

Linear Lifting Units

Overview

SpeedLine WHZ



Features

- Can be installed in any orientation
- Belt drive
- External wheel guides
- Speed up to 10 m/s
- Acceleration up to 40 m/s²

Parameter		WHZ50	WHZ80
Profile size (width × length)	[mm]	50 × 50	80 × 80
Stroke length (Smax), maximum	[mm]	1500	3000
Linear speed, maximum	[m/s]	6,5	10,0
Dynamic load (Fx), maximum	[N]	670	1480
Remarks		The load is always attached to the end of the lifting profile	The load is always attached to the end of the lifting profile
Page		116	118

Linear Lifting Units

Overview

Movo Z



Features

- Telescopic movement
- Ball screw drive
- Internal slide guides
- Load up to 7500 N
- Load torque up to 2000 Nm
- Two end stop limit switches (Z2 only)

Parameter		Z2	Z3
Profile size (width × height)	[mm]	188 × 150	188 × 150
Stroke length (Smax), maximum	[mm]	1500	1500
Linear speed, maximum	[m/s]	1,25	1,25
Dynamic load (Fz), maximum	[N]	7500	7500
Remarks		Can be installed in any direction. The load must be attached at the end of the lifting profile	Can only be installed vertically with motor up. The load must be attached at the end of the lifting profile.
Page		120	122

WHZ50

Belt Drive, Wheel Guide

- » Ordering key - see page 209
- » Accessories - see page 131
- » Additional data - see page 181

General Specifications

Parameter	WHZ50
Profile size (w × h) [mm]	50 × 50
Type of belt	16 ATL 5
Carriage sealing system	none
Adjustable belt tensioning	the belt can be retensioned by the customer if necessary
Lubrication	lubrication of carriage and guide surfaces
Included accessories	-

Performance Specifications

for Units with Single Standard Carriage (N)¹

Parameter		WHZ50
Stroke length (Smax), maximum	[mm]	1500
Total length (L tot), maximum	[mm]	1850
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 (Fx), maximum	[N]	670 ²
Dynamic load (Fy), maximum	[N]	415
Dynamic load (Fz), maximum	[N]	730
Dynamic load torque (Mx), maximum	[Nm]	16
Dynamic load torque (My), maximum	[Nm]	87
Dynamic load torque (Mz), maximum	[Nm]	50
Drive shaft force (Frd), maximum ³	[N]	150
Input/drive shaft torque (Mta), maximum	[Nm]	17
Pulley diameter	[mm]	38,2
Stroke per shaft revolution	[mm]	120
Weight	[kg]	
of unit with zero stroke		4,50
of every 100 mm of stroke		0,42
of each drive station box		2,90

¹ See next page for deviating values of units with other carriage types.

² See diagram Force Fx.

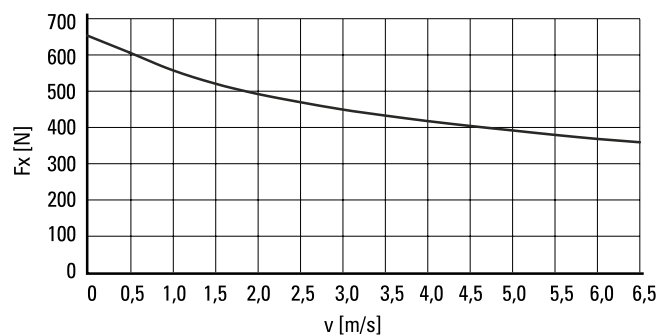
³ Only relevant for units without RediMount flange.

Carriage Idle Torque, (M idle) [Nm]

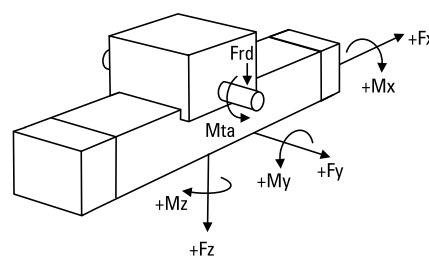
Input speed [rpm]	Idle torque [Nm]
150	1,7
1500	2,4
3250	3,8

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

Force Fx as a Function of the Speed



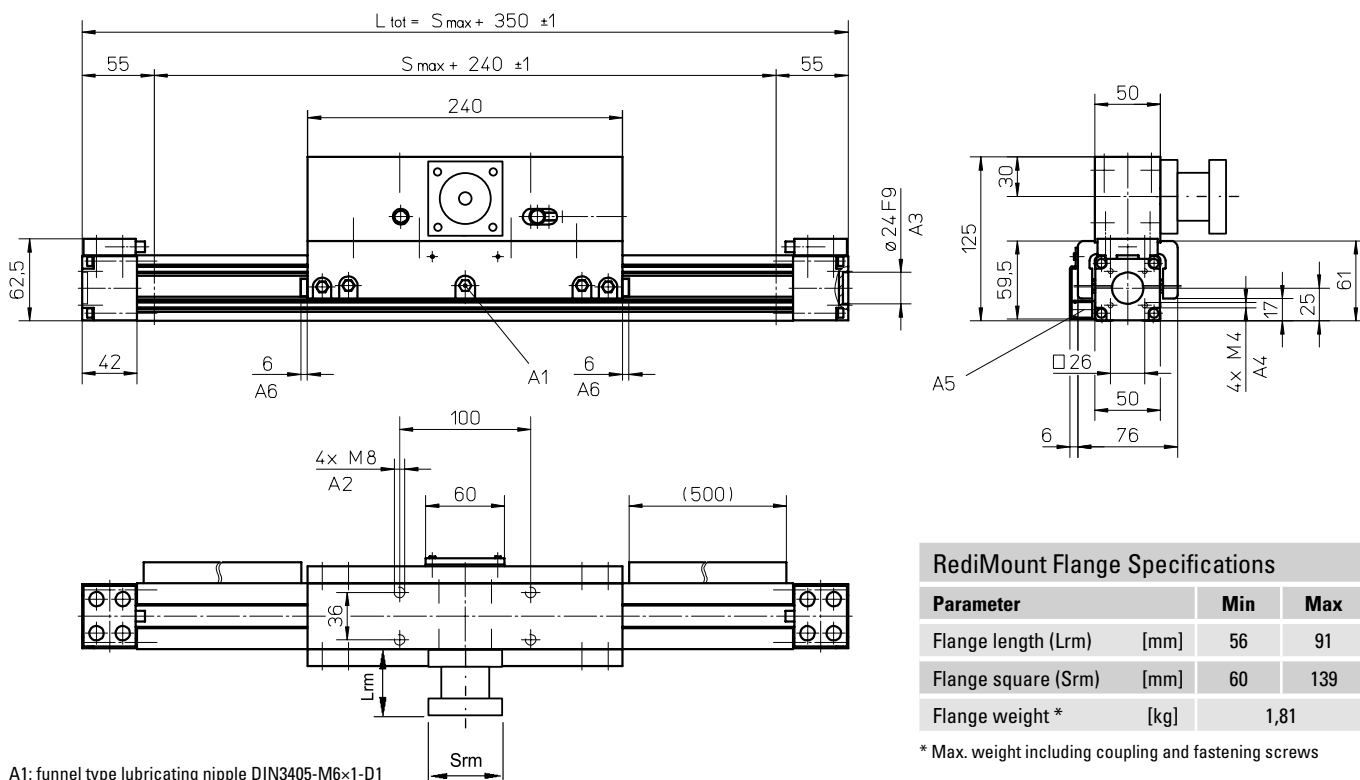
Definition of Forces



WHZ50

Belt Drive, Wheel Guide

Dimensions	Projection	Online Sizing & Selection!
METRIC		www.LinearMotioneering.com

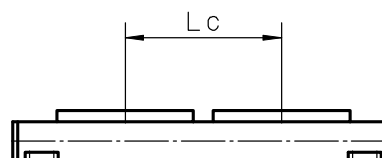
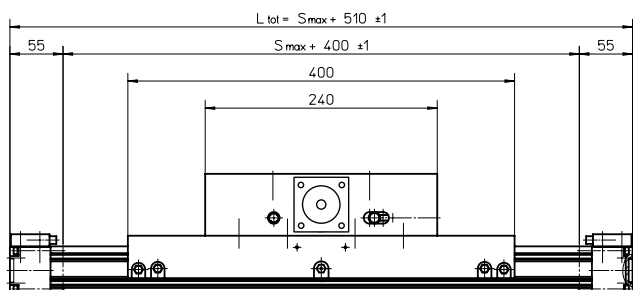


- A1: funnel type lubricating nipple DIN3405-M6×1-D1
- A2: depth 16
- A3: depth 4
- A4: depth 8
- A5: ENF inductive sensor rail kit (optional - see page 166)
- A6: felt pad wipers on both sides of the carriage

Parameter	WHZ50
Stroke length (Smax), maximum [mm]	1500
Total length (L tot), maximum [mm]	2010
Carriage length [mm]	400
Dynamic load torque (My), maximum [Nm]	130
Dynamic load torque (Mz), maximum [Nm]	75
Weight [kg]	3,3

Parameter	WHZ50
Stroke length (Smax), maximum [mm]	1400
Total length (L tot), maximum [mm]	2010
Minimum distance between carriages (Lc) [mm]	260
Dynamic load (Fy), maximum [N]	830
Dynamic load (Fz), maximum [N]	1460
Dynamic load torque (My), maximum [Nm]	Lc ¹ × 0,415
Dynamic load torque (Mz), maximum [Nm]	Lc ¹ × 0,73
Force required to move second carriage [N]	16
Total length (L tot) [mm]	Smax + 350 + Lc

¹ Value in mm



WHZ80

Belt Drive, Wheel Guide

- » Ordering key - see page 209
- » Accessories - see page 131
- » Additional data - see page 181

General Specifications

Parameter	WHZ80
Profile size (w × h) [mm]	80 × 80
Type of belt	32 ATL 5
Carriage sealing system	none
Adjustable belt tensioning	the belt can be retensioned by the customer if necessary
Lubrication	lubrication of carriage and guide surfaces
Included accessories	-

Performance Specifications

for Units with Single Standard Carriage (N)¹

Parameter		WHZ80
Stroke length (Smax), maximum	[mm]	3000
Total length (L tot), maximum	[mm]	3410
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]	1480 ²
Dynamic load (Fy), maximum	[N]	882
Dynamic load (Fz), maximum	[N]	2100
Dynamic load torque (Mx), maximum	[Nm]	75
Dynamic load torque (My), maximum	[Nm]	230
Dynamic load torque (Mz), maximum	[Nm]	100
Drive shaft force (Frd), maximum ³	[N]	500
Input/drive shaft torque (Mta), maximum	[Nm]	50
Pulley diameter	[mm]	63,66
Stroke per shaft revolution	[mm]	200
Weight	[kg]	
of unit with zero stroke		11,20
of every 100 mm of stroke		0,91
of each drive station box		6,65

¹ See next page for deviating values of units with other carriage types.

² See diagram Force Fx.

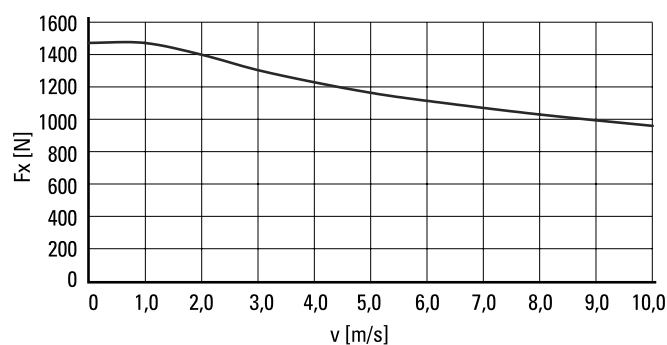
³ Only relevant for units without RediMount flange.

Carriage Idle Torque, (M idle) [Nm]

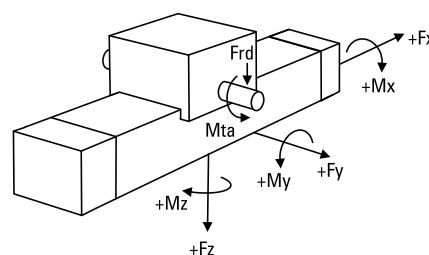
Input speed [rpm]	Idle torque [Nm]
150	2,4
1500	3,5
3000	5,0

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

Force Fx as a Function of the Speed



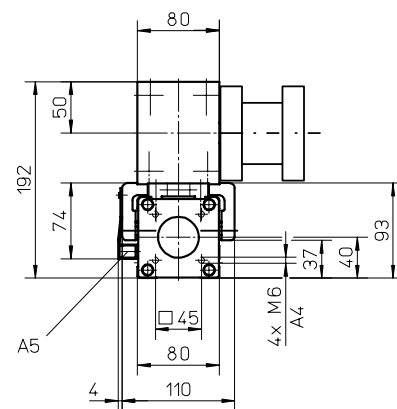
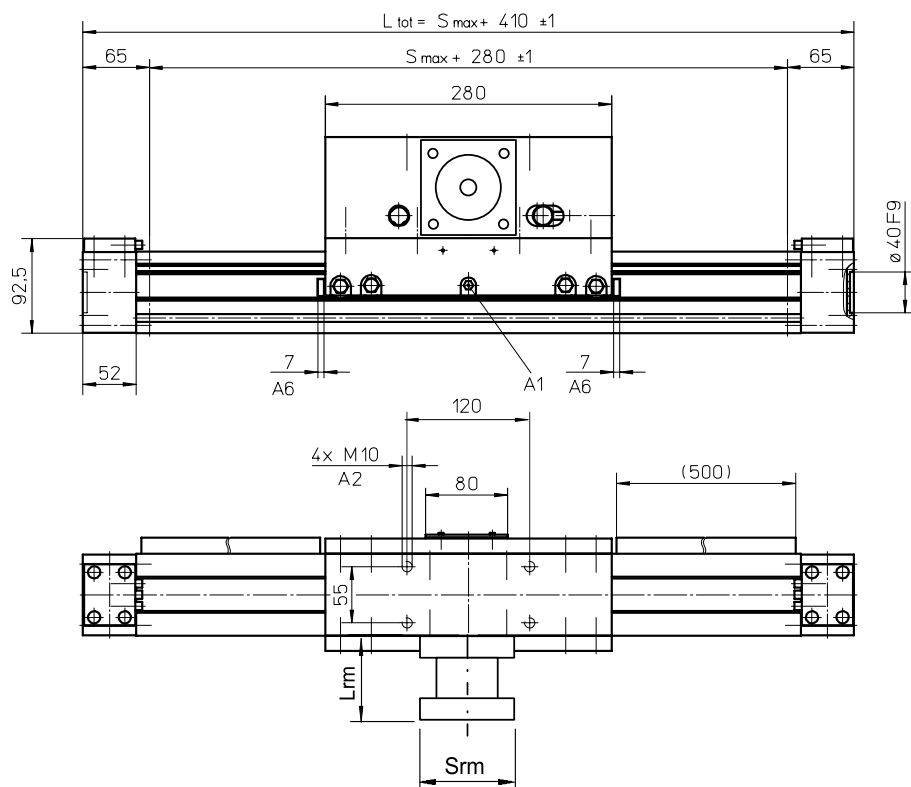
Definition of Forces



WHZ80

Belt Drive, Wheel Guide

Dimensions	Projection	Online Sizing & Selection!
METRIC		www.LinearMotioneering.com



- A1: funnel type lubricating nipple DIN3405-M6×1-D1
- A2: depth 4
- A3: depth 15
- A4: ENF inductive sensor rail kit (optional - see page 166)
- A5: felt pad wipers on both sides of the carriage

RediMount Flange Specifications

Parameter		Min	Max
Flange length (Lrm)	[mm]	81	143
Flange square (Srm)	[mm]	90	200
Flange weight *	[kg]	5,70	

* Max. weight including coupling and fastening screws

Performance Specifications

for Units with Single Long Carriage (L)

Parameter		WHZ80
Stroke length (Smax), maximum	[mm]	3000
Total length (L tot), maximum	[mm]	3580
Carriage length	[mm]	450
Dynamic load torque (My), maximum	[Nm]	345
Dynamic load torque (Mz), maximum	[Nm]	150
Weight	[kg]	7,4

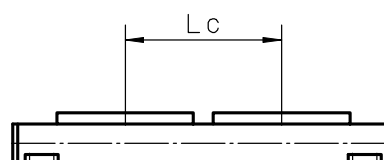
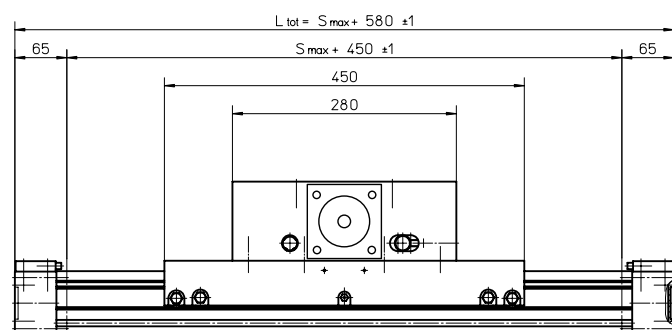
Performance Specifications

for Units with Double Standard Carriage (Z)

Parameter		WHZ80
Stroke length (Smax), maximum	[mm]	2870
Total length (L tot), maximum	[mm]	3580
Minimum distance between carriages (Lc)	[mm]	300
Dynamic load (Fy), maximum	[N]	1764
Dynamic load (Fz), maximum	[N]	4200
Dynamic load torque (My), maximum	[Nm]	$Lc^1 \times 0,882$
Dynamic load torque (Mz), maximum	[Nm]	$Lc^1 \times 2,1$
Force required to move second carriage	[N]	20
Total length (L tot)	[mm]	$Smax + 410 + Lc$

¹ Value in mm

² Second carriage is always a long carriage





Z2

Ball Screw Drive, Slide Guide

» Ordering key - see page 209
 » Accessories - see page 131
 » Additional data - see page 181

General Specifications

Parameter	Z2
Profile size (w × h) [mm]	188 × 150
Type of screw	ball screw with single nut
Sealing system	none
Screw supports	none
Lubrication	lubrication of screw and slide surfaces
Included accessories	none

Performance Specifications

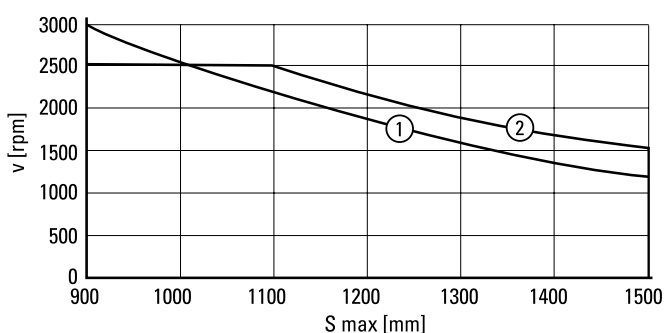
Parameter	Z2
Stroke length (Smax), maximum [mm]	1500
Linear speed, maximum [m/s]	1,25
Acceleration, maximum [m/s ²]	8
Repeatability [± mm]	0,1
Input speed, maximum screw diameter/lead [mm] 25/10, 25/25 screw diameter/lead [mm] 32/20 [rpm]	3000 2500
Operation temperature limits [°C]	-20 – 70
Dynamic load (Fz), maximum screw diameter/lead [mm] 25/10, 25/25 screw diameter/lead [mm] 32/20 [N]	5000 7500
Dynamic load torque (Mx), maximum [Nm]	700
Dynamic load torque (My), maximum [Nm]	700
Dynamic load torque (Mz), maximum [Nm]	330
Drive shaft force (Frd), maximum screw diameter/lead [mm] 25/10, 25/25 screw diameter/lead [mm] 32/20 [N]	1000 1200
Input/drive shaft torque (Mta), maximum screw diameter/lead [mm] 25/10, 25/25 screw diameter/lead [mm] 32/20 [Nm]	45 93
Screw versions, diameter (do) / lead (p) [mm]	25/10, 25/25, 32/20
Weight [kg]	
of unit with zero stroke, ball screw ø 25 mm	19,00
of unit with zero stroke, ball screw ø 32 mm	23,64
of every 100 mm of stroke, ball screw ø 25 mm	2,50
of every 100 mm of stroke, ball screw ø 32 mm	2,80

Idle Torque (M idle) [Nm]

Input speed [rpm]	Screw diameter/lead [mm]		
	do = 25 / p = 10	do = 25 / p = 25	do = 32 / p = 20
500	0,7	1,9	1,5

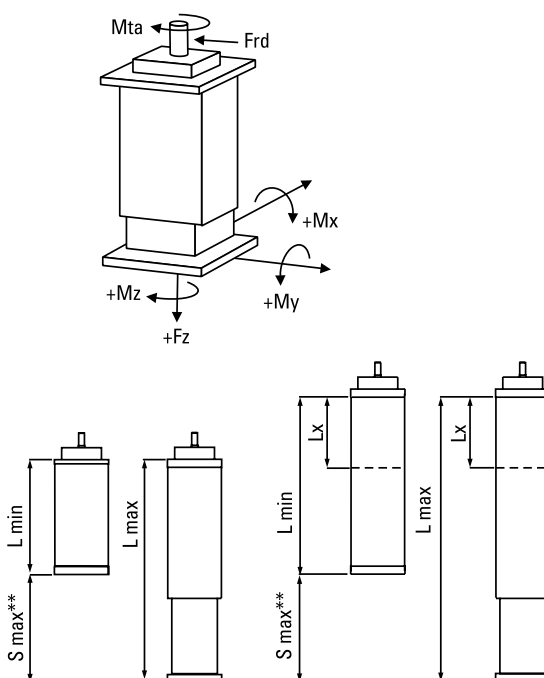
M idle = the input torque needed to move the lifting profiles without any load.

Critical Speed



1: screw diameter 25 mm
 2: screw diameter 32 mm

Definition of Forces and Stroke



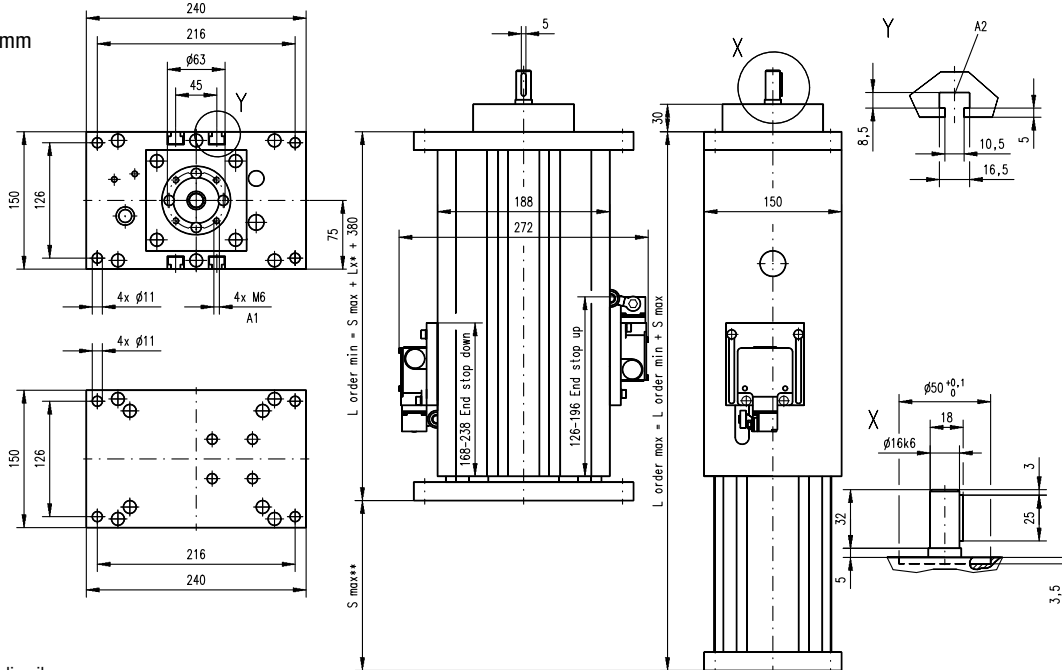
** Smax = maximum stroke between the mechanical ends of the unit. The practical stroke is normally 100 mm shorter to avoid running into the ends of the unit.

Z2

Ball Screw Drive, Slide Guide

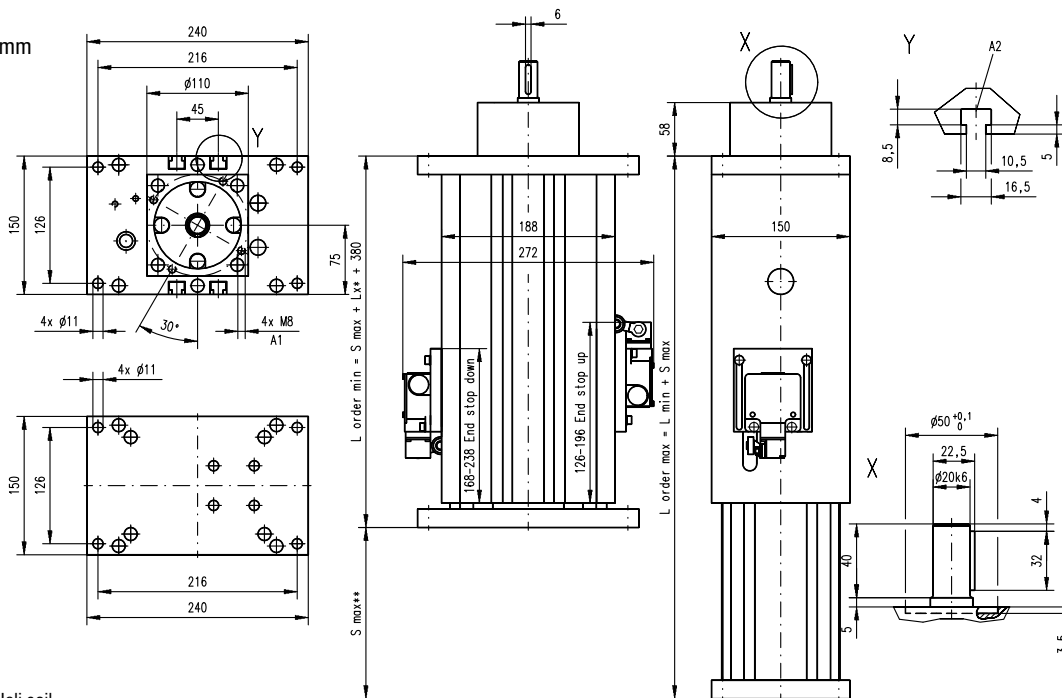
Dimensions	Projection	Online Sizing & Selection!
METRIC		www.LinearMotioneering.com

MGZ2K25
screw ø25 mm



A1: depth 9, Heli coil
A2: T-slot

MGZ2K32
screw ø32 mm



A1: depth 12, Heli coil
A2: T-slot

Type of unit	Minimum retracted length (L min) [mm]	Maximum extended length (L max) [mm]
Standard	$L_{min} = S_{max} + 380$	$L_{max} = L_{min} + S_{max}$
Elongated*	$L_{min} = S_{max} + 380 + L_x$	$L_{max} = L_{min} + S_{max}$

* Elongated versions have an extra length (Lx) added to the total length of the unit which makes the unit longer but does not add any extra length to the stroke (Smax).



Z3

Ball Screw Drive, Slide Guide

» Ordering key - see page 209
 » Accessories - see page 131
 » Additional data - see page 181

General Specifications

Parameter	Z3
Profile size (w × h) [mm]	188 × 150
Type of screw	ball screw with single nut
Sealing system	none
Screw supports	none
Lubrication	lubrication of screw and slide surfaces
Included accessories	none

Performance Specifications

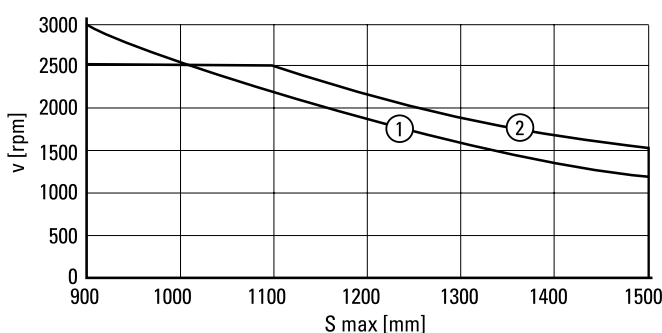
Parameter	Z3
Stroke length (Smax), maximum [mm]	1500
Linear speed, maximum [m/s]	1,25
Acceleration, maximum [m/s ²]	8
Repeatability [± mm]	0,1
Input speed, maximum screw diameter/lead [mm] 25/10, 25/25 [rpm]	3000
screw diameter/lead [mm] 32/20	2500
Operation temperature limits [°C]	-20 – 70
Dynamic load (Fz), maximum screw diameter/lead [mm] 25/10, 25/25 [N]	5000
screw diameter/lead [mm] 32/20	7500
Dynamic load torque (Mx), maximum [Nm]	2000
Dynamic load torque (My), maximum [Nm]	2000
Dynamic load torque (Mz), maximum [Nm]	330
Drive shaft force (Frd), maximum screw diameter/lead [mm] 25/10, 25/25 [N]	1000
screw diameter/lead [mm] 32/20	1200
Input/drive shaft torque (Mta), maximum screw diameter/lead [mm] 25/10, 25/25 [Nm]	45
screw diameter/lead [mm] 32/20	93
Screw versions, diameter (do) / lead (p) [mm]	25/10, 25/25, 32/20
Weight [kg]	
of unit with zero stroke, ball screw ø 25 mm	21,14
of unit with zero stroke, ball screw ø 32 mm	22,65
of every 100 mm of stroke, ball screw ø 25 mm	4,20
of every 100 mm of stroke, ball screw ø 32 mm	4,50

Idle Torque (M idle) [Nm]

Input speed [rpm]	Screw diameter/lead [mm]		
	do = 25 / p = 10	do = 25 / p = 25	do = 32 / p = 20
500	1,1	2,7	2,2

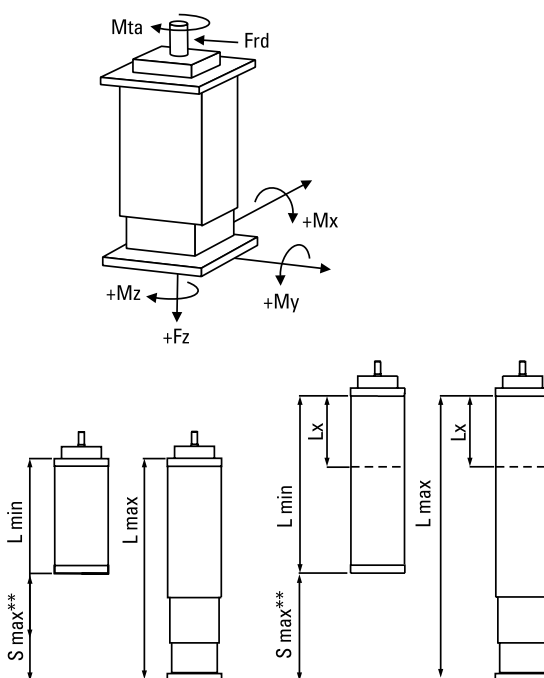
M idle = the input torque needed to move the lifting profiles without any load.

Critical Speed



1: screw diameter 25 mm
 2: screw diameter 32 mm

Definition of Forces and Stroke



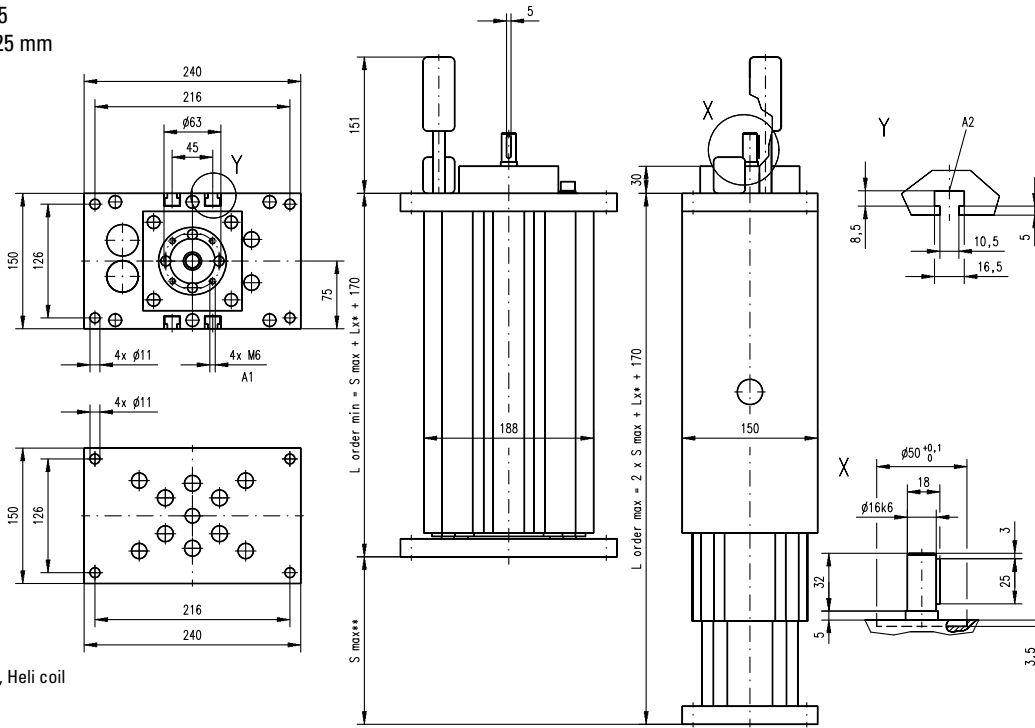
** Smax = maximum stroke between the mechanical ends of the unit. The practical stroke is normally 100 mm shorter to avoid running into the ends of the unit.

Z3

Ball Screw Drive, Slide Guide

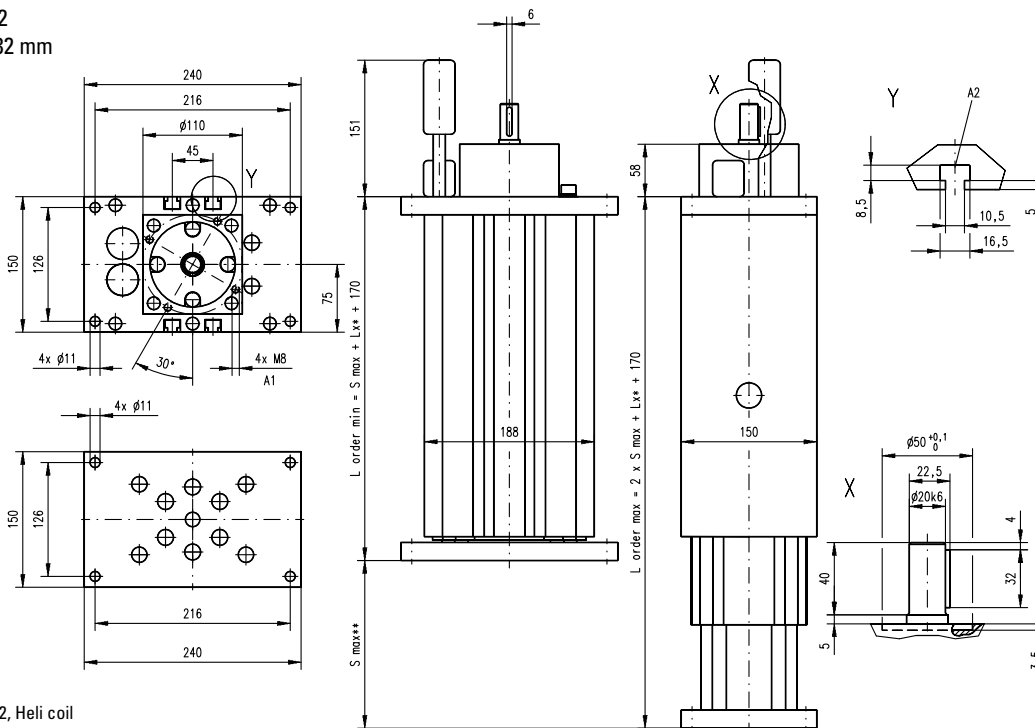
Dimensions	Projection	Online Sizing & Selection!
METRIC		www.LinearMotioneering.com

MGZ3K25
screw ø25 mm



A1: depth 9, Heli coil
A2: T-slot

MGZ3K32
screw ø32 mm



A1: depth 12, Heli coil
A2: T-slot

Type of unit	Minimum retracted length (L min) [mm]	Maximum extended length (L max) [mm]
Standard	$L_{min} = S_{max} + 170$	$L_{max} = L_{min} + S_{max}$
Elongated*	$L_{min} = S_{max} + 170 + L_x$	$L_{max} = L_{min} + S_{max}$

* Elongated versions have an extra length (Lx) added to the total length of the unit which makes the unit longer but does not add any extra length to the stroke (Smax).