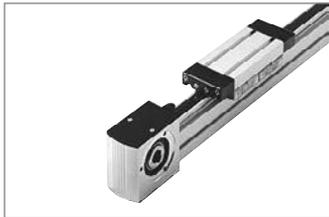


# Linear guides



Cam roller guide LF6S  
(p. 13-6)



Cam roller guide LF6C  
(p. 13-11)



Cam roller guide LF12S  
(p. 13-16)



Cam roller guide LF12C  
(p. 13-23)



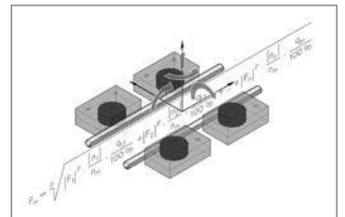
Cam roller guide LF20S  
(p. 13-30)



Cam roller guide LF20C  
(p. 13-37)



Plug-in shafts, synchronous  
shafts (p. 13-47)

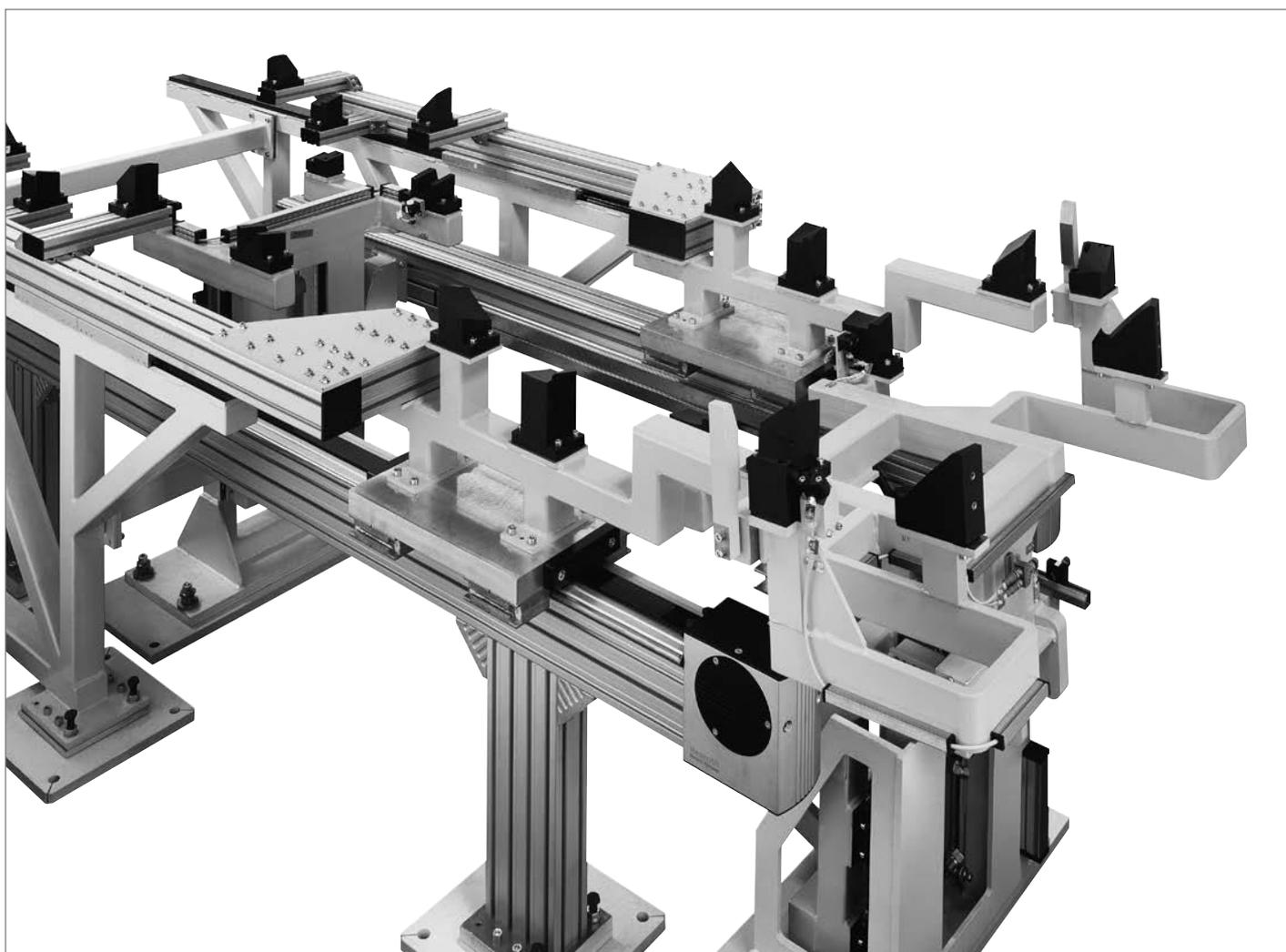


Design (p. 13-49)

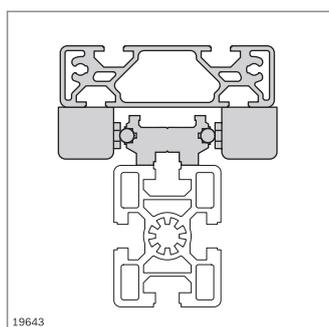
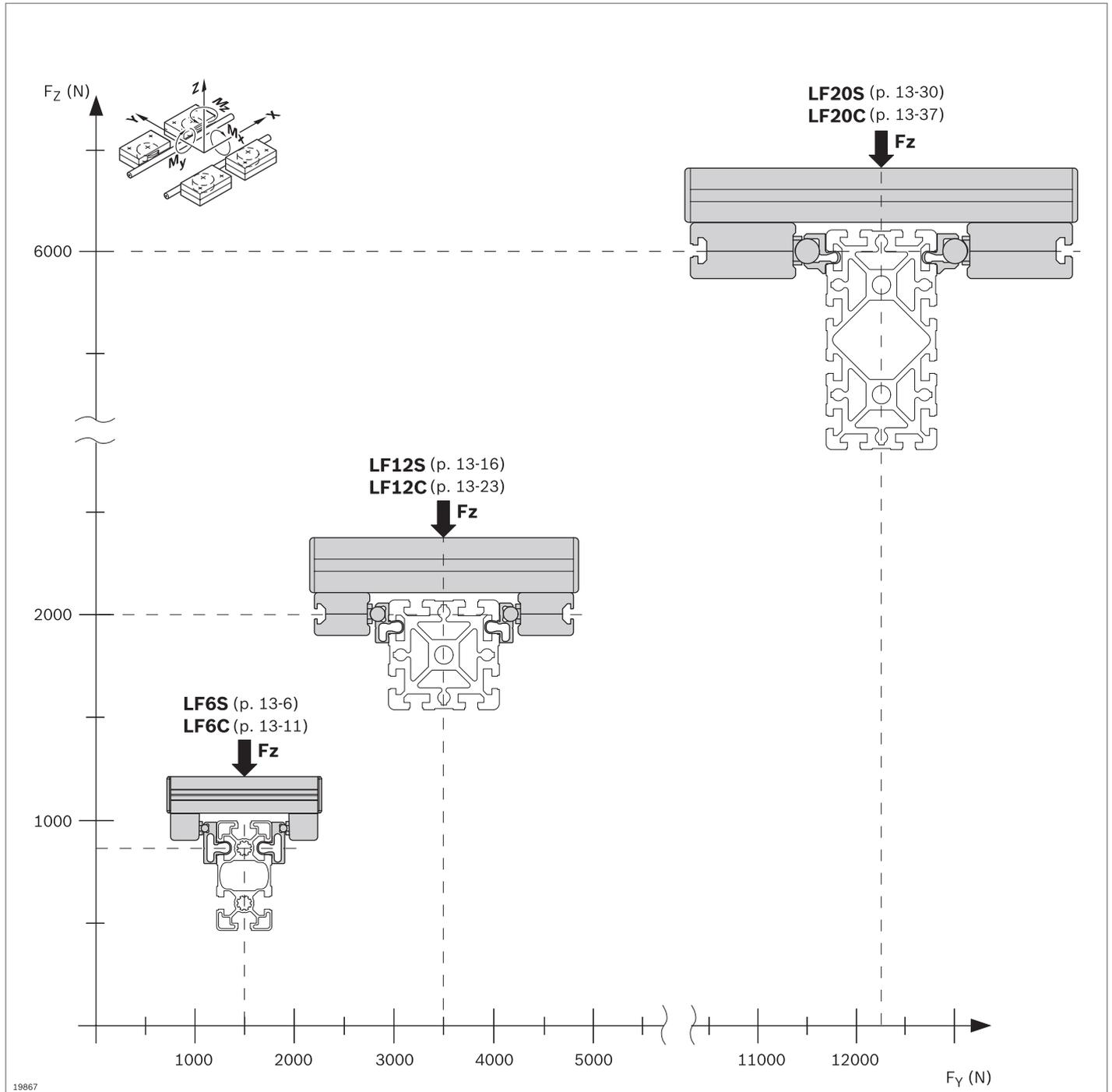


### Linear guides

- ▶ For constructing linear guides based on cam roller guides
- ▶ Cam roller guides are suitable for applications with high speeds and medium loads, in particular for the construction of handling equipment, feed systems, guides in work machines, and many other applications
- ▶ Fully pre-assembled in any required length or as individual components for assembly on site
- ▶ Without drive or with toothed belt drive for attaching gears and motors

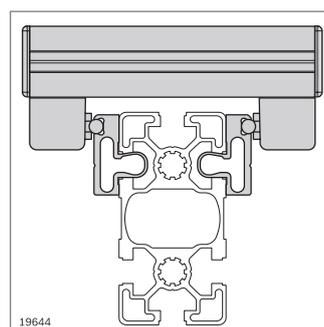


### Linear guides – sizes, designs, and loads



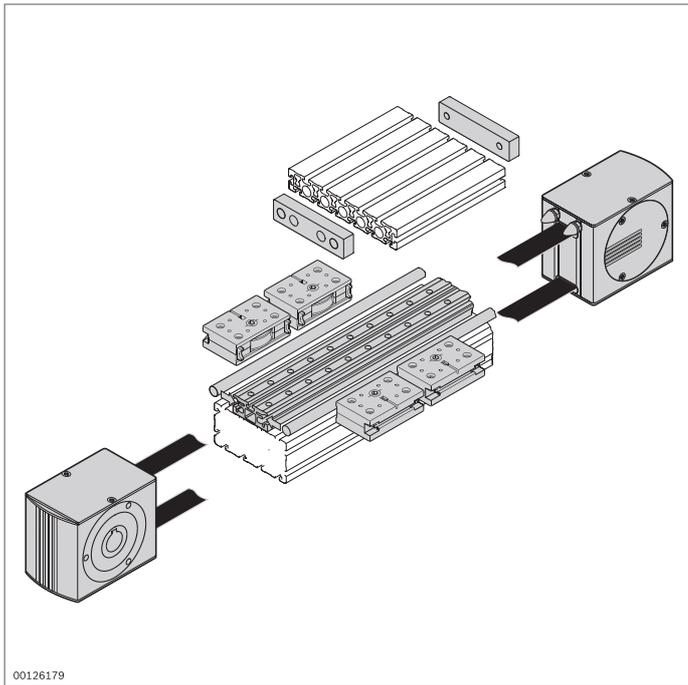
**LF...S**

- ▶ Compact construction
- ▶ Fixed track width
- ▶  $v_{max} = 5 \text{ m/s}$



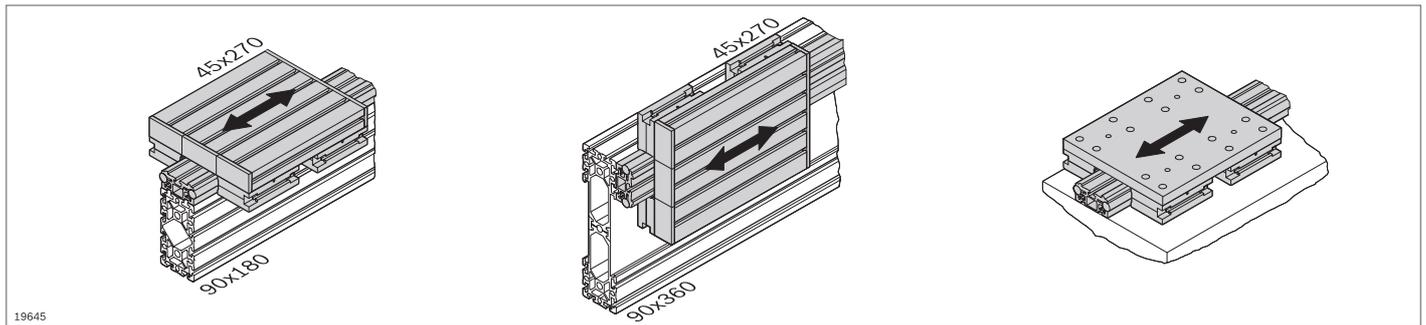
**LF...C**

- ▶ Freely selectable track width for greater torque absorption
- ▶  $v_{max} = 5 \text{ m/s}$



### Cam roller guides LF...S

- ▶ Cam roller guide LF...S with fixed track widths
- ▶ Guide rail made of aluminum with hardened and polished VA guide rods
- ▶ Simple mounting on strut profile or directly on flat surface, e.g. on a machine
- ▶ High precision, dimensional stability and torsional rigidity
- ▶ Lighter and cheaper than steel guides
- ▶ Light trolley with good torsional rigidity
- ▶ Freely selectable trolley lengths
- ▶ Freely selectable stroke lengths possible
- ▶ High permissible speed



The support profiles shown here are examples

**LF6S**

90

45x60

62,5

110,5

$F_y \text{ max} = 1400 \text{ N}$   
 $F_z \text{ max} = 850 \text{ N}$   
 $M_x \text{ max} = 13,6 \text{ Nm}$   
 $v_{\text{max}} = 5 \text{ m/s}$

**LF12S**

180

90x90L

92,5

172,5

$F_y \text{ max} = 3500 \text{ N}$   
 $F_z \text{ max} = 2000 \text{ N}$   
 $M_x \text{ max} = 78 \text{ Nm}$   
 $v_{\text{max}} = 5 \text{ m/s}$

**LF20S**

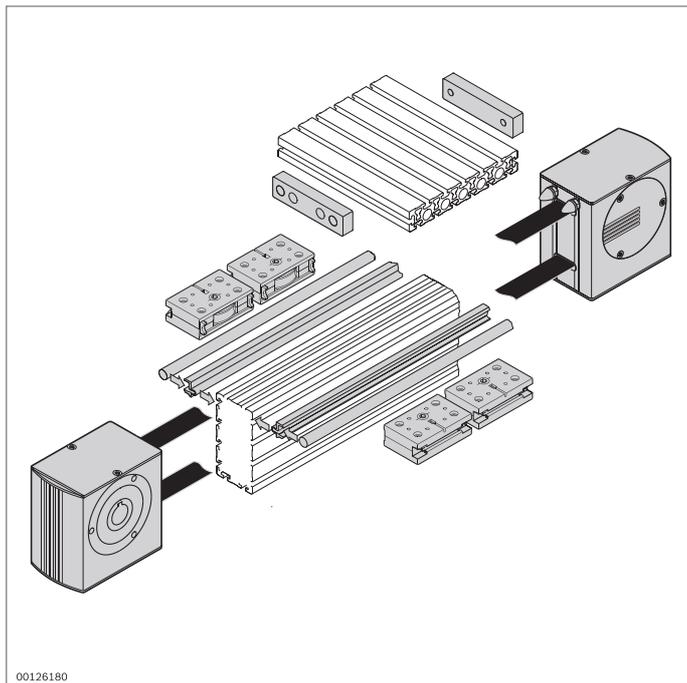
270

90x180

92,5

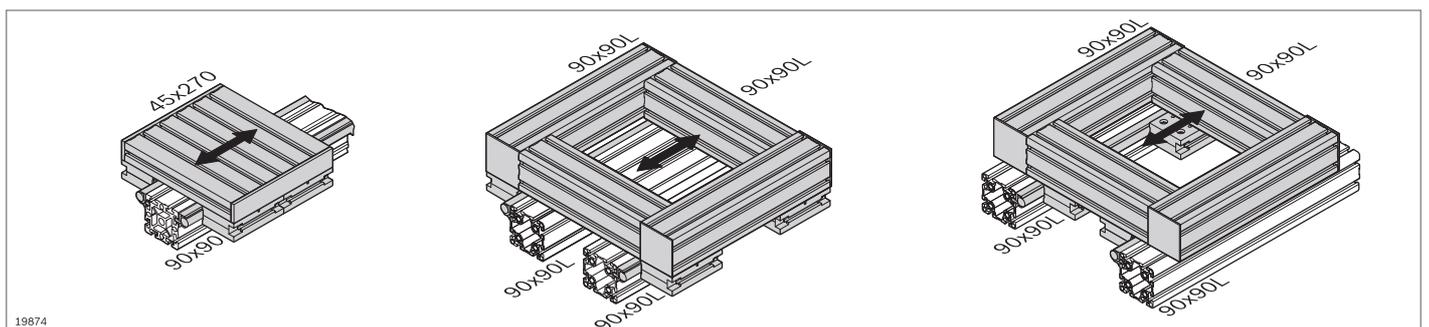
182,5

$F_y \text{ max} = 12500 \text{ N}$   
 $F_z \text{ max} = 6000 \text{ N}$   
 $M_x \text{ max} = 240 \text{ Nm}$   
 $v_{\text{max}} = 5 \text{ m/s}$



### Cam roller guides LF...C

- ▶ Cam roller guide LF...C for free choice of track widths and large track widths
- ▶ Clamping profile made of aluminum with hardened and polished VA guide rods
- ▶ Easy assembly through clipping the clamping profile into the slots of any Rexroth profile with 10 mm slot
- ▶ Optimally adjustable to different loads
- ▶ Greater torque absorption due to a C construction and free choice of track width
- ▶ Light trolley with good torsional rigidity
- ▶ Freely selectable trolley lengths and widths
- ▶ Freely selectable stroke lengths possible
- ▶ High permissible speed



The support profiles shown here are examples

**LF6C**

45x90  
B (=64)

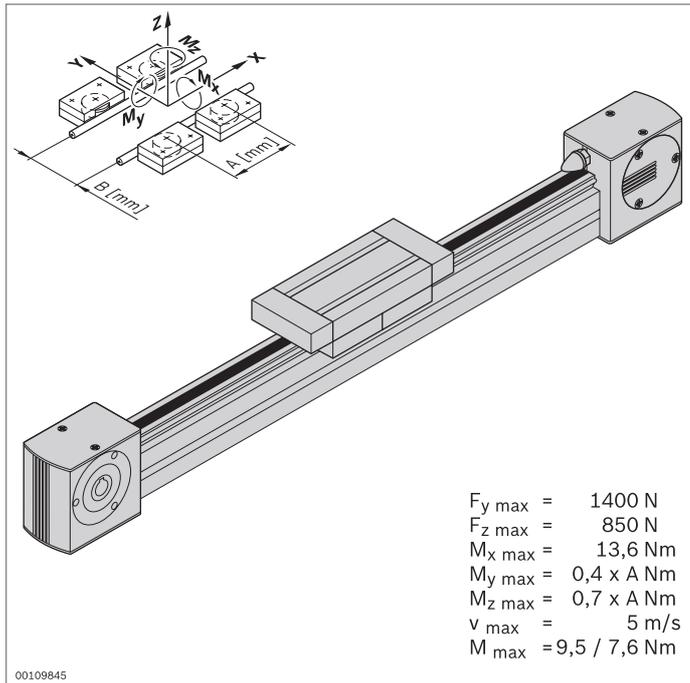
**LF12C**

90x90  
B (=108)

**LF20C**

90x180  
B (=120)

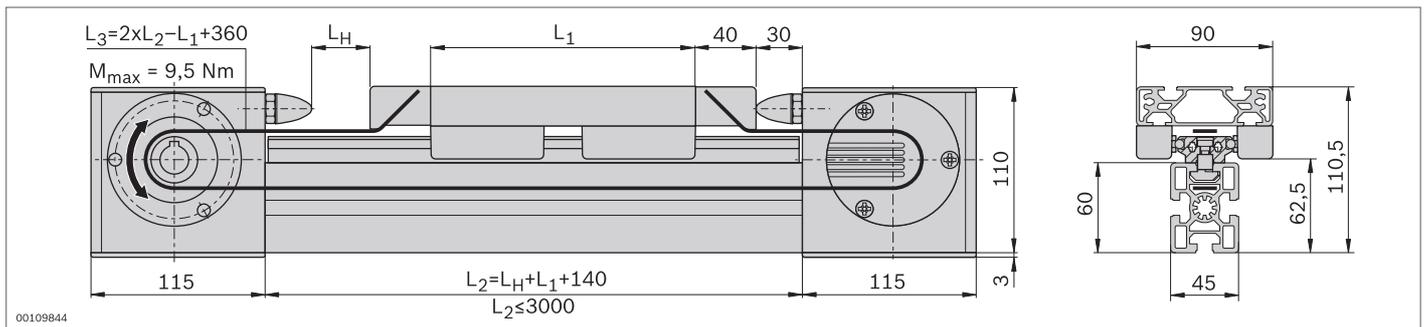
<p> <math>F_y \text{ max} = 1400 \text{ N}</math>  <math>F_z \text{ max} = 850 \text{ N}</math>  <math>M_x \text{ max} = 0,4 \times B \text{ Nm}</math>  <math>M_x \text{ max} = 25,6 \text{ Nm (B=64mm)}</math>  <math>v_{\text{max}} = 5 \text{ m/s}</math> </p>	<p> <math>F_y \text{ max} = 3500 \text{ N}</math>  <math>F_z \text{ max} = 2000 \text{ N}</math>  <math>M_x \text{ max} = 1,0 \times B \text{ Nm}</math>  <math>M_x \text{ max} = 108 \text{ Nm (B=108mm)}</math>  <math>v_{\text{max}} = 5 \text{ m/s}</math> </p>	<p> <math>F_y \text{ max} = 12500 \text{ N}</math>  <math>F_z \text{ max} = 6000 \text{ N}</math>  <math>M_x \text{ max} = 3,0 \times B \text{ Nm}</math>  <math>M_x \text{ max} = 360 \text{ Nm (B=120 mm)}</math>  <math>v_{\text{max}} = 5 \text{ m/s}</math> </p>
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### Cam roller guide LF6S – complete axis



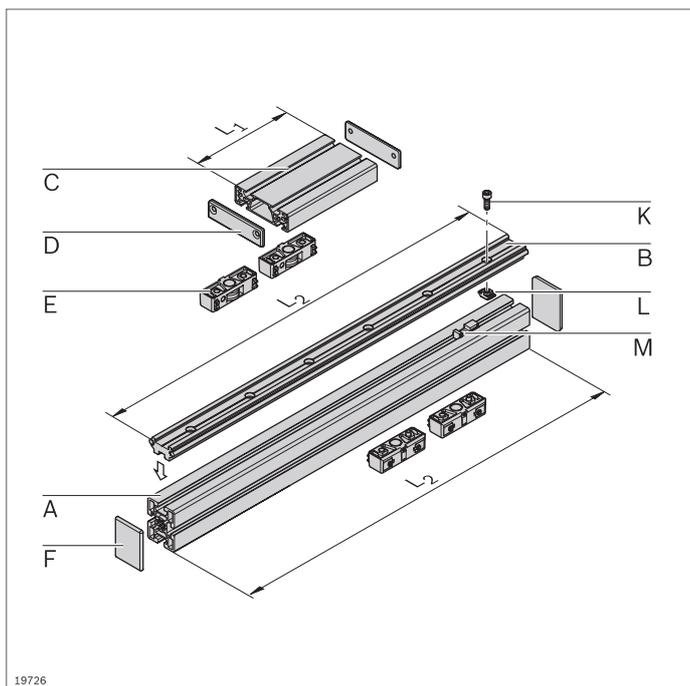
- ▶ Fully assembled cam roller guide
- ▶ Stroke and trolley length can be individually selected
- ▶ Rail profile screwed onto strut profile 45x60
- ▶ Incl. toothed belt drive; additional notes on the drive concept (p. 13-44)



### Technical data

See pages 13-57 for notes on layout and drive

Complete axis LF6S	$L_H / L_1$ (mm)	No.
	$L_1 + 80 \leq L_H \leq 2710$	3 842 998 495 / $L_H / L_1$
	$150 \leq L_1 \leq 1000$	



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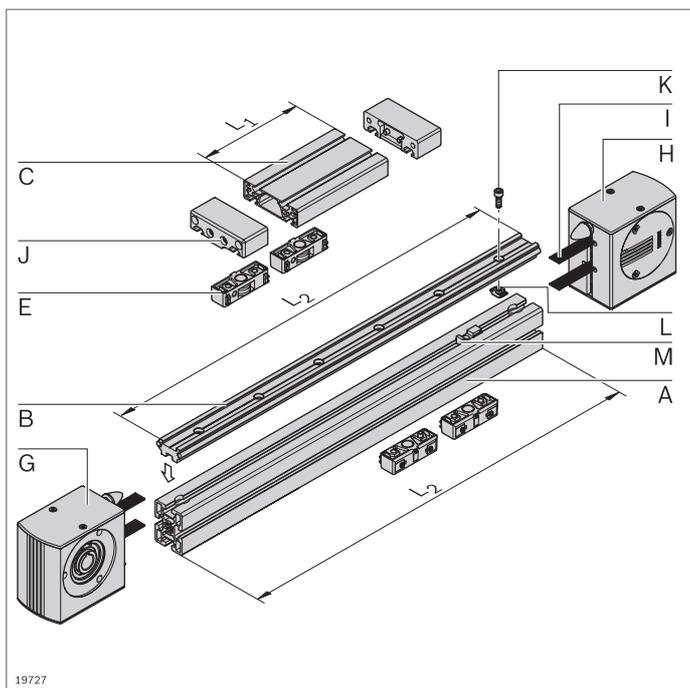
### Cam roller guide LF6S – components

- Components for the individual assembly of cam roller guides, with or without drive

#### Parts list for cam roller guide LF6S without drive

Component	No.	Pcs	Page
A Profile 45x60	3 842 990 570 / L <sub>2</sub>	1	2-40
B Guide profile LF6S	3 842 993 966 / L <sub>2</sub>	1	13-8
C Trolley profile LF6S	3 842 993 061 / L <sub>1</sub>	1	13-8
D Cover cap LF6S	3 842 535 645	2	13-9
E Guide bearing LF6	3 842 535 662	4	13-8
F Cover cap 45x60	3 842 548 755	2	2-40
K Cylinder bolt M6x20 – DIN 7984		n <sup>1)</sup>	
L T-nut M6, 10 mm slot	3 842 530 285	n <sup>1)</sup>	3-4
M Sliding block	3 842 146 877	n <sup>1)</sup>	13-8

<sup>1)</sup> For identification see page 13-8



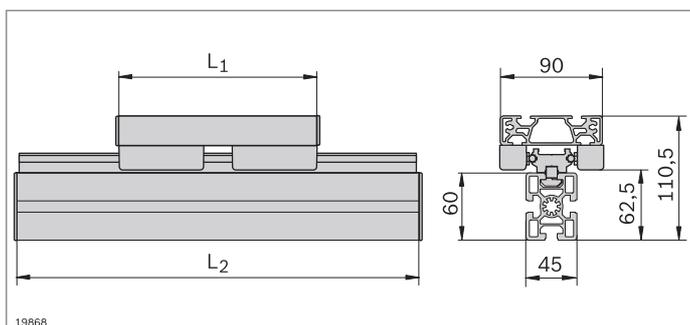
19727

#### Parts list for cam roller guide LF6S with drive

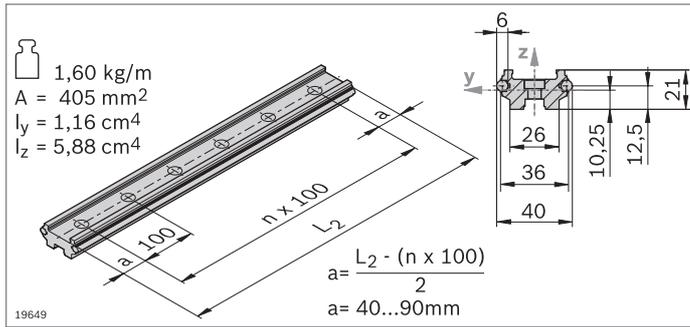
Component	No.	Pcs	Page
A Profile 45x60 LF6S / LF6S	3 842 993 085 / L <sub>2</sub>	1	2-40
B Guide profile LF6S	3 842 993 966 / L <sub>2</sub>	1	13-8
C Trolley profile LF6S	3 842 993 061 / L <sub>1</sub>	1	13-8
E Guide bearing LF6	3 842 535 662	4	13-8
G Drive head LF6S	3 842 526 410	1	13-9
H Return head LF6S	3 842 526 411	1	13-10
I Toothed belt LF6S	3 842 994 659 / L <sub>3</sub> <sup>1)</sup>	1	13-10
J Belt connector LF6S	3 842 535 682	2	13-10
K Cylinder bolt M6x20 – DIN 7984		n <sup>2)</sup>	
L T-nut M6, 10 mm slot	3 842 530 285	n <sup>2)</sup>	3-4
M Sliding block	3 842 146 877	n <sup>2)</sup>	13-8

<sup>1)</sup> L<sub>3</sub> = 2xL<sub>2</sub> - L<sub>1</sub> + 360

<sup>2)</sup> For identification see page 13-8



19868



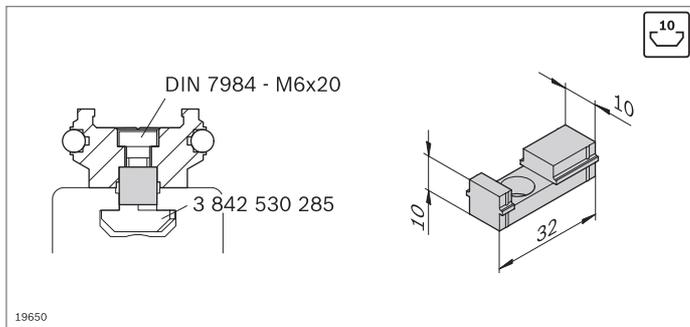
- ▶ Guide profile LF6S with integrated guide rods
- ▶ Installation on MGE strut profiles with 10 mm slot or directly on a flat surface

Guide profile	$L_2$ (mm)	No.
<b>LF6S</b>	1 pc 150 ... 3000	<b>3 842 993 966 / <math>L_2</math></b>
	10 pcs	3000 <b>3 842 539 412</b>

Material: Guide profile: Aluminum; anodized  
 Guide rod: Solid shaft VA, induction hardened, polished

Condition on delivery: Ungreased guide rods; greasing according to assembly instructions **3 842 527 226**

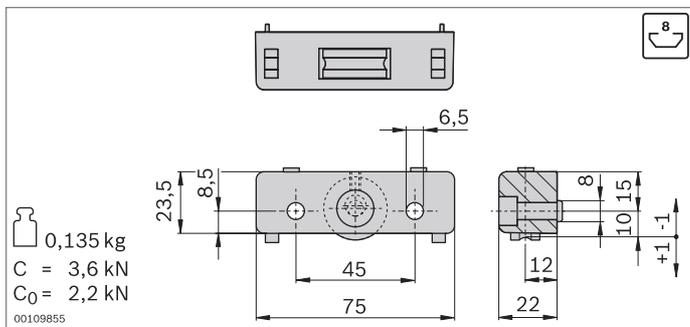
Required accessories: Cylinder bolt DIN 7984 – M6x20  
 T-nut M6, 10 mm slot **3 842 530 285** (p. 3-4)



- ▶ Sliding block as a centering aid for mounting the guide profile in a 10 mm profile slot

Sliding block	No.
	50 <b>3 842 146 877</b>

Material: PA; black



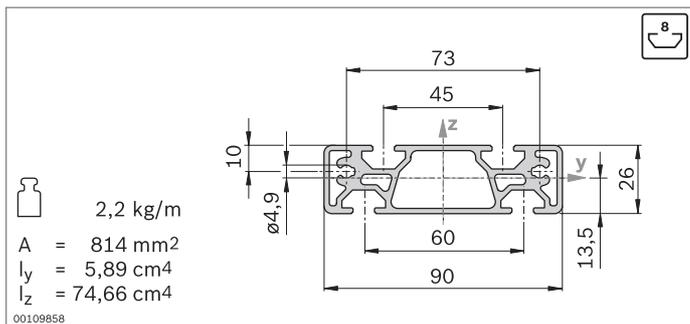
- ▶ Guide bearing for trolley construction
- ▶ Guiding via guide rod
- ▶ Cam rollers with ball bearings, permanently lubricated
- ▶ Lubricating felts with guide rod lubrication reservoir
- ▶ Play-free cam roller adjustment via eccentric bolts

Guide bearing	No.	FS
<b>LF6</b>	2 <b>3 842 535 662</b>	2xFS1

Material: Housing: Diecast aluminum  
 Cam roller: Steel, hardened, polished

Scope of delivery: Incl. fastening material (FS)

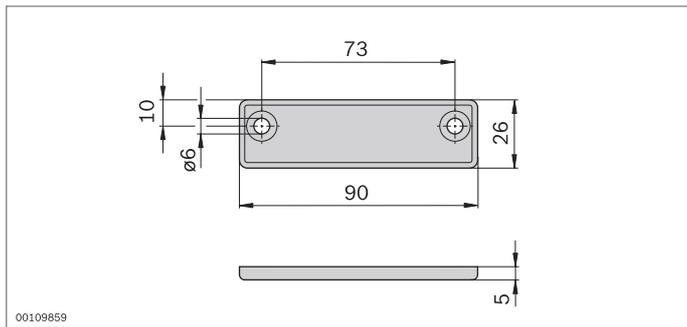
Condition on delivery: Lubricating felts ungreased; greasing according to assembly instructions **3 842 527 226**



- ▶ Trolley profile for the construction of trolley LF6S

Trolley profile	$L_1$ (mm)	No.
<b>LF6S</b>	150 ... 3000	<b>3 842 993 061 / <math>L_1</math></b>

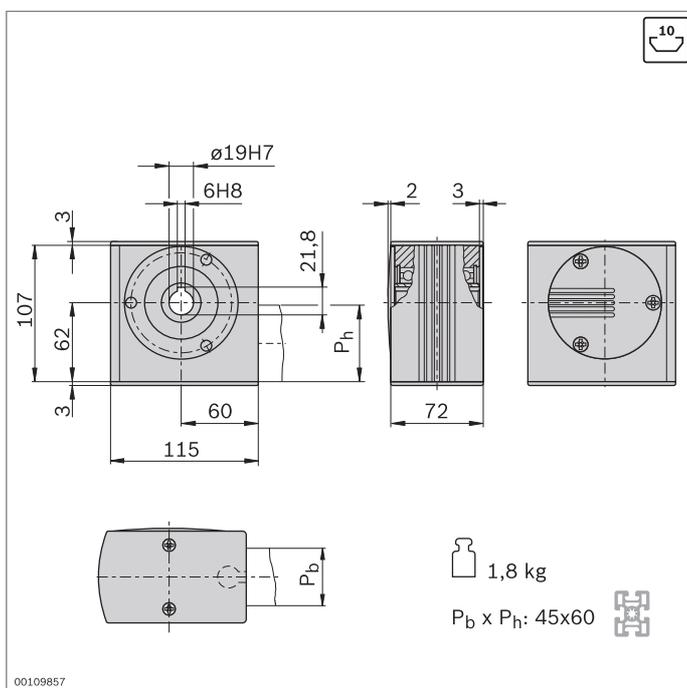
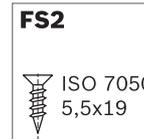
Material: Aluminum; anodized



- ▶ Cover cap for trolley profile LF6S
- ▶ For use on trolleys which are not driven by a toothed belt

Cover cap	No.	FS
<b>LF6S</b>	2 <b>3 842 535 645</b>	2xFS2

Material: PA; black



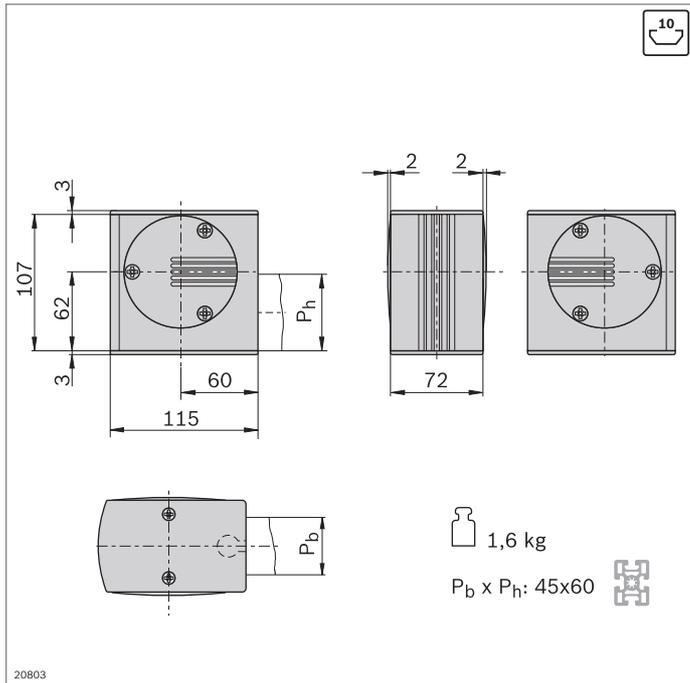
- ▶ Drive head for transferring drive torque to a toothed belt
- ▶ For direct mounting of a motor or (in conjunction with a plug-in shaft) for mounting a hollow shaft gear or a coupling (p. 13-46)
- ▶ Mounted with longitudinal end connector directly on profile 45x60
- ▶ Profile finishing: LF blind hole drilling for longitudinal end connector

Drive head	No.	FS
<b>LF6S</b>	<b>3 842 526 410</b>	2xFS3, FS4

Material: Aluminum; anodized  
Hollow shaft: Steel; galvanized  
Cover caps: PA; black

Scope of delivery: Incl. Fastening material (FS), cover caps





- ▶ Return head for tensioning the toothed belt and changing its direction
- ▶ Mounted directly on profile using longitudinal end connector
- ▶ Profile finishing: LF blind hole drilling for longitudinal end connector

Return head	No.	FS
LF6S	3 842 526 411	2xFS3, FS4

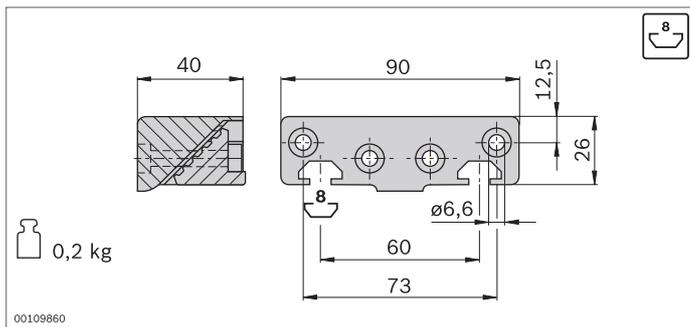
Material: Aluminum; anodized  
Hollow shaft: Steel; galvanized  
Cover caps: PA; black

Scope of delivery: Incl. Fastening material (FS), cover caps

**FS3**



**FS4**



- ▶ Belt connector for fixing the toothed belt on the front of the trolley
- ▶ All connecting parts for mounting on the trolley profile LF6S are included

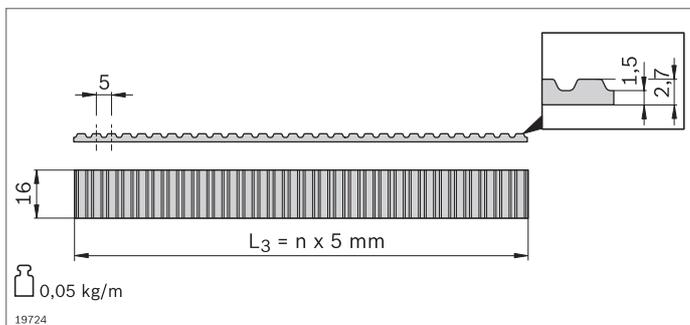
Belt connector	No.	FS
LF6S	2 3 842 535 682	2xFS5, 2xFS6

Material: Aluminum, painted black  
Scope of delivery: Incl. fastening material (FS)

**FS5**



**FS6**

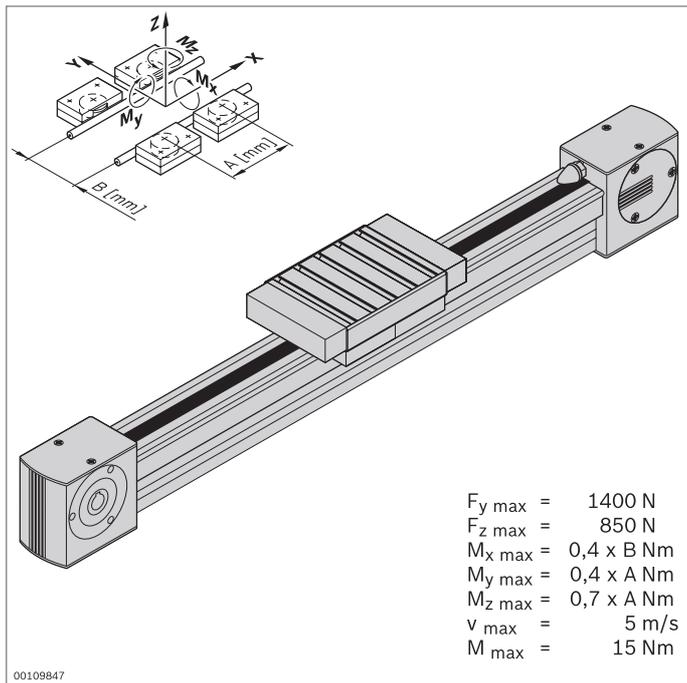


- ▶ Toothed belt as a trolley drive
- ▶ Pitch: AT5

Toothed belt	L <sub>3</sub> (mm)	No.
LF6S	300 ... 50000	3 842 994 659 / L <sub>3</sub> <sup>1)</sup>
	50000	3 842 513 646

<sup>1)</sup> L<sub>3</sub> = 2xL<sub>2</sub> - L<sub>1</sub> + 360

Material: PU with embedded steel wires



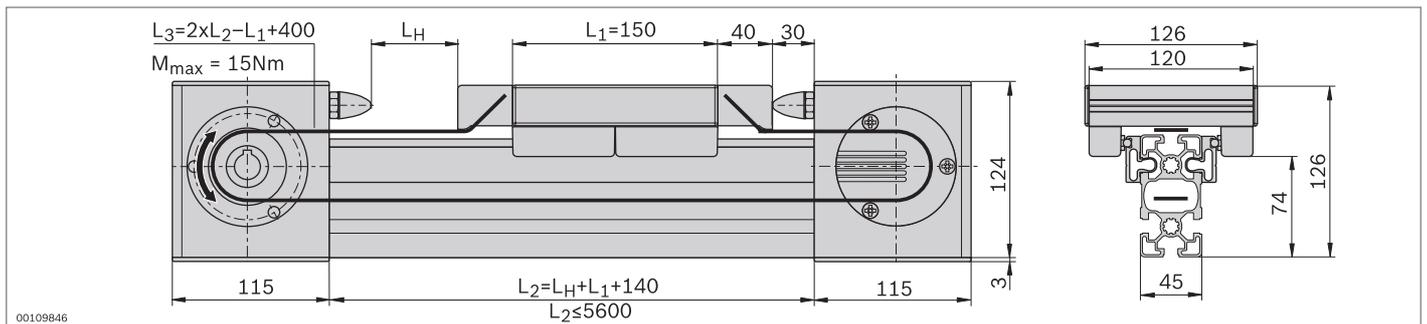
$F_{y \max} = 1400 \text{ N}$   
 $F_{z \max} = 850 \text{ N}$   
 $M_{x \max} = 0,4 \times B \text{ Nm}$   
 $M_{y \max} = 0,4 \times A \text{ Nm}$   
 $M_{z \max} = 0,7 \times A \text{ Nm}$   
 $v_{\max} = 5 \text{ m/s}$   
 $M_{\max} = 15 \text{ Nm}$

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### Cam roller guide LF6C – complete axis



- ▶ Fully assembled cam roller guide
- ▶ Stroke can be individually selected
- ▶ Clamping profile clipped into strut profile 45x90L
- ▶ Incl. toothed belt drive; additional notes on the drive concept (p. 13-44)

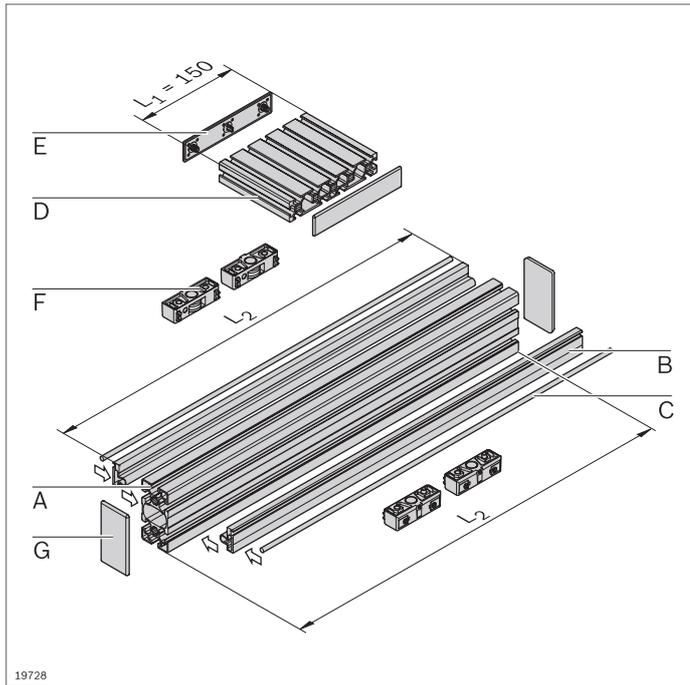


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#### Technical data

For notes on layout and drive, see page 13-50

Complete axis	$L_H$ (mm)	No.
LF6C	50 ... 5310	3 842 998 496 / $L_H$

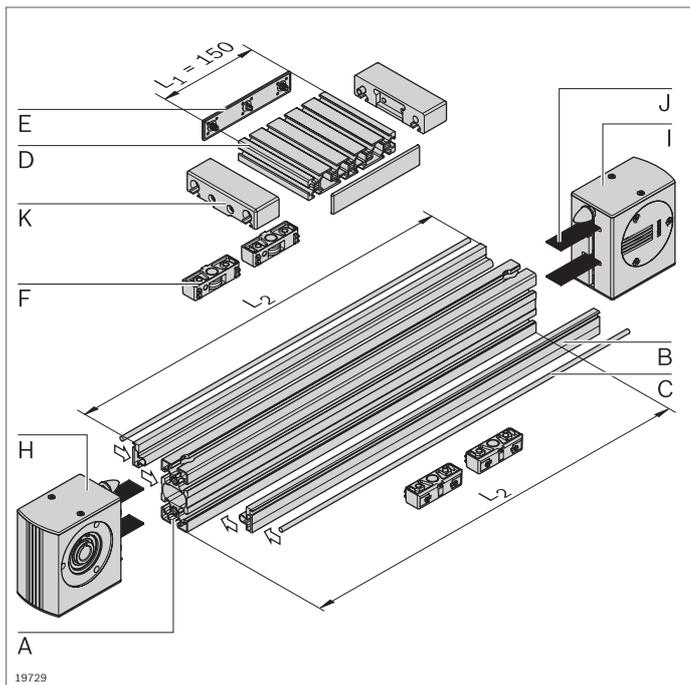


### Cam roller guide LF6C – components

- Components for the individual assembly of cam roller guides, with or without drive

#### Parts list for cam roller guide LF6C without drive

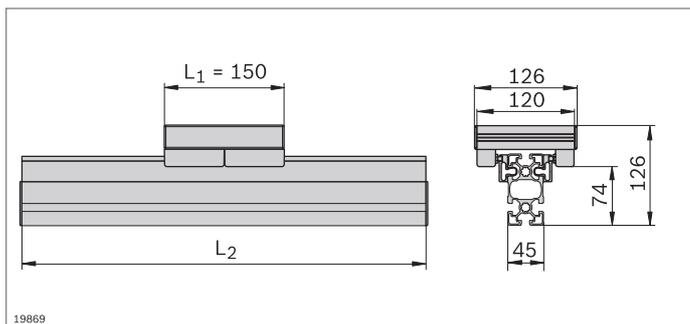
Component	No.	Pcs	Page
A Profile 45x90L	3 842 992 432 / L <sub>2</sub>	1	2-41
B Clamping profile LF6C	3 842 992 925 / L <sub>2</sub>	2	13-13
C Guide rod LF6	3 842 993 967 / L <sub>2</sub>	2	13-13
D Trolley profile LF6C	3 842 993 952 / 120 mm	1	13-13
E Cover cap LF6C	3 842 539 120	2	13-14
F Guide bearing LF6	3 842 535 662	4	13-13
G Cover cap 45x90	3 842 548 757	2	2-41

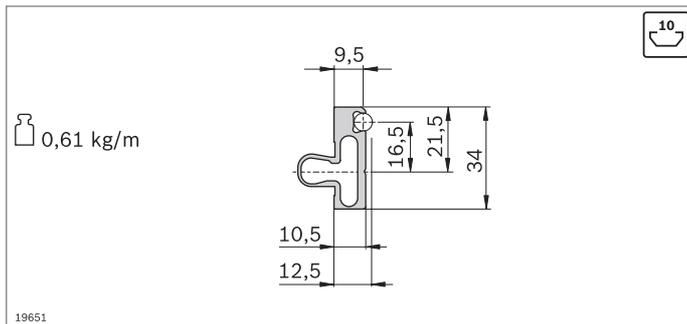


#### Parts list for cam roller guide LF6C with drive

Component	No.	Pcs	Page
A Profile 45x90L LF6C	3 842 993 084 / L <sub>2</sub>	1	2-41
B Clamping profile LF6C	3 842 992 925 / L <sub>2</sub>	2	13-13
C Guide rod LF	3 842 993 967 / L <sub>2</sub>	2	13-13
D Trolley profile LF6C	3 842 993 952 / 120 mm	1	13-13
E Cover cap LF6C	3 842 539 120	2	13-14
F Guide bearing LF6	3 842 535 662	4	13-13
H Drive head LF6C	3 842 526 416	1	13-14
I Return head LF6C	3 842 526 417	1	13-15
J Toothed belt LF6C	3 842 994 711 / L <sub>3</sub> <sup>1)</sup>	1	13-15
K Belt connector LF6C	3 842 535 681	2	13-15

<sup>1)</sup> L<sub>3</sub> = 2xL<sub>2</sub> - L<sub>1</sub> + 400

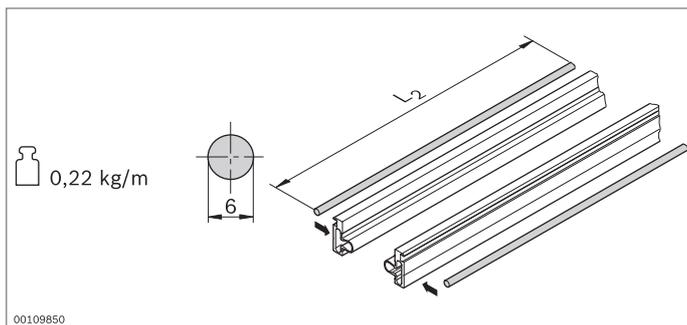




- ▶ The clamping profile is clipped into any 10 mm slot of the strut profile and it holds the guide rods

Clamping profile	L <sub>2</sub> (mm)	No.
<b>LF6C</b>	1 pc 150 ... 3000	<b>3 842 992 925 / L<sub>2</sub></b>
	20 pcs 3000	<b>3 842 518 896</b>

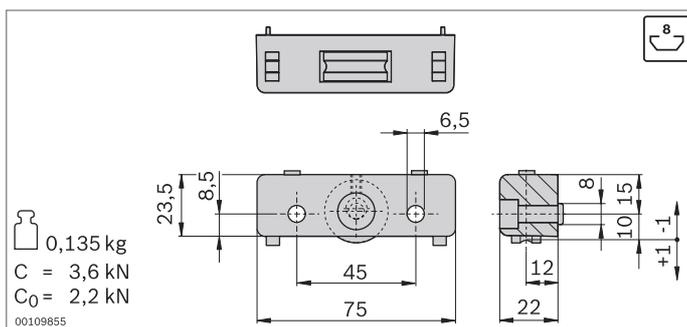
Material: Aluminum; anodized



- ▶ The guide rod is pressed into the clamping profile
- ▶ The guide rod guides the guide bearing

Guide rod	L <sub>2</sub> (mm)	No.
<b>LF6</b>	150 ... 3000	1 <b>3 842 993 967 / L<sub>2</sub></b>
	3000	20 <b>3 842 539 414</b>

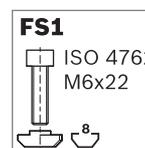
Material: Solid shaft VA, induction hardened, polished  
 Condition on delivery: Ungreased; greasing according to assembly instructions **3 842 527 226**



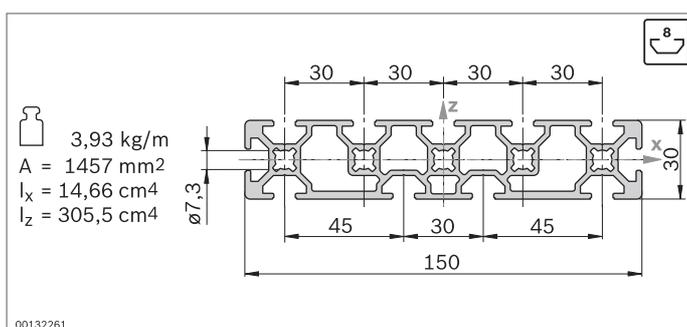
- ▶ Guide bearing for trolley construction
- ▶ Guiding via guide rod
- ▶ Cam rollers with ball bearings, permanently lubricated
- ▶ Lubricating felts with guide rod lubrication reservoir
- ▶ Play-free cam roller adjustment via eccentric bolts

Guide bearing	No.	FS
<b>LF6</b>	2 <b>3 842 535 662</b>	2xFS1

Material: Housing: Diecast aluminum  
 Cam roller: Steel, hardened, polished  
 Scope of delivery: Incl. fastening material (FS)  
 Condition on delivery: Lubricating felts ungreased; greasing according to assembly instructions **3 842 527 226**

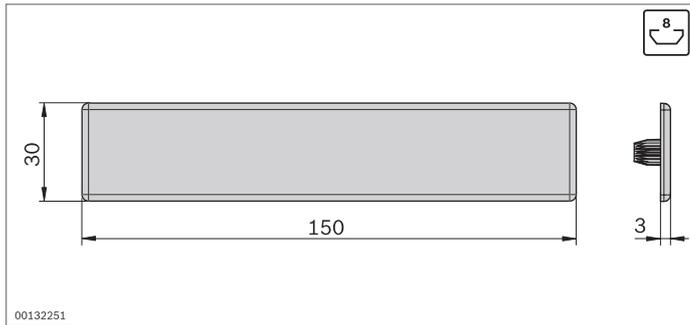


- ▶ Trolley profile for the construction of trolley LF6C



Trolley profile	L (mm)	No.
<b>LF6C</b>	150 ... 3000	<b>3 842 993 952 / L</b>

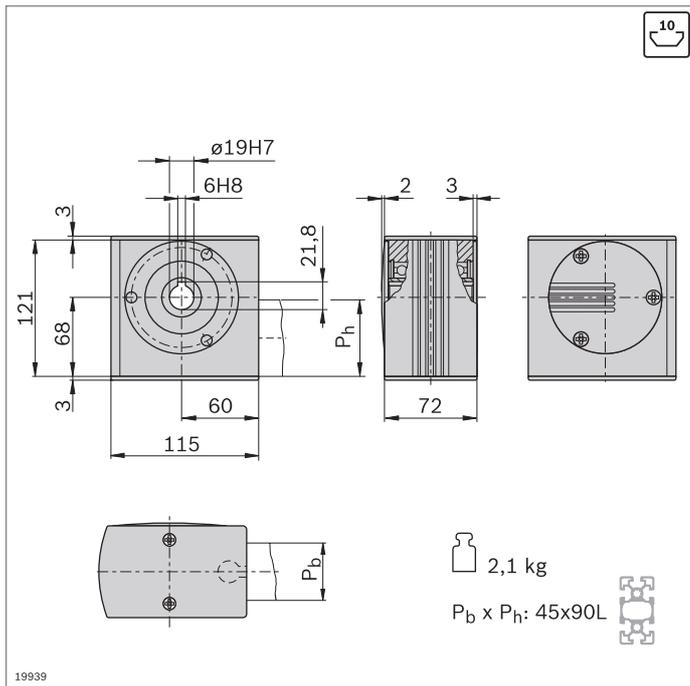
Material: Aluminum; anodized



- ▶ Cover cap for trolley profile LF6C
- ▶ For use on trolleys which are not driven by a toothed belt

Cover cap	No.
<b>LF6C</b>	<b>2 3 842 539 120</b>

Material: PA; black



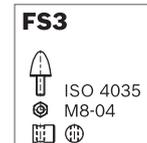
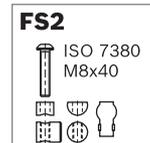
- ▶ Drive head for transferring drive torque to a toothed belt
- ▶ For direct mounting of a motor or (in conjunction with a plug-in shaft) for mounting a hollow shaft gear or a coupling (p. 13-46)
- ▶ Mounted directly on profile 45x90L using longitudinal end connector
- ▶ Profile finishing: LF blind hole drilling for longitudinal end connector

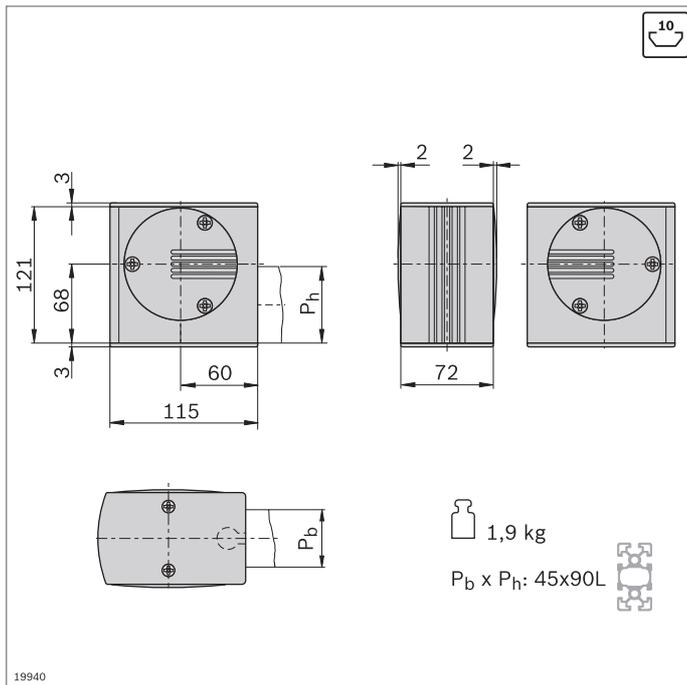
Drive head	No.	FS
<b>LF6C</b>	<b>3 842 526 416</b>	2xFS2, FS3

Material: Aluminum; anodized  
Hollow shaft: Steel; galvanized  
Cover caps: PA; black

Scope of delivery: Incl. Fastening material (FS), cover caps

2,1 kg  
 $P_b \times P_h: 45 \times 90L$



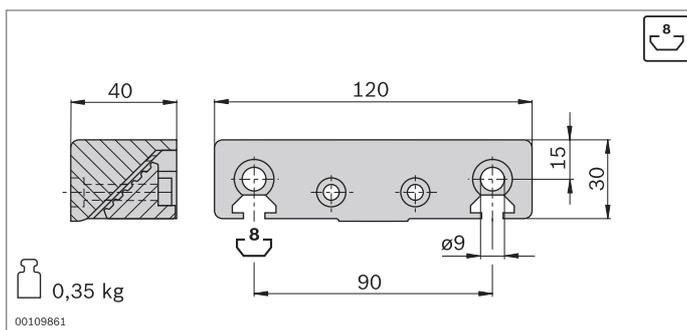
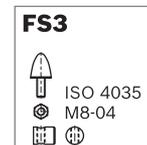


- ▶ Return head for tensioning the toothed belt and changing its direction
- ▶ Mounted directly on profile 45x90L using longitudinal end connector
- ▶ Profile finishing: LF blind hole drilling for longitudinal end connector

Return head	No.	FS
<b>LF6C</b>	<b>3 842 526 417</b>	2xFS2, FS3

Material: Aluminum; anodized  
Hollow shaft: Steel; galvanized  
Cover caps: PA; black

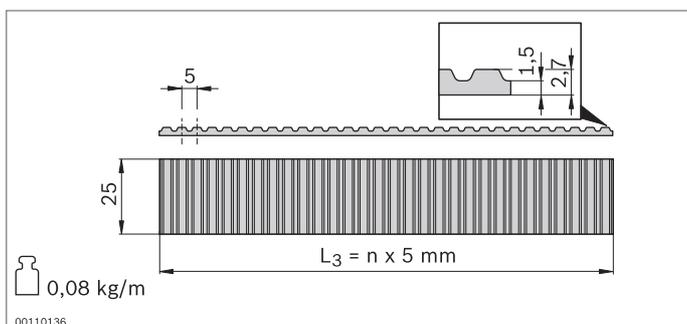
Scope of delivery: Incl. Fastening material (FS), cover caps



- ▶ Belt connector for fastening the toothed belt to the trolley slot
- ▶ All connecting parts for mounting on the trolley profile LF6C are included

Belt connector	No.	FS
<b>LF6C</b>	2 <b>3 842 535 681</b>	2xFS4, 2xFS5, 2xFS6

Material: Aluminum, painted black  
Scope of delivery: Incl. fastening material (FS)

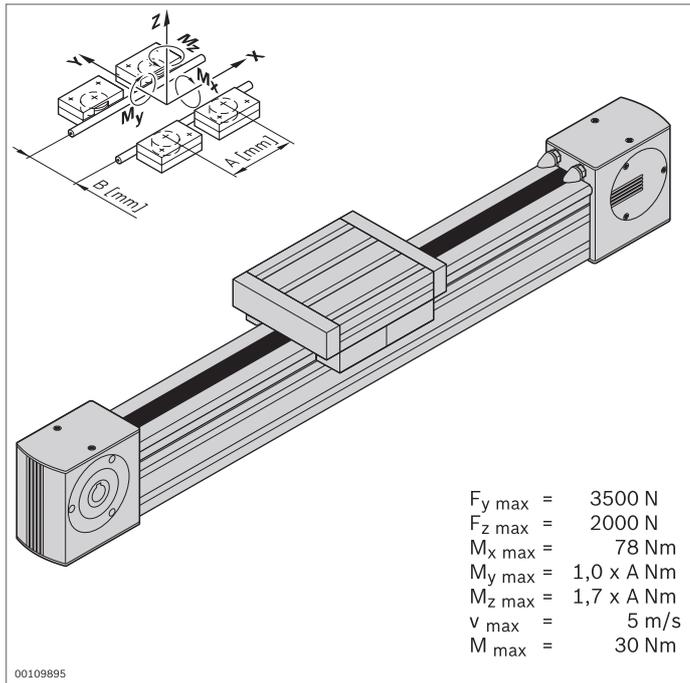


- ▶ Toothed belt as a trolley drive
- ▶ Pitch: AT5

Toothed belt	L <sub>3</sub> (mm)	No.
<b>LF6C</b>	300 ... 50000	<b>3 842 994 711 / L<sub>3</sub><sup>1)</sup></b>
	50000	<b>3 842 518 856</b>

<sup>1)</sup> L<sub>3</sub> = 2xL<sub>2</sub> - L<sub>1</sub> + 400

Material: PU with embedded steel wires

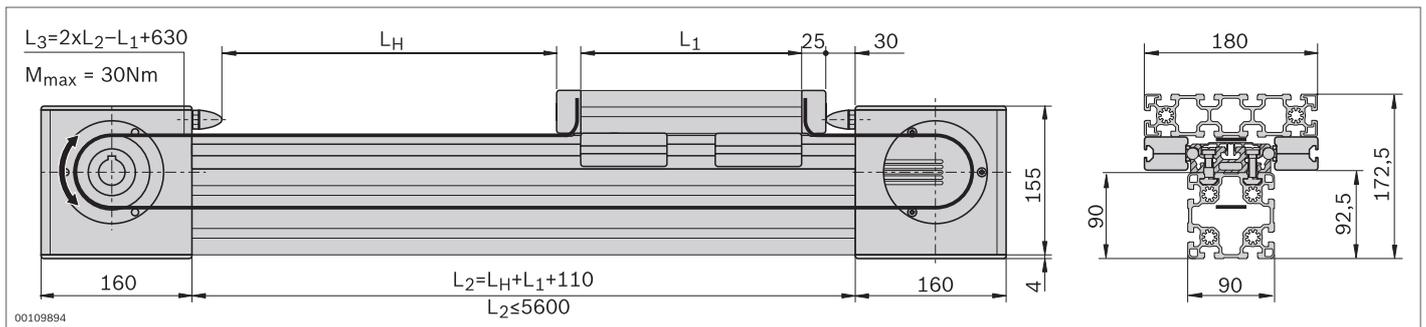


$F_{y \max} = 3500 \text{ N}$   
 $F_{z \max} = 2000 \text{ N}$   
 $M_{x \max} = 78 \text{ Nm}$   
 $M_{y \max} = 1,0 \times A \text{ Nm}$   
 $M_{z \max} = 1,7 \times A \text{ Nm}$   
 $v_{\max} = 5 \text{ m/s}$   
 $M_{\max} = 30 \text{ Nm}$

### Cam roller guide LF12S - complete axis



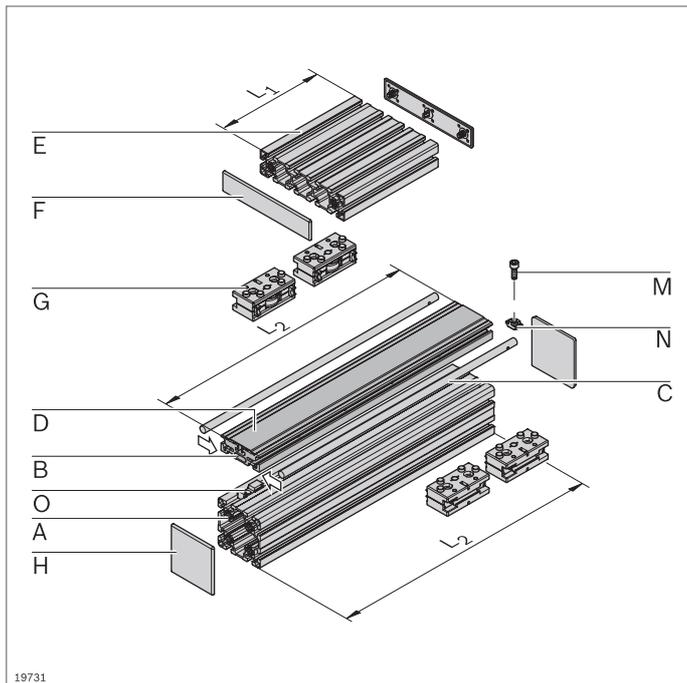
- ▶ Fully assembled cam roller guide
- ▶ Stroke and trolley length can be individually selected
- ▶ Rail profile screwed onto strut profile 90x90L
- ▶ Incl. toothed belt drive; additional notes on the drive concept (p. 13-44)



### Technical data

See pages 13-57 for notes on layout and drive

Complete axis	$L_H / L_1$ (mm)	No.
LF12S	$L_1 + 50 \leq L_H \leq 5310$ $180 \leq L_1 \leq 1000$	3 842 998 497 / $L_H / L_1$



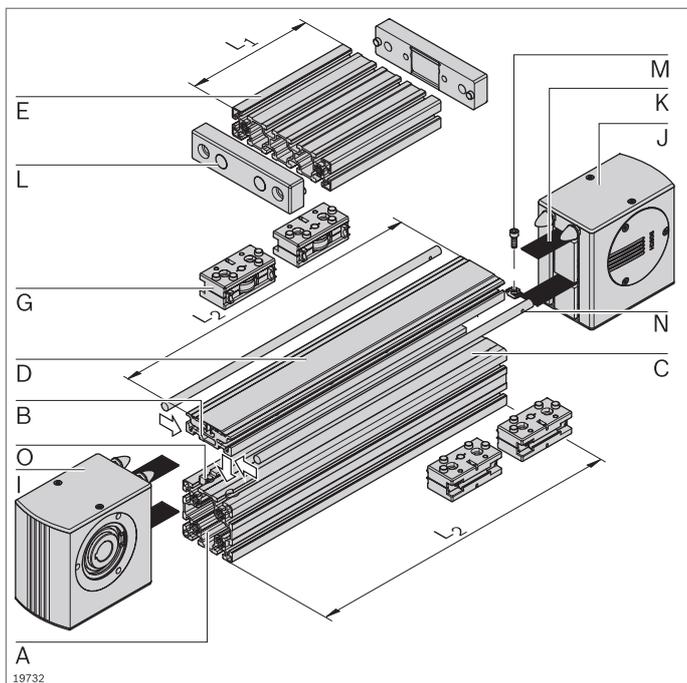
### Cam roller guide LF12S – components

- Components for the individual assembly of cam roller guides, with or without drive

#### Parts list for cam roller guide LF12S without drive

Component	No.	Pcs	Page
<b>A</b> Profile 90x90L	<b>3 842 992 415 / L<sub>2</sub></b>	1	2-45
<b>B</b> Guide profile LF12S	<b>3 842 992 438 / L<sub>2</sub></b>	1	13-18
<b>C</b> Guide rod LF12	<b>3 842 993 968 / L<sub>2</sub></b>	2	13-18
<b>D</b> Cover profile LF12S	<b>3 842 993 062 / L<sub>2</sub></b>	1	13-18
<b>E</b> Profile 45x180	<b>3 842 990 335 / L<sub>1</sub></b>	1	2-43
<b>F</b> Cover cap 45x180	<b>3 842 548 795</b>	2	2-43
<b>G</b> Guide bearing LF12	<b>3 842 535 664</b>	4	13-19
<b>H</b> Cover cap 90x90L	<b>3 842 548 759</b>	2	2-45
<b>M</b> Cylinder bolt DIN 7984 – M8x30		n <sup>1)</sup>	
<b>N</b> T-nut M8, 10 mm slot	<b>3 842 530 287</b>	n <sup>1)</sup>	3-4
<b>O</b> Sliding block	<b>3 842 146 877</b>	n <sup>1)</sup>	13-18

<sup>1)</sup> For identification see page 13-18

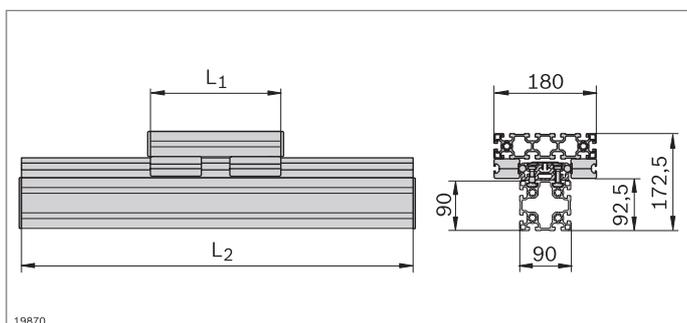


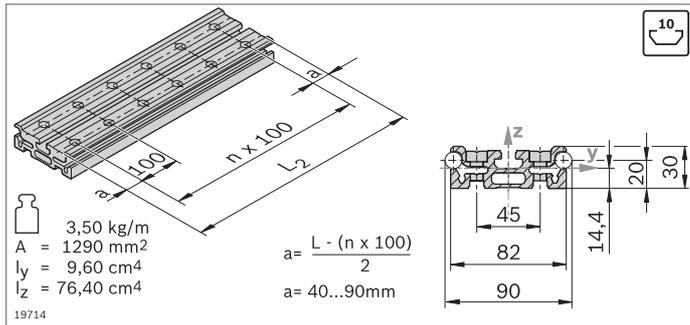
#### Parts list for cam roller guide LF12S with drive

Component	No.	Pcs	Page
<b>A</b> Profile 90x90L LF12S	<b>3 842 992 418 / L<sub>2</sub></b>	1	2-45
<b>B</b> Guide profile LF12S	<b>3 842 992 438 / L<sub>2</sub></b>	1	13-18
<b>C</b> Guide rod LF12	<b>3 842 993 968 / L<sub>2</sub></b>	2	13-18
<b>D</b> Cover profile LF12S	<b>3 842 993 062 / L<sub>2</sub></b>	1	13-18
<b>E</b> Profile 45x180 M12	<b>3 842 990 339 / L<sub>1</sub></b>	1	2-43
<b>G</b> Guide bearing LF12	<b>3 842 535 664</b>	4	13-19
<b>I</b> Drive head LF12S	<b>3 842 526 412</b>	1	13-21
<b>J</b> Return head LF12S	<b>3 842 526 413</b>	1	13-21
<b>K</b> Toothed belt	<b>3 842 994 821 / L<sub>3</sub><sup>1)</sup></b>	1	13-22
<b>L</b> Belt connector	<b>3 842 535 680</b>	2	13-22
<b>M</b> Cylinder bolt DIN 7984 – M8x30		n <sup>2)</sup>	
<b>N</b> T-nut M8, 10 mm slot	<b>3 842 530 287</b>	n <sup>2)</sup>	3-4
<b>O</b> Sliding block	<b>3 842 146 877</b>	n <sup>2)</sup>	13-18

<sup>1)</sup> L<sub>3</sub> = 2xL<sub>2</sub> - L<sub>1</sub> + 630

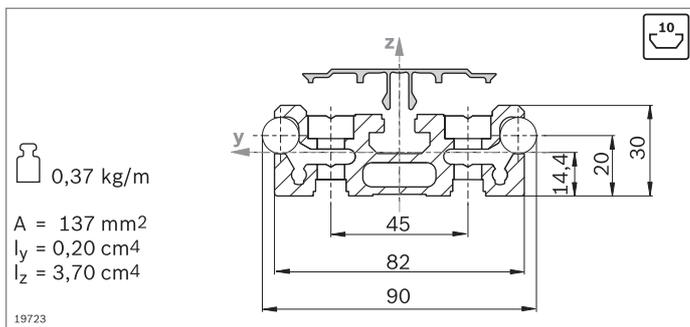
<sup>2)</sup> For identification see page 13-18





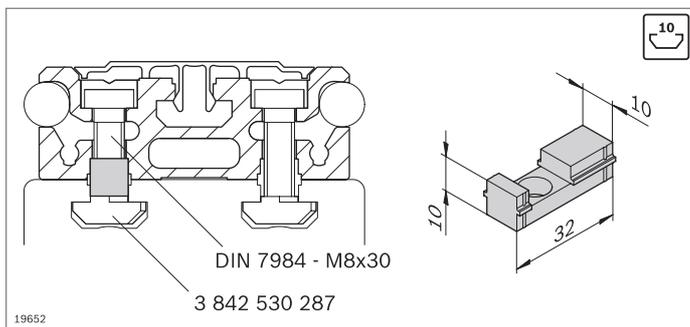
- ▶ Guide profile LF12S to hold the guide rods
- ▶ Installation on MGE strut profiles with 10 mm slot or directly on a flat surface

Guide profile	$L_2$ (mm)	No.
<b>LF12S</b>	180 ... 6070	<b>3 842 992 438 / <math>L_2</math></b>
	6 pcs	<b>6070 3 842 557 945</b>
Material:	Aluminum; anodized	
Accessories:	Cylinder bolt DIN 7984 – M8x30 T-nut M8, 10 mm slot, <b>3 842 530 287</b> Sliding block, cover profile, guide rod	



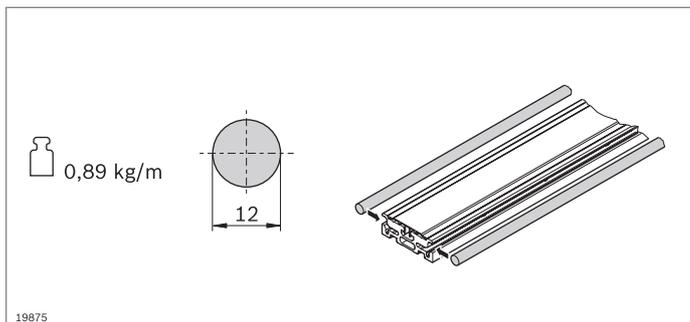
- ▶ Cover profile to prevent contamination on threaded connections

Cover profile	$L_2$ (mm)	No.
<b>LF12S</b>	150 ... 5600	<b>3 842 993 062 / <math>L_2</math></b>
Material:	Aluminum; anodized	



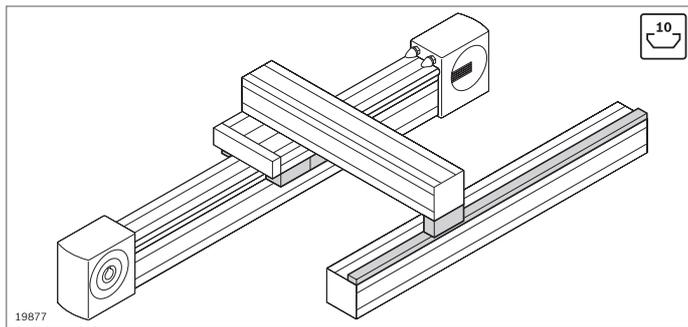
- ▶ Sliding block as a centering aid for mounting the guide profile in a 10 mm profile slot

Sliding block	No.
	50 <b>3 842 146 877</b>
Material:	PA; black

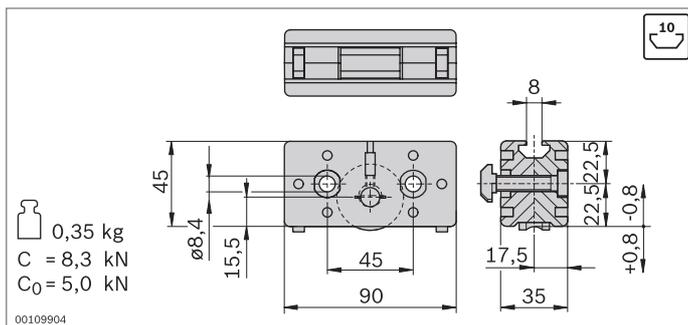


- ▶ The guide rod is pressed into the guide profile
- ▶ The guide rod guides the guide bearing

Guide rod	$L_2$ (mm)	No.
<b>LF12</b>	150 ... 2900	1 <b>3 842 993 968 / <math>L_2</math></b>
	2900	20 <b>3 842 539 415</b>
Material:	Solid shaft VA, induction hardened and polished	
Condition on delivery:	Ungreased; greasing according to assembly instructions <b>3 842 527 226</b>	



- ▶ Guide bearing for trolley construction
- ▶ Supporting bearing for brackets for bearing off-center forces
- ▶ Guide rail to hold supporting bearings (p. 13-20)



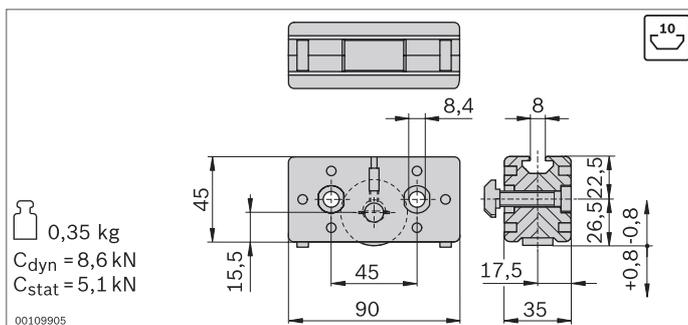
- ▶ Guide bearing for trolley construction
- ▶ Guiding via guide rod
- ▶ Cam rollers with ball bearings, permanently lubricated
- ▶ Lubricating felts with guide rod lubrication reservoir
- ▶ Play-free cam roller adjustment via eccentric bolts
- ▶ Replacement of the lubricating felts possible from rear in installed state

Guide bearing	No.	FS
LF12	2 3 842 535 664	2xFS1, 4xFS2

Material: Housing: Diecast aluminum  
Cam roller: Steel, hardened, polished

Scope of delivery: Incl. fastening material (FS)

Condition on delivery: Lubricating felts ungreased; greasing according to assembly instructions  
**3 842 527 226**



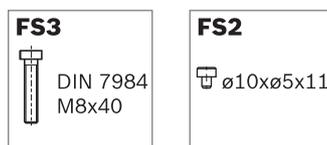
- ▶ Supporting bearing for brackets for bearing off-center forces
- ▶ For support on the guide rail
- ▶ Cam rollers with ball bearings, permanently lubricated
- ▶ Lubricating felts with guide rod lubrication reservoir
- ▶ Play-free cam roller adjustment via eccentric bolts
- ▶ Replacement of the lubricating felts possible from rear in installed state

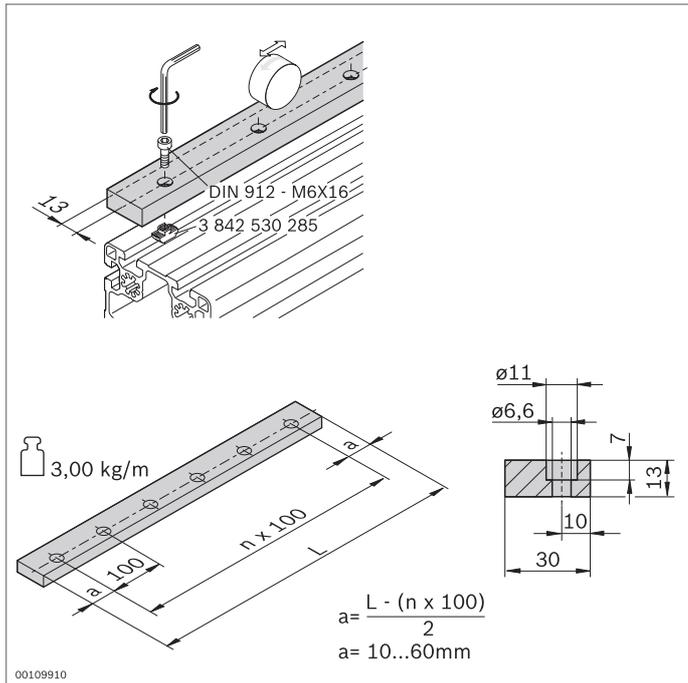
Supporting bearing	No.	FS
LF12	2 3 842 535 666	2xFS3 4xFS2

Material: Housing: Diecast aluminum  
Cam roller: Steel, hardened, polished

Scope of delivery: Incl. fastening material (FS)

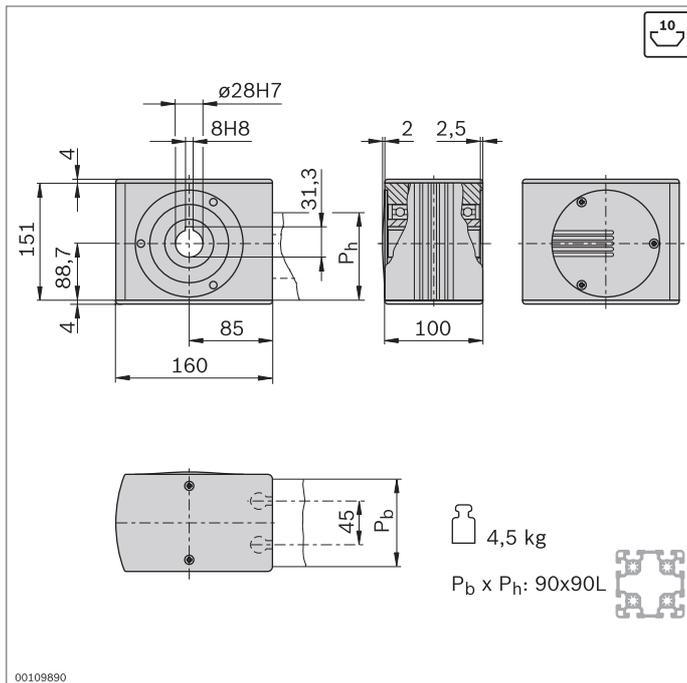
Condition on delivery: Lubricating felts ungreased; greasing according to assembly instructions  
**3 842 527 226**





► Guide rail to hold supporting bearings

Guide rail	L (mm)	No.
<b>LF12</b>	120 ... 2000	<b>3 842 994 702 / L</b>
Material:	Steel, hardened, polished	
Condition on delivery:	Ungreased; greasing according to assembly instructions <b>3 842 527 226</b>	
Accessories:	Cylinder bolt DIN 912 – M6x16 T-nut M6, 10 mm slot ( <b>3 842 530 285</b> )	

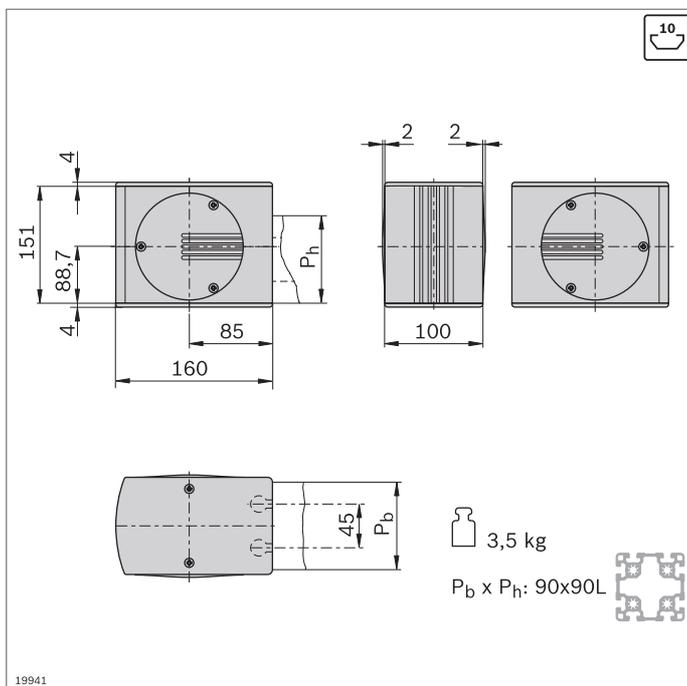
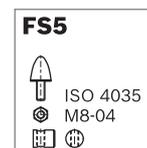


- ▶ Drive head for transferring drive torque to a toothed belt
- ▶ For direct mounting of a motor or (in conjunction with a plug-in shaft) for mounting a hollow shaft gear or a coupling (p. 13-46)
- ▶ Mounted directly on profile by using longitudinal end connector (connector included in scope of delivery)
- ▶ Profile finishing: LF blind hole drilling for longitudinal end connector

Drive head	No.	FS
<b>LF12S</b>	<b>3 842 526 412</b>	2xFS4, 2xFS5

Material: Drive head: Aluminum; anodized  
Cover caps: PA; black  
Hollow shaft: Steel; galvanized

Scope of delivery: Incl. Fastening material (FS), cover caps

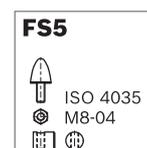


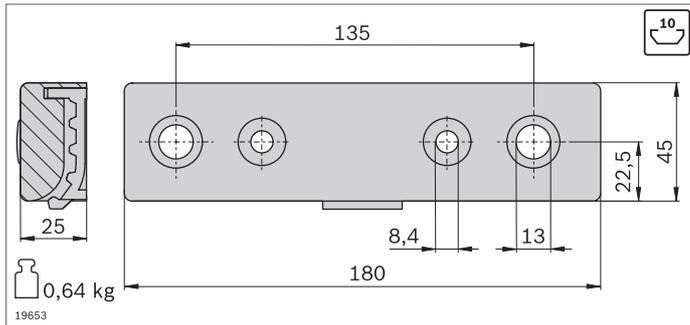
- ▶ Return head for tensioning the toothed belt and changing its direction
- ▶ Mounted directly on profile by using longitudinal end connector (connector included in scope of delivery)
- ▶ Profile finishing: LF blind hole drilling for longitudinal end connector

Return head	No.	FS
<b>LF12S</b>	<b>3 842 526 413</b>	2xFS4, 2xFS5

Material: Aluminum; anodized  
Hollow shaft: Steel; galvanized  
Cover caps: PA; black

Scope of delivery: Incl. Fastening material (FS), cover caps

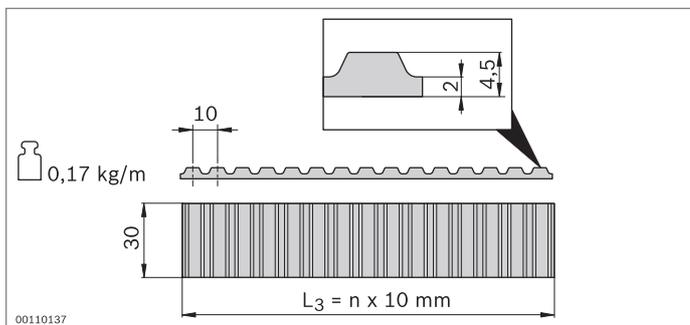
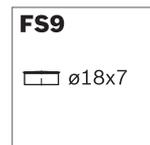
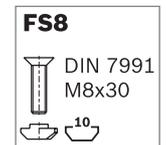
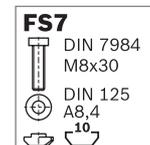




- ▶ Belt connector suitable for trolley built out of strut profiles 45x180
- ▶ All connecting parts included for mounting on the profile end (LF12S) or in the slot (LF12C)
- ▶ Profile finishing for strut profile 45x180 for trolley LF12S: M12

Belt connector	No.	FS
LF12	2 3 842 535 680	4xFS2, 2xFS6, 2xFS7, 2xFS8, 2xFS9

Material: Aluminum, painted black  
 Scope of delivery: Incl. fastening material (FS)

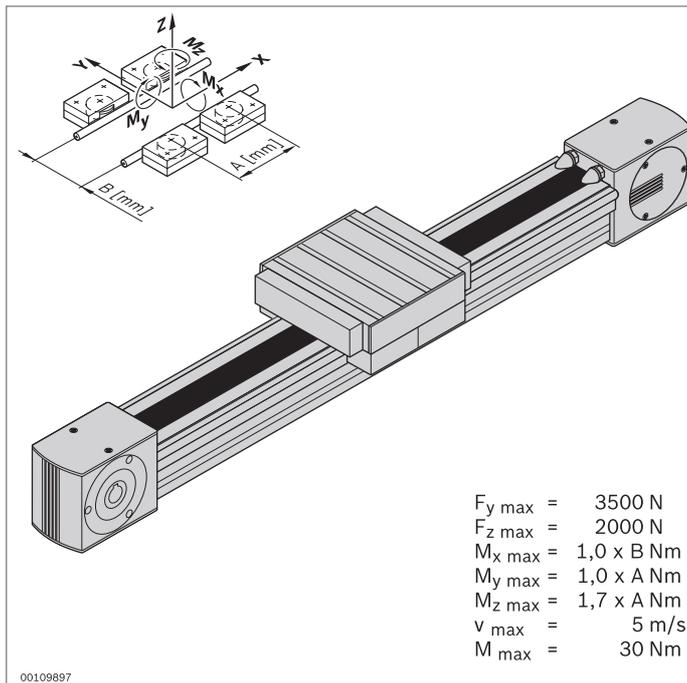


- ▶ Toothed belt as a trolley drive
- ▶ Pitch: AT10

Toothed belt	L <sub>3</sub> (mm)	No.
LF12	300 ... 50000	3 842 994 821 / L <sub>3</sub> <sup>1)</sup>
	50000	3 842 526 422

<sup>1)</sup> L<sub>3</sub> = 2xL<sub>2</sub> - L<sub>1</sub> + 630

Material: PU with embedded steel wires

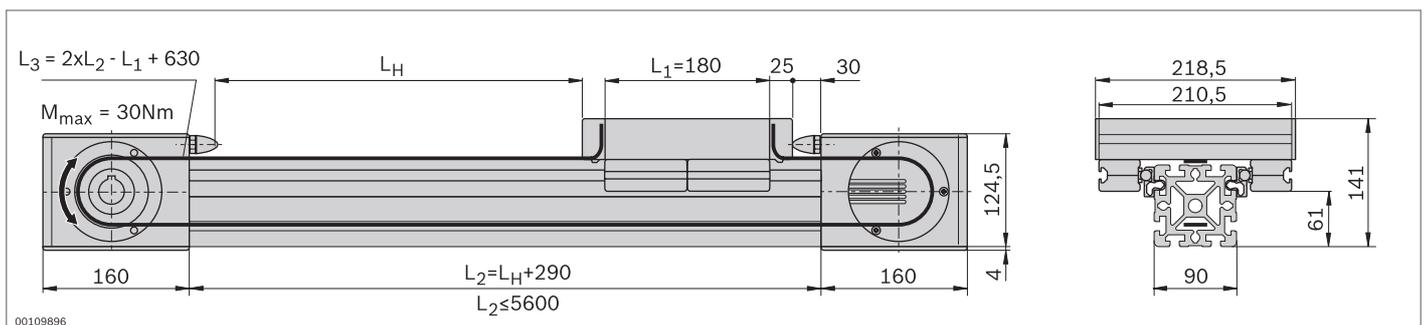


### Cam roller guide LF12C – complete axis



- ▶ Fully assembled cam roller guide
- ▶ Stroke can be individually selected
- ▶ Clamping profile clipped into strut profile 90x90
- ▶ Incl. toothed belt drive; additional notes on the drive concept (p. 13-44)

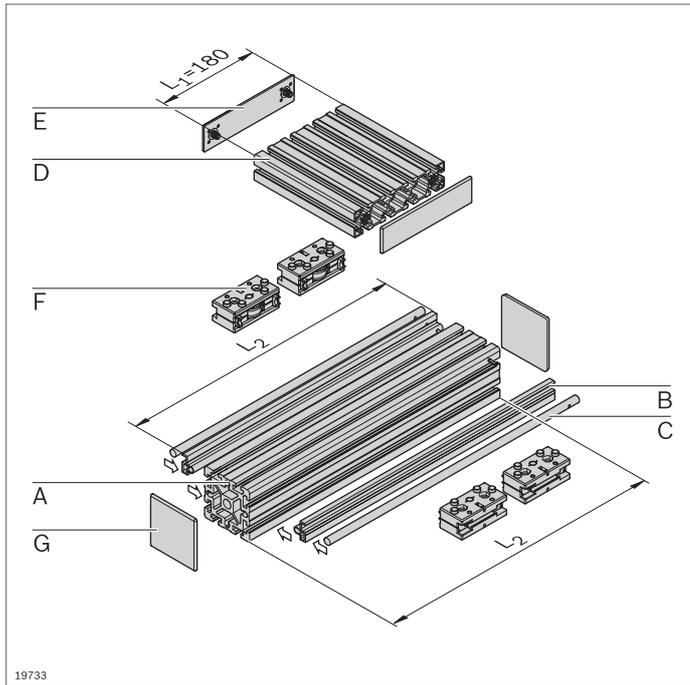
$F_y \text{ max} = 3500 \text{ N}$   
 $F_z \text{ max} = 2000 \text{ N}$   
 $M_x \text{ max} = 1,0 \times B \text{ Nm}$   
 $M_y \text{ max} = 1,0 \times A \text{ Nm}$   
 $M_z \text{ max} = 1,7 \times A \text{ Nm}$   
 $v \text{ max} = 5 \text{ m/s}$   
 $M \text{ max} = 30 \text{ Nm}$



### Technical data

For notes on layout and drive, see page 13-50

Complete axis	$L_H$ (mm)	No.
LF12C	50 ... 5310	3 842 998 498 / $L_H$

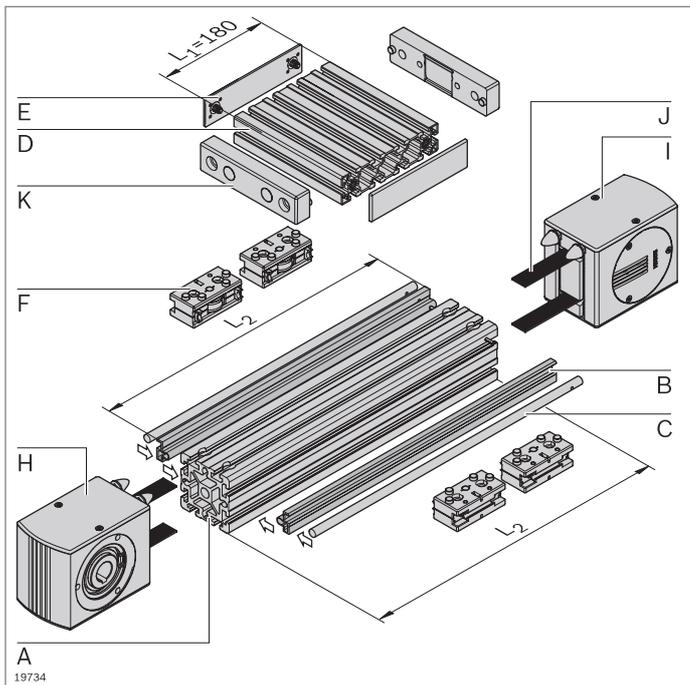


### Cam roller guide LF12C – components

- Components for the individual assembly of cam roller guides, with or without drive

#### Parts list for cam roller guide LF12C without drive

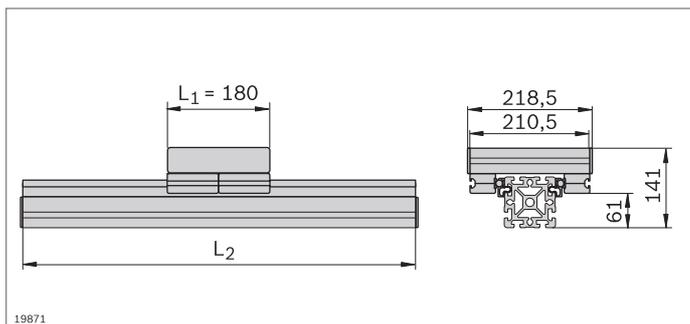
Component	No.	Pcs	Page
<b>A</b> Profile 90x90	<b>3 842 990 500 / L<sub>2</sub></b>	1	2-46
<b>B</b> Clamping profile LF12C	<b>3 842 992 440 / L<sub>2</sub></b>	2	13-25
<b>C</b> Guide rod LF12	<b>3 842 993 968 / L<sub>2</sub></b>	2	13-25
<b>D</b> Profile 45x180	<b>3 842 990 335 / 210.5 mm</b>	1	2-43
<b>E</b> Cover cap 45x180	<b>3 842 548 795</b>	2	2-43
<b>F</b> Guide bearing LF12	<b>3 842 535 664</b>	4	13-26
<b>G</b> Cover cap 90x90	<b>3 842 548 761</b>	2	2-46

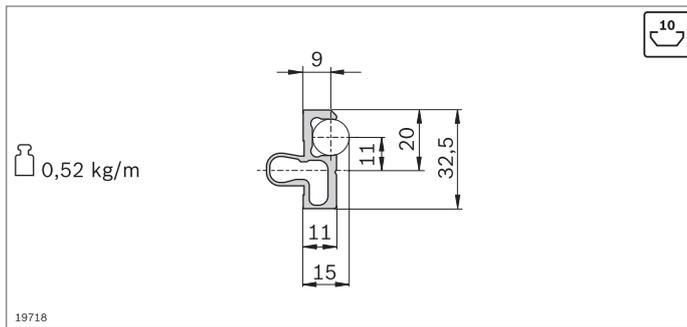


#### Parts list for cam roller guide LF12C with drive

Component	No.	Pcs	Page
<b>A</b> Profile 90x90 LF	<b>3 842 993 082 / L<sub>2</sub></b>	1	2-46
<b>B</b> Clamping profile LF12C	<b>3 842 992 440 / L<sub>2</sub></b>	2	13-25
<b>C</b> Guide rod LF12	<b>3 842 993 968 / L<sub>2</sub></b>	2	13-25
<b>D</b> Profile 45x180	<b>3 842 990 335 / 210.5 mm</b>	1	2-43
<b>E</b> Cover cap 45x180	<b>3 842 548 795</b>	2	2-43
<b>F</b> Guide bearing LF12	<b>3 842 535 664</b>	4	13-26
<b>H</b> Drive head LF12C	<b>3 842 526 863</b>	1	13-28
<b>I</b> Return head LF12C	<b>3 842 526 865</b>	1	13-28
<b>J</b> Toothed belt LF12	<b>3 842 994 821 / L<sub>3</sub><sup>1)</sup></b>	1	13-29
<b>K</b> Belt connector LF12	<b>3 842 535 680</b>	2	13-29

<sup>1)</sup> L<sub>3</sub> = 2xL<sub>2</sub> - L<sub>1</sub> + 630

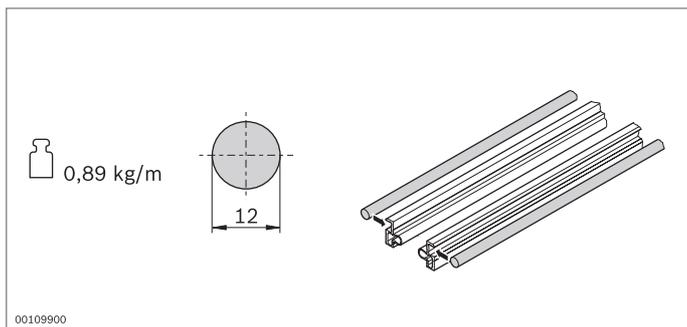




- ▶ The clamping profile is clipped into any chosen strut profile with a 10 mm slot and holds the guide rods

Clamping profile	L <sub>2</sub> (mm)	No.
<b>LF12C</b>	1 pc 150 ... 3000	<b>3 842 992 440 / L<sub>2</sub></b>
	20 pcs 3000	<b>3 842 518 897</b>

Material: Aluminum; anodized

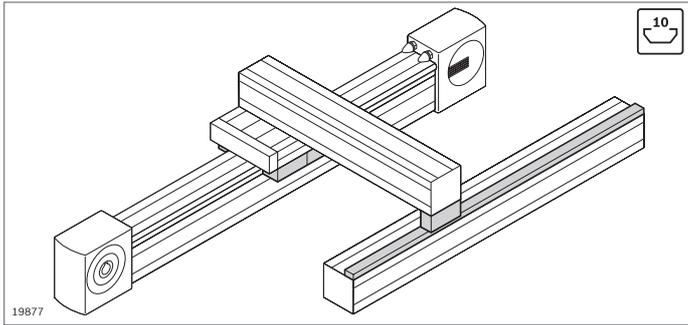


- ▶ The guide rod is pressed into the clamping profile
- ▶ The guide rod guides the guide bearing

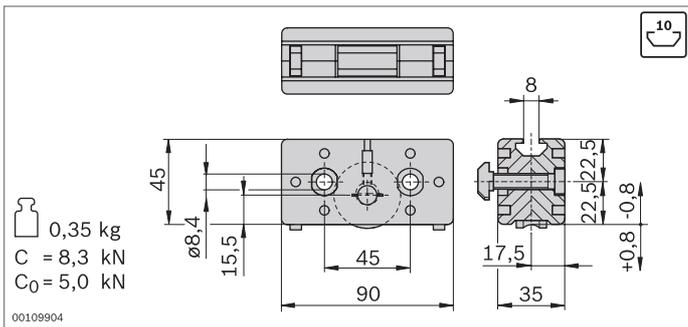
Guide rod	L <sub>2</sub> (mm)	No.
<b>LF12</b>	150 ... 2900	1 <b>3 842 993 968 / L<sub>2</sub></b>
	2900	20 <b>3 842 539 415</b>

Material: Solid shaft VA, induction hardened and polished

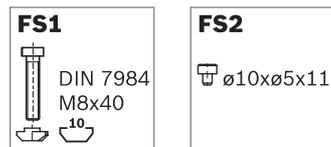
Condition on delivery: Ungreased; greasing according to assembly instructions **3 842 527 226**



- ▶ Guide bearing for trolley construction
- ▶ Supporting bearing for brackets for bearing off-center forces
- ▶ Guide rail to support supporting bearings (p. 13-27)



- ▶ Guide bearing for trolley construction
- ▶ Guiding via guide rod
- ▶ Cam rollers with ball bearings, permanently lubricated
- ▶ Lubricating felts with guide rod lubrication reservoir
- ▶ Play-free cam roller adjustment via eccentric bolts
- ▶ Replacement of the lubricating felts possible from rear in installed state

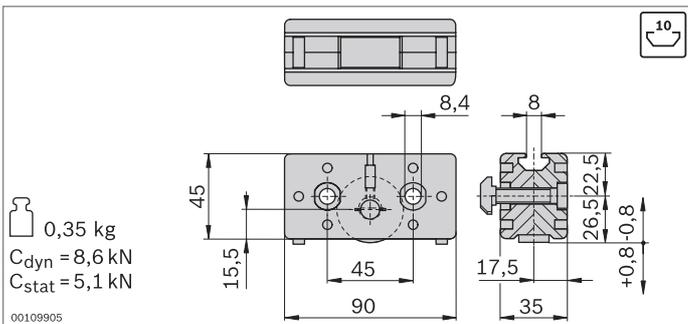


Guide bearing	No.	FS
LF12	2 <b>3 842 535 664</b>	2xFS1 4xFS2

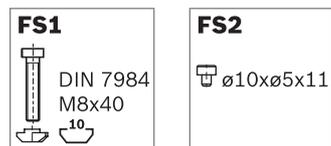
Material: Guide bearing: Diecast aluminum  
Cam roller: Steel, hardened, polished

Scope of delivery: Incl. fastening material (FS)

Condition on delivery: Lubricating felts ungreased; greasing according to assembly instructions  
**3 842 527 226**



- ▶ Supporting bearing for brackets for bearing off-center forces
- ▶ For support on the guide rail
- ▶ Cam rollers with ball bearings, permanently lubricated
- ▶ Lubricating felts with guide rod lubrication reservoir
- ▶ Play-free cam roller adjustment via eccentric bolts
- ▶ Replacement of the lubricating felts possible from rear in installed state

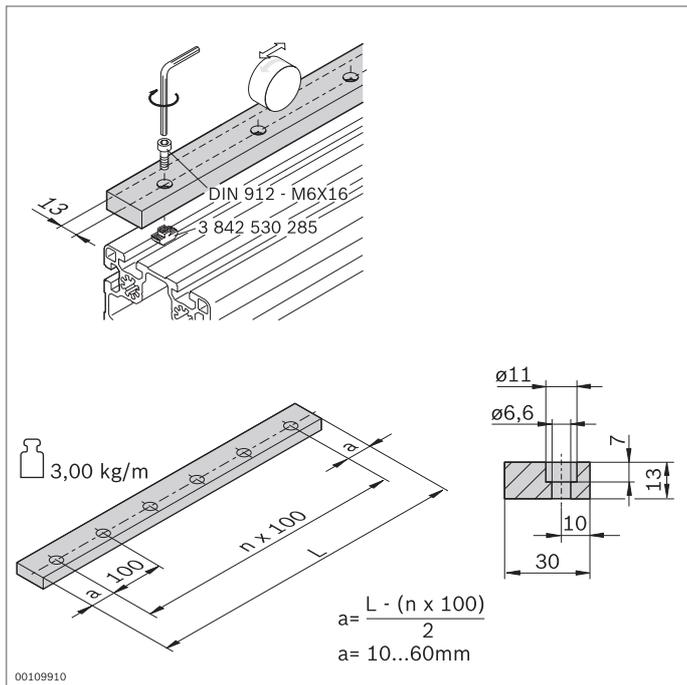


Supporting bearing	No.	FS
LF12	2 <b>3 842 535 666</b>	2xFS1 4xFS2

Material: Guide bearing: Diecast aluminum  
Cam roller: Steel, hardened, polished

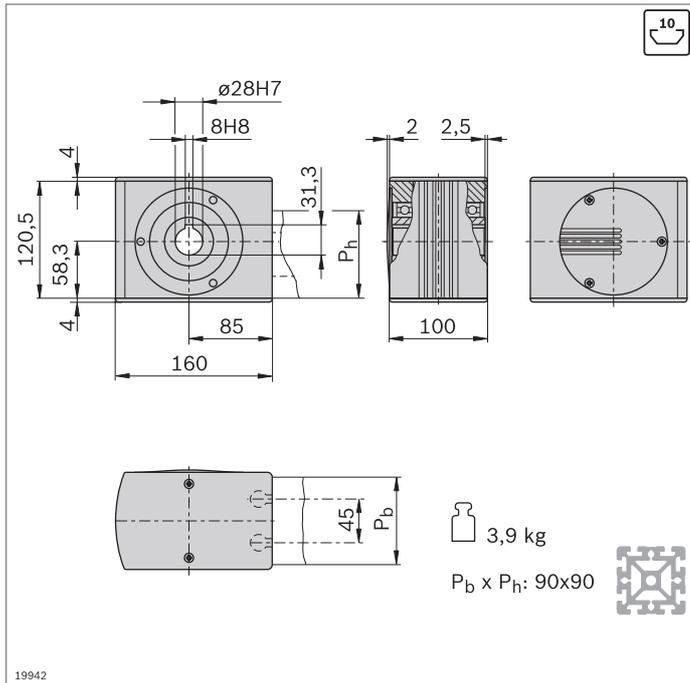
Scope of delivery: Incl. fastening material (FS)

Condition on delivery: Lubricating felts ungreased; greasing according to assembly instructions  
**3 842 527 226**



► Guide rail to hold supporting bearings

Guide rail	L (mm)	No.
<b>LF12</b>	120 ... 2000	<b>3 842 994 702 / L</b>
Material:	Steel, hardened, polished	
Condition on delivery:	Ungreased; greasing according to assembly instructions <b>3 842 527 226</b>	
Accessories:	Cylinder bolt DIN 912 – M6x16 T-nut M6, 10 mm slot ( <b>3 842 530 285</b> )	

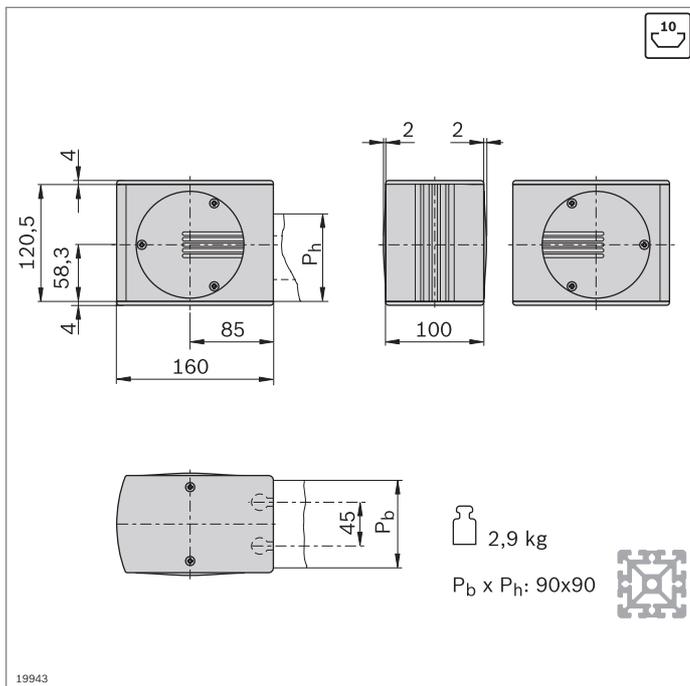
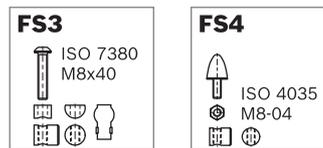


- ▶ Drive head for transferring drive torque to a toothed belt
- ▶ For direct mounting of a motor or (in conjunction with a plug-in shaft) for mounting a hollow shaft gear or a coupling (p. 13-46)
- ▶ Mounted directly on profile by using longitudinal end connector (connector included in scope of delivery)
- ▶ Profile finishing: LF blind hole drilling for longitudinal end connector

Drive head	No.	FS
<b>LF12C</b>	<b>3 842 526 863</b>	4xFS3, 2xFS4

Material: Drive head: Aluminum; anodized  
Hollow shaft: Steel; galvanized  
Cover caps: PA; black

Scope of delivery: Incl. Fastening material (FS), cover caps

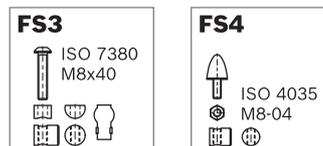


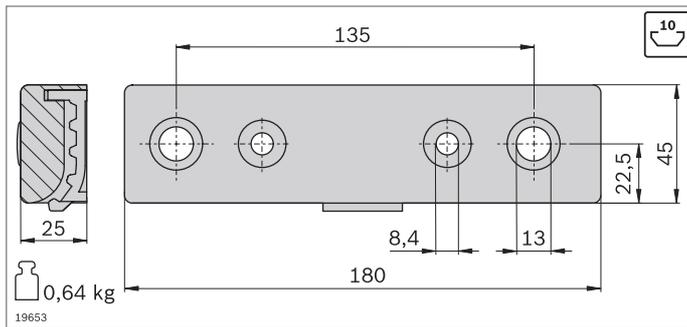
- ▶ Return head for tensioning the toothed belt and changing its direction
- ▶ Mounted directly on profile by using longitudinal end connector (connector included in scope of delivery)
- ▶ Profile finishing: LF blind hole drilling for longitudinal end connector

Return head	No.	FS
<b>LF12C</b>	<b>3 842 526 865</b>	4xFS3, 2xFS4

Material: Return head: Aluminum; anodized  
Hollow shaft: Steel; galvanized  
Cover caps: PA; black

Scope of delivery: Incl. Fastening material (FS), cover caps



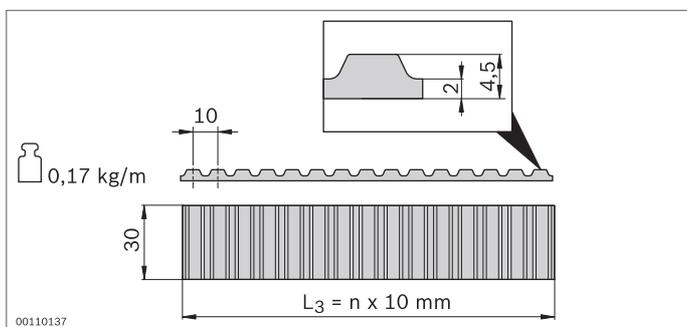


- ▶ Belt connector suitable for trolley built out of strut profiles 45x180
- ▶ All connecting parts included for mounting at the profile end (LF12S) or the slot (LF12C)
- ▶ Profile finishing for strut profile 45x180 for trolley LF12S: M12

Belt connector	No.	FS
<b>LF12</b>	2 <b>3 842 535 680</b>	4xFS2, 2xFS5, 2xFS6, 2xFS7, 2xFS8

Material: Aluminum, painted black  
 Scope of delivery: Incl. fastening material (FS)

<p><b>FS2</b></p> <p>ø10xø5x11</p>	<p><b>FS5</b></p> <p>DIN7984 M12x40</p>	<p><b>FS6</b></p> <p>DIN 7984 M8x30 DIN 125 A8,4</p>	<p><b>FS7</b></p> <p>DIN 7991 M8x30</p>
<p><b>FS8</b></p> <p>ø18x7</p>			

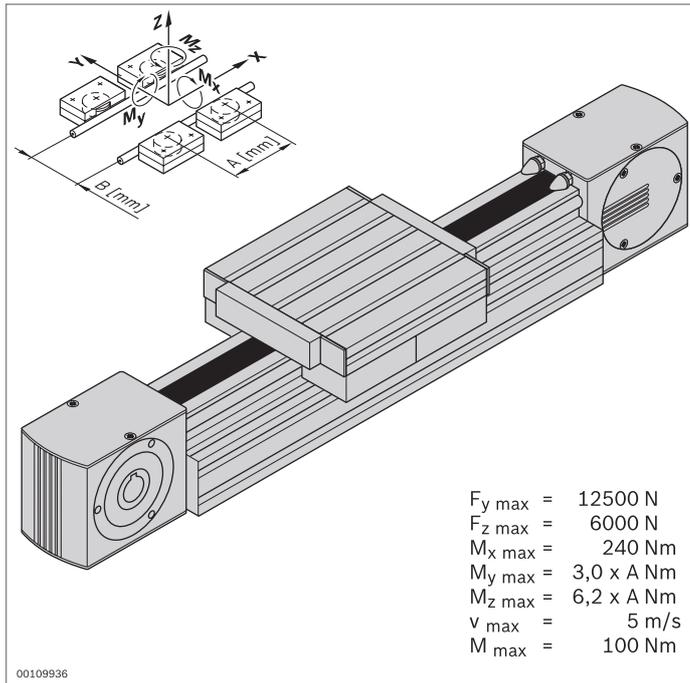


- ▶ Toothed belt as a trolley drive
- ▶ Pitch: AT10

Toothed belt	L <sub>3</sub> (mm)	No.
<b>LF12</b>	300 ... 50000	<b>3 842 994 821 / L<sub>3</sub><sup>1)</sup></b>
	50000	<b>3 842 526 422</b>

<sup>1)</sup> L<sub>3</sub> = 2xL<sub>2</sub> - L<sub>1</sub> + 630

Material: PU with embedded steel wires

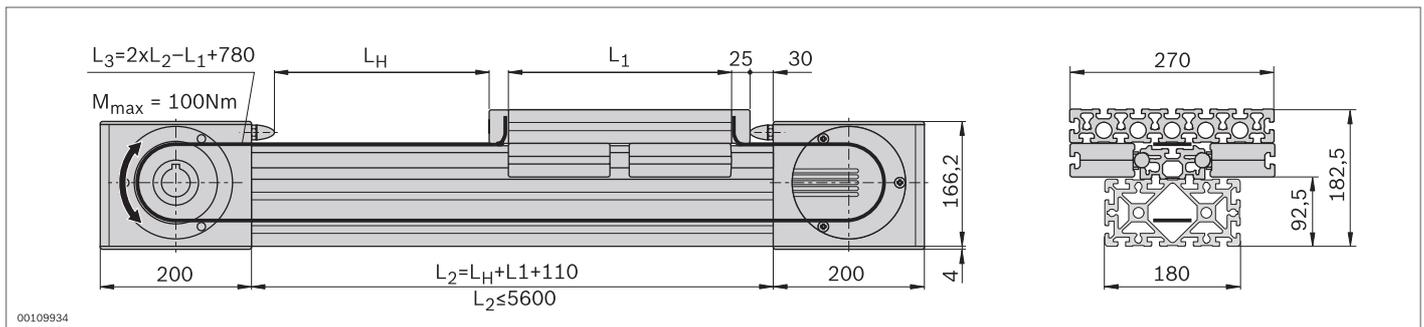


$F_y \text{ max} = 12500 \text{ N}$   
 $F_z \text{ max} = 6000 \text{ N}$   
 $M_x \text{ max} = 240 \text{ Nm}$   
 $M_y \text{ max} = 3,0 \times A \text{ Nm}$   
 $M_z \text{ max} = 6,2 \times A \text{ Nm}$   
 $v \text{ max} = 5 \text{ m/s}$   
 $M \text{ max} = 100 \text{ Nm}$

### Cam roller guide LF20S – complete axis



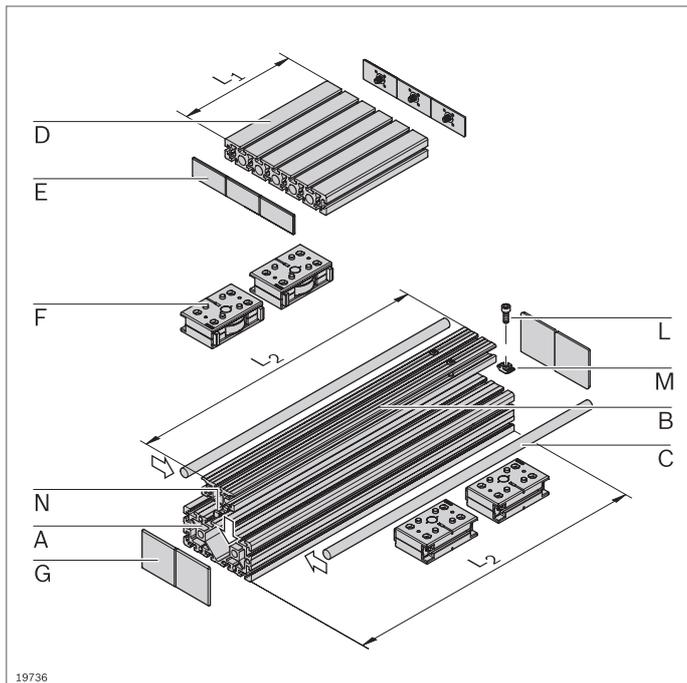
- ▶ Fully assembled cam roller guide
- ▶ Stroke and trolley length can be individually selected
- ▶ Rail profile mounted on strut profile 90x180
- ▶ Incl. toothed belt drive; additional notes on the drive concept (p. 13-44)



### Technical data

See pages 13-57 for notes on layout and drive

Complete axis	$L_H / L_1$ (mm)	No.
LF20S	$L_1 + 50 \leq L_H \leq 5220$ $270 \leq L_1 \leq 1000$	3 842 998 499 / $L_H / L_1$



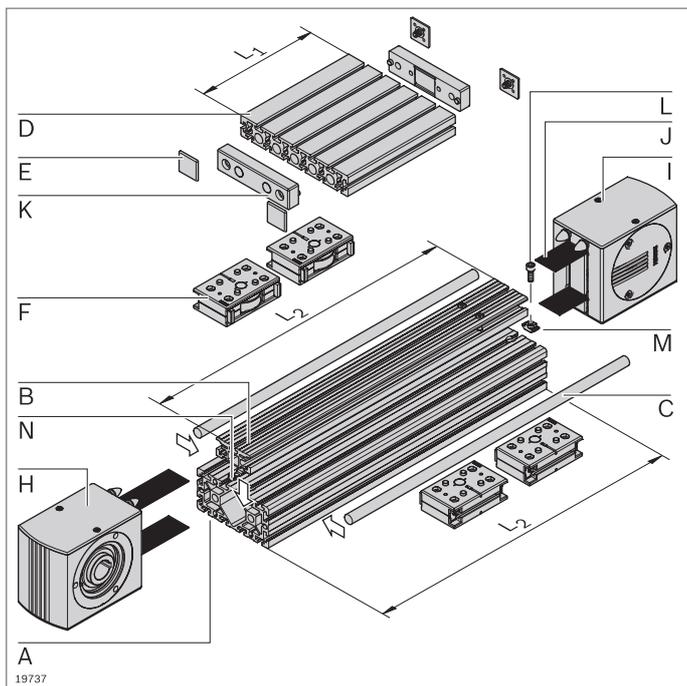
### Cam roller guide LF20S – components

► Components for the individual assembly of cam roller guides, with or without drive

#### Parts list for cam roller guide LF20S without drive

Component	No.	Pcs	Page
A Profile 90x180	3 842 990 416 / L <sub>2</sub>	1	2-47
B Guide profile LF20S	3 842 993 080 / L <sub>2</sub>	1	13-32
C Guide rod LF20	3 842 993 969 / L <sub>2</sub>	2	13-32
D Profile 45x270	3 842 992 927 / L <sub>1</sub>	1	2-44
E Cover cap 45x90	3 842 548 757	6	2-44
F Guide bearing LF20	3 842 535 663	4	13-33
G Cover cap 90x90	3 842 548 761	4	2-46
L Cylinder bolt DIN 7984 – M8x45		n <sup>1)</sup>	
M T-nut M8, 10 mm slot	3 842 530 287	n <sup>1)</sup>	3-4
N Sliding block	3 842 146 877	n <sup>1)</sup>	13-32

<sup>1)</sup> For identification see page 13-32

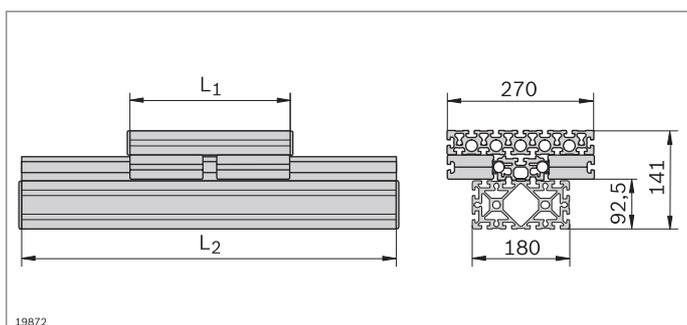


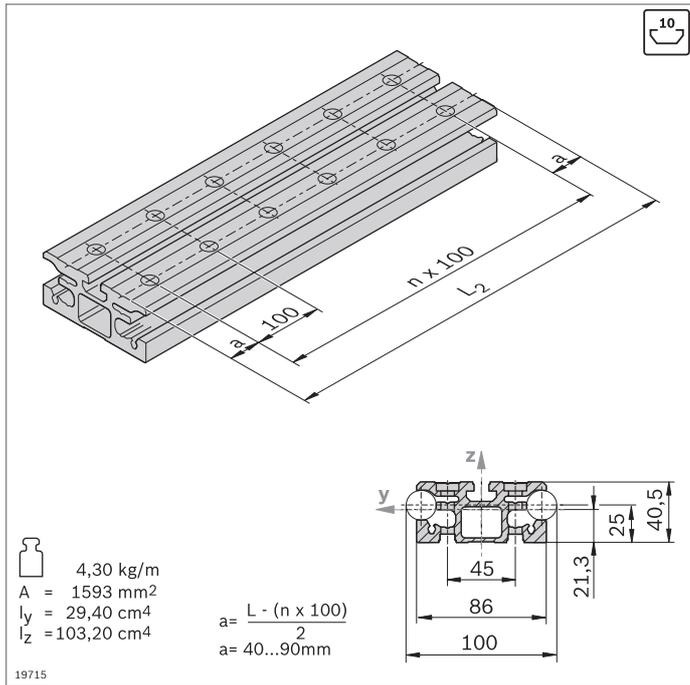
#### Parts list for cam roller guide LF20S with drive

Component	No.	Pcs	Page
A Profile 90x180 LF-S	3 842 993 081 / L <sub>2</sub>	1	2-47
B Guide profile LF20S	3 842 993 080 / L <sub>2</sub>	1	13-32
C Guide rod LF20	3 842 993 969 / L <sub>2</sub>	2	13-32
D Profile 45x270 M12	3 842 992 928 / L <sub>1</sub>	1	2-44
E Cover cap 45x45	3 842 548 753	4	2-39
F Guide bearing LF20	3 842 535 663	4	13-33
H Drive head LF20S	3 842 526 414	1	13-35
I Return head LF20S	3 842 526 415	1	13-35
J Toothed belt LF20	3 842 994 662 / L <sub>3</sub> <sup>1)</sup>	1	13-36
K Belt connector LF20	3 842 535 680	2	13-36
L Cylinder bolt DIN 7984 – M8x45		n <sup>2)</sup>	
M T-nut M8, 10 mm slot	3 842 530 287	n <sup>2)</sup>	3-4
N Sliding block	3 842 146 877	n <sup>2)</sup>	13-32

<sup>1)</sup> L<sub>3</sub> = 2xL<sub>2</sub> - L<sub>1</sub> + 780

<sup>2)</sup> For identification see page 13-32

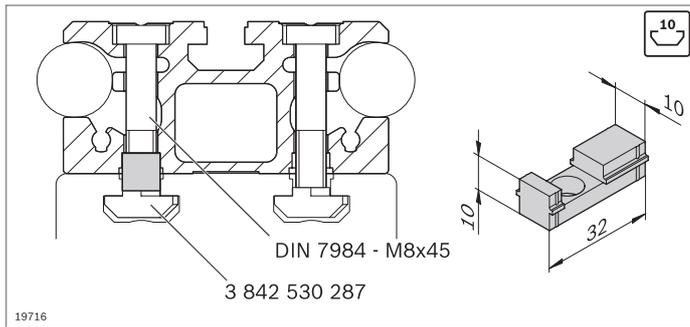




- ▶ Guide profile LF20S to hold the guide rods
- ▶ Installation on MGE strut profiles with 10 mm slot or directly on a flat surface

Guide profile	$L_2$ (mm)	No.
<b>LF20S</b>	1 pc 180 ... 6070	<b>3 842 993 080 / <math>L_2</math></b>
	6 pcs	6070 <b>3 842 557 958</b>

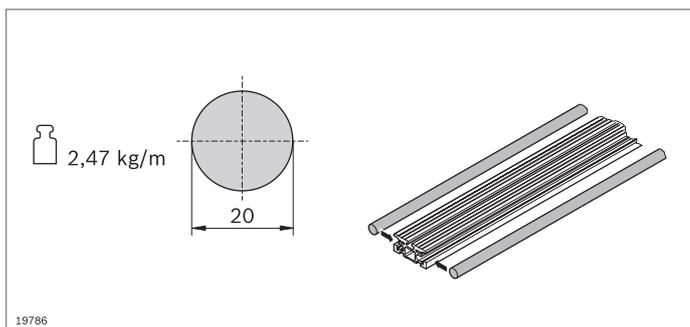
Accessories: Cylinder screw DIN 7984 M8x45  
 T-nut M8, 10 mm slot (p. 3-4)  
 Sliding block



- ▶ Sliding block as a centering aid for mounting the guide profile in a 10 mm profile slot

Sliding block	No.
	50 <b>3 842 146 877</b>

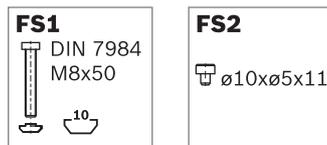
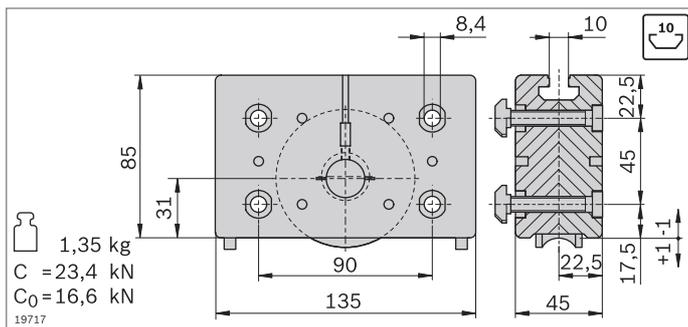
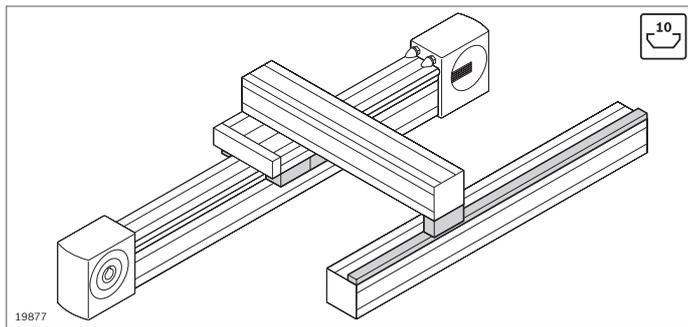
Material: PA; black



- ▶ The guide rod is pressed into the guide profile
- ▶ The guide rod guides the guide bearing

Guide rod	$L_2$ (mm)	No.
<b>LF20</b>	150 ... 2900	1 <b>3 842 993 969 / <math>L_2</math></b>
	2900	20 <b>3 842 539 416</b>

Material: Solid shaft VA, induction hardened, polished  
 Condition on delivery: Ungreased; greasing according to assembly instructions **3 842 527 226**



- ▶ Guide bearing for trolley construction
- ▶ Supporting bearing for brackets for bearing off-center forces
- ▶ Guide rail to support supporting bearings (p. 13-34)

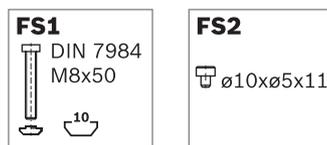
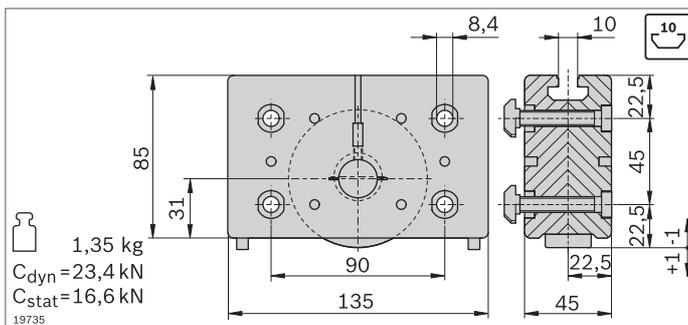
- ▶ Guide bearing for trolley construction
- ▶ Guiding via guide rod
- ▶ Cam rollers with ball bearings, permanently lubricated
- ▶ Lubricating felts with guide rod lubrication reservoir
- ▶ Play-free cam roller adjustment via eccentric bolts
- ▶ Replacement of the lubricating felts possible from rear in installed state

Guide bearing	No.	FS
LF20	2 3 842 535 663	4xFS1 4xFS2

Material: Housing: Diecast aluminum  
Cam roller: Steel, hardened, polished

Scope of delivery: Incl. fastening material (FS)

Condition on delivery: Lubricating felts ungreased; greasing according to assembly instructions  
**3 842 527 226**



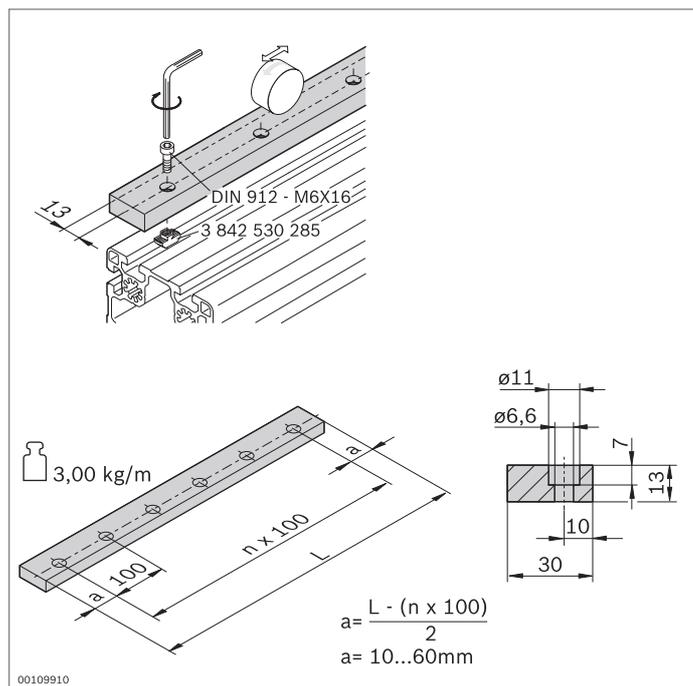
- ▶ Supporting bearing for brackets for bearing off-center forces
- ▶ For support on the guide rail
- ▶ Cam rollers with ball bearings, permanently lubricated
- ▶ Lubricating felts with guide rod lubrication reservoir
- ▶ Play-free cam roller adjustment via eccentric bolts
- ▶ Replacement of the lubricating felts possible from rear in installed state

Supporting bearing	No.	FS
LF20	2 3 842 535 665	4xFS1 4xFS2

Material: Housing: Diecast aluminum  
Cam roller: Steel, hardened, polished

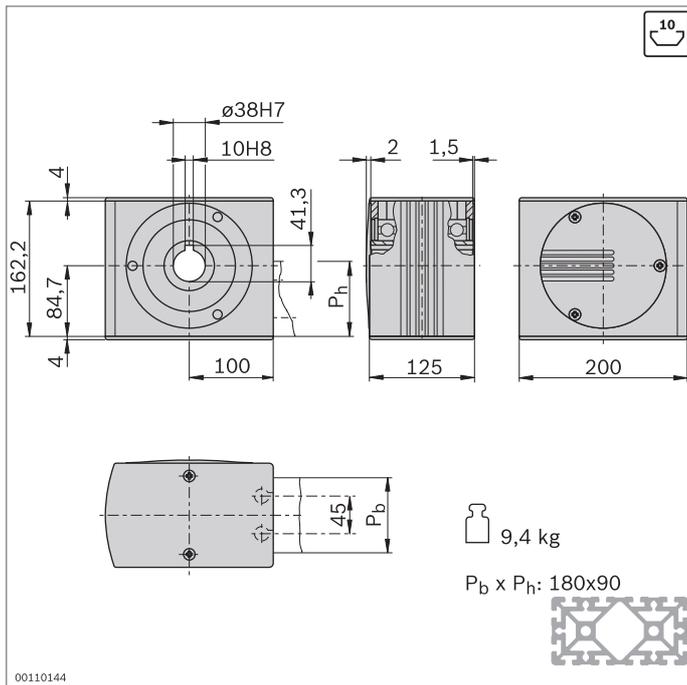
Scope of delivery: Incl. fastening material (FS)

Condition on delivery: Lubricating felts ungreased; greasing according to assembly instructions  
**3 842 527 226**



► Guide rail to hold supporting bearings

Guide rail	L (mm)	No.
<b>LF20</b>	120 ... 2000	<b>3 842 994 702 / L</b>
Material:	Steel, hardened, polished	
Condition on delivery:	Ungreased; greasing according to assembly instructions <b>3 842 527 226</b>	
Accessories:	Cylinder bolt DIN 912 – M6x16 T-nut M6, 10 mm slot ( <b>3 842 530 285</b> )	

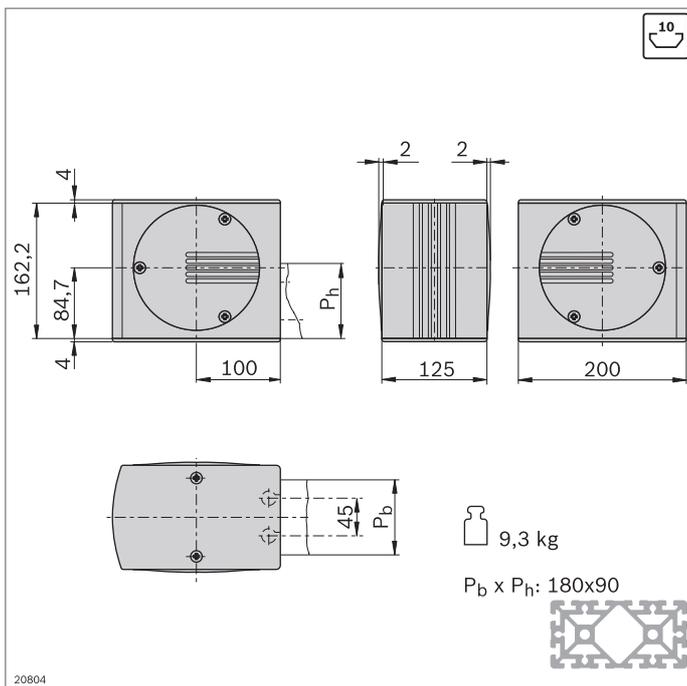
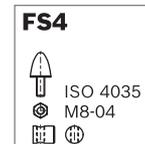


- ▶ Drive head for transferring drive torque to a toothed belt
- ▶ For direct mounting of a motor or (in conjunction with a plug-in shaft) for mounting a hollow shaft gear or a coupling (p. 13-46)
- ▶ Mounted directly on profile by using longitudinal end connector (connector included in scope of delivery)
- ▶ Profile finishing: LF-S blind hole drilling for longitudinal end connector

Drive head	No.	FS
<b>LF20S</b>	<b>3 842 526 414</b>	4xFS3, 2xFS4

Material: Drive head: Aluminum; anodized  
Hollow shaft: Steel; galvanized

Scope of delivery: Incl. Fastening material (FS), cover caps

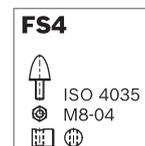


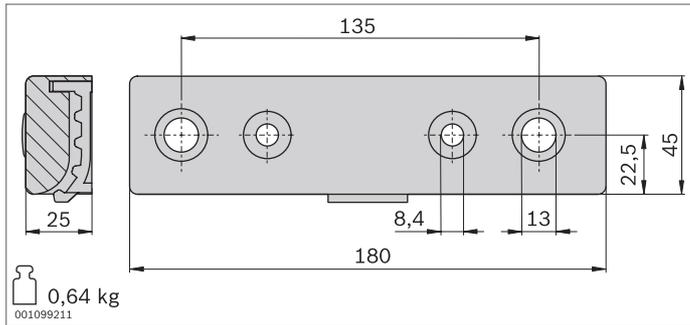
- ▶ Return head for tensioning the toothed belt and changing its direction
- ▶ Mounted directly on profile by using longitudinal end connector (connector included in scope of delivery)
- ▶ Profile finishing: LF-S blind hole drilling for longitudinal end connector

Return head	No.	FS
<b>LF20S</b>	<b>3 842 526 415</b>	4xFS3, 2xFS4

Material: Return head: Aluminum; anodized  
Hollow shaft: Steel; galvanized  
Cover caps: PA; black

Scope of delivery: Incl. Fastening material (FS), cover caps

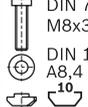


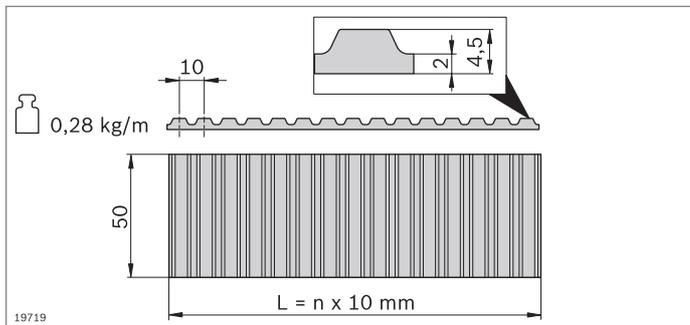


- ▶ Belt connector for fixing the toothed belt on the front of the trolley
- ▶ Profile finishing for strut profile 45x270 for trolley LF20S: M12
- ▶ All connecting parts included for mounting at the profile end (LF20S) or the slot (LF20C)

Belt connector	No.	FS
<b>LF20</b>	2 <b>3 842 535 680</b>	4xFS2, 2xFS5, 2xFS6, 2xFS7, 2xFS8

Material: Aluminum, painted black  
 Scope of delivery: Incl. fastening material (FS)

<p><b>FS2</b></p> <p>☐ <math>\varnothing 10 \times \varnothing 5 \times 11</math></p>	<p><b>FS5</b></p> <p>DIN7984 M12x40</p> 	<p><b>FS6</b></p> <p>DIN 7984 M8x30 DIN 125 A8,4</p> 	<p><b>FS7</b></p> <p>DIN 7991 M8x30</p> 
<p><b>FS8</b></p> <p>☐ <math>\varnothing 18 \times 7</math></p>			

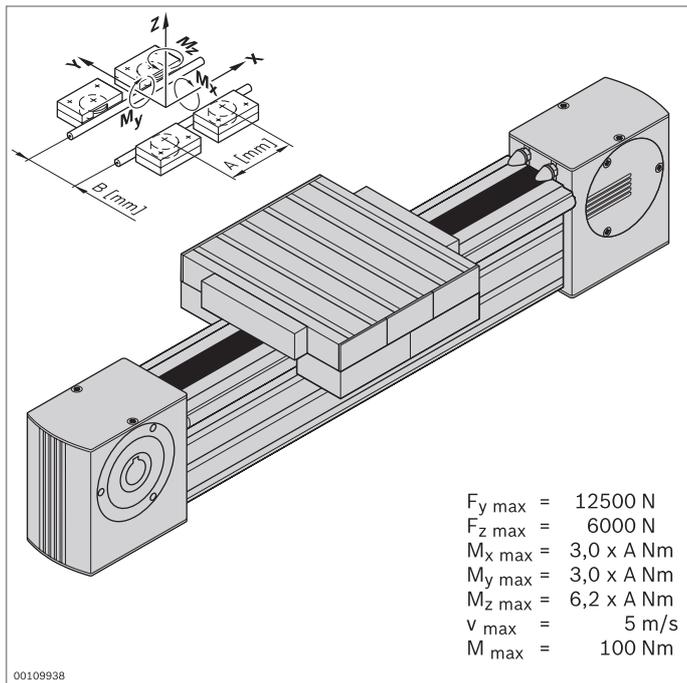


- ▶ Toothed belt as a trolley drive
- ▶ Pitch: AT10

Toothed belt	$L_3$ (mm)	No.
<b>LF20</b>	300 ... 50000	<b>3 842 994 662 / <math>L_3</math><sup>1)</sup></b>
	50000	<b>3 842 513 648</b>

<sup>1)</sup>  $L_3 = 2xL_2 - L_1 + 780$

Material: PU with embedded steel wires



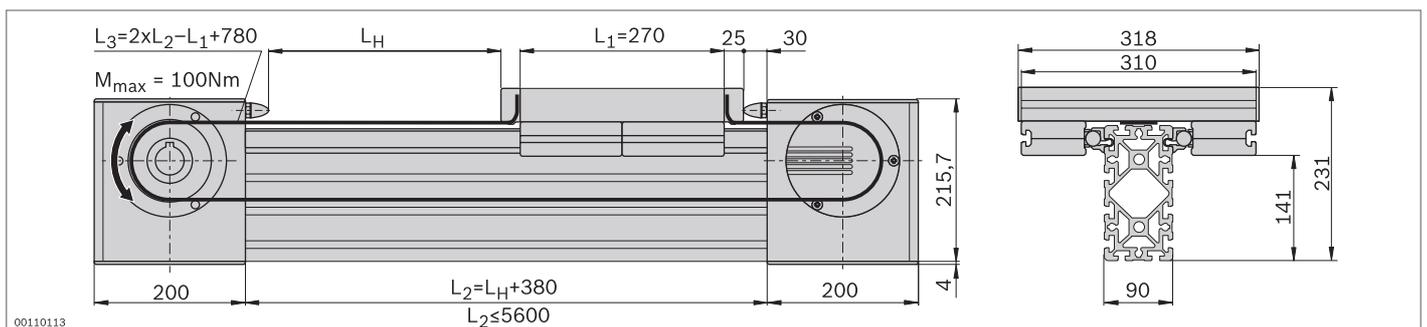
$F_{y \max} = 12500 \text{ N}$   
 $F_{z \max} = 6000 \text{ N}$   
 $M_{x \max} = 3,0 \times A \text{ Nm}$   
 $M_{y \max} = 3,0 \times A \text{ Nm}$   
 $M_{z \max} = 6,2 \times A \text{ Nm}$   
 $v_{\max} = 5 \text{ m/s}$   
 $M_{\max} = 100 \text{ Nm}$

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### Cam roller guide LF20C – complete axis



- ▶ Fully assembled cam roller guide
- ▶ Stroke can be individually selected
- ▶ Clamping profile clipped into strut profile 90x180
- ▶ Incl. toothed belt drive; additional notes on the drive concept (p. 13-44)

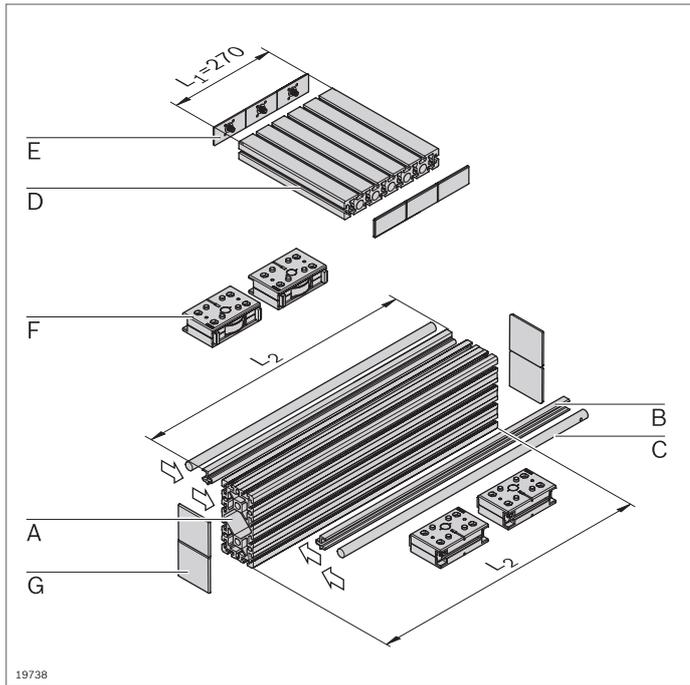


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#### Technical data

For notes on layout and drive, see page 13-50

Complete axis	$L_H$ (mm)	No.
LF20C	50 ... 5220	3 842 998 500 / $L_H$

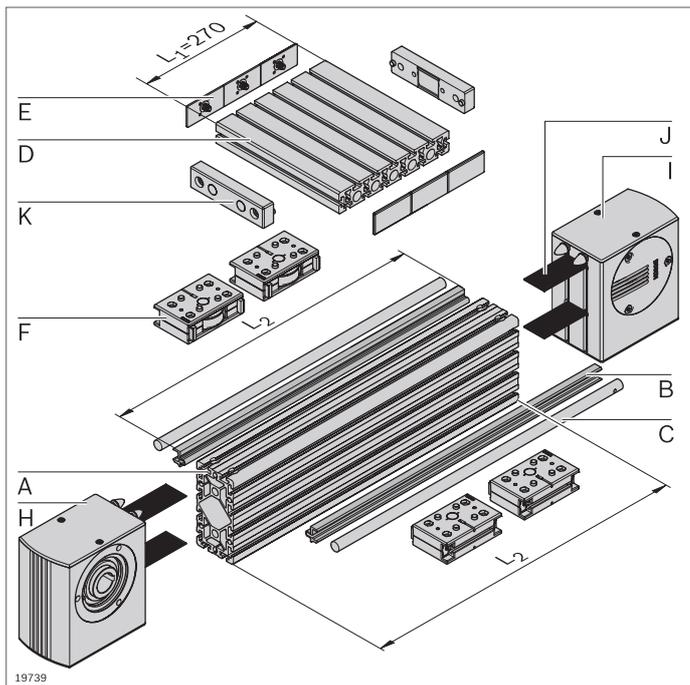


### Cam roller guide LF20C – components

- Components for the individual assembly of cam roller guides, with or without drive

#### Parts list for cam roller guide LF20C without drive

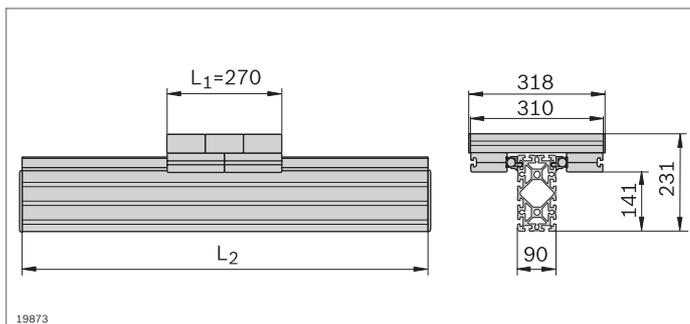
Component	No.	Pcs	Page
A Profile 90x180	3 842 990 416 / L <sub>2</sub>	1	2-47
B Clamping profile LF20C	3 842 992 441 / L <sub>2</sub>	2	13-39
C Guide rod LF20	3 842 993 969 / L <sub>2</sub>	2	13-39
D Profile 45x270	3 842 992 927 / 310 mm	1	2-44
E Cover cap 45x90	3 842 548 757	6	2-44
F Guide bearing LF20	3 842 535 663	4	13-40
G Cover cap 90x90	3 842 548 761	4	2-47

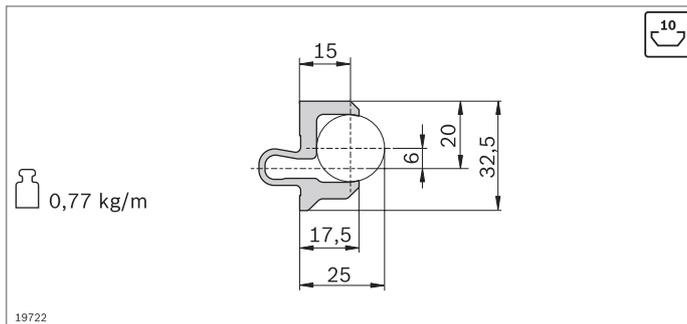


#### Parts list for cam roller guide LF20C with drive

Component	No.	Pcs	Page
A Profile 90x180 LF LF	3 842 992 898 / L <sub>2</sub>	1	2-47
B Clamping profile LF20C	3 842 992 441 / L <sub>2</sub>	2	13-39
C Guide rod LF20	3 842 993 969 / L <sub>2</sub>	2	13-39
D Profile 45x270	3 842 992 927 / 310 mm	1	2-44
E Cover cap 45x90	3 842 548 757	6	2-44
F Guide bearing LF20	3 842 535 663	4	13-40
H Drive head	3 842 526 867	1	13-42
I Return head	3 842 526 869	1	13-42
J Toothed belt	3 842 994 662 / L <sub>3</sub> <sup>1)</sup>	1	13-43
K Belt connector	3 842 535 680	2	13-43

<sup>1)</sup> L<sub>3</sub> = 2xL<sub>2</sub> - L<sub>1</sub> + 780

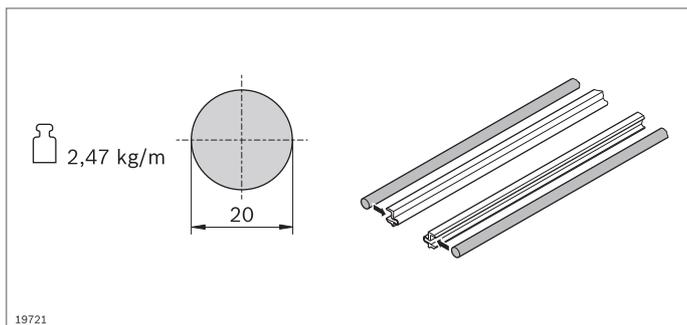




- ▶ The clamping profile is clipped into any chosen 10 mm strut profile slot and holds the guide rods

Clamping profile	L (mm)	No.
<b>LF20C</b>	1 pc 150 ... 3000	<b>3 842 992 441 / L</b>
	20 pcs 3000	<b>3 842 518 898</b>

Material: Aluminum; anodized

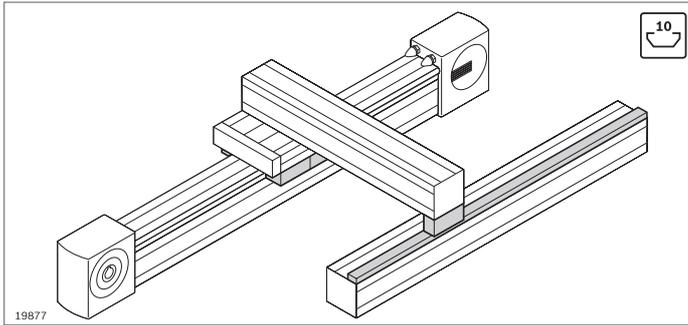


- ▶ The guide rod is pressed into the clamping profile
- ▶ The guide rod guides the guide bearing

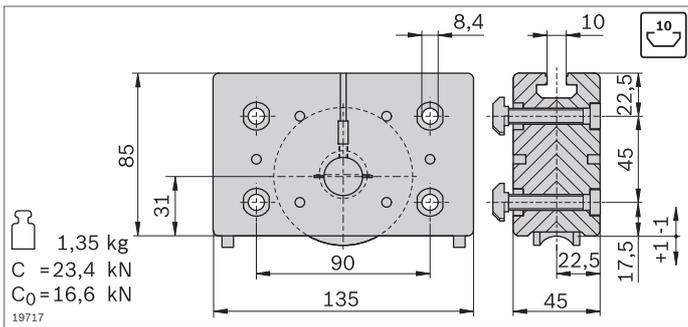
Guide rod	L (mm)	No.
<b>LF20</b>	150 ... 2900	1 <b>3 842 993 969 / L</b>
	2900	20 <b>3 842 539 416</b>

Material: Solid shaft VA, induction hardened, polished

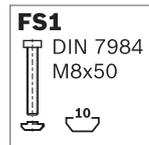
Condition on delivery: Ungreased; greasing according to assembly instructions **3 842 527 226**



- ▶ Guide bearing for trolley construction
- ▶ Supporting bearing for brackets for bearing off-center forces
- ▶ Guide rail to support supporting bearings (p. 13-41)



- ▶ Guide bearing for trolley construction
- ▶ Guiding via guide rod
- ▶ Cam rollers with ball bearings, permanently lubricated
- ▶ Lubricating felts with guide rod lubrication reservoir
- ▶ Play-free cam roller adjustment via eccentric bolts
- ▶ Replacement of the lubricating felts possible from rear in installed state

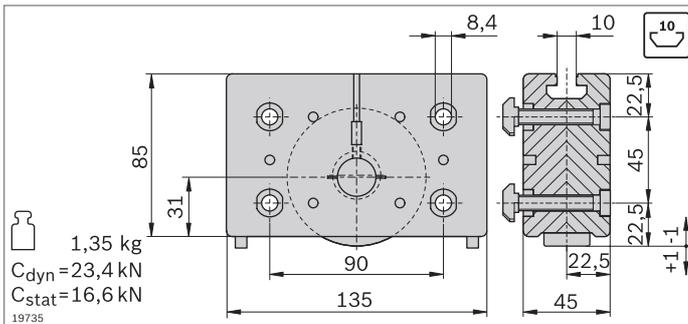


Guide bearing	No.	FS
LF20	2 3 842 535 663	4xFS1 4xFS2

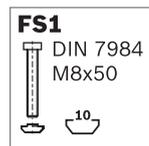
Material: Housing: Diecast aluminum  
Cam roller: Steel, hardened, polished

Scope of delivery: Incl. fastening material (FS)

Condition on delivery: Lubricating felts ungreased; greasing according to assembly instructions  
**3 842 527 226**



- ▶ Supporting bearing for brackets for bearing off-center forces
- ▶ For support on the guide rail
- ▶ Cam rollers with ball bearings, permanently lubricated
- ▶ Lubricating felts with guide rod lubrication reservoir
- ▶ Play-free cam roller adjustment via eccentric bolts
- ▶ Replacement of the lubricating felts possible from rear in installed state

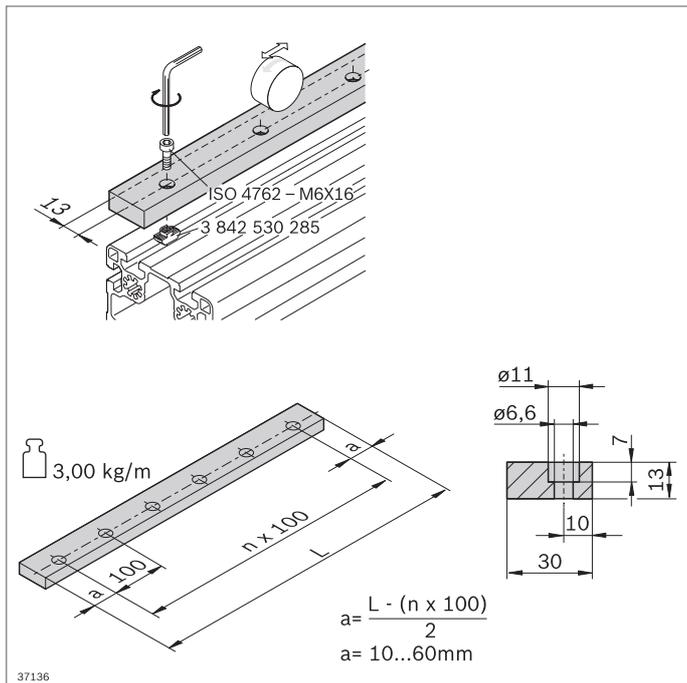


Supporting bearing	No.	FS
LF20	2 3 842 535 665	4xFS1 4xFS2

Material: Housing: Diecast aluminum  
Cam roller: Steel, hardened, polished

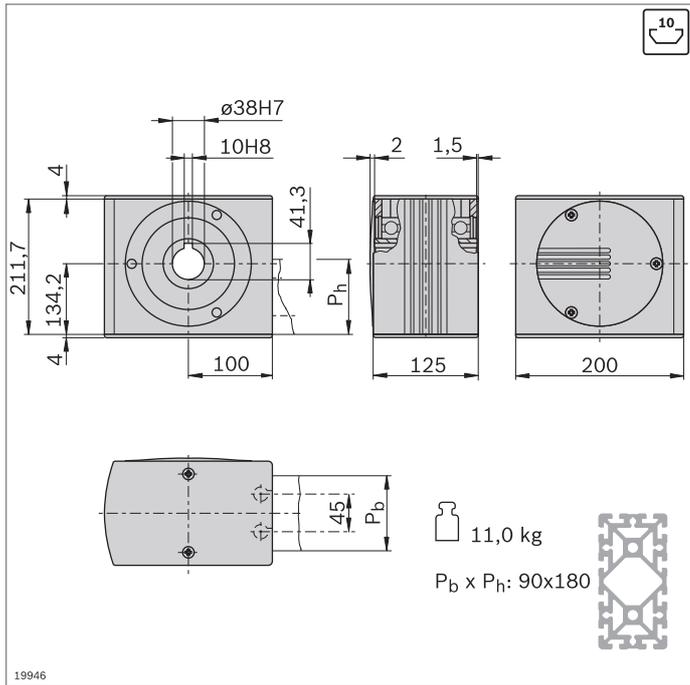
Scope of delivery: Incl. fastening material (FS)

Condition on delivery: Lubricating felts ungreased; greasing according to assembly instructions  
**3 842 527 226**



► Guide rail to hold supporting bearings

Guide rail	L (mm)	No.
<b>LF20</b>	120 ... 2000	<b>3 842 994 702 / L</b>
Material:	Steel, hardened, polished	
Accessories:	Cap screw ISO 4762 - M6x16 T-nut M6, 10 mm slot ( <b>3 842 530 285</b> )	
Condition on delivery:	Ungreased; greasing according to assembly instructions <b>3 842 527 226</b>	

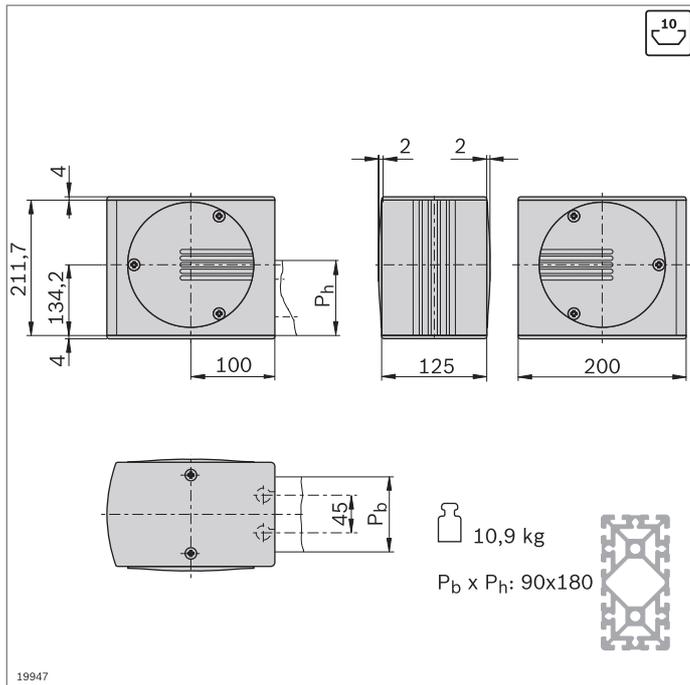
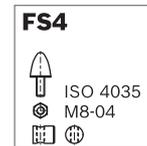
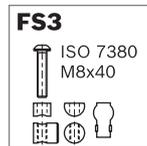


- ▶ Drive head for transferring drive torque to a toothed belt
- ▶ For direct mounting of a motor or (in conjunction with a plug-in shaft) for mounting a hollow shaft gear or a coupling (p. 13-46)
- ▶ Mounted directly on profile by using longitudinal end connector (connector included in scope of delivery)
- ▶ Profile finishing: LF blind hole drilling for longitudinal end connector

Drive head	No.	FS
<b>LF20C</b>	<b>3 842 526 867</b>	4xFS3, 2xFS4

Material: Drive head: Aluminum; anodized  
Hollow shaft: Steel; galvanized

Scope of delivery: Incl. Fastening material (FS), cover caps

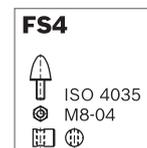
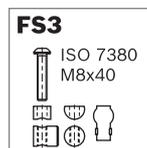


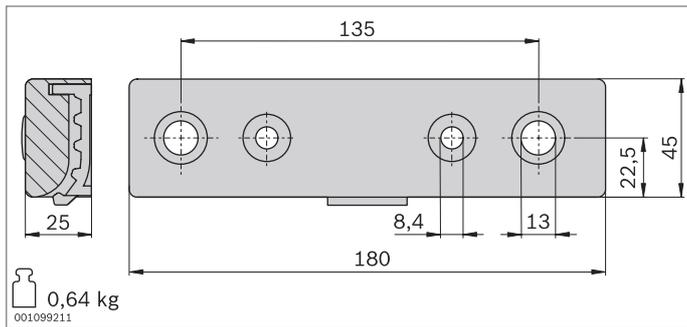
- ▶ Return head for tensioning the toothed belt and changing its direction
- ▶ Mounted directly on profile by using longitudinal end connector (connector included in scope of delivery)
- ▶ Profile finishing: LF blind hole drilling for longitudinal end connector

Return head	No.	FS
<b>LF20C</b>	<b>3 842 526 869</b>	4xFS3, 2xFS4

Material: Return head: Aluminum; anodized  
Hollow shaft: Steel; galvanized  
Cover caps: PA; black

Scope of delivery: Incl. Fastening material (FS), cover caps



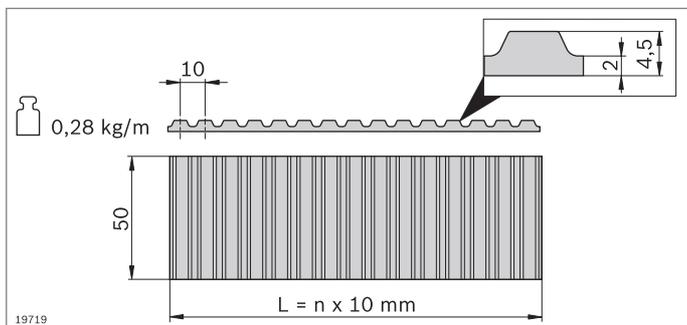


- ▶ Belt connector for fastening the toothed belt to the trolley slot
- ▶ Profile finishing for strut profile 45x270 for trolley LF20S: M12
- ▶ All connecting parts included for mounting at the profile end (LF20S) or the slot (LF20C)

Belt connector	No.	FS
<b>LF20</b>	2 <b>3 842 535 680</b>	4xFS2, 2xFS5, 2xFS6, 2xFS7, 2xFS8

Material: Aluminum, painted black  
 Scope of delivery: Incl. fastening material (FS)

<b>FS2</b> ø10xø5x11	<b>FS5</b> DIN7984 M12x40	<b>FS6</b> DIN 7984 M8x30 DIN 125 A8,4 10	<b>FS7</b> DIN 7991 M8x30 10
<b>FS8</b> ø18x7			

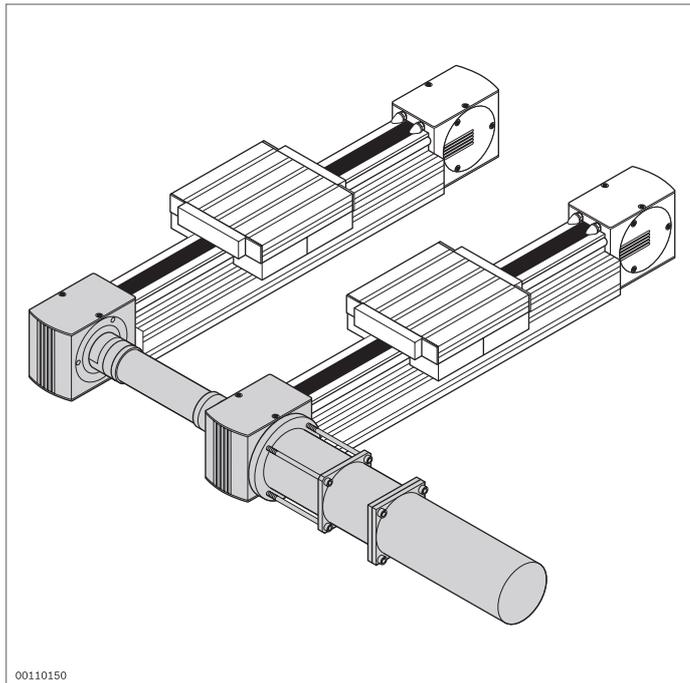


- ▶ Toothed belt as a trolley drive
- ▶ Pitch: AT10

Toothed belt	L (mm)	No.
<b>LF20</b>	300 ... 50000	<b>3 842 994 662 / L<sub>3</sub><sup>1)</sup></b>
	50000	<b>3 842 513 648</b>

<sup>1)</sup>  $L_3 = 2xL_2 - L_1 + 780$

Material: PU with embedded steel wires



## Linear guide drives

### Drive concept

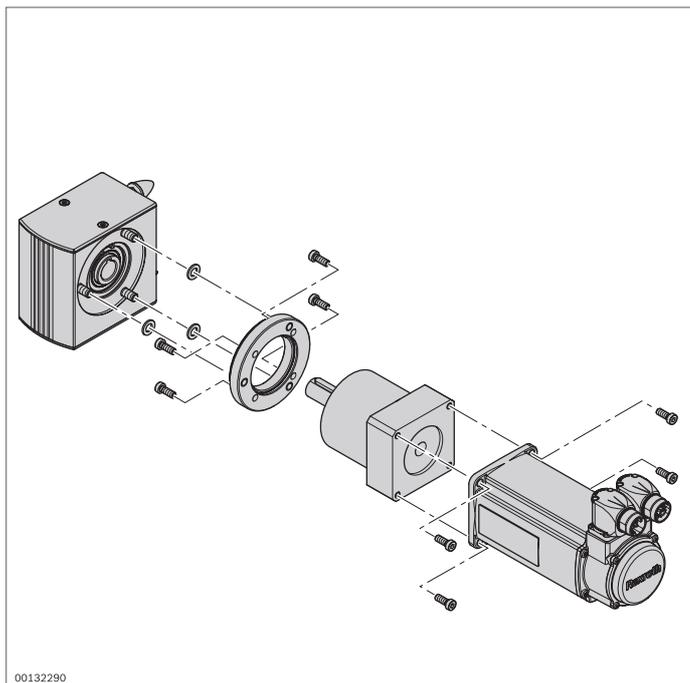
The linear guides are driven via the hollow shaft in the drive head. The drive head is used to directly install a motor or alternatively (in connection with a plug-in shaft) a hollow shaft gear or a coupling. Depending on the desired speeds of movement for the application, it is necessary to use various motor types in conjunction with intermediate gears. Due to the multitude of drive components available in the market, there are a large number of possible combinations.

The MGE modular profile system makes it easy to assemble Bosch Rexroth linear guides through the use of a standard shaft and simple connection dimensions.

### Fastening

The drive head is directly secured on the profile by means of longitudinal end connectors.

The motor, or the intermediate gear flange, can be screwed to the drive head as a complete unit from the left- or right-hand side.

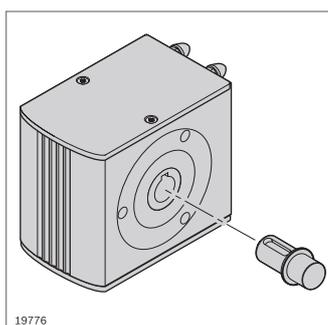


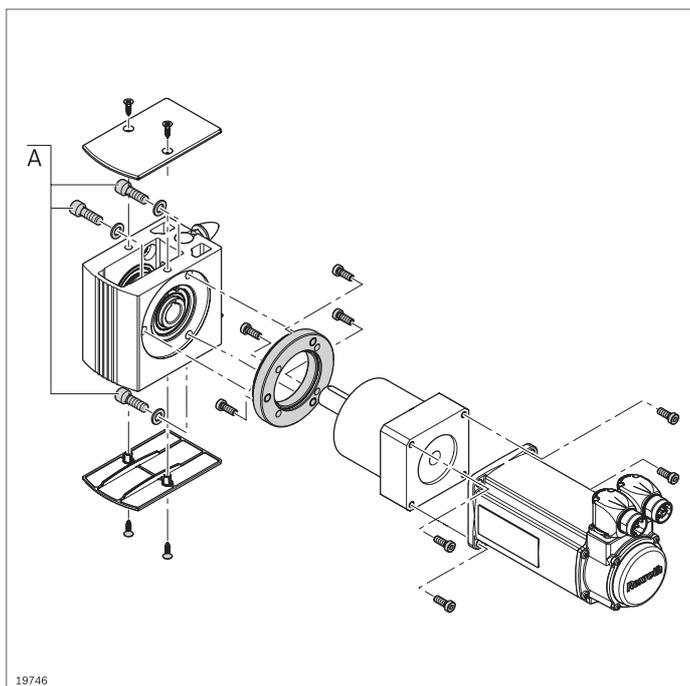
### Synchronous shafts

The use of synchronous shafts (p. 13-47) enables several linear axes to be operated with one drive.

### Connection dimensions (flanges)

The connection dimensions for the size LF6, LF12 and LF20 linear guides are shown on pages 13-45.





### Flange

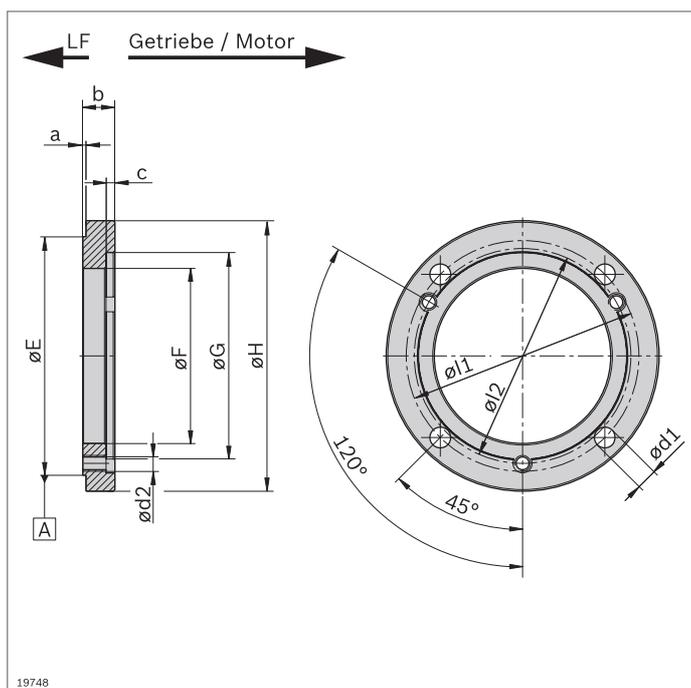
A flange is generally required for fixing the motor/gear unit in place. The connection dimensions for connection to the drive head are shown below. The connection to the motor/gear unit depends on the model chosen in each case.

Also see connection dimensions of drive heads LF6S (p. 13-9), LF6C (p. 13-14), LF12C (p. 13-28), LF12S (p. 13-21), LF20C (p. 13-42), LF20S (p. 13-35)

#### Fastening material flange (A)

Note regarding flange in self-build version. Adapt fastening material to suit differing flange thicknesses.

	LF6 (b = 14.5 mm)	LF12 (b = 20 mm)	LF20 (b = 20 mm)
Drive head – flange	ISO 4762 – M8x22 (3x) ISO 7092 – 8 (3x)	ISO 4762 – M8x25 (3x) ISO 7092 – 8 (3x)	ISO 4762 – M10x30 (3x) ISO 7092 – 10 (3x)



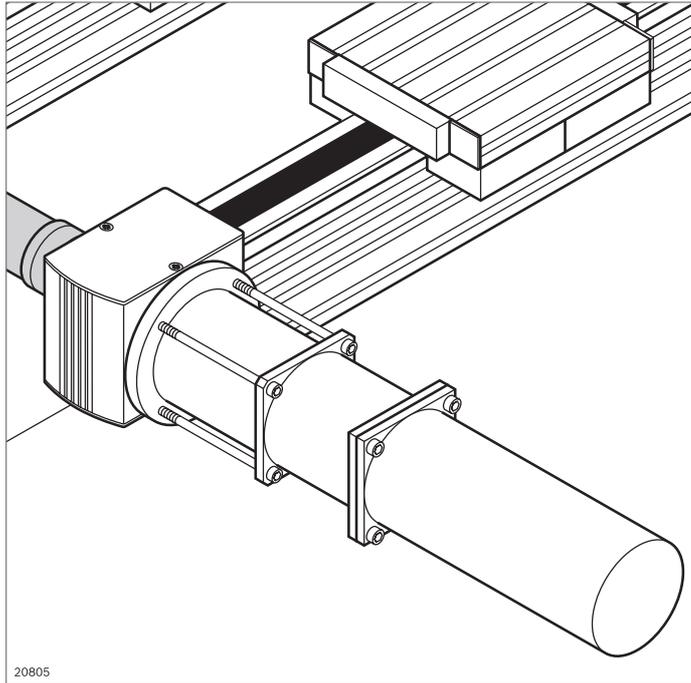
Drawing and dimensions for flange in self-build version. Customer-specific adjustment is necessary, depending on the motor and gear unit. The fastening material must be self-sourced.

#### Flange

Dimension parameter	LF6 (mm)	LF12 (mm)	LF20 (mm)
a	3.5 ± 0.15	3.5 ± 0.15	2 ± 0.15
b <sub>min</sub> <sup>*)</sup> // 0.05	*)	*)	*)
c <sup>*)</sup>	*)	*)	*)
E	Ø 88 -0.1/-0.3	Ø 111 -0.1/-0.3	Ø 150 -0.1/-0.3
F <sub>min</sub> <sup>*)</sup>	Ø *)	Ø *)	Ø *)
G <sup>*)</sup> 0.05 A	Ø *)	Ø *)	Ø *)
H <sup>*)</sup>	Ø *)	Ø *)	Ø *)
I1 <sup>*)</sup>	Ø *)	Ø *)	Ø *)
I2	Ø 78	Ø 100	Ø 135
d1 <sup>*)</sup>	Ø *)	Ø *)	Ø *)
d2	Ø 0.25 M8	M8	M10

<sup>\*)</sup> Dimension according to customer drive.

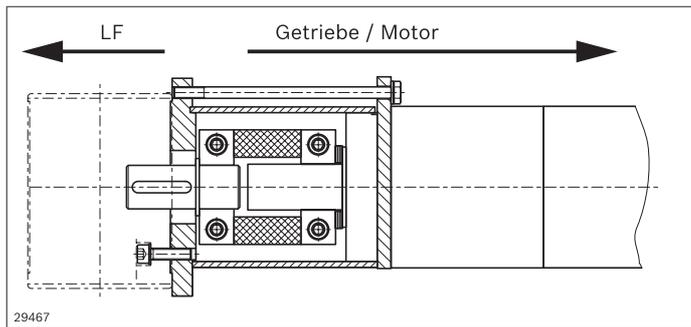
**Notice:** The values must be checked by the user.



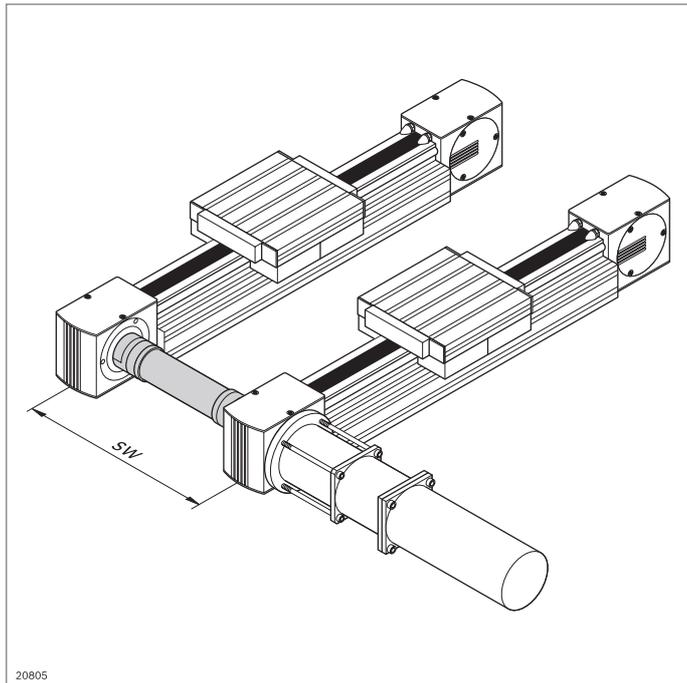
20805

### **Alternative mounting with coupling**

Instead of direct mounting over the section link, a coupling can be inserted. This allows any user truing errors to be rectified. The coupling must be designed and sourced by the customer.



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20805

### Plug-in shafts, synchronous shafts

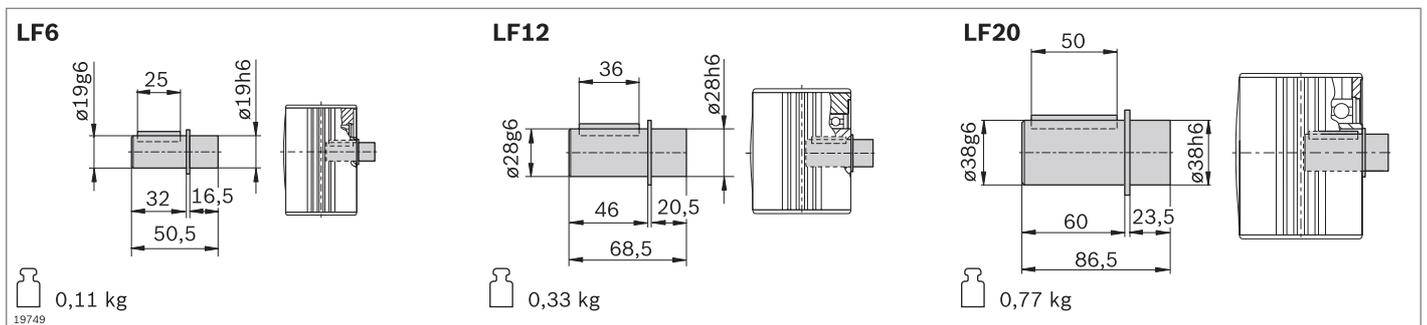
#### Plug-in shafts

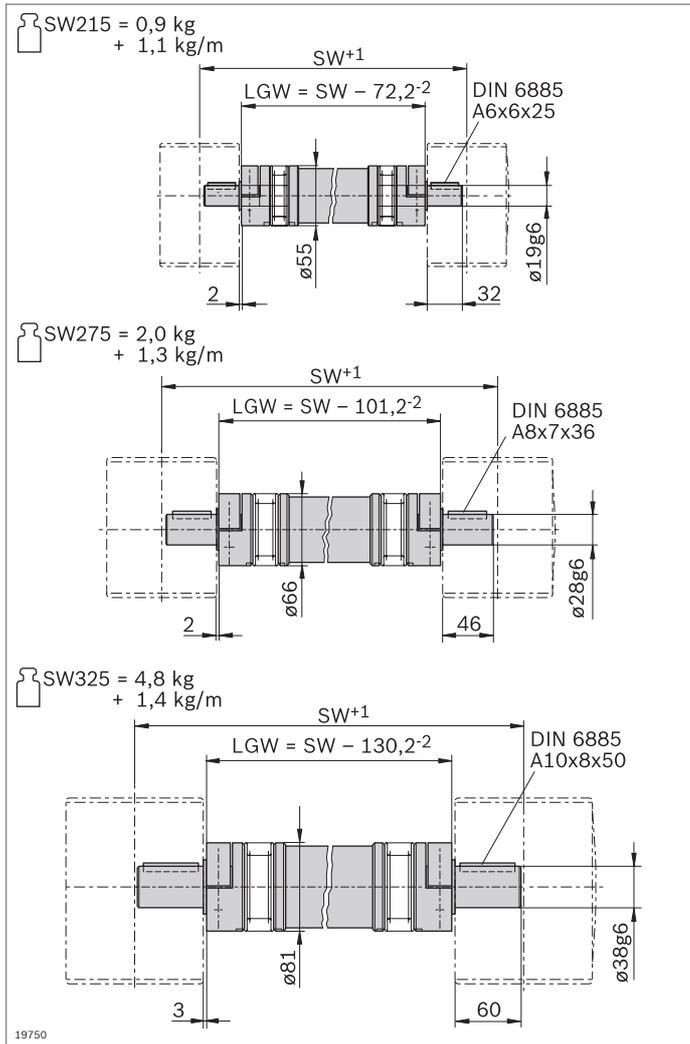
- ▶ Enable the installation of customized drive solutions

Plug-in shaft	No.
LF6	3 842 526 893
LF12	3 842 526 894
LF20	3 842 526 895

Material: Nickel-plated steel

SW = support separation





SW = support separation  
 LGW = length of synchronous shaft

### Synchronous shafts

- ▶ Allow several linear guides to be operated synchronously while being driven by a common motor
  - ▶ The synchronous shaft can be replaced without the drive heads having to be disassembled
- The selection diagrams on page 13-55, 13-56 specify maximum values without safety margins.

Synchronous shaft	SW (mm)	No.
LF6	215 ... 3000	3 842 994 811 / SW
LF12	275 ... 3500	3 842 994 812 / SW
LF20	325 ... 3500	3 842 994 813 / SW

Material: Steel/aluminum

## Technical data for roller, design, mounting

### General technical data and calculations

#### Speed

$$v_{\max} = 5 \text{ m/s}$$

#### Acceleration

$$a_{\max} = 15 \text{ m/s}^2$$

#### Temperature resistance

$$-10 \text{ °C} < \vartheta < 40 \text{ °C}$$

#### Lubrication

All cam roller guide bearings are delivered with built-in lubricating felts.

#### Condition on delivery

Ungreased (greasing with Klüber Isoflex Topas NCA 52; see assembly instructions **3 842 527 226**)  
Lubricating felts with reservoir are not greased.  
Guide rods are ungreased.

#### Definition of dynamic load rating C

The radial loading of constant magnitude and direction which a linear rolling bearing can theoretically withstand for a nominal service life of 100 km distance traveled (acc. to ISO 14728 Part 1).

#### Note regarding maximum load $F_{\max}$

The maximum loads apply to individual loads. Combining loads decreases the expected service life.

#### Definition and calculation of = nominal service life

The calculated service life which an individual linear rolling bearing – or a group of apparently identical rolling element bearings operating under the same conditions – can attain with a 90 % probability, based on the materials of normal manufacturing quality that are generally used today and under usual operating conditions (acc. to ISO 14728 Part 1) and optimal installation conditions.

#### Nominal service life at constant speed

$$L = \left( \frac{C}{F} \right)^3 10^5$$

$$L_h = \left( \frac{L}{2 \cdot s \cdot n_s \cdot 60} \right)$$

L = nominal service life (m)

$L_h$  = nominal service life (h)

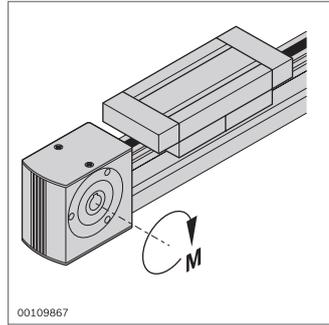
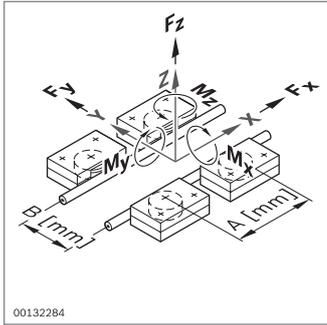
C = dynamic load capacity (N)

F = equivalent load (N)

s = length of stroke\* (m)

$n_s$  = stroke frequency (double stroke) ( $\text{min}^{-1}$ )

\*) For  $s < 2 \cdot L_1$  (trolley length) load capacities are reduced.  
Please consult us.



### Load-dependent design

- The specified values are maximum single loads, which are reduced when loads are combined

**Notice:** If cumulative forces and moments arise in your application and load limits may be reached, please contact your Rexroth representative for consultation in design.

	$A_{min}^{1)}$ (mm)	$F_z$ (N)	$F_y$ (N)	$M_x$ (Nm)	$M_z$ (Nm)	$M_y$ (Nm)	$v_{max}$ (m/s)	$M_{max}$ (Nm)
<b>LF6S</b>	75	850	1400	13.6	$0.7 \cdot A^{2)}$	$0.4 \cdot A^{2)}$	5	9.5 / 7.6
<b>LF6C</b>	75	850	1400	$0.4 \cdot B^{2)}$	$0.7 \cdot A^{2)}$	$0.4 \cdot A^{2)}$	5	15
<b>LF12S</b>	90	2000	3500	78.0	$1.7 \cdot A^{2)}$	$1.0 \cdot A^{2)}$	5	30
<b>LF12C</b>	90	2000	3500	$1.0 \cdot B^{2)}$	$1.7 \cdot A^{2)}$	$1.0 \cdot A^{2)}$	5	30
<b>LF20S</b>	135	6000	12500	240.0	$6.2 \cdot A^{2)}$	$3.0 \cdot A^{2)}$	5	100
<b>LF20C<sup>3)</sup></b>	135	6000	12500	$3.0 \cdot B^{2)}$	$6.2 \cdot A^{2)}$	$3.0 \cdot A^{2)}$	5	100

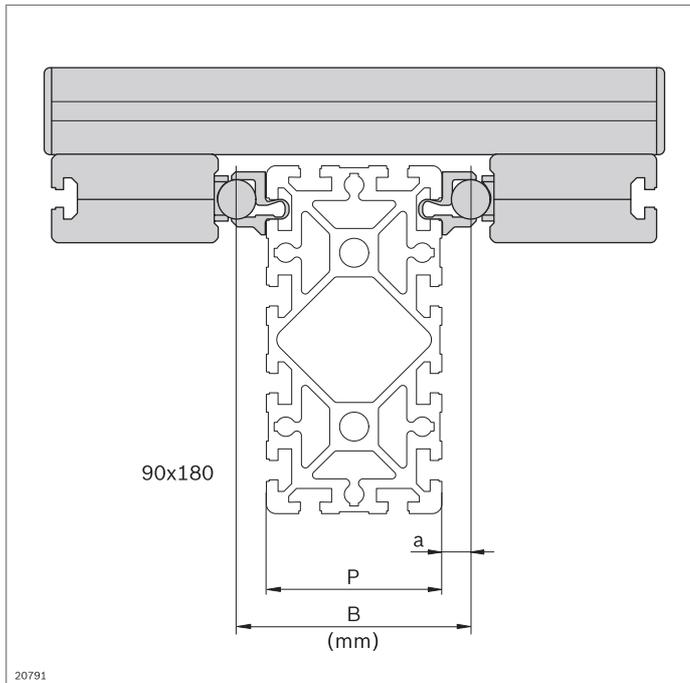
<sup>1)</sup>  $A_{min}$  = Length guide bearing

<sup>2)</sup> Notice: A (spacing of support wheels, see image above) in mm; see below for calculation of B (track width)

<sup>3)</sup> Maximum values (profile slot load-bearing capacity) are only reached with the following profiles: 45x270; 60x90; 90x90; 90x180; 90x360 (see p. 18-15)

Do not exceed the maximum loading of the screwed connections for rails, carriages and fastenings. Ensure sufficiently stable basic profile and respective substructure.

Take account of the general service life of lubricants!



### Calculating the track width B

$$B = P + 2 \cdot a$$

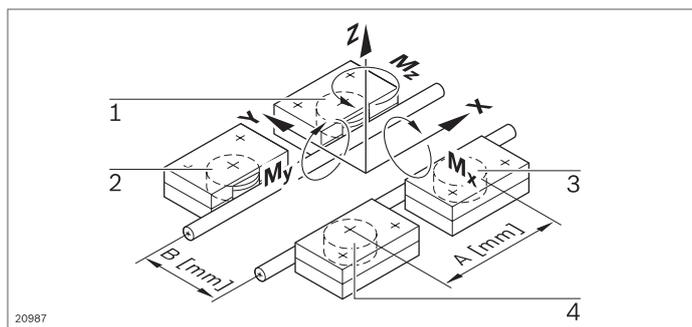
- B = track width (in mm)
- P = profile width (in mm)
- a = rod spacing (in mm)

#### LF ... C

- Values for a: for LF6C = 9.5 mm (p. 13-13)
- for LF12C = 9 mm (p. 13-25)
- for LF20C = 15 mm (p. 13-39)

#### LF ... S

- Values for a: for LF6S = 40 - 6 = 34 mm (p. 13-8)
- for LF12S = 90 - 12 = 78 mm (p. 13-18)
- for LF20S = 100 - 20 = 80 mm (p. 13-32)



Cam roller 1:

$$F_r = -\left(\frac{F_y}{2}\right) - \left(\frac{M_z}{A}\right)$$

$$F_a = \left(\frac{F_z}{4}\right) + \left(\frac{M_x}{2 \cdot B}\right) - \left(\frac{M_y}{2 \cdot A}\right)$$

Cam roller 3:

$$F_r = +\left(\frac{F_y}{2}\right) + \left(\frac{M_z}{A}\right)$$

$$F_a = \left(\frac{F_z}{4}\right) - \left(\frac{M_x}{2 \cdot B}\right) - \left(\frac{M_y}{2 \cdot A}\right)$$

Cam roller 2:

$$F_r = -\left(\frac{F_y}{2}\right) + \left(\frac{M_z}{A}\right)$$

$$F_a = \left(\frac{F_z}{4}\right) + \left(\frac{M_x}{2 \cdot B}\right) + \left(\frac{M_y}{2 \cdot A}\right)$$

Cam roller 4:

$$F_r = +\left(\frac{F_y}{2}\right) - \left(\frac{M_z}{A}\right)$$

$$F_a = \left(\frac{F_z}{4}\right) - \left(\frac{M_x}{2 \cdot B}\right) + \left(\frac{M_y}{2 \cdot A}\right)$$

**Table 1: Load factors for cam rollers**

	Load case: $F_r \geq  F_a $				Load case: $F_r <  F_a $			
	x	y	$x_0$	$y_0$	x	y	$x_0$	$y_0$
<b>LF6</b>	1	3.1	1.2	3.5	0.5	3.6	1	3.7
<b>LF12</b>	1	4.2	1.2	5.2	0.5	4.7	1	5.4
<b>LF20</b>	1	4	1.2	4.9	0.5	4.5	1.1	5

**Table 2: Cam rollers - load capacities**

	C for 10 <sup>5</sup> m (N)	C <sub>0</sub> (N)
<b>LF6</b>	3670	2280
<b>LF12</b>	8300	5000
<b>LF20</b>	23400	16600

## Calculation of load on bearing for a trolley

### Loading of the individual rollers

- ▶ A mm: Spacing of the rollers' rotational axes
- ▶ B mm: Center-to-center distance between the guide rods
- ▶ Only compressive forces can be transferred between cam rollers and guide rods in the radial direction.  
The following therefore applies in respect of radial forces:  
 $F_r \leq 0: F_r = 0$
- ▶ Cam rollers can be loaded equally in both directions.  
Therefore force  $F_a$  is sufficient for calculating P and P<sub>0</sub>

### Equivalent dynamic and static loads

To calculate the service life of a cam roller guide, the roller with the greatest load has to be considered.

The following must be determined:

$$P = \max(P_1, \dots, P_4)$$

$$P_0 = \max(P_{01}, \dots, P_{04})$$

Equivalent dynamic load P

$$P = x \cdot |F_r| + y \cdot |F_a|$$

Equivalent static load P<sub>0</sub>

$$P_0 = x_0 \cdot |F_r| + y_0 \cdot |F_a|$$

F<sub>r</sub> (N): radial load of the roller

The following applies:  $F_r \leq 0: F_r = 0$

F<sub>a</sub> (N): axial load of the roller

x, x<sub>0</sub>: Radial factor (table 1)

y, y<sub>0</sub>: Axial factor (table 1)

C: dynamic load capacity (table 2)

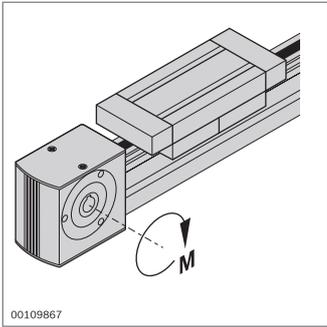
C<sub>0</sub>: static load capacity (table 2)

Static safety values:

$$S_0 = \left(\frac{C_0}{P_0}\right)$$

S<sub>0</sub> ≥ 4 recommended!

## Size selection



### Determining the forces and moments which arise

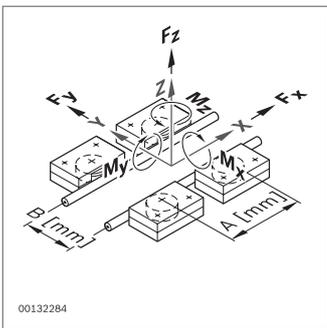
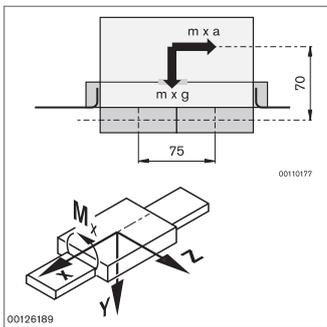
$$F_{x \text{ dyn}}, F_{y \text{ dyn}}, F_{z \text{ dyn}}^{1)}$$

$$M_{x \text{ dyn}}, M_{y \text{ dyn}}, M_{z \text{ dyn}}$$

1)  $F_{z \text{ dyn}}$  includes the weight of the trolley

All the influences must be considered, e.g.:

- Net mass and load
- Acceleration forces and moments
- Process forces and moments
- Loads caused by dampers and/or stops



### Determining the permissible forces and moments

For values see p. 13-51

### Selection of the suitable size

$$F_{x, y, z \text{ dyn}} < F_{x, y, z \text{ dyn zul}} !$$

$$M_{x, y, z \text{ dyn}} < M_{x, y, z \text{ dyn zul}} !$$

If F and M are cumulative:

In case of higher load, the next size is to be used. In case of doubt, please contact your Rexroth representative for consultation in design.

### Example

$$m = 30 \text{ kg} \quad a = 2.5 \text{ m/s}^2;$$

$$L_1 = 150 \text{ mm} \quad L_2 = 5000 \text{ mm}$$

$$g = 9.81 \text{ m/s}^2$$

$$F_{z \text{ dyn}} = m \cdot g = 294 \text{ N}$$

$$M_{y \text{ dyn}} = m \cdot a \cdot 70 \text{ mm} = 5.25 \text{ Nm}$$

### Example of LF 6 S, LF 6 C

$$F_{z \text{ dyn zul}} = 850 \text{ N} > F_{z \text{ dyn}} = 294 \text{ N}$$

$$M_{y \text{ dyn zul}} = 0.4 \cdot A = 0.4 \cdot 75 \text{ mm}$$

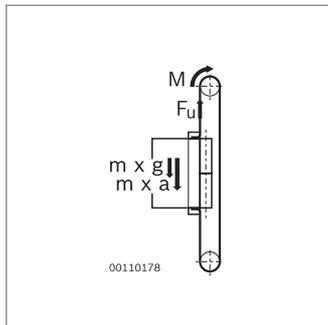
$$= 30 \text{ Nm} > M_{y \text{ dyn}} = 5.25 \text{ Nm}$$

### Example

$$F_{z \text{ dyn}} = 294 \text{ N} < F_{z \text{ dyn zul}} = 850 \text{ N} !$$

$$M_{y \text{ dyn}} = 5.25 \text{ Nm} < M_{y \text{ dyn zul}} = 30 \text{ Nm} !$$

## Calculating the drive

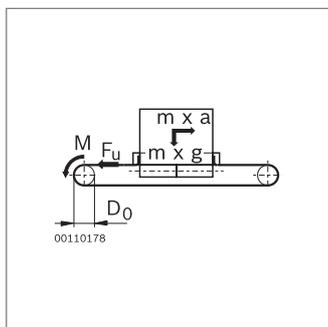


### Peripheral force $F_u$

$$F_u = m \cdot a + m \cdot g + F_0 + \mu \cdot m \cdot g$$

$$F_u \leq F_{u\text{zul}} !$$

$F_0$ : frictional force on return units  
 $\mu$ : coefficient of friction of the guide  
 see table below.



### Alternative calculation formula

$$F_u = m \cdot a + F_0 + \mu \cdot m \cdot g \leq F_{u\text{zul}} !$$

### Example of LF6C

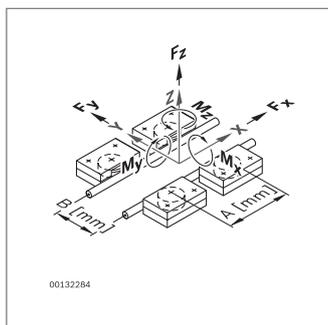
$$m = 30 \text{ kg}; \quad a = 2.5 \text{ m/s}^2$$

$$F_u = (30 \cdot 2.5) \text{ N} + 10 \text{ N}$$

$$+ (0.025 \cdot 30 \cdot 9.81) \text{ N}$$

$$F_u = 75 \text{ N} + 10 \text{ N} + 0.025 \cdot 294 \text{ N}$$

$$F_u = 92.35 \text{ N} < F_{u\text{zul}} = 600 \text{ N} !$$



### Required drive torque M

$$M = \frac{1}{2} \cdot D_0 \cdot F_u \leq M_{\text{zul}} !$$

### Example

$$M = \frac{1}{2} \cdot 50.94 \text{ mm} \cdot 92.35 \text{ N}$$

$$= 2.4 \text{ Nm}$$

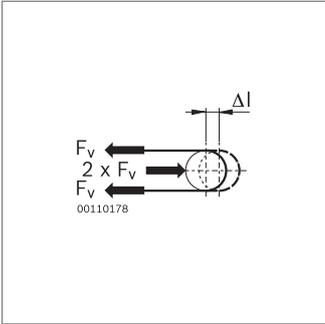
$$M = 2.35 \text{ Nm} \leq M_{\text{zul}}$$

$$= 15 \text{ Nm} !$$

	v (m/s)	$F_{u\text{zul}}$ (N)	$M_{\text{zul}}$ (Nm)	$F_0$ (N)	$\mu$	$D_0$ (mm)	$D_0 \times \pi$ (mm)
<b>LF6S</b>	≤ 2.0	500	9.5	10	0.025	38.21	120
<b>LF6S</b>	2.01 ... 5.0	400	7.6	10	0.025	38.21	120
<b>LF6C</b>	≤ 5.0	600	15.0	10	0.025	50.94	160
<b>LF12S</b>	≤ 5.0	820	30.0	30	0.020	73.20	230
<b>LF12C</b>	≤ 5.0	820	30.0	30	0.020	73.20	230
<b>LF20S</b>	≤ 5.0	2000	100.0	35	0.015	101.86	320
<b>LF20C</b>	≤ 5.0	2000	100.0	35	0.015	101.86	320

$F_0$ : frictional force on return units;  $\mu$ : coefficient of friction

### Checking the selected size



#### Preload force $F_v$ of toothed belt

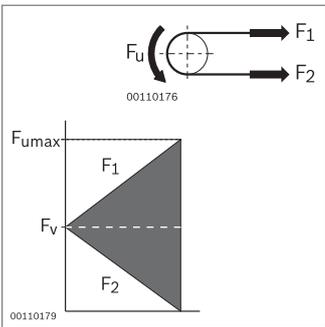
$$0.5 \cdot F_u \leq F_v \leq F_u$$

Recommendation:  $F_v = 0.5 \cdot F_u$

#### Example

$$F_u = 92.35 \text{ N}$$

$$F_v = 50 \text{ N}$$



#### Maximum toothed belt force $F_{1 \max}$

$$F_{1 \max} = F_v + 0.5 \cdot F_u \leq F_{1 \text{zul}}$$

$$F_{2 \min} = F_v - 0.5 \cdot F_u > 0 !$$

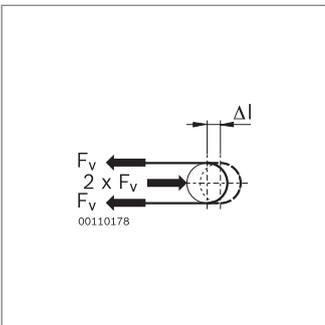
#### Example of LF6C

$$F_{1 \max} = 50 \text{ N} + 0.5 \cdot 92.35 \text{ N}$$

$$F_{1 \max} = 96.18 \text{ N} < F_{1 \text{zul}} = 900 \text{ N} !$$

$$F_{2 \min} = 50 \text{ N} - 0.5 \cdot 92.35 \text{ N}$$

$$F_{2 \min} = 3.825 \text{ N} > 0 !$$



#### Required preload length $\Delta l$

$$\Delta l = 0.5 \cdot F_v \cdot L / C_{\text{spez}} \leq \Delta l_{\max} !$$

#### Example

$$L = 2 \cdot L_2 - L_1 + 400 \text{ mm}$$

$$L = 10250 \text{ mm}$$

$$\Delta l = 0.5 \cdot 50 \text{ N} \cdot 10250 \text{ mm}$$

$$/ 420000 \text{ N}$$

$$\Delta l = 0.8 \text{ mm} < \Delta l_{\max} = 13 \text{ mm} !$$

	$F_{1 \text{zul}}$ (N)	$C_{\text{spez}}$ (N)	$\Delta l_{\max}$ (mm)	L (mm)	Page
<b>LF6S</b>	750	315000	11	$2 \cdot L_2 - L_1 + 360$	13-6
<b>LF6C</b>	900	420000	13	$2 \cdot L_2 - L_1 + 400$	13-11
<b>LF12S</b>	1230	1250000	16	$2 \cdot L_2 - L_1 + 630$	13-16
<b>LF12C</b>	1230	1250000	16	$2 \cdot L_2 - L_1 + 630$	13-23
<b>LF20S</b>	3000	1870000	23	$2 \cdot L_2 - L_1 + 780$	13-30
<b>LF20C</b>	3000	1870000	23	$2 \cdot L_2 - L_1 + 780$	13-37

$C_{\text{spez}}$ : Belt stiffness;

L: Toothed belt,

see also LF6S (p. 13-6), LF6C (p. 13-11),

LF12S (p. 13-16), LF12C (p. 13-23),

LF20S (p. 13-30), LF20C (p. 13-37)

### Dimensioning of synchronous shafts

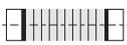
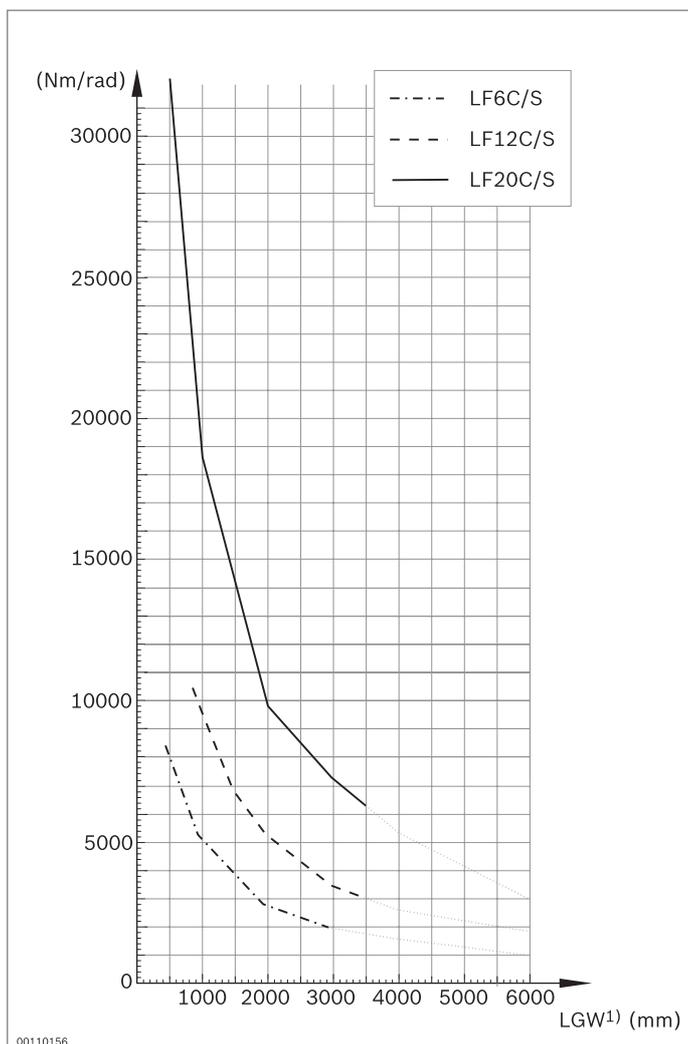
			LF6	LF12	LF20
Support separation SW	horizontal		215 ... 3000 mm	275 ... 3500 mm	325 ... 3500 mm
	vertical		215 ... 2000 mm	275 ... 2000 mm	325 ... 1100 mm
Nominal torque			max. 30 Nm	max. 60 Nm	max. 150 Nm
Permitted rpm			Diagram 3 (p. 13-56) max. $0.7 \cdot n_k$	Diagram 3 (p. 13-56) max. $0.7 \cdot n_k$	Diagram 3 (p. 13-56) max. $0.7 \cdot n_k$
Elasticity	axial		max. 2 mm	max. 3 mm	max. 4 mm
	lateral		Diagram 4 (p. 13-56)	Diagram 4 (p. 13-56)	Diagram 4 (p. 13-56)
	Rotation angle		Diagram 5 (p. 13-56)	Diagram 5 (p. 13-56)	Diagram 5 (p. 13-56)

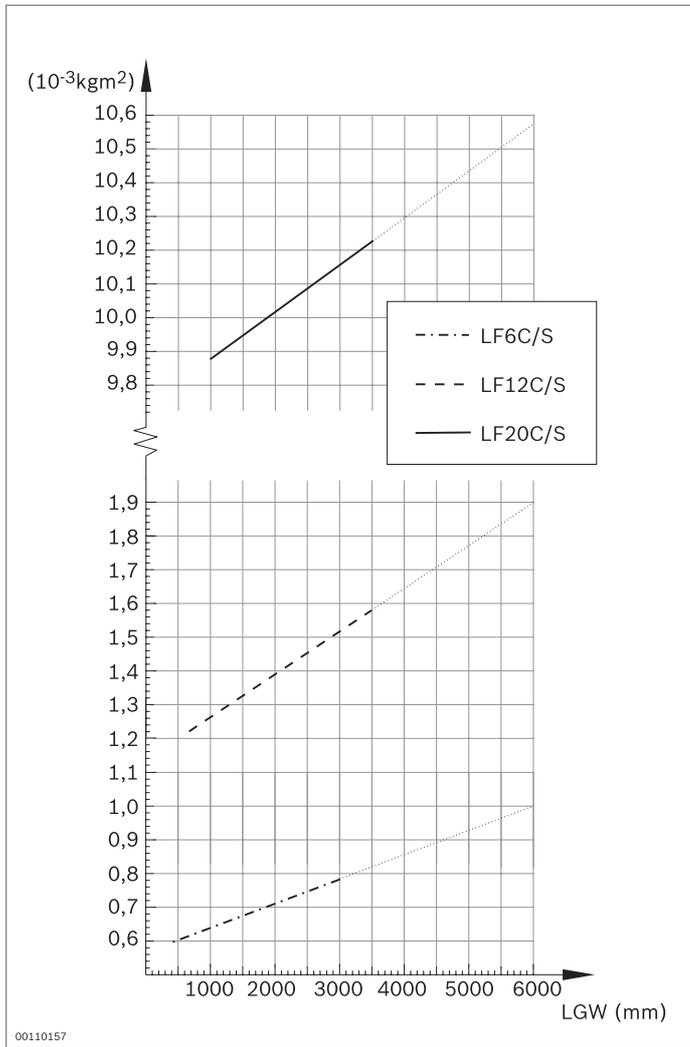
Diagram 1: Torsion stiffness



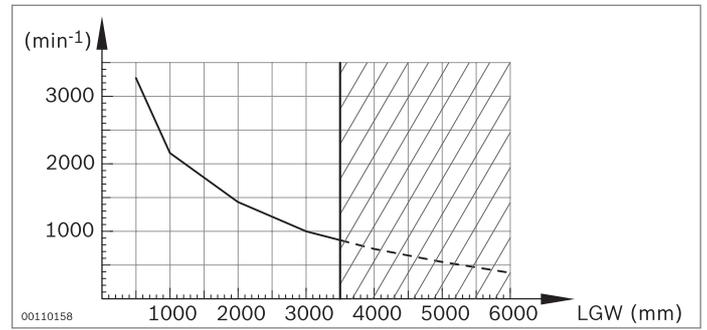
<sup>1)</sup> Length synchronous shaft LGW

- LF6 LGW = SW - 72
- LF12 LGW = SW - 101
- LF20 LGW = SW - 130

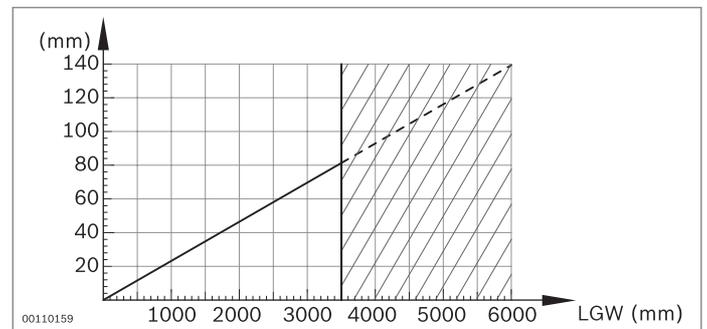
**Diagram 2: Mass inertia**



**Diagram 3: Critical rpm due to bending  $n_k$**

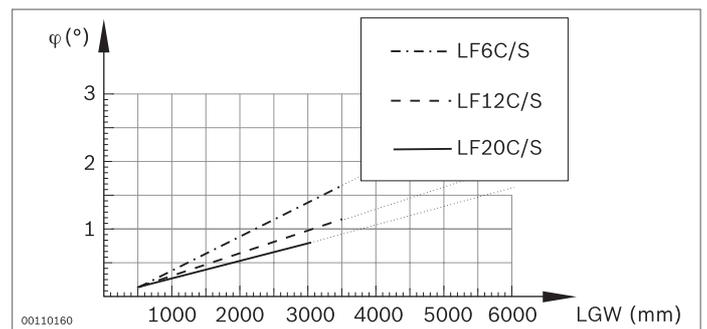


**Diagram 4: Lateral offset**

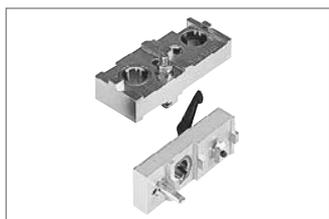


Aligned shafts are recommended.

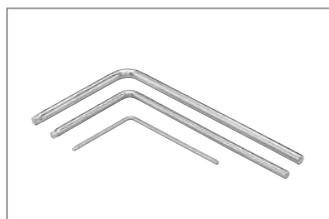
**Diagram 5: Rotation angle**



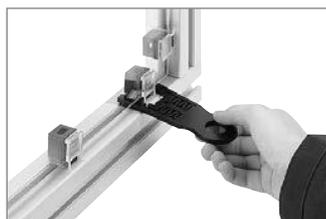
# Tools



Drilling jigs (p. 14-2)



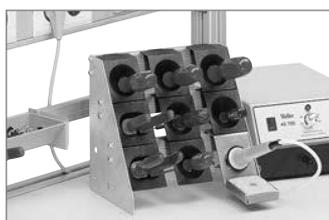
Torx® offset screwdriver  
(p. 14-5)



Variofix remover,  
Flexible grinder (p. 14-6)



Beveling shears (p. 14-6)



Tool shelf,  
tool holder (p. 14-7)

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