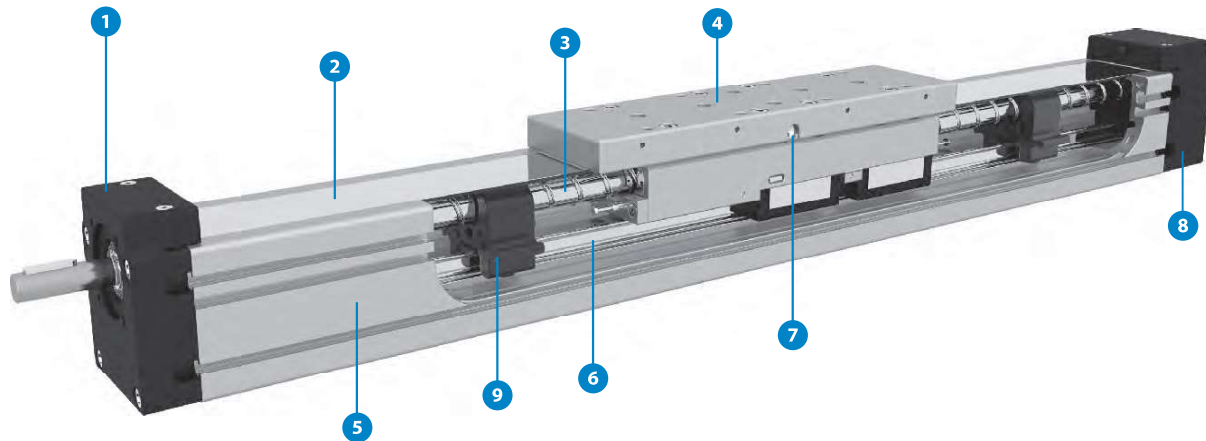


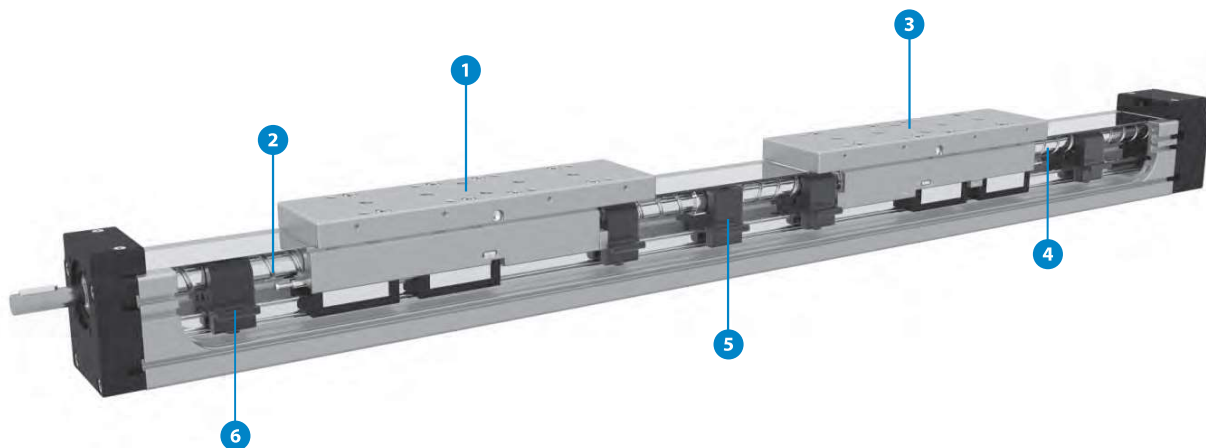
STRUCTURAL DESIGN

Standard version



- 1 - Drive block with floating bearing (MTV 110 - fixed bearing)
- 2 - Corrosion-resistant protection strip
- 3 - Ball screw tolerance ISO7 (ISO5 available on request)
- 4 - Carriage; with built in Magnets
- 5 - Aluminium profile-Hard anodized
- 6 - Integrated Linear Ball Guideway
- 7 - Central lubrication port; both sides
- 8 - End block with fixed bearing (MTV 110 - floating bearing)
- 9 - Screw support - SA

2LR version



- 1 - Carriage; with build in right hand ball nut
- 2 - Right hand ball screw
- 3 - Carriage; with build in left hand ball nut
- 4 - Left hand ball screw
- 5 - Central screw support - fixed
- 6 - Screw support - SA

HOW TO ORDER

**MTV - 65 - 1610 - ISO7 - 1 - 1000 - 2SA - 2LR**

Series : \_\_\_\_\_  
**MTV**

Size : \_\_\_\_\_  
**65**  
**80**  
**110**

Ball screw : \_\_\_\_\_  
**MTV 65:** Ø16×5, Ø16×10, Ø16×16  
**MTV 80:** Ø20×5, Ø20×10, Ø20×20, Ø20×50  
**MTV 110:** Ø32×5, Ø32×10, Ø32×20, Ø32×32

Ball screw tolerance : \_\_\_\_\_  
**ISO7** (Standard)  
**ISO5**

Ball screw journal : \_\_\_\_\_  
**0** : Without keyway  
**1** : With keyway

Absolute stroke (mm) : \_\_\_\_\_  
 (Absolute stroke = Effective stroke + 2 x Safety stroke) **!** 2LR version: Absolute stroke of one carriage.

Number of screw supports  $n_{SA}$  : \_\_\_\_\_  
 (only even integer number - 2, 4, 6, 8, 10SA) - for MTV 65 max. 4SA is available

Leave blank : Without SA

2LR version : \_\_\_\_\_  
 Both right and left ball screws are used.

Leave blank : Standard version

**!** Available for: MTV65: 16x5, 16x10  
 MTV80: 20x5

TECHNICAL DATA

General technical data for MTV series

Linear Unit	Carriage length $L_v$ [ mm ]	Load capacity		Dynamic moment			Max. permissible loads					* Max. length $L_{max}$ [ mm ]	* Max. stroke [ mm ]
		Dynamic $C$ [ N ]	Static $C_0$ [ N ]	$M_x$ [ Nm ]	$M_y$ [ Nm ]	$M_z$ [ Nm ]	Forces		Moments				
							$F_{py}$ [ N ]	$F_{pz}$ [ N ]	$M_{px}$ [ Nm ]	$M_{py}$ [ Nm ]	$M_{pz}$ [ Nm ]		
MTV 65	220	19800	35000	158	700	700	6540	10190	94	350	233	2920	2690
MTV 65 2LR												5789	2667
MTV 80	290	34200	60000	370	1470	1470	8930	15070	150	500	384	5480	5163
MTV 80 2LR												11055	5224
MTV 110	330	49600	85000	630	2650	2650	10000	20260	295	670	535	5850	5456

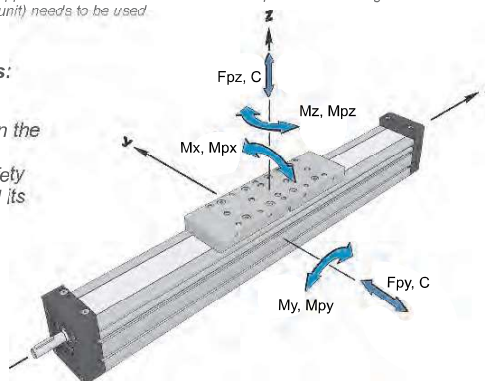
\* For lengths / stroke over the stated value in the table above please contact us.  
 Values for max. stroke are not valid for screw support SA. For the case of the SA the equation of defining the linear unit length (for particular size of the linear unit) needs to be used.

**!** Recommended values of loads:

All the data of static and dynamic moments and load capacities stated in the upper table are theoretical without considering any safety factor. The safety factor depends on the application and its requested safety. We recommend a minimum safety factor ( $f_s = 5.0$ )

**Modulus of elasticity**

$E = 70000 \text{ N} / \text{mm}^2$



Operating conditions	
Operating temperature	0°C ~ +60°C
Duty cycle	100%

**!** For operating temperature out of the presented range, please contact us.

## TECHNICAL DATA

### Exceptions for standard version

Linear Unit	Number of SA $n_{SA}$	Max. length $L_{max}$ [ mm ]	Max. stroke [ mm ]
MTV 65	0	2100	1870
MTV 80	0	2500	2183
	2	5010	4648
MTV 110	0	3100	2706

Linear Unit	Ball screw [ d × l ]	Max. length $L_{max}$ [ mm ]	Max. stroke [ mm ]
MTV 80	20 × 10	2880	2563

**i** Exceptions for maximum length and stroke!

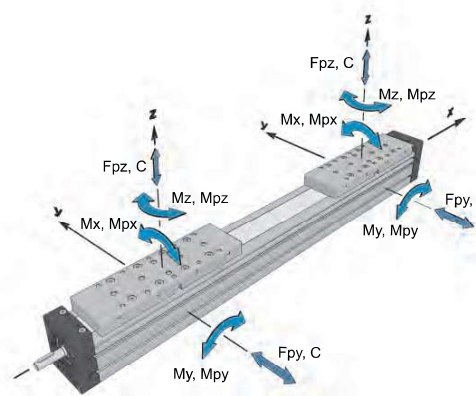
**i** Stated values in the table apply only for horizontally orientated unit.

### Exceptions for 2LR version

Linear Unit	Number of SA $n_{SA}$	Max. length $L_{max}$ [ mm ]	Max. stroke [ mm ]
MTV 65 2LR	0	4195	1870
MTV 80 2LR	0	4973	2183
	2	10200	4750

Linear Unit	Ball screw [ d × l ]	Max. length $L_{max}$ [ mm ]	Max. stroke [ mm ]
MTV 65 2LR	16 × 10	2379	962

**i** Exceptions for maximum length and stroke!



### Ball Screw Drive data

Linear unit	3 Max. rotational speed (Without SA) [ rev / min ]	1 Max. travel speed (Without SA) [ m / s ]	Lead constant [ mm / rev ]	Ball screw [ d × l ]	2 Max. Repeatability precision [ mm ]		Dynamic load capacity BS $C_a$ [ N ]	5 Max. axial load $F_x$ [ N ]	Max. drive torque $M_a$ [ Nm ]	4 Min. stroke [ mm ]
					STANDARD ISO7	ISO5				
MTV 65	4200	0,35	5	16 × 5	± 0,02	± 0,01	13150	8700	7,7	40
		0,70	10	16 × 10	± 0,02	± 0,01	11550	6730	11,9	40
		1,12	16	16 × 16	± 0,02	± 0,01	8170	4200	11,9	40
MTV 80	3300	0,28	5	20 × 5	± 0,02	± 0,01	14800	14800	13,0	55
		0,55	10	20 × 10	± 0,02	± 0,01	15900	13850	24,5	55
		1,10	20	20 × 20	± 0,02	± 0,01	16250	6930	24,5	55
MTV 110	3000	2,50	50	20 × 50	± 0,02	± 0,01	13000	2770	24,5	55
		0,18	5	32 × 5	± 0,02	± 0,01	18850	18850	16,7	65
		0,50	10	32 × 10	± 0,02	± 0,01	33400	29600	52,3	65
MTV 110	3000	1,00	20	32 × 20	± 0,02	± 0,01	29700	14800	52,3	65
		1,60	32	32 × 32	± 0,02	± 0,01	35150	9240	52,3	70

<sup>1</sup> Max. travel speed depends of the length of the linear unit, see diagram for particular size of the linear unit.  
For travel speed over the stated value in the table above or diagrams please contact us.

<sup>2</sup> For the ball nut with the preload of 2%, please contact us.

<sup>3</sup> With SA or 2LR version the max. rotation speed is limited to 3000 rev / min.

<sup>4</sup> For minimum stroke below the stated value in the table above please contact us.

<sup>5</sup> In the case of 2RL version the axial load is total axial load of both carriages.

**Max. acceleration [ m/s<sup>2</sup> ]** 20

**i** For acceleration over the stated value in the table above, please contact us.

Linear Unit	Planar moment of inertia		Linear Unit	Max. permissible drive torque $M_a$ [ Nm ]
	$I_y$ [ cm <sup>4</sup> ]	$I_z$ [ cm <sup>4</sup> ]		
MTV 65	71,3	89,4	MTV 65	5,5
MTV 80	144,1	192,3	MTV 80	11,9
MTV 110	562,0	669,0	MTV 110	27,3

**i** Reduced effective diameter at journal with keyway decreases values of max. drive torque.

Mass, moved mass, mass moment of inertia and no load torque

Linear Unit	Ball screw [ d × l ]	Number of SA n <sub>SA</sub>	Mass of linear unit [ kg ]	Moved mass [ kg ]	Mass moment of inertia [ 10 <sup>-5</sup> kg * m <sup>2</sup> ]	<sup>1</sup> No load torque [ Nm ]
MTV 65	16 × 5	0	4,0 + 0,0073 * Stroke [ mm ]	1,50	1,6 + 0,0052 * Stroke [ mm ]	0,11
		2	4,5 + 0,0073 * Stroke [ mm ]	1,58	1,9 + 0,0052 * Stroke [ mm ]	0,13
		4	5,0 + 0,0073 * Stroke [ mm ]	1,66	2,2 + 0,0052 * Stroke [ mm ]	0,15
	16 × 5 2LR version	0	7,2 + 0,0146 * Stroke [ mm ]	3,00	2,9 + 0,0104 * Stroke [ mm ]	0,22
		2	8,2 + 0,0146 * Stroke [ mm ]	3,16	3,5 + 0,0104 * Stroke [ mm ]	0,26
		4	9,2 + 0,0146 * Stroke [ mm ]	3,32	4,1 + 0,0104 * Stroke [ mm ]	0,29
	16 × 10	0	4,0 + 0,0073 * Stroke [ mm ]	1,50	1,9 + 0,0052 * Stroke [ mm ]	0,12
		2	4,5 + 0,0073 * Stroke [ mm ]	1,58	2,2 + 0,0052 * Stroke [ mm ]	0,16
		4	5,0 + 0,0073 * Stroke [ mm ]	1,66	2,5 + 0,0052 * Stroke [ mm ]	0,19
	16 × 10 2LR version	0	7,2 + 0,0146 * Stroke [ mm ]	3,00	3,5 + 0,0104 * Stroke [ mm ]	0,24
		2	8,2 + 0,0146 * Stroke [ mm ]	3,16	4,1 + 0,0104 * Stroke [ mm ]	0,28
		4	9,2 + 0,0146 * Stroke [ mm ]	3,32	4,8 + 0,0104 * Stroke [ mm ]	0,31
16 × 16	0	4,0 + 0,0073 * Stroke [ mm ]	1,50	2,5 + 0,0052 * Stroke [ mm ]	0,13	
	2	4,5 + 0,0073 * Stroke [ mm ]	1,58	2,8 + 0,0052 * Stroke [ mm ]	0,19	
	4	5,0 + 0,0073 * Stroke [ mm ]	1,66	3,2 + 0,0052 * Stroke [ mm ]	0,24	
MTV 80	20 × 5	0	8,2 + 0,0114 * Stroke [ mm ]	3,00	5,6 + 0,0127 * Stroke [ mm ]	0,16
		2	8,9 + 0,0114 * Stroke [ mm ]	3,07	6,2 + 0,0127 * Stroke [ mm ]	0,19
		4 / 6 / 8 / 10	9,7 + 0,4 * (n <sub>SA</sub> -4) + 0,0114 * Stroke [ mm ]	3,21 + 0,035 * (n <sub>SA</sub> - 4)	7,0 + 0,4 * (n <sub>SA</sub> -4) + 0,0127 * Stroke [ mm ]	0,24 + 0,015 * (n <sub>SA</sub> - 4)
	20 × 5 2LR version	0	14,6 + 0,0228 * Stroke [ mm ]	6,00	9,5 + 0,0254 * Stroke [ mm ]	0,32
		2	15,9 + 0,0228 * Stroke [ mm ]	6,14	10,7 + 0,0254 * Stroke [ mm ]	0,37
		4 / 6 / 8 / 10	17,6 + 0,8 * (n <sub>SA</sub> -4) + 0,0228 * Stroke [ mm ]	6,42 + 0,07 * (n <sub>SA</sub> - 4)	12,3 + 0,8 * (n <sub>SA</sub> -4) + 0,0254 * Stroke [ mm ]	0,48 + 0,03 * (n <sub>SA</sub> - 4)
	20 × 10	0	8,2 + 0,0114 * Stroke [ mm ]	3,00	6,2 + 0,0127 * Stroke [ mm ]	0,17
		2	8,9 + 0,0114 * Stroke [ mm ]	3,07	6,8 + 0,0127 * Stroke [ mm ]	0,22
		4 / 6 / 8 / 10	9,7 + 0,4 * (n <sub>SA</sub> -4) + 0,0114 * Stroke [ mm ]	3,21 + 0,035 * (n <sub>SA</sub> - 4)	7,6 + 0,4 * (n <sub>SA</sub> -4) + 0,0127 * Stroke [ mm ]	0,33 + 0,025 * (n <sub>SA</sub> - 4)
	20 × 20	0	8,2 + 0,0114 * Stroke [ mm ]	3,00	8,5 + 0,0127 * Stroke [ mm ]	0,18
		2	8,9 + 0,0114 * Stroke [ mm ]	3,07	9,1 + 0,0127 * Stroke [ mm ]	0,29
		4 / 6 / 8 / 10	9,7 + 0,4 * (n <sub>SA</sub> -4) + 0,0114 * Stroke [ mm ]	3,21 + 0,035 * (n <sub>SA</sub> - 4)	10,1 + 0,5 * (n <sub>SA</sub> -4) + 0,0127 * Stroke [ mm ]	0,50 + 0,055 * (n <sub>SA</sub> - 4)
20 × 50	0	8,2 + 0,0114 * Stroke [ mm ]	3,00	24,4 + 0,0127 * Stroke [ mm ]	0,28	
	2	8,9 + 0,0114 * Stroke [ mm ]	3,07	25,5 + 0,0127 * Stroke [ mm ]	0,55	
	4 / 6 / 8 / 10	9,7 + 0,4 * (n <sub>SA</sub> -4) + 0,0114 * Stroke [ mm ]	3,21 + 0,035 * (n <sub>SA</sub> - 4)	27,1 + 0,6 * (n <sub>SA</sub> -4) + 0,0127 * Stroke [ mm ]	1,08 + 0,0135 * (n <sub>SA</sub> - 4)	
MTV 110	32 × 5	0	17,3 + 0,0216 * Stroke [ mm ]	4,90	34,6 + 0,0690 * Stroke [ mm ]	0,45
		2	17,7 + 0,0216 * Stroke [ mm ]	5,03	35,1 + 0,0690 * Stroke [ mm ]	0,52
		4 / 6 / 8 / 10	19,3 + 0,8 * (n <sub>SA</sub> -4) + 0,0216 * Stroke [ mm ]	5,29 + 0,065 * (n <sub>SA</sub> - 4)	39,4 + 2,2 * (n <sub>SA</sub> -4) + 0,0690 * Stroke [ mm ]	0,66 + 0,035 * (n <sub>SA</sub> - 4)
	32 × 10	0	17,3 + 0,0216 * Stroke [ mm ]	4,90	35,5 + 0,0690 * Stroke [ mm ]	0,50
		2	17,7 + 0,0216 * Stroke [ mm ]	5,03	36,1 + 0,0690 * Stroke [ mm ]	0,64
		4 / 6 / 8 / 10	19,3 + 0,8 * (n <sub>SA</sub> -4) + 0,0216 * Stroke [ mm ]	5,29 + 0,065 * (n <sub>SA</sub> - 4)	40,4 + 2,2 * (n <sub>SA</sub> -4) + 0,0690 * Stroke [ mm ]	0,92 + 0,070 * (n <sub>SA</sub> - 4)
	32 × 20	0	17,3 + 0,0216 * Stroke [ mm ]	4,90	39,3 + 0,0690 * Stroke [ mm ]	0,55
		2	17,7 + 0,0216 * Stroke [ mm ]	5,03	39,9 + 0,0690 * Stroke [ mm ]	0,83
		4 / 6 / 8 / 10	19,3 + 0,8 * (n <sub>SA</sub> -4) + 0,0216 * Stroke [ mm ]	5,29 + 0,065 * (n <sub>SA</sub> - 4)	44,4 + 2,2 * (n <sub>SA</sub> -4) + 0,0690 * Stroke [ mm ]	1,40 + 0,140 * (n <sub>SA</sub> - 4)
	32 × 32	0	17,3 + 0,0216 * Stroke [ mm ]	4,90	47,0 + 0,0690 * Stroke [ mm ]	0,60
		2	17,7 + 0,0216 * Stroke [ mm ]	5,03	47,8 + 0,0690 * Stroke [ mm ]	1,05
		4 / 6 / 8 / 10	19,3 + 0,8 * (n <sub>SA</sub> -4) + 0,0216 * Stroke [ mm ]	5,29 + 0,065 * (n <sub>SA</sub> - 4)	52,8 + 2,3 * (n <sub>SA</sub> -4) + 0,0690 * Stroke [ mm ]	1,96 + 0,225 * (n <sub>SA</sub> - 4)

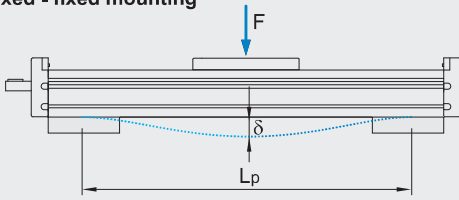
<sup>1</sup> The stated values are for strokes up to 500mm.  
No Load Torque value increases with stroke elongation.

**i** Mass calculation doesn't include mass of motor, reduction gear, switches and clamps.

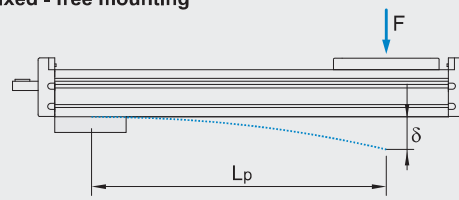
TECHNICAL DATA

Deflection of the linear unit

Fixed - fixed mounting



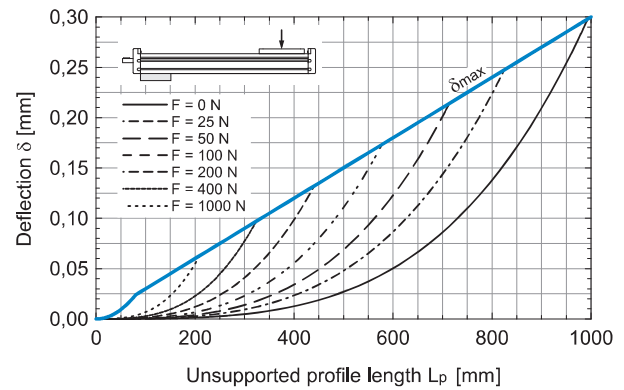
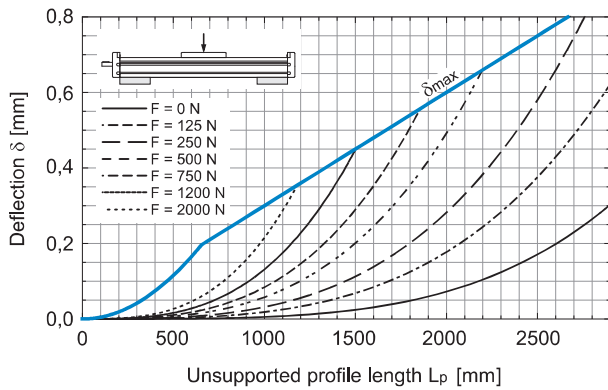
Fixed - free mounting



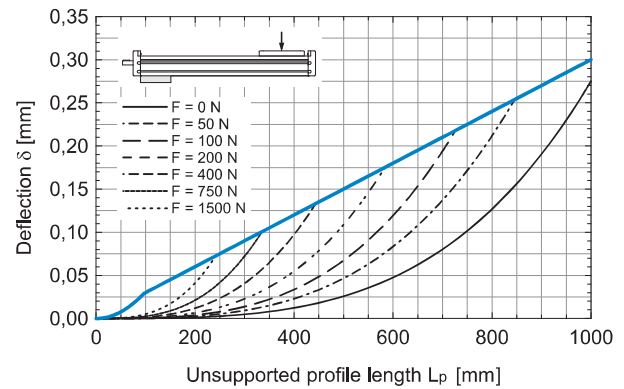
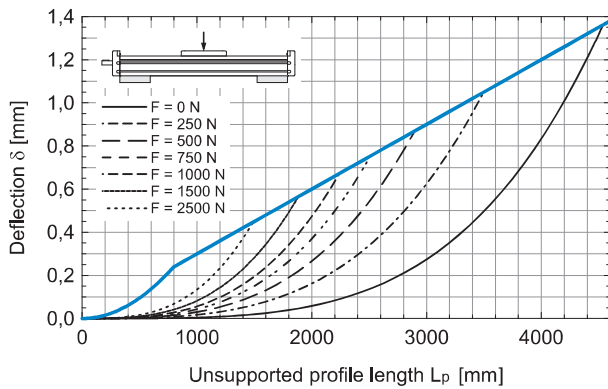
- $\delta$  Maximum deflection of the linear unit [mm]
- $\delta_{max}$  Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- $L_p$  Unsupported profile length [mm]

**i** The maximum permissible deflection  $\delta_{max}$  must not be exceeded. In the case that maximum deflection  $\delta$  exceeds the maximum permissible deflection  $\delta_{max}$  additional profile supports are needed.

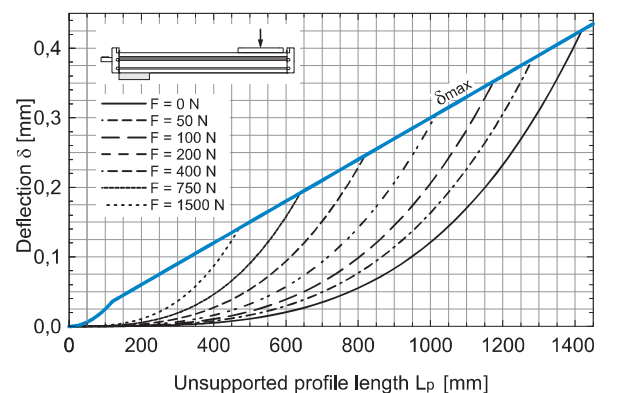
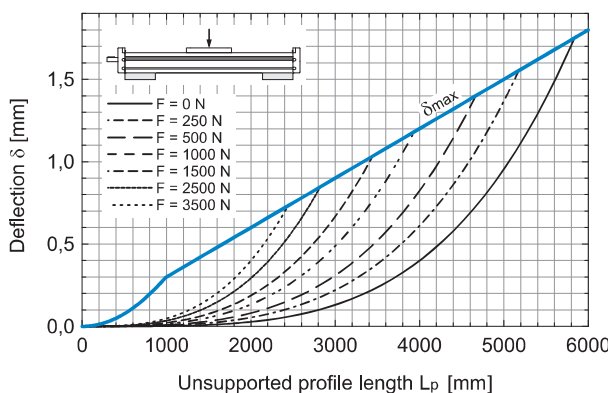
MTV 65



MTV 80

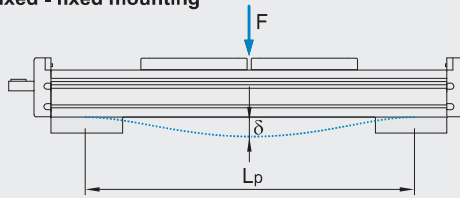


MTV 110



**Deflection of the 2LR version**

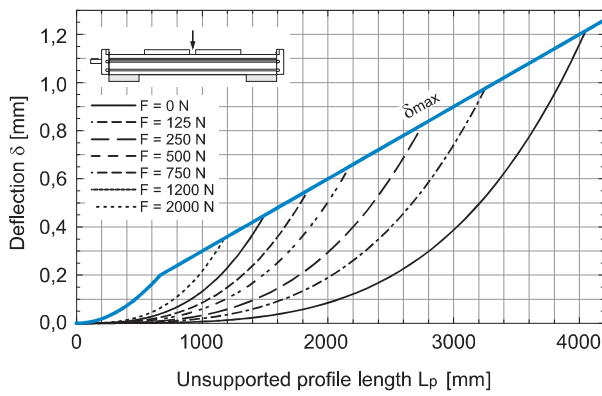
**Fixed - fixed mounting**



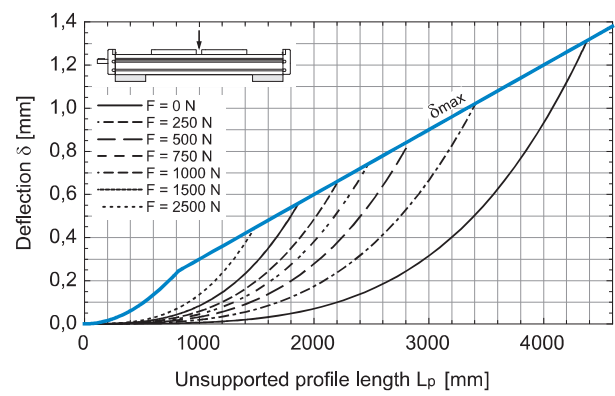
- $\delta$  Maximum deflection of the linear unit [mm]
- $\delta_{max}$  Maximum permissible deflection of the linear unit [mm]
- F Applied force [N]
- $L_p$  Unsupported profile length [mm]

**i** The maximum permissible deflection  $\delta_{max}$  must not be exceeded. In the case that maximum deflection  $\delta$  exceeds the maximum permissible deflection  $\delta_{max}$  additional profile supports are needed.

**MTV 65**



**MTV 80**

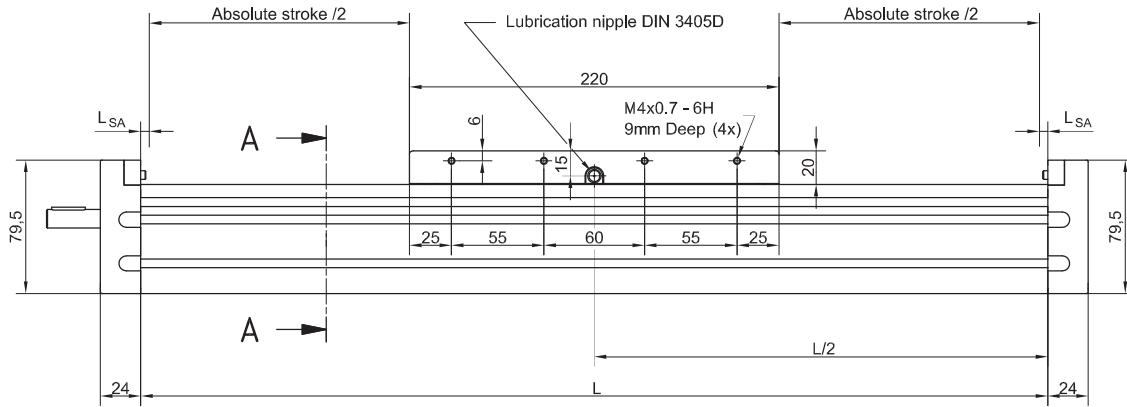


## DIMENSIONS

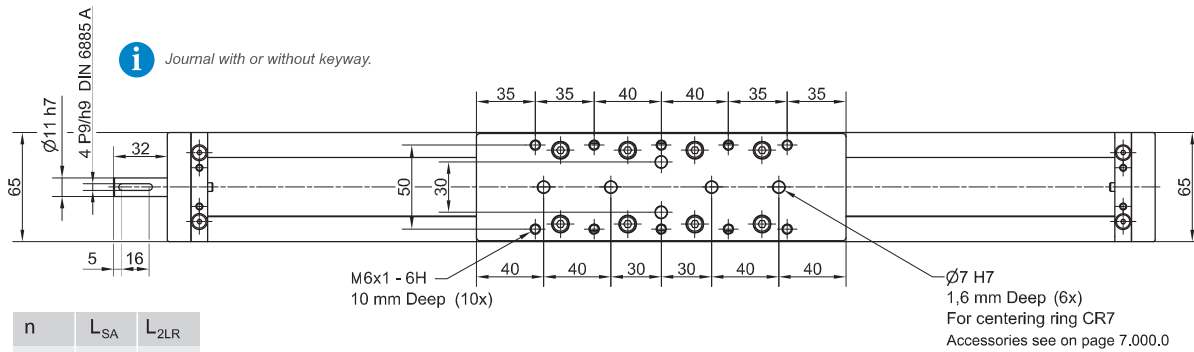


Linear Unit doesn't include any safety

Absolute stroke = Effective stroke + 2 x Safety stroke stroke.



Journal with or without keyway.



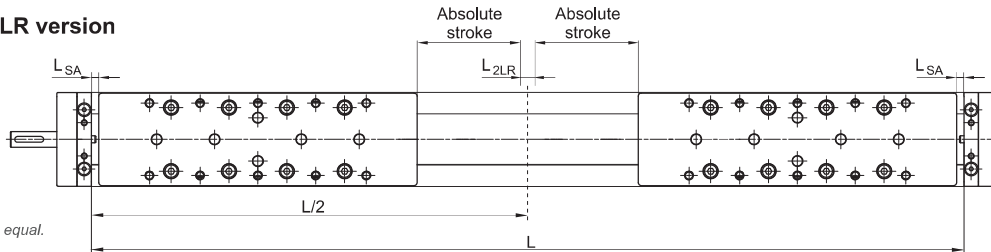
n	L <sub>SA</sub>	L <sub>2LR</sub>
0	5,0	5,0
2SA	31,0	67,0
4SA	62,0	129,0

L<sub>SA</sub> Additional length [ mm ]

L<sub>2LR</sub> Min. distance between carriages [ mm ]



2LR version



All dimensions in mm;  
Drawings scales are not equal.

## Defining of the linear unit length

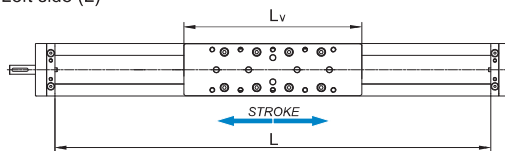
### Standard version

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 2 \times L_{SA}$

$L_{\text{total}} = L + 48 \text{ mm}$

$L_v = 220 \text{ mm}$

Left side (L)



Right side (R)

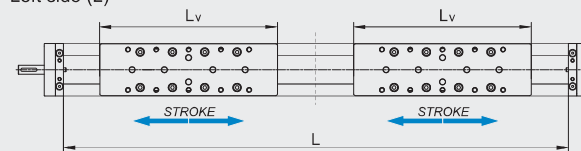
### Version 2LR

$L = 2 \times (\text{Effective stroke} + 2 \times \text{Safety stroke}) + 2 \times L_v + 2 \times L_{SA} + L_{2LR}$

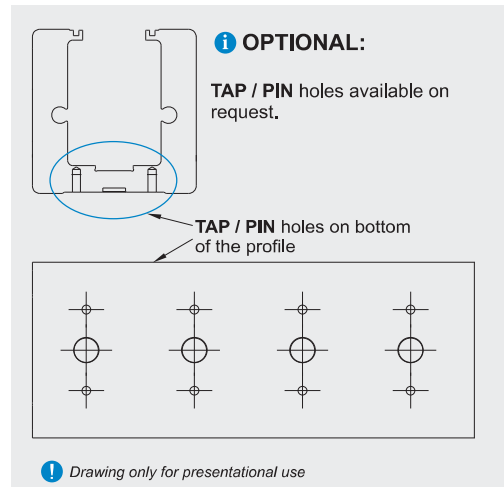
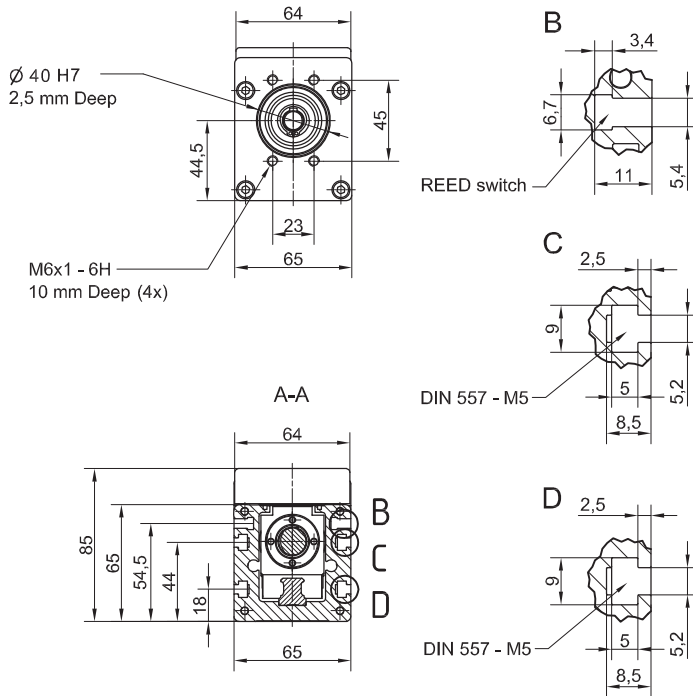
$L_{\text{total}} = L + 48 \text{ mm}$

$L_v = 220 \text{ mm}$

Left side (L)



Right side (R)



**i** All dimensions in mm.  
Drawings scales are not equal.

### Mounting the drive

- by the **MOTOR SIDE DRIVE - MSD**
- by the **MOTOR ADAPTER WITH COUPLING**

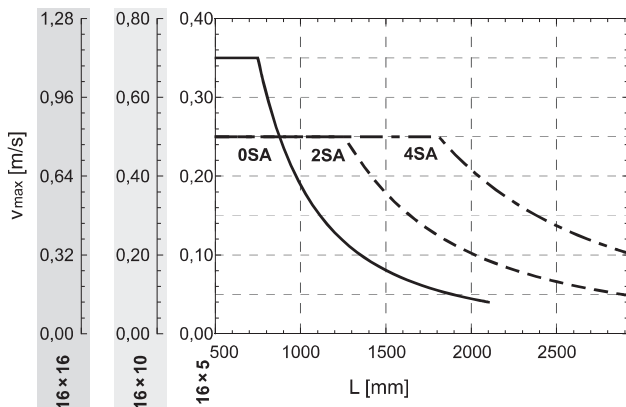
**i** More info about MSD please refer to page 6.065.0

**i** Available on request.

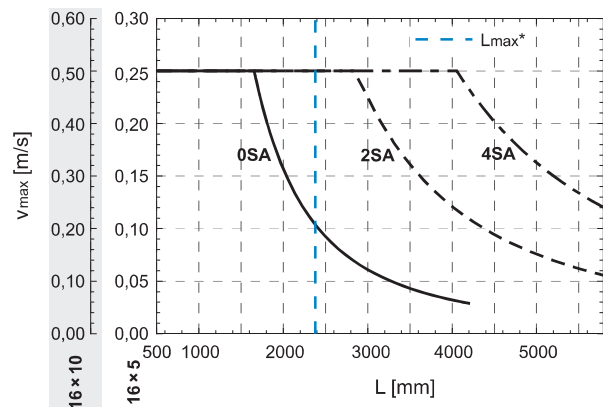


### Maximum travel speed as a function of the profile length ( $v_{max} - L$ curves)

#### Standard version



#### 2LR version



\* Maximum length  $L_{max}$  of MTV 65 2LR linear unit with 16x10 ball screw

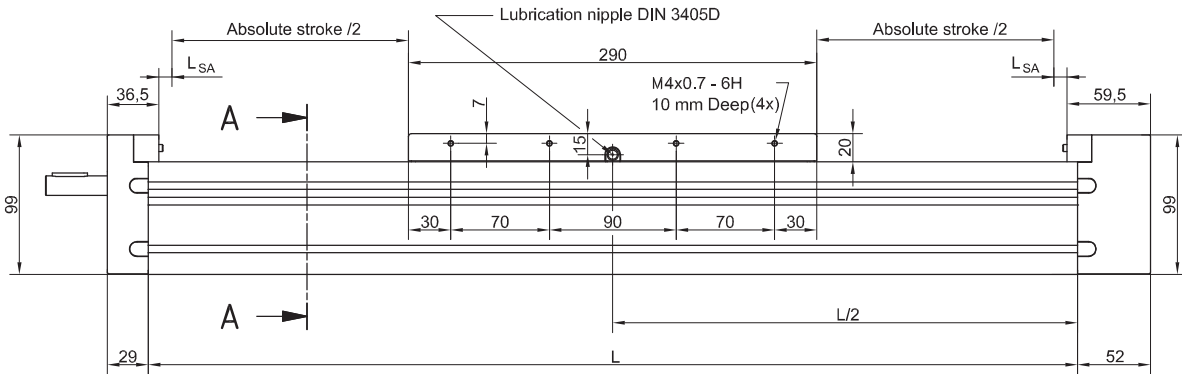


## DIMENSIONS

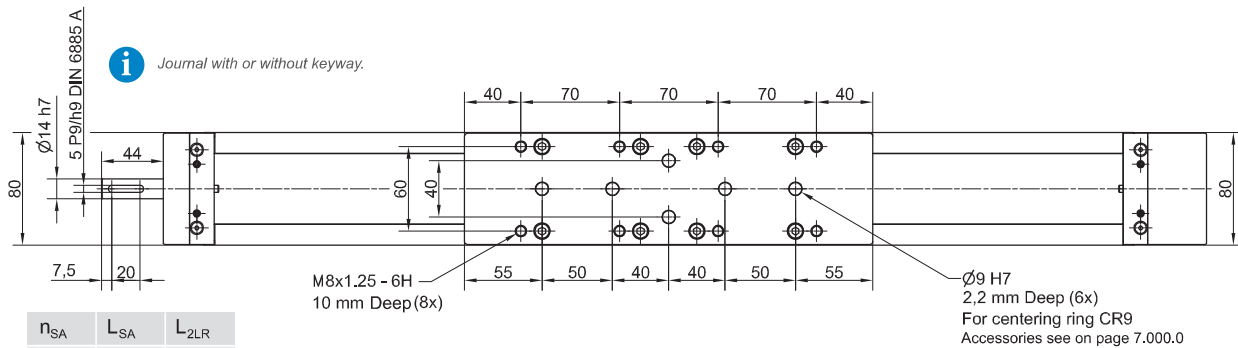


Linear Unit doesn't include any safety

Absolute stroke = Effective stroke + 2 x Safety stroke stroke.



Journal with or without keyway.

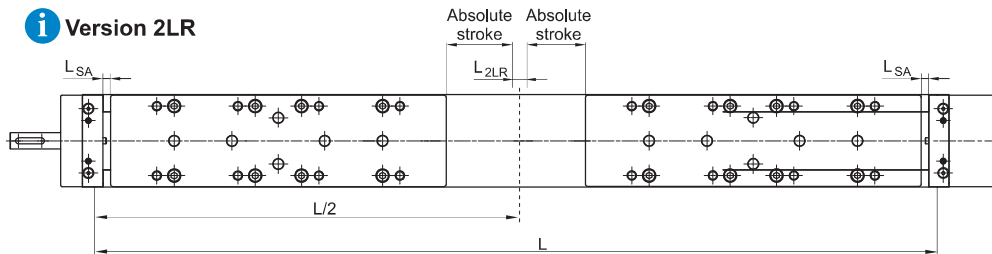


n <sub>SA</sub>	L <sub>SA</sub>	L <sub>2LR</sub>
0	6,0	0,0
2SA	28,5	48,0
4SA	59,5	110,0
6SA	90,5	172,0
8SA	121,5	234,0
10SA	152,5	296,0

L<sub>SA</sub> Additional length [ mm ]

L<sub>2LR</sub> Min. distance between carriages [ mm ]

### Version 2LR



All dimensions in mm;  
Drawings scales are not equal.

## Defining of the linear unit length

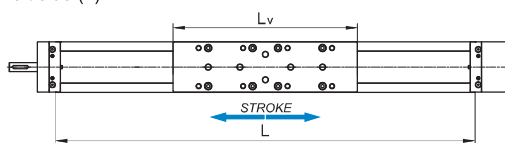
### Standard version

$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 2 \times L_{SA} + 15 \text{ mm}$

$L_{\text{total}} = L + 81 \text{ mm}$

$L_v = 290 \text{ mm}$

Left side (L)



Right side (R)

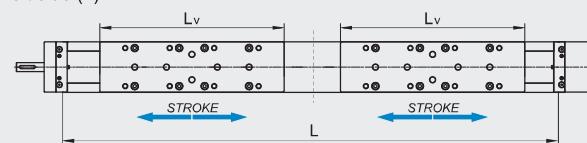
### Version 2LR

$L = 2 \times (\text{Effective stroke} + 2 \times \text{Safety stroke}) + 2 \times L_v + 2 \times L_{SA} + L_{2LR} + 15 \text{ mm}$

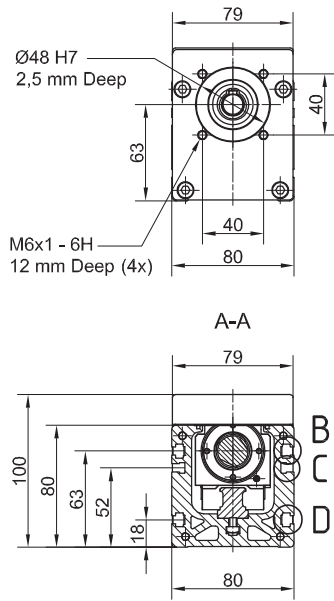
$L_{\text{total}} = L + 81 \text{ mm}$

$L_v = 290 \text{ mm}$

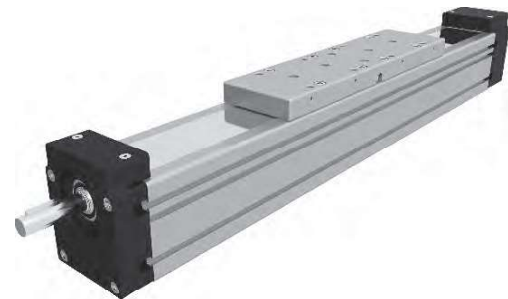
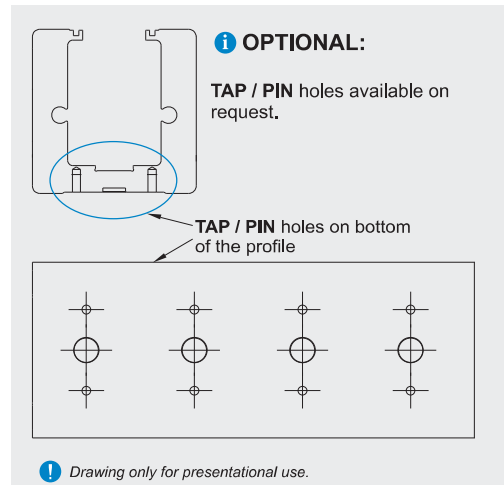
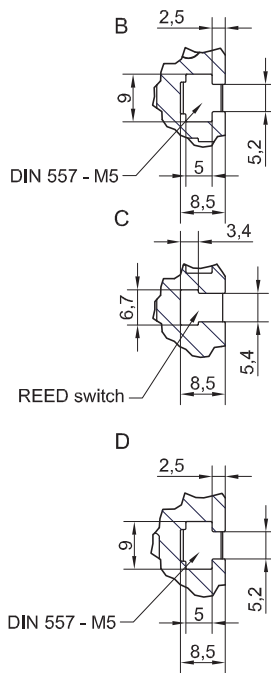
Left side (L)



Right side (R)



**i** All dimensions in mm.  
Drawings scales are not equal.



### Mounting the drive

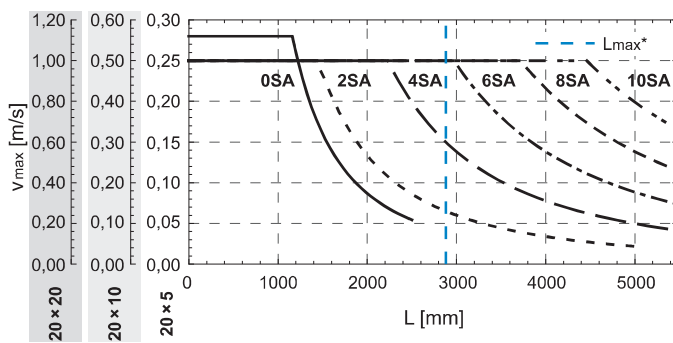
- by the **MOTOR SIDE DRIVE - MSD**
- by the **MOTOR ADAPTER WITH COUPLING**

**i** More info about MSD please refer to page 6.065.0

**i** Available on request.

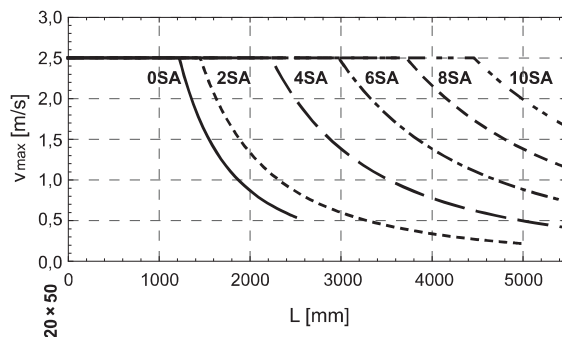
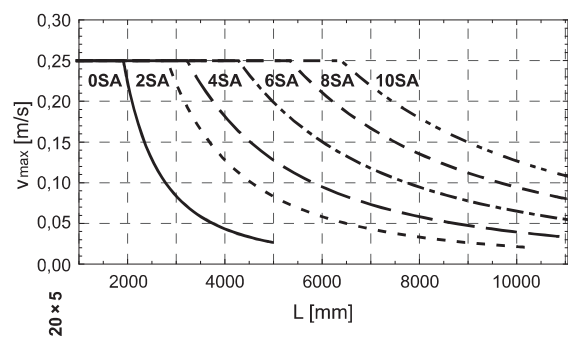
### Maximum travel speed as a function of the profile length ( $v_{max}$ - L curves)

#### Standard version



\* Maximum length  $L_{max}$  of MTV 80 linear unit with 20x10 ball screw

#### 2LR version

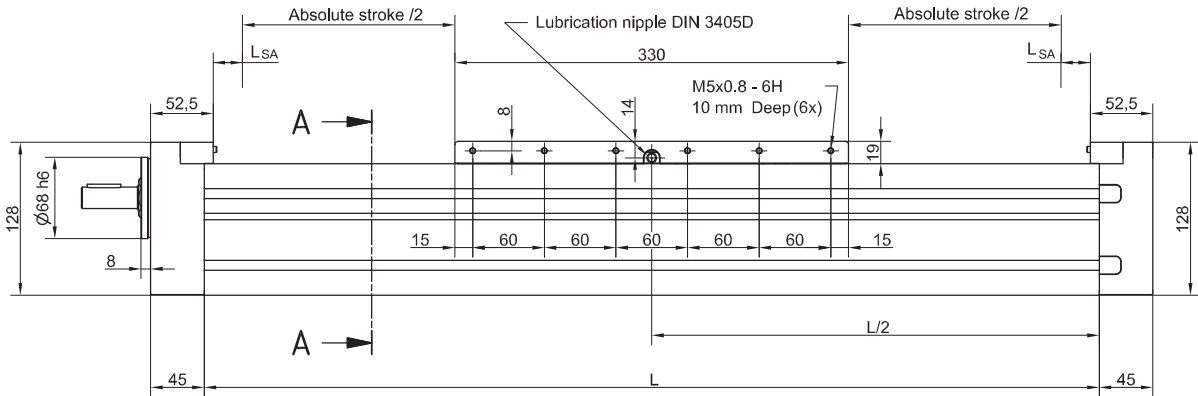


## DIMENSIONS

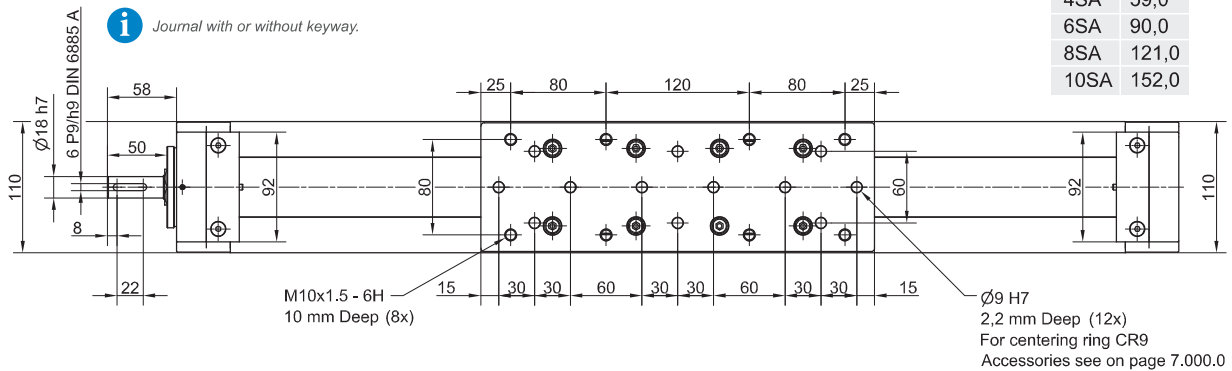
**i** Linear Unit doesn't include any safety

Absolute stroke = Effective stroke + 2 x Safety stroke stroke.

**L<sub>SA</sub>** Additional length [ mm ]



n <sub>SA</sub>	L <sub>SA</sub>
0	24,5
2SA	28,0
4SA	59,0
6SA	90,0
8SA	121,0
10SA	152,0



**i** All dimensions in mm;  
Drawings scales are not equal.

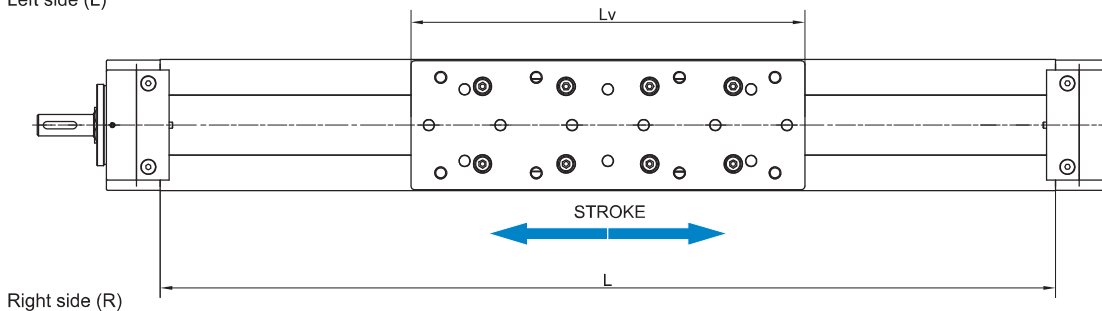
## Defining of the linear unit length

$$L = \text{Effective stroke} + 2 \times \text{Safety stroke} + L_v + 2 \times L_{SA} + 15 \text{ mm}$$

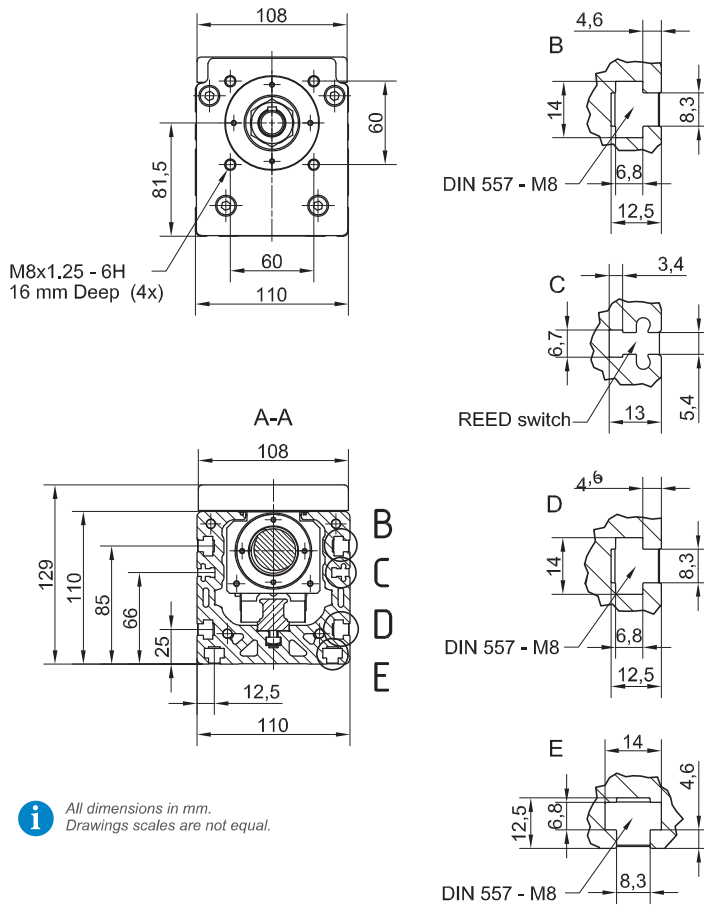
$$L_v = 330 \text{ mm}$$

$$L_{\text{total}} = L + 90 \text{ mm}$$

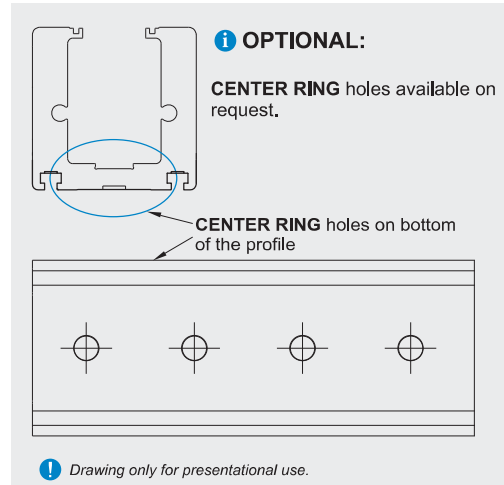
Left side (L)



Right side (R)



**i** All dimensions in mm.  
Drawings scales are not equal.



### Mounting the drive

- by the **MOTOR SIDE DRIVE - MSD**
- by the **MOTOR ADAPTER WITH COUPLING**

**i** More info about MSD please refer to page 6.065.0

**i** Available on request.

### Maximum travel speed as a function of the profile length ( $v_{max}$ - L curves)

