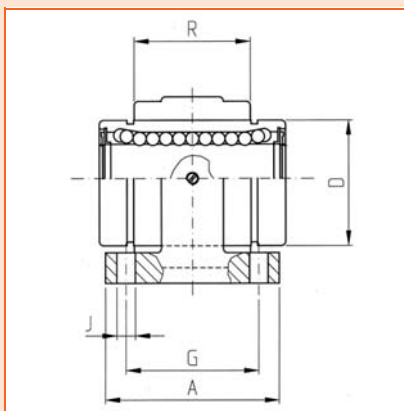
Material unit: GE 16 - GE 50: Aluminium, pressured casting

Available with all ball bearings (e. g. stainless-, super ball bearings,...)

Our housing units are assembled with precision linear ball bearings in closed, slotted, or open variants. They can tolerate loads up to the amount of the dynamic load rating of the bearing, from any direction (see product overview of linear bearings.)

The installation of the units can be standing, hanging, or sideways.

Designation	Dimensions						
	d mm	D mm	A mm	B mm	C mm	E ±0,01 mm	F ±0,15 mm
GE 12 GE 12 AJ GE 12 OPAJ	12	22	32	43	34	18	32
GE 16 GE 16 AJ GE 16 OPAJ	16	26	35	50	41	22	40
GE 20 GE 20 AJ GE 20 OPAJ	20	32	42	60	47,5	25	45
GE 25 GE 25 AJ GE 25 OPAJ	25	40	54	74	60	30	60
GE 30 GE 30 AJ GE 30 OPAJ	30	47	60	84	67	35	68
GE 40 GE 40 AJ GE 40 OPAJ	40	62	78	108	87	45	86
GE 50 GE 50 AJ GE 50 OPAJ	50	75	90	130	98	50	108



Dimensions									Weight
	G ±0,15 mm	J mm	R mm	Z mm	Q mm	Y mm	SW	α	kg
	23	4,5	20	4,8	-	-	-	-	0,08
					-	5,5	7	-	0,08
					7,5	23	2	78°	0,07
	26	4,5	22	5,5	-	-	-	-	0,12
					-	6	7	-	0,12
					10	30	2,5	78°	0,1
	32	4,5	28	7	-	-	-	-	0,21
					-	7,5	7	-	0,21
					10	35	2,5	60°	0,17
	40	5,5	40	8	-	-	-	-	0,43
					-	8	8	-	0,43
					12,5	42	3	60°	0,38
	45	6,6	48	9	-	-	-	-	0,64
					-	9,5	10	-	0,64
					12,5	49	3	50°	0,56
	58	9	56	11	-	-	-	-	1,23
					-	12,5	13	-	1,23
					16,8	65	4	50°	1,16
	50	9	72	12,5	-	-	-	-	2,07
					-	14	13	-	2,07
					21	72	4	50°	1,80



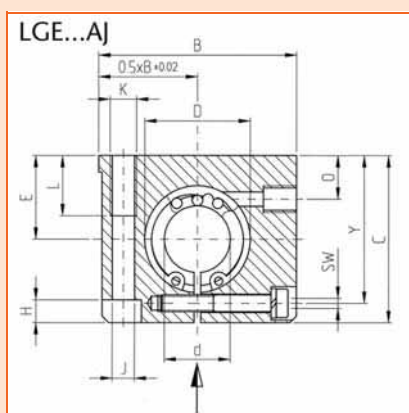
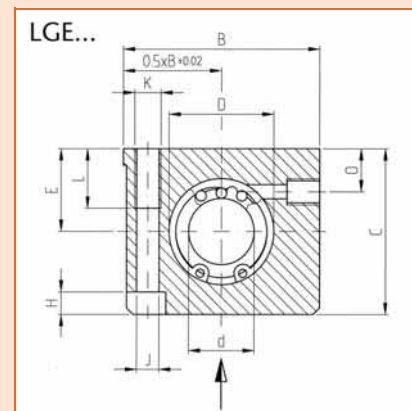
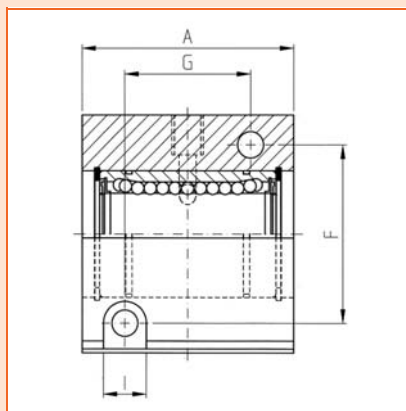
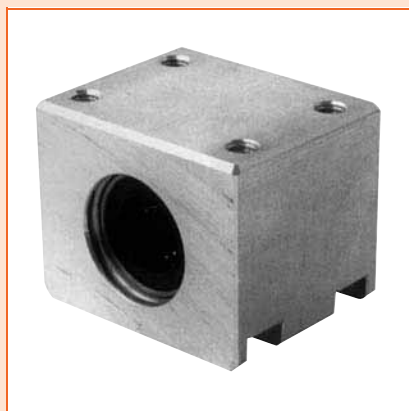
## SLIDE UNITS LIGHT SERIES

**LGE...**  
**LGE...AJ**

**closed**  
**slotted, adjustable**

UU = seals on both sides  
Material unit: Aluminium  
Available with all ball bearings (e.g. stainless ball bearing,...)  
Technical change: some types with stop angle

Designation	Dimensions							
	d mm	D mm	A +0,3 mm	B mm	C mm	E +0,01/-0,02 mm	F ±0,15 mm	
LGE 08 LGE 08 AJ	8	16	32	35	28	13	25	
LGE 12 LGE 12 AJ	12	22	39	43	35	18	32	
LGE 16 LGE 16 AJ	16	26	43	53	42	22	40	
LGE 20 LGE 20 AJ	20	32	54	60	50	25	45	
LGE 25 LGE 25 AJ	25	40	67	78	60	30	60	
LGE 30 LGE 30 AJ	30	47	79	87	70	35	68	
LGE 40 LGE 40 AJ	40	62	91	108	90	45	86	
LGE 50 LGE 50 AJ	50	75	113	130	105	50	108	



Dimensions									Weight
G ±0,15 mm	H mm	I mm	J mm	K mm	O mm	Y mm	SW mm	kg	
20	14	6	3,2	M4	8	- 23,8	- 2,5	0,08	
23	10	8	4,2	M5	10	- 31,2	- 2,5	0,14	
26	12	10	5,2	M6	12	- 37,5	- 3	0,2	
32	26	11	6,8	M8	13	- 44,2	- 4	0,38	
40	20	15	8,6	M10	15	- 53,7	- 5	0,73	
45	22	15	8,6	M10	16	- 63	- 5	1,12	
58	30	18	10,3	M12	20	- 81	- 6	2,3	
50	18	20	14	M16	24	- 94,5	- 6	3,89	

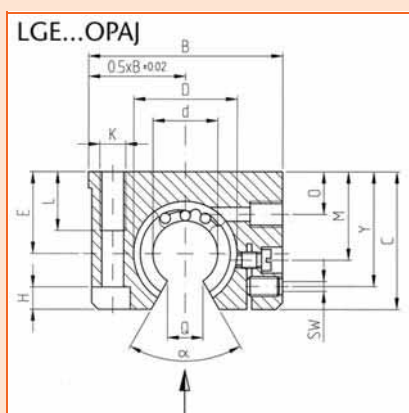
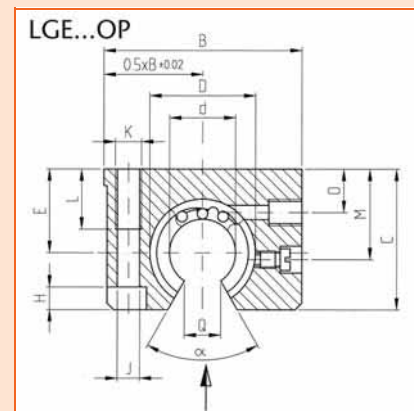
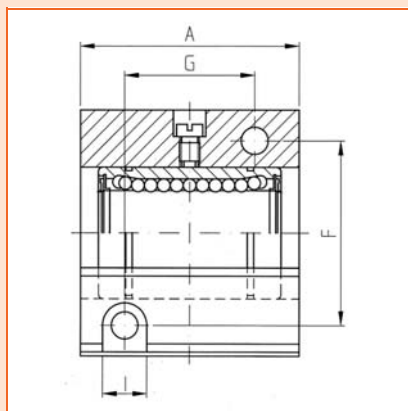
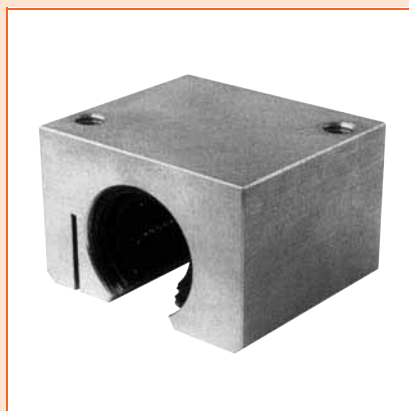
## SLIDE UNITS LIGHT SERIES

**LGE...OP**  
**LGE...OPAJ**

**slotted**  
**slotted, adjustable**

UU = seals on both sides  
Material unit: Aluminium  
Available with all ball bearings (e.g. stainless ball bearing,...)  
Technical change: some types with stop angle

Designation	Dimensions									
	d mm	D mm	A +0,03 mm	B mm	C mm	E +0,03/-0,02 mm	F ±0,15 mm	G ±0,15 mm	H mm	
LGE 12 OP LGE 12 OPAJ	12	22	39	43	28	18	32	23	4,5	
LGE 16 OP LGE 16 OPAJ	16	26	43	53	35	22	40	26	5	
LGE 20 OP LGE 20 OPAJ	20	32	54	60	42	25	45	32	8	
LGE 25 OP LGE 25 OPAJ	25	40	67	78	51	30	60	40	11	
LGE 30 OP LGE 30 OPAJ	30	47	79	87	60	35	68	45	12	
LGE 40 OP LGE 40 OPAJ	40	62	91	108	77	45	86	50	17	
LGE 50 OP LGE 50 OPAJ	50	75	113	130	88	50	108	58	13	

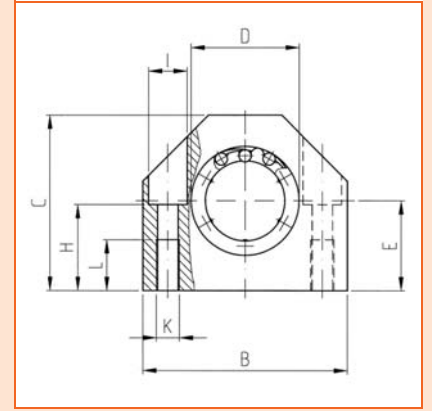
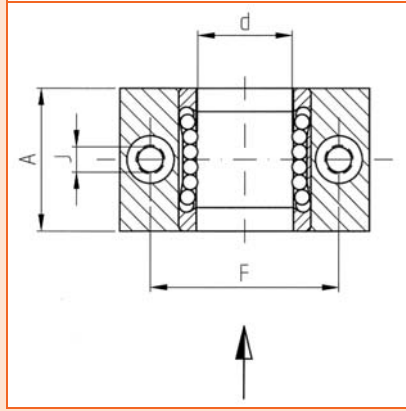
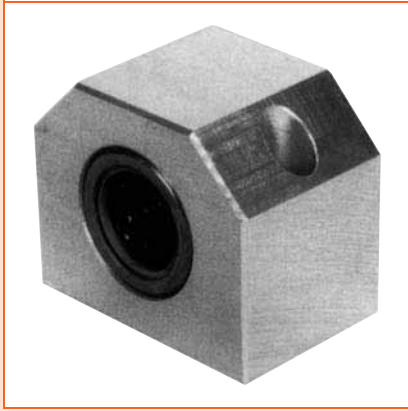


Dimensions											Weight
I	J	K	L	M	O	Q	?	Y	SW	kg	
mm	mm	mm	mm	mm	mm	mm		mm			
8	4,2	M5	11	16,65	8	7,5	60°	- 24	- 3	0,1	
10	5,2	M6	13	22	12	10	60°	- 30	- 3	0,17	
11	6,8	M8	18	25	13	10	60°	- 35	- 3	0,28	
15	8,6	M10	22	31,5	15	12,5	60°	- 43	- 3	0,6	
15	8,6	M10	22	33	16	12,5	60°	- 50	- 3	0,9	
18	10,3	M12	26	43,5	20	16,8	60°	- 66	- 3	1,7	
20	13,5	M16	34	47,5	20	21	50°	- 76	- 3	2,8	

**COMPACT SLIDE UNITS****CGE...****with linear ball bearing, series KH**

UU = seals on both sides  
 Material unit: Aluminium  
 Accessories: Shaft support block, serie CWB

Designation	Dimensions						
	d mm	D K 7 mm	A +0,3 mm	B mm	C mm	E +0,01/-0,02 mm	
CGE 12	12	19	28	40	33	17	
CGE 16	16	24	30	45	38	19	
CGE 20	20	28	30	53	45	23	
CGE 25	25	35	40	62	54	27	
CGE 30	30	40	50	67	60	30	
CGE 40	40	52	60	87	76	39	
CGE 50	50	62	70	103	92	47	



Dimensions							Weight
F ±0,15 mm	H mm	I H13 mm	J mm	K	L mm	kg	
29	16	8	4,3	M5	11	0,08	
34	18	8	4,3	M5	11	0,12	
40	22	10	5,3	M6	13	0,15	
48	26	11	6,6	M8	18	0,29	
53	29	11	6,6	M8	18	0,42	
69	38	15	8,4	M10	22	0,82	
82	46	18	10,5	M12	26	1,33	

## SLIDE UNIT ADJUSTABLE

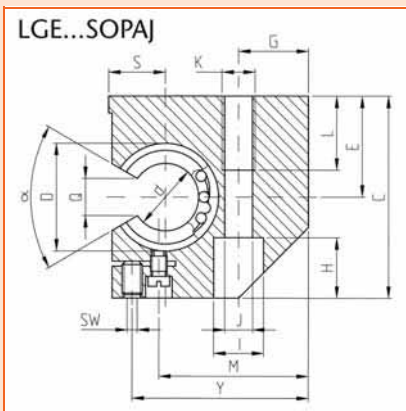
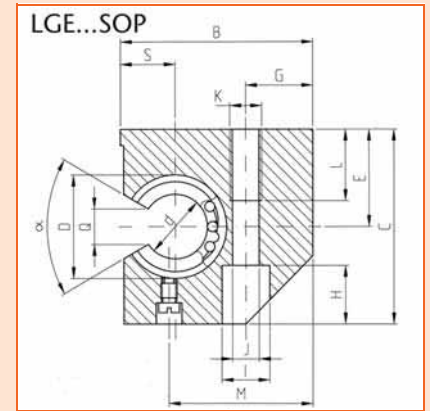
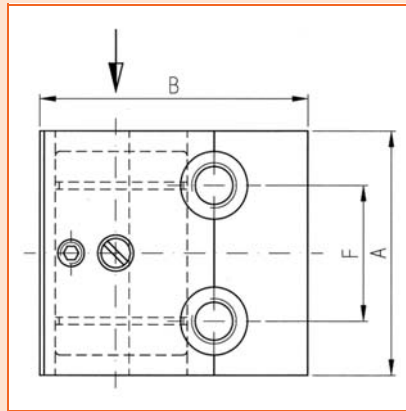
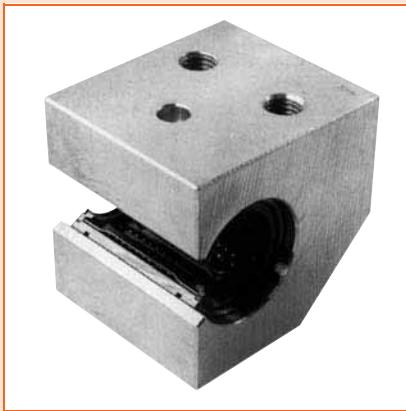
**LGE..SOP**  
**LGE..SOPAJ**

**adjustable**

UU = seals on both sides  
Material unit: Aluminium  
Available with all ball bearings (e.g. stainless ball bearings,...)

Technical change: some types with stop angle

Designation	Dimensions									
	d mm	D H <sub>6</sub> mm	A +0,3 mm	B mm	C mm	E +0,01/-0,02 mm	F mm	G mm	H mm	
LGE 20 SOP LGE 20 SOPAJ	20	32	54	60	60	30	30	21	18	
LGE 25 SOP LGE 25 SOPAJ	25	40	67	75	72	35	36	26	22	
LGE 30 SOP LGE 30 SOPAJ	30	47	79	86	82	40	42	27	27	
LGE 40 SOP LGE 40 SOPAJ	40	62	91	110	100	45	48	35	33	
LGE 50 SOP LGE 50 SOPAJ	50	75	113	127	115	50	62	39	33	



Dimensions											Weight
I	J	K	L	M	Q	S	Y	SW	$\alpha$	kg	
mm	mm		mm	mm	mm	$+0,01/-0,02$ mm	mm	mm			
15	8,4	M10	22	43	10	17	- 53	- 3	60°	0,2	
18	10,5	M12	26	55,5	12,5	21	- 67	- 3	60°	0,75	
20	13,5	M16	34	59	12,5	25	- 76	- 3	60°	1,25	
26	17,5	M20	43	76,5	16,8	32	- 99	- 3	60°	2	
26	17,5	M20	50	86,5	21	38	- 112	- 3	50°	3	



## FLANGED SLIDE UNIT

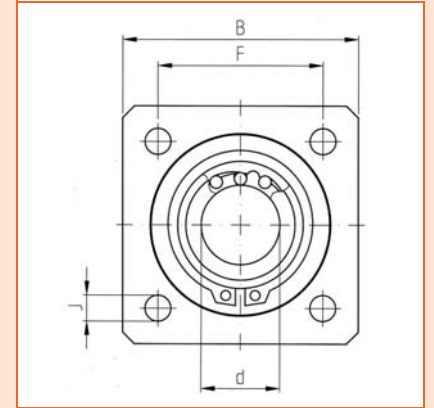
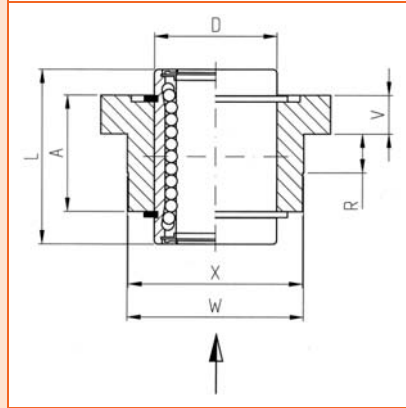
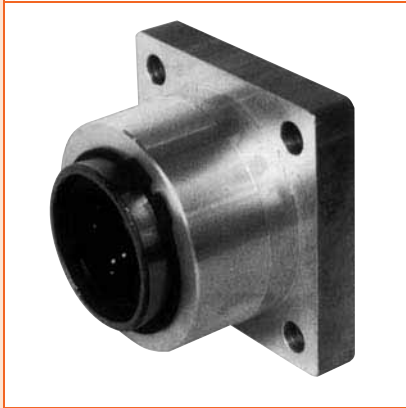
### FLE...

UU = seals on both sides

Material unit: Aluminium

Available with all ball bearings (e.g. stainless ball bearings,...)

Designation	Dimensions					
	d mm	D H6 mm	A -0,1/-0,3 mm	B mm	F ±0,25 mm	
FLE 12	12	22	22	40	30	
FLE 16	16	26	24	50	35	
FLE 20	20	32	30	60	42	
FLE 25	25	40	42	70	54	
FLE 30	30	47	50	80	60	
FLE 40	40	62	59	100	78	
FLE 50	50	75	75	130	98	



Dimensions							Weight
J	L	R	V	W	X		kg
mm	mm	mm	mm	g7 mm	-0,2/-0,5 mm		
5,5	32	10	6	23	32		0,09
5,5	36	10	8	38	38		0,12
6,6	45	10	10	46	46		0,22
6,6	58	10	12	58	58		0,45
9	66	10	14	66	66		0,85
11	80	10	16	90	90		1,4
11	100	10	18	100	100		2,6

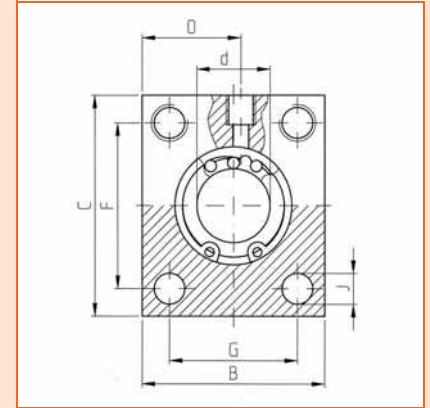
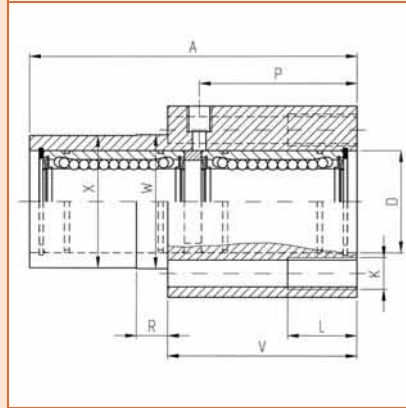
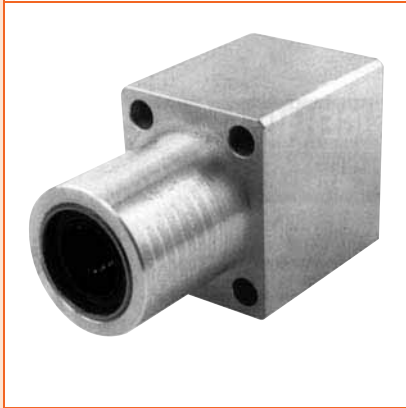
## TANDEM SLIDE UNIT

**TFE...**

**combined flange unit**

UU = seals on both sides  
 Material unit: Aluminium  
 Available with all ball bearings (e.g. stainless ball bearings,...)

Designation	Dimensions							
	d mm	D H6 mm	A mm	B mm	C mm	F ±0,15 mm	G ±0,15 mm	
TFE 12	12	22	76	34	42	32	24	
TFE 16	16	26	84	40	50	38	28	
TFE 20	20	32	104	50	60	45	35	
TFE 25	25	40	130	60	74	56	42	
TFE 30	30	47	152	70	84	64	50	



Dimensions										Weight
J	K	L	O	P	R	V	W	X		kg
mm		mm	mm	mm	mm	mm	g7 mm	-0,2/-0,5 mm		
5,3	M6	13	19	36	10	46	30	30		0,2
6,6	M8	18	22	40	10	50	35	35		0,32
8,4	M10	22	27	50	10	60	42	42		1
10,5	M12	26	32	63	10	73	52	52		1
13,5	M16	34	37	74	10	82	61	61		1,5

## TANDEM SLIDE UNIT

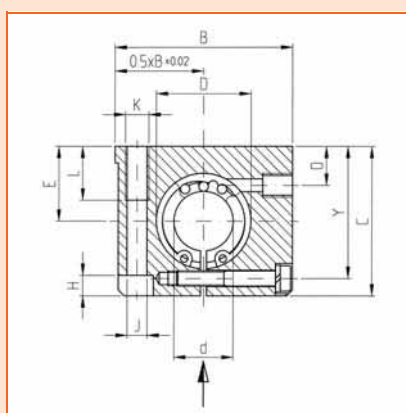
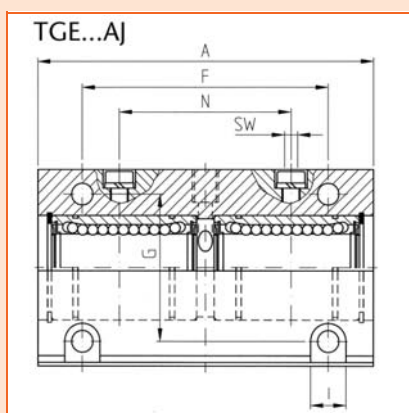
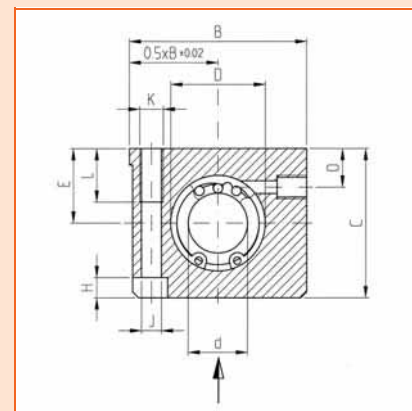
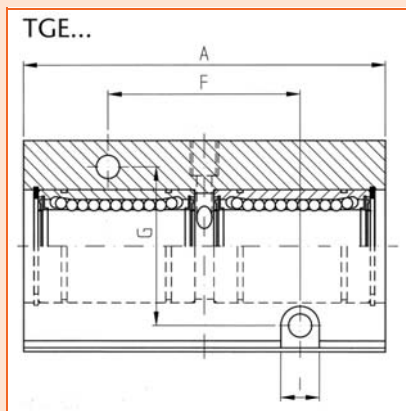
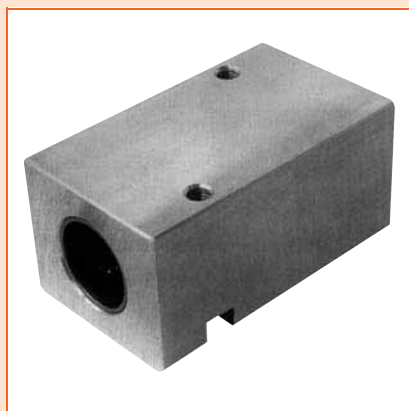
**TGE...**  
**TGE...AJ**

**closed**  
**slotted, adustable**

UU = seals on both sides  
Material unit: Aluminium  
Available with all ball bearings (e.g. stainless ball bearings,...)

Technical change: some types with stop angle

Designation	Dimensions								
	d mm	D H6 mm	A +0,3 mm	B mm	C mm	E +0,01/-0,02 mm	I mm	J mm	
TGE 08 TGE 08 AJ	8	16	62	35	28	13	8	4,2	
TGE 12 TGE 12 AJ	12	22	76	43	35	18	10 8	5,2 4,2	
TGE 16 TGE 16 AJ	16	26	84	53	42	22	10	5,2	
TGE 20 TGE 20 AJ	20	32	104	60	50	25	11	6,8	
TGE 25 TGE 25 AJ	25	40	130	78	60	30	15	8,6	
TGE 30 TGE 30 AJ	30	47	152	87	70	35	18 15	10,3 8,6	
TGE 40 TGE 40 AJ	40	62	176	108	90	45	20 18	14,3 10,3	
TGE 50 TGE 50 AJ	50	75	224	130	105	50	20	14	



Dimensions										Weight
	K	L	O	F	G	H	Y	N	SW	kg
		mm	mm	±0,15 mm	±0,15 mm	mm	mm	mm	mm	
	M5	13 11	8	35 50	25	10 14	- 23,8	- 32	- 2,5	0,15
	M6 M5	13 11	10	40 56	30 32	10	- 31,2	- 40	- 2,5	0,31
	M6	13	12	45 64	36 40	12	- 37,5	- 44	- 3	0,47
	M8	18	13	55 76	45	16	- 44,2	- 53	- 4	0,8
	M10	22	15	70 94	54 60	20	- 53,7	- 66	- 5	1,54
	M12 M10	26 22	16	85 106	62 68	22	- 63	- 78	- 5	2,35
	M16 M12	34 26	20	100 124	80 86	30	- 81	- 88	- 6	4,58
	M16	34	20	125 160	100 108	17,5 13	- 94	- 118	- 8	7,84

## TANDEM SLIDE UNIT

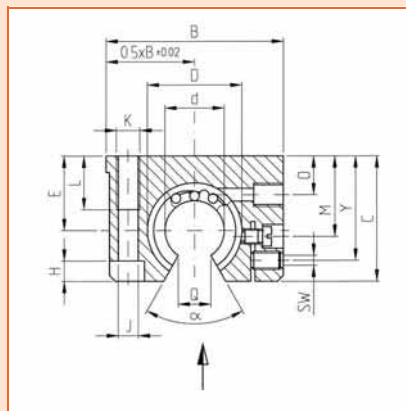
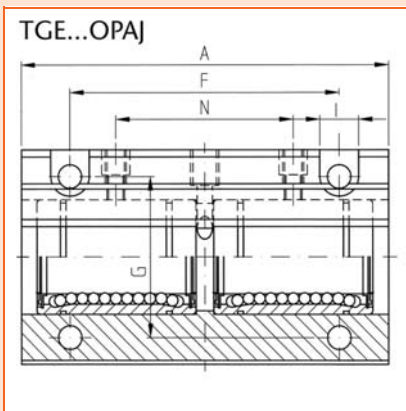
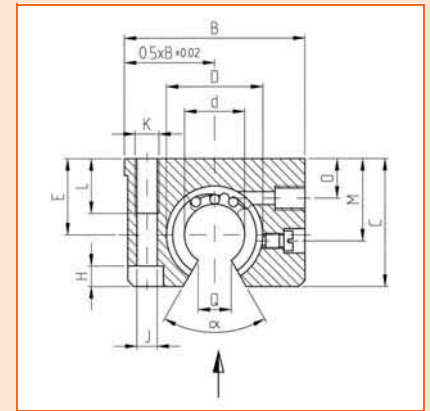
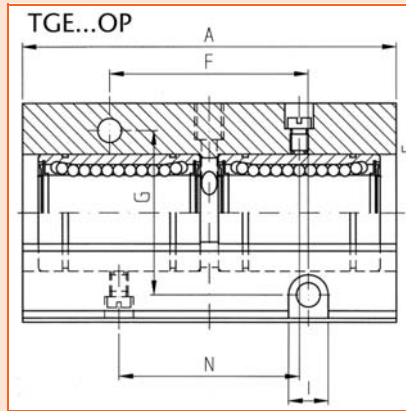
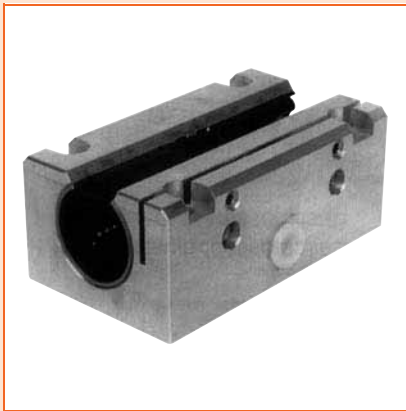
**TGE...OP**  
**TGE...OPAJ**

**slotted**  
**slotted, adjustable**

UU = seals on both sides  
Material unit: Aluminium  
Available with all ball bearings (e.g. stainless ball bearings,...)

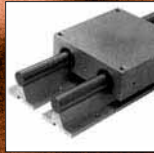
Technical change: some types with stop angle

Designation	Dimensions										
	d mm	D H6 mm	A +0,3 mm	B mm	C mm	E +0,01/-0,02 mm	L mm	M mm	N mm	O mm	
TGE 12 OP TGE 12 OPAJ	12	22	76	43	30	18	13 11	16,65	37	10	
TGE 16 OP TGE 16 OPAJ	16	26	84	53	35	22	13	22	41	12	
TGE 20 OP TGE 20 OPAJ	20	32	104	60	42	25	18	25	50	13	
TGE 25 OP TGE 25 OPAJ	25	40	130	78	51	30	22	31,5	63	15	
TGE 30 OP TGE 30 OPAJ	30	47	152	87	60	35	26 22	33	73	16	
TGE 40 OP TGE 40 OPAJ	40	62	176	108	77	45	34 26	43,5	85	20	
TGE 50 OP TGE 50 OPAJ	50	75	224	130	88	50	34	47,5	121	20	



Dimensions											Weight
	F ±0,15 mm	G ±0,15 mm	H mm	I mm	J mm	K	Y mm	SW mm	Q mm	α	kg
	40	30	5	10	5,2	M6	-	-	7,5	60°	0,26
	56	32	5	8	4,2	M5	23,5	3	7,5	60°	0,26
	45	36	5	10	5,2	M6	-	-	10	60°	0,37
	64	40	5	10	5,2	M6	29	3	10	60°	0,37
	55	45	8	11	6,8	M8	-	-	10	60°	0,63
	76	45	8	11	6,8	M8	35	3	10	60°	0,63
	70	54	11	15	8,6	M10	-	-	12,5	60°	1,24
	94	60	11	15	8,6	M10	43	3	12,5	60°	1,24
	85	62	12	18	10,3	M12	-	-	12,5	60°	1,9
	106	68	12	15	8,6	M10	50	3	12,5	60°	1,9
	100	80	17	20	14,25	M16	-	-	16,8	60°	3,72
	124	86	17	18	10,3	M12	66	3	16,8	60°	3,72
	125	100	13	20	14	M16	-	-	21	50°	6,19
	160	108	13	20	14	M16	76	3	21	50°	6,19





ASSEMBLED UNITS

## TECHNICAL DATA

MiniTec Quattro linear slides are ideal solutions. The combination of precision linear bearings with integrated seals and exactly matched housings ensure optimum positioning characteristics.

Quality-monitored series production of all components is the basis for uniform precision and cost-effectiveness. The massive outer shell of the linear bearings, of ball bearing steel in combination with chromium steel balls of Class II and cages of heat-stabilised PA 66 guarantee outstanding quiet operation. MiniTec Quattro linear slides provide a wide variety of applications, particularly in the area of handling.

### Temperature range:

-20 to +100 °C; for higher temperatures the use of bearings with steel cages is necessary.

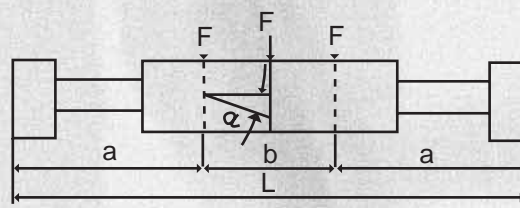
### Shaft Deflection:

When selecting closed Quattro linear slides, the maximum permitted shaft deflection of 0.5° must be taken into consideration. The deflection can be calculated by the following formula\*:

- F Load (N)
- a Round gap of first ball bushing (mm)
- b Middle gap of ball bushing (according to Table 1)
- E • J Value from Table 1

$$\tan \alpha = \frac{F \cdot a \cdot b}{4 \cdot E \cdot J}$$

shaft Ø mm	E • J (N mm <sup>2</sup> )	B
8	4,222 • 10 <sup>5</sup>	35
12	2,138 • 10 <sup>6</sup>	45
16	6,756 • 10 <sup>6</sup>	56
20	1,649 • 10 <sup>7</sup>	71
25	4,027 • 10 <sup>7</sup>	88
30	8,350 • 10 <sup>7</sup>	96
40	2,639 • 10 <sup>8</sup>	134
50	6,443 • 10 <sup>8</sup>	156



### Dynamic load ratings and weights:

- Dynamic load ratings according to ball bushing used; see Pages 10 - 19
- Weights of slides and traverses can be found on Pages 74 - 79

\*Intrinsic weight of shafts and slides is not taken into consideration.

## ASSEMBLED UNITS

**QGE...**  
**QGE...G**

**closed, with steel retainer**  
**closed, with resin retainer**

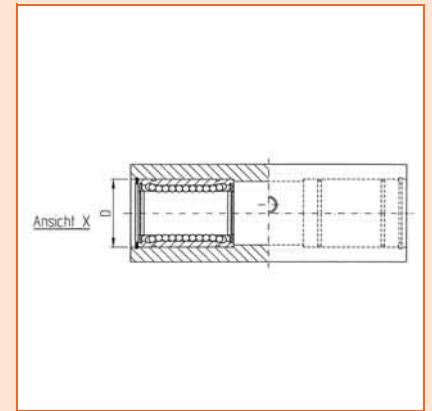
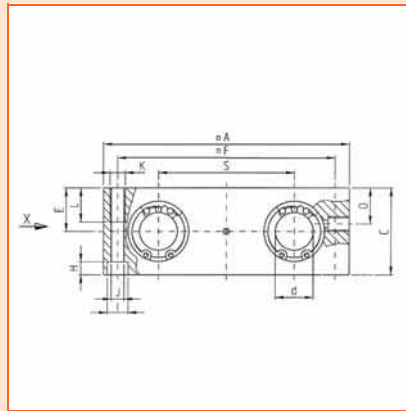
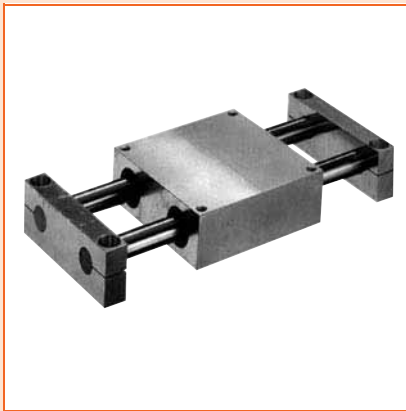
Material unit: Aluminium

All assembled units are equipped with bearings sealed on both sides. The units will be delivered completely assembled.  
For a complete guide is necessary: 2x Shaft and 2 traverses.

On request stainless version.

On request other variations available (e. g. with screw drive)

Designation		Dimensions					
Steel retainer	Resin retainer	d mm	D mm	□A mm	C mm	E +0,01/-0,02 mm	
QGE 08	QGE 08 G	8	16	65	23	11,5	
QGE 12	QGE 12 G	12	22	85	32	16	
QGE 16	QGE 16 G	16	26	100	36	18	
QGE 20	QGE 20 G	20	32	130	46	23	
QGE 25	QGE 25 G	25	40	160	56	28	
QGE 30	QGE 30 G	30	47	180	64	32	
QGE 40	QGE 40 G	40	62	230	80	40	
QGE 50	QGE 50 G	50	75	280	96	48	



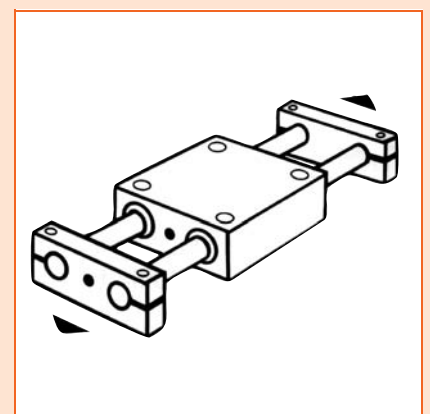
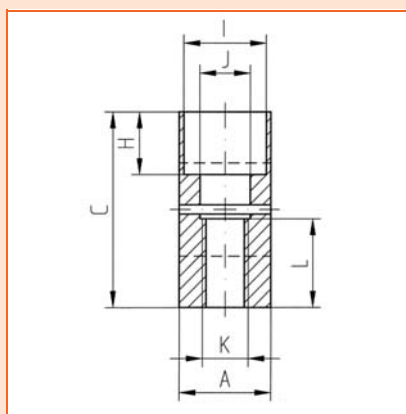
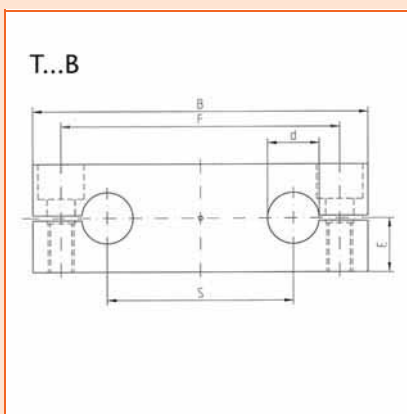
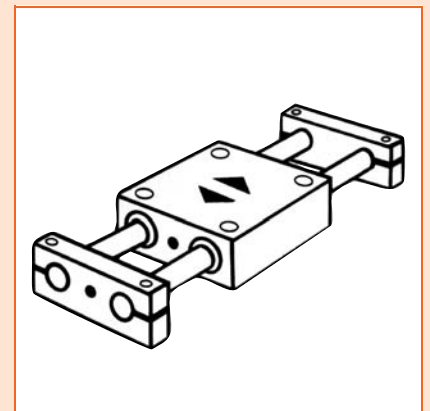
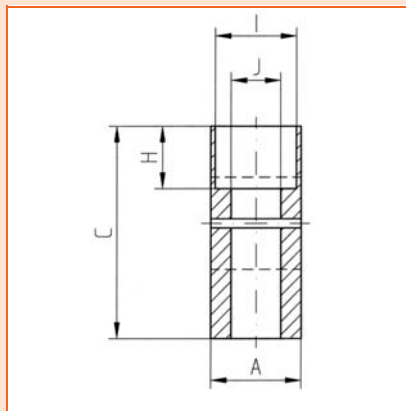
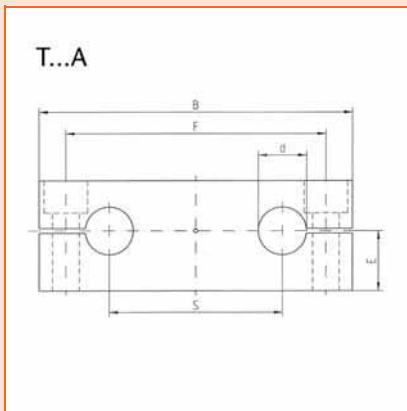
Dimensions									Weight
	□F mm	H mm	I mm	J mm	K	L mm	O mm	S ±0,02 mm	kg
	55	4,6	8	4,3	M5	11	8	32	0,27
	73	5,7	10	5,3	M6	13	13	42	0,6
	88	5,7	10	5,3	M6	13	15	54	0,9
	115	6,8	11	6,8	M8	18	19	72	1,88
	140	9	15	9	M10	22	24	88	3,65
	158	11	18	10,5	M12	26	27	96	5,14
	202	13	18	13,5	M16	34	35	122	10,22
	250	13	20	13	M16	34	43	152	18

## TRAVERSE FOR ASSEMBLED UNIT

**T..A**  
**T..B**

Material: Aluminium

Designation	Dimensions					
	d mm	A mm	B mm	F mm	H mm	
T 08 A T 08 B	8	12	65	52	7	
T 12 A T 12 B	12	14	85	70	8,5	
T 16 A T 16 B	16	18	100	82	10,5	
T 20 A T 20 B	20	20	130	108	13,5	
T 25 A T 25 B	25	25	160	132	16	
T 30 A T 30 B	30	25	180	150	16	
T 40 A T 40 B	40	30	230	190	21	
T 50 A T 50 B	50	30	280	240	21	



Dimensions								Weight
I mm	J mm	S ±0,02 mm	C mm	E ±0,015 mm	K mm	L mm	kg	
10	5,5	32	23 22	12,5 11	- M5	- 8	0,04	
11	6,6	42	32 28	18 14	- M6	- 12	0,09 0,08	
15	9	54	36 32	20 16	- M8	- 14	0,13 14	
18	11	72	46 42	25 21	- M10	- 19	0,26 0,28	
20	13,5	88	56 52	30 26	- M12	- 24	0,49 0,52	
20	13,5	96	64 58	35 29	- M12	- 26	0,6 0,62	
26	17,5	122	80 72	44 36	- M16	- 30	1,13 1,2	
26	17,5	152	96 88	52 44	- M16	- 34	1,7 1,79	

## ASSEMBLED UNIT OPEN VERSION

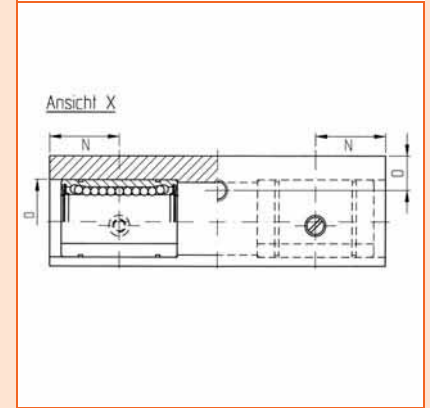
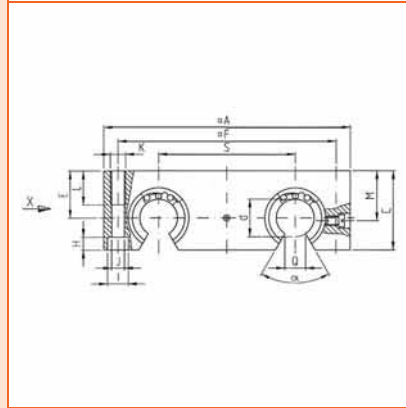
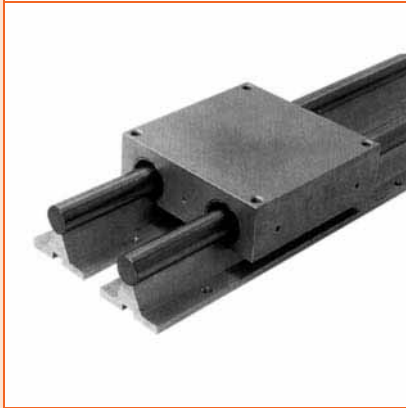
**QGE..OP**  
**QGE...GOP**

**with steel retainer**  
**with resin retainer**

Material unit: Aluminium

All assembled units are equipped with bearings sealed on both sides. The units will be delivered completely assembled.  
For a complete guide is necessary: 2x Shaft support

Designation		Dimensions							
Steel retainer	Resin retainer	d	D	□A	C	E +0,01/-0,02 mm	□F	H	
		mm	mm	mm	mm		mm	mm	
QGE 12 OP	QGE 12 GOP	12	22	85	30	18	73	5,7	
QGE 16 OP	QGE 16 GOP	16	26	100	35	22	88	5,7	
QGE 20 OP	QGE 20 GOP	20	32	130	42	25	115	6,8	
QGE 25 OP	QGE 25 GOP	25	40	160	51	30	140	9	
QGE 30 OP	QGE 30 GOP	30	47	180	60	35	158	11	
QGE 40 OP	QGE 40 GOP	40	62	230	77	45	202	13	
QGE 50 OP	QGE 50 GOP	50	75	280	93	55	250	13	



Dimensions											Weight
	I mm	J mm	K mm	L mm	M mm	N mm	O mm	Q mm	S ±0,02 mm	α	Kg
	10	5,2	M6	13	16,65	19,5	10	7,5	42	60°	0,51
	10	5,2	M6	13	22	21,5	12	10	54	60°	0,83
	11	6,8	M8	18	25	27	13	10	72	60°	1,59
	15	8,6	M10	22	31,5	32,5	15	12,5	88	60°	3,03
	18	10,5	M12	26	33	39,5	16	12,5	96	60°	4,47
	18	14	M16	34	43,5	45,5	20	16,8	122	60°	9,29
	20	13	M16	34	52,5	55,5	25	21	152	50°	16,36



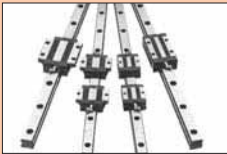
# MINITEC DELIVERY PROGRAMME



Ball screw thread drives



Profile aligning rails



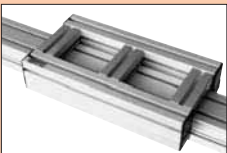
Precision steel shafts



Linear bearings



Linear system LR



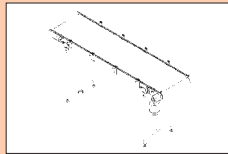
Linear system LG



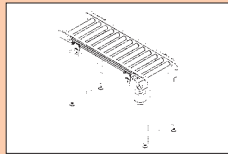
Linear system LB



Belt conveyor



Roller conveyor



Transfersystem



TSG-Components



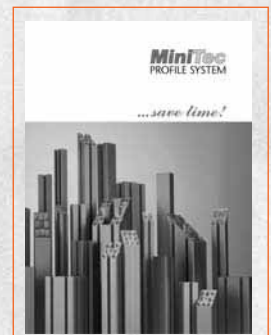
TSG control systems



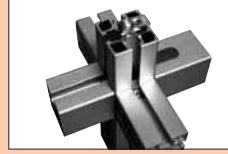
Miniature ball bearings



Rollers



Profile system



Linear system LR



Linear system LG

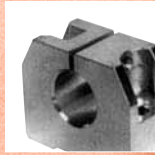


Linear system LB

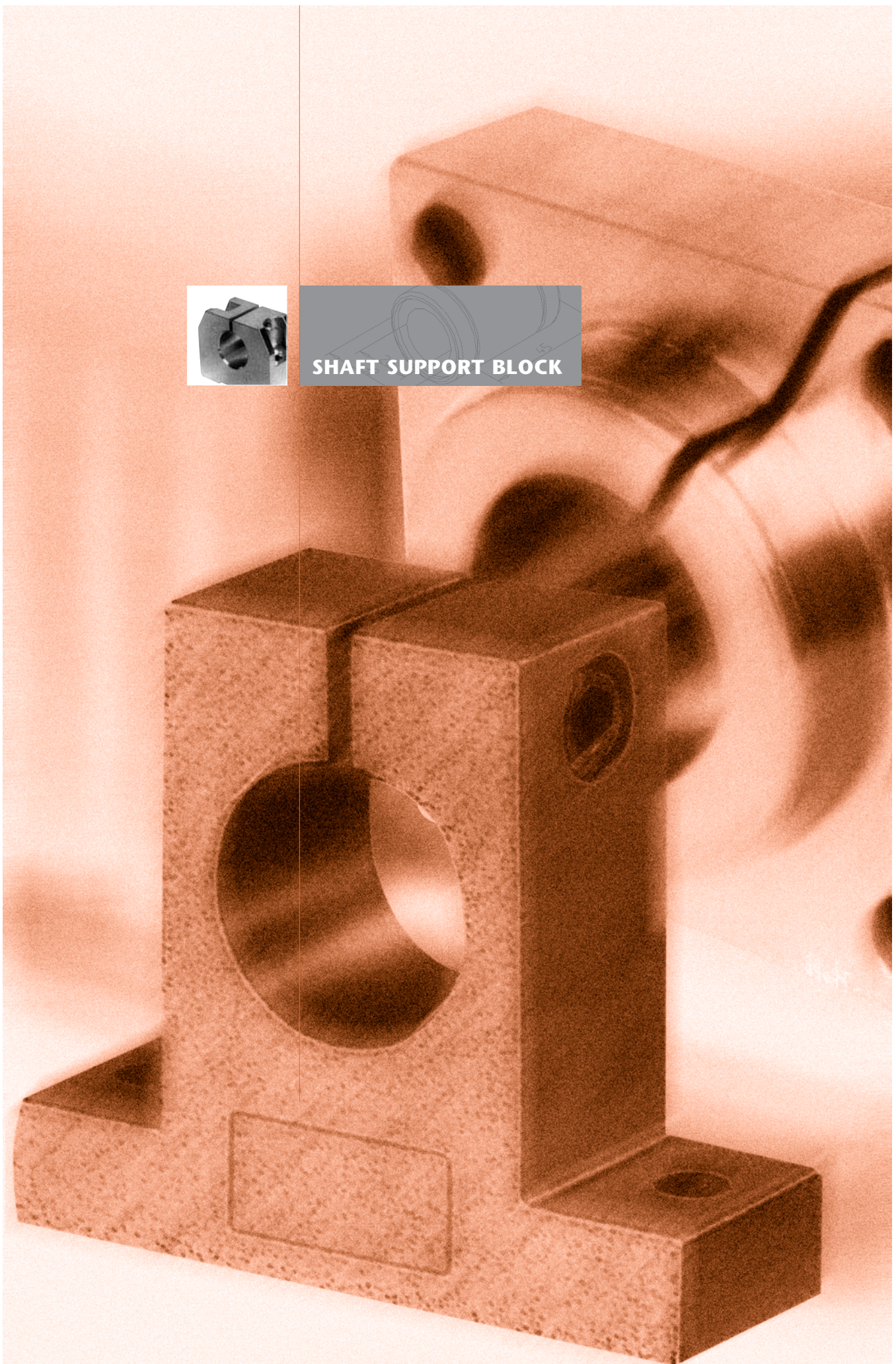


Solutions





SHAFT SUPPORT BLOCK



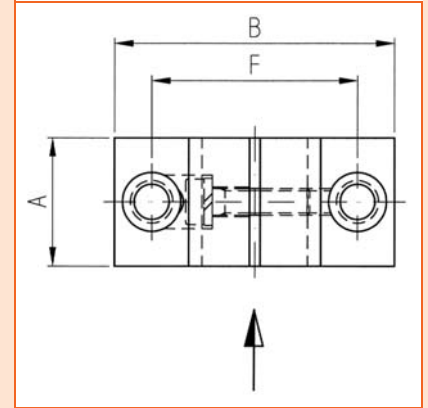
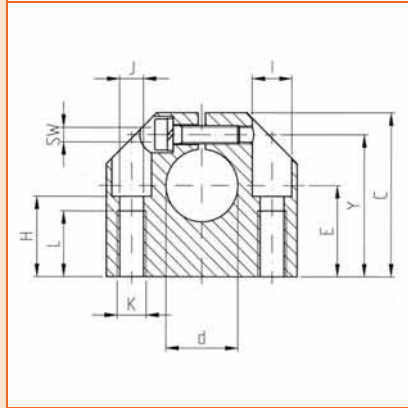
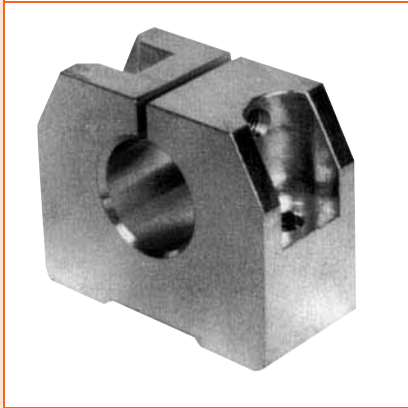
## SHAFT SUPPORT BLOCKS

**CWB...**

**for units CGE...**

Material: Aluminium

Designation	Dimensions						
	d mm	A mm	B mm	C mm	E ±0,02 mm	F ±0,12 mm	
CWB 06	6	16	32	27	15	22	
CWB 08	8	16	32	27	16	22	
CWB 10	10	18	40	33	18	27	
CWB 12	12	18	40	33	19	27	
CWB 14	14	20	45	38	20	32	
CWB 16	16	20	45	38	22	32	
CWB 20	20	24	53	45	25	39	
CWB 25	25	28	62	54	31	44	
CWB 30	30	30	67	60	34	49	
CWB 40	40	40	87	76	42	66	
CWB 50	50	50	103	92	50	80	



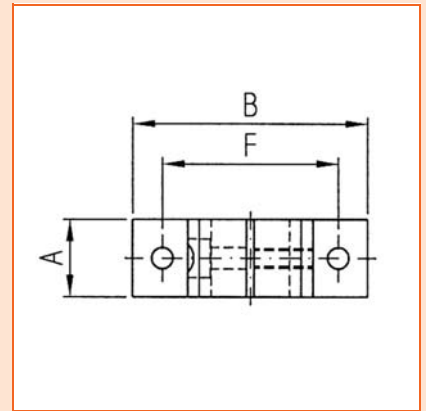
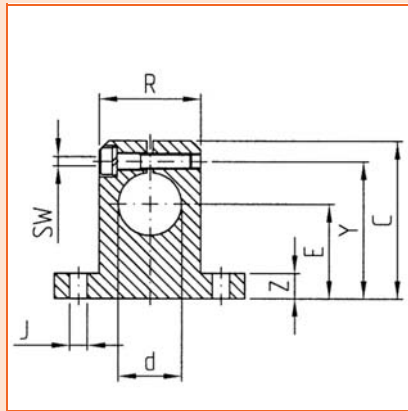
Dimensions								Weight
	H mm	I mm	J mm	K mm	L mm	Y mm	SW mm	kg
	13	8	4,3	M5	11	22	3	0,03
	13	8	4,3	M5	11	23	2,5	0,03
	16	10	5,3	M6	13	27	3	0,05
	16	10	5,3	M6	13	28	3	0,05
	18	10	5,3	M6	13	32	3	0,07
	18	10	5,3	M6	13	33	3	0,07
	22	11	6,6	M8	18	39	4	0,12
	26	15	8,4	M10	22	48	4	0,17
	29	15	8,4	M10	22	54	4	0,22
	38	18	10,5	M12	26	68	5	0,48
	46	20	13,5	M16	34	83	6	0,82

## SHAFT SUPPORT BLOCKS

**WB...**

Material: Aluminium

Designation	Dimensions					
	d mm	A mm	B mm	C mm	E ±0,015 mm	
WB 06	6	10	32	27	15	
WB 08	8	10	32	27	15	
WB 12	12	12	42	35	20	
WB 16	16	16	50	42	25	
WB 20	20	20	60	50	30	
WB 25	25	25	74	58	35	
WB 30	30	28	84	68	40	
WB 40	40	32	108	86	50	
WB 50	50	40	130	100	60	
WB 60	60	48	160	124	75	
WB 80	80	60	200	160	100	



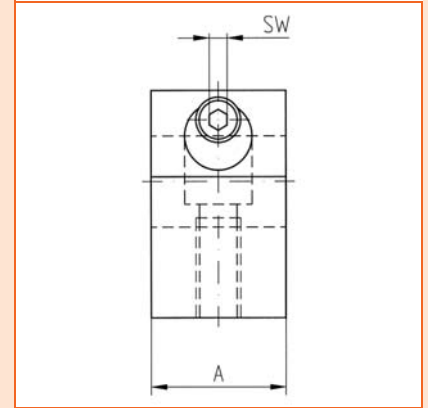
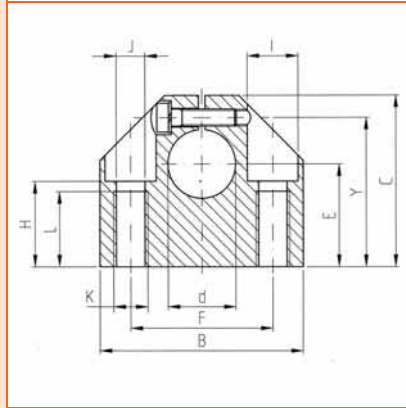
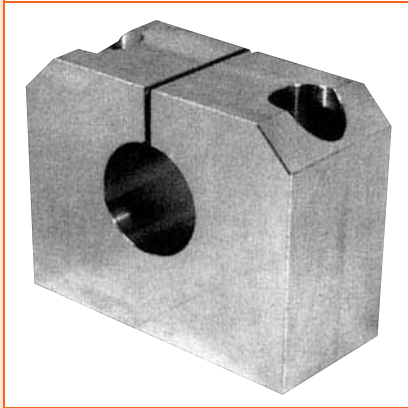
Dimensions							Weight
F ±0,15 mm	J mm	R mm	Z mm	Y mm	SW mm	kg	
25	4,5	16	5	22,5	2,5	0,02	
25	4,5	16	5	22,5	2,5	0,02	
32	4,5	20	5,5	29	3	0,02	
40	4,5	26	6,5	36	3	0,04	
45	4,5	32	8	44	3	0,07	
60	5,5	38	9	51	4	0,11	
68	6,6	45	10	60	5	0,17	
86	9	56	12	75	6	0,29	
108	9	80	14	90,5	6	0,73	
132	10,5	100	15	112	8	1,33	
170	13	130	22	148	10	2,81	

## SHAFT SUPPORT BLOCK LIGHT VERSION

**LWB...**

Material: Aluminium

Designation	Dimensions						
	d mm	A mm	B mm	C mm	E ±0,02 mm	F ±0,1 mm	
LWB 08	8	18	23	28	15	22	
LWB 12	12	20	43	35	20	30	
LWB 16	16	24	53	42	25	38	
LWB 20	20	30	60	50	30	42	
LWB 25	25	38	78	60	35	56	
LWB 30	30	40	87	70	40	64	
LWB 40	40	48	108	90	50	82	
LWB 50	50	58	132	105	60	100	



Dimensions								Weight
	H mm	I mm	J mm	K	L mm	Y mm	SW mm	kg
	13	6	3,5	M4	9	22,5	3	0,04
	16,5	10	5,3	M6	13	29,5	4	0,10
	21	11	6,6	M8	18	36,5	3	0,15
	25	15	8,4	M10	22	43,5	4	0,23
	30	18	10,5	M12	26	52,8	5	0,41
	34	18	10,5	M12	26	60,5	6	0,53
	44	20	14	M16	34	77	8	0,99
	49	26	17,5	M20	43	93	8	1,50

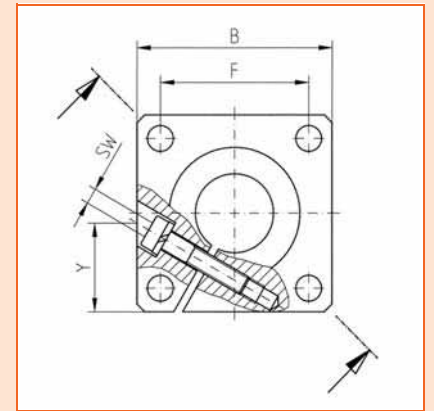
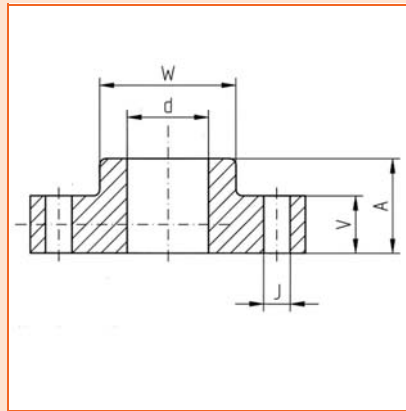
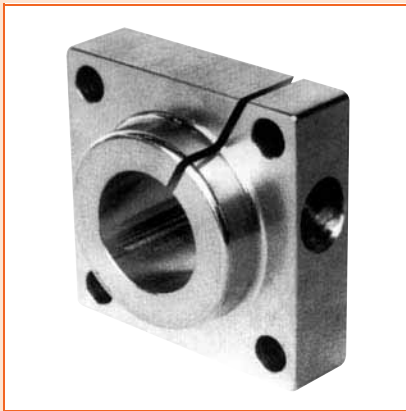


## FLANGED SHAFT SUPPORT BLOCK

**FWB...**

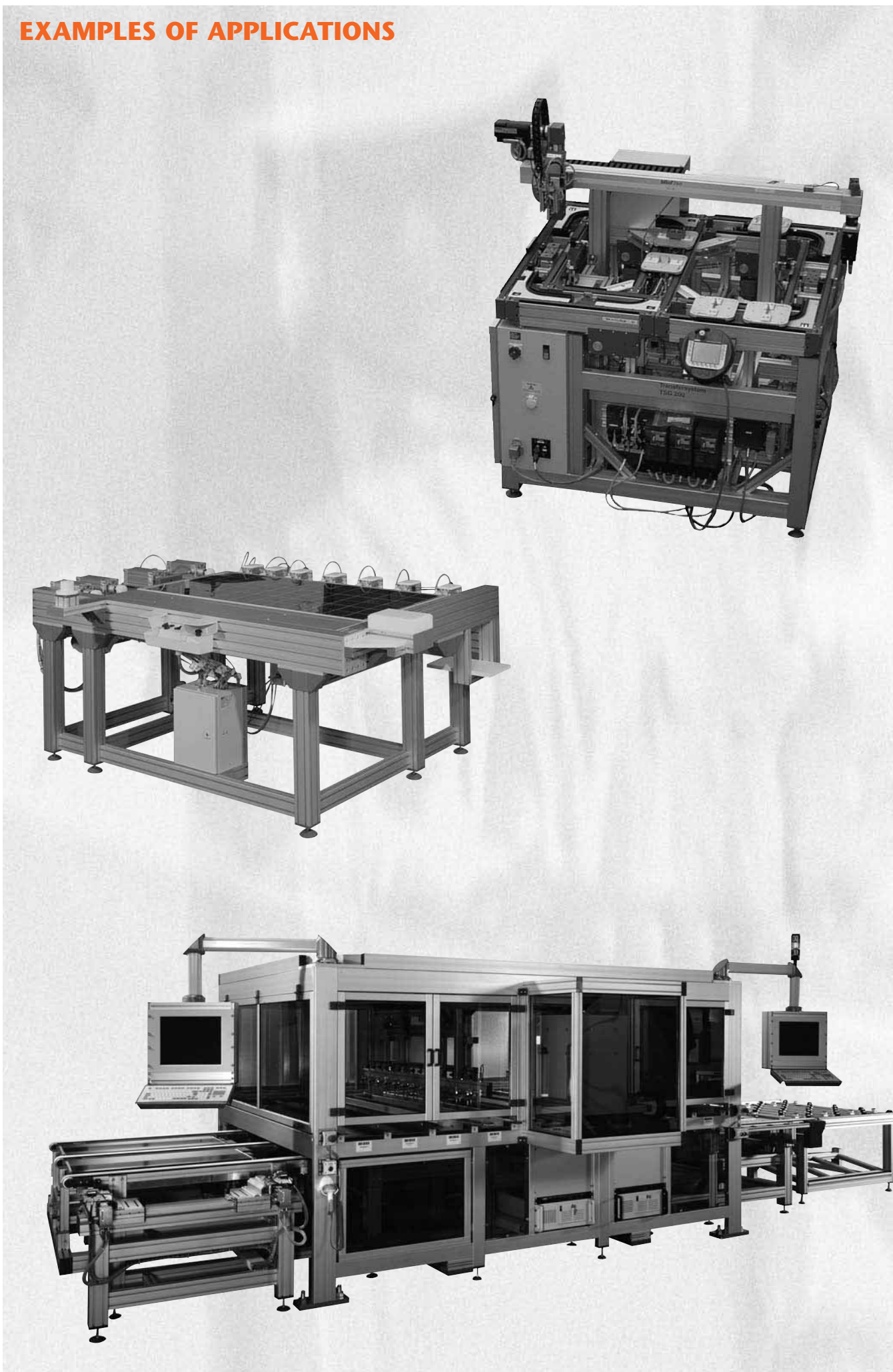
Material: Aluminium

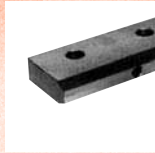
Designation	Dimensions			
	d mm	A mm	B mm	F ±0,12 mm
FWB 12	12	20	40	30
FWB 16	16	20	50	35
FWB 20	20	23	50	38
FWB 25	25	25	60	42
FWB 30	30	30	70	54
FWB 40	40	40	100	68
FWB 50	50	50	100	75
FWB 60	60	60	110	85



Dimensions						Weight
J	V	W	Y	SW		
mm	mm	mm	mm	mm	kg	
5,5	12	23,5	19,5	3	0,06	
5,5	12	27,5	25	3	0,08	
6,6	14	33,5	22,5	4	0,10	
6,6	16	42	26,5	5	0,15	
9	19	49,5	30,5	6	0,30	
11	26	65	47	8	0,70	
11	36	75	41,5	8	1,20	
11	40	85	43,5	8	1,45	

## EXAMPLES OF APPLICATIONS





SHAFT SUPPORTS



## SHAFT SUPPORT

**WU...**  
**WUG...**  
**WUW...**

**assembled, without bores**  
**assembled, with bores**  
**with fixed shaft and bores**

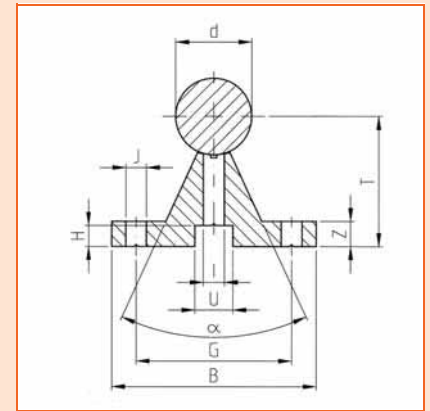
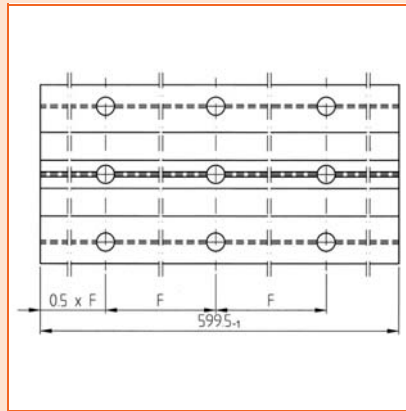
These engineering elements are needed to support shafts in combination with MiniTec linear ball bearings OP or housing unit type ...OP  
 Material: Aluminium

Thoroughly supported shafts permit particularly stiff bearings; in many cases, however, there is support by sections.

The standard length of our shaft supports is 600 mm, and the length of the shaft may be up to 6000 mm (longer lengths upon request.)

Variant F distribution available upon request.

Designation	Dimensions				
	d	$\alpha$	B	H	T
	mm		mm	mm	mm
WU 1 WUG 1 WUW 12	12	50°	40	4,5	22
WU 2 WUG 2 WUW 16	16	50°	54	5,5	32
WU 2 WUG 2 WUW 20	20	50°	54	5,5	34,02
WU 3 WUG 3 WUW 25	25	50°	65	6,8	39,66
WU 3 WUG 3 WUW 30	30	50°	65	6,8	42,19
WU 4 WUG 4 WUW 40	40	50°	85	10,8	60
WU 4 WUG 4 WUW 50	50	50°	85	10,8	65,05
WU 4 WUG 4 WUW 60	60	50°	85	10,8	70,1



Dimensions							Weight
U	Z	G	I	J	F	kg	
mm	mm	mm	mm	mm	mm		
8	5	-	-	-	-	0,72	
		29	4,5	4,5	120	0,72	
		29	4,5	4,5	120	1,61	
10	6	-	-	-	-	0,95	
		41	5,5	5,5	150	0,95	
		41	5,5	5,5	150	1,89	
10	6	-	-	-	-	0,95	
		41	5,5	5,5	150	0,95	
		41	5,5	5,5	150	2,42	
12	6,6	-	-	-	-	1,24	
		51	6,6	6,6	150	1,24	
		51	6,6	6,6	150	3,52	
12	6,6	-	-	-	-	1,24	
		51	6,6	6,6	150	1,24	
		51	6,6	6,6	150	4,55	
18	10	-	-	-	-	2,65	
		65	11	9	150	2,65	
		65	11	9	150	8,55	
18	10	-	-	-	-	2,65	
		65	11	9	150	2,65	
		65	11	9	150	11,85	
18	10	-	-	-	-	2,65	
		65	11	9	150	2,65	
		65	11	9	150	15,85	

## SHAFT SUPPORT LOW VERSION

**LWU...**  
**LWG...**  
**LWW...**

**assembled, without bores**  
**assembled, with bores**  
**with fixed shaft and bores**

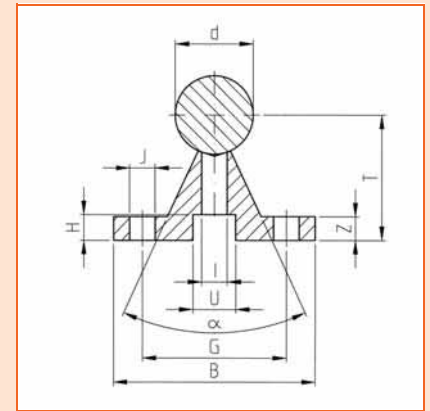
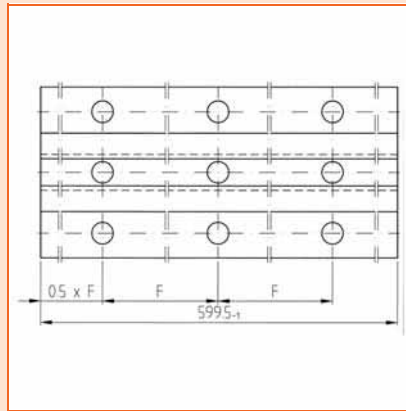
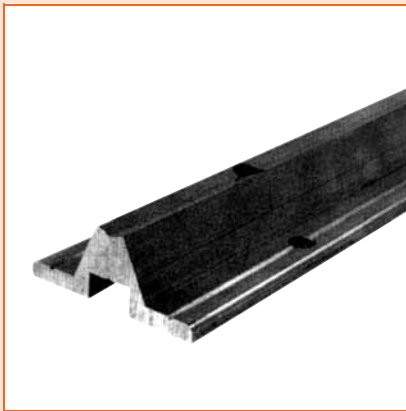
These engineering elements are needed to support shafts in combination with MiniTec linear ball bearings OP or housing unit type ...OP  
 Material: Aluminium

Thoroughly supported shafts permit particularly stiff bearings; in many cases, however, there is support by sections.

The standard length of our shaft supports is 600 mm, and the length of the shaft may be up to 6000 mm (longer lengths upon request.)

Variant F distribution available upon request.

Designation	Dimensions				
	d mm	$\alpha$	B mm	G +0,15 mm	H mm
LWU 12 LWG 12 LWW 12	12	50°	40	- 29 29	5
LWU 16 LWG 16 LWW 16	16	50°	45	- 33 33	6
LWU 20 LWG 20 LWW 20	20	50°	52	- 37 37	6,5
LWU 25 LWG 25 LWW 25	25	50°	57	- 42 42	8,5
LWU 30 LWG 30 LWW 30	30	50°	69	- 51 51	10,5
LWU 40 LWG 40 LWW 40	40	50°	73	- 55 55	10,5
LWU 50 LWG 50 LWW 50	50	46°	84	- 63 63	12,5



	Dimensions						Weight
	I	J	T	U	Z	F	kg
	mm	mm	mm	mm	mm	mm	
	-	-				-	0,43
	4,5	4,5	22	8	5	120	0,43
	4,5	4,5				120	0,96
	-	-				-	0,52
	5,5	5,5	26	9,5	5	150	0,52
	5,5	5,5				150	1,47
	-	-				-	0,78
	6,6	6,6	32	11	6	150	0,78
	6,6	6,6				150	2,26
	-	-				-	0,85
	9	6,6	36	14	6	200	0,85
	9	6,6				200	3,16
	-	-				-	1,14
	11	9	42	17	7	200	1,14
	11	9				200	4,47
	-	-				-	1,58
	11	9	50	17	6	300	1,58
	11	9				300	7,5
	-	-				-	2,07
	13	11	60	19	9	300	2,07
	13	11				300	11,32



## SHAFT SUPPORT SINGLE-ROW PITCH

**SWG...-1**  
**SWW...-1**

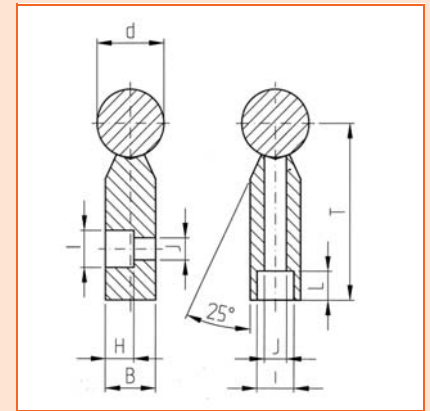
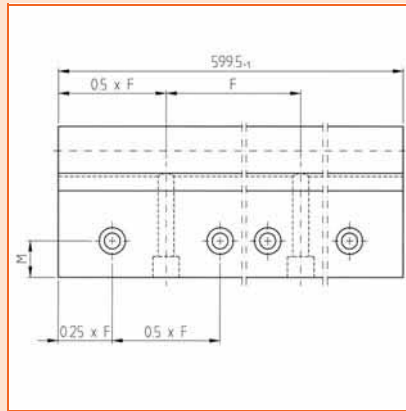
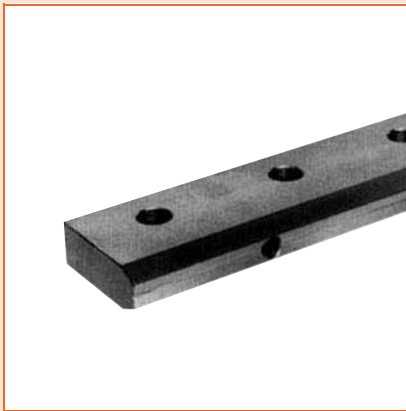
**assembled, with bores**  
**assembled, with fixed shaft**

Material: Aluminium

The standard length is 600mm, shaft length is 6000mm (larger lengths on request).

Variant F distribution available upon request.

Designation	Dimensions				
	d	B	H	I	
	mm	mm	mm	mm	
SWG 20 -1 SWW 20 -1	20	15	8,5	11	
SWG 25 -1 SWW 25 -1	25	20	11	15	
SWG 30 -1 SWW 30 -1	30	25	13,5	18	
SWG 40 -1 SWW 40 -1	40	30	16	20	
SWG 50 -1 SWW 50 -1	50	35	18,5	24	



Dimensions						Weight
J	L	M	T	F	kg	
mm	mm	$\pm 0,15$ mm	mm	mm		
6,6	8,5	15	52	100	0,92 2,39	
9	15	18	62	120	1,36 3,67	
11	15,3	21	72	150	1,98 5,31	
14	17,5	25	88	200	2,86 8,78	
16	21,5	30	105	200	3,94 13,19	

## SHAFT SUPPORT TWO-ROWED PITCH

**SWG...-2**  
**SWW...-2**

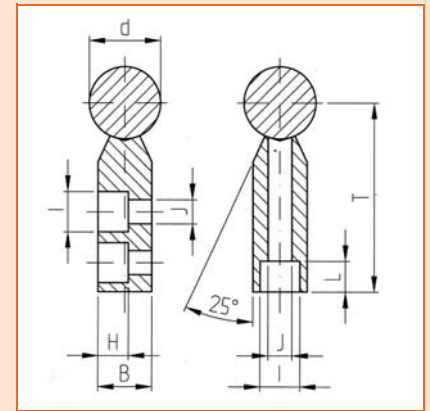
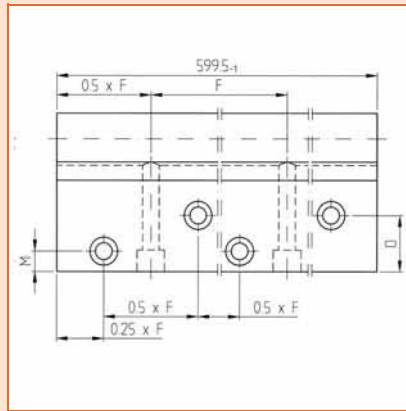
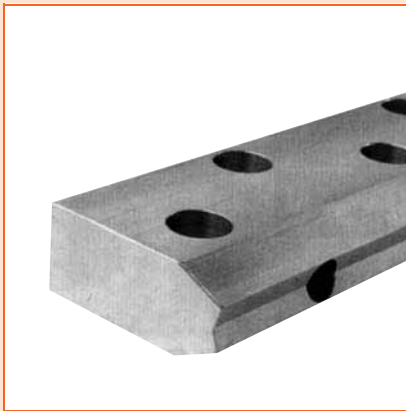
**assembled, with bores**  
**assembled, with fixed shaft**

Material: Aluminium

The standard length is 600mm, shaft length is 6000mm (larger lengths on request).

Variant F distribution available upon request.

Designation	Dimensions					
	d	B	H	I	J	
	mm	mm	mm	mm	mm	
SWG 20 -2 SWW 20 -2	20	15	8,5	11	6,6	
SWG 25 -2 SWW 25 -2	25	20	11	15	9	
SWG 30 -2 SWW 30 -2	30	25	13,5	18	11	
SWG 40 -2 SWW 40 -2	40	30	16	20	14	
SWG 50 -2 SWW 50 -2	50	35	18,5	24	16	



Dimensions						Weight
L	M	O	T	F		kg
mm	±0,15 mm	±0,15 mm	mm	mm	mm	
8,5	8	22	52	75		0,9 2,38
15	10	26	62	75		1,33 3,64
15,3	12	30	72	100		1,88 5,21
17,5	12	38	88	100		2,65 8,57
21,5	15	45	105	100		3,64 12,89

## SHAFT SUPPORT

**NWU...**  
**NWG...**  
**NWW...**

**assembled, without bores**  
**assembled, with bores**  
**with fixed shaft**

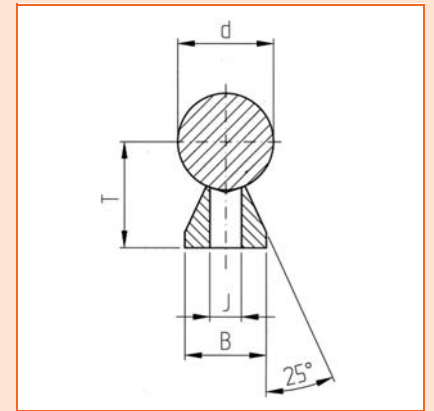
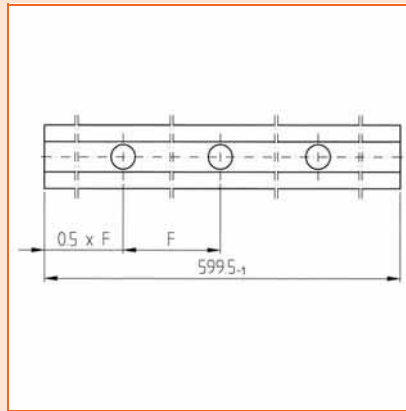
Material: Aluminium

Thoroughly supported shafts permit particularly stiff bearings; in many cases, however, there is support by sections.

The standard length of our shaft supports is 600 mm, and the length of the shaft may be up to 6000 mm (longer lengths upon request.)

Variant F distribution available upon request.

Designation	Dimensions	
	d mm	B ±0,02 mm
NWU 12 NWG 12 NWW 12	12	11
NWU 16 NWG 16 NWW 16	16	14
NWU 20 NWG 20 NWW 20	20	17
NWU 25 NWG 25 NWW 25	25	21
NWU 30 NWG 30 NWW 30	30	23
NWU 40 NWG 40 NWW 40	40	30
NWU 50 NWG 50 NWW 50	50	35



Dimensions				Weight
T ±0,02 mm	J mm	F mm	kg	
14,5	-	-	0,13	
	4,5	75	0,13	
	4,5	75	0,66	
18	-	-	0,26	
	5,5	75	0,26	
	5,5	75	1,2	
22	-	-	0,31	
	6,6	75	0,31	
	6,6	75	1,79	
26	-	-	0,36	
	9	75	0,36	
	9	75	2,67	
30	-	-	0,43	
	11	100	0,43	
	11	100	3,76	
39	-	-	0,52	
	13,5	100	0,52	
	13,5	100	6,44	
46	-	-	0,64	
	15,5	100	0,64	
	15,5	100	9,89	



PRECISION  
STEEL SHAFTS



## TECHNICAL DATA

### 1. Overview

MiniTec precision shafts for linear bearings are available from stock in all current diameters.

**Furthermore, we have an extensive inventory of intermediate sizes, special variants, and materials.**

All quality parameters are optimally selected for use in linear guides.

<u>Surface roughness:</u>	Ra 0,15 µm to 0,3 µm = Rz 1,25 µm to 2,5 µm (see following pages for further details)
<u>Diameter tolerance:</u>	up to 100 mm: h6 Hard chrome plated variant: h7 for SM linear bearings of high-precision applications: g6 (see following pages for further details)
<u>Circularity:</u>	< 1/2 tolerance per DIN ISO 286-2 (tolerance range)
<u>Straightness:</u>	< Ø 10 mm: < = 0.3 mm/m from Ø 10 mm to Ø 20 mm: < = 0,2 mm/m Ø 20 mm and up: < = 0,1 mm/m (see following pages for further details)
<u>Materials:</u>	
<i>Standard</i>	Heat-treated steel, e.g. Cf53 (1.1213) - HRC 60-66
<i>Miniature shafts Ø 3 and Ø 4</i>	100 Cr6 (W-Nr. 1.3505) - HRC 58-63 X90 (W-Nr. 1.1112) - HRC 53-60
<i>Hollow shafts</i>	100 Cr6 (W-Nr. 1.3505) - HRC 58-63
<i>Special material with increased grain strength</i>	42CrMo4 heat-treated (W-Nr. 1.7225) HRC 53-61 (not in stock)
<i>Corrosion-resistant shafts</i>	X46Cr13 (W-Nr. 1.4034) - HRC 52-55 X90CrMoV18 (W-Nr. 1.4112) - HRC 53-60 X105CrMo17 (W-Nr. 1.4125) - HRC 53-60
<i>Hard chrome-plated shafts</i>	Cf53 (W-Nr. 1.1213) Chrome layer thickness: 0,008 bis 0,015, Layer hardness: HRC 65 - 70 (see following pages for further details)

MiniTec precision shafts are protected by anticorrosives. The protective material must be removed before installation..

#### Hollow shafts:

outside ø mm	inside ø mm	Weight kg/m	Length max. mm	outer layer depth mm
12	4	0,796	4000	1,3 - 1,5
16	7	1,284	4000	1,4 - 1,6
20	12	1,578	4000	1,5 - 1,7
25	14	2,645	4000	1,6 - 1,8
30	19	3,323	4000	1,7 - 1,8
40	26	5,697	4000	1,9 - 2,1
50	35	7,861	4000	1,4 - 2,2





## 2. Shafts

Shaft ø mm	Weight Kg/m	Length max. mm	Outer layer depth* mm	ISO h6 dimension**		ISO g6 dimension		
				above µm	below µm	above µm	below µm	
3	0,055	300	fully hardened	0	h6 -8	h7 -10	-2	-8
4	0,098	400	fully hardened	0	-8	-12	-4	-12
5	0,154	3500	0,8	0	-8	-12	-4	-12
6	0,222	3500	0,8	0	-9	-12	-4	-12
8	0,395	4000	0,9	0	-9	-15	-5	-14
10	0,617	4000	0,9	0	-9	-15	-5	-14
12	0,888	6000	1,0	0	-11	-18		
14	1,208	6000	1,2	0	-11	-18		
15	1,387	6000	1,2	0	-11	-18		
16	1,578	6000	1,2	0	-11	-18		
18	1,998	6000	1,6	0	-13	-18		
20	2,466	6000	1,6	0	-13	-21		
22	2,984	6000	1,6	0	-13	-21		
24	3,551	6000	1,8	0	-13	-21		
25	3,853	6000	1,8	0	-13	-21		
28	4,834	6000	2,0	0	-13	-21		
30	5,549	6000	2,0	0	-16	-21		
32	6,313	6000	2,0	0	-16	-25		
35	7,553	6000	2,2	0	-16	-25		
38	8,903	6000	2,2	0	-16	-25		
40	9,865	6000	2,2	0	-16	-25		
45	12,45	6000	2,4	0	-16	-25		
50	15,413	6000	2,4	0	-16	-25		
60	22,195	6000	2,8	0	-19	-30		
70	30,210	6000	2,8	0	-19	-30		
80	39,458	6000	2,8	0	-19	-30		
90	49,94	6000	3,0	0	-22	-35		
100	61,654	6000	3,0	0	-22	-35		

\* Outer layer depth [mm] DIN ISO 50190-3 - Tolerance:  $\pm 0,5$

\*\* DIN Iso 286-2

## Fitting tolerances for steel shafts (Diameter tolerances) per DIN ISO 286-2

Up to 6 mm: h6

Hard chrome plated variant: h7

For SM linear bearings of high-precision applications: g6

Special tolerances, e.g. f7, are available upon request.

Shaft Diameters ø mm	Tolerance category h7	Tolerance category h6	Tolerance category g6	Tolerance category f7
3	+0/-10	+0/-6	-2/-8	-6/-16
3 - 6	+0/-12	+0/-8	-4/-12	-10/-22
6 - 10	+0/-15	+0/-9	-5/-14	-13/-28
10 - 18	+0/-18	+0/-11	-6/-17	-16/-34
18 - 30	+0/-21	+0/-13	-7/-20	-20/-41
30 - 50	+0/-25	+0/-16	-9/-25	-25/-50
50 - 80	+0/-30	+0/-19	-10/-29	-30/-60
80 - 100	+0/-35	+0/-22	-12/-34	-36/-71

## INTERESTING FACTS

- Rust- and acid-resistant steels are often denoted "ROSTFREI" (rust-proof) in Germany. From a metallurgical standpoint, however, there are basically no 100% rust-proof steels.
- The stainless steels used by MiniTec can be designated as corrosion-resistant. It is primarily due to the alloy components such as the high percentage of chromium and nickel that steels can be called stainless steel.
- These steels can still corrode (rust), for instance if the chromium percentage is low. Corrosion can also appear in spots if e.g. base metal (ferritic) portions lie on the surface. At these points, spots of pit corrosion can appear.  
Furthermore, surface corrosion can occur if base materials are in the immediate vicinity and a high proportion of ferritic components are transferred to the stainless steel (for instance due to moisture), resulting in surface corrosion (flaking rust), which is generally only on the surface and can easily be removed using rust protection oil.
- When working so-called rust- and acid-resistant steels with base metal tools (e.g. HSS steel tools), tool wear can also result in a base metal layer of tool residue on the steel surface, which can lead to surface corrosion later. At MiniTec, however, ceramic or fully hardened metal (VHM) tools are used, largely circumventing this effect.
- MiniTec precision steel shafts are protected by anti-corrosion oil. The protective material must be removed before installation.

*Note: The infeed and outfeed zone (at the beginning and end of each fabrication length) of about 200 mm are NOT to dimension and NOT hardened!*

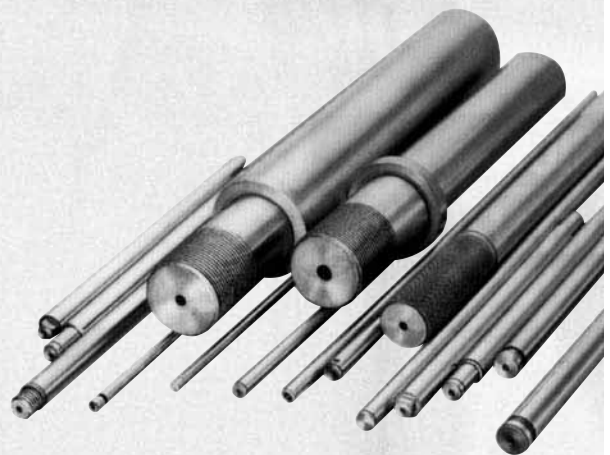
## TECHNICAL DATA

### 3. Chemical and Physical Characteristics

Steel type		Physical properties / application			Chemical properties						
Material number	Designation	Application	Tensile strength [N/mm <sup>2</sup> ]	Breaking elongation	Carbon [C]	Silicon [Si]	Manganese [Mn]	Phosphor (P)	Chromium (Cr)	Molybdenum [Mo]	Surface hardness [HRC]
<b>Tempered steel</b>											
1.1213	CF53	Standard shafts, hard chrome-plated	*740-880	-	0,50-0,57	0,15-0,35	0,40-0,70	0,025	-	-	57-62 **65-70
1.3505	100Cr6	Miniatur shafts, hollow shafts	-	-	0,95-1,10	0,15-0,35	0,25-0,45	0,025	1,40-1,60	-	60+2
1.7225	42CrMo4	special material with increased core strength	*1100-1300	*10	0,38-0,45	≤ 0,40	0,60-0,90	0,035	0,90-1,20	0,15-0,30	53-61
<b>Rust- and acid-resistant steels*</b>											
1.4043	X46Cr13	corrosion-resistant shafts	≤ 800	-	0,43-0,50	1,00	1,00	0,04	12,5-14,5	-	52-54
1.4112	X90CrMoV18	corrosion-resistant shafts	≤ 835	-	0,85-0,95	1,00	1,00	0,04	17,00-19,0	0,90-1,30	55-57
1.4125	X105CrMo17	corrosion-resistant shafts	≤ 915	-	0,95-1,20	1,00	1,00	0,04	16,00-18,0	0,40-0,80	57-60

\*Source for chemical and physical properties -> steel guide (\*values for steels up to Ø 16 mm),

\*\* Chromium layer



## TECHNICAL DATA

### 4. Properties of Alloy Components

#### CARBON [C]:

Carbon makes it possible to harden steel. As the carbon proportion increases, the strength and hardening capacity of the steel increases, while its elongation, workability, ease of welding, and machinability (using milling machines) are reduced. The corrosion resistance to water, acids, and hot gasses is practically not influenced by carbon.

#### SILICON [Si]:

Silicon is already present in all steel, since the iron ore already contains silicon components according to its composition. Silicon steels, however, may only be designated such starting at a silicon content of > 0.40%. Silicon increases the strength and wear resistance (Si-Mn tempered steels); a great increase in the limit of elasticity, thus it is useful as an alloy component in spring steels. A high silicon content also positively influences acid resistance.

#### MANGANESE [Mn]:

Manganese increases the hardening capacity of steel. The elongation limit and strength is increased by the Mn proportion, and Mn is also favourable for workability and welding capacity, while greatly influencing the hardening depth. Mn steels are highly wear-resistant to impact, while the core remains rigid.

#### MOLYBDENUM [Mo]:

Molybdenum improves the hardening capacity and largely reduces the initial brittleness, for instance in Cr-Ni and Mn steels, supporting the formation of small grains, and also has a favourable influence on welding capability. Increase in the elongation limit, strength, and corrosion resistance. High Mo content reduces susceptibility to pitting.

#### CHROMIUM [Cr]:

Chromium makes steel oil- or air-temperable. It increases capacity for hardening and thus the temperability. The notch impact resistance is reduced, but elongation only falls by a little. The welding capacity of chromium steels falls as the Cr content rises. The tensile strength rises by 80-100 N/mm per 1% Cr. To obtain corrosion-resistant steels, a minimum content of 13% chromium must be dissolved in the basic mass.

# FLEXURAL STRENGTHS

## 5. Shaft Deflection

To take deflection and its angle into consideration, we must consider the corresponding application. The following table can be used to find the typical application conditions and the formulae to be used.

Type of fastening	Special conditions	Deflection formula	Formula for deflection angle
1 Fixed on the ends		$\delta_{max} = Pl^3/48 EI = Pl^3C$	$i_1 = 0$ $i_2 = Pl^2/16 EI = 3Pl^2C$
2 Fixed on the ends		$\delta_{max} = Pl^3/192EI = 1/4Pl^3C$	$i_1 = 0$ $i_2 = 0$
3 Loose on the ends		$\delta_{max} = 5Pl^4/384EI = 5/8Pl^4C$	$i_2 = pl^3/24 EI = 2pl^3C$
4 Fixed on the ends		$\delta_{max} = Pl^4/384EI = 1/8Pl^4C$	$i_2 = 0$
5 Loose on the ends		$\delta_1 = Pa^3(2 + 3b/a)/6EI = 8Pa^3(2 + 3b/a)C$ $\delta_{max} = Pa^3(3l^2/a^2 - 4)/24EI = 2Pa^3(3l^2/a^2 - 4)C$	$i_1 = Pab/2EI = 24PabC$ $i_2 = Pa(a+b)/2EI = 24Pa(a+b)C$
6 Fixed on the ends		$\delta_1 = Pa^3(2 - 3a/l)/6EI = 8Pa^3(2 + 3a/l)C$ $\delta_{max} = Pa^3(2 + 3b/a)/24EI = 2Pa^3(2 + 3b/a)C$	$i_1 = Pa^2b/2EI = 24Pa^2bC/l$ $i_2 = 0$
7 Fixed on one end		$\delta_{max} = Pl^3/3EI = 16Pl^3C$	$i_1 = Pl^2/2EI = 24Pl^2C$ $i_2 = 0$
8 Fixed on one end		$\delta_{max} = Pl^4/8EI = 6Pl^4C$	$i_1 = Pl^3/6EI = 8Pl^3C$ $i_2 = 0$
9 Loose on the ends		$\delta_{max} = \sqrt{3} M_0 l^2/216EI = 2\sqrt{3} M_0 l^2C/9$	$i_1 = M_0 l/12EI = 4M_0 lC$ $i_2 = M_0 l/24EI = 2M_0 lC$
10 Fixed on the ends		$\delta_{max} = M_0 l^2/216EI = 2M_0 l^2C/9$	$i_1 = M_0 l/16EI = 3M_0 lC$ $i_2 = 0$

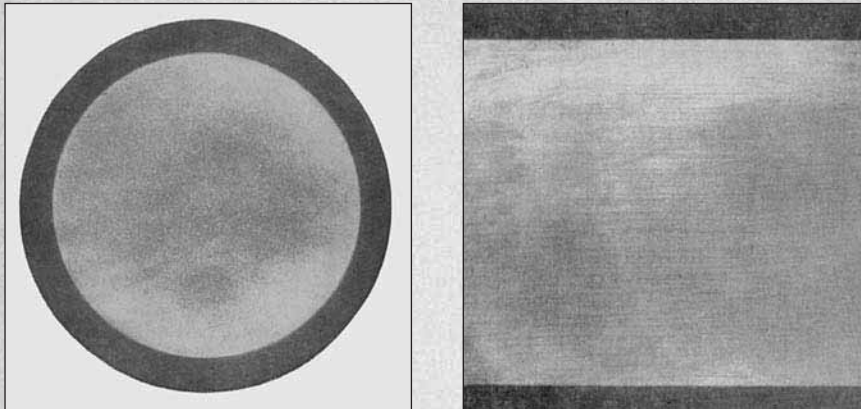
$\delta_1$  = deflection in load bearing point,  $p$  = distributed load,  $\delta_{max}$  = max. deflection (mm),  $a, b$  = distance between load bearing points,  $P$  = point load (kgf),  $l$  = length between fastening points,  $i_2$  = deflection angle at fastening point,  $I$  = geometrical inertial moment (mm<sup>4</sup>)  
 $M_0$  = moment (Kgfmm),  $E$  = modulus of direct elasticity  $2.1 \times 10^4$  (Kgf/mm<sup>2</sup>),  $i_1$  = deflection angle at load bearing point,  
 $C = 1/48 EI$  (Kgfmm<sup>-2</sup>)

## SURFACE TREATMENT

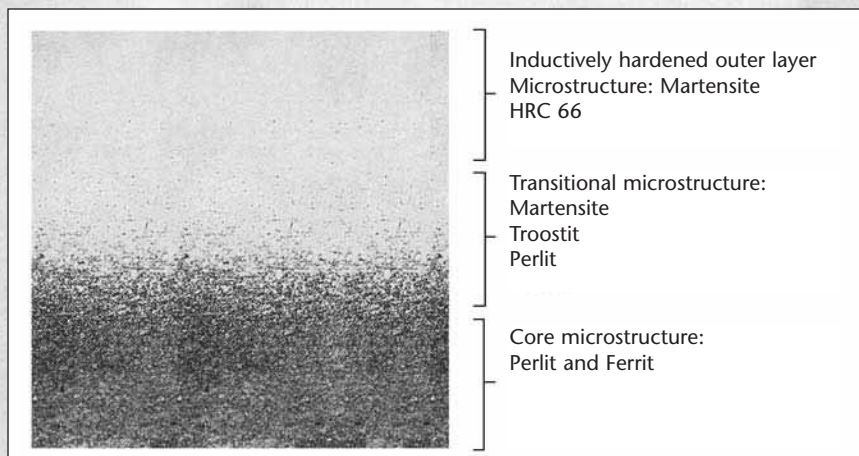
### 6. Inductively Hardened Surface

MiniTec steel shafts generally have inductively hardened surfaces. That means that the shafts have a hard layer outside, guaranteeing high wear resistance. In the centre, the shafts are soft. This ensures that the shafts are better able to withstand bending stresses, impact and torsion and notch stresses. The result is a very good damping characteristic.

The surface of the steel shafts is ground and polished in the IT fitting system (ISO tolerance ranges) per DIN ISO 286-2, thus offering an optimum fit to the MiniTec ball sleeves.



The example illustration shown below shows the microstructure within the edge zone. You can easily see the hardened outer layer (light martensite) and the transition to a tougher core microstructure (grey perlite and ferrite.)



## HARDENING DEPTH

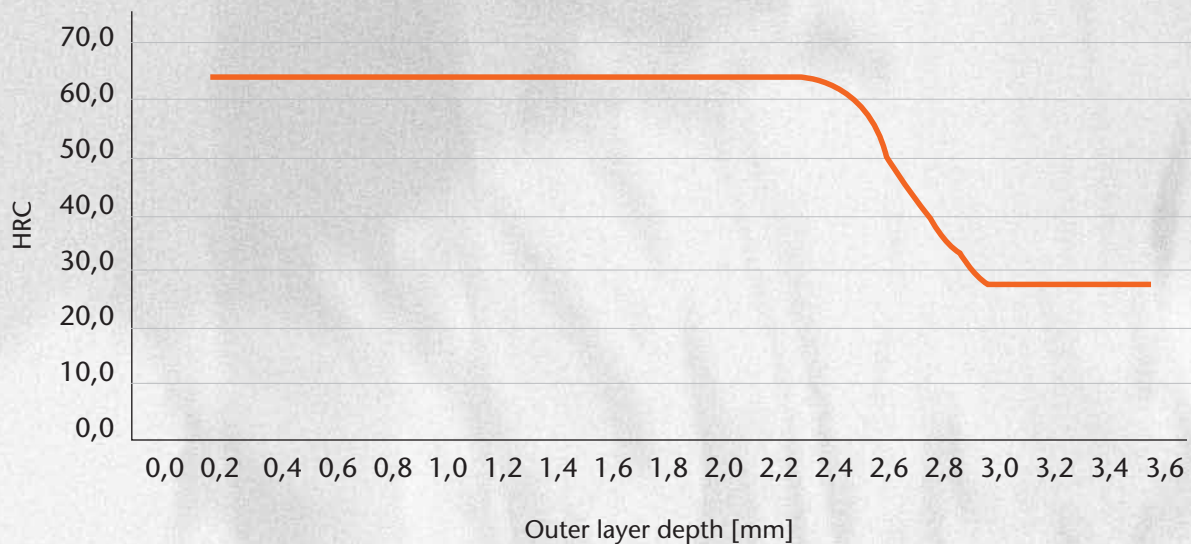
### (Outer layer depth)

#### Inductively Hardened Surface

The hardening depth (hardened outer zone) of the shafts vary according to the shaft diameter and material type. Since the hard outer zone falls off towards the soft core, one speaks of a transition zone subject to a tolerance.

The minimum hardening depths are given in the table under "2. Steel Shafts."

Example Hardening Curve:



## HARD CHROME-PLATED STEEL SHAFTS

Hard chrome-plated steel shafts are used wherever a highly wear-resistant and rust-proof surface quality is required for steel shafts, e.g. for piston rods and similar application cases.

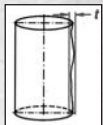
The chrome layer is galvanically applied and is only a few  $\mu\text{m}$  thick. In order to achieve high wear resistance, a hard chrome layer (8 to 15  $\mu\text{m}$ ) is applied.

The high chromium proportion ensures a particularly high resistance to corrosion.

*The corrosion protection is only provided by the chromium layer on the cylindrical shell surface. Please note that the cutting surfaces (frontal faces) and/or the machined shaft segments (e.g. nozzle penetrations, ground surfaces, etc.) have no chromium coating.*

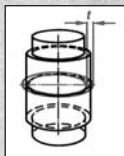
*If the shaft should be completely in a rust-resistant variant, we recommend the use of stainless steel as the base material.*

## Straightness



Definition: The tolerance zone is limited in the measurement plane by two parallel straight lines with distance t.

## Circularity



Definition: The tolerance zone is limited in the measurement plane perpendicular to the axis by two concentric circles with distance t whose common centre lies on the reference axis.

The precision of the straightness of our shafts varies with the diameter.

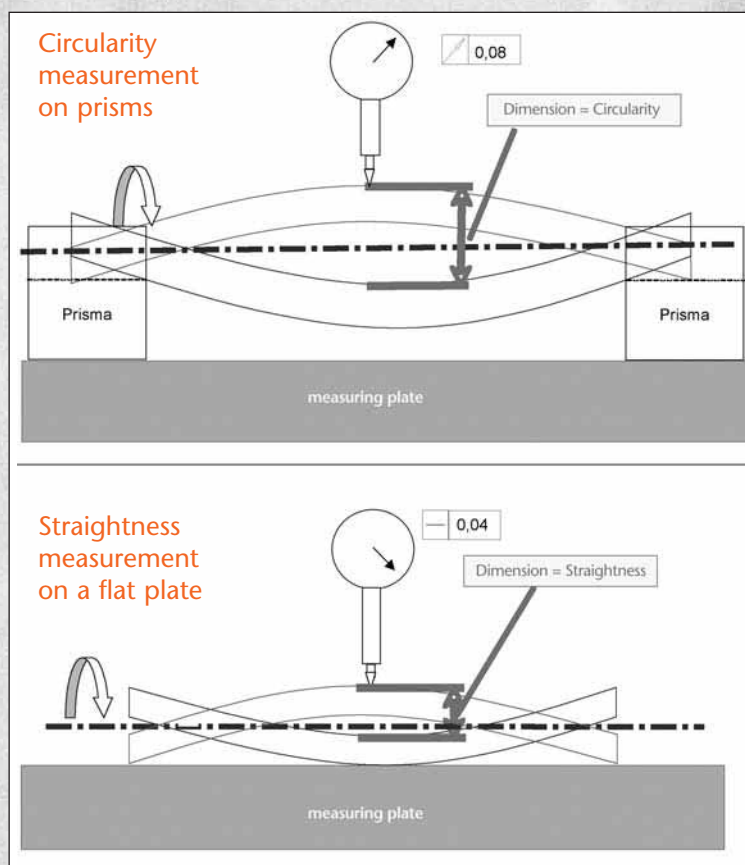
< Ø 10 mm: <= 0,3 mm/m

from Ø 10 mm to Ø 20 mm: <= 0,2 mm/m

from Ø 20 mm: <= 0,1 mm/m

The straightness is always specified over the standard length of 1.0 m. The actual straightness of a fixed length must therefore be converted.

Example: Straightness of a shaft 650 mm in length with diameter 12 mm  
 $650 \text{ mm} \times 0,2 / 1000 = 0,13 \text{ mm}$

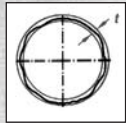


**Straightness = Circularity / 2**

The straightness tolerance is half the gauge display value when turning the shaft by 360°, straightness measurement per ISO 13012.



## CIRCULARITY



Definition: The form tolerance zone is limited in the measurement plane perpendicular to the axis by two concentric circles of distance  $t$ .

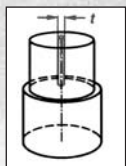
The circularity of the shafts is based on the ISO tolerance system per DIN ISO 286.

Circularity of the shaft = 1/2 tolerance range per DIN ISO 286-2

Example: Shaft  $\varnothing 20$  h6 (tolerance range  $+0 / -13 \mu\text{m}$ ): Circularity =  $6.5 \mu\text{m}$

The circularity of the shafts is determined using a form measurement machine, the circularity of the shafts being exaggerated in the diagramme shown.

## CONCENTRICITY (COAXIALITY)



Definition: The tolerance zone is limited by a cylinder of diameter  $t$  whose axis matches the reference axis.

Application: e.g. tapping turn on a shaft.

## SURFACE QUALITY [roughness]

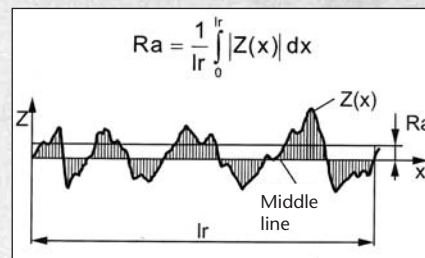
The surface roughness of the ground outer surface of the shell is specified by MiniTec as the  $R_z$  value.

$R_a$   $0.15 \mu\text{m}$  to  $0.3 \mu\text{m}$  =  $R_z$   $1.25 \mu\text{m}$  to  $2.5 \mu\text{m}$

Technically, in practice there are two different roughness measurements in use.

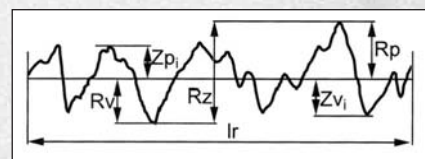
### Middle roughness $R_a$ : (DIN EN ISO 4287)

Arithmetic average of the absolute amounts of distance  $Y$  of the roughness profile from the middle line within the measurement section.



### Max. roughness profile height $R_z$ : (DIN EN ISO 4287)

The arithmetic mean of the individual roughness depths of five adjacent individual measurement sections of equal length.



## INTERIOR THREAD

(Feasibility due to hardened outer zones)

Dimension recommendations for interior threads

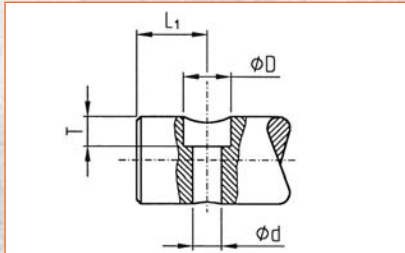
Shaft ø mm	Metric ISO-thread max.	Depth $t_1/t_2$ mm
8	M4	10
10	M5	10
12	M6	12,5
14	M8	12,5
16	M10	16
20	M12	19
25	M16	22
30	M20	28
40	M30	28
50	a. A.	36
60	a. A.	42
80	a. A.	50
100	a. A.	58

Differences are possible between tempered steel and stainless steel.  
In case of doubt, we will be happy to advise you.



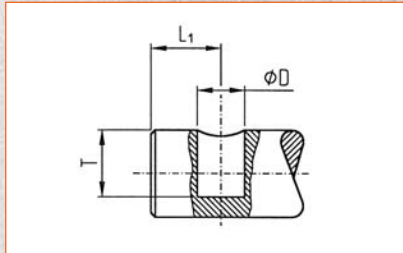
# SHAFT MACHINING

## Radial passageway



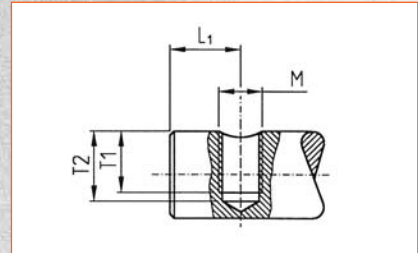
Ordering example:  
Radial boring for M8 screw  
 $\phi d 9 / \phi D 15$ , DIN 974-1

## Radial boring

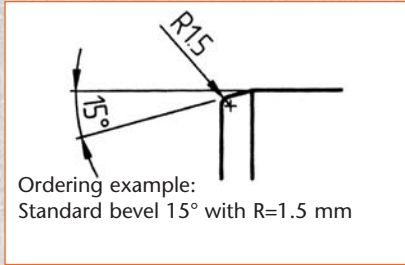


Ordering example:  
Radial boring  $\phi D 10 \times T 15$ ,  
 $L_1 = 25$  mm

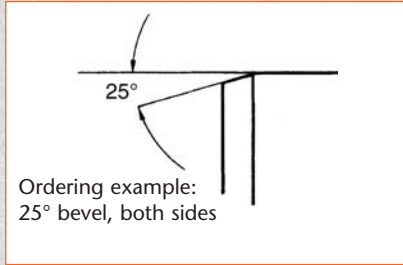
## Radial thread



Ordering example:  
Radial thread M8 x 20 /  $T_2 = 22$   
 $L_1 = 30$  mm

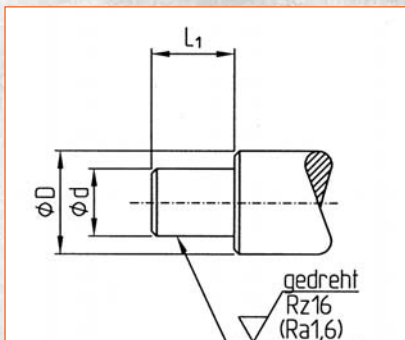


Ordering example:  
Standard bevel  $15^\circ$  with  $R=1.5$  mm



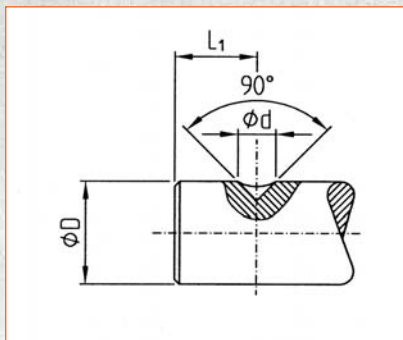
Ordering example:  
 $25^\circ$  bevel, both sides

## Shaft pin in turned variant



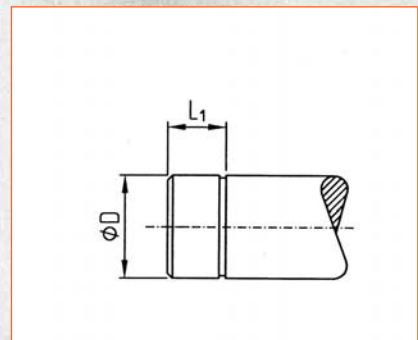
Ordering example:  
Pin 25 h 6 / 40 lg, one side

## Shaft end with countersink for stud screws



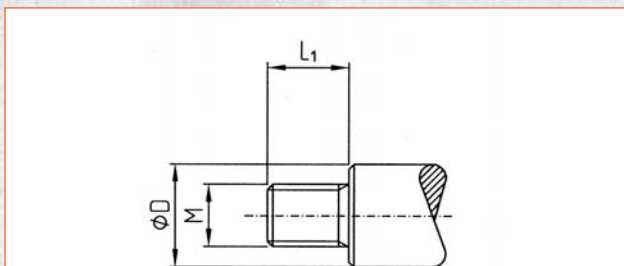
Ordering example:  
 $90^\circ$  sink, 4 deep,  $l = 25$ , single-sided

## Shaft end with recess for retaining rings e.g. DIN 471



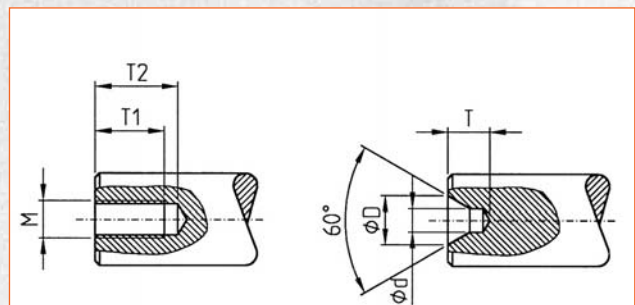
Ordering example:  
Recess DIN 471,  $l = 5$ , two-sided

## Shaft end with threads. Threads are soft. Thread outfeed with or without thread groove

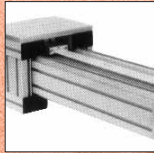


Ordering example:  
Outer thread M 20 x 40 lg, single-sided, DIN13-1  
Thread outfeed per DIN 76-A

## Centred thread boring on face. Centring D-DIN 332 on the face

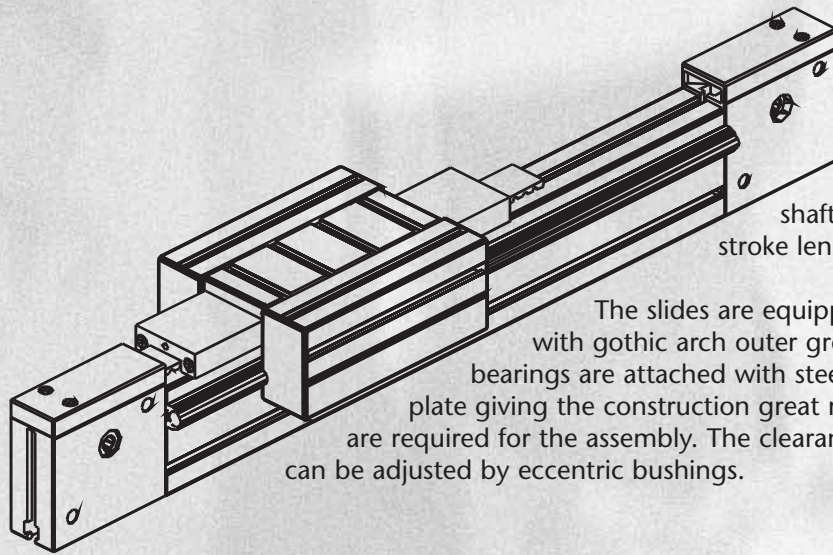


Ordering example 1: Single-side axial, interior thread M...  
Ordering example 2: Single-sided centring  $D = \dots$ , per DIN 332



LINEAR SYSTEM LR

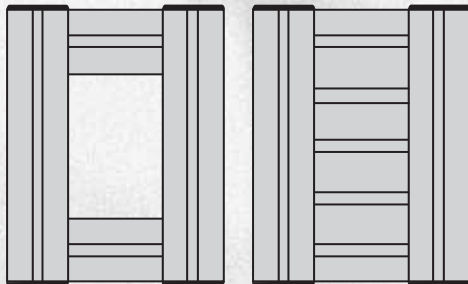
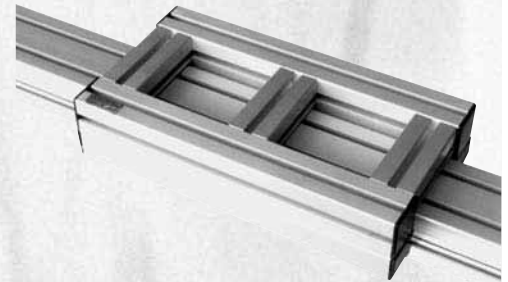
## LINEAR SYSTEM LR



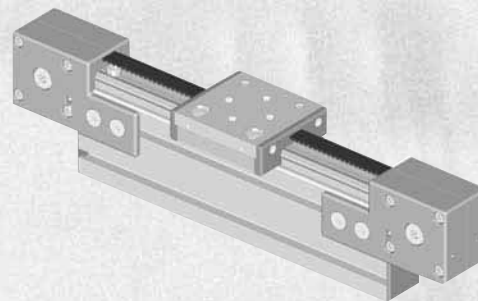
The profile system LR is based on double-row angular contact bearings made of bearing steel and hardened and ground precision shafts  $\varnothing 12 \text{ mm} / \text{Cf } 53$ . Any required stroke length can be implemented.

The slides are equipped with double-row roller bearings with gothic arch outer grooves. For very high loads multiple bearings are attached with steel-T-Slot bars directly to the slide-plate giving the construction great rigidity. No special bearing profiles are required for the assembly. The clearance between bearings and shafts can be adjusted by eccentric bushings.

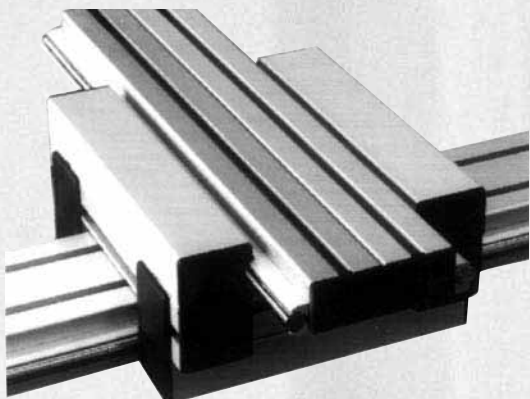
The slides are completely covered, lubrication felts are fitted in the endcaps which clean and grease the shafts. For maintenance purposes the felts can be exchanged quickly and easily without tools. This advantage is important for applications in rough working conditions



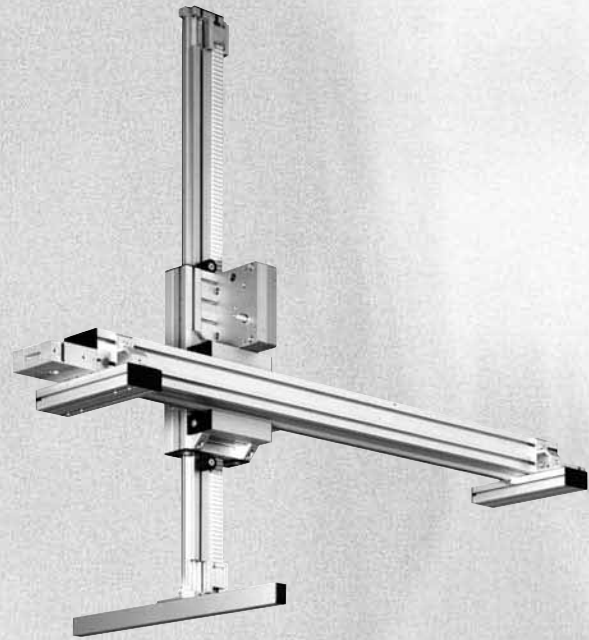
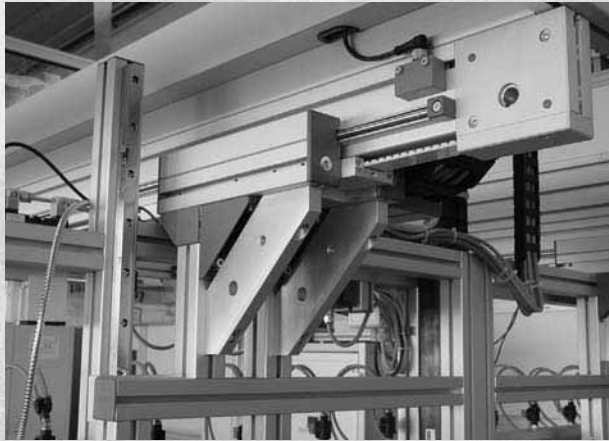
Both closed and open-frame slides with any desired length or width can be fabricated.



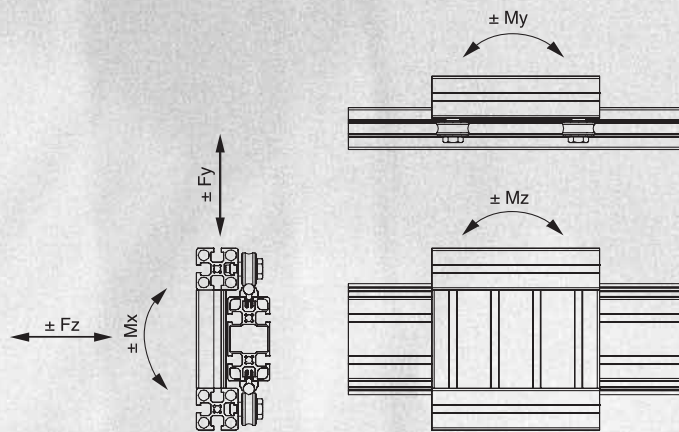
X/Y-tables are easily constructed by the attachment of 4 bearings on to the top of the slide. The guide rails for this configuration are made from profile 45 x 32. Caps LR and cover profile AL also fit the y-axis.



# LINEAR SYSTEM LR



## Load capacity

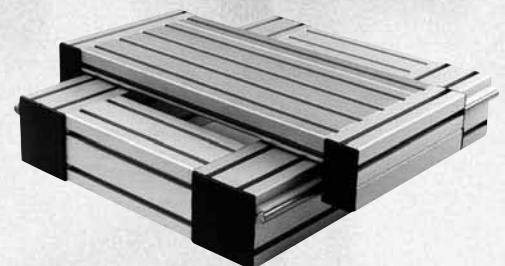


Calculation of max. moment loads as function of the slide length:

$$My \text{ max.} = 0,89 \cdot (L-45) \text{ Nm}$$

$$Mz \text{ max.} = 1,50 \cdot (L-45) \text{ Nm}$$

L = length of slide



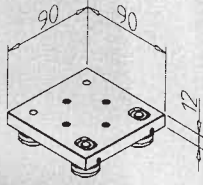
Linear system Slides	LR 6		LR 12				
	Slide LR 6 4 bearings L = 90 mm	Slide LR 6 4 bearings L = 90 mm	Slide 45 4 bearings L = 180 mm	Slide 90 4 bearings L = 180 mm	Slide 135 4 bearings L = 180 mm	Slide 180 4 bearings L = 180 mm	Slide 180 8 bearings L = 360 mm
Mx max.	30 Nm	30 Nm	79 Nm	107 Nm	130 Nm	165 Nm	240 Nm
My max.	75 Nm	75 Nm	120 Nm	120 Nm	120 Nm	120 Nm	275 Nm
Mz max.	40 Nm	40 Nm	202 Nm	202 Nm	202 Nm	202 Nm	470 Nm
Fy max.	800 N	800 N	3500 N	3500 N	3500 N	3500 N	7000 N
Fz max.	640 N	640 N	1500 N	1500 N	1500 N	1500 N	3000 N

Linear system Slides	LR 16	
	Slides LR 16-95	Slides LR 16-90
Mx max.	158 Nm	214 Nm
My max.	288 Nm	288 Nm
Mz max.	323 Nm	323 Nm
Fy max.	7000 N	7000 N
Fz max.	3000 N	3000 N

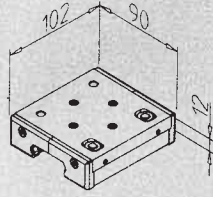
Maximal speed slide 45 - 180: 10 m/sec.  
Maximal speed slide LR 6: 5 m/sec.

## EXAMPLES OF SLIDES

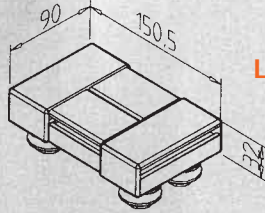
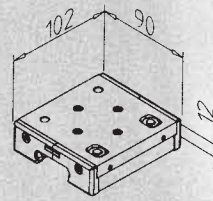
LR 6



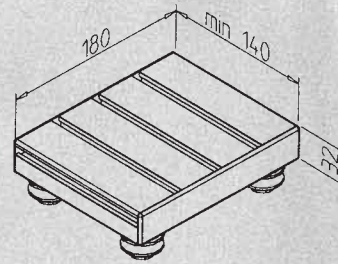
LR 6 Z with cover



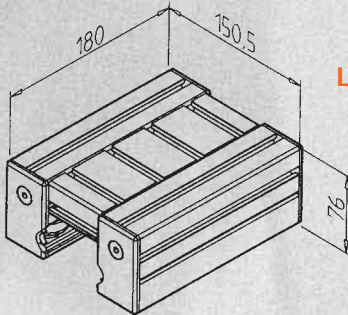
LR 6 Z



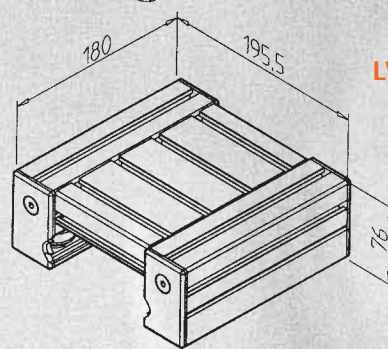
LW 32



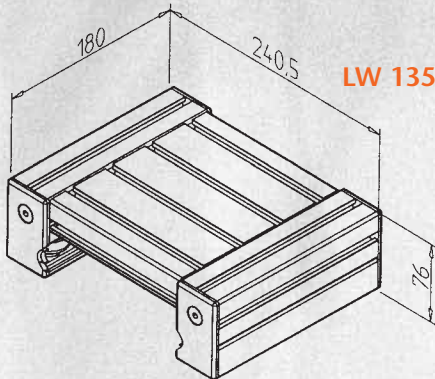
LW 32 E



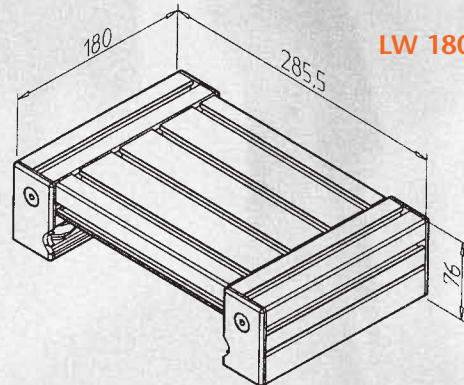
LW 45



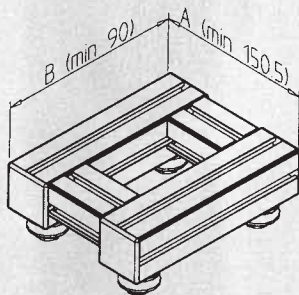
LW 90



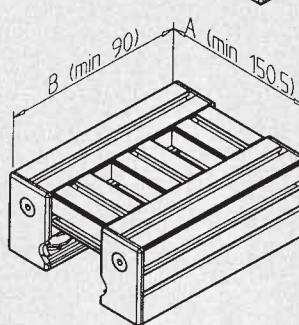
LW 135



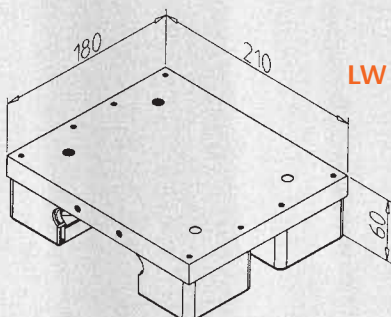
LW 180



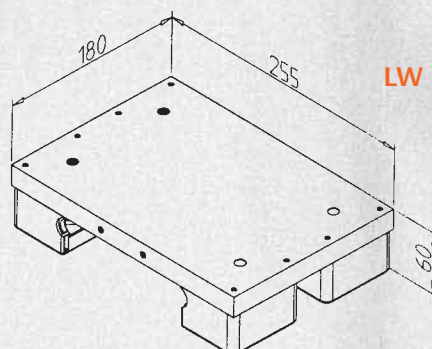
Open



Open



LW LR 16-45



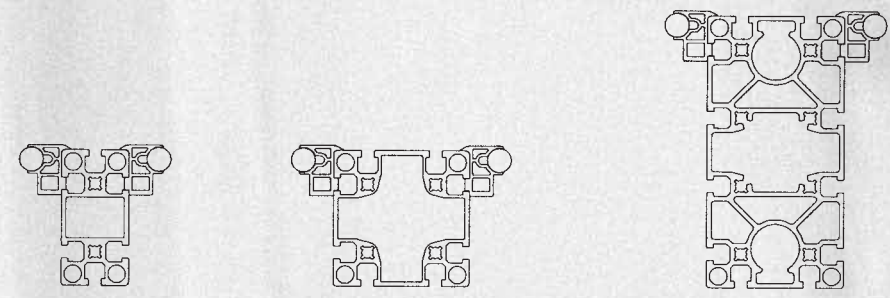
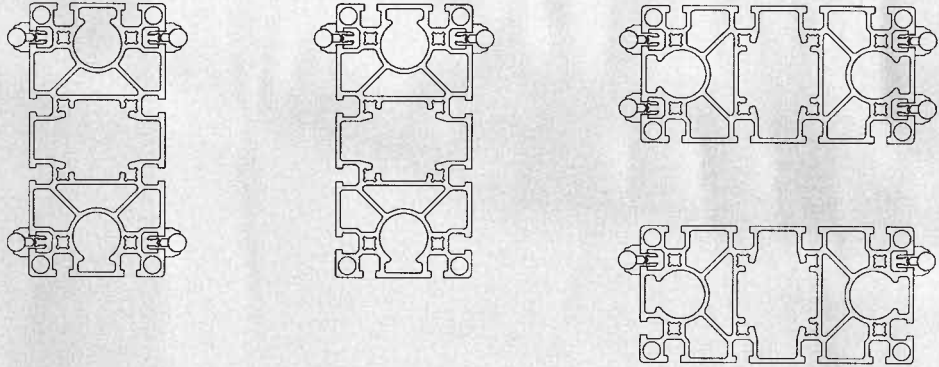
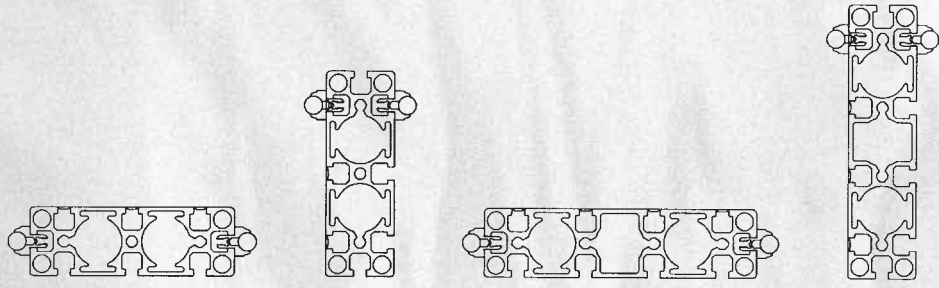
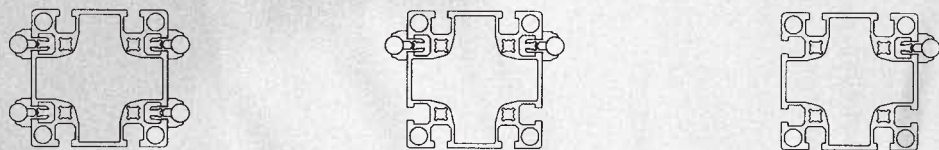
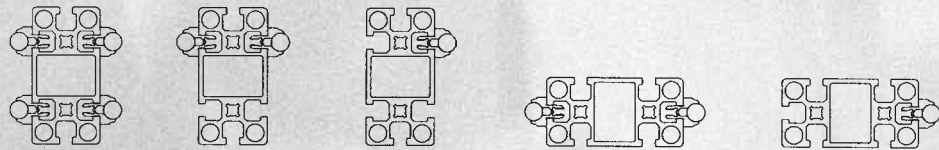
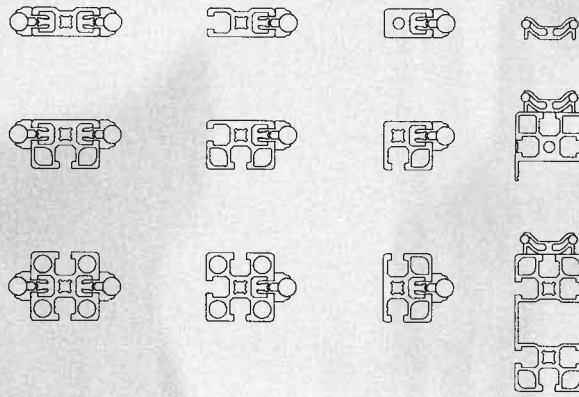
LW LR 16-90

## POSSIBLE DESIGNS OF RAILS

Calculation of rail length LR 12 + LR 16  
(not for LR6)

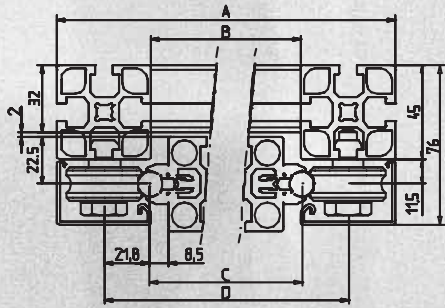
Travel  
+ Slide length  
+ 2 x Belt tensioner  
+ 40 mm Security distance

= Travel  
+ Slide length  
+ 180 mm

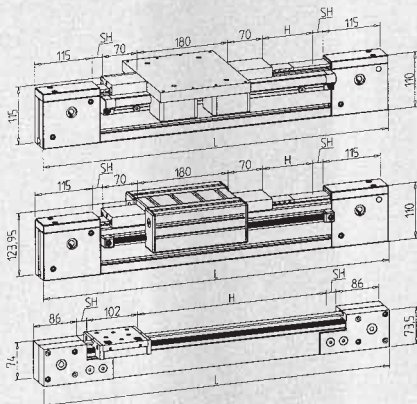
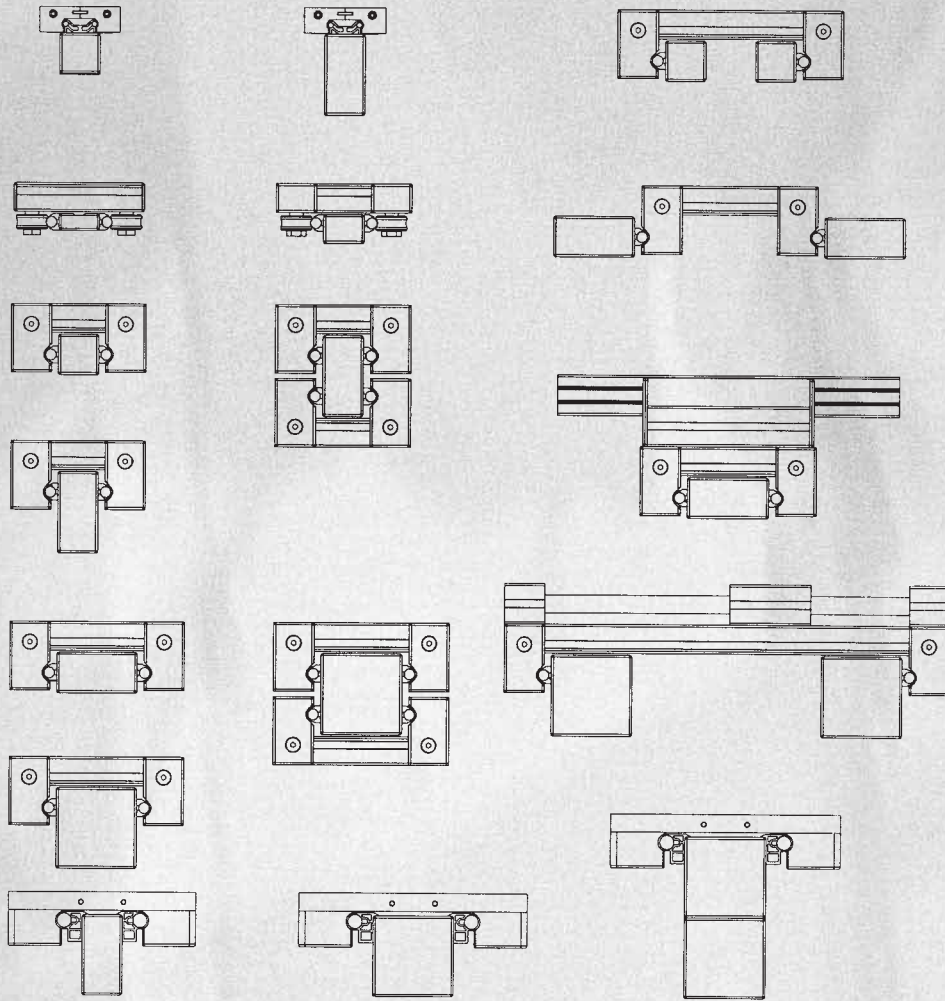




## POSSIBLE COMBINATIONS OF RAILS AND SLIDES



Slide-type	LR 6	LW 45	LW 90	LW 135	LW 180	LR 16-45	LR 16-90
A	90	150,5	195,5	240,5	285,5	210	255
B	-	60,5	105,5	150,5	195,5	-	-
C	32	62	107	152	197	85	130
D	60	105,5	150,5	195,5	240,5	149,5	194,5



### LR 12 + LR 16

Calculation of total length L:  
 Travel H  
 + Slide length  
 + 2 x Reverse unit  
 + 2 x Belt tensioner  
 + 40 mm Security distance SH  
 = Travel + slide length + 410 mm

### LR 6

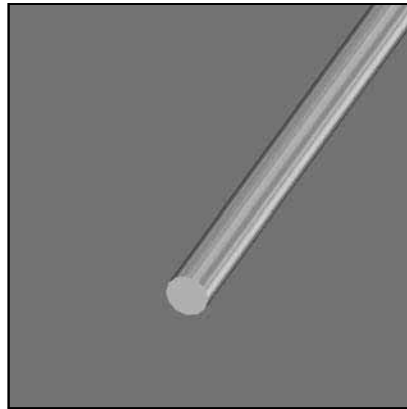
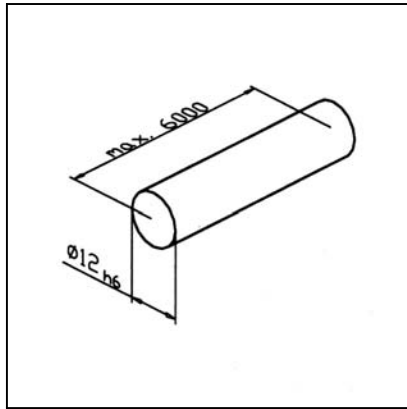
Calculation of total length L:  
 Travel H  
 + Slide length (102)  
 + 2 x Belt tensioner  
 + 40 mm Security distance SH  
 = Travel + 314 mm\*

\*Please note: This is just a reference value, as the belt tension is brought up by the timing belt pulley.

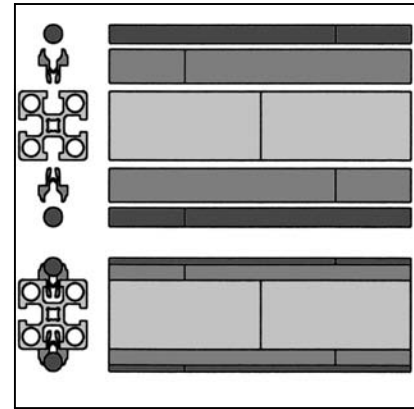


COMPONENTS  
LR

## SHAFT 12



Part. N° 17.1741/0



### TECH. DATA / ITEM SUPPLIED

- Cf 53, hardened 60 + 5 HRC, precision ground h6

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- Weight 0,888 kg/m

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- max. Length 6 m

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- **Stainless version Part N° 17.1760/0**

### APPLICATION

- All MiniTec linear guides LR

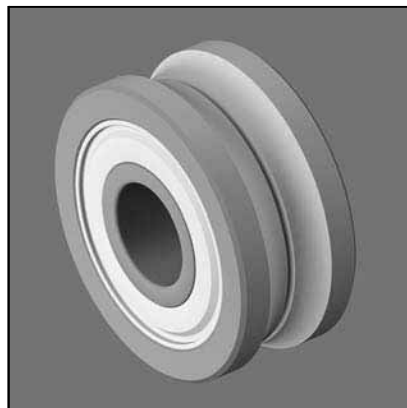
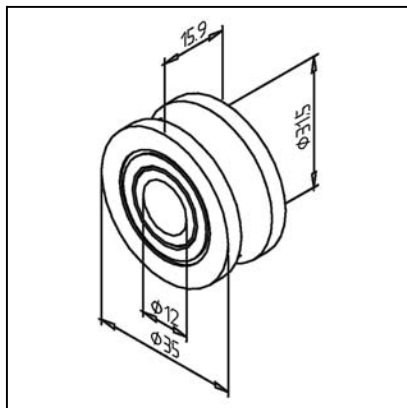
### ASSEMBLY

- Press shaft into supporting profile with appropriate tool (plastic mallet)

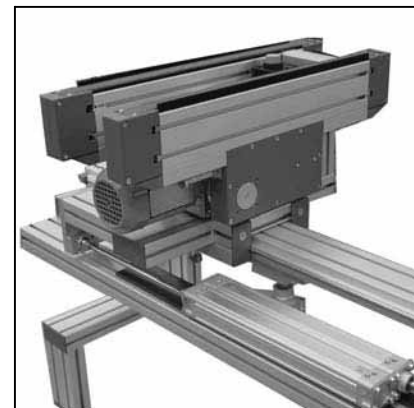
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- For rails L > 6000 mm assemble profile, shaft supporting profile and shaft with offset joints

## BALL BEARING LR 12



Part. N° 28.0001/0



### TECH. DATA / ITEM SUPPLIED

- Double-row angular contact bearing

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- For shaft 12

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- Load capacity:

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- dyn. C = 10.50 N

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- stat. C<sub>0</sub> = 6.00 N

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- Weight 0,068 kg

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- **Stainless version Part N° 28.0001/1**

### APPLICATION

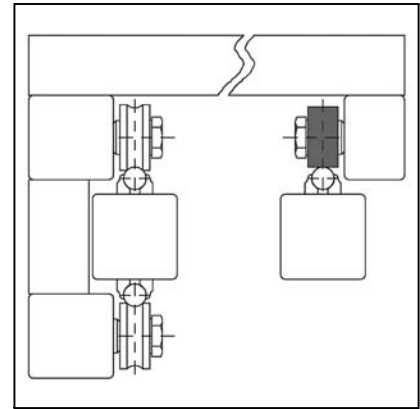
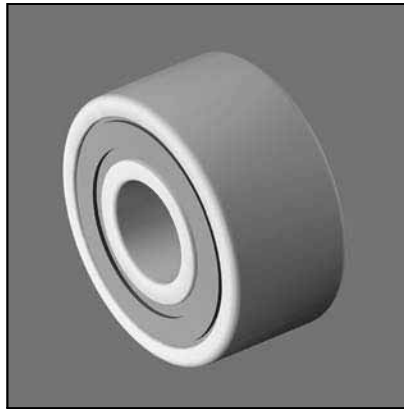
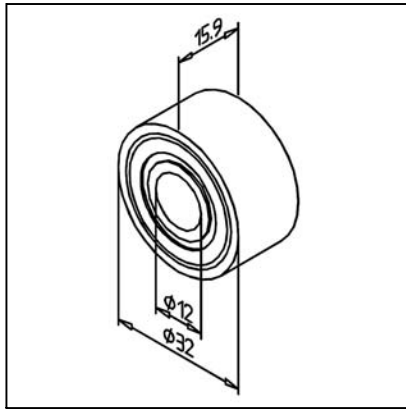
- All MiniTec linear guides LR

### ASSEMBLY

- With fixing kit LRK Part N° 28.0021/0 or LRE Part N° 28.0022/0

## BALL BEARING LR 12 L

Part. N° 28.0005/0



### TECH. DATA / ITEM SUPPLIED

- Double-row angular contact bearing		
- Load capacity:		
- dyn. C =	8.60	N
- stat. C <sub>0</sub> =	5.10	N
- Weight	0,06	kg

### APPLICATION

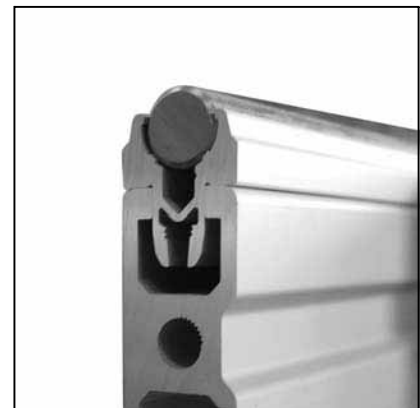
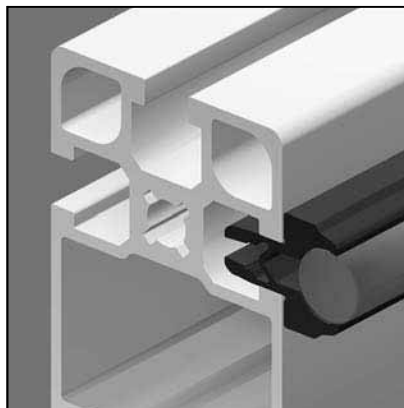
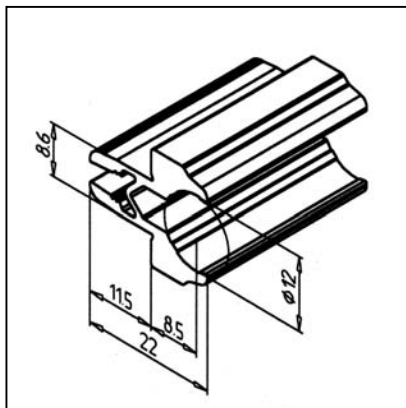
- MiniTec linear guiding systems with movable and fixed bearing side
- Balancing deviations in distance in parallel linear systems

### ASSEMBLY

- With fixing kit LRK Part N° 28.0021/0 or LRE Part N° 28.0022/0

## SHAFT SUPPORTING PROFILE

Part. N° 28.0002/0



### TECH. DATA / ITEM SUPPLIED

- Aluminium, natural anodized E6/EV1		
- Weight	0,365	kg/m
- Length	6	m

### APPLICATION

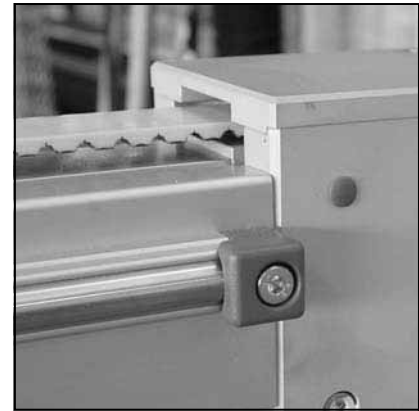
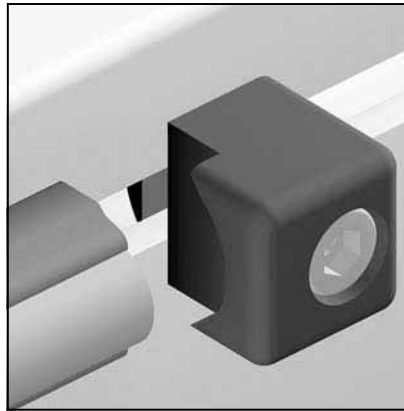
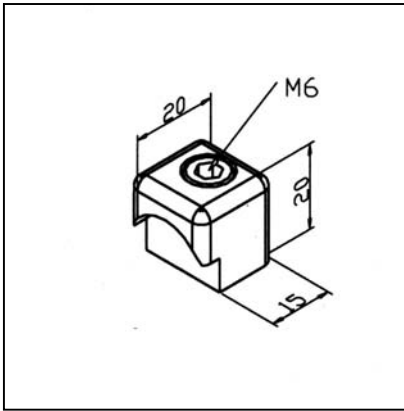
- MiniTec linear guides LR/LG

### ASSEMBLY

- Press into the groove of rail profile
- If necessary clamp with set-screw M5 x 10 in position
- Press shaft into supporting profile with appropriate tool (plastic mallet)

## SHAFT RETENTION DEVICE

Part. N° 28.0052/0



### TECH. DATA / ITEM SUPPLIED

- Aluminium , powder coated, grey
- Fixing kit
- Weight 0,03 kg
- Stainless version Part N° 28.0053/0

### APPLICATION

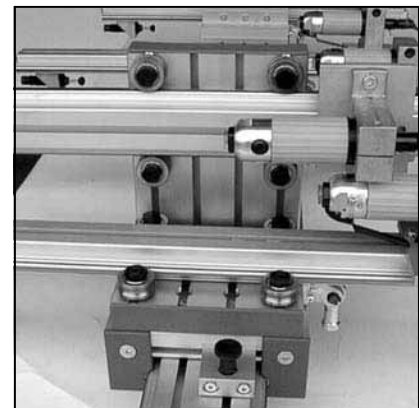
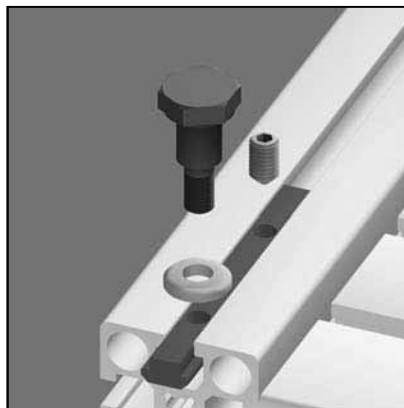
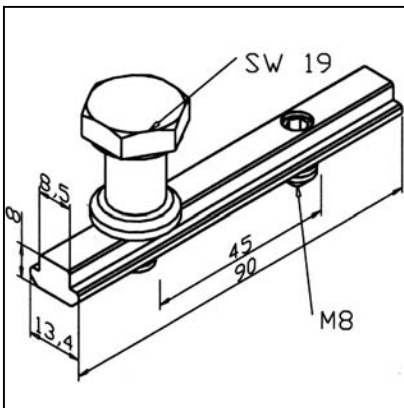
- Axial retention of shafts in dynamically stressed linear guides

### ASSEMBLY

- Fix the retention device at both shaft ends with fixing kit from supply schedule
- No processing required

## FIXING KIT LRK

Part. N° 28.0021/0



### TECH. DATA / ITEM SUPPLIED

- 1 T-slot bar, steel, zinc-plated with set-screw
- 1 Bolt M8 concentric, steel, black finished
- 1 Washer 3,5 mm, steel, precision ground, back finished
- Weight 0,1 kg
- Stainless version Part N° 28.0021/1

### APPLICATION

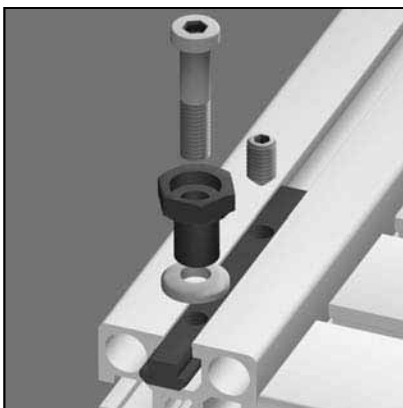
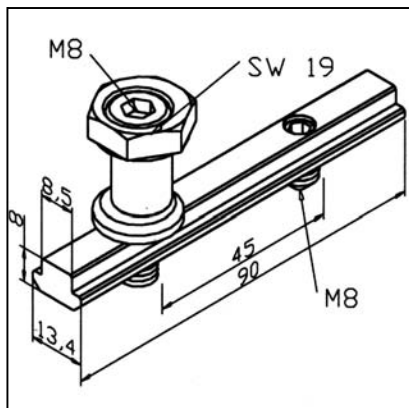
- All MiniTEec linear guides LR
- Concentric attachment of ball bearings LR 12

### ASSEMBLY

- Fix T-slot bar in groove of lower slide side with the set-screws at inner position
- Threads M8 without set-screws are used for the fixing bolts
- Insert bolt in the bearing and washer bore, Tighten firmly on T-slot bar with spanner 19 A/F
- Recommended locking torque: 25 Nm

## FIXING KIT LRE

Part. N° 28.0022/0



### TECH. DATA / ITEM SUPPLIED

- T-slot bar, steel, zinc plated with set-screw
- Eccentric bush, steel black finished
- Bolt M8, steel, black finished
- Washer 3,5 mm, steel, precision ground, black finished
- Weight 0,1 kg
- Stainless version Part N° 28.0022/1

### APPLICATION

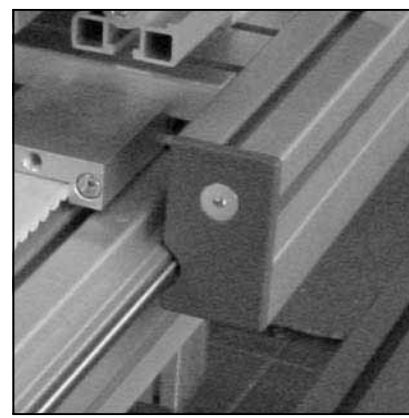
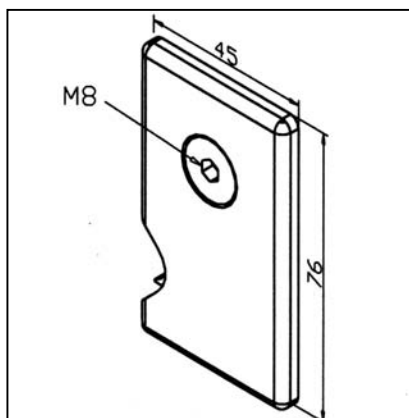
- All MiniTec linear guides LR
- Eccentric attachment of ball bearings LR 12

### ASSEMBLY

- Mounting of T-slot bar: see fixing kit LRK
- Insert eccentric bush in the bearing and washer bore, retighten T-slot bar with key 4 A/F
- Adjust bush with ring spanner width 19 mm (turn for freedom from clearance with 0,9 - 1 Nm) and fix bolt
- Recommended locking torque: 25 Nm

## END CAP LR (RIGHT)

Part. N° 28.0004/1



### TECH. DATA / ITEM SUPPLIED

- ABS with integrated, spring-mounted stripping and greasin felt
- Fixing kit
- Weight 0,03 kg
- Also deliverable in black, Part. N° 28.0004/0

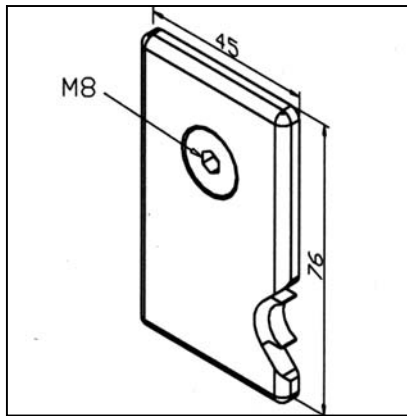
### APPLICATION

- All MiniTec linear guides LR

### ASSEMBLY

- Insert cover profile between the end caps
- Insert the lubricated felts and press fastening peg in profile 45 x 45 of the slide plate
- Use fixing kit from supply schedule
- Clean and relubricate the felt or replace it when necessary Part N° 28:0004/8

## END CAP LR (LEFT)



### TECH. DATA / ITEM SUPPLIED

- ABS with integrated, spring-mounted stripping and greasin felt
- Fixing kit
- Weight 0,03 kg
- Also deliverable in black,  
**Part. N° 28.0004/2**



### APPLICATION

- All MiniTec linear guides LR

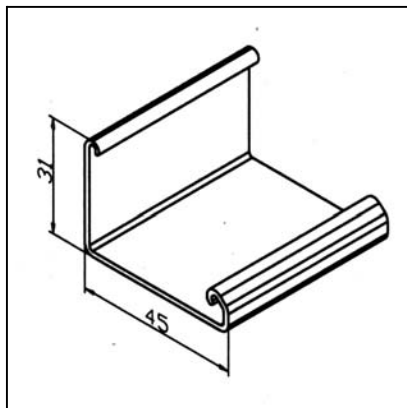


Part. N° 28.0004/3

### ASSEMBLY

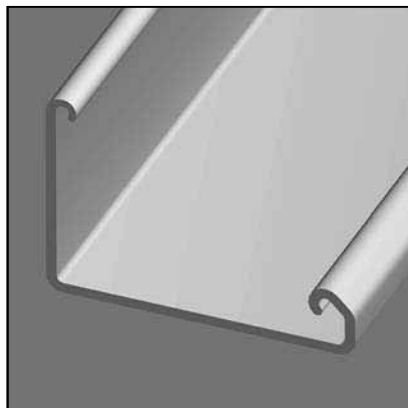
- Insert cover profile between the end caps
- Insert the lubricated felts and press fastening peg in profile 45 x 45 of the slide plate
- Use fixing kit from supply schedule
- Clean and relubricate the felt or replace it **Part N° 28.0004/8** when necessary

## COVER PROFILE LR



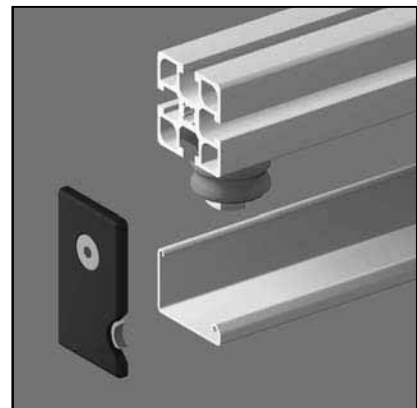
### TECH. DATA / ITEM SUPPLIED

- Aluminium, naural anodized E6/EV1
- Weight 0,362 kg/m
- Lenght 6 m



### APPLICATION

- All MiniTec linear guides LR



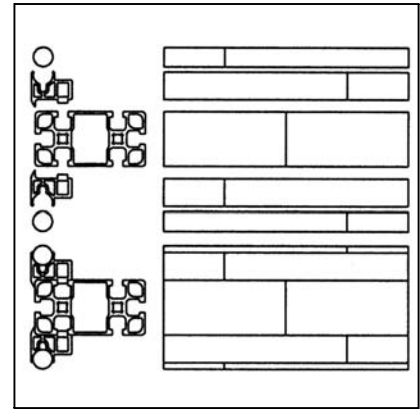
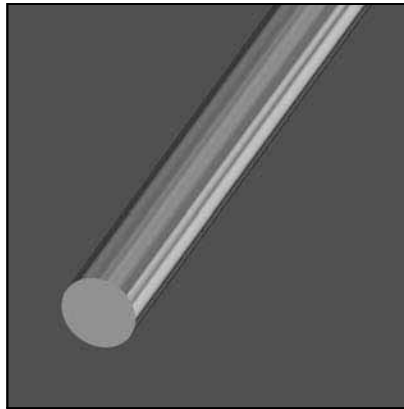
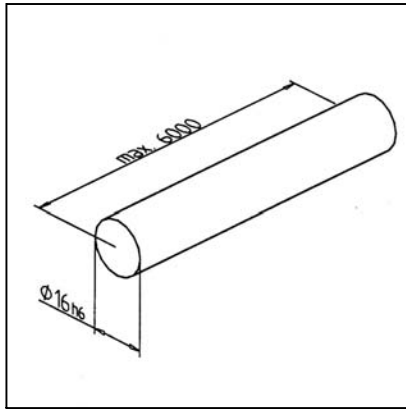
Part. N° 28.0049/0

### ASSEMBLY

- Cut profile according to the length of the slide
- Insert the cover profile between the end caps; insert the felts; fasten the end caps LR on the slide by means of the supplied screws

## SHAFT 16

Part. N° 17.1743/0



### TECHN. DATA / ITEMS SUPPLIED

- Cf 53, hardened  $60 \pm 5$  HRC, precision ground h6

- Weight 1,578 kg/m

- max. Length 6 m

### APPLICATIONS

- MiniTec linear guide LR 16

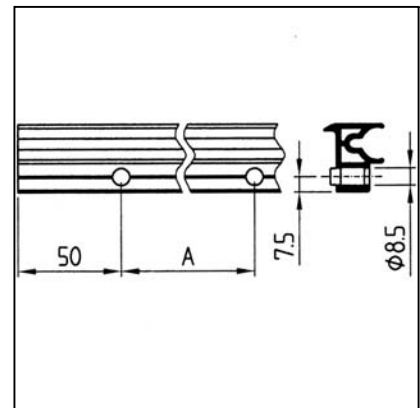
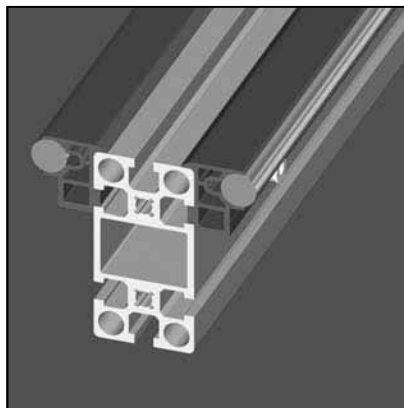
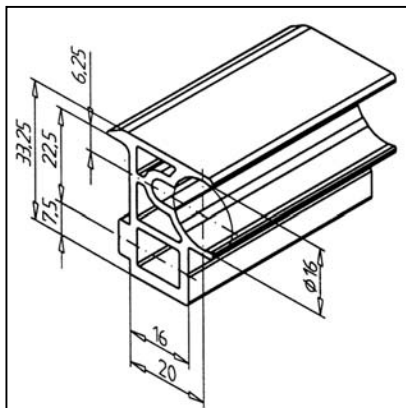
### ASSEMBLY

- Carefully hammer into the shaft carrier profile with a plastic-tipped hammer

- On guides with  $L > 6000$  mm assemble profile, shaft support and shaft with offset joints

## SHAFT SUPPORTING PROFILE LR 16

Part. N° 28.0019/0



### TECHN. DATA / ITEMS SUPPLIED

- Aluminium natur, eloxiert E6 / EV1

- Weight 0,845 kg/m

- Length 6 m

### APPLICATIONS

- MiniTec linear guide LR16

### ASSEMBLY

- Make holes with diameter 8.5 in the shaft carrier profile

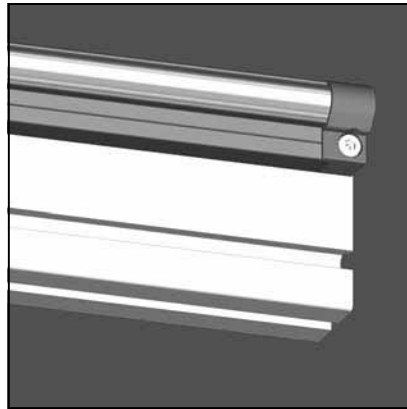
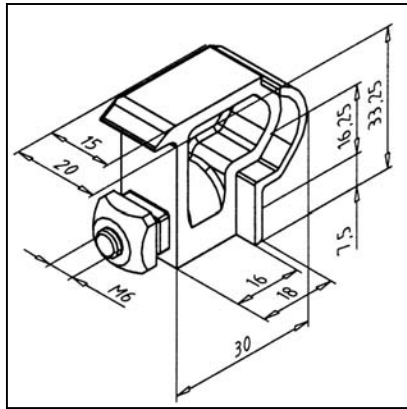
- Recommended distance: 50 mm from the edge, then approximately every 200 - 300 mm

- Fasten to the carrier profile using M8 x 30 cheese-head screw and M8 slide nut

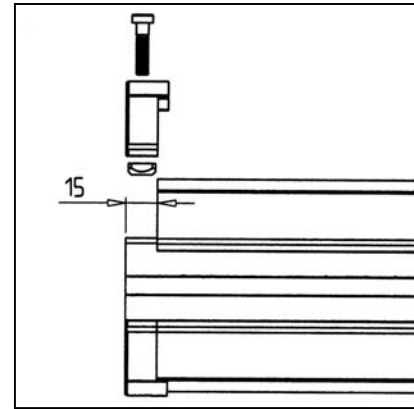
- Hammer the shaft into the shaft carrier profile with a plastic-tipped hammer



## SHAFT FASTENER LEFT LR 16



Part. N° 28.0809/0



### TECHNICAL DATA / INCLUDED ITEMS

- Aluminium GD, powder coated, grey
- With fastening materials
- Weight 0,04 kg

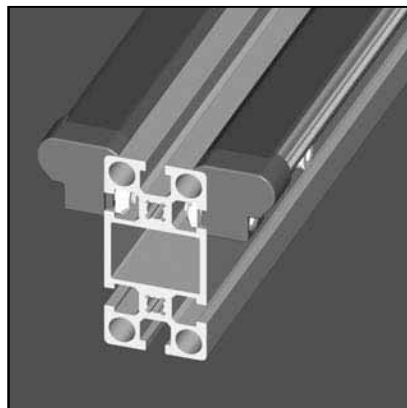
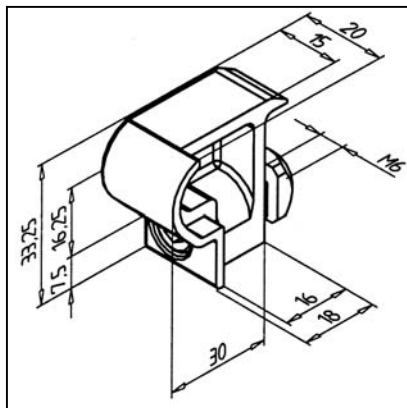
### APPLICATIONS

- Axial fastening of shafts in linear guides subject to heavy dynamic stress

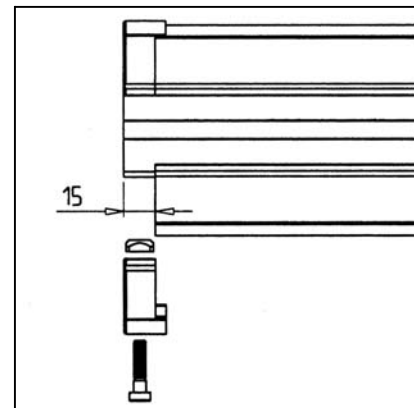
### ASSEMBLY

- Shaft carrier profile and shafts must be 15 mm shorter on each side than the carrier profile
- Attach the shaft fastening at both ends of the shaft with supplied fastening materials
- No machining is necessary

## SHAFT RETENTION DEVICE RIGHT LR 16



Part. N° 28.0808/0



### TECHN. DATA / ITEMS SUPPLIED

- Aluminium GD, powder coated, grey
- Fixing kit
- Weight 0,04 kg

### APPLICATIONS

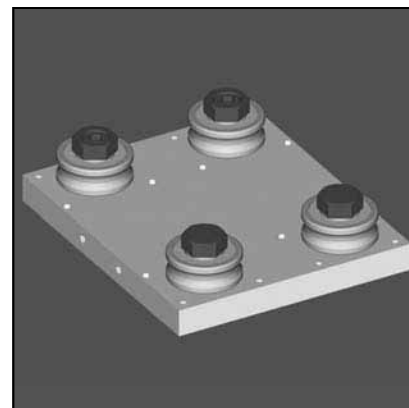
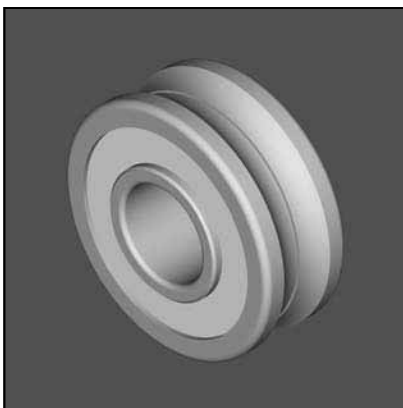
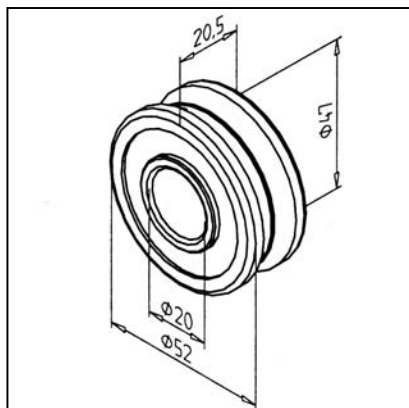
- Axial fastening of shafts in linear guides subject to heavy dynamic stress

### ASSEMBLY

- Shaft carrier profile and shafts must be 15 mm shorter on each side than the carrier profile
- Attach the shaft fastening at both ends of the shaft with supplied fastening materials
- No machining is necessary

## BALL BEARING LR 16

Part. N° 50.1726/0



### TECHN. DATA / ITEMS SUPPLIED

- Double-row angular contact bearing		
- For shaft 16		
- Load capacity		
- dyn. C =	19.90	N
- stat. Co =	12.60	N
- Weight	0,2	kg

### APPLICATIONS

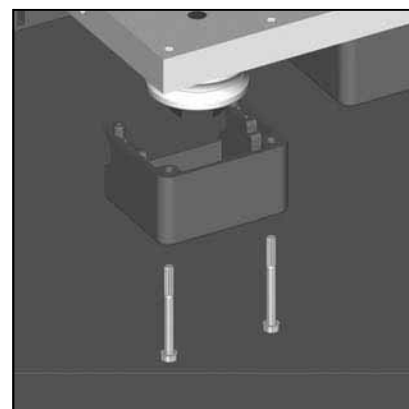
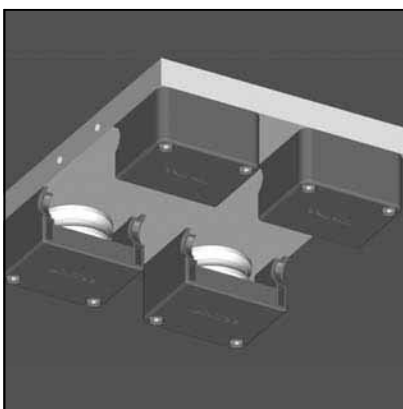
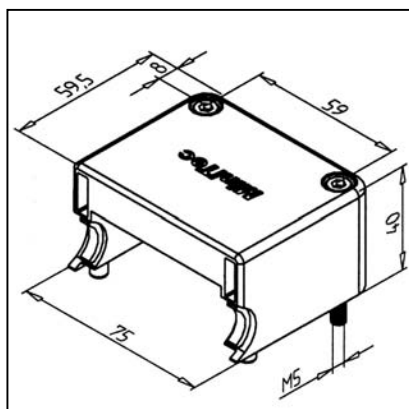
- MiniTec linear guides LR 16

### ASSEMBLY

- Fastening with central bush Part. N° 28.0814/0 or adjustable with eccentric bush Part. N° 28.0813/0 and M 12 x 40 bolt Part. N° 21.1257/0

## END CAP LR 16

Part. N° 28.0815/0



### TECHN. DATA / ITEMS SUPPLIED

- ABS with integrated, spring-mounted stripping and greasin felt		
- Fixing kit		
- Weight	0,71	kg

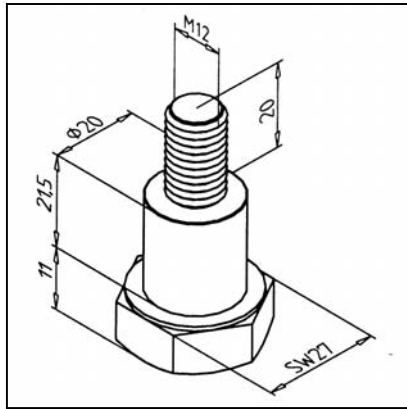
### APPLICATIONS

- MiniTec linear guides LR 16

### ASSEMBLY

- Use fixing kit from supply schedule  
- Depending on the conditions, clean and soak the felt or insert a replacement felt Part. N° 28.0816/0

## BOLT CONCENTRIC LR 16

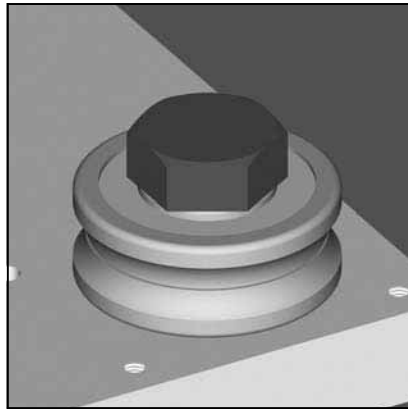


### TECHNICAL DATA / INCLUDED ITEMS

- Bolt M12 concentric, steel, black gunmetal finish

---

- Weight 0,12 kg



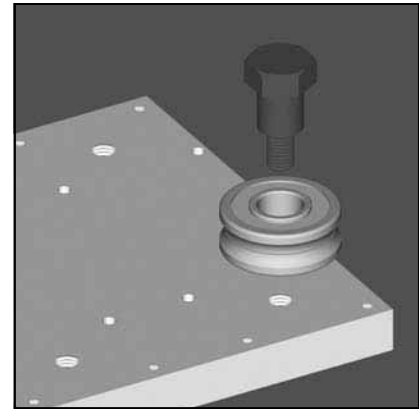
### APPLICATIONS

- MiniTec linear guides LR 16

---

- Concentric fastening of ball bearings LR 16

Part. N° 28.0814/0



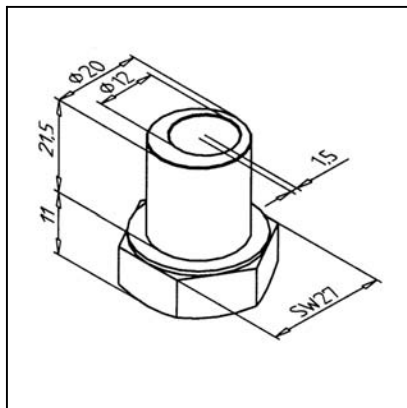
### ASSEMBLY

- MiniTec linear guides LR 16

---

- Recommended tightening torque:50Nm

## ECCENTRIC BUSH

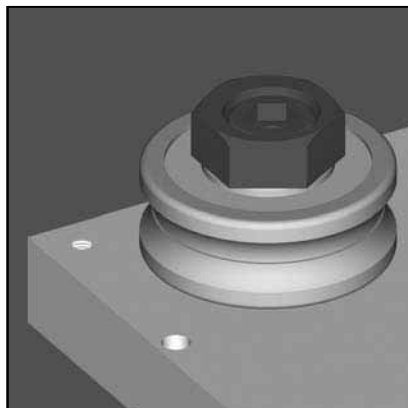


### TECHN. DATA / ITEMS SUPPLIED

- Eccentric bush, steel, black gunmetal finish

---

- Weight 0,059 kg



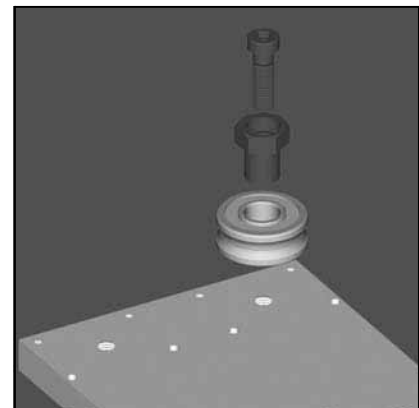
### APPLICATIONS

- MiniTec linear guides LR 16

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- Eccentric fastening of ball bearings LR 16

Part. N° 28.0813/0



### ASSEMBLY

- Insert screw M12 x 40 Part. N° 21.1257/0 into eccentric bush and assemble loosely with bearing

---

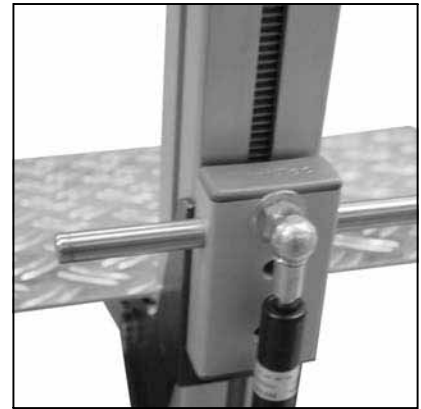
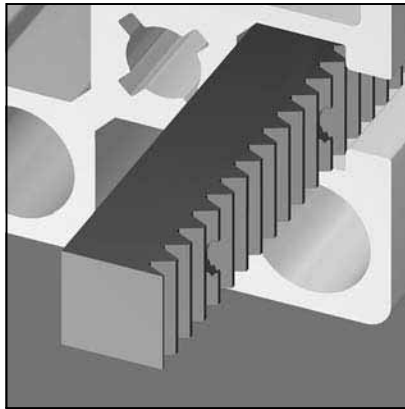
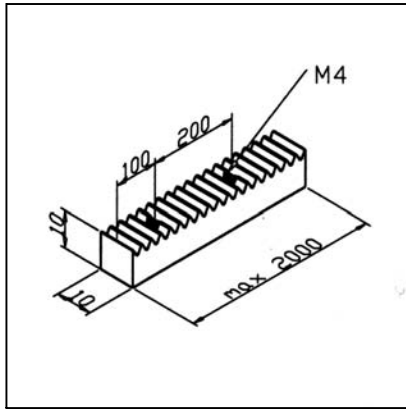
- Adjust the bearing by turning the eccentric bush with the spanner (wrench size 27) for zero play (with 0.9 - 1 Nm torque resistance) and hold the eccentric bush in this position. Tighten the bolt.

---

- Recommended tightening torque:50Nm

## TOOTHED RACK 8

Part. N° 28.0051/0



### TECH. DATA / ITEM SUPPLIED

- Steel
- Modul 1
- 1 set-screw M4 x 8 in 200 mm grid
- Weight 0,785 kg/m
- Length 2 m

### APPLICATION

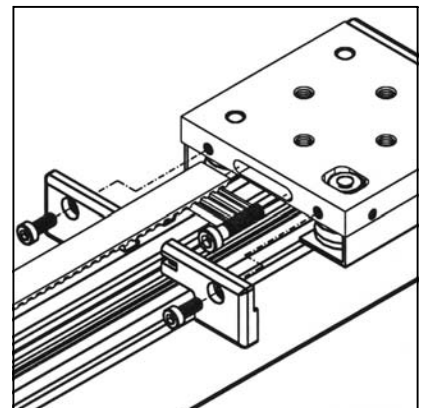
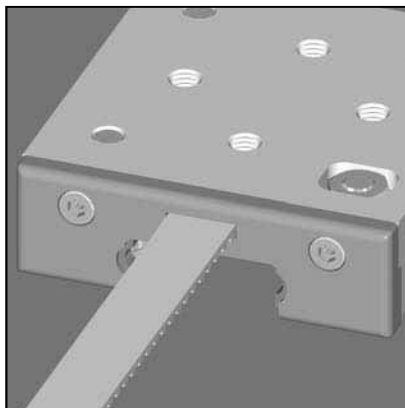
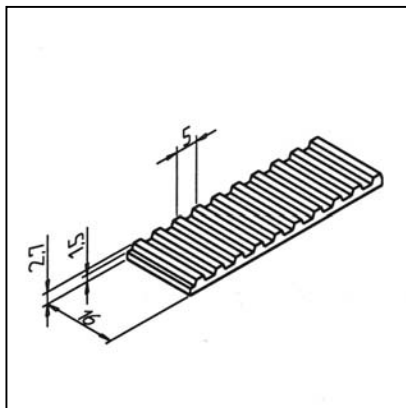
- Linear guides with extremely long travels
- Linear guides with compact dimension overall
- Recurring height sectioning and longitudinal sectioning in 3,14 mm grid (e.g. sorting frame)

### ASSEMBLY

- Push toothed rack into profile groove
- Secure with set-screw M4

## TIMING BELT 16 AT 5

Part. N° 28.0502/0



### TECH. DATA / ITEM SUPPLIED

- PUR white, steel-wire reinforced
- Typ 16 AT 5
- Weight 0,052 kg/m
- Load max. 1260 N

### APPLICATION

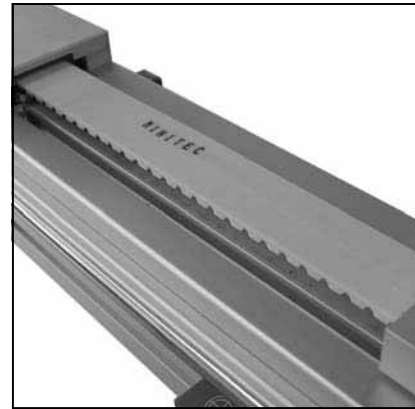
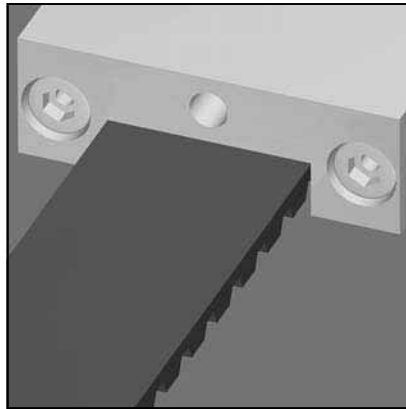
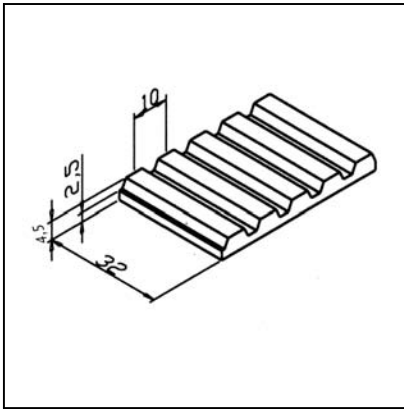
- Suitable for all MiniTec linear guides LR 6 Z

### ASSEMBLY

- Fix both sides in slide LR 6 Z
- Belt length calculation:  
2 x rail length + 260 mm

## TIMING BELT 32 AT 10

Part. N° 28.0093/0



### TECH. DATA / ITEM SUPPLIED

- PUR white, reinforced with integrated wires
- Typ 32 AT 10
- Weight 0,19 kg/m
- Load max. Apr 75 N

### APPLICATION

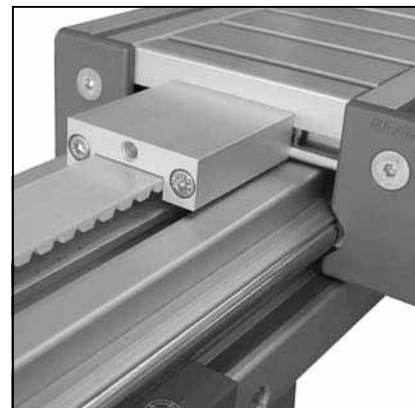
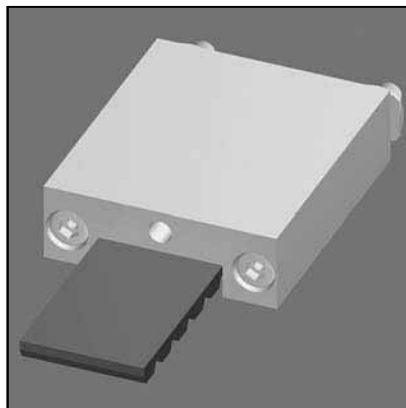
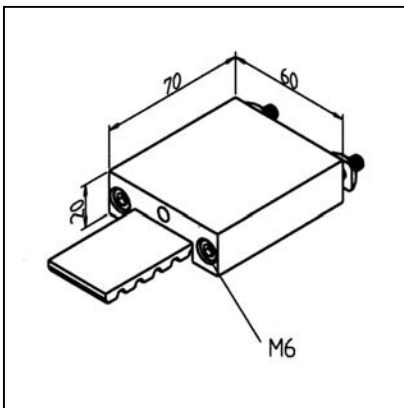
- For all MiniTec linear guides LR
- For belt drives

### ASSEMBLY

- Fix timing belt or timing belt tensioner
- Calculations belt length: see page 142

## TIMING BELT TENSIONER

Part. N° 28.0090/0



### TECH. DATA / ITEM SUPPLIED

- Housing, aluminium, natural anodized
- Tensioning plug, steel, zinc plated with matelung with 3 teeth
- Fitting for timing belt AT 10
- Fixing kit
- Weight 0,236 kg
- Stainless version Part N° 28.0090/1

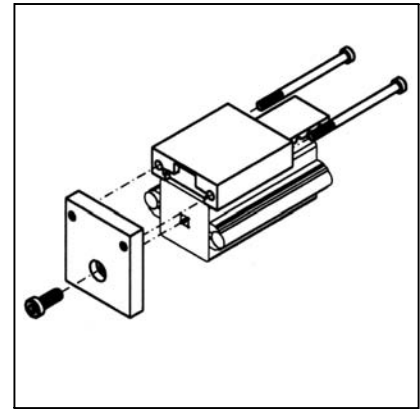
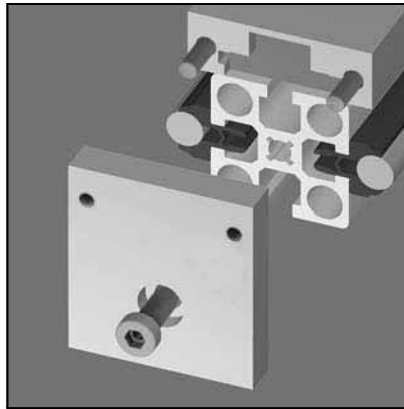
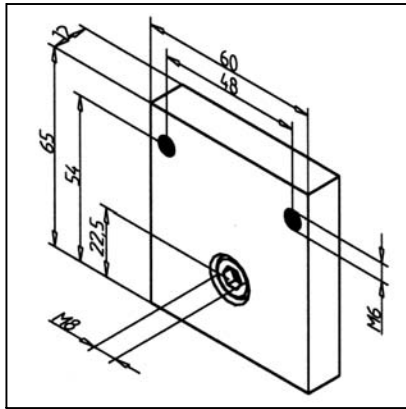
### APPLICATION

- For each end of the timing belt a timing belt tensioner is necessary
- For all MiniTec linear guides LR
- For MiniTec belt drive

### ASSEMBLY

- Subsequent fixing on the face of the slide with fixing kit from supply schedule
- After fixing on slide face, tension the belt central tensioning screw M8, 5 A/F
- Recommended stretching: after coordination

**FASTENING KIT FOR TIMING BELT TENSIONING DEVICE 45** Part. N° 28.0054/0



**TECH. DATA / ITEM SUPPLIED**

- Plate aluminium, natural anodized
- Fixing kit
- Weight 0,089 kg

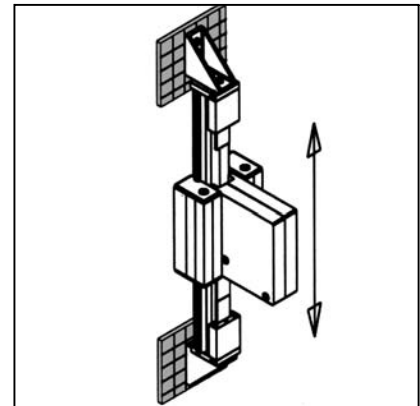
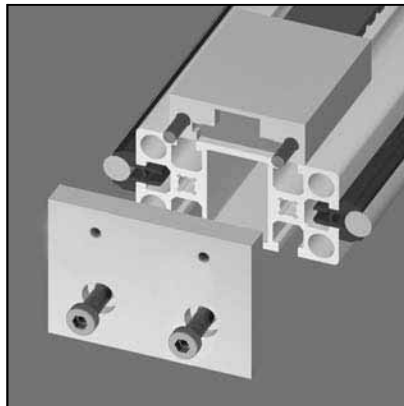
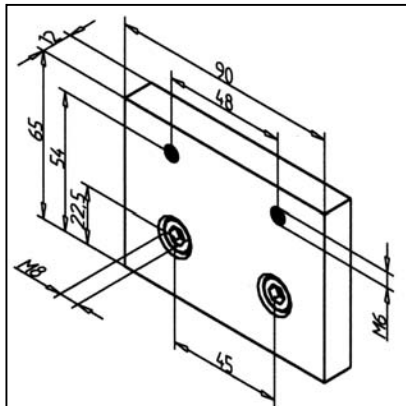
**APPLICATION**

- In connection with belt drive
- For each timing belt tensioner one fastening kit is necessary
- Attachment of timing belt tensioner on rail 45

**ASSEMBLY**

- Fasten with fixing kit from supply schedule on rail end; thread M8 required
- Mount timing belt tensioner

**FASTENING KIT FOR TIMING BELT TENSIONING DEVICE 45 X 90 F** Part. N° 28.0055/0



**TECH. DATA / ITEM SUPPLIED**

- Plate aluminium, natural anodized
- Fixing kit
- Weight 0,089 kg

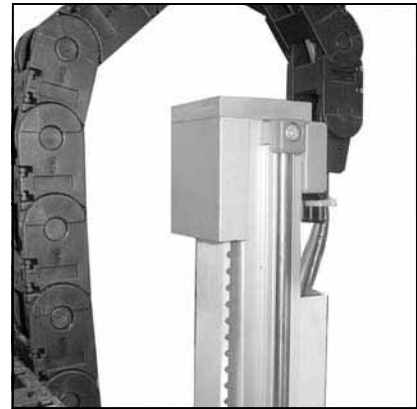
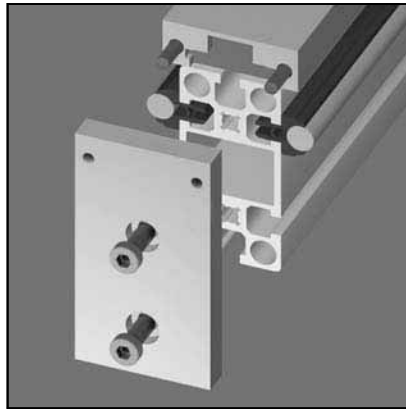
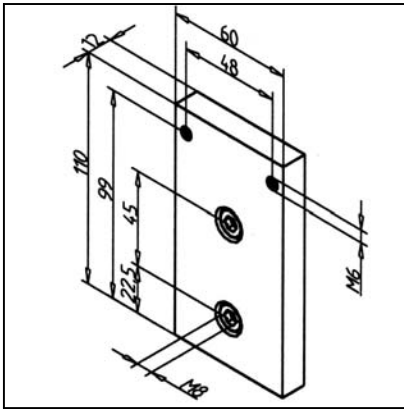
**APPLICATION**

- For each timing belt tensioner one fastening kit is necessary
- Attachment of timing belt tensioner on rail 45 x 90 F in connection with belt drive

**ASSEMBLY**

- Fasten with fixing kit from supply schedule on rail end; thread M8 required
- Mount timing belt tensioner

**FASTENING KIT FOR TIMING BELT TENSIONING DEVICE 45X90H** Part. N° 28.0056/0



**TECH. DATA / ITEM SUPPLIED**

- Plate aluminium, natural anodized

---

- Fixing kit

---

- Weight 0,089 kg

**APPLICATION**

- For each timing belt tensioner one fastening kit is necessary

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- Attachment of timing belt tensioner on rail 45 x 90 H in connection with belt drive

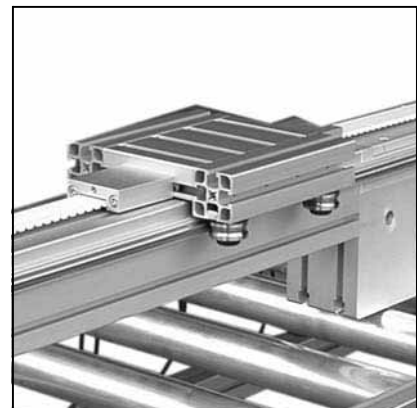
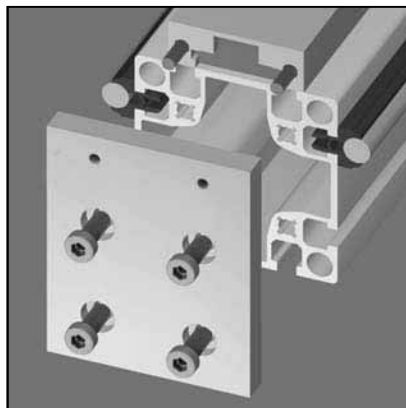
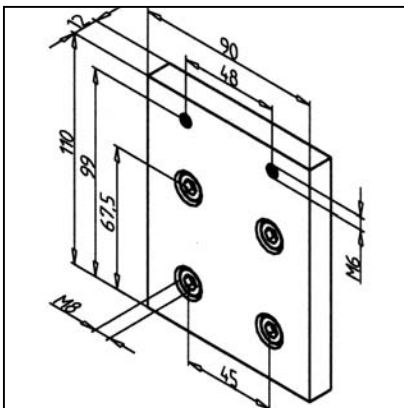
**ASSEMBLY**

- Fasten with fixing kit from supply schedule on rail end; thread M8 required

---

- Mount timing belt tensioner

**FASTENING KIT FOR TIMING BELT TENSIONING DEVICE 90** Part. N° 28.0057/0



**TECH. DATA / ITEM SUPPLIED**

- Plate aluminium, natural anodized

---

- Fixing kit

---

- Weight 0,089 kg

**APPLICATION**

- For each timing belt tensioner one fastening kit is necessary

---

- Attachment of timing belt tensioner on rail 90 in connection with belt drive

**ASSEMBLY**

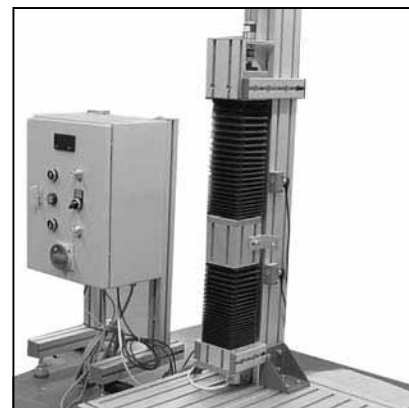
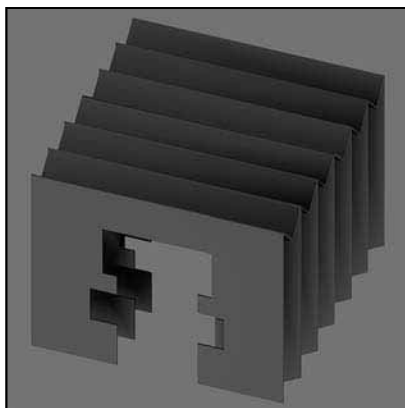
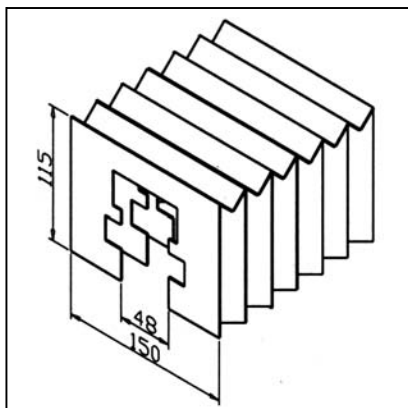
- Fasten with fixing kit from supply schedule on rail end; thread M8 required

---

- Mount timing belt tensioner

## PROTECTIVE BELLOW LR 45

Part. N° 33.3007/0



### TECH. DATA / ITEM SUPPLIED

- Plastic, black with plastic frame
- Without fixing kit
- Length when pushed together for 1 m travel: - 110 mm
- Weight 0,65 kg/m
- max. Length 6 m

### APPLICATION

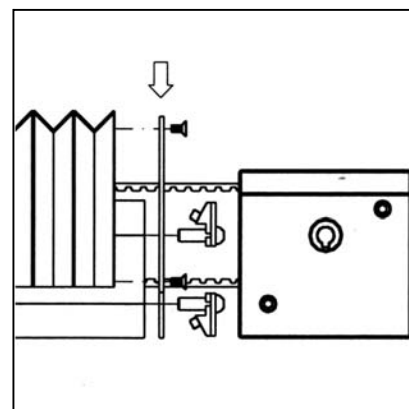
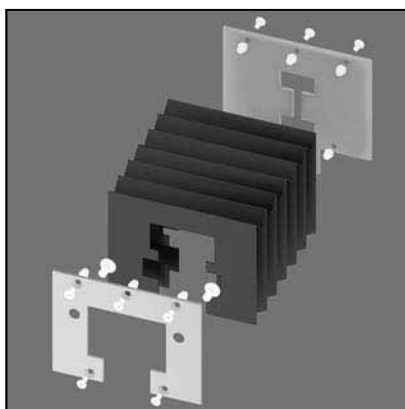
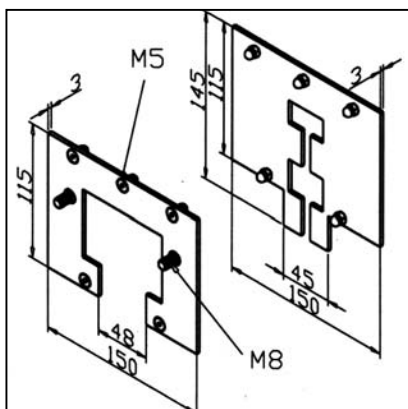
- Cover of MiniTec linear guides LR 45
- Rough working conditions, dust, chips

### ASSEMBLY

- Push bellow onto rail
- Fix ends with fastening kit for protective bellow Part N° 33.3010/0
- The travel length is reduced by approx. 22% when bellow is used
- Caution: Consider higher friction moment when dimensioning drive unit!

## FASTENING KIT FOR PROTECTIVE BELLOW LR 45

Part. N° 33.3010/0



### TECH. DATA / ITEM SUPPLIED

- 1 End frame slide
- 1 End frame pulley
- Fixing kit for frame and bellow

### APPLICATION

- Fastening of protective bellow LR 45 on slide LW 45
- Fastening of protective bellow LR 45 on timing belt pulley T 45

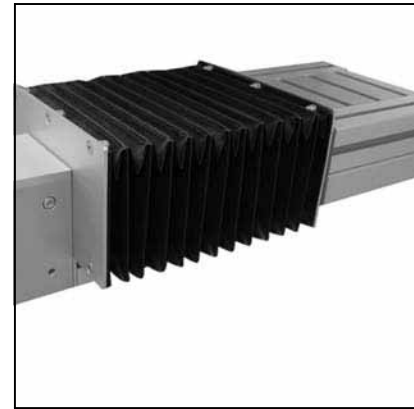
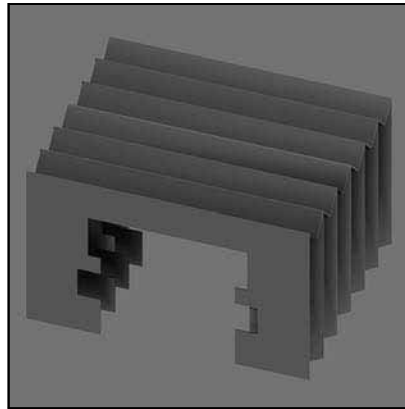
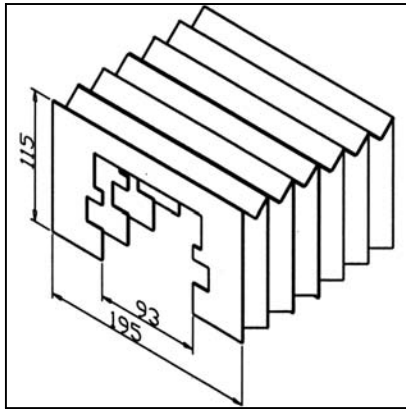
### ASSEMBLY

- Fasten end frame on slide
- Push protective bellow on rail
- Loosen power-lock fastener on the pulley side and insert end frame pulley between rail and timing belt pulley; tighten power-lock fastener
- Fasten protective bellow by means of the supplied screws on the end frame



## PROTECTIVE BELLOW LR 90

Part. N° 33.3008/0



### TECH. DATA / ITEM SUPPLIED

- Plastic, black with plastic frame
- Without fixing kit
- Length when pushed together for 1 m travel: - 110 mm
- Weight 0,75 kg/m
- max. Length 6 m

### APPLICATION

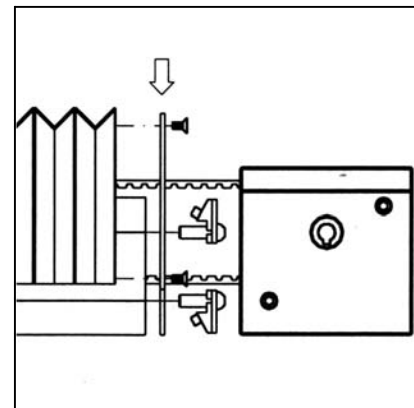
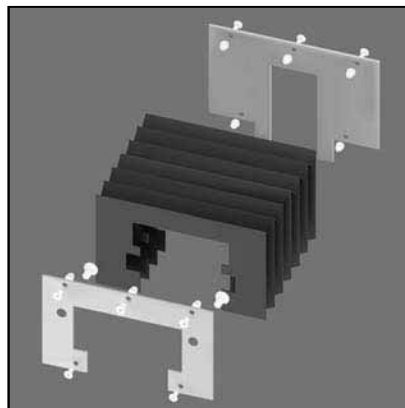
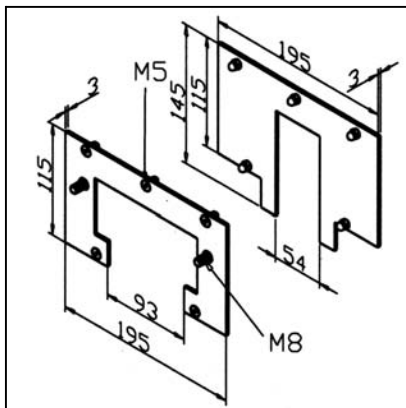
- Cover of MiniTec linear guides LR 90
- Rough working conditions, dust, chips

### ASSEMBLY

- Push bellow onto rail
- Fix ends with fastening kit for protective bellow a **Part N° 33.3011/0** at slide or reverse unit
- The travel length is reduced by approx. 22% when bellow is used
- Caution: Consider higher friction moment when dimensioning drive unit!

## FASTENING KIT FOR PROTECTIVE BELLOW LR 90

Part. N° 33.3011/0



### TECH. DATA / ITEM SUPPLIED

- 1 End frame slide
- 1 End frame pulley
- Fixing kit for frame and bellow

### APPLICATION

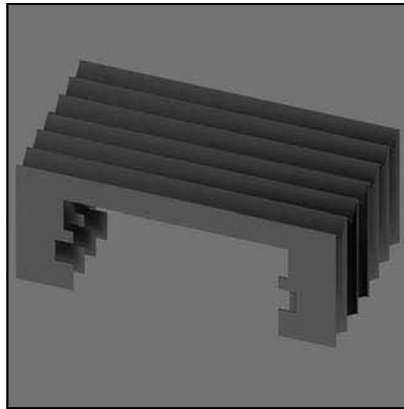
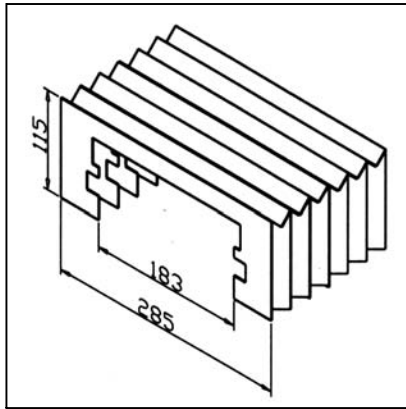
- Cover of MiniTec linear guides LR 90
- Rough working conditions, dust, chips

### ASSEMBLY

- Push bellow onto rail
- Fix ends with fastening kit for protective bellow **Part N° 33.3011/0** at slide or reverse unit
- The travel length is reduced by approx. 22% when bellow is used
- Caution: Consider higher friction moment when dimensioning drive unit!

## PROTECTIVE BELLOW LR 180

Part. N° 33.3009/0



### TECH. DATA / ITEM SUPPLIED

- Plastic, black with plastic frame
- Without fixing kit
- Length when pushed together for 1 m travel: - 110 mm
- Weight 0,95 kg/m
- max. Length 6 m

### APPLICATION

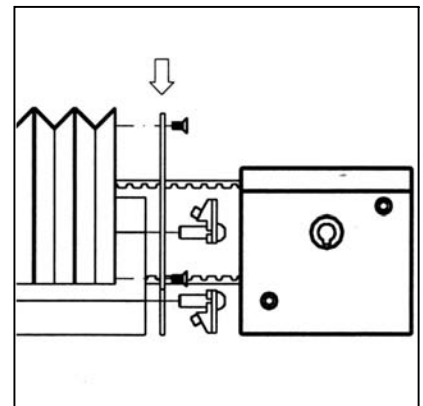
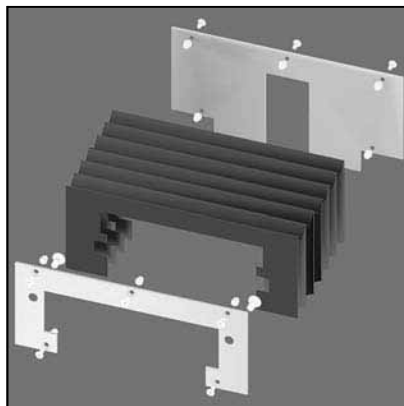
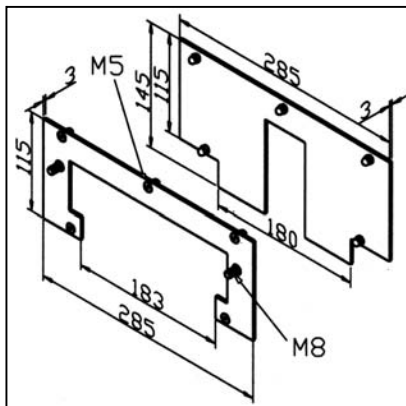
- Cover of MiniTec linear guides LR 180
- Rough working conditions, dust, chips

### ASSEMBLY

- Push bellow onto rail
- Fix ends with fastening kit for protective bellow a Part N° 33.3012/0 at slide or reverse unit
- The travel length is reduced by approx. 22% when bellow is used
- Caution: Consider higher friction moment when dimensioning drive unit!

## FASTENING KIT FOR PROTECTIVE BELLOW LR 180

Part. N° 33.3012/0



### TECH. DATA / ITEM SUPPLIED

- 1 End frame slide
- 1 End frame pulley
- Fixing kit for frame and bellow

### APPLICATION

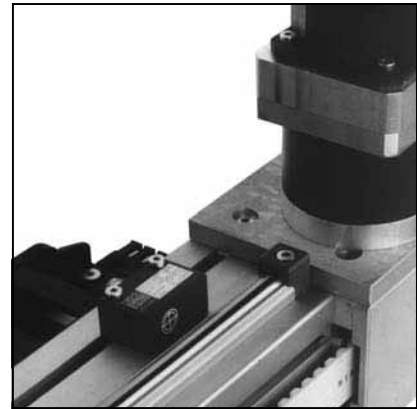
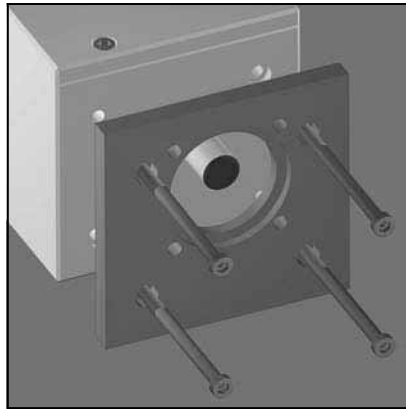
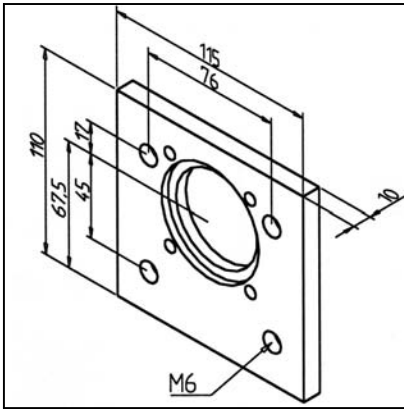
- Fastening of protective bellow LR 180 on slide LW 180

### ASSEMBLY

- Fasten end frame on slide
- Push protective bellow on rail
- Loosen power-lock fastener on the pulley side and insert end frame pulley between rail and timing belt pulley; tighten power-lock fastener
- Fasten protective bellow by means of the supplied screws on the end frame

## ADAPTOR PLATE

Part. N° 28.0112/0



### TECH. DATA / ITEM SUPPLIED

- Aluminium, natural
- Dimension according to customers specification

### APPLICATION

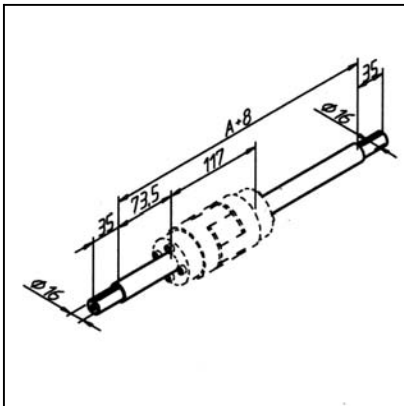
- Attachment of motors, timing belt pulley and counter

### ASSEMBLY

- Mount on timing belt pulley

## CONNECTING SHAFT 45

Part. N° 17.1706/0



### TECH. DATA / ITEM SUPPLIED

- Steel, Ø 20 mm
- Length and processing of ends according to customer specification
- 2 pieces, clutch not included
- Fixing kit
- Weight 2,47 kg/m
- + Spring

### APPLICATION

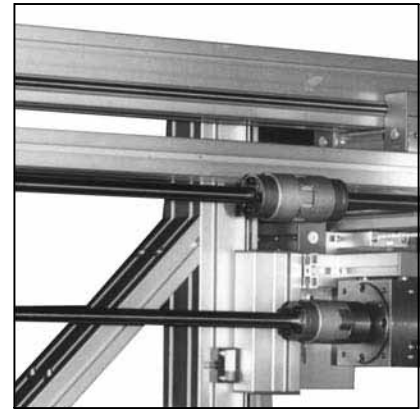
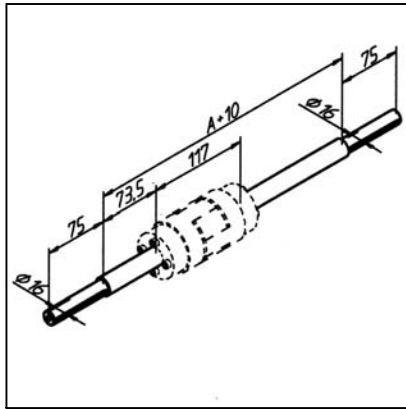
- Simultaneous transmission of 2 parallel linear guides
- Install support bearing for longer shafts

### ASSEMBLY

- Fasten shafts with spring in timing belt pulley
- Connect both shaft pieces with clutch Part N° 28.0180/0

## CONNECTING SHAFT 90

Part. N° 17.1706/1



### TECH. DATA / ITEM SUPPLIED

- Steel, Ø 20 mm
- Length and processing of ends according to customer specification
- 2 pieces, clutch not included
- Fixing kit
- Weight 2,47 kg/m
- + Spring

### APPLICATION

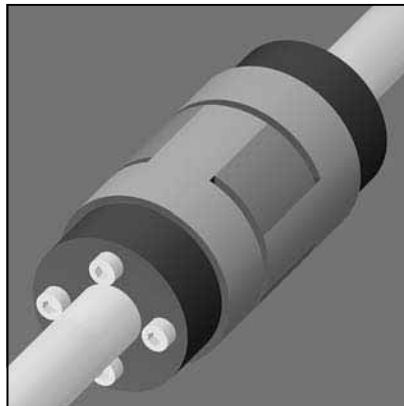
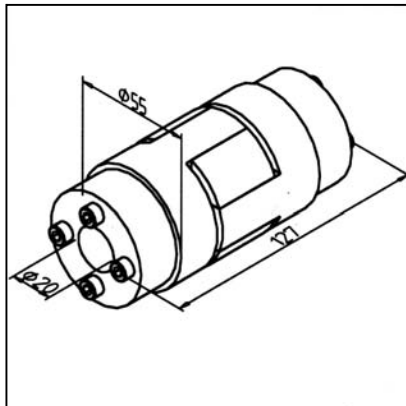
- Simultaneous transmission of 2 parallel linear guides
- For longer shafts use additional support bearing

### ASSEMBLY

- Fasten shaft with spring in timing belt pulley
- Connect both shaft pieces with clutch **Part N° 28.0180/0**

## CLUTCH 20

Part. N° 28.0180/0



### TECH. DATA / ITEM SUPPLIED

- Clutch, steel with plastic inlay
- 2 tensioning sets, steel
- Weight 0,5 kg
- Locking torque max. 30 Nm

### APPLICATION

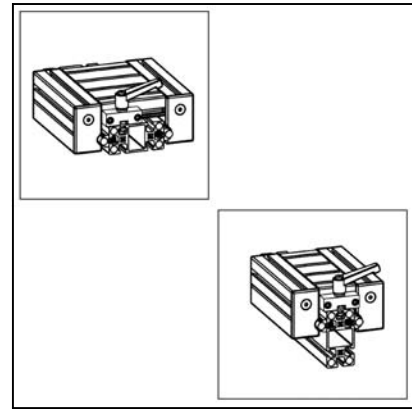
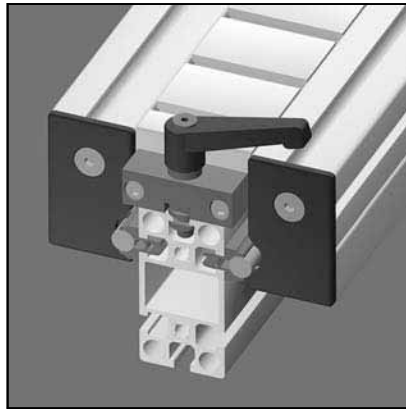
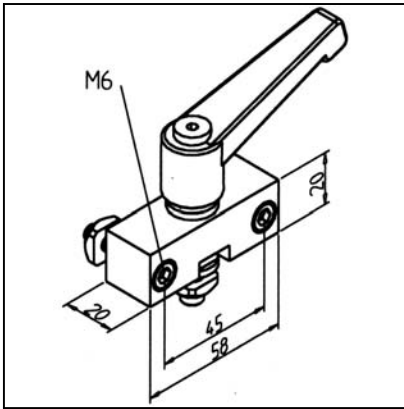
- Correction of motors to reverse unit
- Correction of misalignment for simultaneous transmission of 2 parallel linear guides with connecting shaft 45 a **Part N° 17.1706/0** or connecting shaft **Part N° 17.1706/1**

### ASSEMBLY

- Attachment with integrated tensioning device
- Position of both reverse units continuously adjustable

## SLIDE CLAMPING UNIT (TOP) LWG / LWN / LW

Part. N° 28.0270/0



### TECH. DATA / ITEM SUPPLIED

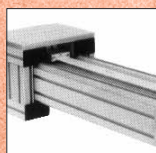
- Housing, aluminium, anodized E2/E6/EV1
- Clamp
- Fixing kit
- Weight 0,199 kg

### APPLICATION

- Clamping of MiniTec slide LW and slides LWN / LWG on rail surface
- Clamping of MiniTec adjusting units

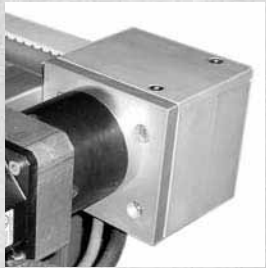
### ASSEMBLY

- Preadjust clamping shaft and lead it in profile groove
- Insert plastic element
- Mount housing block
- Secure clamping lever with mounting adhesive on clamping shaft



SYSTEM LR -  
READY FOR USE  
MODULES LR

## CONNECTION OF MOTORS



### Timing belt pulley T 45

Rotary-current-, step or servo-motors with max. shaft diameter of 16 mm are suitable. Assemble directly on the timing belt pulley. The pulley bore with fitting key groove and the connection side of the reverse unit will be designed according to customer specification.

### Timing belt pulley T 90

Rotary-current-, step or servo-motors with max. shaft diameter of 24 mm are suitable. Assemble directly on the timing belt pulley. The pulley bore with fitting key groove and the connection side of the reverse unit will be designed according to customer specification.

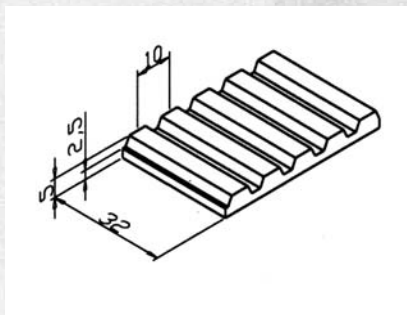
### Belt drive 45 und 90

Motors with hollow shafts can be attached directly on the slide-plate. Step and servo motors are connected via a coupling on the drive of the belt drive, diameter 17. Shaft, slide-plate or adapter plate are also available according to customer specification.

### Technical Data

Timing belt pulley:	LR6	T 45	T 90	Belt drive
Pulley				
D =	56,05 mm	58,6 mm	58,6 mm	58,6 mm
W =	16 mm	32 mm	32 mm	32 mm
Teeth	36	19	19	19
Bore	10 mm	8 mm	8 mm	8 mm
Reborable to max.	14 mm	16 mm	30 mm	drive shaft d 17
Travel (1 revolution)	180 mm	190 mm	190 mm	190 mm
Timing belt	16AT5	32AT10	32AT10	32AT10
Belt length in the reverse unit	160 mm	210 mm	210 mm	420 mm
Friction moment at 1/1000				
Belt tensioning	0,30 Nm	0.35 Nm	0.35 Nm	0.35 Nm
Maximal Load	30 Nm	70 Nm	130 Nm	30 Nm

### Calculation of the timing belt



#### When using T 45 and T 90

2 x rail length  
 + 2 x 210 mm belt length in reverse  
 - slide length  
 - 2 x 20 mm in belt tensioner  
 = 2 x rail length - slide length + 380 mm

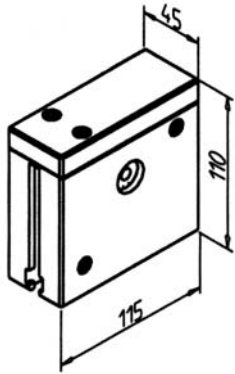
#### When using belt drive

Rail length + 212 mm

#### When using LR6

2 x Rail length + 260 mm

## TIMING BELT PULLEY T 45 (LR 12 + LR 16)



### Techn. data/items supplied

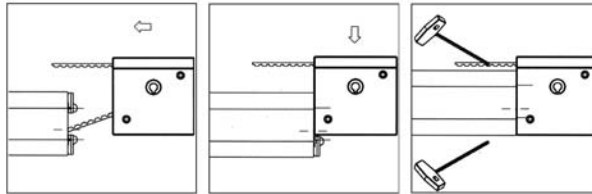
- Aluminium, anodized E6/EV1
- Completely assembled with pulley
- 2 ball bearings

### Applications

- For MiniTec linear guides LR

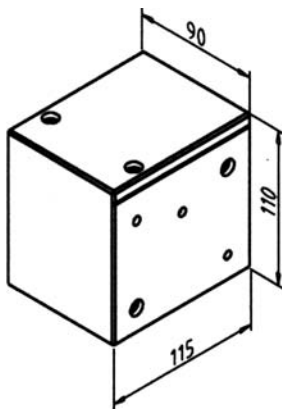
### Assembly

- Form threads M8 in both rail ends and mount power lock fastener **Part N° 21.1018/0**
- Pass belt through the rail and through pulley unit
- Insert pulley unit from top
- Tighten set screw



Bore	Weight	Part N°	Part N° stainless steel
without	1,170 kg	28.0083/0	28.0046/0
Ø 11 mm	1,168 kg	28.0083/2	28.0046/2
Ø 14 mm	1,167 kg	28.0083/3	28.0046/3
Ø 15 mm	1,165 kg	28.0083/5	28.0046/5
Ø 16 mm	1,165 kg	28.0083/4	28.0046/4

## TIMING BELT PULLEY T 90 (LR 12 + LR 16)



### Techn. data/items supplied

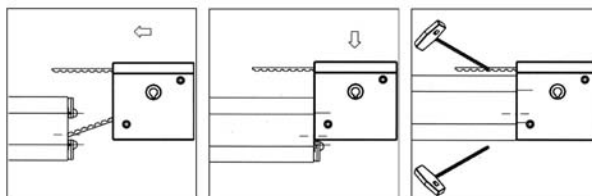
- Aluminium, anodized E6/EV1
- Completely assembled with pulley
- 2 ball bearings

### Applications

- For MiniTec linear guides LR

### Assembly

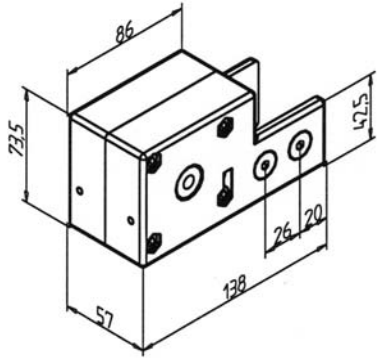
- Form threads M8 in both ends of rail and mount power lock fastener **Part N° 21.1018/0**
- Pass belt through the rail and through pulley unit
- Insert pulley unit from top
- Tighten set screw



Bore	Weight	Part N°	Part N° stainless steel
without	2,800 kg	28.0082/0	28.0045/0
Ø 11 mm	2,798 kg	28.0082/2	28.0045/2
Ø 14 mm	2,795 kg	28.0082/3	28.0045/3
Ø 16 mm	2,789 kg	28.0082/4	28.0045/4
Ø 19 mm	2,775 kg	28.0082/5	28.0045/5
Ø 20 mm	2,773 kg	28.0082/7	28.0045/7
Ø 24 mm	2,164 kg	28.0082/6	28.0045/6



## TIMING BELT PULLEY LR 6



### Techn. data/items supplied

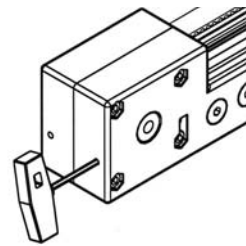
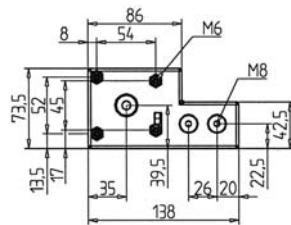
- Aluminium GD, power coated, grey
- Assembled ready for use
- with fixing kit

### Applications

- For MiniTec linear guides LR 6 Z

### Assembly

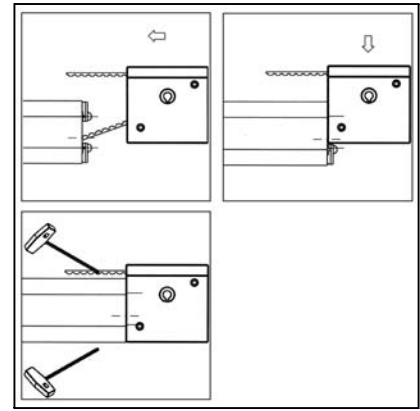
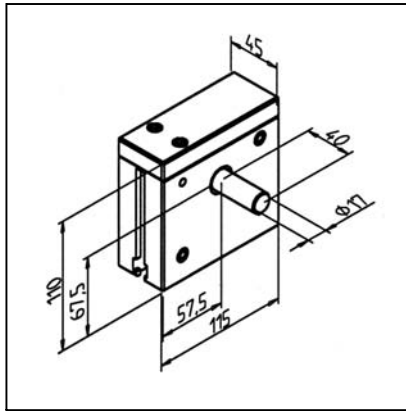
- Insert square-nuts M8 in rail
- Lead timing belt through reverse unit
- Slip reverse unit on rail and prefix screws
- Fix timing belt on slide
- Tighten timing belt at reverse unit with key 3 A/F - if necessary from both sides
- Tighten fixing screws



Bore	Weight	Part N°	Part N° stainless steel
ohne	0,96 kg	28.0510/0	28.0509/0
Ø 10 mm	0,96 kg	28.0510/1	28.0509/1
Ø 11 mm	0,96 kg	28.0510/2	28.0509/2
Ø 14 mm	0,96 kg	28.0510/3	28.0509/3

## TIMING BELT PULLEY T 45 Z

Part. N° 28.0083/1



### TECH. DATA / ITEMS SUPPLIED

- Anodized E6 / EV1
- Completely assembled with pulley and shaft end
- 2 ball-bearings
- Top cover mounted
- Weight 1,2 kg
- Stainless version Part N° 28.0046/1

### APPLICATIONSS

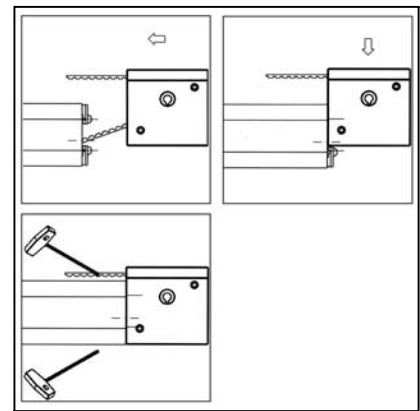
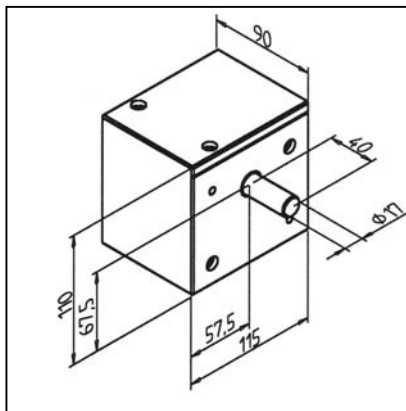
- All MiniTec linear guides

### ASSEMBLY

- Form thread M8 and mount MiniTec power-lock fastener Part N° 21.1018/0
- Pass belt through the rail and through pulley unit
- Insert pulley unit from top
- Tighten power-lock fastener
- Tighten the timing belt

## TIMING BELT PULLEY T 90 Z

Part. N° 28.0082/1



### TECH. DATA / ITEMS SUPPLIED

- Aluminium, anodized E6 / EV1
- Main casting completely assembled with pulley and shaft end
- 2 ball-bearings
- Top cover mounted
- Weight 1,2 kg
- Stainless version Part N° 28.0045/1

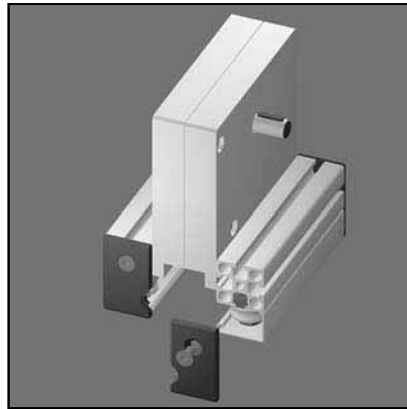
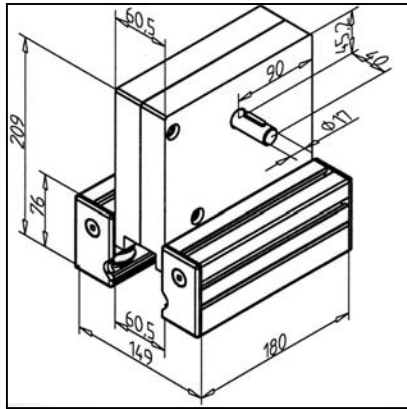
### APPLICATIONSS

- All MiniTec linear guides

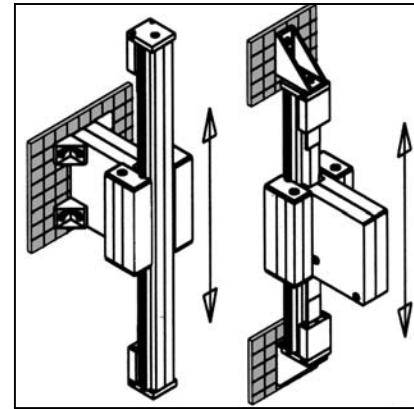
### ASSEMBLY

- Form thread M8 and mount MiniTec power-lock fastener Part N° 21.1018/0 einschrauben
- Pass belt through the rail and through pulley unit
- Insert pulley unit from top
- Tighten power-lock fastener
- Tighten the timing belt

## BELT DRIVE 45



Part. N° 28.0248/0



### TECH. DATA / ITEMS SUPPLIED

- Aluminium
- Shaft end Ø 17 for motor connection
- 2 idler pulleys aluminium, integrated in linear slide LW 45
- Weight 4,901 kg

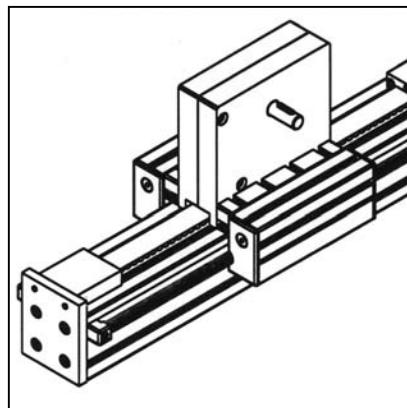
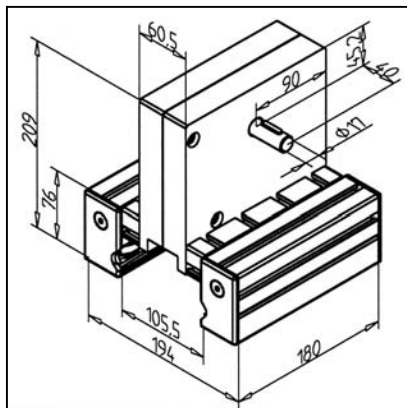
### APPLICATIONS

- MiniTec linear guides LR with extremely long travels, z-axis
- Use rail 45, 45 x 90 H, 45 x 135 H and 45 x 180 H

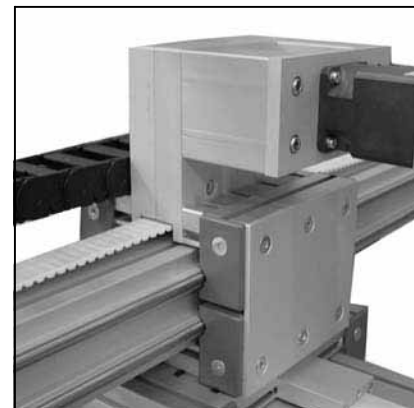
### ASSEMBLY

- Push the timing belt through the drive, slide drive on the rail and adjust clearance
- Fasten timing belt ends with timing belt tensioner **Part N° 28.0090/0** and fastening plate for rail 45 **Part N° 28.0054/0** or for rail 45 x 90 H **Part N° 28.0056/0** on the rail ends
- Tighten the timing belt
- Calculation of the timing belt: rail length + 212 mm

## BELT DRIVE 90



Part. N° 28.0249/0



### TECH. DATA / ITEMS SUPPLIED

- Aluminium
- Shaft end Ø 17 for motor connection
- 2 idler pulleys aluminium, integrated in linear slide LW 90
- Weight 5,024 kg

### APPLICATIONS

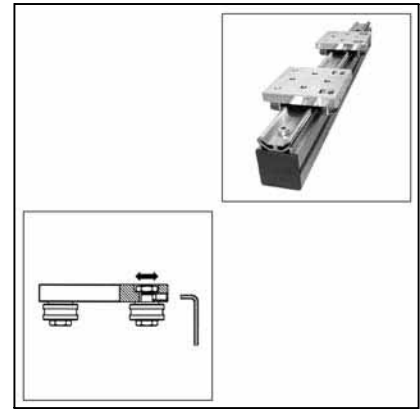
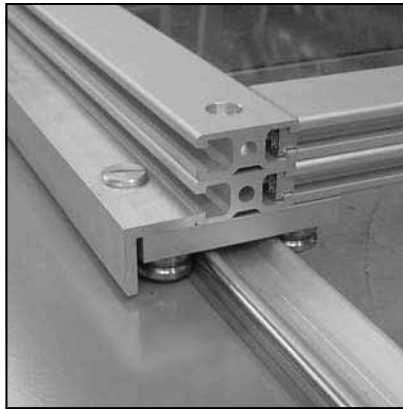
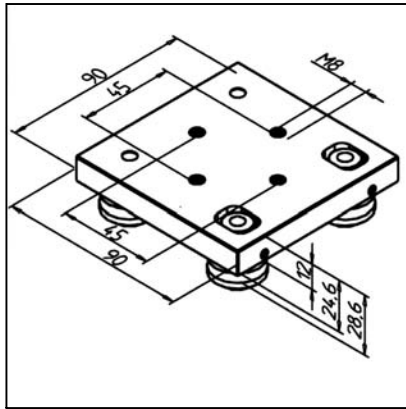
- MiniTec linear guides with extremely long travels, z-axis
- Use rail 45 x 90 F, rail 90 or 90 x 180 H

### ASSEMBLY

- Push the timing belt through the drive, slide drive on the rail and adjust clearance
- Fasten timing belt ends with timing belt tensioner **Part N° 28.0090/0** and fastening plate for rail 45 **Part N° 28.0057/0** or for rail 45 x 90 H **Part N° 28.0055/0** on the rail ends
- Tighten the timing belt
- Calculation of the timing belt: rail length + 212 mm

## SLIDE LR 6

Part. N° 28.0138/0



### TECH. DATA / ITEMS SUPPLIED

- Aluminium, all faces machined
- Double row, angular-contact bearings
- Assembled ready for use
- Load capacity: see page 117
- Weight 0,396 kg
- Stainless version Part N° 28.0139/0

### APPLICATIONS

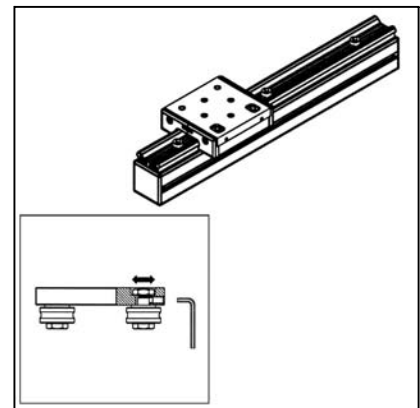
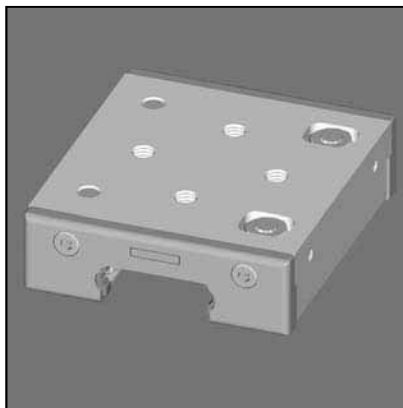
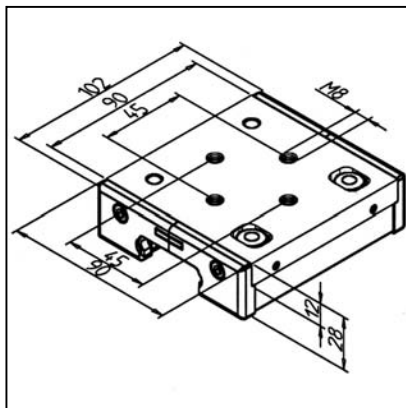
- MiniTec linear guide systems LR 6
- Material-handling
- Measuring devices
- Doors

### ASSEMBLY

- Slip slide onto rail
- Adjust clearance with key 2,5 A/F
- Tighten fixing screw with a torque of 20 Nm
- When used in extreme environment, use slide LR6 with cover, Part N° 28.0138/1

## SLIDE LR 6 WITH COVER

Part. N° 28.0138/1



### TECH. DATA / ITEMS SUPPLIED

- Aluminium, all faces machined
- Double row, angular-contact bearings LR6
- 4 concentric fixing bush
- 4 covers, plastic grey, with spring loaded greasing-felts
- Load capacity: see page 117
- Weight 0,458 kg
- Stainless version Part N° 28.0139/1

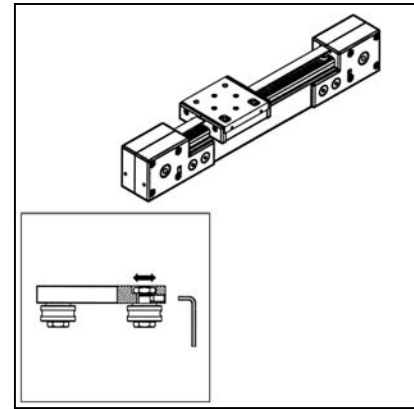
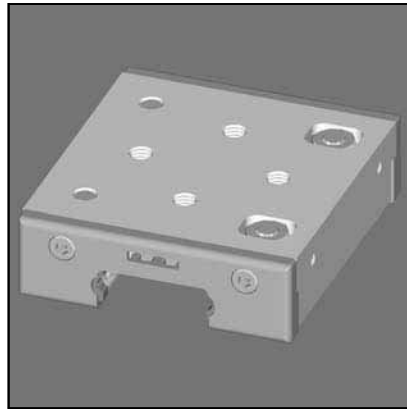
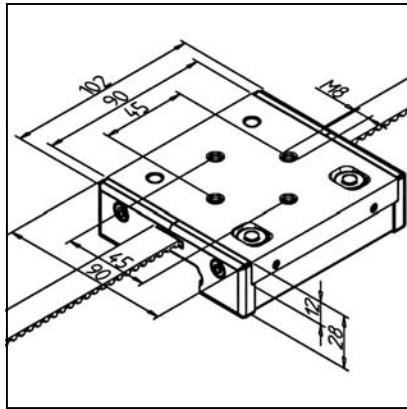
### APPLICATIONS

- MiniTec linear guide systems LR 6
- Jigs
- Sliding doors
- Large drawers

### ASSEMBLY

- Slip slide onto rail
- Adjust clearance with key 2,5 A/F
- Recommended torque: 20 Nm
- Saturate greasing felts with appropriate oil

## SLIDE LR 6 Z



Part. N° 28.0138/2

### TECH. DATA / ITEMS SUPPLIED

- Aluminium, all faces machined
  - Double row, angular-contact bearings LR6
  - 4 concentric fixing bush
  - 4 covers, plastic grey, with spring loaded greasing-felts
  - Belt fixing device integrated into slide-plate
  - Load capacity: see page 117
- |          |          |
|----------|----------|
| - Weight | 0,502 kg |
|----------|----------|
- Stainless version Part N° 28.0139/2

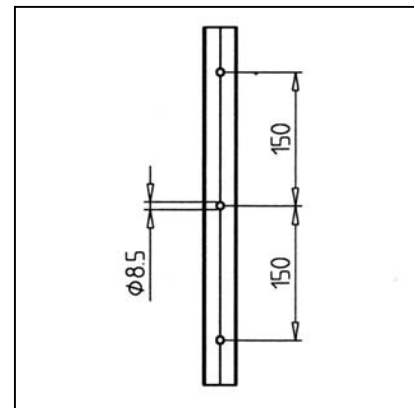
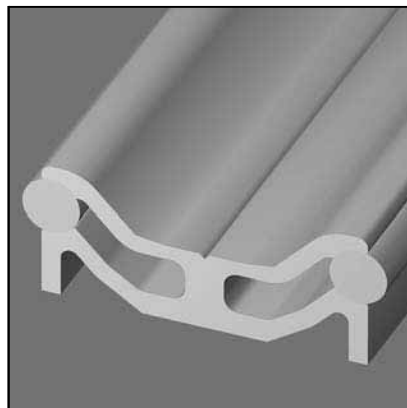
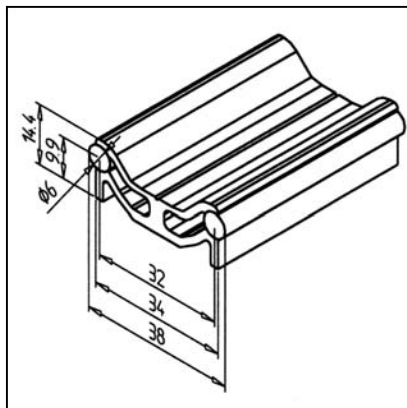
### APPLICATIONS

- MiniTec linear guide systems LR 6
- Material-handling devices

### ASSEMBLY

- Slip slide onto rail
- Adjust clearance with key 2,5 A/F
- Recommended torque: 20 Nm
- Saturate greasing felts with appropriate oil
- Screw end-caps clamping lower covers

## RAIL LR 6



Part. N° 28.0016/0

### TECH. DATA / ITEMS SUPPLIED

- Aluminium, natural anodized E6/EV 1
  - 2 Shafts Cf 53 h6, 60±3 HRC
  - With fixing bores Ø 8,5 mm, grid: 150 mm
- |          |            |
|----------|------------|
| - Weight | 0,958 kg/m |
| - Length | 4 m        |
- Stainless version Part N° 28.0016/3

### APPLICATIONS

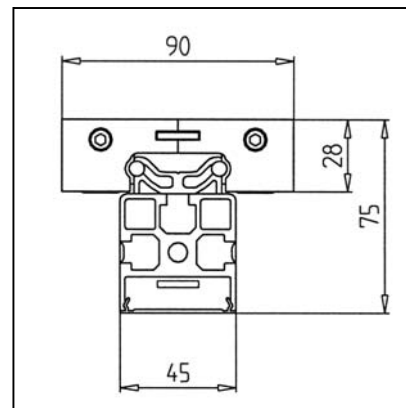
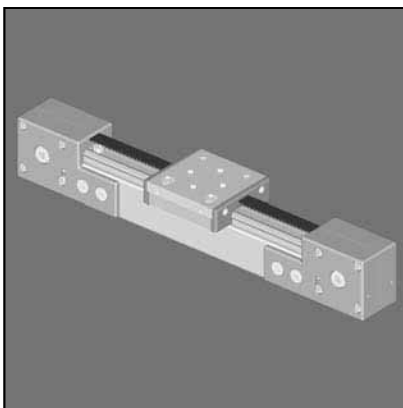
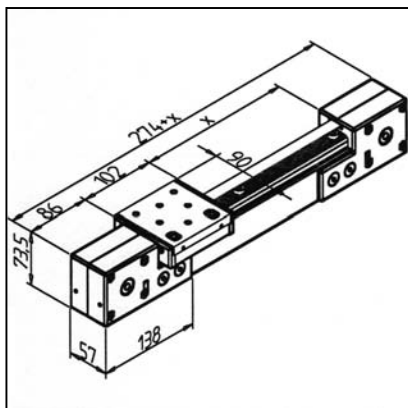
- MiniTec linear guide systems LR 6
- Material-handling
- Measuring devices
- Doors

### ASSEMBLY

- Fasten rail with cap screws M8 x 20 and square nut M8 on MiniTec profile

## MODULE LR 6 Z 45

Part. N° 28.0500/0



### TECH. DATA / ITEMS SUPPLIED

- Linear-guide, ready for use assembled from:

- 1 Rail LR 6 with precision-steel-shafts  $\varnothing$ , 6mm, h6, with profile 45 x 45 R 1 Slide LW 6 Z with timing belt fastener 2 timing-belt reverse units 1 timing belt 16 AT 5, steel-reinforced

- Weight (without profile) 2,25 kg  
 - Weight/100 mm stroke 0,322 kg

- Please specify travel "X" and bore of timing belt reverse unit ( $\varnothing$  11 mm/ $\varnothing$  14 mm/None)

### APPLICATIONS

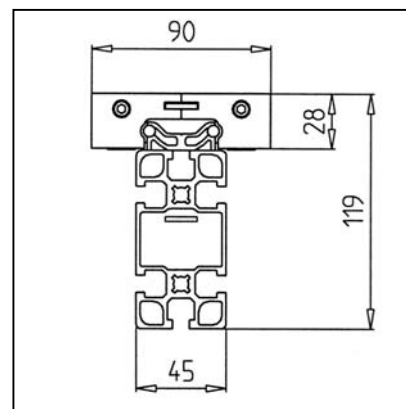
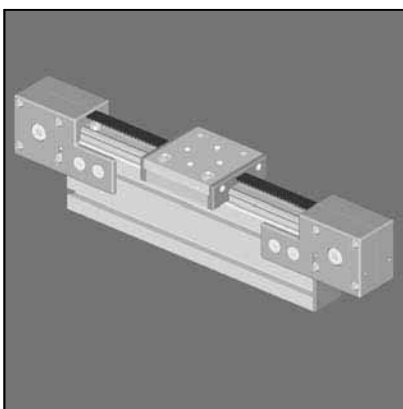
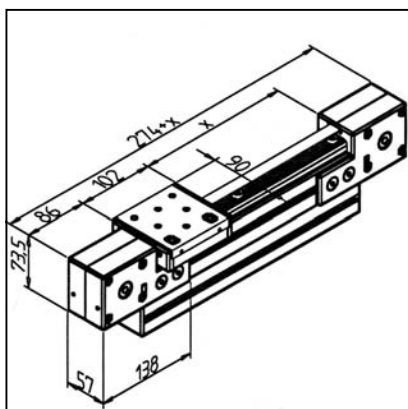
- MiniTec linear guide systems LR 6
- Material-handling
- Measuring devices
- Doors

### ASSEMBLY

- Timing-belt tensioners integrated in reverse-units

## MODULE LR 6 Z 90

Part. N° 28.0501/0



### TECH. DATA / ITEMS SUPPLIED

- Linear-guide, ready for use assembled from:

- 1 Rail LR 6 with precision-steel-shafts  $\varnothing$ , 6mm, h6, with profile 45 x 45 R  
 - 1 Slide LW 6 Z with timing belt fastener,  
 - 2 timing-belt reverse units 1 timing belt 16 AT 5, steel-reinforced

- Basis weight (without profile) 2,25 kg  
 - Weight/100 mm stroke 0,453 kg

- Please specify travel "X" and bore of timing belt reverse unit ( $\varnothing$  11 mm/ $\varnothing$  14 mm/None)

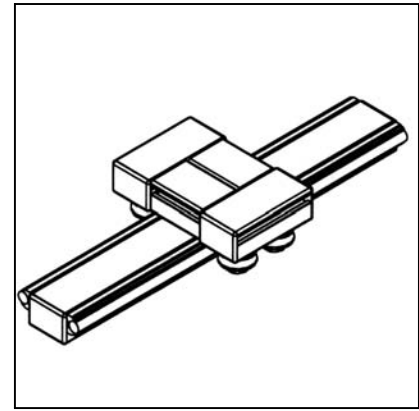
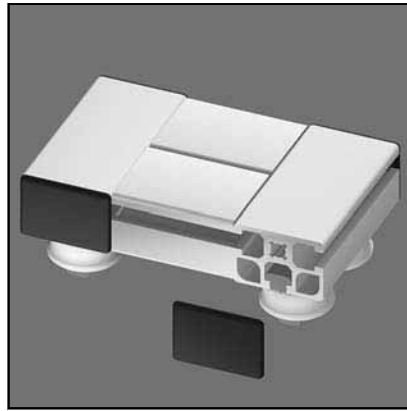
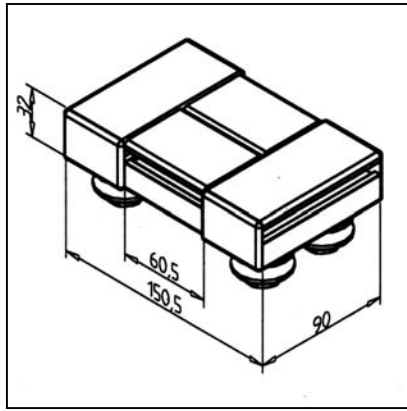
### APPLICATIONS

- MiniTec linear guide systems LR 6
- Material-handling
- Measuring devices
- Doors

### ASSEMBLY

- Timing-belt tensioners integrated in reverse-units

## SLIDE LW 32



Part. N° 28.0088/0

### TECH. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 concentric and 2 eccentric bearing units
- End caps
- Load capacity: see page 117
- Weight 1,06 kg
- Stainless version Part N° 28.0088/1

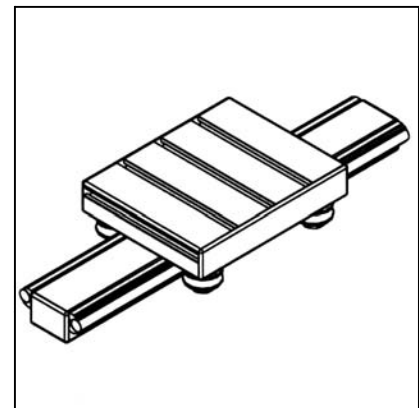
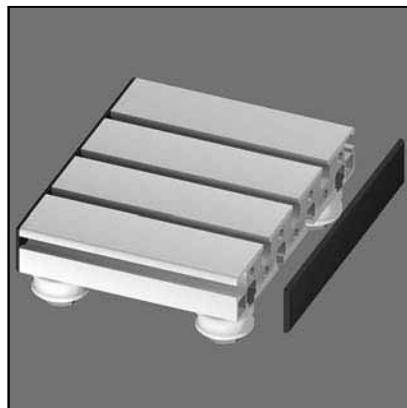
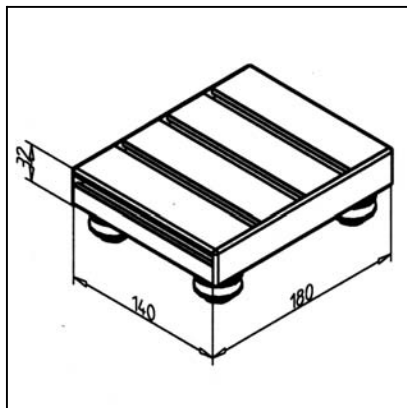
### APPLICATIONS

- Handling systems
- Measuring devices
- Automatic advance units
- For rails 19 and 32

### ASSEMBLY

- Slip slide on rail 19 or 32; adjust clearance with eccentric bush

## SLIDE LW 32 E



Part. N° 28.0089/0

### TECH. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 concentric and 2 eccentric bearing units
- End caps
- Load capacity: see page 117
- Weight 1,92 kg
- Stainless version Part N° 28.0089/1

### APPLICATIONS

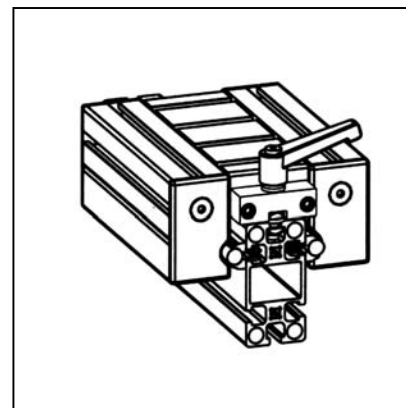
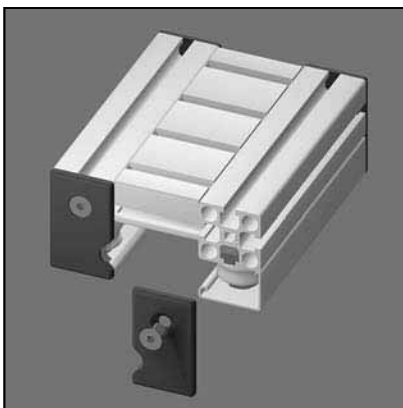
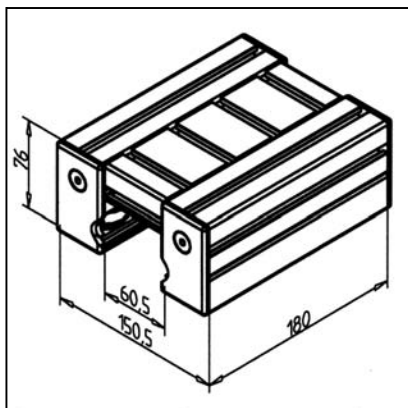
- 1- or multi-axis guides
- Handling systems
- Measuring devices
- For rails 19 and 32

### ASSEMBLY

- Slip slide on rail 19 or 32; adjust clearance with eccentric bush

## SLIDE LW 45

Part. N° 28.0091/0



### TECH. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 concentric and 2 eccentric bearing units
- End caps LR and 2 cover profiles LR
- Load capacity: see page 117
- Weight 2,26 kg
- Stainless version Part N° 28.0091/3

### APPLICATIONS

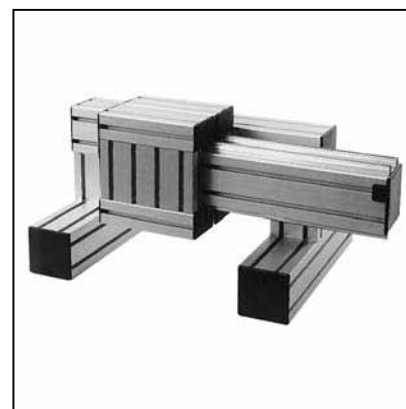
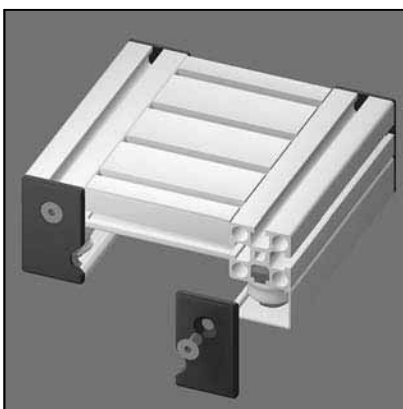
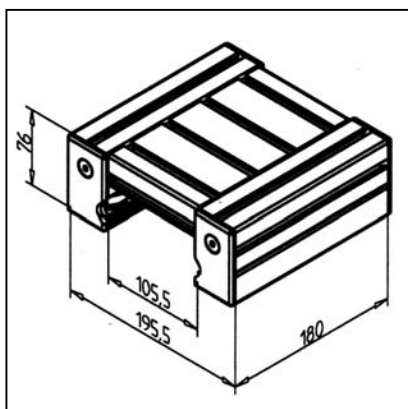
- 1- or multi-axis guides
- Linear robots
- Handling systems
- Measuring devices
- For rails 45, 45 x 90 H, 45 x 180 H and 135 H

### ASSEMBLY

- Assemble slide on rail 45 or 45 x 90 H, adjust clearance with eccentric bush
- Assemble cover and greasing system
- OPTIONS:
- Slide clamping unit Part N° 28.0270/0

## SLIDE LW 90

Part. N° 28.0092/0



### TECH. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 concentric and 2 eccentric bearing units
- End caps LR and Cover profiles LR
- Load capacity: see page 117
- Weight 2,7 kg
- Stainless version Part N° 28.0092/2

### APPLICATIONS

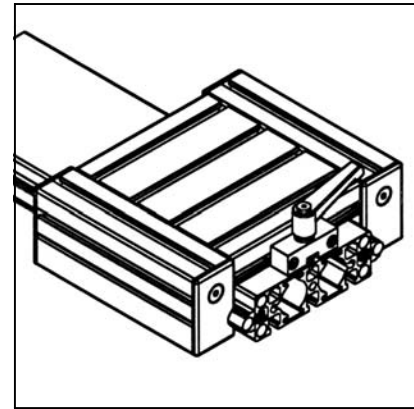
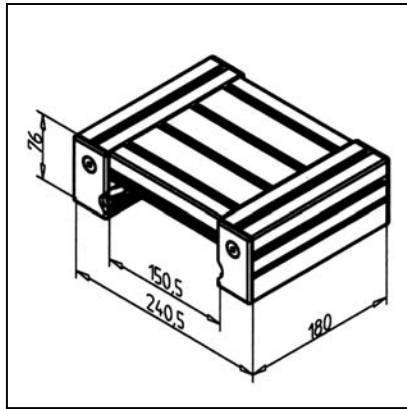
- 1- or multi-axis guides
- Linear robots
- Handling systems
- Measuring devices
- For rails 45 x 90 F, 90 x 90, 90 x 180 H

### ASSEMBLY

- Assemble slide on rail 45 x 90 F, rail 90 or rail 90 x 180 H; adjust clearance with eccentric bush
- Assemble cover and greasing system
- OPTIONS:
- Slide clamping Part N° 28.0270/0



## SLIDE LW 135



Part. N° 28.0084/0

### TECH. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 concentric and 2 eccentric bearing units
- End caps LR and Cover profiles LR
- Load capacity: see page 117
- Weight 3,15 kg
- Stainless version Part N° 28.0084/1

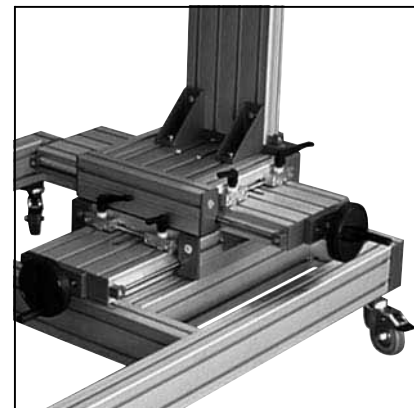
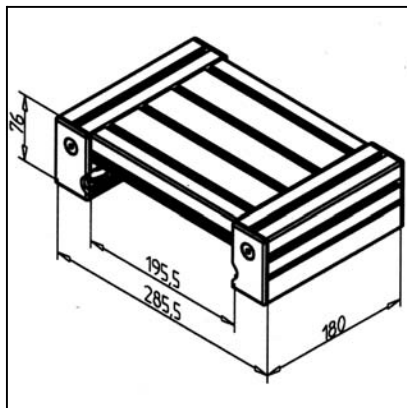
### APPLICATIONS

- 1- or multi-axis guides
- Linear robots
- Handling systems
- Measuring devices
- For rails 135 F

### ASSEMBLY

- Assemble slide on rail 45 x 135; adjust clearance with eccentric bush
- Assemble cover and greasing system
- OPTIONS:
- Slide clamping unit Part N° 28.0270/0

## SLIDE LW 180



Part. N° 28.0087/0

### TECH. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 concentric and 2 eccentric bearing units
- End caps LR and Cover profiles LR
- Load capacity: see page 117
- Weight 3,59 kg
- Stainless version Part N° 28.0087/1

### APPLICATIONS

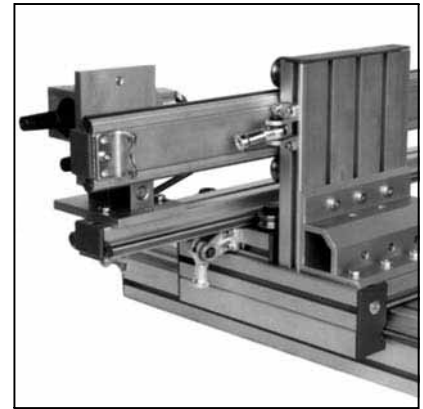
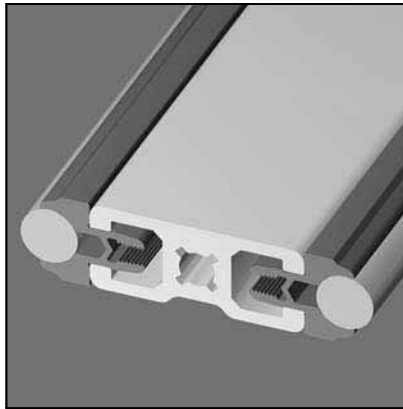
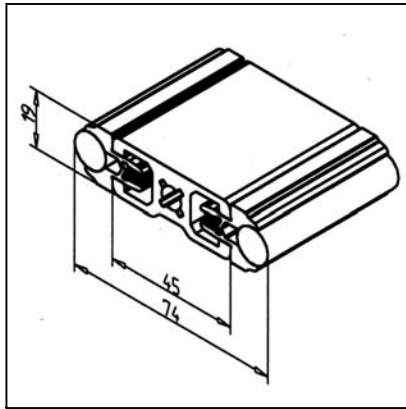
- 1- or multi-axis guides
- Linear robots
- Handling systems
- Measuring devices
- For rails 45 x 180 F and 90 x 180 F

### ASSEMBLY

- Assemble slide on rail 90 x 180; adjust clearance with eccentric bush
- Assemble cover and greasing system
- OPTIONS:
- Slide clamping unit Part N° 28.0270/0

## RAIL 19

Part. N° 28.0009/0



### TECH. DATA / ITEMS SUPPLIED

- Profile 19 x 45
- Both sides with shaft supporting profile and shafts Ø 12 h6, ready for use
- Without end caps
- Weight 3,179 kg/m
- Length 6 m
- Stainless version Part N° 28.0009/3

### APPLICATIONS

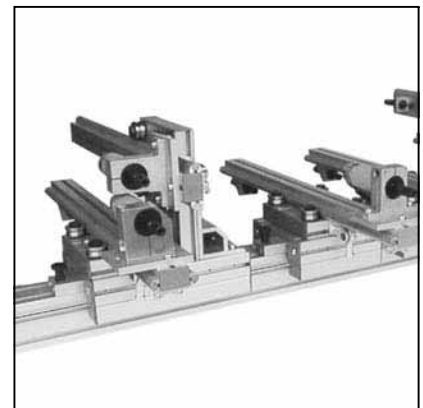
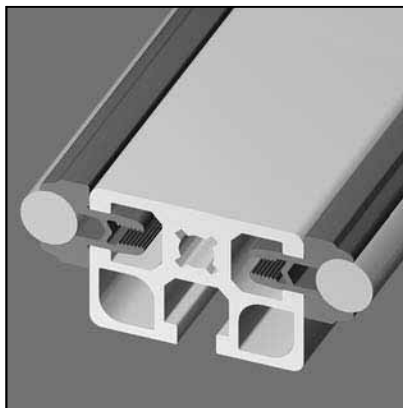
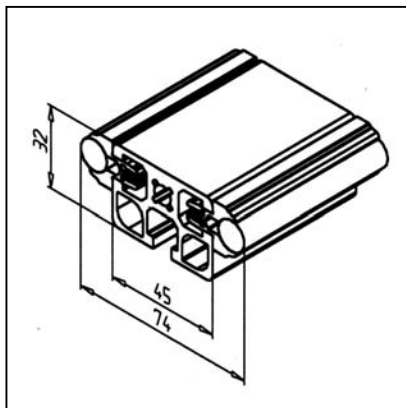
- Linear-guides
- Longer rails with composite shafts possible

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 32

Part. N° 28.0010/0



### TECH. DATA / ITEMS SUPPLIED

- Profile 45 x 32 F
- Both sides with shaft supporting profile and shafts Ø 12 h6, ready for use
- Without end caps
- Weight 4,161 kg/m
- Length 6 m
- Stainless version Part N° 28.0010/3

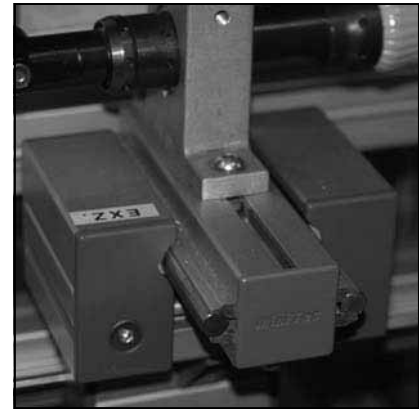
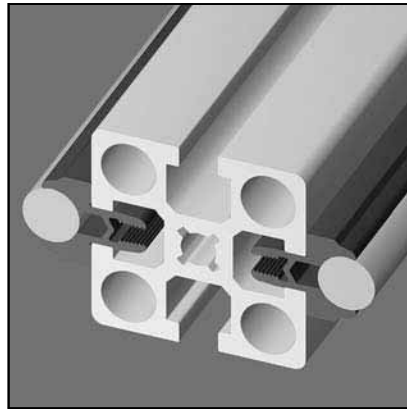
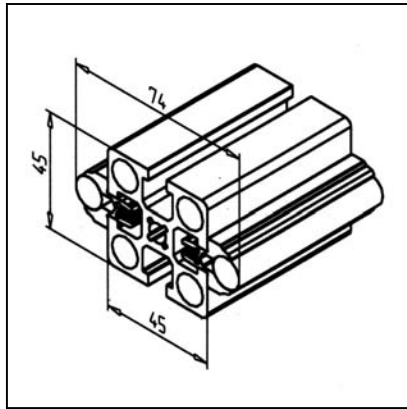
### APPLICATIONS

- Linear-guides
- Longer rails with composite shafts possible

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 45



Part. N° 28.0006/0

### TECH. DATA / ITEMS SUPPLIED

- Profile 45 x 45
- Both sides with shaft supporting profile and shafts Ø 12 h6, ready for use
- Without end caps
- Weight 4,43 kg/m
- Length 6 m
- Stainless version Part N° 28.0006/3

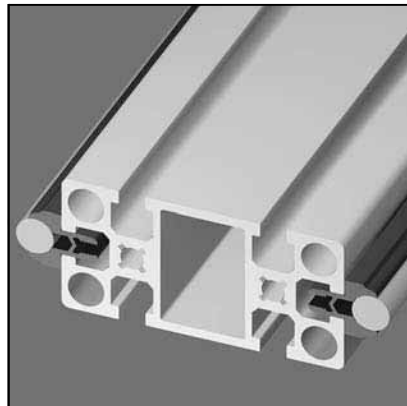
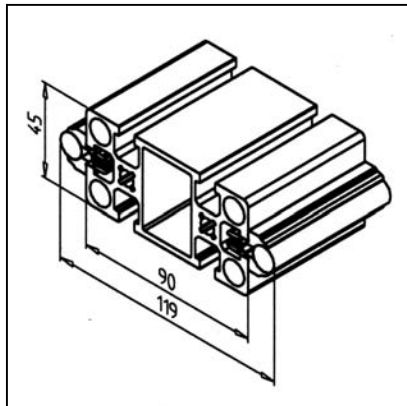
### APPLICATIONS

- Linear-guides
- Longer rails with composite shafts possible

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 45 X 90 F



Part. N° 28.0007/1

### TECH. DATA / ITEMS SUPPLIED

- Profile 45 x 90
- Both sides with shaft supporting profile and shafts Ø 12 h6, ready for use
- Without end caps
- Weight 6,19 kg/m
- Length 6 m
- Stainless version Part N° 28.0007/3

### APPLICATIONS

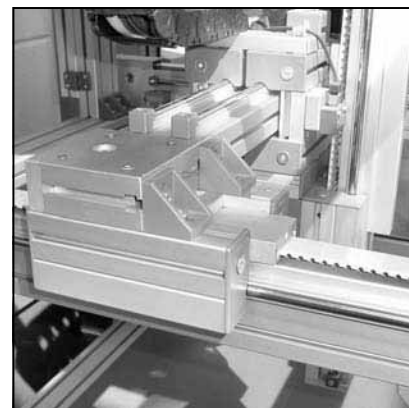
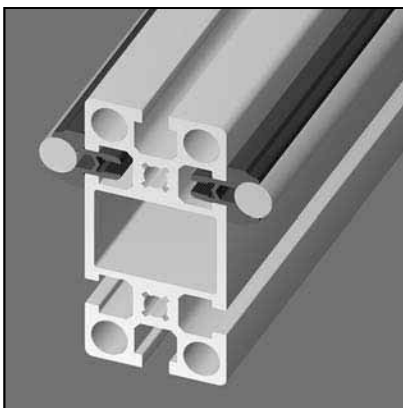
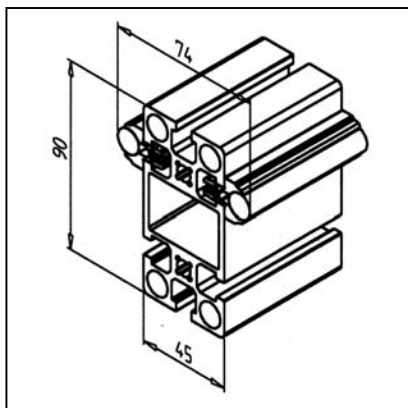
- Linear-guides
- Longer rails with composite shafts possible

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 45 X 90 H

Part. N° 28.0007/2



### TECH. DATA / ITEMS SUPPLIED

- Profile 45 x 90
- Both sides with shaft supporting profile and shafts Ø 12 h6, ready for use
- Without end caps
- Weight 6,19 kg/m
- Length 6 m
- Stainless version Part N° 28.0007/4

### APPLICATIONS

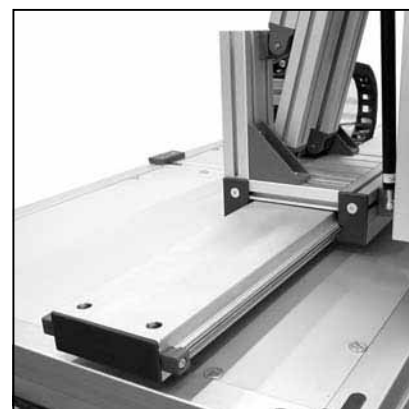
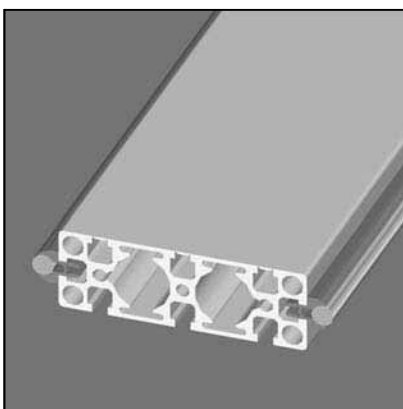
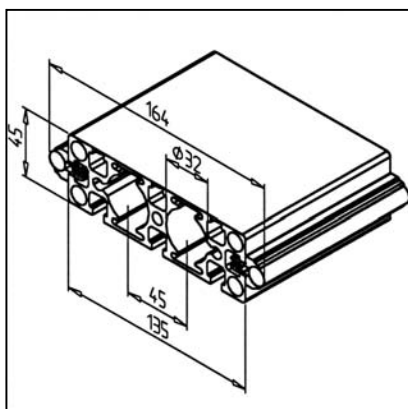
- Linear and lifting guides
- Belt return in profile
- Longer rails with shafts put together

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 135 F

Part. N° 28.0012/1



### TECH. DATA / ITEMS SUPPLIED

- Profile 45 x 135 G
- Both sides with shaft supporting profile and shafts Ø 12 h6, ready for use
- Without end caps
- Weight 8,09 kg/m
- Length 6 m
- Stainless version Part N° 28.0012/3

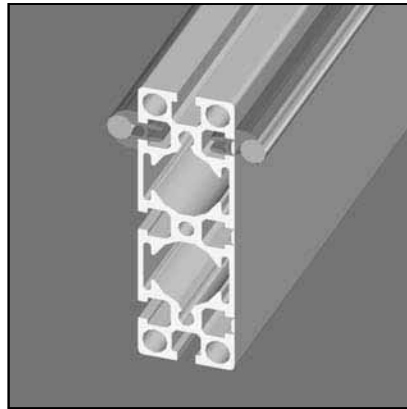
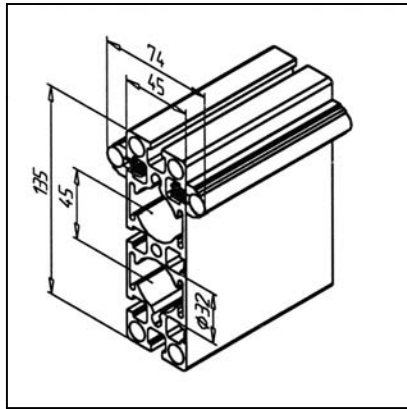
### APPLICATIONS

- Linear and lifting guides
- Longer rails with shafts put together

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 135 H



Part. N° 28.0012/2

### TECH. DATA / ITEMS SUPPLIED

- Profile 45 x 135 G
- Both sides with shaft supporting profile and shafts Ø 12 h6, ready for use
- Without end caps
- Weight 8,25 kg/m
- Length 6 m
- Stainless version Part N° 28.0012/4

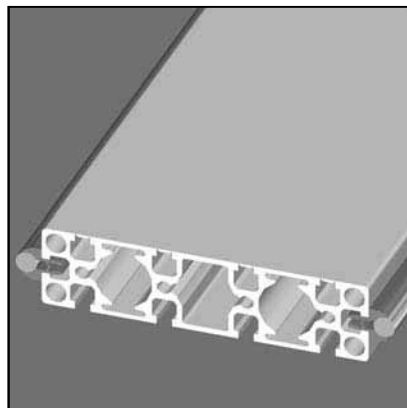
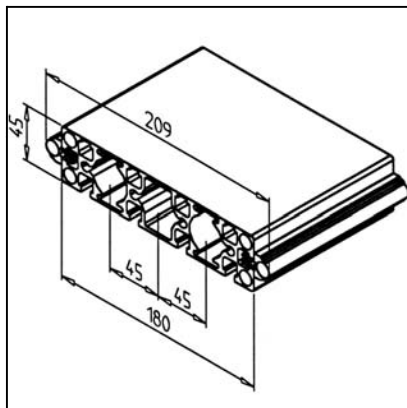
### APPLICATIONS

- Linear-guides
- Longer rails with composite shafts possible

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 45 X 180 F



Part. N° 28.0013/1

### TECH. DATA / ITEMS SUPPLIED

- Profile 45 x 180 G
- Both sides with shaft supporting profile and shafts Ø 12 h6, ready for use
- Without end caps
- Weight 9,474 kg/m
- Length 6 m
- Stainless version Part N° 28.0013/3

### APPLICATIONS

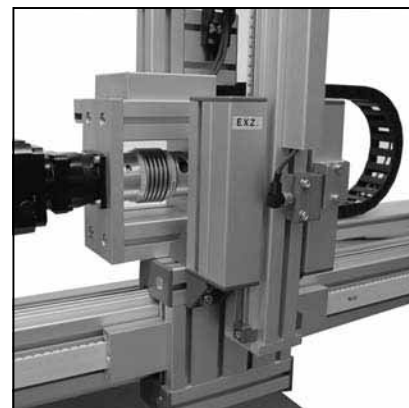
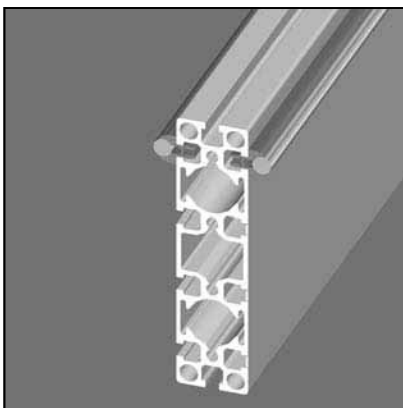
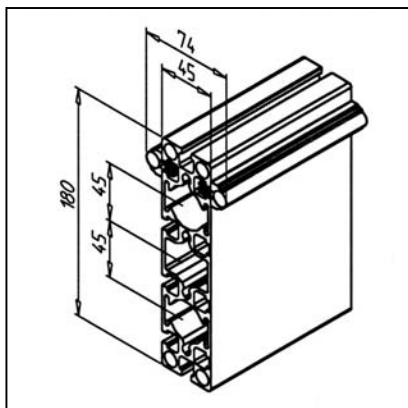
- Linear-guides
- Longer rails with composite shafts possible

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 45 X 180 H

Part. N° 28.0013/2



### TECH. DATA / ITEMS SUPPLIED

- Profile 45 x 180 G
- Both sides with shaft supporting profile and shafts  $\varnothing 12$  h6, ready for use
- Without end caps
- Weight 9,474 kg/m
- Length 6 m
- Stainless version Part N° 28.0013/4

### APPLICATIONS

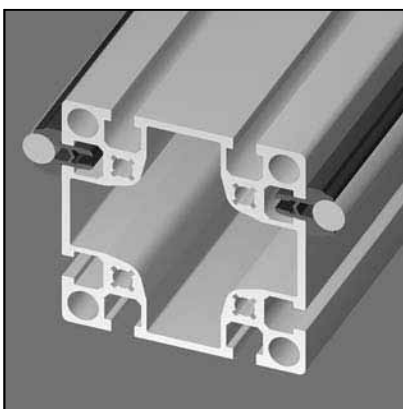
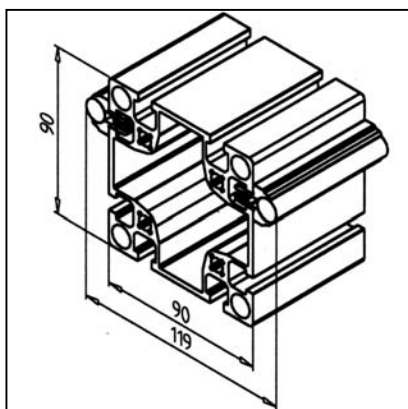
- Linear-guides
- Longer rails with composite shafts possible

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 90

Part. N° 28.0008/0



### TECH. DATA / ITEMS SUPPLIED

- Profile 90 x 90 L
- Both sides with shaft supporting profile and shafts  $\varnothing 12$  h6, ready for use
- Without end caps
- Weight 7,88 kg/m
- Length 6 m
- Stainless version Part N° 28.0008/3

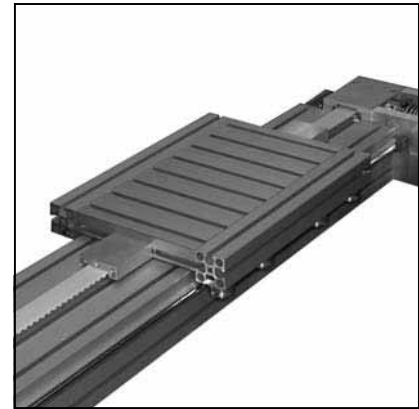
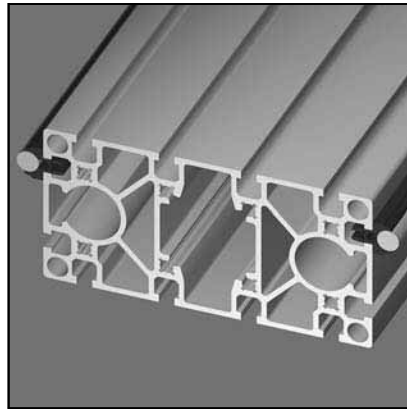
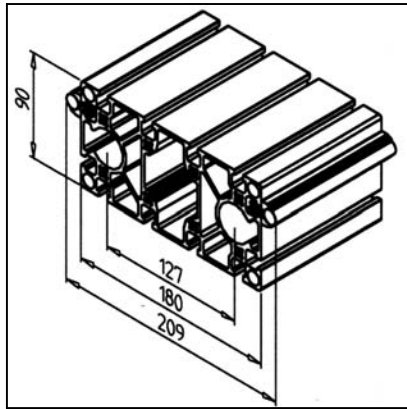
### APPLICATIONS

- Linear-guides
- Timing belt return inside the profile
- Longer rails with composite shafts possible

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 180 F



Part. N° 28.0011/1

### TECH. DATA / ITEMS SUPPLIED

- Profile 90 x 180 S
- Both sides with shaft supporting profile and shafts Ø 12 h6, ready for use
- Without end caps
- Weight 14,95 kg/m
- Length 6 m
- Stainless version Part N° 28.0011/3

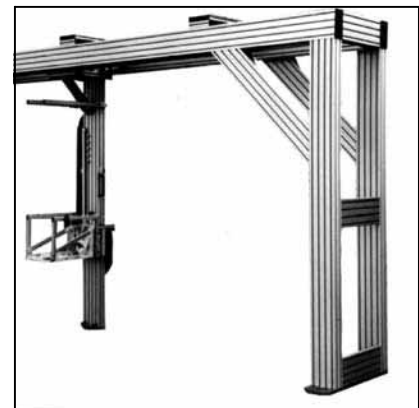
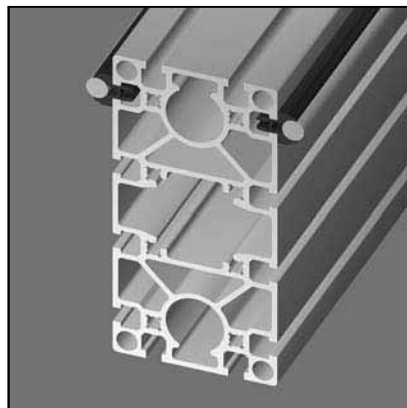
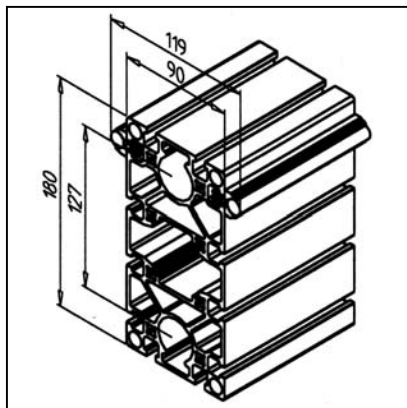
### APPLICATIONS

- Linear-guides
- Timing belt return inside the profile
- Longer rails with composite shafts possible

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## RAIL 180 H



Part. N° 28.0011/2

### TECH. DATA / ITEMS SUPPLIED

- Profile 90 x 180 S
- Both sides with shaft supporting profile and shafts Ø 12 h6, ready for use
- Without end caps
- Weight 14,95 kg/m
- Length 6 m
- Stainless version Part N° 28.0011/4

### APPLICATIONS

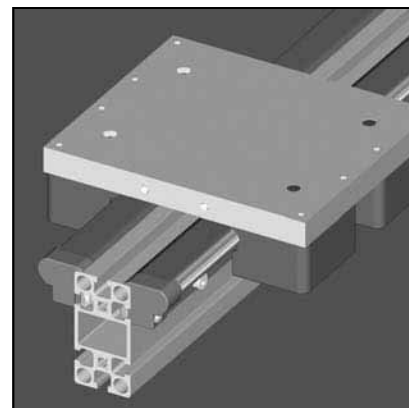
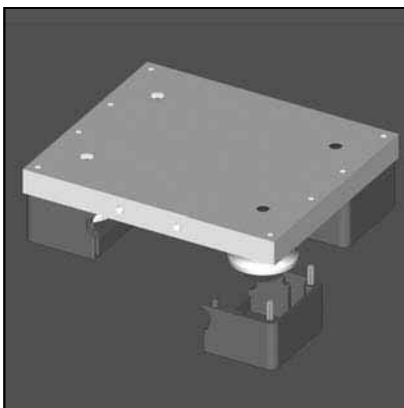
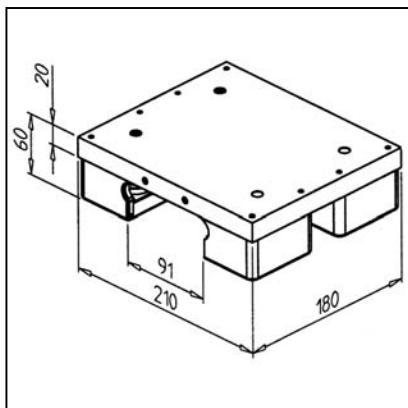
- Linear-guides
- Timing belt return inside the profile
- Longer rails with composite shafts possible

### ASSEMBLY

- For vertical use or for high speed Applications, we recommend the use of shaft retention devices **Part N° 28.0052/0**
- Load capacity: see page 117

## SLIDE LR16 - 45

Part. N° 28.0810/0



### TECHN. DATA / ITEMS SUPPLIED

- With 2 concentric and 2 eccentric bearing units
- Load / Bearing:
- dyn. C = 19.90 N
- stat. Co = 12.60 N
- Weight 3,52 kg

### APPLICATIONSS

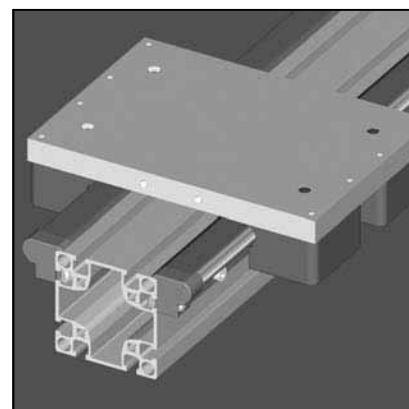
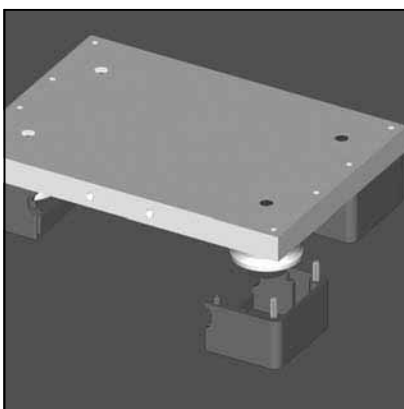
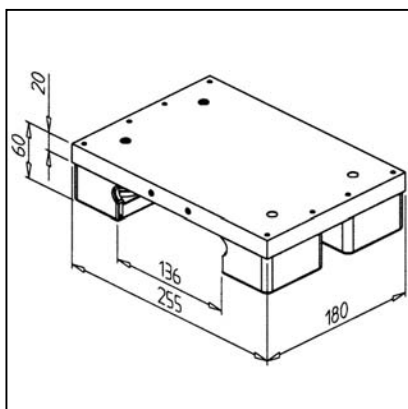
- Single and multi-axis guidance
- Linear robot
- Handling equipment
- Measuring equipment
- For rail LR16 45x90 H

### ASSEMBLY

- Push the trolley onto the rails, adjust for zero play with eccentric fastening set
- Mount the covering and lubrication system

## SLIDE LR 16 - 90

Part. N° 28.0811/0



### TECHN. DATA / ITEMS SUPPLIED

- Fully assembled trolley
- With 2 concentric and 2 eccentric bearing units
- Load / Bearing:
- dyn. C = 19.90 N
- stat. Co = 12.60 N
- Weight 3,957 kg

### APPLICATIONSS

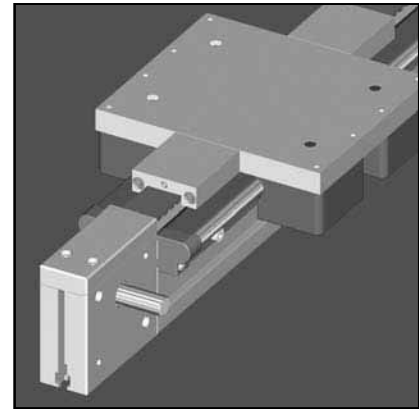
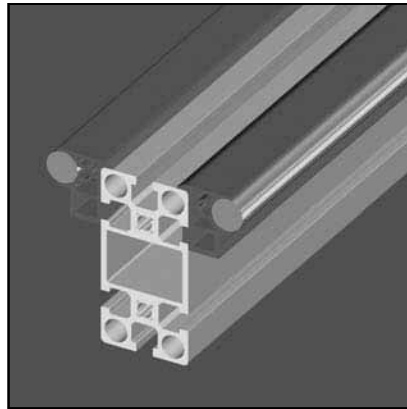
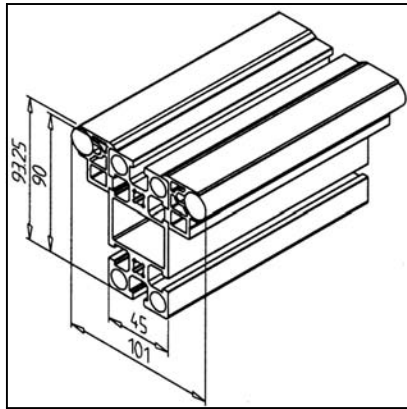
- Single and multi-axis guidance
- Linear robot
- Handling equipment
- Measuring equipment
- For rail LR16 90 and LR16 90x180 H

### ASSEMBLY

- Push the trolley onto the rails, adjust for zero play with eccentric fastening set
- Mount the covering and lubrication system



## RAIL LR 16 45X90 H



Part. N° 28.0820/0

### TECHN. DATA / ITEMS SUPPLIED

- Profile 45 x 90
- With shaft carrier profile LR 16 and shaft with diameter 16 h6 on both sides, assembled ready to fit
- Without end caps
- Weight 7,979 kg/m
- Length 6 m

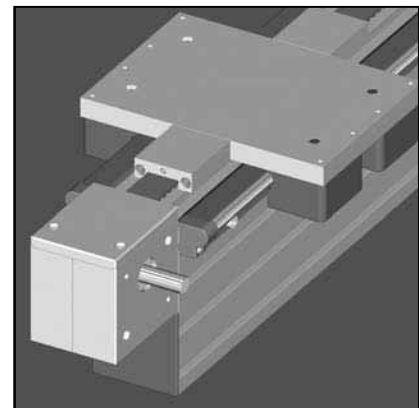
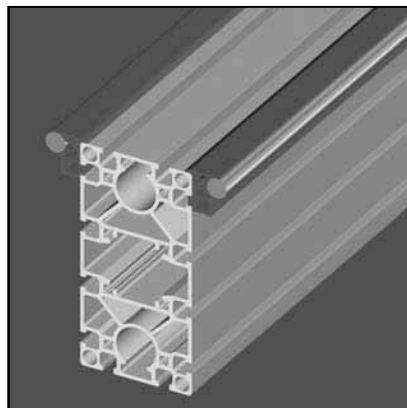
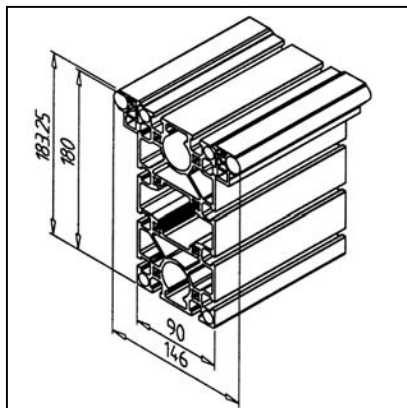
### APPLICATIONSS

- Linear and column guides for high loading capacity
- Toothed belt return in profile
- Greater lengths are possible with compound shafts

### ASSEMBLY

- When used vertically, or with high acceleration figures, we recommend the use of shaft fastener LR 16 **Part. N° 28.0808/0 and 28.0809/0**

## RAIL LR 16 90X180 H



Part. N° 28.0822/0

### TECHN. DATA / ITEMS SUPPLIED

- Profile 90 x 180 S
- With shaft carrier profile and shaft with diameter 16 h6 on both sides, assembled ready to fit
- Without end caps
- Weight 16,278 kg/m
- Length 6 m

### APPLICATIONSS

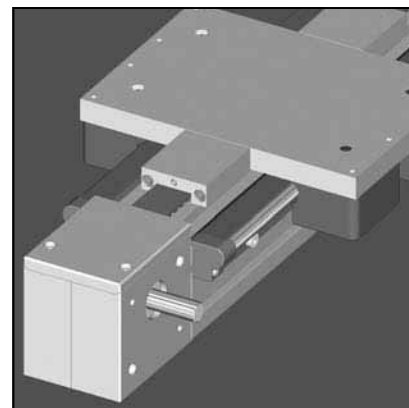
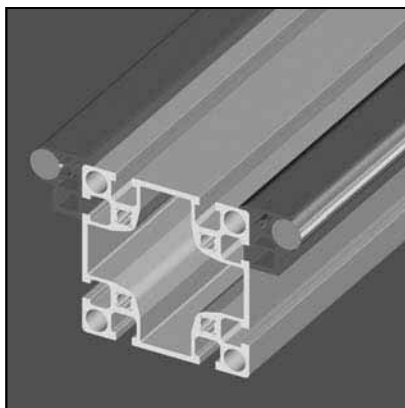
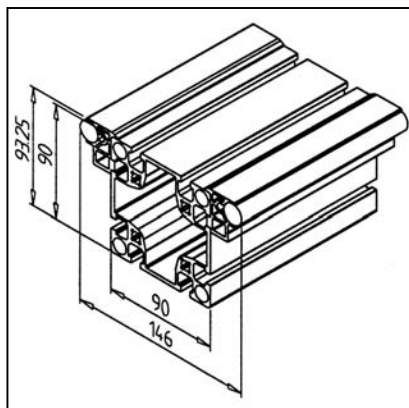
- Linear and column guides for high loading capacity
- Toothed belt return in profile
- Greater lengths are possible with compound shafts

### ASSEMBLY

- When used vertically, or with high acceleration figures, we recommend the use of shaft fastener LR 16 **Part. N° 28.0808/0 and 28.0809/0**

## RAIL LR 16 90

Part. N° 28.0821/0



### TECHN. DATA / ITEMS SUPPLIED

- Profile 90 x 90
- With shaft carrier profile LR 16 and shaft with diameter 16 h6 on both sides, assembled ready to fit
- Without end caps
- Weight 10,067 kg/m
- Length 6 m

### APPLICATIONS

- Linear and column guides for high loading capacity
- Toothed belt return in profile
- Greater lengths are possible with compound shafts

### ASSEMBLY

- When used vertically, or with high acceleration figures, we recommend the use of shaft fastener LR 16 **Part. N° 28.0808/0 and 28.0809/0**



## LINEAR SYSTEM LB



The LB design is based on LME 20 linear ball bearings that are built into our construction profile in the specially provided bore holes. Precision shafts D 20 mm give this guide high load capacity. The LB design offers substantial advantages for short travelling distances and high stroke frequencies. Especially compact and economical guide elements based on our solid precision ball bushings from the LME series with integrated sealing rings, which provide functional security under rough conditions.

### Possible applications

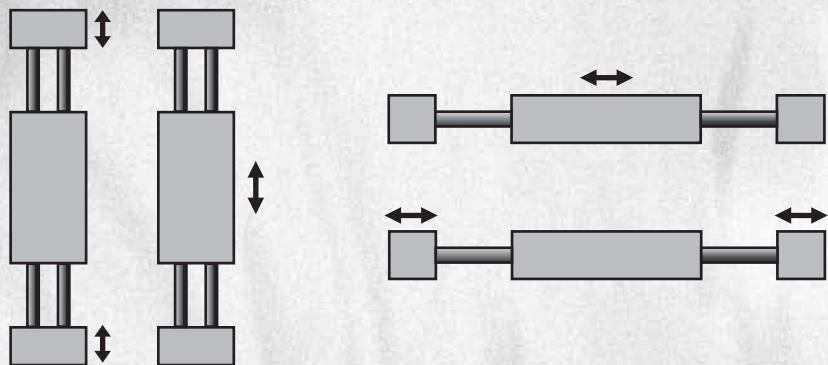
Calculation of life:

$$L = \frac{C}{F} \cdot 10^5$$

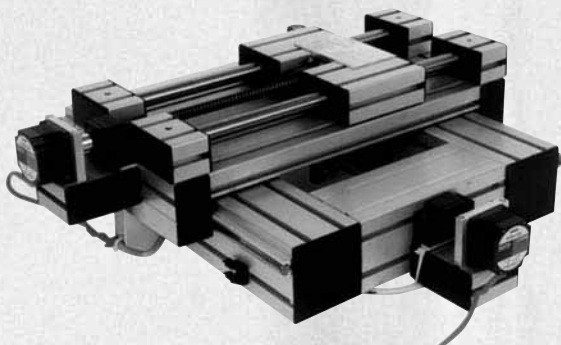
L = Life

C = Basic dynamic load rating (N)

F = Working load (N)



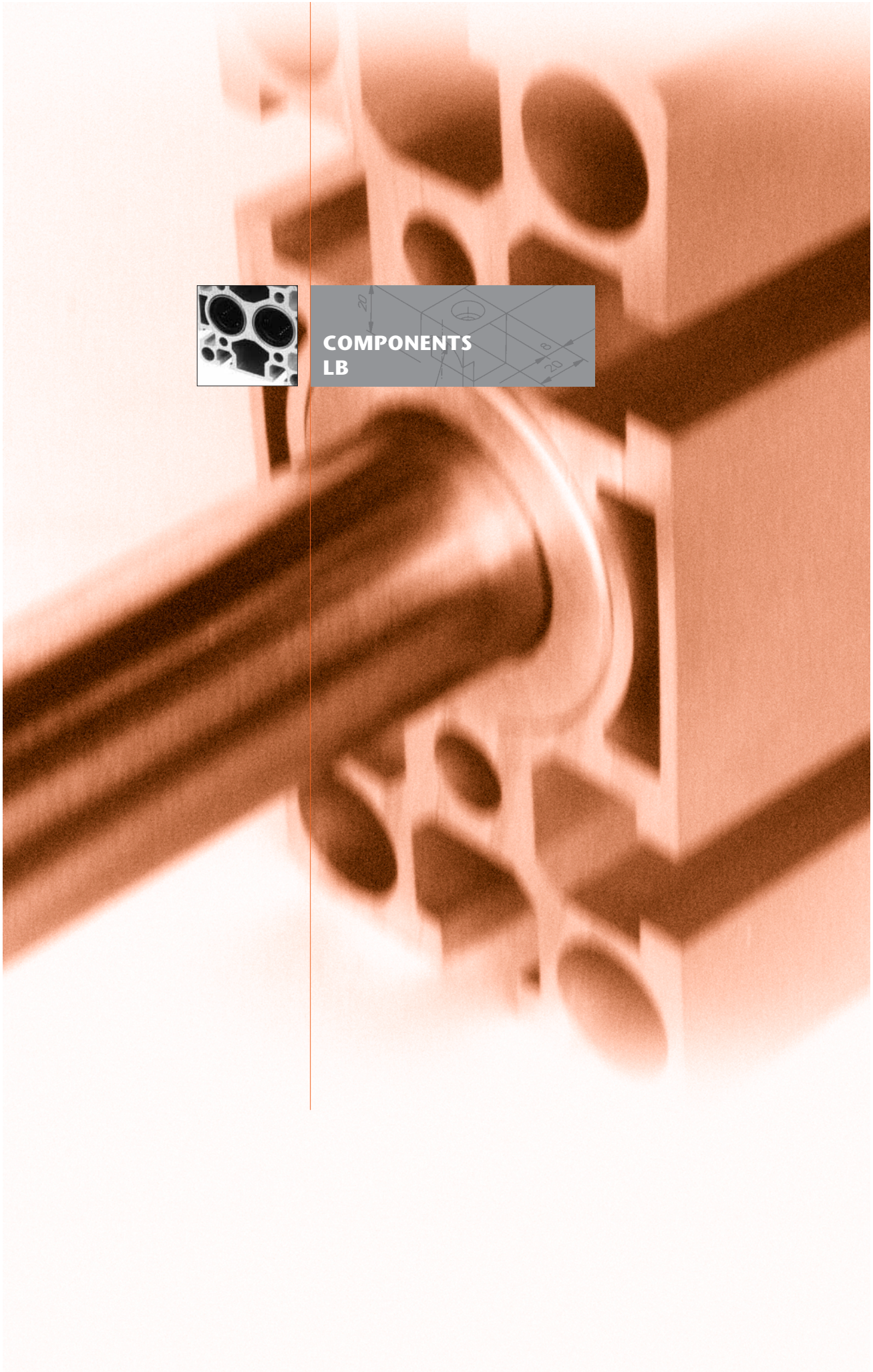
MiniTec LB series linear guides are particularly suitable for short strokes of up to 1 meter. The modular system provides absolute flexibility in the design of the guide. The ball bushings with solid outer ring made from hardened and ground bearing steel are mounted directly into the profile 32 Ø bores of the extra strong profil 45 x 135, 45 x 180, 90 x 180, 90 x 45 S and 90 x 90 S.



The axial position of the bushes is secured with one-component glue. The ball-bushing combines low friction, limited clearance, low noise and long life.

When designing a linear system LB, shaft deflection under load of max. 0.5° must be considered.

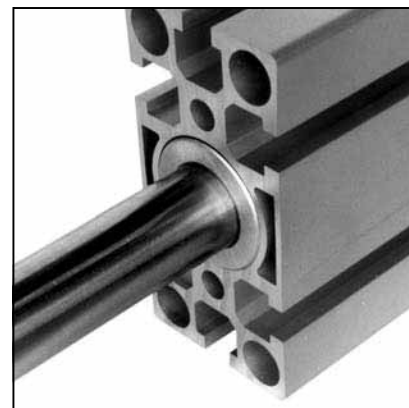
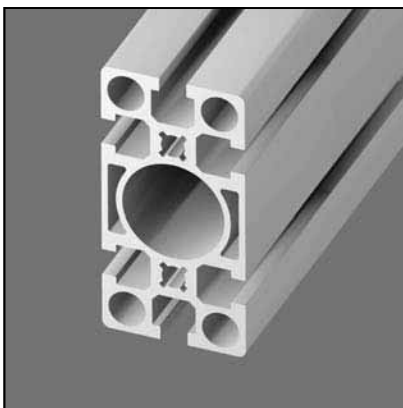
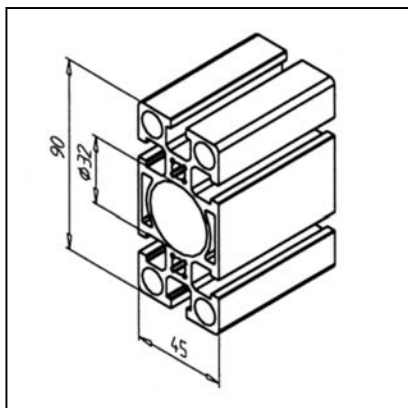
For further technical details see MiniTec catalogue "Linear bearings".  
 Linear guides LB are available completely assembled with ball-screw on request.  
 All components are also available in stainless version.



COMPONENTS  
LB

## PROFILE 45 X 90 S

Part. N° 20.1017/0



### TECHN. DATA / ITEMS SUPPLIED

- lx =	113,487 cm <sup>4</sup>
- ly =	30,719 cm <sup>4</sup>
- wx =	25,219 cm <sup>3</sup>
- wy =	13,653 cm <sup>3</sup>
- Weight	3,86 kg/m
- Length	6 m
- Packing unit	24 m

### APPLICATIONS

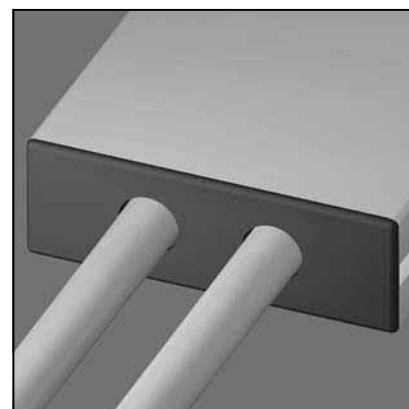
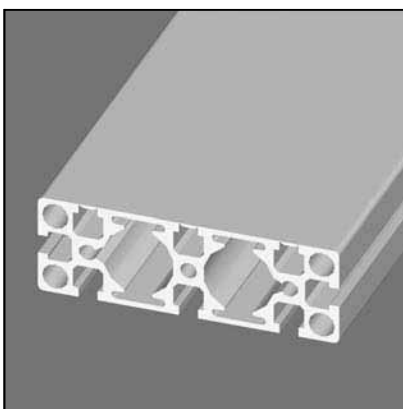
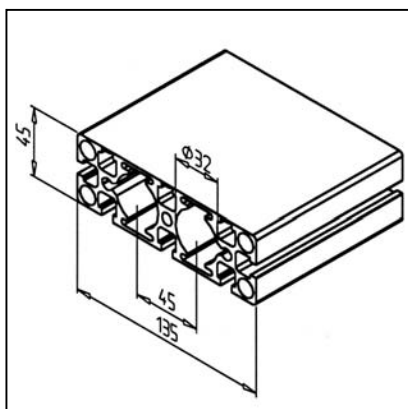
- Universal for general heavy duty constructions
- Linear guides LB
- Linear-guides
- 5 charities for pressed air piping
- Central bore Ø 32 mm for ball-bushings LME 20, for ball-bearings 6201 or 6002, for compressed air piping or guiding of hydraulic add-in cylinders

### ASSEMBLY

- MiniTec power-lock fastener
- Cross bolt-fastener
- Angle 45 / 90
- Screw connection

## PROFILE 45 X 135 1G

Part. N° 20.1078/0



### TECHN. DATA / ITEMS SUPPLIED

- lx =	359,242 cm <sup>4</sup>
- ly =	47,064 cm <sup>4</sup>
- wx =	20,618 cm <sup>3</sup>
- wy =	53,221 cm <sup>3</sup>
- Weight	5,57 kg/m
- Length	6 m
- Packing unit	12 m

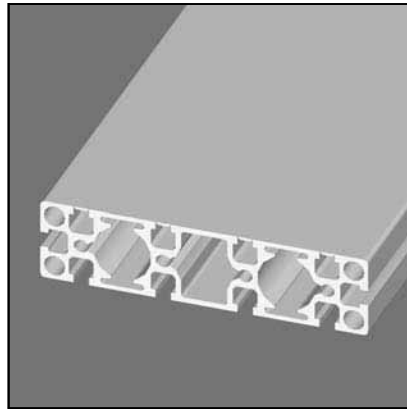
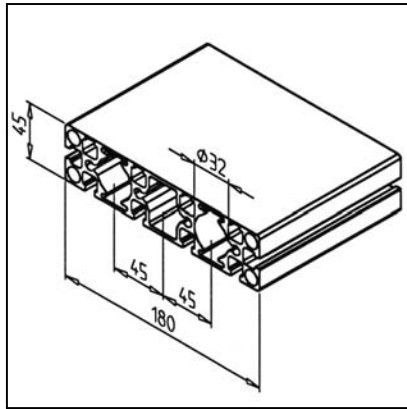
### APPLICATIONS

- General engineering structures, particularly for use in the food industry, in medical engineering and for the filling of beverages, where strict hygienic standards are set
- Linear guiding
- Central bore Ø 32 mm for ball-bushings LME 20, for ball-bearings 6201 or 6002, for compressed air piping or guiding of hydraulic add-in cylinders

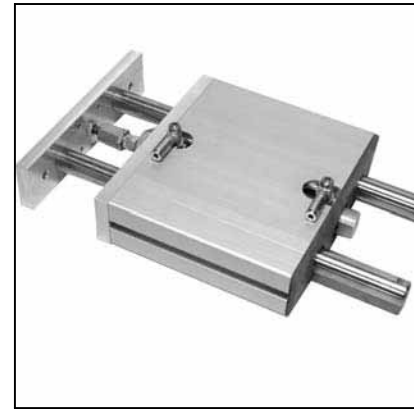
### ASSEMBLY

- MiniTec power-lock fastener
- 3 closed grooves can be opened up to the desired length, by means of the tear-off lever **Part N° 26.0815/0**

## PROFILE 45 X 180 1G



Part. N° 20.1079/0



### TECHN. DATA / ITEMS SUPPLIED

- Ix =	810,885 cm <sup>4</sup>
- Iy =	61,015 cm <sup>4</sup>
- wx =	90,097 cm <sup>3</sup>
- wy =	26,704 cm <sup>3</sup>
- Weight	6,954 kg/m
- Length	6 m
- Packing unit	12 m

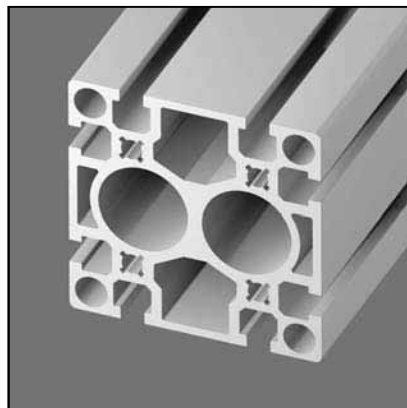
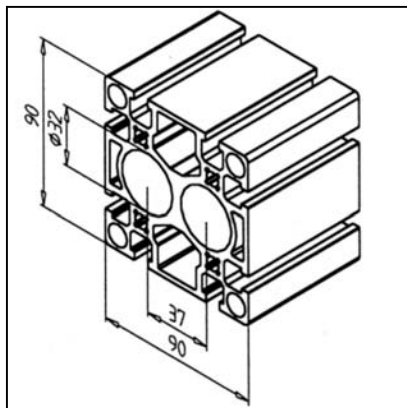
### APPLICATIONS

- General engineering structures, particularly for use in the food industry, in medical engineering and for the filling of beverages, where strict hygienic standards are set
- Linear guiding
- Central bore Ø 32 mm for ball-bushings LME 20, for ball-bearings 6201 or 6002, for compressed air piping or guiding of hydraulic add-in cylinders

### ASSEMBLY

- MiniTec power-lock fastener
- 4 closed grooves can be opened up to the desired length, by means of the tear-off lever **Part N° 26.0815/0**

## PROFILE 90 X 90 S



Part. N° 20.1019/0



### TECHN. DATA / ITEMS SUPPLIED

- Ix =	223,949 cm <sup>4</sup>
- Iy =	208,888 cm <sup>4</sup>
- wx =	49,766 cm <sup>3</sup>
- wy =	46,419 cm <sup>3</sup>
- Weight	7,514 kg/m
- Length	6 m
- Packing unit	12 m

### APPLICATIONS

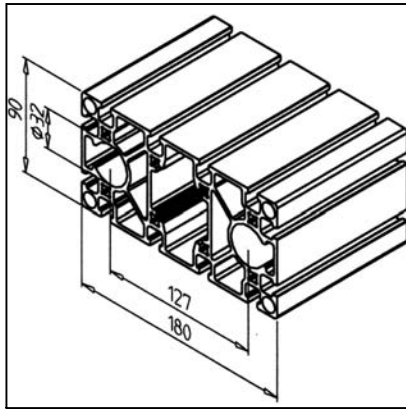
- Universal for general heavy duty constructions
- Linear guiding
- Central bore Ø 32 mm for ball-bushings LME 20, for ball-bearings 6201 or 6002, for compressed air piping or guiding of hydraulic add-in cylinders

### ASSEMBLY

- MiniTec power-lock fastener
- Angle 45 or 90
- Screw connection

## PROFILE 90 X 180 S

Part. N° 20.1013/0



### TECHN. DATA / ITEMS SUPPLIED

- lx =	1421,865	cm <sup>4</sup>
- ly =	376,784	cm <sup>4</sup>
- wx =	157,983	cm <sup>3</sup>
- wy =	83,729	cm <sup>3</sup>
- Weight	11,482	kg/m
- Length	6	m
- Packing unit	6	m

### APPLICATIONS

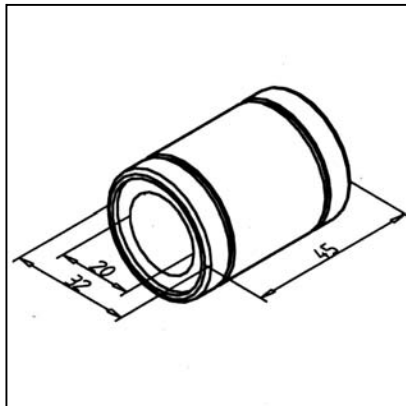
- Universal for general heavy duty constructions
- Linear guiding LB as slide
- Central bore Ø 32 mm for ball-bushings LME 20, for ball-bearings 6201 or 6002, for compressed air piping or guiding of hydraulic add-in cylinders

### ASSEMBLY

- MiniTec power-lock fastener
- Angle 45 or 90
- Screw connection

## BALL BUSHING LME 20 UU

Part. N° 10.1745/0



### TECHN. DATA / ITEMS SUPPLIED

- Housing	100	Cr6
-	2	integrated sealing rings, heat resistant up to 110°C, for higher temperatures up to 180°C use ball bushing with steel cage
- Load:		
- dyn. C =	880	N
- stat. C° =	1.40	N
- Weight	0,075	kg

### APPLICATIONS

- Precision linear guides
- Linear slide system LB
- Lifting-tables
- Quattro-units

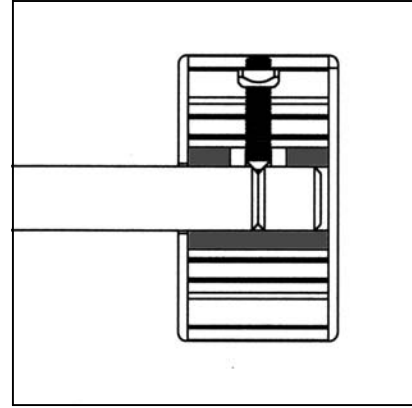
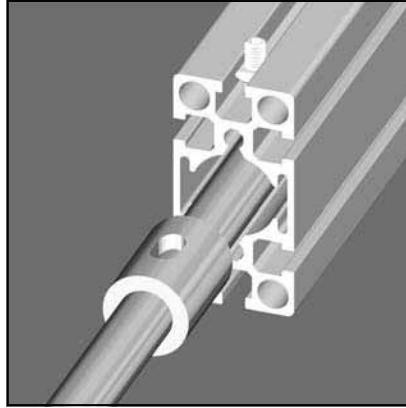
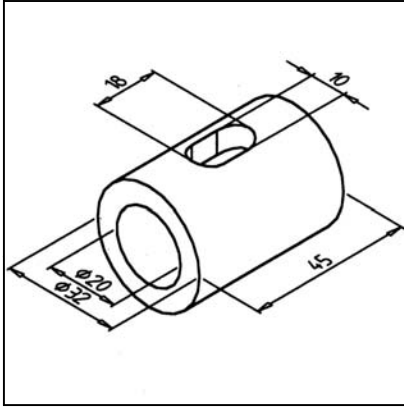
### ASSEMBLY

- Push in bore 32 of the profile
- Axial securing with housing adhesive



## CENTERING BUSH

Part. N° 28.0146/0



### TECHN. DATA / ITEMS SUPPLIED

- Aluminium, natural
- Weight 0,067 kg

### APPLICATIONS

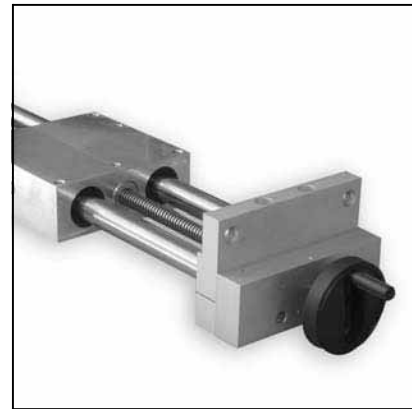
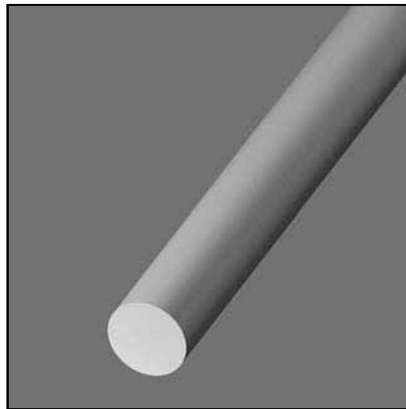
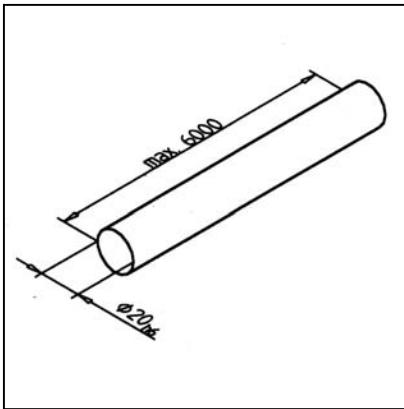
- Central clamping of shafts for all shaft supporting blocks of the MiniTec-linear system LB

### ASSEMBLY

- Insert centering bush in bore  $\varnothing$  32 mm
- Insert shaft
- Attachment with set screw M8 x 35

## SHAFT 20

Part. N° 17.1744/0



### TECHN. DATA / ITEMS SUPPLIED

- Cf53, inductive hardened 60 +5 HRC ground h6
- Weight 2,466 kg/m
- Length 6 m

### APPLICATIONS

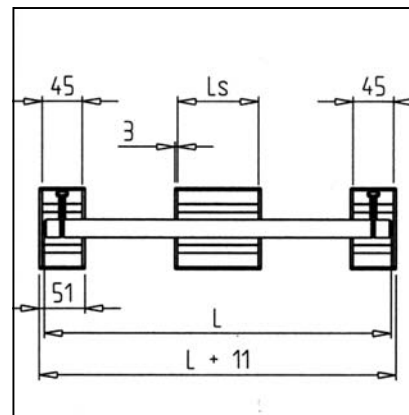
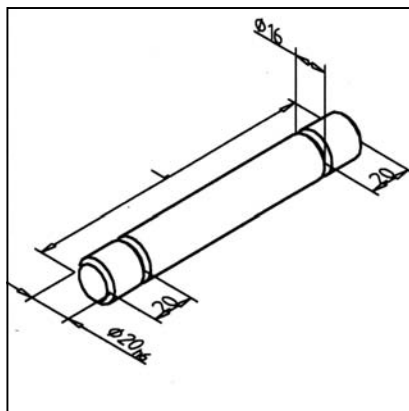
- Linear guide system LB

### ASSEMBLY

- With centering bush in shaft support block

## SHAFT 20 FOR LB-SYSTEM

Part. N° 28.0154/0



### TECHN. DATA / ITEMS SUPPLIED

- Steel Cf53, inductive hardened 60 +5 HRC grinded
- Tolerance h6
- Processed for shaft support block WB
- Weight 0,067 kg/m
- Please indicate measure L

### APPLICATIONS

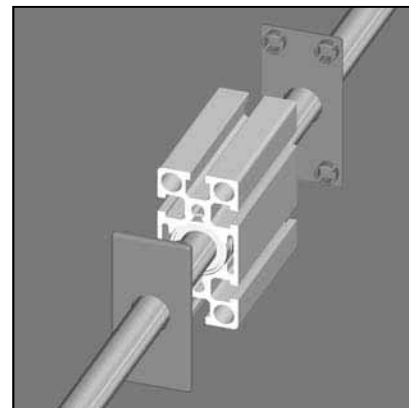
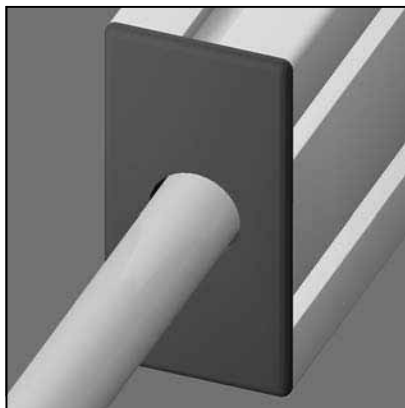
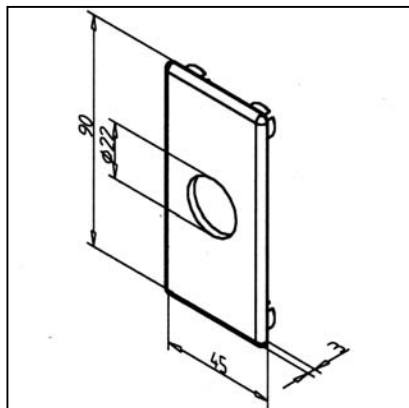
- MiniTec linear guides LB
- In each direction usable

### ASSEMBLY

- Insert in shaft support
- Clamp with set screw M8 x 35

## END CAP LB 45

Part. N° 28.0094/1



### TECHN. DATA / ITEMS SUPPLIED

- ABS, non-aging and oil resistant, grey
- On request also deliverable in black
- 1 centric bore  $\varnothing$  22 mm
- Weight 0,095 kg/m

### APPLICATIONS

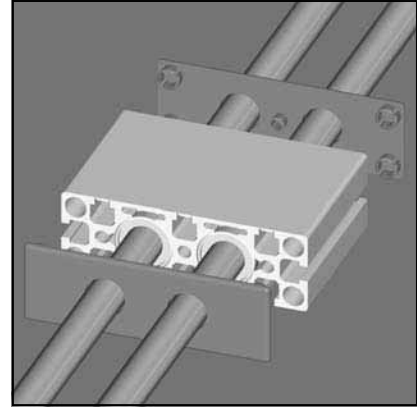
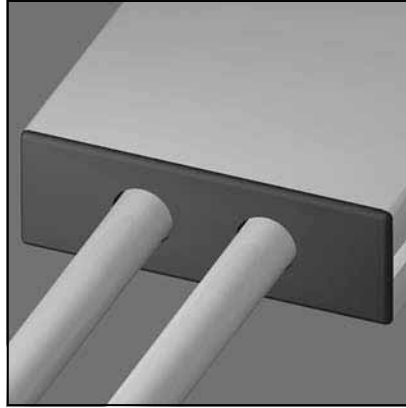
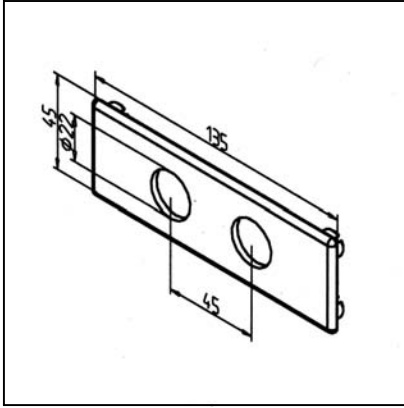
- Face covering of linear slides LB 45
- Face covering of shaft support block WB 45 (shaft side)

### ASSEMBLY

- Press into profile bores

## END CAP LB 45 X 135

Part. N° 28.0101/1



### TECHN. DATA / ITEMS SUPPLIED

- ABS, non-aging and oil resistant, grey
- On request also deliverable in black
- 2 bores Ø 22 mm
- Weight 0,017 kg

### APPLICATIONS

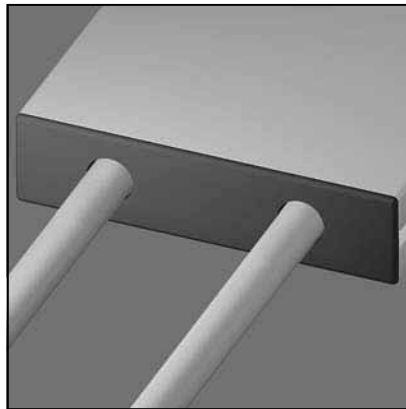
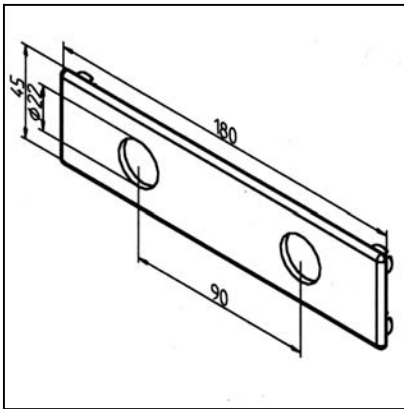
- Face covering of linear slides LB 45 x 135
- Face covering of shaft support blocks WB 45 x 135

### ASSEMBLY

- Press into profile bores

## END CAP LB 45 X 180

Part. N° 28.0102/1



### TECHN. DATA / ITEMS SUPPLIED

- ABS, non-aging and oil resistant, grey
- On request also deliverable in black
- 2 bores Ø 22 mm
- Weight 0,02 kg

### APPLICATIONS

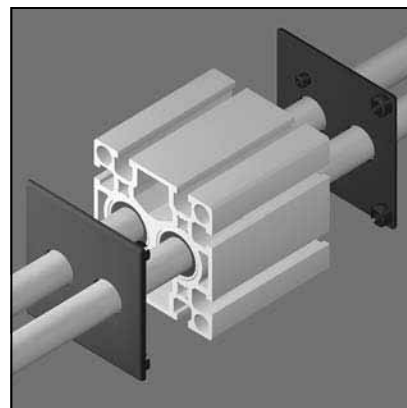
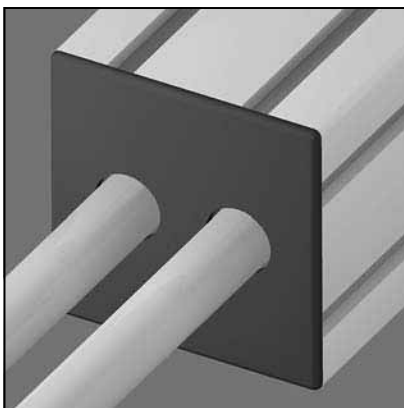
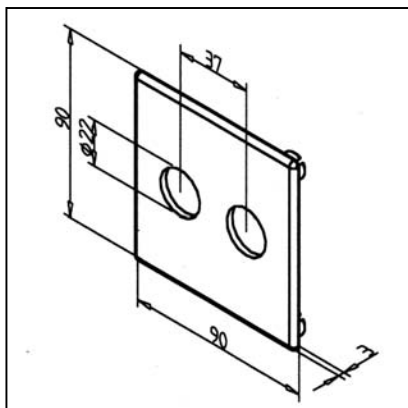
- Face covering of linear slides LB 45 x 180
- Face covering of shaft support blocks WB 45 x 180

### ASSEMBLY

- Press into profile bores

## END CAP LB 90

Part. N° 28.0095/1



### TECHN. DATA / ITEMS SUPPLIED

- ABS, non-aging and oil resistant, grey
- On request also deliverable in black
- 2 bores Ø 22 mm
- Weight 0,0165 kg

### APPLICATIONS

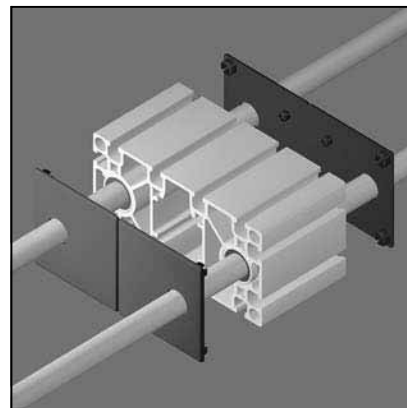
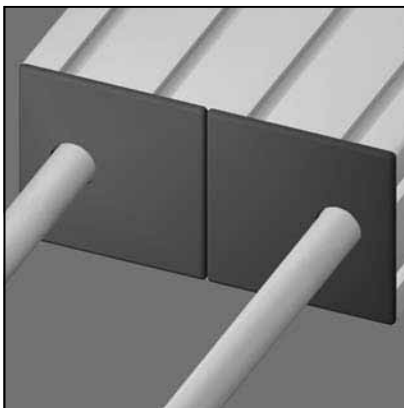
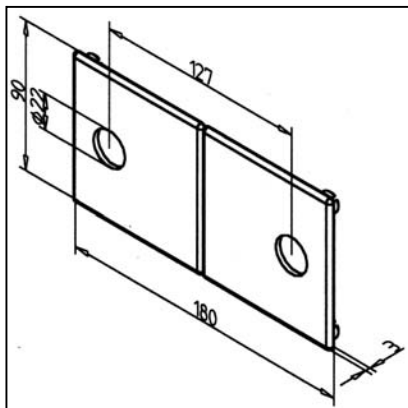
- Face covering of linear slides LB 90
- Face covering of shaft support blocks WB 90

### ASSEMBLY

- Press into profile bores

## END CAP LB 180

Part. N° 28.0103/1



### TECHN. DATA / ITEMS SUPPLIED

- ABS, non-aging and oil resistant, grey
- On request also deliverable in black
- 2 bores Ø 22 mm
- Weight 0,037 kg

### APPLICATIONS

- Face covering of linear slides LB 180
- Face covering of shaft support blocks WB 180

### ASSEMBLY

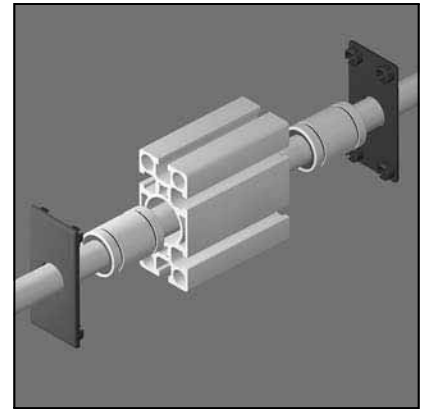
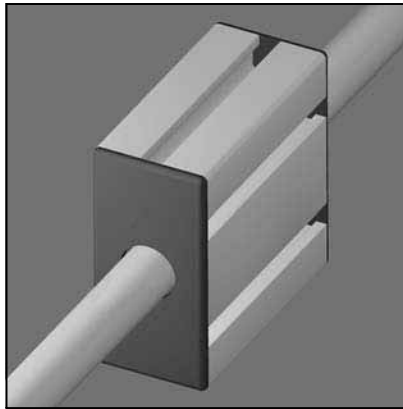
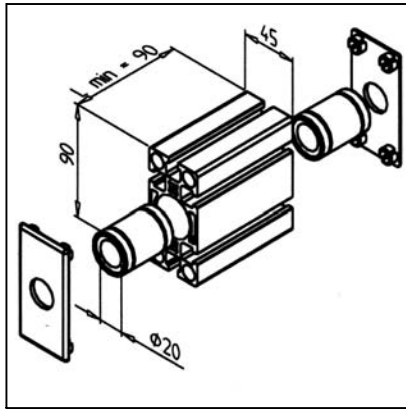
- Press into profile bores



SYSTEM LB -  
READY FOR USE  
MODULES LB

## SLIDE LB 45

Part. N° 28.0150/0



### TECHN. DATA / ITEMS SUPPLIED

- Profile 45 x 90 S
- Completely assembled with 2 ball bushings LME 20 UU
- Profile face covered with end caps LB 45, grey
- Weight 0,55 kg
- Other length on request

### APPLICATIONS

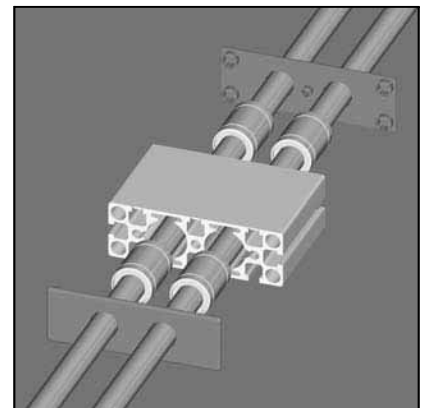
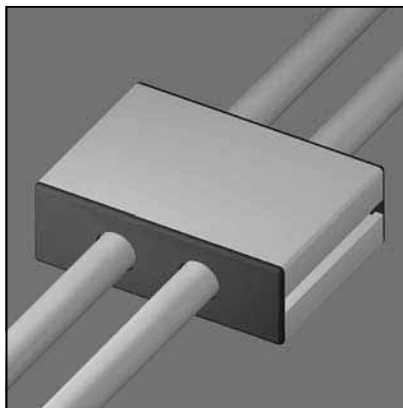
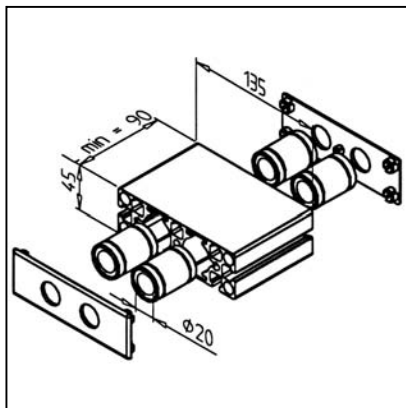
- All MiniTec linear systems LB

### ASSEMBLY

- Lead shaft through slide

## SLIDE LB 45 X 135

Part. N° 28.0155/0



### TECHN. DATA / ITEMS SUPPLIED

- Profile 45 x 135
- Completely assembled with 2 ball bushings LME 20 UU
- Profile face covered with end caps LB 45 x 135, grey
- Weight 0,865 kg
- Other length on request

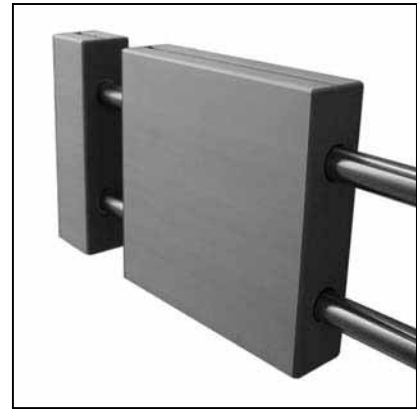
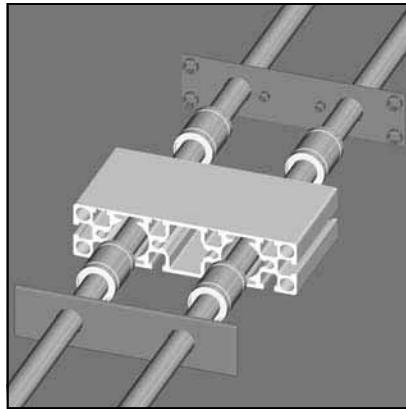
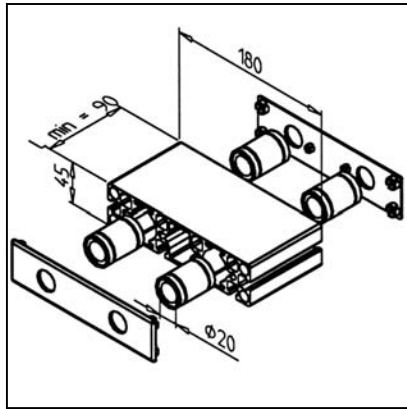
### APPLICATIONS

- All MiniTec linear systems LB

### ASSEMBLY

- Lead shaft through slide

## SLIDE LB 45 X 180



Part. N° 28.0156/0

### TECHN. DATA / ITEMS SUPPLIED

- Profile 45 x 180
- Completely assembled with 2 ball bushings LME 20 UU
- Profile face covered with end caps LB 45 x 180, grey
- Weight 1,007 kg
- Other length on request

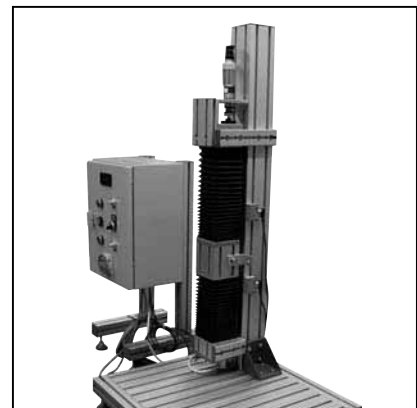
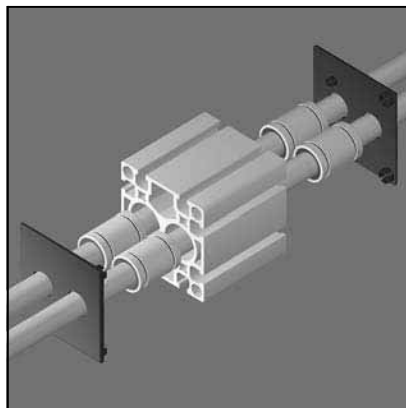
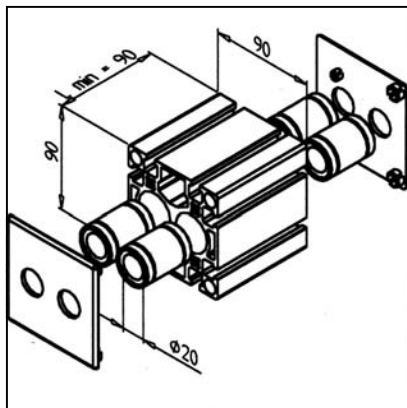
### APPLICATIONS

- All MiniTec linear systems LB

### ASSEMBLY

- Lead shaft through slide

## SLIDE LB 90



Part. N° 28.0152/0

### TECHN. DATA / ITEMS SUPPLIED

- Profile 90 x 90 S
- Completely assembled with 4 ball bushings LME 20 UU
- Profile face covered with end caps LB 90, grey
- Weight 0,55 kg
- Other length on request

### APPLICATIONS

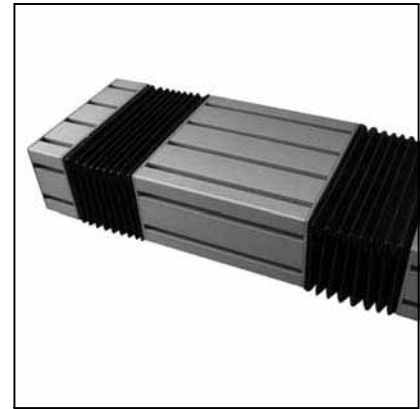
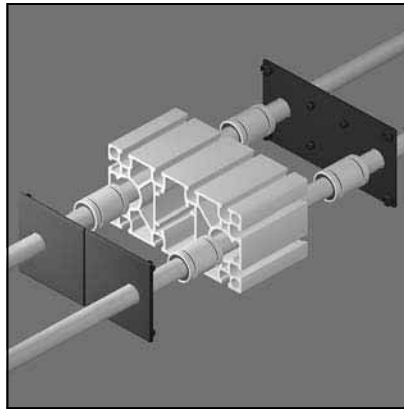
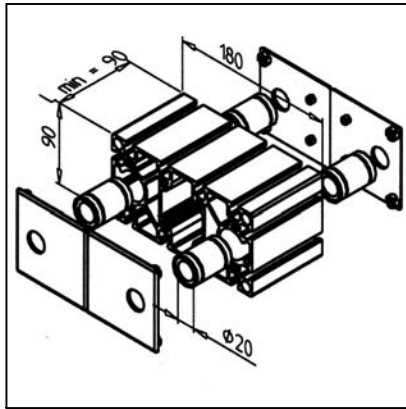
- All MiniTec linear systems LB

### ASSEMBLY

- Lead shaft through slide

## SLIDE LB 180

Part. N° 28.0143/0



### TECHN. DATA / ITEMS SUPPLIED

- Profile 90 x 180 S
- Completely assembled with 4 ball bushings LME 20 UU
- Profile face covered with end caps LB 180, grey
- Weight 1,35 kg
- Other length on request

### APPLICATIONS

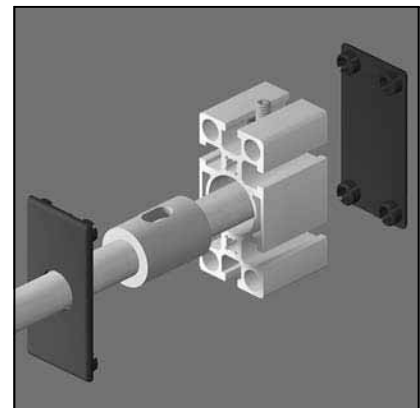
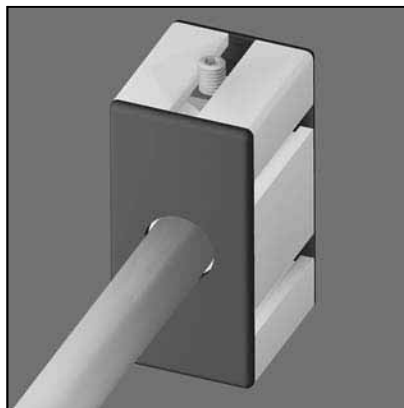
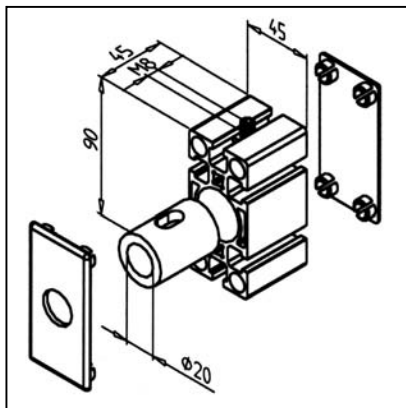
- All MiniTec linear systems LB

### ASSEMBLY

- Lead shaft through slide

## SHAFT SUPPORT BLOCK WB 45

Part. N° 28.0151/0



### TECHN. DATA / ITEMS SUPPLIED

- Profile 45 x 90 S
- Completely assembled with centering bush
- Shaft side with end cap LB 45, grey
- Outer side with end cap 45 x 90, grey
- Weight 0,21 kg

### APPLICATIONS

- Fastening shafts Ø 20 in MiniTec linear systems LB 45

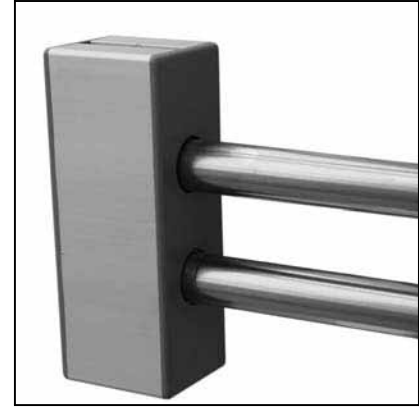
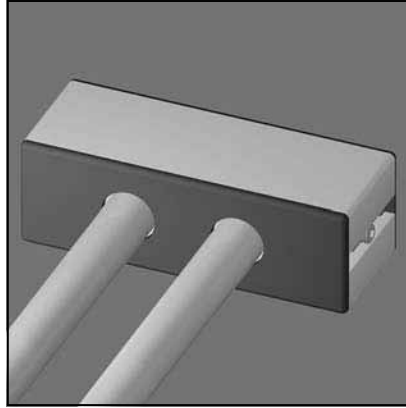
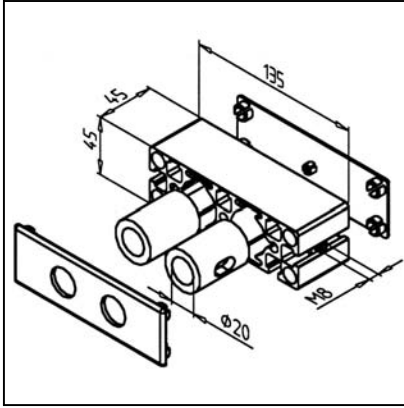
### ASSEMBLY

- Insert shaft
- Tighten with set screw M8 x 35



## SHAFT SUPPORT BLOCK WB 45 X 135

Part. N° 28.0157/0



### TECHN. DATA / ITEMS SUPPLIED

- Profile 45 x 135
- Completely assembled with centering bush
- Shaft side with end cap LB 45 x 135, grey
- Outer side with end cap 45 x 135, grey
- Weight 0,432 kg

### APPLICATIONS

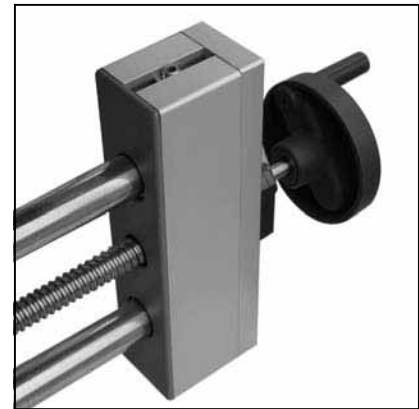
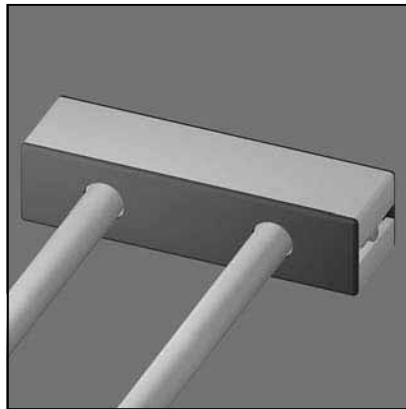
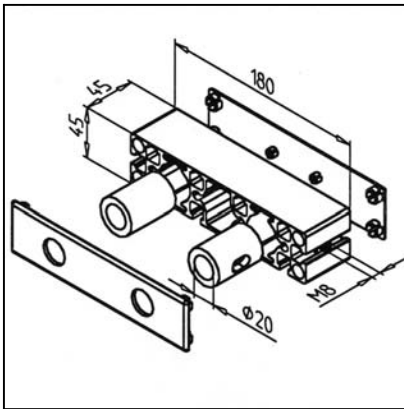
- Fastening shafts Ø 20 in MiniTec linear systems LB 45

### ASSEMBLY

- Insert shaft
- Tighten with set screw M8 x 35

## SHAFT SUPPORT BLOCK WB 45 X 180

Part. N° 28.0159/0



### TECHN. DATA / ITEMS SUPPLIED

- Profile 45 x 180
- Completely assembled with centering bush
- Shaft side with end cap LB 45 x 180, grey
- Outer side with end cap 45 x 180, grey
- Weight 0,416 kg

### APPLICATIONS

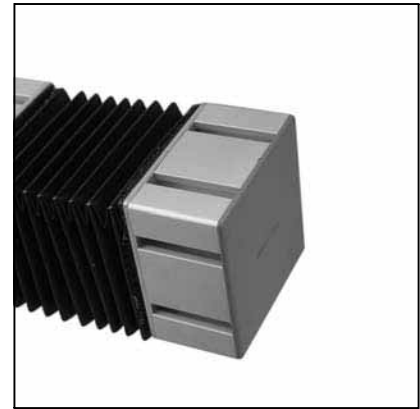
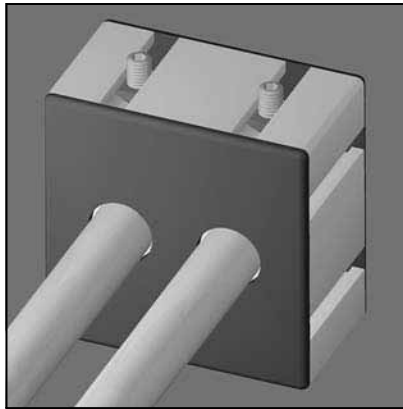
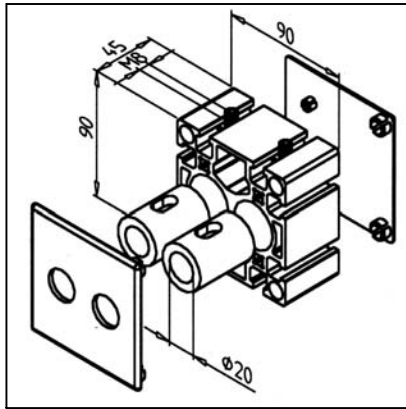
- Fastening shafts Ø 20 in MiniTec linear systems LB 45

### ASSEMBLY

- Insert shaft
- Tighten with set screw M8 x 35

## SHAFT SUPPORT BLOCK WB 90

Part. N° 28.0153/0



### TECHN. DATA / ITEMS SUPPLIED

- Profile 90 x 90 S
- Completely assembled with 2 centering bush
- Shaft side with end cap LB 90, grey
- Outer side with end cap 90 x 90, grey
- Weight 0,41 kg

### APPLICATIONS

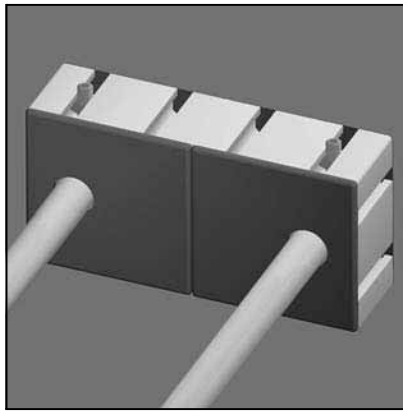
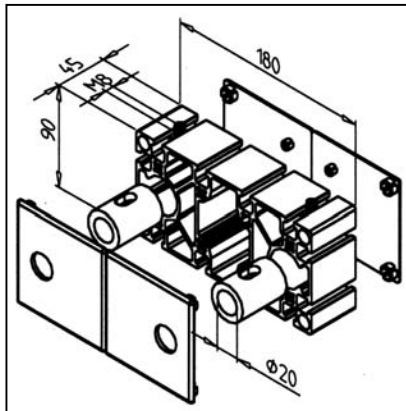
- Fastening shafts Ø 20 in MiniTec linear systems LB 90

### ASSEMBLY

- Insert shaft
- Tighten with set screw M8 x 35

## SHAFT SUPPORT BLOCK WB 180

Part. N° 28.0144/0



### TECHN. DATA / ITEMS SUPPLIED

- Profile 90 x 180 S
- Completely assembled with 2 centering bush
- Shaft side with end cap LB 180, grey
- Outer side with 2 end cap 90 x 90, grey
- Weight 0,65 kg

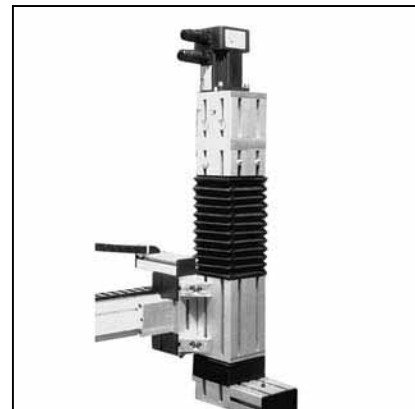
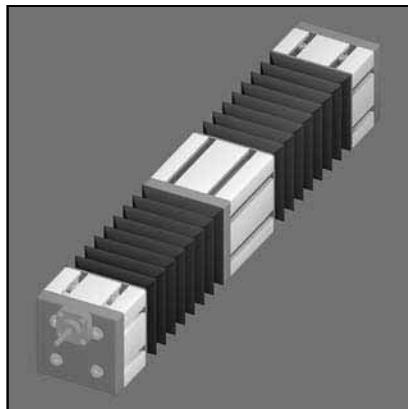
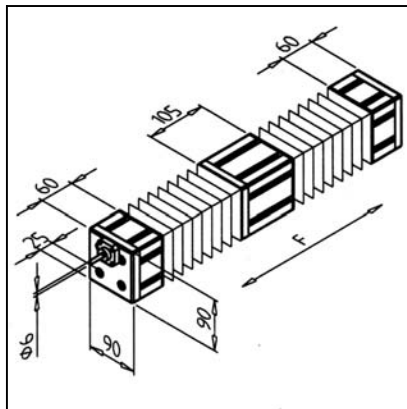
### APPLICATIONS

- Fastening shafts Ø 20 in MiniTec linear systems LB 180

### ASSEMBLY

- Insert shaft
- Tighten with set screw M8 x 35

## LINEAR MODULE LB 90



Part. N° 28.0178/0

### TECHN. DATA / ITEMS SUPPLIED

- Linear module made of profile 90 x 90; ready for use
- Drive unit with rolled circulating ball spindle RNCT 1003 Ø 10 mm, incline 3
- Incline fault / 300: 12 µm (class C3)
- Slide guidance on 4 linear ball bearings with hardened ground precision shafts Ø 20 mm, total length 760 mm

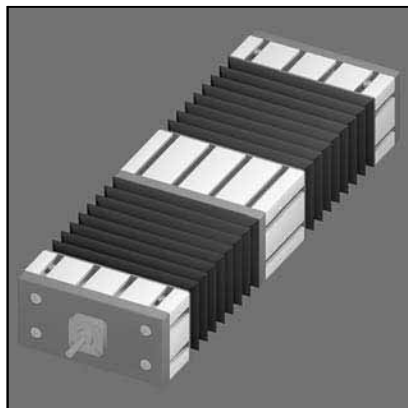
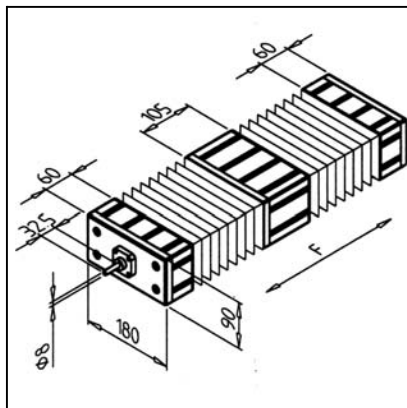
### TECHN. DATA / ITEM SUPPLIED

- Shaft end processed at fixed bearing side according to customer specification for motor and crank connection
- Shafts and spindles covered with protective bellows
- Positioning accuracy: ± 0,1 mm

### ASSEMBLY

- Handling systems
- Z-axis in portals
- Multiple axis systems
- Grabbing units

## LINEAR MODULE LB 180



Part. N° 28.0179/0

### MULTIPLE AXIS SYSTEMS

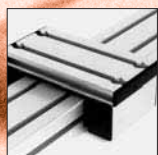
- Linear module made of profile 90 x 180; ready for use
- Drive unit with rolled circulated ball spindle RNCT 1404-3,4 Ø 14 mm, incline 4
- Incline fault / 300: 12 µm (class C3)
- Slide guidance on 4 linear ball bearings with hardened ground precision shafts Ø 20 mm, total length 950 mm

### TECHN. DATA / ITEM SUPPLIED

- Shaft end processed at fixed bearing side according to customer specification for motor and crank connection
- Shafts and spindles covered with protective bellows
- Positioning accuracy: ± 0,1 mm

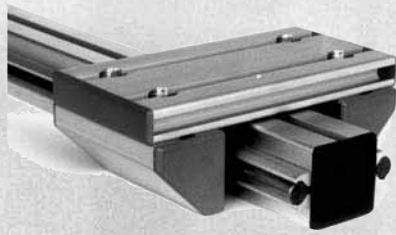
### APPLICATIONS

- Handling systems
- Z-axis in portals
- Multiple axis systems
- Grabbing units

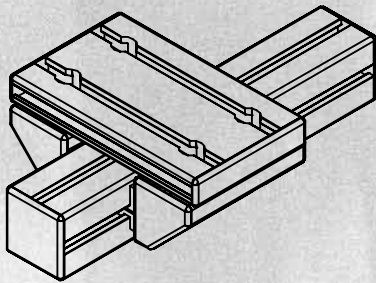


LINEAR SYSTEM LN/LG

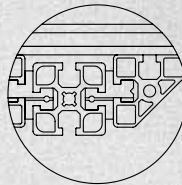
## SLIDEWAYS



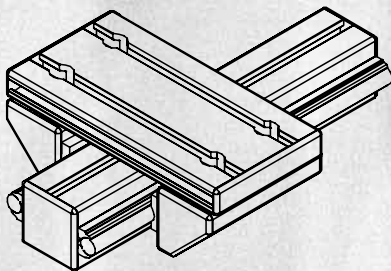
The LN/LG slide guides were built for applications where demands for guidance accuracy are not high but where extreme usage conditions are present. These guides are especially suitable for wet operation, high dust concentrations, and insufficient lubrication. The slides series LN/LG are constructed according to the same modular principle as series LR.



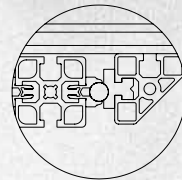
### Series LN:



Slide guidance in profile groove and on profile surface. This series requires little space.



### Series LG:



Slide guidance on ground and hardened shafts h6 made from material Cf53. For operation in humid environment we recommend the use of our stainless shafts.

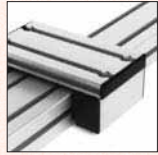
Accuracy: Series LG:  $\pm 0.15$  mm Series LN:  $\pm 0.20$  mm.  
The lateral guide rails can be used to adjust clearance.

Max. load: 50 N/cm supporting slide rail (= slide length)  
Slide friction coefficient: 0.05 on steel shaft (Series LG), 0.1 on anodized profile surface (Series LN)

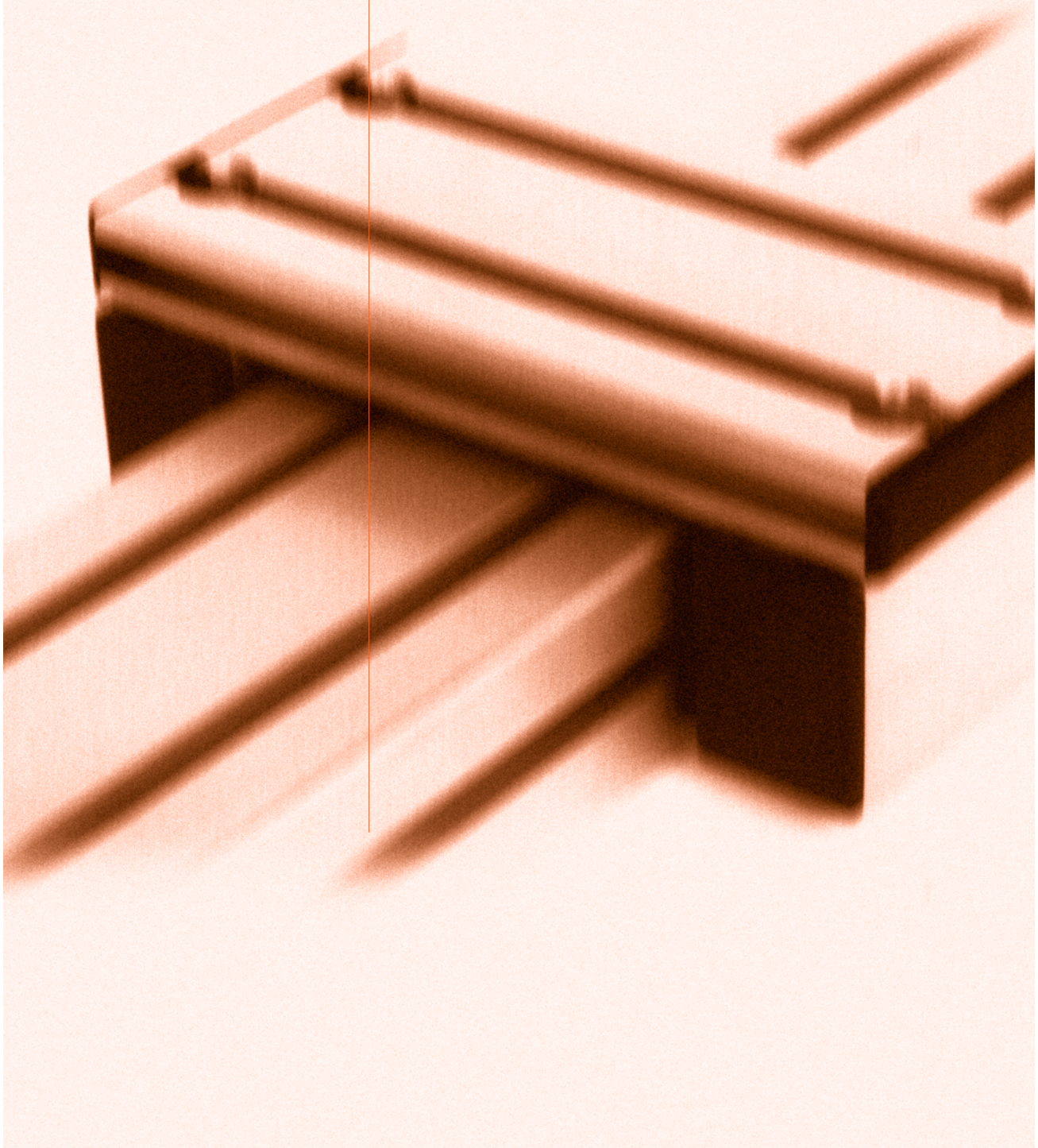
This bearing requires no lubrication. Please consider higher slip-stick effect.

Travel: 1 m/sec (max.)  
Average temperature: 50°C (max.)  
Peak load: 70°C (max.)

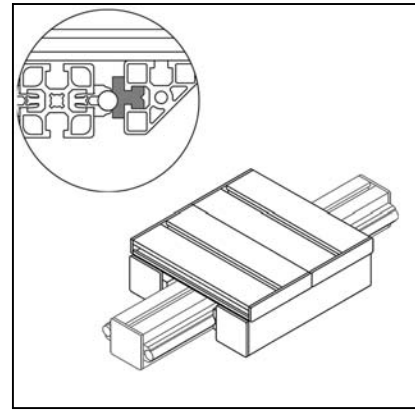
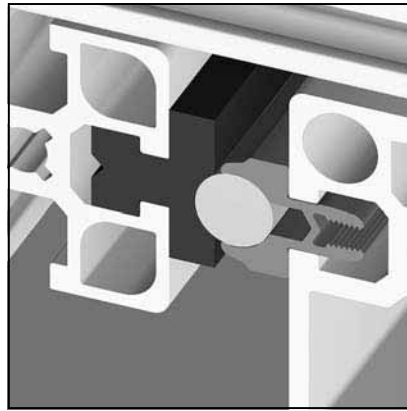
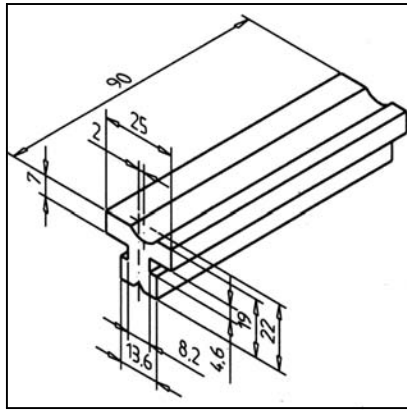
The slide rail is resistant to organic acids, alkalis, hydrous solutions, inorganic salt, organic acids and alcohol. They are not fully resistant to hydrocarbon and halogenated hydrocarbons.



COMPONENTS  
LG



## SLIDE RAIL LG



Part. N° 22.1094/0

### TECHN. DATA / ITEMS SUPPLIED

- Hard plastic PE-UHMW, black
- 2 set screws
- Max. surface pressure: 10 N/mm<sup>2</sup>
- Weight 0,032 kg

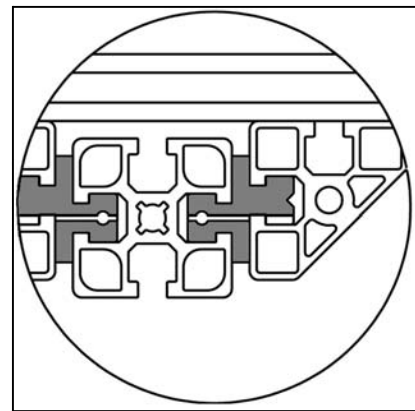
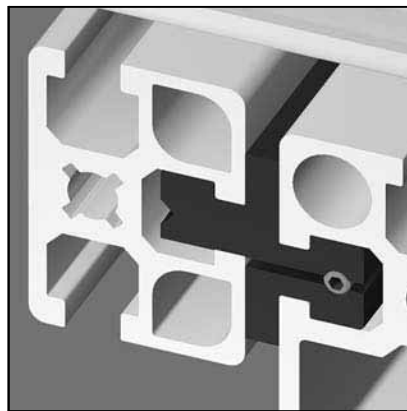
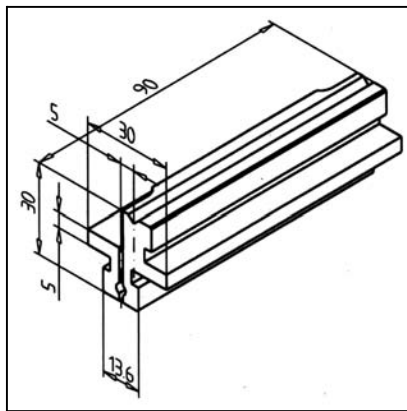
### APPLICATIONS

- Slide guides LG

### ASSEMBLY

- Insert into groove of lateral guide profile
- Secure with set screw

## SLIDE RAIL LN



Part. N° 22.1095/0

### TECHN. DATA / ITEMS SUPPLIED

- Hard plastic PE-UHMW, black
- Fixing kit
- Max. surface pressure: 10 N/mm<sup>2</sup>
- Weight 0,03 kg

### APPLICATIONS

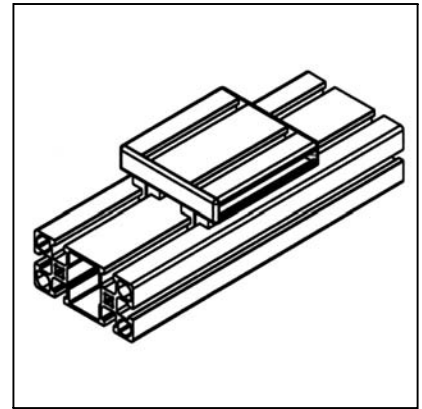
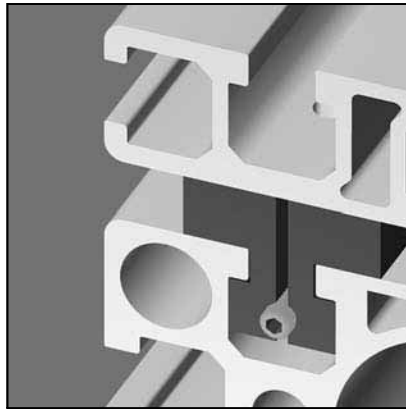
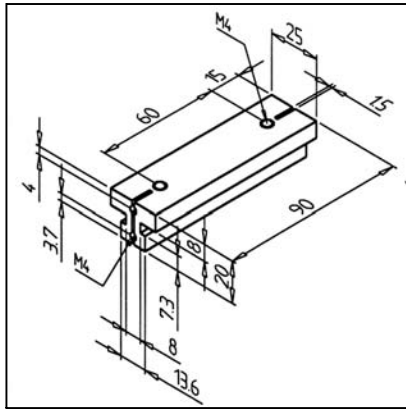
- Slide guides LN
- Adjusting units
- Heavy sliding doors
- Drawers

### ASSEMBLY

- Connect with slide plate
- Insert into grooves of the guide profile
- Adjust with clearance, use fixing kit

# SLIDE RAIL LN-S

Part. N° 22.1096/0



## TECHN. DATA / ITEMS SUPPLIED

- Hard plastic PE-UHMW, black
- 2 set screws M5 x 10
- Max. surface pressure: 10 N/mm<sup>2</sup>
- Weight 0,03 kg

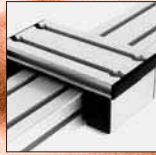
## APPLICATIONS

- Slide guides LN-S
- Adjusting units
- Automatic advance units
- Workpiece support

## ASSEMBLY

- Insert into profile groove
- Adjust with clearance
- Connect with slide plate

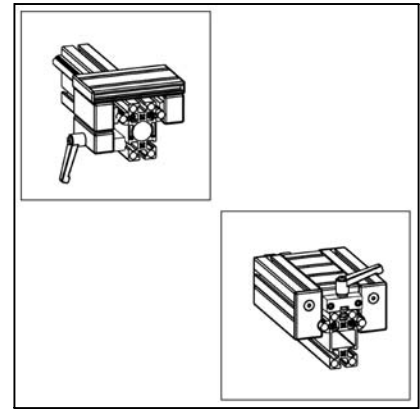
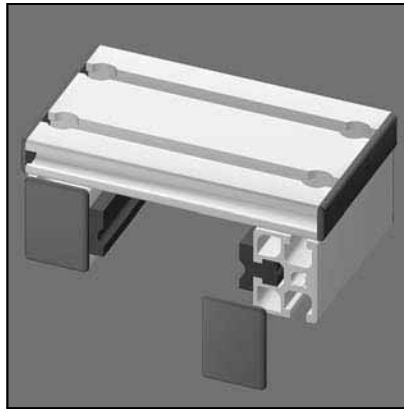
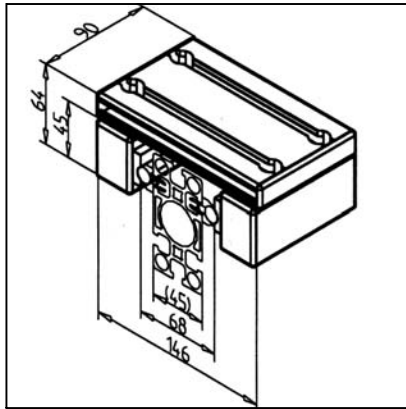




SYSTEM LN/LG -  
READY FOR USE  
MODULES LN/LG

## SLIDE LWG 32 X 45 - 45

Part. N° 28.0132/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 slide rails LG
- End caps
- Clearance adjusted
- Load max. 450 N
- Weight 0,726 kg

### APPLICATIONS

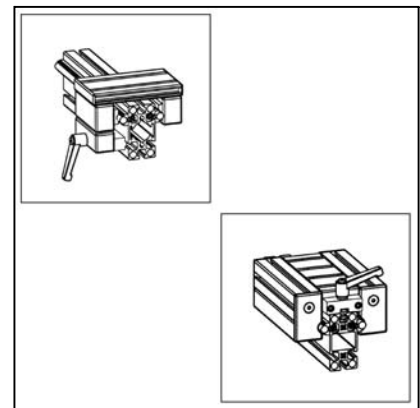
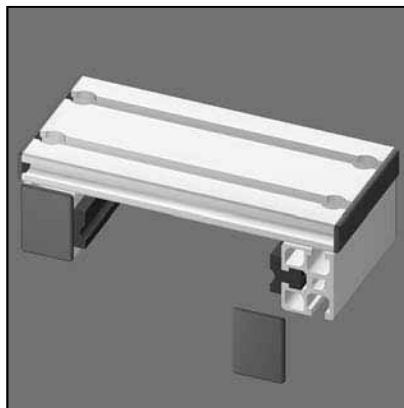
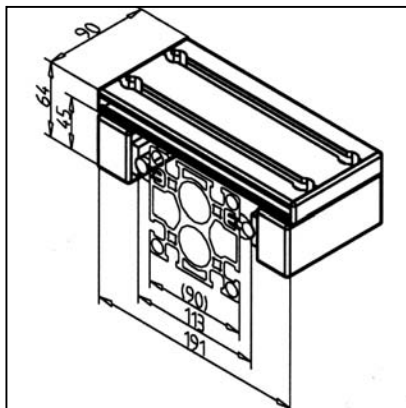
- Simple linear guides
- Automatic advance units
- Adjusting units

### SPECIAL DESIGNS

- With slide clamping unit (Top)  
Part N° 28.0132/1
- With slide clamping unit (Lateral)  
Part N° 28.0132/2
- Slide plate made of aluminium profile  
32 x 180
- Different slide lengths

## SLIDE LWG 32 X 45 - 90

Part. N° 28.0133/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 slide rails LG
- End caps
- Clearance adjusted
- Load max. 450 N
- Weight 0,81 kg

### APPLICATIONS

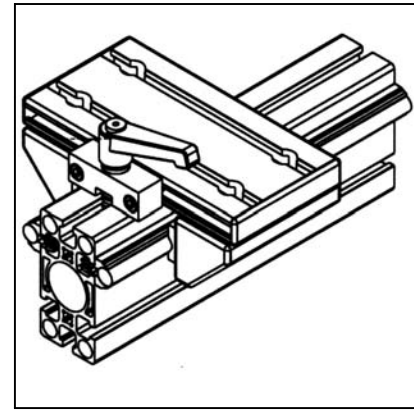
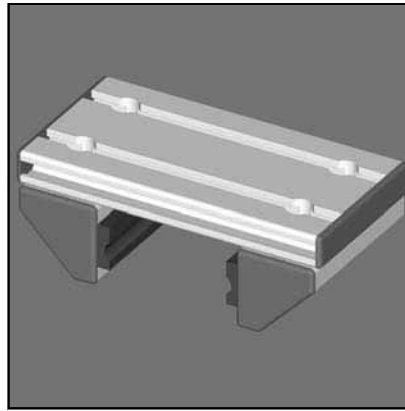
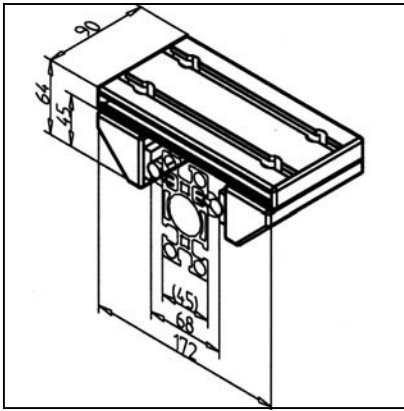
- Simple linear guides
- Automatic advance units
- Adjusting units

### SPECIAL DESIGNS

- With slide clamping unit (Top)  
Part N° 28.0133/1
- With slide clamping unit (Lateral)  
Part N° 28.0133/2
- Slide plate made of aluminium profile  
32 x 180
- Different slide lengths

## SLIDE LWG 45/45° - 45

Part. N° 28.0136/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 slide rails LG
- End caps
- Clearance adjusted
- Load max. 450 N
- Weight 0,759 kg

### APPLICATIONS

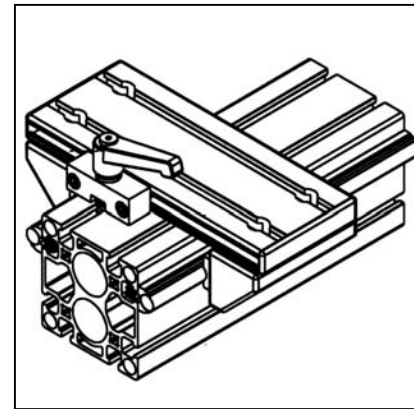
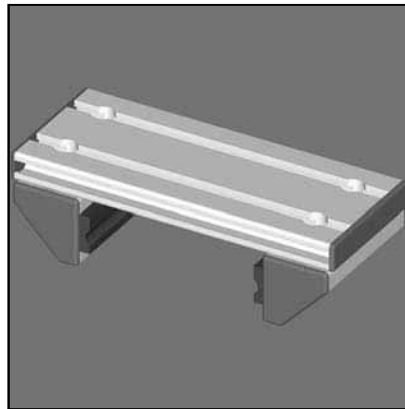
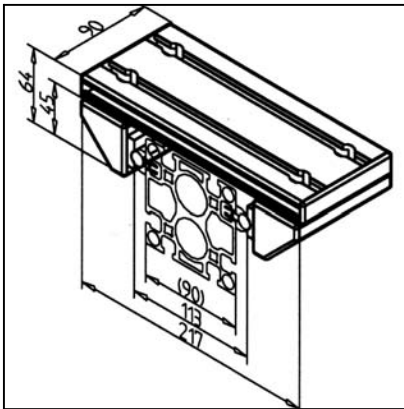
- Simple linear guides
- Automatic advance units

### SPECIAL DESIGNS

- With slide clamping unit (Top)  
Part N° 28.0136/1
- Slide plate made of aluminium profile 32 x 180
- Different slide lengths

## SLIDE LWG 45/45° - 90

Part. N° 28.0137/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 slide rails LG
- End caps
- Clearance adjusted
- Load max. 450 N
- Weight 0,849 kg

### APPLICATIONS

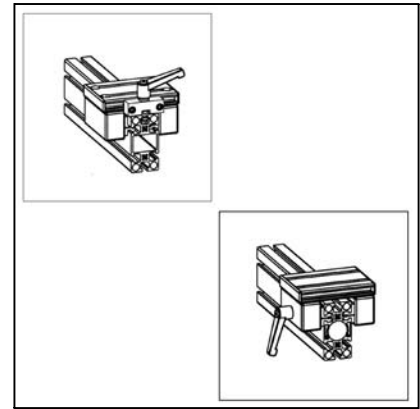
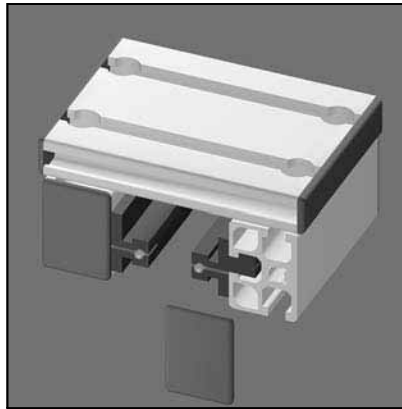
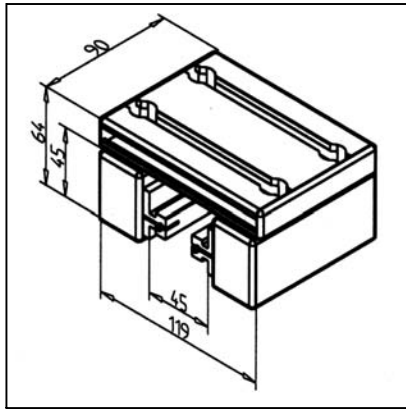
- Simple linear guides
- Automatic advance units

### SPECIAL DESIGNS

- With slide clamping unit (Top)  
Part N° 28.0137/1
- Slide plate made of aluminium profile 32 x 180
- Different slide lengths

## SLIDE LWN 32 X 45 - 45

Part. N° 28.0192/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 slide rails LN
- End caps
- Clearance adjusted
- Load max. 450 N
- Weight 0,678 kg

### APPLICATIONS

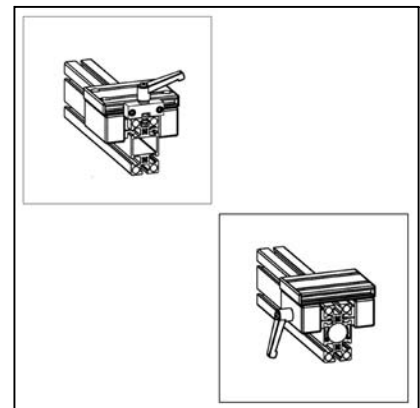
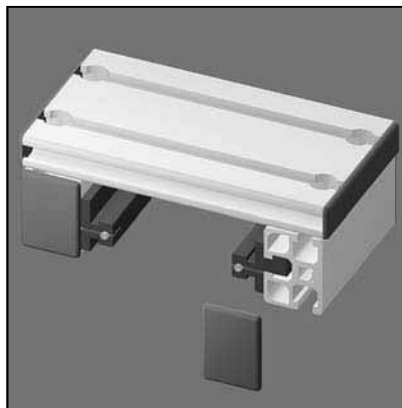
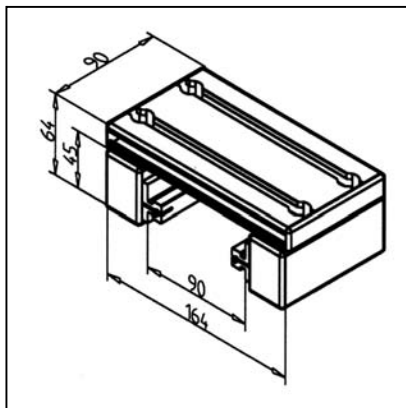
- Simple linear guides
- Automatic advance units

### SPECIAL DESIGNS

- With slide clamping unit (Top)  
Part N° 28.0192/1
- With slide clamping unit (Lateral)  
Part N° 28.0192/2
- Slide plate made of aluminium profile  
32 x 180
- Different slide lengths

## SLIDE LWN 32 X 45 - 90

Part. N° 28.0193/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 slide rails LN-S
- End caps
- Clearance adjusted
- Load max. 450 N
- Weight 0,762 kg

### APPLICATIONS

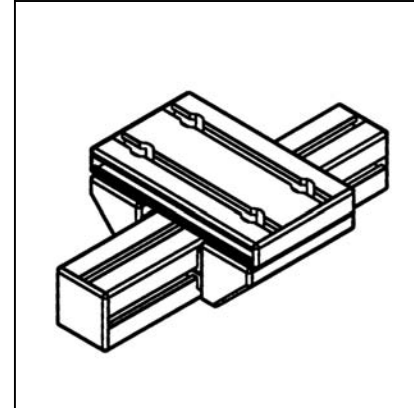
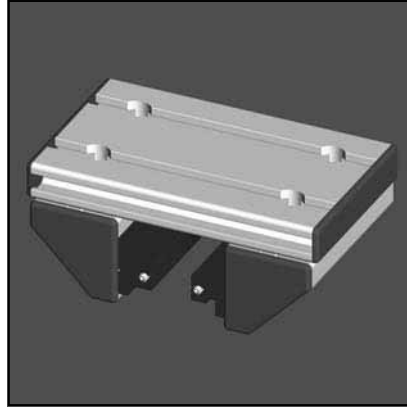
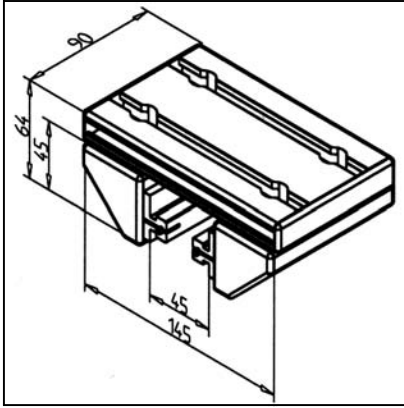
- Simple linear guides
- Automatic advance units

### SPECIAL DESIGNS

- With slide clamping unit (Top)  
Part N° 28.0193/1
- With slide clamping unit (Lateral)  
Part N° 28.0193/2
- Slide plate made of aluminium profile  
32 x 180
- Different slide lengths

## SLIDE LWN 45/45° - 45

Part. N° 28.0196/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 slide rails LN-S
- End caps
- Clearance adjusted
- Load max. 450 N
- Weight 0,717 kg

### APPLICATIONS

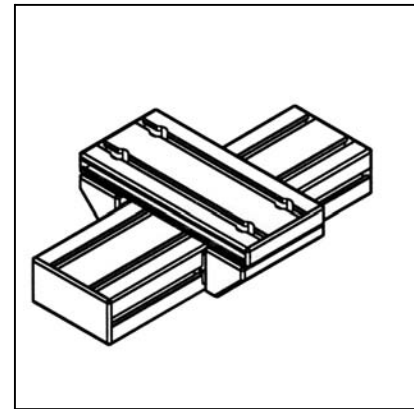
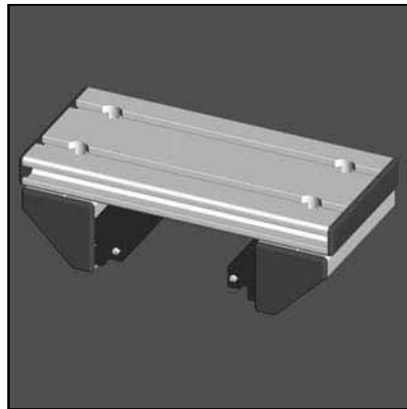
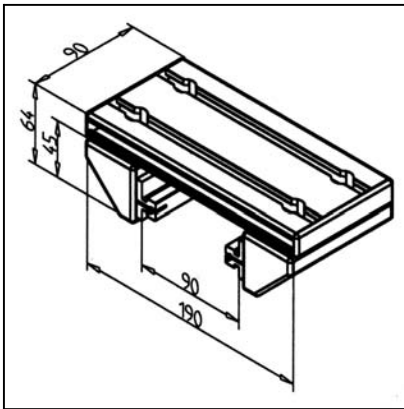
- Simple linear guides
- Automatic advance units

### SPECIAL DESIGNS

- With slide clamping unit (Top)  
Part N° 28.0196/1
- Slide plate made of aluminium profile  
32 x 180
- Different slide lengths

## SLIDE LWN 45/45° - 90

Part. N° 28.0197/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 slide rails LN-S
- End caps
- Clearance adjusted
- Load max. 450 N
- Weight 0,801 kg

### APPLICATIONS

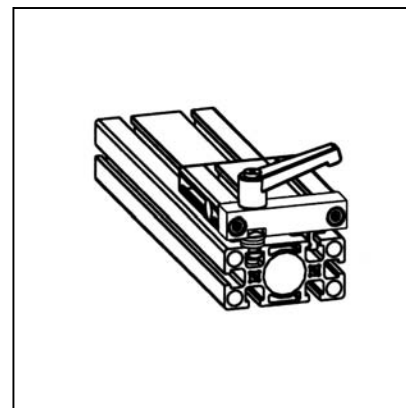
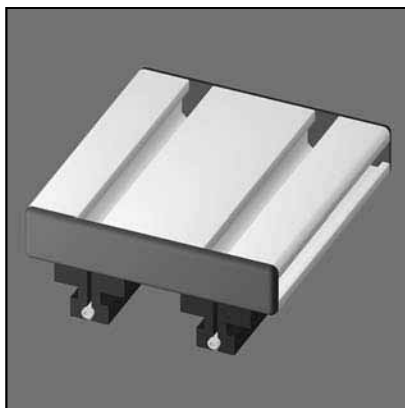
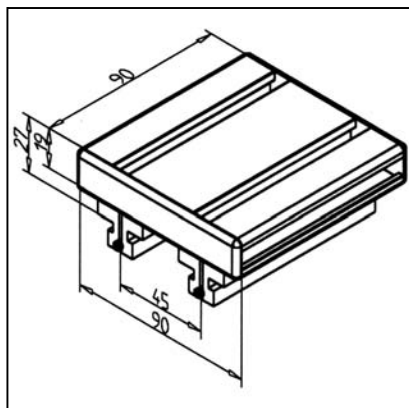
- Simple linear guides
- Automatic advance units

### SPECIAL DESIGNS

- With slide clamping unit (Top)  
Part N° 28.0197/1
- Slide plate made of aluminium profile  
32 x 180
- Different slide lengths

## SLIDE LWN-S

Part. N° 28.0170/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide completely assembled
- 2 slide rails LN-S
- End caps
- Clearance adjusted
- Load max. 450 N
- Weight 0,261 kg

### APPLICATIONS

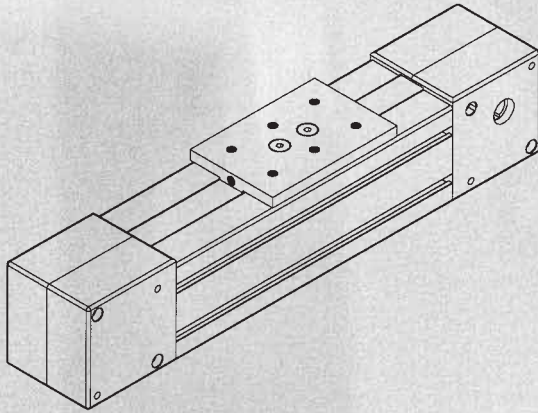
- Simple linear guides
- Automatic advance units

### SPECIAL DESIGNS

- With slide clamping unit (Top)  
Part N° 28.0170/1
- Slide plate made of aluminium profile  
32 x 180
- Different slide lengths

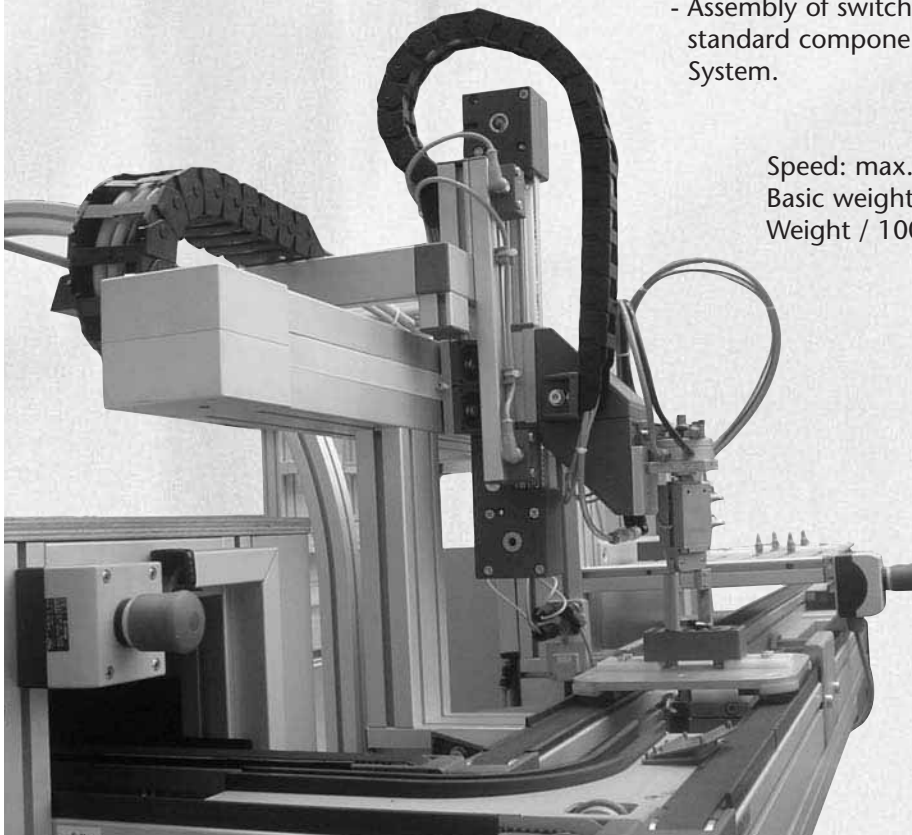
## LINEAR MODULE LMZ 90 WITH TIMING BELT

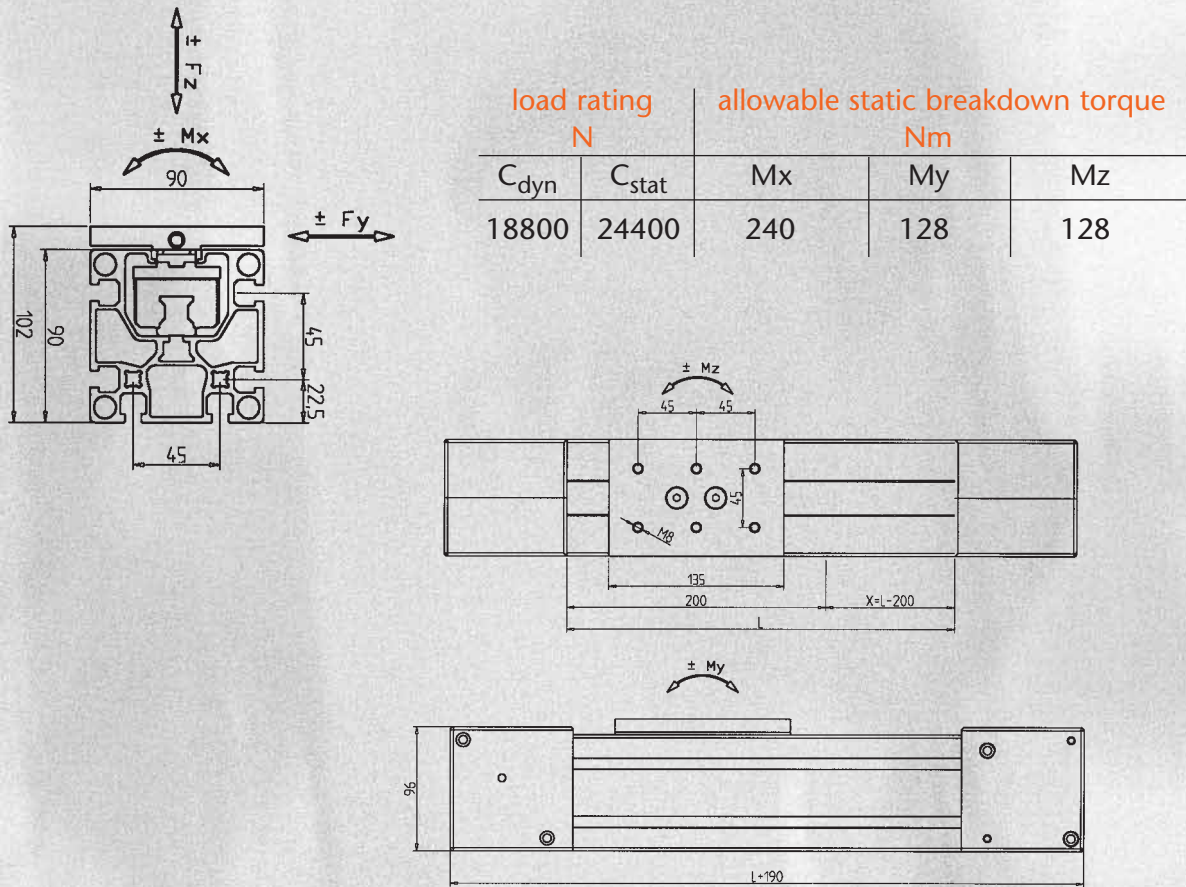
Part N° 28.0400/0



- Compact carrier profile with standard t-slots. Compatible to MiniTec construction profiles, anodized E6/EV1.
- Integrated rail guide
- With two slides, covered by timing belt.
- Permanent lubrication. Lubrication system for a service performance up to 10000 km
- Aluminium slide (processed on all sides) with integrated timing belt tensioner and 6 connection threads M8.
- 2 deflection units with precision ball bearings (mounted on carrier profile by using MiniTec powerlock fastener, prepared for built-on motors with connection shaft  $\varnothing$  17 mm and feather key. The adapter plate can be processed according to desired motor specifications.
- Infeed: 200 mm/revolution
- Max. allowable belt tractive force: 3.500 N
- Timing belt 25 AT 10, strengthened with steel wire. Mounted with preload.
- Max. traverse path  $X = 3.800$  mm
- Assembly of switches sideways on t-slots with standard components of the MiniTec Profile-System.

Speed: max. 3m/s  
 Basic weight: 5.200 g  
 Weight / 100mm traverse path: 800g



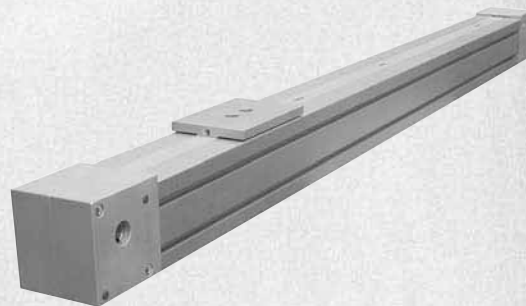


**Availabilities:**

- Module completely assembled with drive connection, but without drive
- Customized module completely assembled with gear and engine
- Customized module completely assembled with gear, engine and control system

**Application examples:**

- Pick-and-Place
- Robotic palletizer
- Measuring systems
- Feedings
- Handling systems

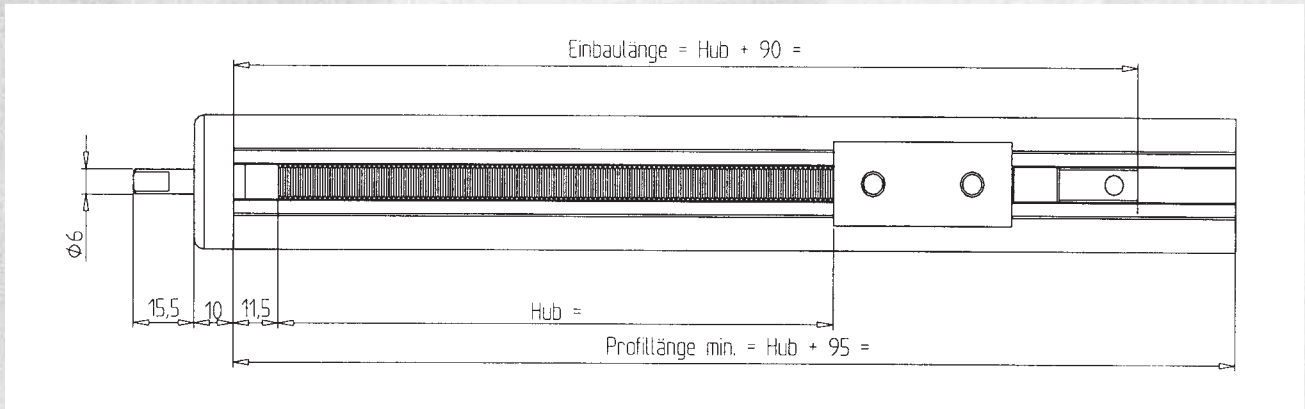


**Operating conditions:**

Please consider the the max. allowable deflection of 3,5 mm / 4000 mm for cantilever assemblies. To guarantee high stability, we recommend to support the module every 300 to 600mm (particularly for modules with a high dynamic load).

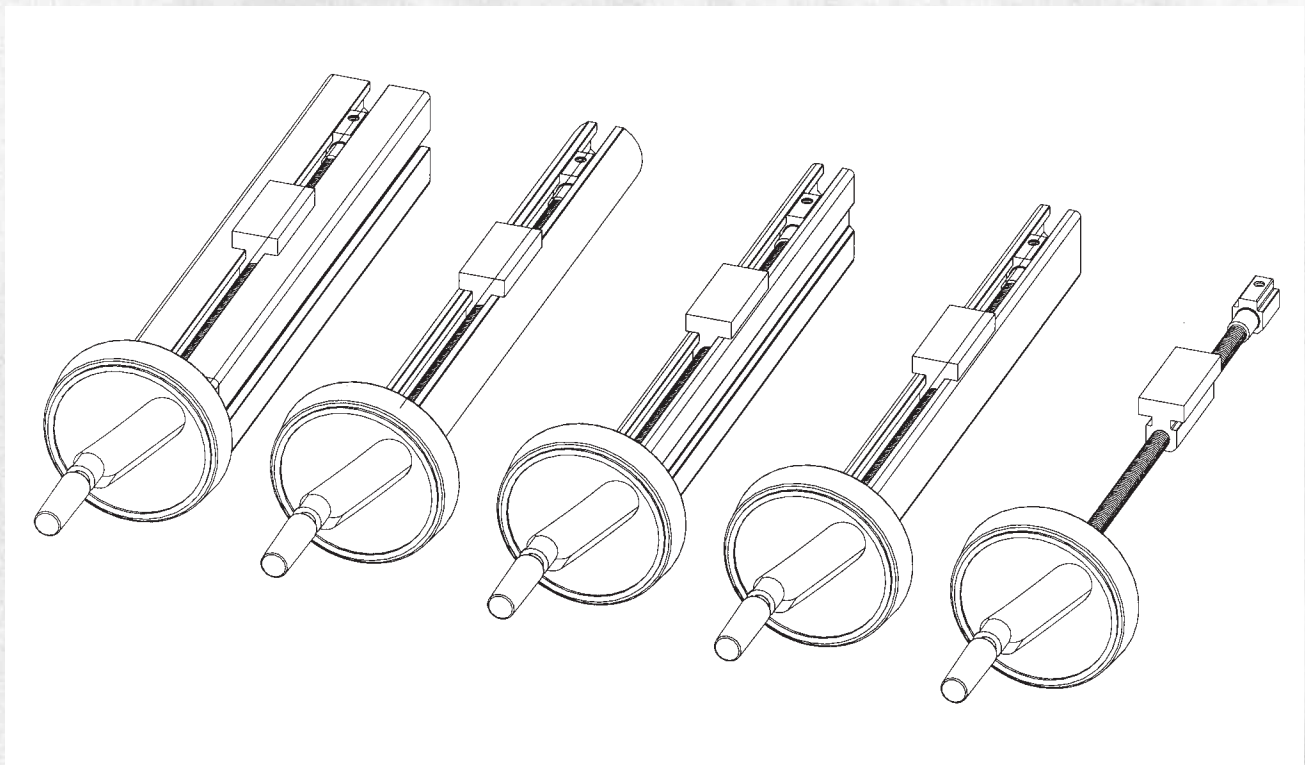


## MINI-ADJUSTMENT UNITS



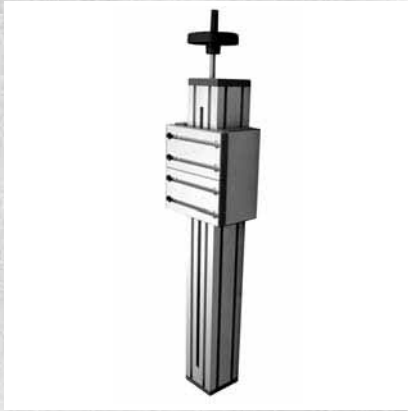
MiniTec mini-adjustment units are ready-to-install devices that are also mounted strictly in accordance with the modular construction principle as standard elements from our profile system. They are used in machine construction, packaging equipment, filling systems and testing equipment.

### Versions

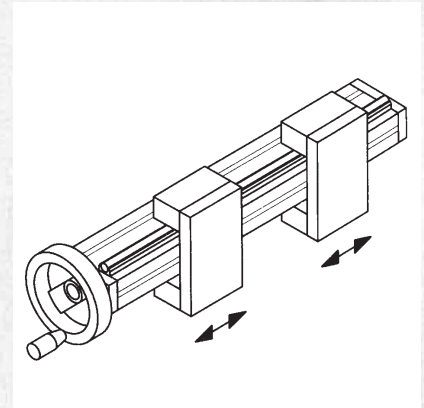
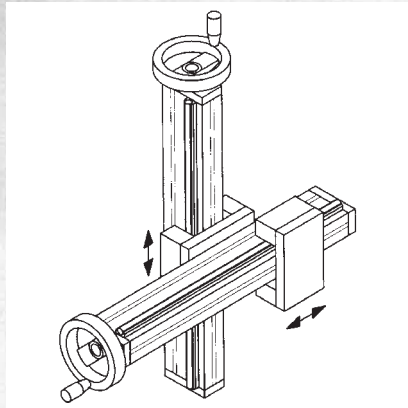
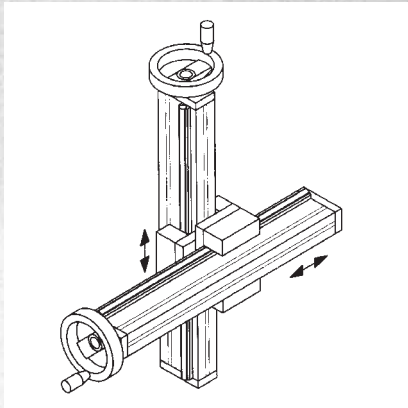


Spindles:	VA metric thread M8 x 1,25, slides made of brass
Travel:	895 mm (max.)
Load capacity:	1000 gr

## ADJUSTING UNITS

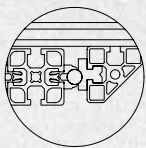


### Possible combinations:



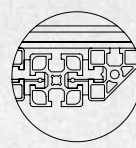
MiniTec adjusting units are ready-to-use modules that are strictly assembled according to the modular system of our standard profile elements. They are used in mechanical engineering, in the packing industry, for filling installations and testing. The adjusting units are equipped with slide elements made from plastics PE-UHMW. This material is resistant against most acids and lyes. The friction value for ground steel shafts in 0.05 and 0.1 for anodized aluminium surfaces (see page 265).

### Designs



#### Series VEW

Slide guidance on ground, hardened precision shafts  $\varnothing$  12 mm, h6, material special steel Cf 53, mat. no. 1.1213



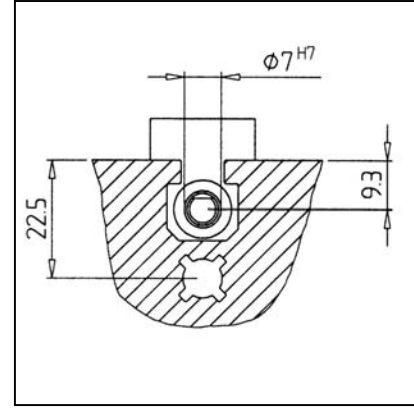
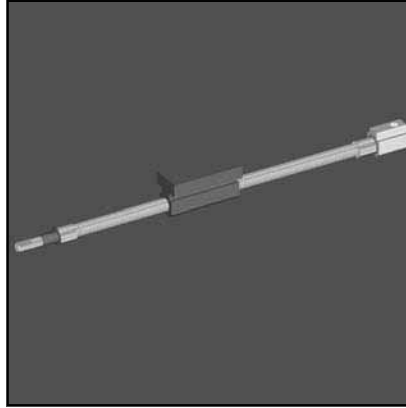
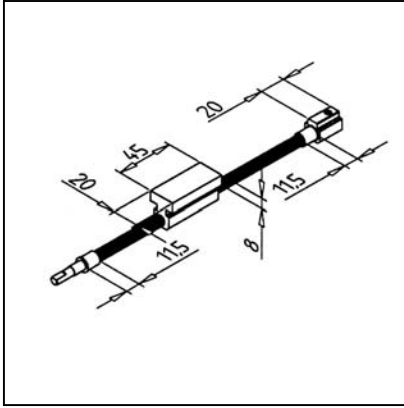
#### Series VEN

Slide guidance in profile grooves

Screw:	ACME-Screw 16 x 4, St, with nut RG 7
Incline fault:	$\pm 0.1/300$ mm (max.)
Positioning accuracy:	$\pm 0.1/300$ mm
Travel:	1000 mm (max.)
Max. load:	50 N/cm slide rail (slide length)

## MINI ADJUSTING UNIT FITTING KIT

Part. N° 28.0350/0



### TECHN. DATA / ITEMS SUPPLIED

- Without carrier profile, handwheel and bearing block for mounting in existing equipment
- VA spindle M8 x 1.25
- Brass carriage
- Max. loading 1 - 2 kg
- Please quote stroke length

### APPLICATIONS

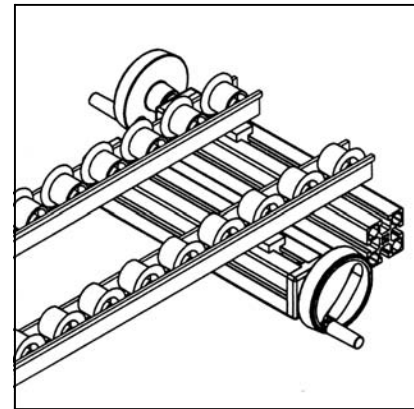
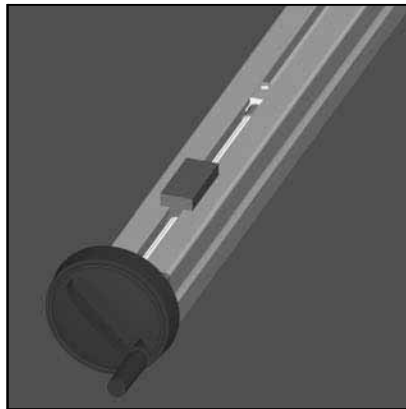
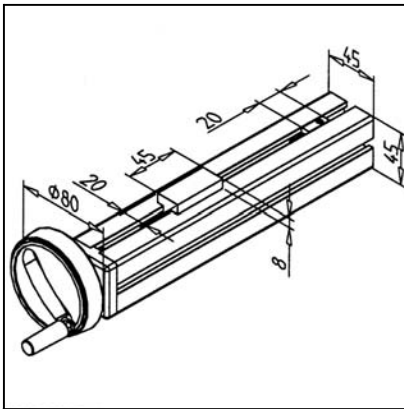
- For adjustment of the lateral guides on conveying equipment
- For adjusting sensor holders or light barriers
- For simple equipment

### ASSEMBLY

- With MiniTec power-lock fastener
- Push into the profile groove and fasten the end block

## MINI ADJUSTING UNIT WITH PROFILE 45 X 45

Part. N° 28.0354/0



### TECHN. DATA / ITEMS SUPPLIED

- With carrier profile 45 x 45 F
- VA spindle M8 x 1.25
- Brass carriage
- Max. loading 1 - 2 kg
- Please quote stroke length

### APPLICATIONS

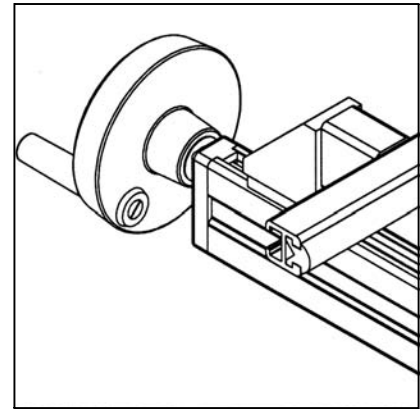
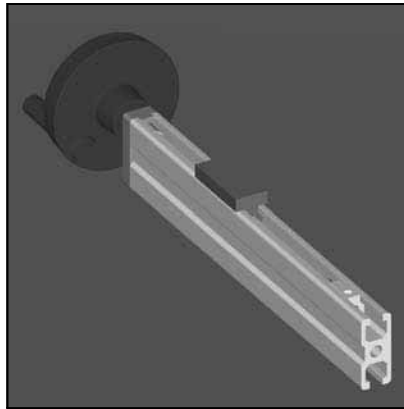
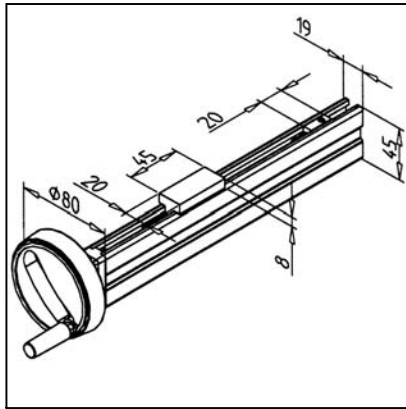
- For adjustment of the lateral guides on conveying equipment
- For adjusting sensor holders or light barriers
- For simple equipment

### ASSEMBLY

- With MiniTec power-lock fastener
- Can also be fastened with a mounting bracket
- Also available without carrier profile, Part. N° 28.0354/1

## MINI ADJUSTING UNIT WITH PROFILE 19 X 45

Part. N° 28.0352/0



### TECHN. DATA / ITEMS SUPPLIED

- With carrier profile 19 x 45
- VA spindle M8 x 1.25
- Brass carriage
- Max. loading 1 - 2 kg
- Please quote stroke length

### APPLICATIONS

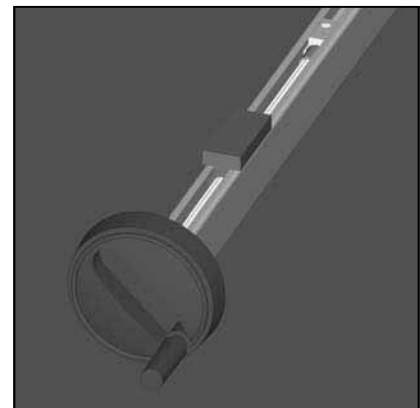
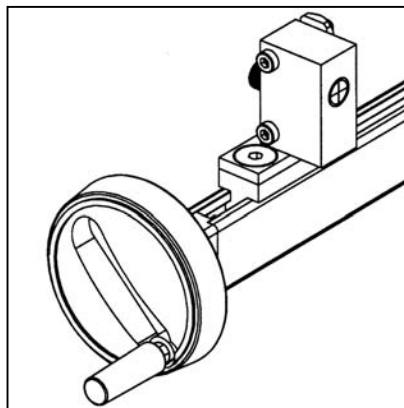
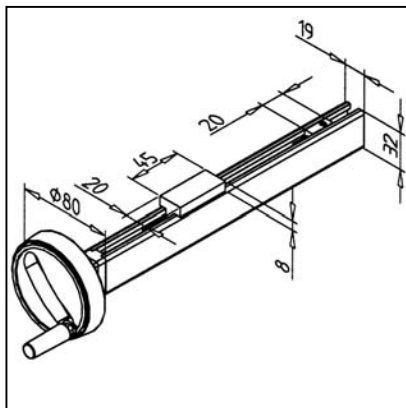
- For adjustment of the lateral guides on conveying equipment
- For adjusting sensor holders or light barriers
- For simple equipment

### ASSEMBLY

- With MiniTec power-lock fastener
- Can also be fastened with a mounting bracket
- Also available without carrier profile, Part. N° 28.0352/1

## MINI ADJUSTING UNIT WITH PROFILE 19 X 32

Part. N° 28.0351/0



### TECHN. DATA / ITEMS SUPPLIED

- With carrier profile 19 x 32
- VA spindle M8 x 1.25
- Brass carriage
- Max. loading 1 - 2 kg
- Please quote stroke length

### APPLICATIONS

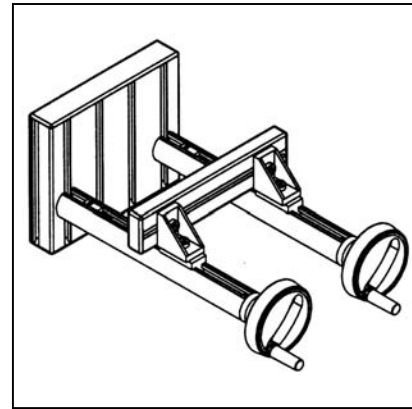
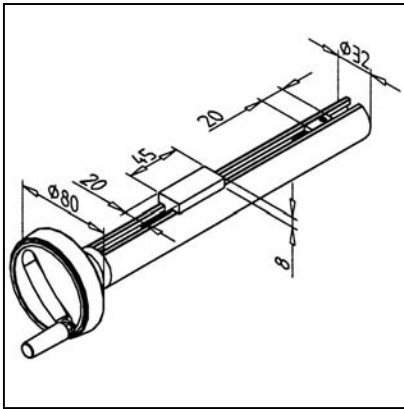
- For adjustment of the lateral guides on conveying equipment
- For adjusting sensor holders or light barriers
- For simple equipment

### ASSEMBLY

- With MiniTec power-lock fastener
- Can also be fastened with a mounting bracket
- Also available without carrier profile, Part. N° 28.0351/1

## MINI ADJUSTING UNIT WITH HANDLE PROFILE 32

Part. N° 28.0353/0



### TECHN. DATA / ITEMS SUPPLIED

- With carrier profile handle profile 32
- VA spindle M8 x 1.25
- Brass carriage
- Max. loading 1 - 2 kg
- Please quote stroke length

### APPLICATIONS

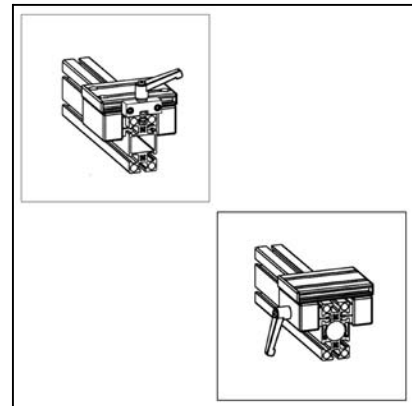
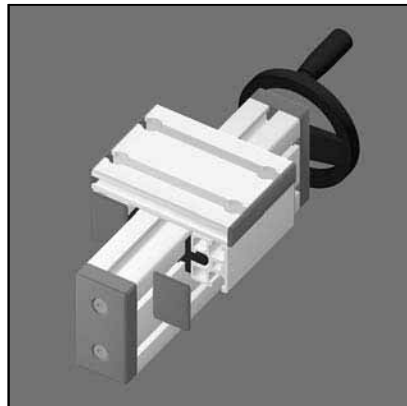
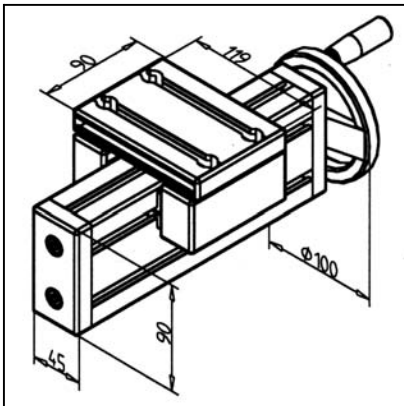
- For adjustment of the lateral guides on conveying equipment
- For adjusting sensor holders or light barriers
- For simple equipment

### ASSEMBLY

- With MiniTec power-lock fastener
- Can also be fastened with a mounting bracket
- Fasten with strap handle profile 32, Part. N° 22.1022/0
- Also available without carrier profile, Part. N° 28.0353/1

## ADJUSTING UNIT VEN 45 X 90 H

Part. N° 28.0185/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide plate made of profile 19 x 90
- AVCME screw 16 x 4
- Basic length 120 mm (0 mm stroke)
- Basic weight 1,97 kg
- Weight/100 mm stroke 0,49 kg
- Please indicate desired length of stroke

### APPLICATIONS

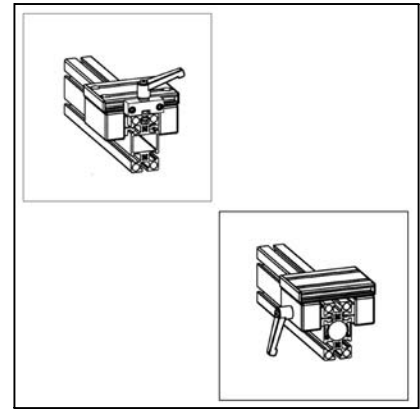
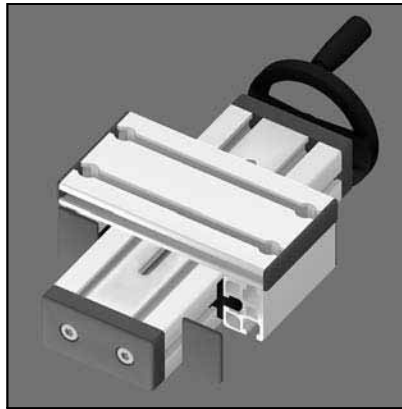
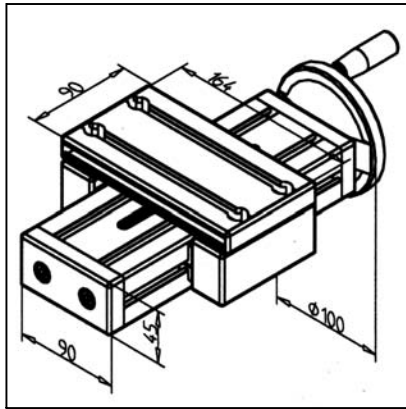
- Adjustment of conveyor systems
- Adjustment of feeders
- Adjustable devices

### SPECIAL DESIGNS

- Slide plate made of profile 32 x 180
- Different slide lengths
- Digital display
- Angular drive
- OPTIONS:
  - With slide clamping unit (Top) Part N° 28.0185/1
  - With slide clamping unit (Lateral) Part N° 28.0185/2

## ADJUSTING UNIT VEN 45 X 90 F

Part. N° 28.0188/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide plate of profile 19 x 90
- ACME screw 16 x 4
- Basic length 120 mm (0 mm stroke)
- Basic weight 2,05 kg
- Weight/100 mm stroke 0,5 kg
- Please indicate desired length of stroke

### APPLICATIONS

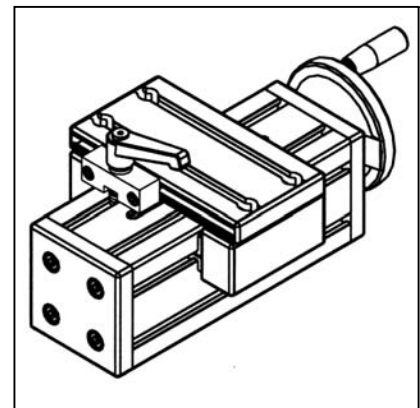
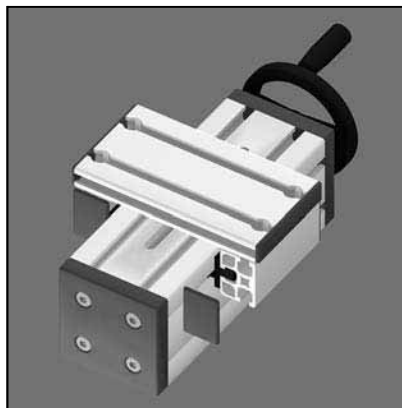
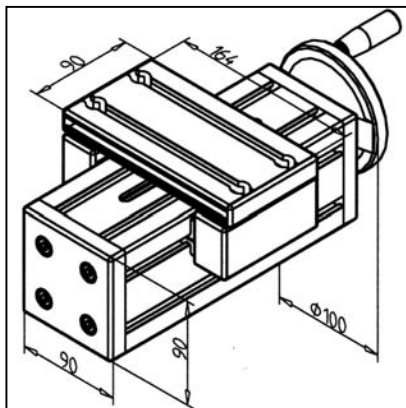
- Adjustment of conveyor systems
- Adjustment of feeders
- Adjustable devices

### SPECIAL DESIGNS

- Slide plate made of profile 32 x 180
- Different slide lengths
- Digital display
- Angular drive
- OPTIONS:  
With slide clamping unit (Top)  
Part N° 28.0188/1  
With slide clamping unit (Lateral)  
Part N° 28.0188/2

## ADJUSTING UNIT VEN 90

Part. N° 28.0186/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide plate of profile 19 x 90
- ACME screw 16 x 4
- Basic length 120 mm (0 mm stroke)
- Basic weight 2,75 kg
- Weight/100 mm stroke 0,87 kg
- Please indicate desired length of stroke

### APPLICATIONS

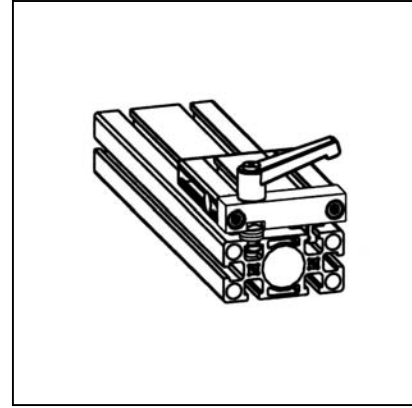
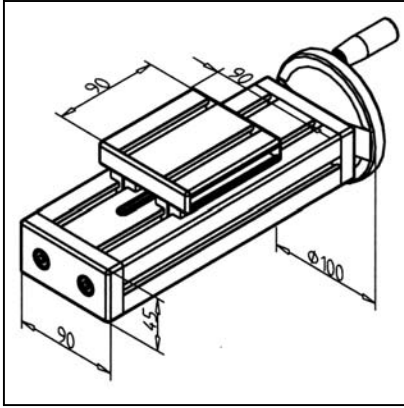
- Adjustment of conveyor systems
- Adjustment of feeders
- Adjustable devices

### SPECIAL DESIGNS

- Slide plate made of profile 32 x 180
- Different slide lengths
- Digital display
- Angular drive
- OPTIONS:  
With slide clamping unit (Top)  
Part N° 28.0186/1  
With slide clamping unit (Lateral)  
Part N° 28.0186/2

## ADJUSTING UNIT VEN 45 X 90 S

Part. N° 28.0187/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide plate of profile 19 x 90
- ACME screw 16 x 4
- Basic length 120 mm (0 mm stroke)
- Basic weight 1,59 kg
- Weight/100 mm stroke 0,5 kg
- Please indicate desired length of stroke

### APPLICATIONS

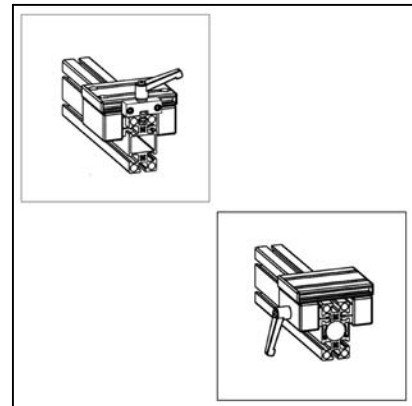
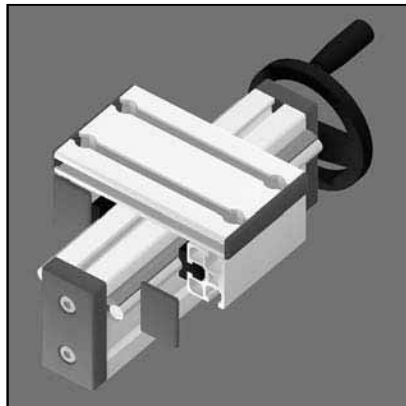
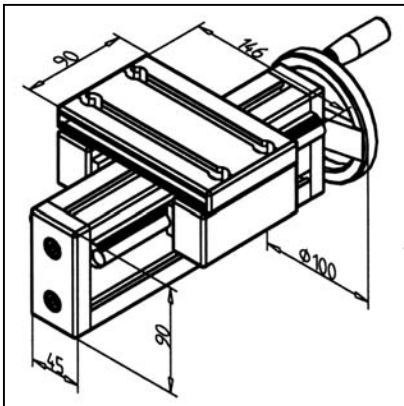
- Adjustment of conveyor systems
- Adjustment of feeders
- Adjustable devices

### SPECIAL DESIGNS

- Slide plate made of profile 32 x 180
- Different slide lengths
- Digital display
- Angular drive
- OPTIONS:  
With slide clamping unit (Top)  
Part N° 28.0187/1

## ADJUSTING UNIT VEW 45 X 90 H

Part. N° 28.0182/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide plate of profile 19 x 90
- ACME screw 16 x 4
- Basic length 120 mm (0 mm stroke)
- Basic weight 2,109 kg
- Weight/100 mm stroke 0,74 kg
- Please indicate desired length of stroke

### APPLICATIONS

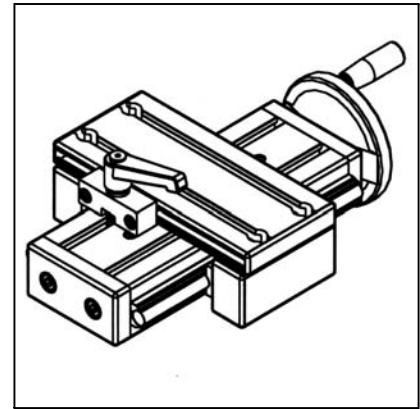
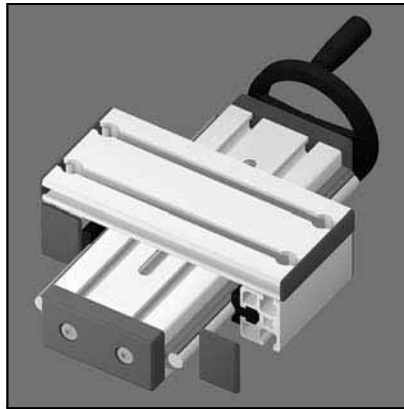
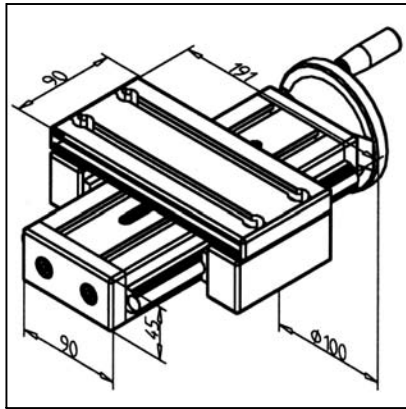
- Adjustment of conveyor systems
- Adjustment of feeders
- Adjustable devices

### SPECIAL DESIGNS

- Slide plate made of profile 32 x 180
- Different slide lengths
- Digital display
- Angular drive
- Shafts stainless
- OPTIONS:  
With slide clamping unit (Top)  
Part N° 28.0182/1  
With slide clamping unit (Lateral)  
Part N° 28.0182/2

## ADJUSTING UNIT VEW 45 X 90 F

Part. N° 28.0181/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide plate of profile 19 x 90
- ACME screw 16 x 4
- Basic length 120 mm (0 mm stroke)
- Basic weight 2,31 kg
- Weight/100 mm stroke 0,75 kg
- Please indicate desired length of stroke

### APPLICATIONS

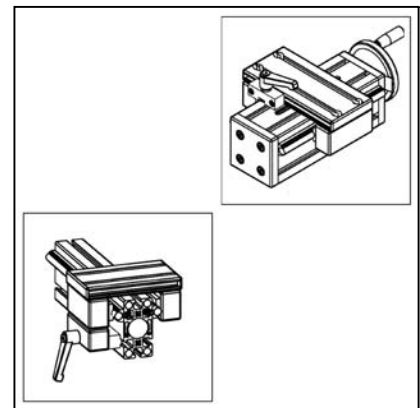
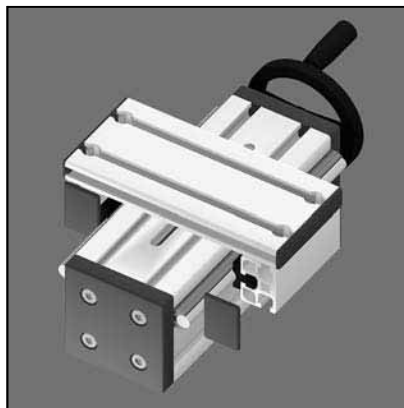
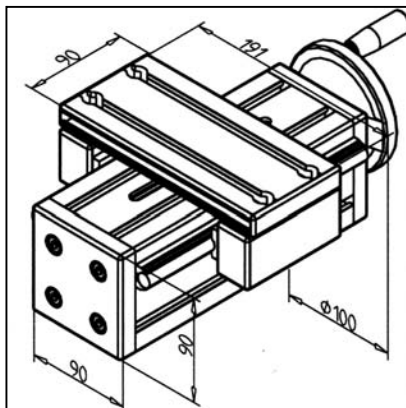
- Adjustment of conveyor systems
- Adjustment of feeders
- Adjustable devices

### SPECIAL DESIGNS

- Slide plate made of profile 32 x 180
- Different slide lengths
- Digital display
- Angular drive
- Shafts stainless
- OPTIONS:  
With slide clamping unit (Top)  
Part N° 28.0181/1

## ADJUSTING UNIT VEW 90

Part. N° 28.0183/0



### TECHN. DATA / ITEMS SUPPLIED

- Slide plate of profile 19 x 90
- ACME screw 16 x 4
- Basic length 120 mm (0 mm stroke)
- Basic weight 3,03 kg
- Weight/100 mm stroke 1,12 kg
- Please indicate desired length of stroke

### APPLICATIONS

- Adjustment of conveyor systems
- Adjustment of feeders
- Adjustable devices

### SPECIAL DESIGNS

- Slide plate made of profile 32 x 180
- Different length of stroke
- Digital display
- Angular drive
- Shafts stainless
- Options:  
With slide clamping unit (Top)  
Part N° 28.0183/1  
With slide clamping unit (Lateral)  
Part N° 28.0183/2



## INDEX

### A

ADAPTOR PLATE	138
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ADJUSTING UNIT VEW 45 X 90 F	199
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