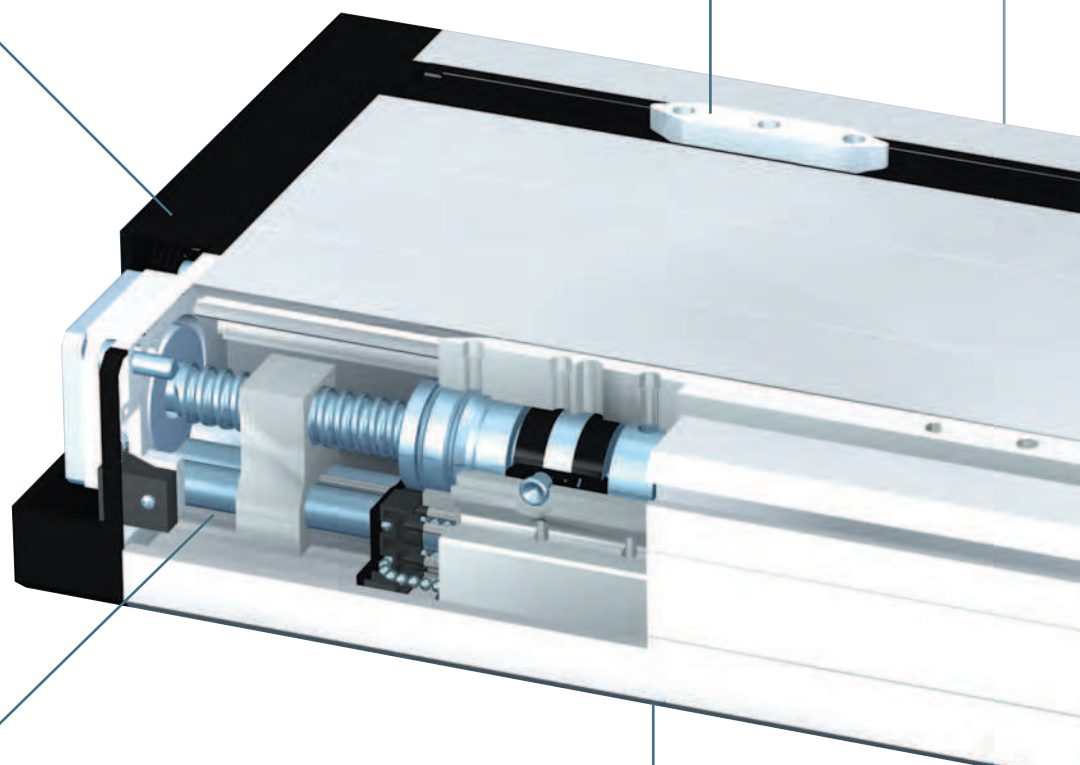


# Functional overview

at example LES 5

Plastic cap  
electromagnetically shielded

Clamping surface  
milled flat



Shaft housing outline  
precision milled

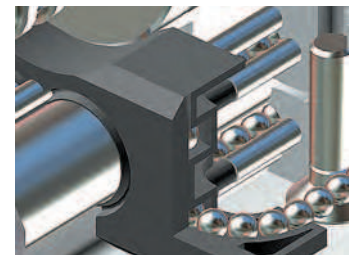
Profile underside  
milled flat



- End position buffering both sides with soft PVC parabolic springs
- Counter-bearing with 2 needle sleeves



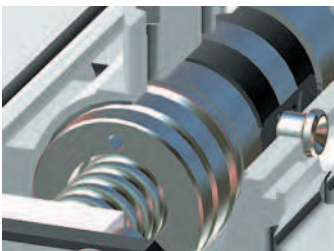
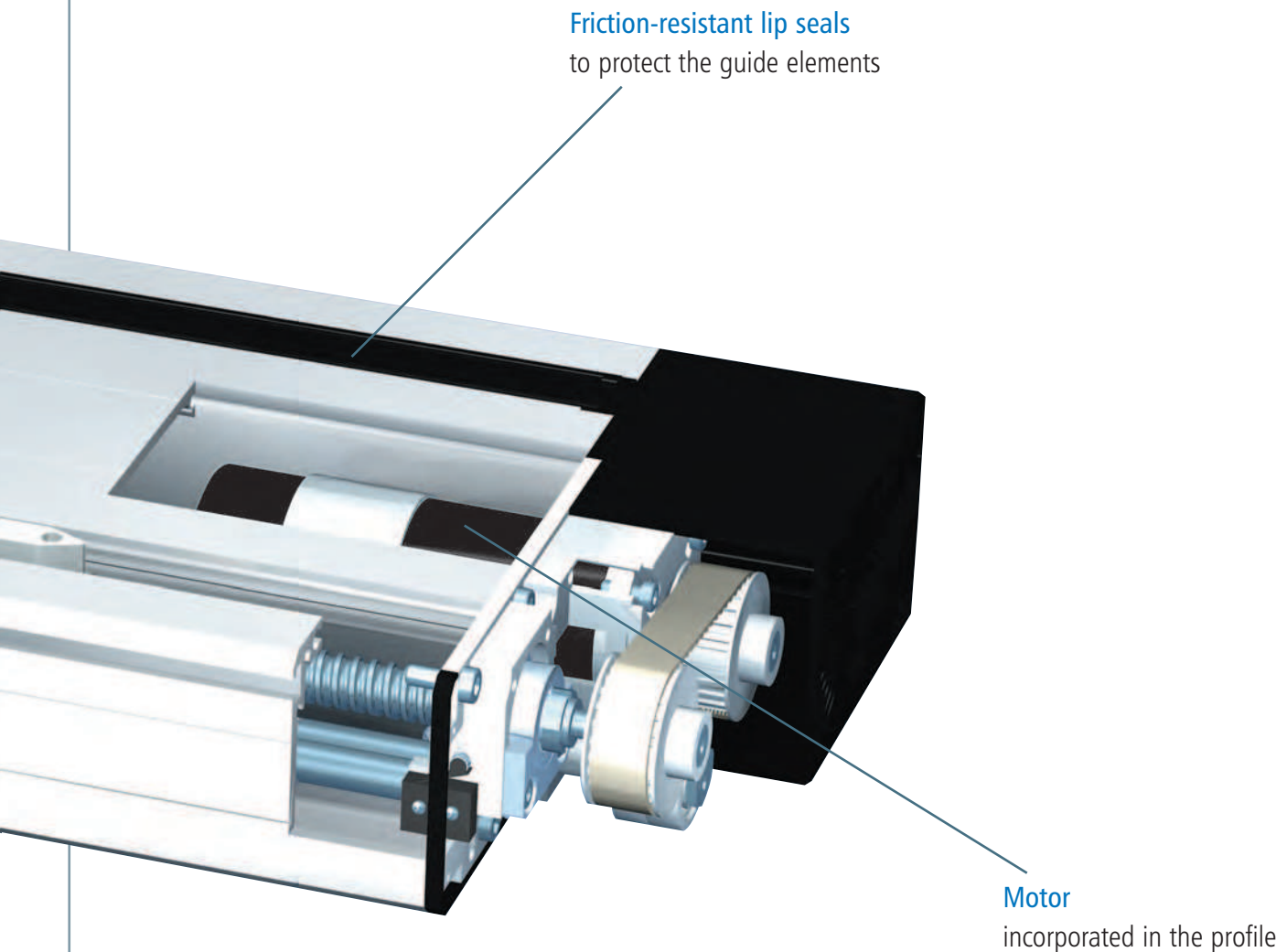
- Spindle support from a profile length of 1500 mm without limiting the process range



- Recirculating ball in patented aluminium linear slides
- Glass fibre reinforced loop components with scrapers

# Functional overview

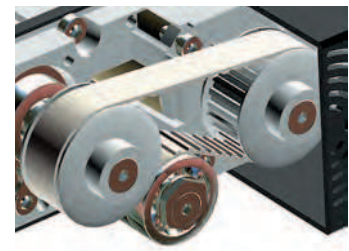
at example LES 5



- Preset play-free recirculating ball nut with scrapers
- Central lubrication system for recirculating ball nut and circulations



- Integrated overrun limit switch
- Spindle bearing with angular contact bearings
- Axially free from play by means of self-locking special nuts



- Belt return and connecting electronics covered completely by protective cap

# Linear units with spindle drive

# LES 6



LES 6 with side belt drive module

## Features

- Aluminium shaft housing profile W150 × H75 mm, naturally anodised
- Clamping area and profile underside milled flat
- With 4 precision steel shafts Ø 12 h6, material Cf53, Hardness 60 ± 2 HRC
- Aluminium shaft slides WS 5/70, 2 x WS 5/70 (70 mm long), adjustable for no play, central lubrication system
- Recirculating ball drive 2.5/4/5/10 and 20 mm pitches
- Profile sealing with friction-resistant lip seals
- Cast aluminium end plates
- With 2 limit or reference switches, Repeat accuracy ± 0.02 mm
- Sealed angular contact bearings in drive - steel flange

## Ordering key

2 3 4 XXX 0 XXX

### Drive

- 6 = Preparation Direct drive modules
- 7 = Preparation Belt drive module

### Shaft slides

- 0 = 2 Shaft slides 70 mm
- 2 = 4 Shaft slides 70 mm

### Profile length (L1)

e.g. 029 = 290 mm (min.)

299 = 2990 mm (max.)

(rounded to the last digit)

Standard profile lengths available in 100 mm raster

### Recirculating ball drive

- 0 = without
- 1 = Pitch 2.5 mm
- 2 = Pitch 4.0 mm
- 3 = Pitch 5.0 mm
- 4 = Pitch 10 mm
- 5 = Pitch 20 mm

### Options:

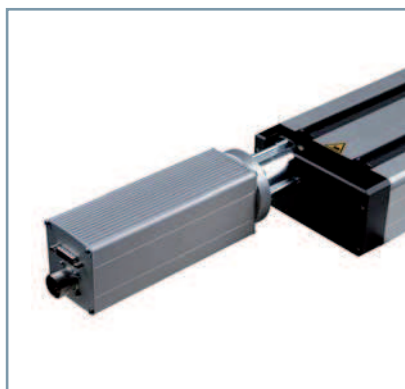
- Black anodized aluminium profile
- Electromagnetic brake
- Steel slides LS2 (Part no. 223007)
- Limit switch attachment kit (see accessories)

### To order:

- Length measuring system
- Bellows gaiter cover
- Assembly left of the motor module

## Drive modules

see pages 2-68 et seq. of the catalogue



## Technical specification

### Aluminium profile

Aluminium profile LES 6	
Moment of inertia $I_x$	707.100 cm <sup>4</sup>
Moment of inertia $I_y$	212.200 cm <sup>4</sup>
*Centre of gravity <small>see dimensioned drawing</small>	32.78 mm
Cross-sectional area	30.07 cm <sup>2</sup>
Material	AlMgSi0, 5F22
Anodising	E6/EV1
Weight with steel shafts	11.4 kg/m
Weight with steel shafts and spindles	12.8 kg/m

## No load running torques

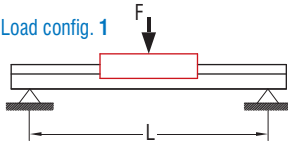
No load torques (Ncm)					
Speed (rpm)	Spindle pitch				
	2.5	4	5	10	20
500	17	17	18	20	21
1500	20	20	22	24	25
3000	24	25	26	29	30

# Linear units with spindle drive

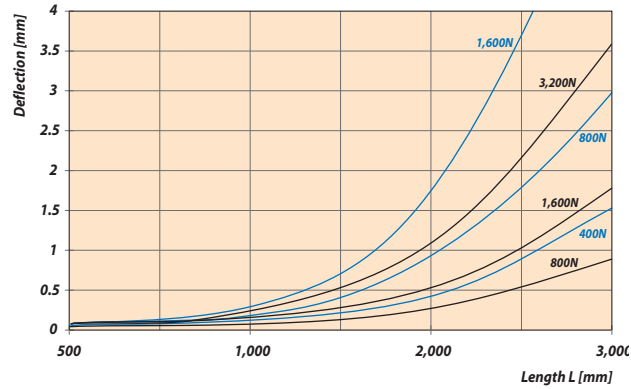
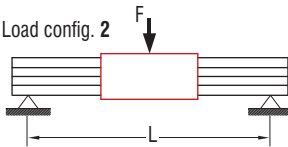
## LES 6

### Bending

Load config. 1



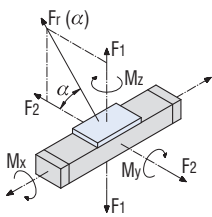
Load config. 2



### Load factors

$$Fr(\alpha) = \frac{F_2}{\cos \alpha}$$

$$Fr(\alpha) = \frac{F_1}{\sin \alpha}$$



LES 6 with two WS 5/70	
$C_0$	5153.30 N
C	2319.41 N
$F_1$ stat.	4401.33 N
$F_1$ dyn.	1980.96 N
$F_2$ stat.	5153.30 N
$F_2$ dyn.	2319.14 N
$M_x$ stat.	211.54 Nm
$M_y$ stat.	164.31 Nm
$M_z$ stat.	192.39 Nm
$M_x$ dyn.	95.21 Nm
$M_y$ dyn.	73.95 Nm
$M_z$ dyn.	86.59 Nm

LES 6 with four WS 5/70	
$C_0$	6,606 N
C	3,746 N
$F_1$ stat.	5,642 N
$F_1$ dyn.	3,198 N
$F_2$ stat.	6,606 N
$F_2$ dyn.	3,746 N
$M_x$ stat.	211.575 Nm
$M_y$ stat.	366.73 Nm
$M_z$ stat.	429.39 Nm
$M_x$ dyn.	119.925 Nm
$M_y$ dyn.	207.87 Nm
$M_z$ dyn.	243.49 Nm

### permissible spindle speeds

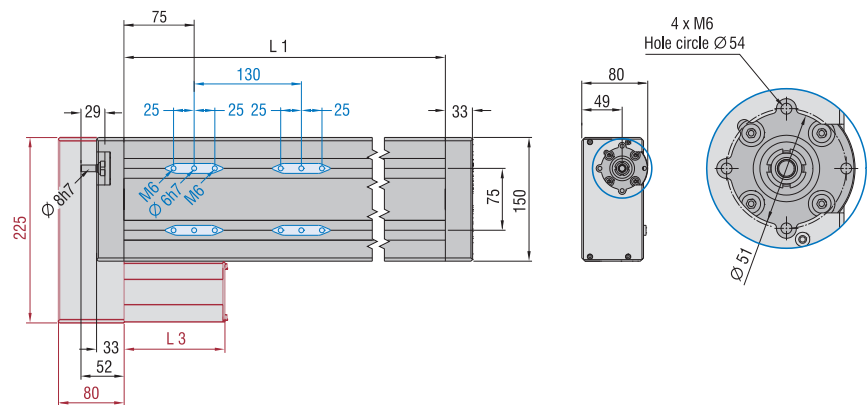
LES 4 / 5 / 6	Spindle pitch [mm]	max. permissible feed speed v permissible [mm/s]				
		2.5	4	5	10	20
490	4000	167	267	333	667	1333
990	3000	125	200	250	500	1000
1390	1500	63	100	125	250	500
1490 *	3000	125	200	250	500	1000
1990 *	1650	69	110	138	275	550
2490 *	1050	44	70	88	175	350
2990 *	750	31	50	63	125	250

\* with spindle support

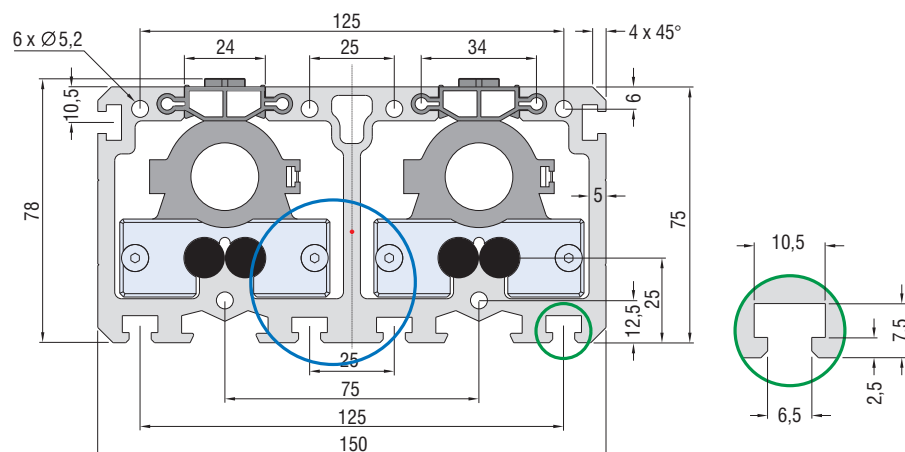
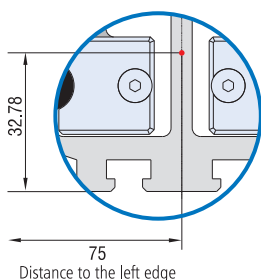
### dimensioned drawing

process travel  
 at 2xWS 5/70 = L1 -150 mm  
 at 4xWS 5/70 = L1 -280 mm

external limit switches see page 2-83



### dimensioned drawing Aluminium profile



# Clutch housing

## Drive element accessories

### Connection options

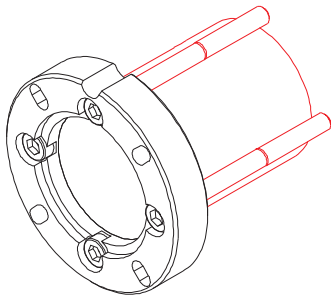
Direct drive preparation

Connecting options <i>Direct drive</i>	LES 4	LES 6	LES 5	Angular gear fixing 0°	Angular gear fixing 90°
MS 200 HT-2 DC 100 EC 60	Connection via coupling casing 1 <i>short sleeve</i> with adequate shaft coupling			Coupling casing 1 <i>long sleeve</i>	
MS 600 HT MS 900 HT EC 86	Connection via coupling casing 2 <i>short sleeve</i> with adequate shaft coupling			Coupling casing 2 <i>long sleeve</i>	
Angular gear fixing 0°	split coupling casing <i>short sleeve</i> with adequate shaft coupling			Connection via transmission shaft set	
Angular gear fixing 90°	split coupling casing <i>short sleeve</i> with adequate shaft coupling				

### Ordering overview

Clutch housing

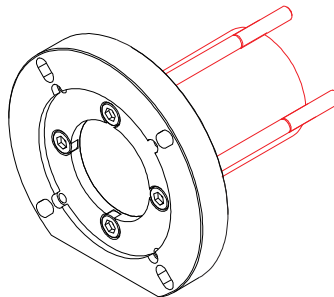
Clutch housing 1



short sleeve  
Part no.: 218 100 0001

long sleeve  
Part no.: 218 100 0002

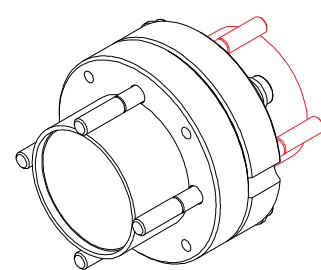
Clutch housing 2



short sleeve  
Part no.: 218 100 1001

long sleeve  
Part no.: 218 100 1002

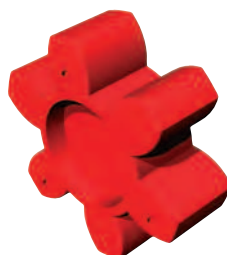
Split clutch housing



short sleeve  
Part no.: 218 100 2001

long sleeve  
Part no.: 218 100 2002

### Clutches



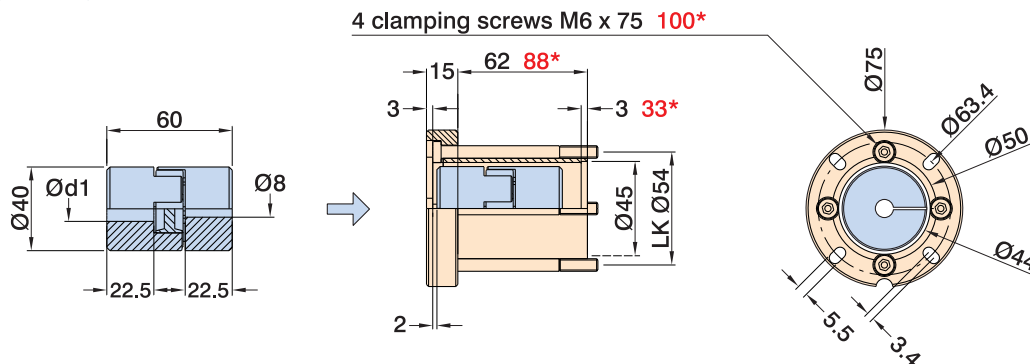
coupling	Item no.:	d <sub>1</sub>	d <sub>2</sub>
20/30	218 001 5060	5,0	6,0
	218 001 9999	from 4 to 7 mm	
30/40	218 002 6380	6,35	8,0
	218 002 8080	8,0	8,0
	218 002 9999	from 6 to 13 mm	
40/60	218 003 9580	9,52	8,0
	218 003 9999	from 8 to 18 mm	

# Clutch housing

## Drive element accessories

### dimensioned drawing

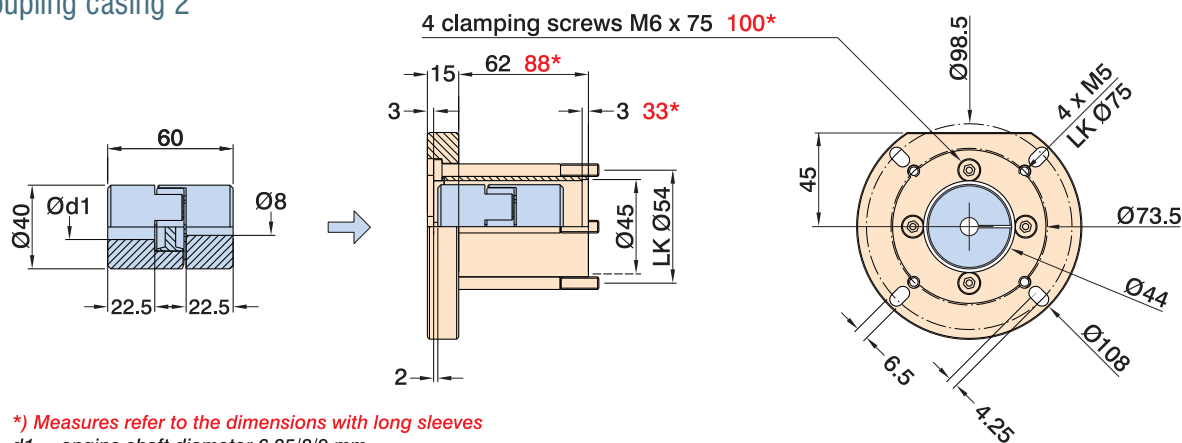
#### Coupling casing 1



*\*) Measures refer to the dimensions with long sleeves*  
 d1 = engine shaft diameter 6.35/8/9 mm  
 Suitable shaft coupling WK 40/60 on page 2-68 (not included in scope of delivery)

### dimensioned drawing

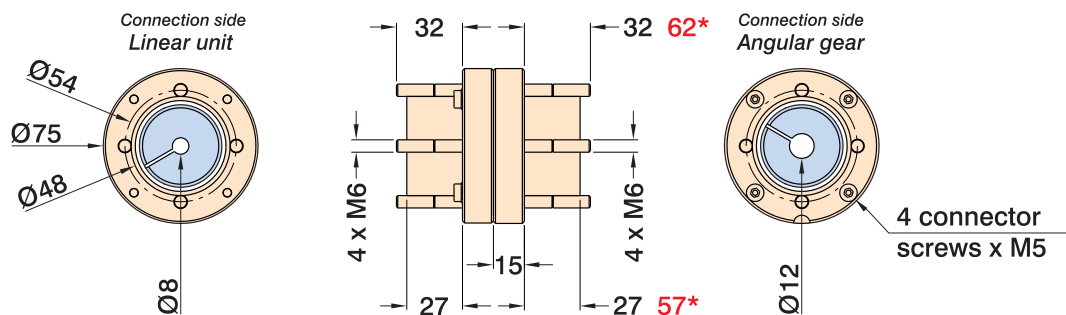
#### Coupling casing 2



*\*) Measures refer to the dimensions with long sleeves*  
 d1 = engine shaft diameter 6.35/8/9 mm  
 Suitable shaft coupling WK 40/60 on page 2-68 (not included in scope of delivery)

### dimensioned drawing

#### Split coupling casing



*\*) Measures refer to the dimensions with long sleeves*  
 Suitable shaft coupling WK 40/60 on page 2-68 (not included in scope of delivery)

# Slide/crossbench plates

# Connectors

## Hole diagram, slide plate PS 1

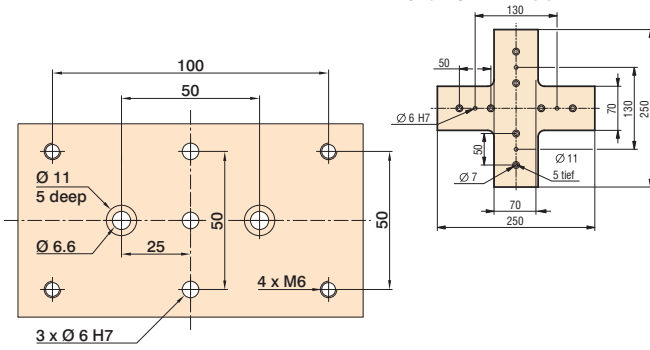
L 125 x W 70 x H 7.7 mm

Mounting on:  
LES 4 with 1 x WS 5/70

Part no.: **277001**

## Connecting cross 2 x LES 4

Part no.: **277007**



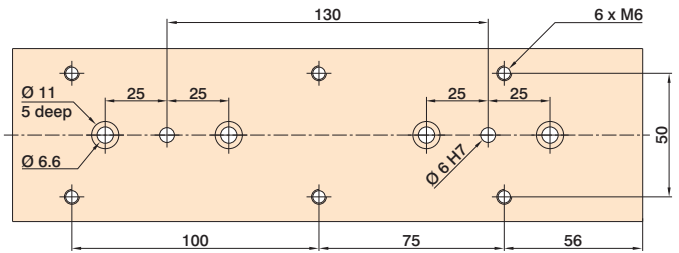
## Hole diagram, slide plate PS 2

L 255 x W 70 x H 7.7 mm

Mounting on:  
LES 4 with 2 x WS 5/70

Fixing option for:  
Angle bracket WV 2 / WV 5

Part no.: **277002**

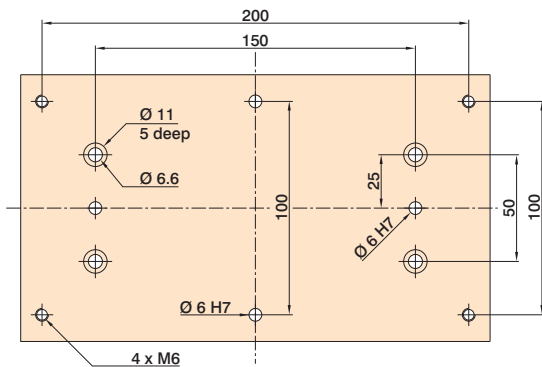


## Hole diagram, slide plate PS 3

L 220 x W 125 x H 7.5 mm

Mounting on:  
LES 5 with 2 x WS 5/70

Part no.: **277003**



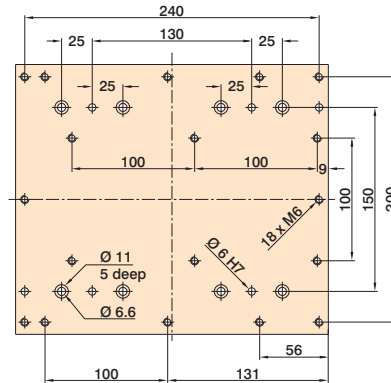
## Hole diagram, slide plate PS 4

L 225 x W 220 x H 7.5 mm

Mounting on: LES 5 with 4 x WS 5/70

Mounting on crossbench: LES 5 with LES 5 (in conjunction with VP 2) Fixing option for: Angle bracket WV 3 / WV 6

Part no.: **277004**



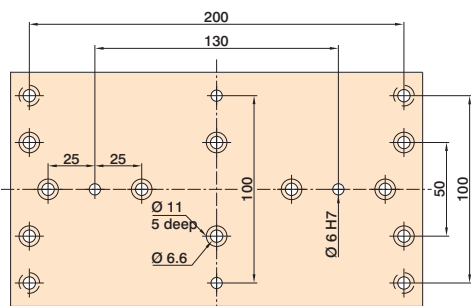
## Hole diagram, slide plate PS 6

L 220 x W 125 x H 7.5 mm

Mounting on: LES 4 with 2 x WS 5/70

Mounting on crossbench: LES 4 with LES 5 (in conjunction with PS 3). Fixing option for: LES 4/LES 5

Part no.: **277011**



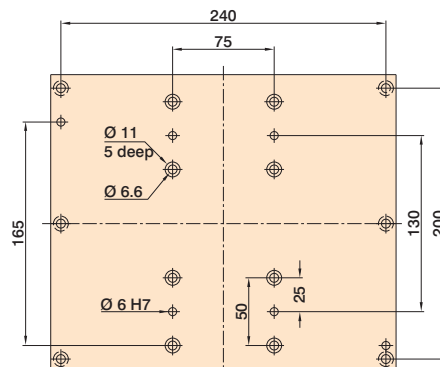
## Hole diagram, slide plate PS 7

L 255 x W 220 x H 7.5 mm

Mounting on: LES 6 with 4 x WS 5/70

Mounting on crossbench: LES 6 with LES 5 (in conjunction with PS 4)

Part no.: **277016**



# Slide/crossbench plates

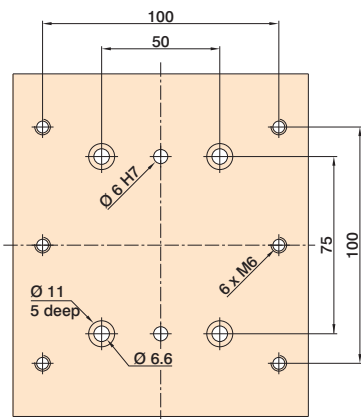
# Connectors

## Hole diagram, slide plate PS 8

L 125 × W 145 × H 7.7 mm

Mounting on:

LES 6 with 2 × WS 5/70 **Part no.: 277017**



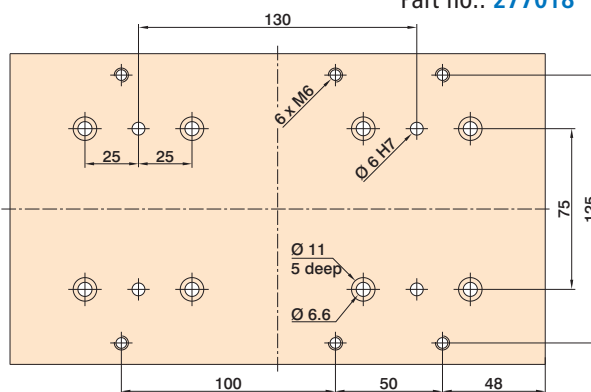
## Hole diagram, slide plate PS 9

L 250 × W 145 × H 7.5 mm

Mounting on: LES 6 with 4 × WS 5/70

Fixing option for: Angle bracket WV 7

**Part no.: 277018**



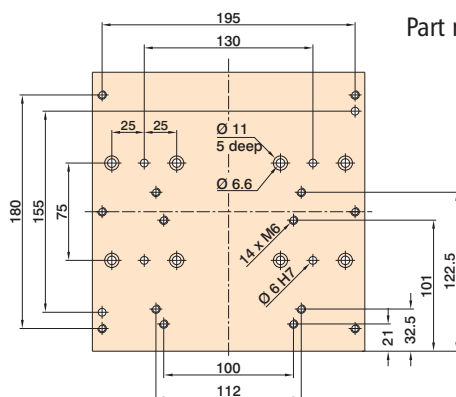
## Hole diagram, slide plate PS 10

L 210 × W 215 × H 7.5 mm

Mounting on: LES 6 with 4 × WS 5/70

Mounting on crossbench: LES 6 with LES 6 (in conjunction with PS 11)

**Part no.: 277019**



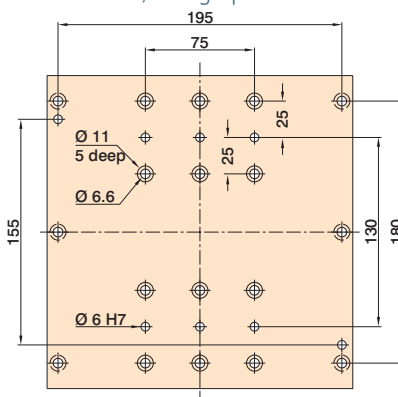
## Hole diagram, slide plate PS 11

L 210 × W 215 × H 7.5 mm

Mounting on: LES 6 with 4 × WS 5/70

Mounting on crossbench: LES6 with LES4 (in conjunction with PS10) Fixing option for: LES 6

**Part no.: 277020**

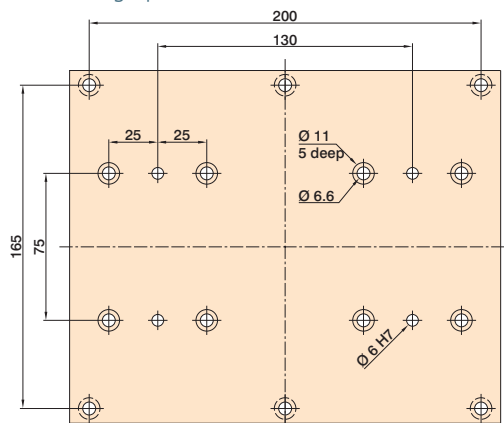


## Hole diagram, slide plate PS 12

L 220 × W 180 × H 7.5 mm

Mounting on: LES 6 with 4 × WS 5/70

Fixing option for: LES 5 **Part no.: 277021**



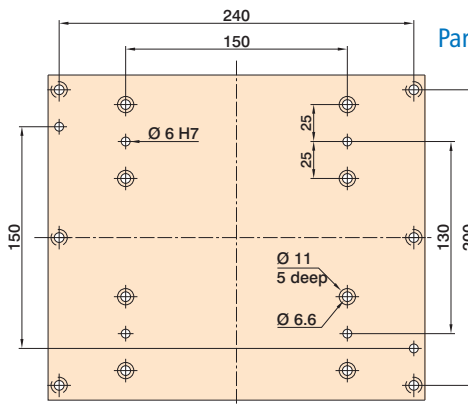
## Hole diagram, connection plate VP 2

L 255 × W 220 × H 7.5 mm

Mounting on: LES 5 with 4 × WS 5/70

Fixing option for: LES 5

**Part no.: 277006**





# T-slot slide plates

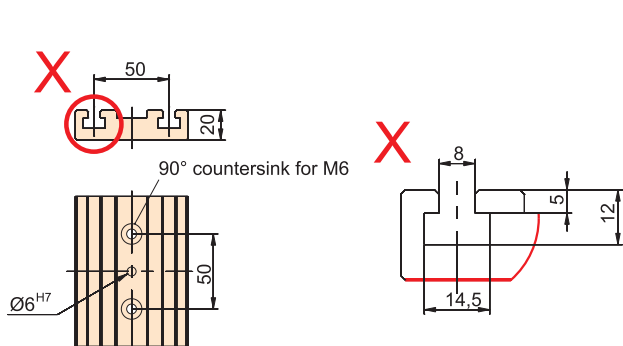
# Connectors

## Hole pattern T-slot plate PT 25 × 250 for LES 4

L 100 x W 75 x H 20 mm

Mounting on: LES 4 with 1 x WS 5/70

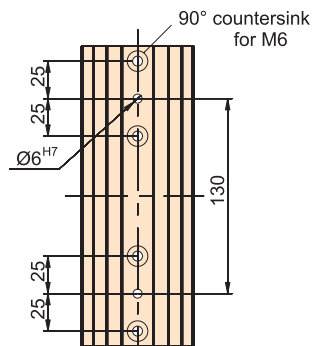
Part no.: **277030 0001**



L 200 x W 75 x H 20 mm

Mounting on: LES 4 with 2 x WS 5/70

Part no.: **277030 0002**

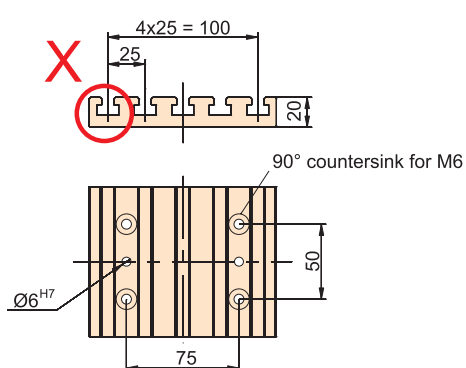


## Hole pattern T-slot plate PT 25 × 250 for LES 6

L 100 x W 125 x H 20 mm

Mounting on: LES 6 with 2 x WS 5/70

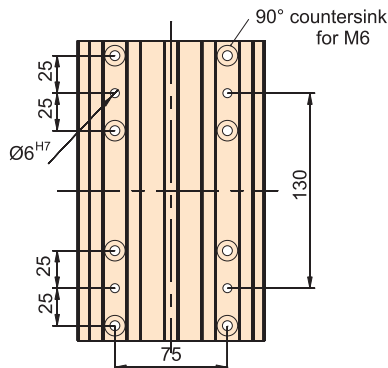
Part no.: **277030 0003**



L 200 x W 125 x H 20 mm

Mounting on: LES 6 with 4 x WS 5/70

Part no.: **277030 0004**

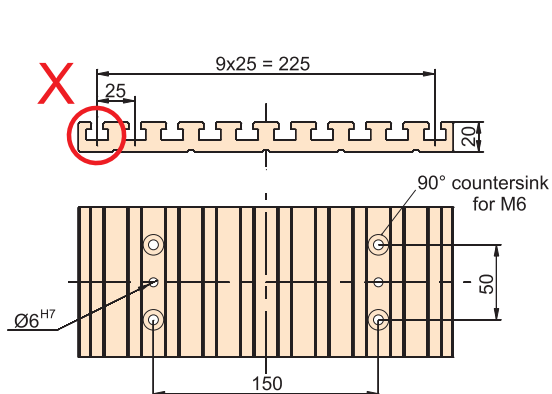


## Hole pattern T-slot plate PT 25 × 250 for LES 5

L 100 x W 250 x H 20 mm

Mounting on: LES 5 with 2 x WS 5/70

Part no.: **277030 0005**



L 200 x W 250 x H 20 mm

Mounting on: LES 5 with 4 x WS 5/70

Part no.: **277030 0006**

