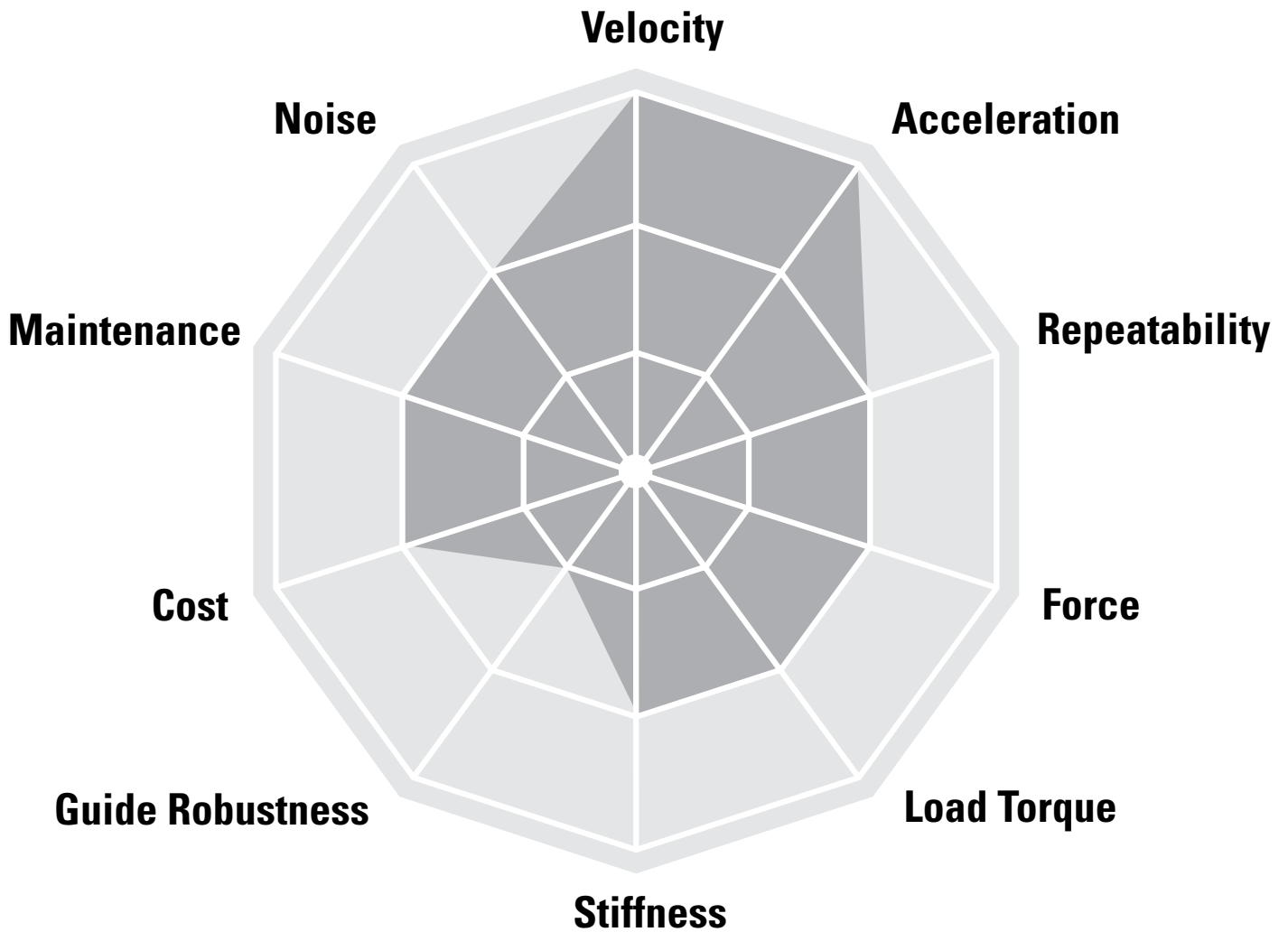


Linear Units with Belt Drive and Wheel Guide

SpeedLine, ForceLine



Typical Applications

Typical applications are where low to medium loads need to be moved at high speed and acceleration. Typical examples are in packaging, cutting, pick and place and materials handling applications where the cycle times are critical.

Linear Units with Belt Drive and Wheel Guide

Overview

SpeedLine WH



Features

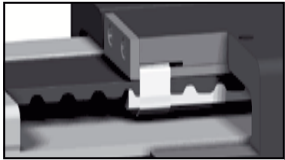
- Can be installed in all directions
- Speed up to 11 m/s
- Acceleration up to 40 m/s²
- Stroke up to 11 m

Parameter		WH50	WH80	WH120
Profile size (width × height)	[mm]	50 × 50	80 × 80	120 × 110
Stroke length (S max), maximum	[mm]	3000	11000	11000
Linear speed, maximum	[m/s]	6,5	10,0	10,0
Dynamic carriage load (Fz), maximum	[N]	730	2100	9300
Remarks		external wheel guides no cover band	external wheel guides no cover band	external wheel guides no cover band
Page		92	94	96

WH-Series Technical Presentation

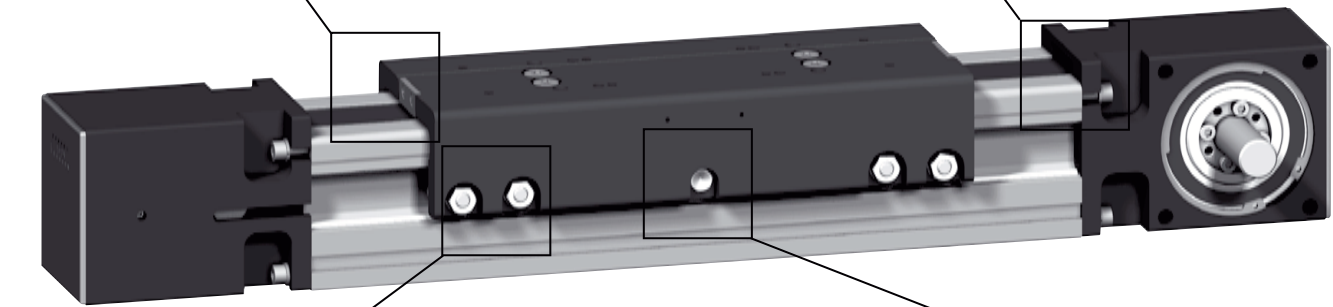
Belt tensioning

The belt can easily be replaced or re-tensioned from the outside of the unit without the load being removed from the carriage.



Belt drive

The steel reinforced belt is wear resistant, highly efficient and very accurate even at high speeds and loads.



Wheel guides

The H-type arrangement of the guides allows fast moves and high forces and moments.



Central lubrication

The guides are lubricated from a central point that are easy and fast to access.

Linear Units with Belt Drive and Wheel Guide

Overview

Forceline MLSH



Features

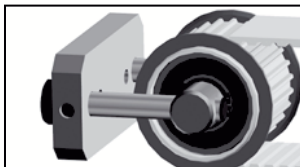
- Can be installed in all directions
- Patented plastic cover band
- Speed up to 10 m/s
- Low profile height

Parameter		MLSH60Z	MLSH80Z
Profile size (width × height)	[mm]	160 × 65	240 × 85
Stroke length (S max), maximum	[mm]	5500	5900
Linear speed, maximum	[m/s]	10,0	10,0
Dynamic carriage load (Fz), maximum	[N]	3000	5000
Remarks		internal wheel guides	internal wheel guides
Page		98	100

MLSH-Series Technical Presentation

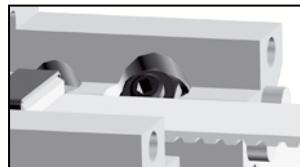
Belt tensioning

The belt can easily be re-tensioned from the outside of the unit without the load being removed from the carriage.



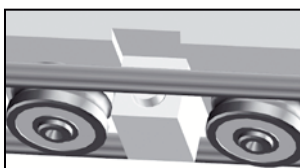
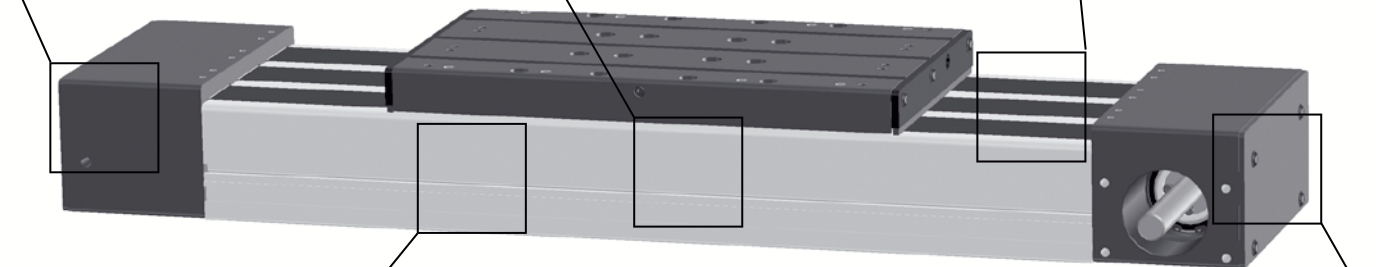
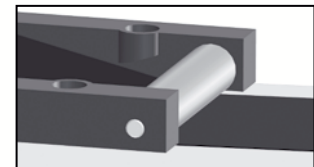
Belt drive

The highly dynamic and accurate belt is protected by the cover band ensuring long and trouble free operation.



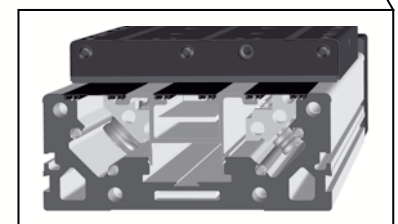
Cover band

The patented self-adjusting cover band protect the interior of the unit from the penetration of dirt, dust and liquids.



Wheel guides

The robust wheel guides runs inside of the profile providing superior motion dynamics.



Unique profile

The unique design of the profile guarantees the highest performance and protection of the guides and belt.

WH50

Belt Drive, Wheel Guide

- » Ordering key - see page 193
- » Accessories - see page 125
- » Additional data - see page 173

General Specifications

Parameter	WH50
Profile size (w × h) [mm]	50 × 50
Type of belt	16ATL5
Carriage sealing system	none
Adjustable belt tensioning	the belt can be retensioned by the customer if necessary
Lubrication	lubrication of guiding surfaces
Included accessories	4 × mounting clamps

Performance Specifications

Parameter		WH50
Stroke length (S max), maximum	[mm]	3000
Linear speed, maximum	[m/s]	6,5
Acceleration, maximum	[m/s ²]	40
Repeatability	[± mm]	0,05
Input speed, maximum	[rpm]	3250
Operation temperature limits	[°C]	0 – 80
Dynamic load (F _x), maximum	[N]	670 ³
Dynamic load (F _y), maximum	[N]	415 ¹ / 2820 ²
Dynamic load (F _z), maximum	[N]	730 ¹ / 5080 ²
Dynamic load torque (M _x), maximum	[Nm]	16 ¹ / 99 ²
Dynamic load torque (M _y), maximum	[Nm]	87 ¹ / 500 ²
Dynamic load torque (M _z), maximum	[Nm]	50 ¹ / 280 ²
Drive shaft force (F _{rd}), maximum	[N]	150
Drive shaft torque (M _{ta}), maximum	[Nm]	17
Pulley diameter	[mm]	38,2
Stroke per shaft revolution	[mm]	120
Weight of unit with zero stroke	[kg]	3,50
of every 100 mm of stroke		0,44
of each carriage		0,90

¹ Value for the complete unit

² Value for the wheel guide only

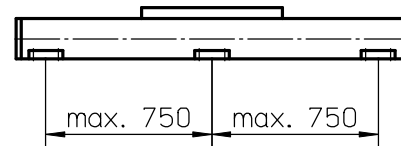
³ See diagram Force F_x

Carriage Idle Torque, (M_{idle}) [Nm]

Input speed [rpm]	Idle torque [Nm]
150	1,7
1500	2,4
3250	3,8

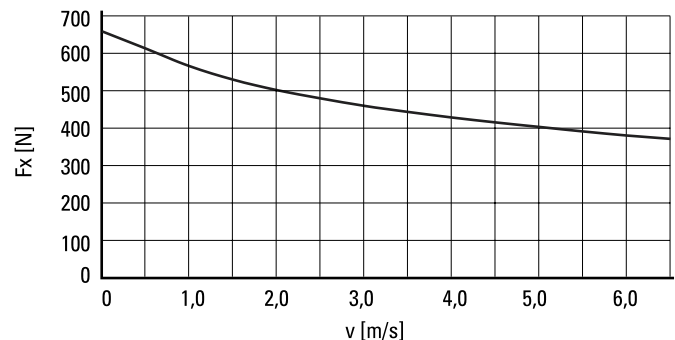
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

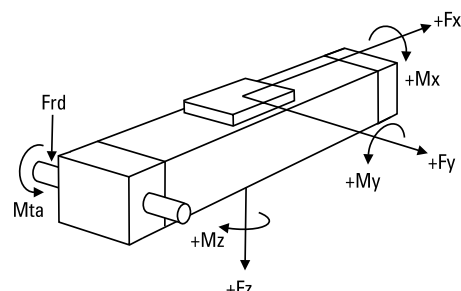


A mounting clamp must be installed at least at every 750 mm to be able to operate the maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Force F_x as a Function of the Speed

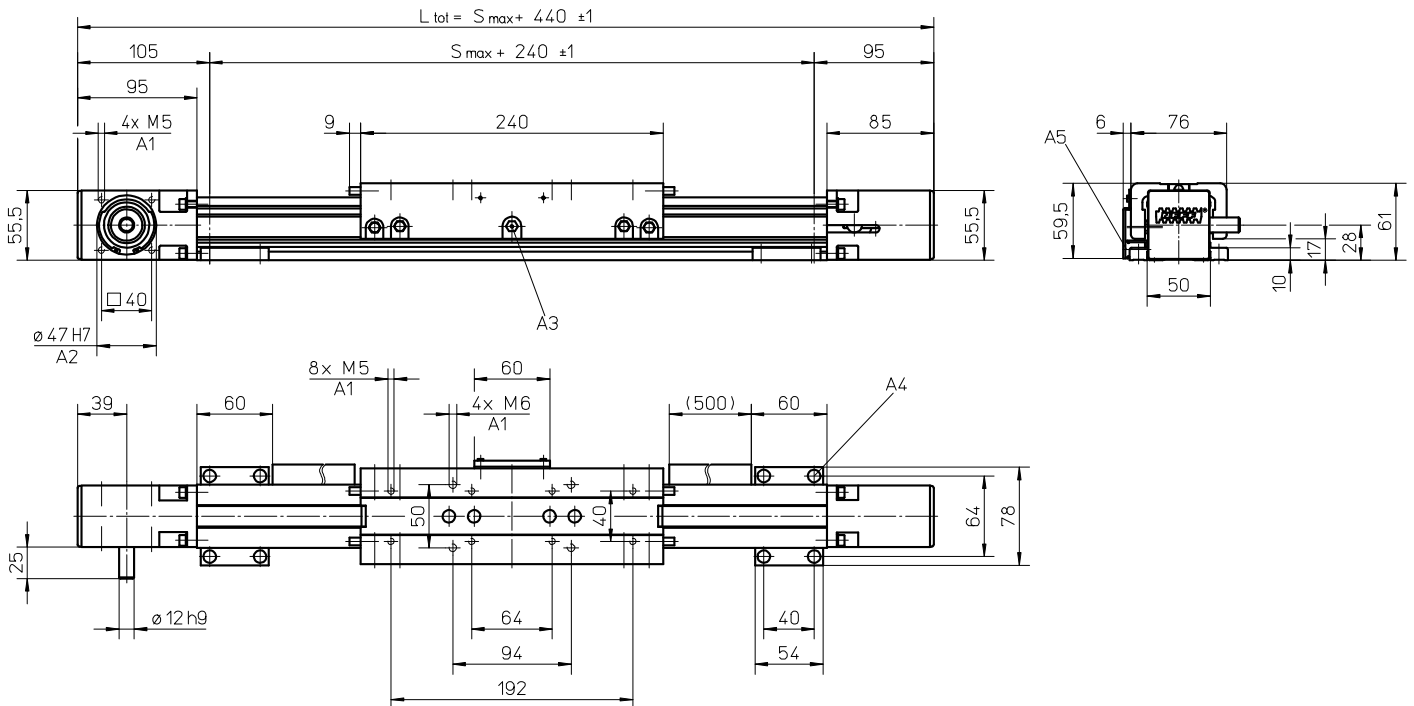


Definition of Forces



WH50

Belt Drive, Wheel Guide

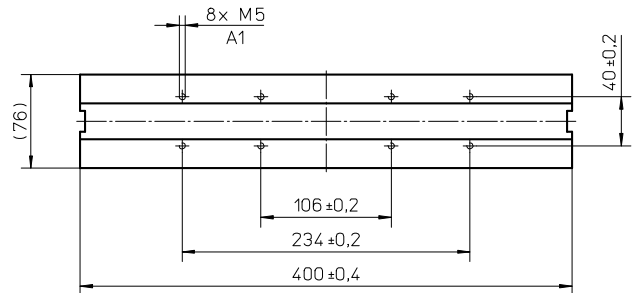


A1: depth 10
 A2: depth 3
 A3: funnel type lubricating nipple DIN3405-M6x1-D1

A4: socket cap screw ISO4762-M5x12 8.8
 A5: ENF inductive sensor rail option kit (optional)

Long Carriage

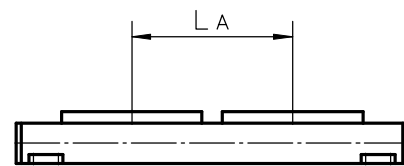
Parameter		WH50
Carriage length	[mm]	400
Dynamic load torque (My), maximum	[Nm]	130
Dynamic load torque (Mz), maximum	[Nm]	75
Weight	[kg]	1,47



A1: depth 10

Double Carriages

Parameter		WH50
Minimum distance between carriages (L _A)	[mm]	260
Dynamic load (F _y), maximum	[N]	830
Dynamic load (F _z), maximum	[N]	1460
Dynamic load torque (My), maximum	[Nm]	L _A ¹ × 0,415
Dynamic load torque (Mz), maximum	[Nm]	L _A ¹ × 0,73
Force required to move second carriage	[N]	16
Total length (L _{tot})	[mm]	S _{max} + 440 + L _A



¹ Value in mm

WH80

Belt Drive, Wheel Guide

- » Ordering key - see page 193
- » Accessories - see page 125
- » Additional data - see page 173

General Specifications

Parameter	WH80
Profile size (w × h) [mm]	80 × 80
Type of belt	32ATL10
Carriage sealing system	none
Adjustable belt tensioning	the belt can be retensioned by the customer if necessary
Lubrication	lubrication of guiding surfaces
Included accessories	4 × mounting clamps

Performance Specifications

Parameter		WH80
Stroke length (S max), maximum	[mm]	11000
Linear speed, maximum	[m/s]	10,0
Acceleration, maximum	[m/s ²]	40
Repeatability	[± mm]	0,05
Input speed, maximum	[rpm]	3000
Operation temperature limits	[°C]	0 – 80
Dynamic load (Fx), maximum	[N]	2700 ³
Dynamic load (Fy), maximum	[N]	882 ¹ / 8150 ²
Dynamic load (Fz), maximum	[N]	2100 ¹ / 14680 ²
Dynamic load torque (Mx), maximum	[Nm]	75 ¹ / 480 ²
Dynamic load torque (My), maximum	[Nm]	230 ¹ / 1610 ²
Dynamic load torque (Mz), maximum	[Nm]	100 ¹ / 900 ²
Drive shaft force (Frd), maximum	[N]	500
Drive shaft torque (Mta), maximum	[Nm]	100
Pulley diameter	[mm]	63,66
Stroke per shaft revolution	[mm]	200
Weight of unit with zero stroke	[kg]	8,63
of every 100 mm of stroke		0,93
of each carriage		2,75

¹ Value for the complete unit

² Value for the wheel guide only

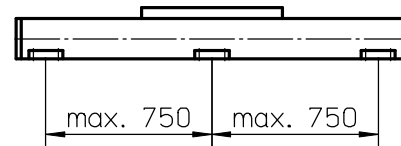
³ See diagram Force Fx

Carriage Idle Torque, (M idle) [Nm]

Input speed [rpm]	Idle torque [Nm]
150	2,4
1500	3,5
3000	5,0

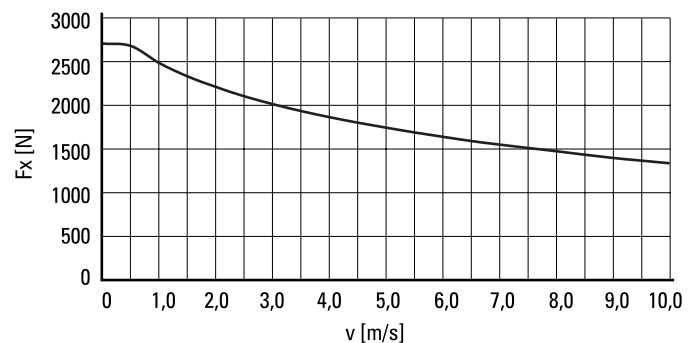
M idle = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

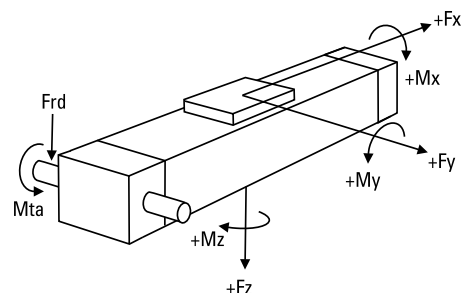


A mounting clamp must be installed at least at every 750 mm to be able to operate the maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information. Units with a profile length over 6300 mm consists of two profiles where the joint between the two profiles must be adequately supported on both sides.

Force Fx as a Function of the Speed



Definition of Forces



WH120

Belt Drive, Wheel Guide

» Ordering key - see page 193
» Accessories - see page 125
» Additional data - see page 173

General Specifications

Parameter	WH120
Profile size (w × h) [mm]	120 × 110
Type of belt	50ATL10
Carriage sealing system	none
Adjustable belt tensioning	the belt can be retensioned by the customer if necessary
Lubrication	lubrication of guiding surfaces
Included accessories	4 × mounting clamps

Performance Specifications

Parameter		WH120
Stroke length (S max), maximum	[mm]	11000
Linear speed, maximum	[m/s]	10,0
Acceleration, maximum	[m/s ²]	40
Repeatability	[± mm]	0,05
Input speed, maximum	[rpm]	2308
Operation temperature limits	[°C]	0 – 80
Dynamic load (Fx), maximum	[N]	5000 ³
Dynamic load (Fy), maximum	[N]	4980 ¹ / 40500 ²
Dynamic load (Fz), maximum	[N]	9300 ¹ / 64800 ²
Dynamic load torque (Mx), maximum	[Nm]	500 ¹ / 3140 ²
Dynamic load torque (My), maximum	[Nm]	930 ¹ / 5830 ²
Dynamic load torque (Mz), maximum	[Nm]	500 ¹ / 3640 ²
Drive shaft force (Frd), maximum	[N]	700
Drive shaft torque (Mta), maximum	[Nm]	200
Pulley diameter	[mm]	82,76
Stroke per shaft revolution	[mm]	260
Weight of unit with zero stroke	[kg]	17,00
of every 100 mm of stroke		1,64
of each carriage		5,50

¹ Value for the complete unit

² Value for the wheel guide only

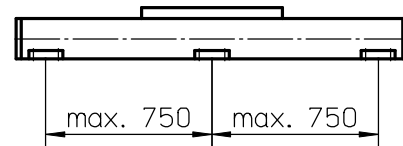
³ See diagram Force Fx

Carriage Idle Torque, (M idle) [Nm]

Input speed [rpm]	Idle torque [Nm]
150	4,8
1500	7,0
2308	10,0

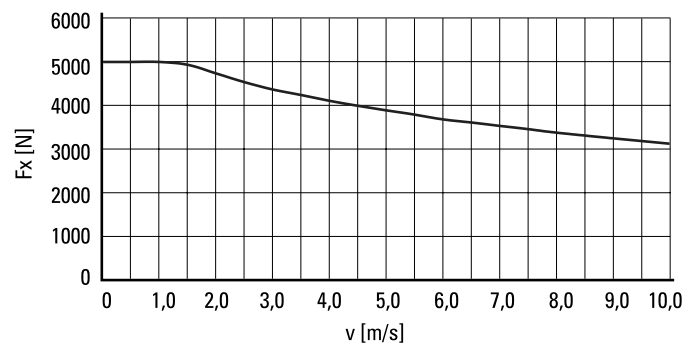
M idle = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

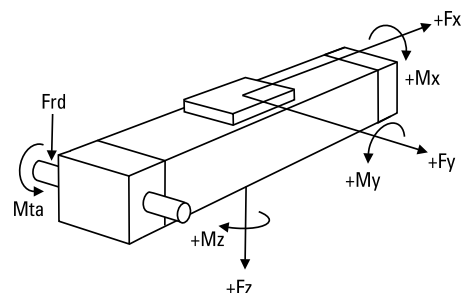


A mounting clamp must be installed at least at every 750 mm to be able to operate the maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information. Units with a profile length over 4900 mm consists of two profiles where the joint between the two profiles must be adequately supported on both sides.

Force Fx as a Function of the Speed

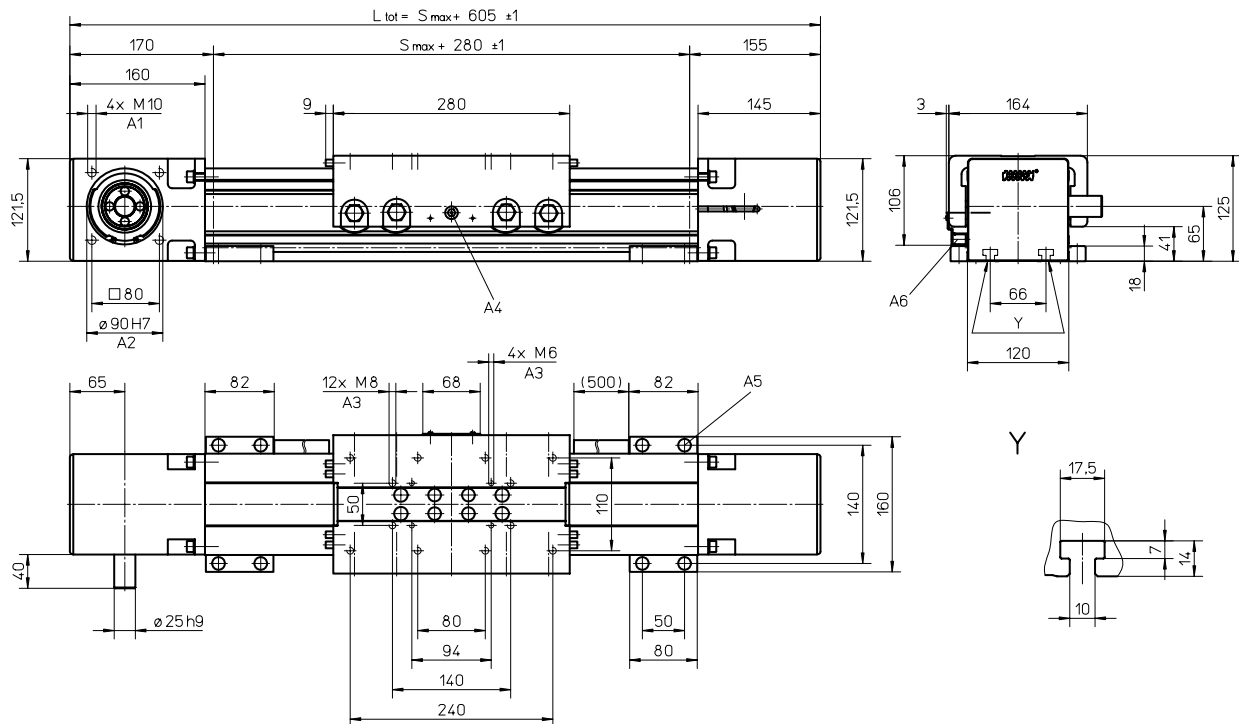


Definition of Forces



WH120

Belt Drive, Wheel Guide

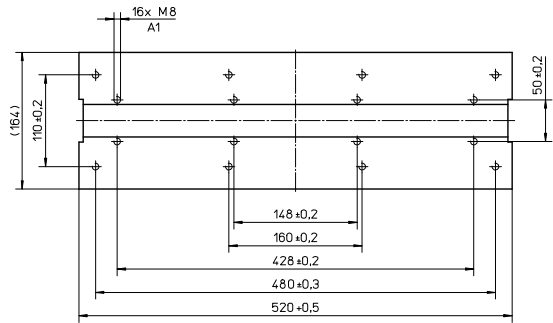


A1: depth 20
 A2: depth 7
 A3: depth 12

A4: funnel type lubricating nipple DIN3405-M6x1-D1
 A5: socket cap screw ISO4762-M8x20 8.8
 A6: ENF inductive sensor rail option kit (optional)

Long Carriage

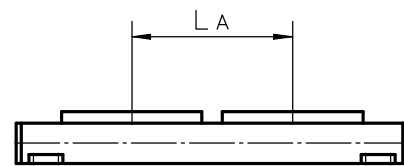
Parameter		WH120
Carriage length	[mm]	520
Dynamic load torque (M_y), maximum	[Nm]	1395
Dynamic load torque (M_z), maximum	[Nm]	750
Weight	[kg]	8,67



A1: depth 12

Double Carriages

Parameter		WH120
Minimum distance between carriages (L_A)	[mm]	300
Dynamic load (F_y), maximum	[N]	9960
Dynamic load (F_z), maximum	[N]	18600
Dynamic load torque (M_y), maximum	[Nm]	$L A^1 \times 4,98$
Dynamic load torque (M_z), maximum	[Nm]	$L A^1 \times 9,3$
Force required to move second carriage	[N]	30
Total length (L_{tot})	[mm]	$S_{max} + 605 + L A$



¹ Value in mm

MLSH60Z

Belt Drive, Wheel Guide

- » Ordering key - see page 194
- » Accessories - see page 125
- » Additional data - see page 173

General Specifications

Parameter	MLSH60Z
Profile size (w × h) [mm]	160 × 65
Type of belt	32ATL5
Carriage sealing system	plastic cover band
Adjustable belt tensioning	the belt can be retensioned by the customer if necessary
Lubrication	no lubrication required
Included accessories	4 × mounting clamps

Performance Specifications

Parameter		MLSH60Z
Stroke length (S max), maximum	[mm]	5500
Linear speed, maximum	[m/s]	6,5
Acceleration, maximum	[m/s ²]	40
Repeatability	[± mm]	0,05
Input speed, maximum	[rpm]	3000
Operation temperature limits	[°C]	0 – 80
Dynamic load (F _x), maximum	[N]	1480 ³
Dynamic load (F _y), maximum	[N]	3000 ¹ / 24760 ²
Dynamic load (F _z), maximum	[N]	3000 ¹ / 24760 ²
Dynamic load torque (M _x), maximum	[Nm]	165 ¹ / 1920 ²
Dynamic load torque (M _y), maximum	[Nm]	310 ¹ / 2600 ²
Dynamic load torque (M _z), maximum	[Nm]	310 ¹ / 2600 ²
Drive shaft force (F _{rd}), maximum	[N]	200
Drive shaft torque (M _{ta}), maximum	[Nm]	45
Pulley diameter	[mm]	42,97
Stroke per shaft revolution	[mm]	135
Weight	[kg]	
of unit with zero stroke		12,60
of every 100 mm of stroke		1,33
of each carriage		3,90

¹ Value for the complete unit

² Value for the wheel guide only

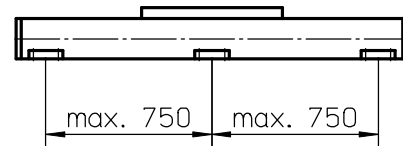
³ See diagram Force F_x

Carriage Idle Torque, (M_{idle}) [Nm]

Input speed [rpm]	Idle torque [Nm]
150	4,6
1500	9,0
3000	12,0

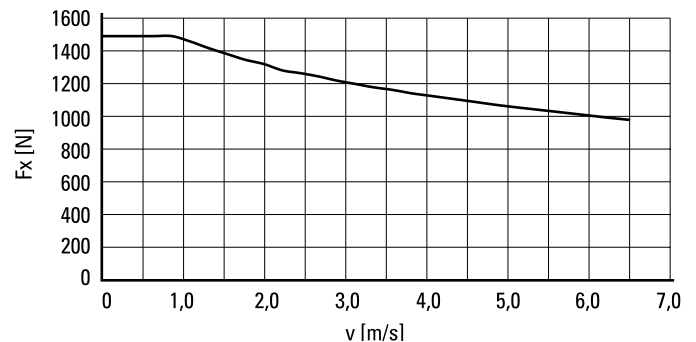
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

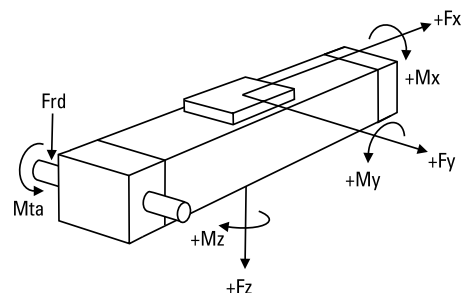


A mounting clamp must be installed at least at every 750 mm to be able to operate the maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Force F_x as a Function of the Speed

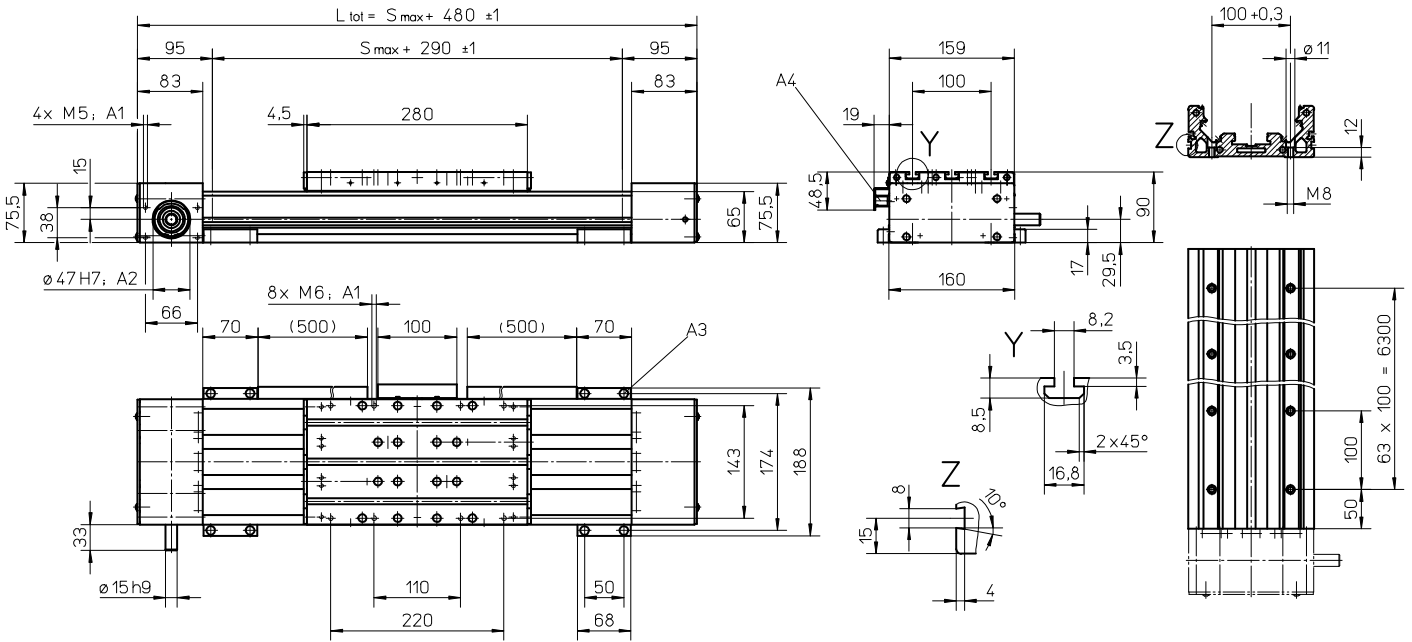


Definition of Forces



MLSH60Z

Belt Drive, Wheel Guide

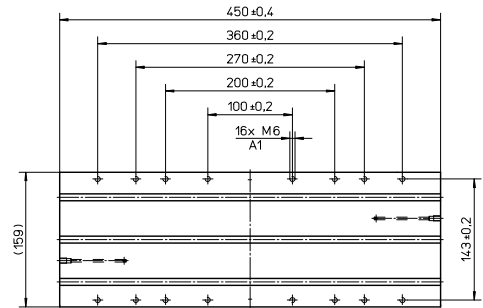


A1: depth 10
A2: depth 4

A3: socket cap screw ISO4762-M6x20 8.8
A4: ENF inductive sensor rail option kit (optional)

Long Carriage

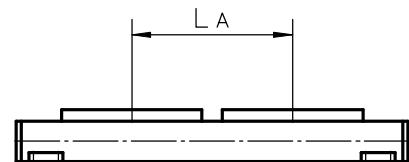
Parameter		MLSH60Z
Carriage length	[mm]	450
Dynamic load torque (M_y), maximum	[Nm]	585
Dynamic load torque (M_z), maximum	[Nm]	585
Weight	[kg]	6



A1: depth 10

Double Carriages

Parameter		MLSH60Z
Minimum distance between carriages (L_A)	[mm]	290
Dynamic load (F_y), maximum	[N]	6000
Dynamic load (F_z), maximum	[N]	6000
Dynamic load torque (M_y), maximum	[Nm]	$L A^1 \times 3$
Dynamic load torque (M_z), maximum	[Nm]	$L A^1 \times 3$
Force required to move second carriage	[N]	10
Total length (L_{tot})	[mm]	$S_{max} + 480 + L A$



¹ Value in mm

MLSH80Z

Belt Drive, Wheel Guide

- » Ordering key - see page 194
- » Accessories - see page 125
- » Additional data - see page 173

General Specifications

Parameter	MLSH80Z
Profile size (w × h) [mm]	240 × 85
Type of belt	75ATL10
Carriage sealing system	plastic cover band
Adjustable belt tensioning	the belt can be retensioned by the customer if necessary
Lubrication	no lubrication required
Included accessories	4 × mounting clamps

Performance Specifications

Parameter		MLSH80Z
Stroke length (S max), maximum	[mm]	5900
Linear speed, maximum	[m/s]	10,0
Acceleration, maximum	[m/s ²]	40
Repeatability	[± mm]	0,05
Input speed, maximum	[rpm]	3000
Operation temperature limits	[°C]	0 – 80
Dynamic load (Fx), maximum	[N]	5000 ³
Dynamic load (Fy), maximum	[N]	5000 ¹ / 55090 ²
Dynamic load (Fz), maximum	[N]	5000 ¹ / 55090 ²
Dynamic load torque (Mx), maximum	[Nm]	350 ¹ / 2890 ²
Dynamic load torque (My), maximum	[Nm]	450 ¹ / 4490 ²
Dynamic load torque (Mz), maximum	[Nm]	450 ¹ / 4490 ²
Drive shaft force (Frd), maximum	[N]	700
Drive shaft torque (Mta), maximum	[Nm]	150
Pulley diameter	[mm]	63,66
Stroke per shaft revolution	[mm]	200
Weight of unit with zero stroke of every 100 mm of stroke of each carriage	[kg]	30,7 2,4 10,0

¹ Value for the complete unit

² Value for the wheel guide only

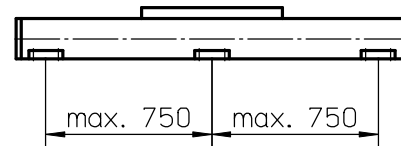
³ See diagram Force Fx

Carriage Idle Torque, (M idle) [Nm]

Input speed [rpm]	Idle torque [Nm]
150	8,5
1500	12,5
3000	15,5

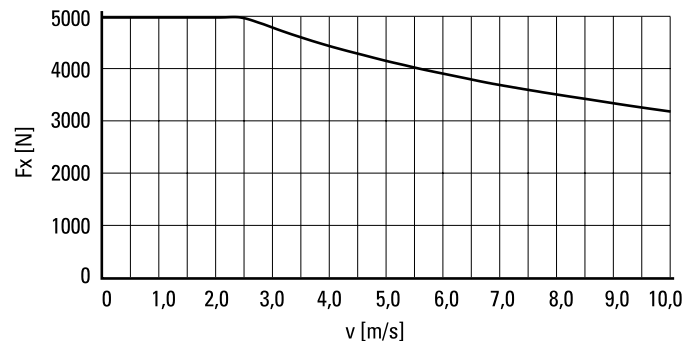
M idle = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

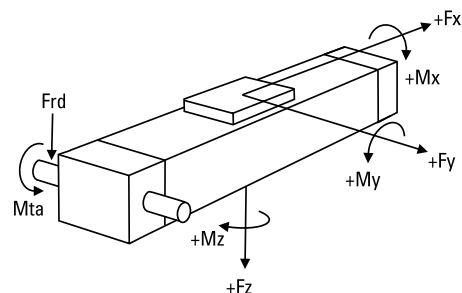


A mounting clamp must be installed at least at every 750 mm to be able to operate the maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Force Fx as a Function of the Speed

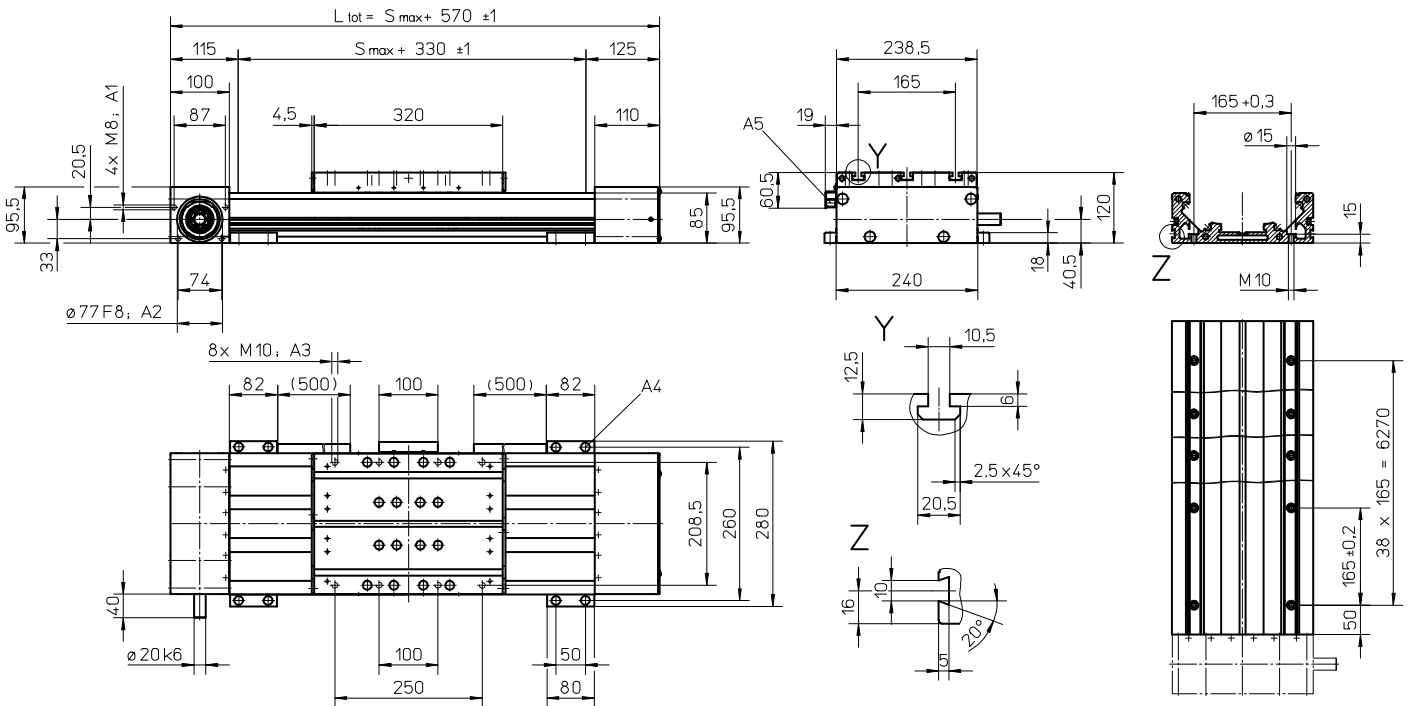


Definition of Forces



MLSH80Z

Belt Drive, Wheel Guide

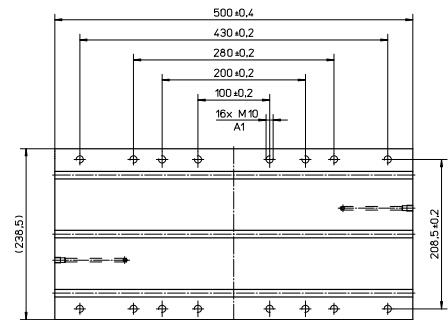


A1: depth 18
A2: depth 4
A3: depth 15

A4: socket cap screw ISO4762-M8x20 8.8
A5: ENF inductive sensor rail option kit (optional)

Long Carriage

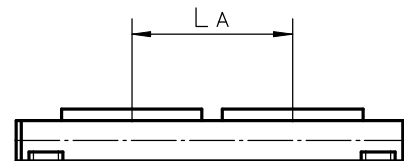
Parameter		MLSH80Z
Carriage length	[mm]	500
Dynamic load torque (My), maximum	[Nm]	700
Dynamic load torque (Mz), maximum	[Nm]	700
Weight	[kg]	14,1



A1: depth 15

Double Carriages

Parameter		MLSH80Z
Minimum distance between carriages (LA)	[mm]	340
Dynamic load (Fy), maximum	[N]	10000
Dynamic load (Fz), maximum	[N]	10000
Dynamic load torque (My), maximum	[Nm]	$L A^1 \times 5$
Dynamic load torque (Mz), maximum	[Nm]	$L A^1 \times 5$
Force required to move second carriage	[N]	20
Total length (L tot)	[mm]	$S_{max} + 570 + L A$



¹ Value in mm