

Linear Motion Systems

www.thomsonlinear.com

THOMSON[®]
Linear Motion. Optimized.™



*Linear Motion. **Optimized.***

Thomson - the Choice for Optimized Motion Solutions

Often the ideal design solution is not about finding the fastest, sturdiest, most accurate or even the least expensive option. Rather, the ideal solution is the optimal balance of performance, life and cost.

Quickly Configure the Optimal Mechanical Motion Solution

Thomson has several advantages that makes us the supplier of choice for motion control technology.

- Thomson owns the broadest standard product offering of mechanical motion technologies in the industry.
- Modified versions of standard product or white sheet design solutions are routine for us.
- Choose Thomson and gain access to over 70 years of global application experience in industries including packaging, factory automation, material handling, medical, clean energy, printing, automotive, machine tool, aerospace and defense.
- As part of Danaher Corporation, we are financially strong and unique in our ability to bring together control, drive, motor, power transmission and precision linear motion technologies.

A Name You Can Trust

A wealth of product and application information as well as 3D models, software tools, our distributor locator and global contact information is available at www.thomsonlinear.com/contact_us. Talk to us early in the design process to see how Thomson can help identify the optimal balance of performance, life and cost for your next application. And, call us or any of our 2000+ distribution partners around the world for fast delivery of replacement parts.

The Danaher Business System

The Danaher Business System (DBS) was established to increase the value we bring to customers. It is a mature and successful set of tools we use daily to continually improve manufacturing operations and product development processes. DBS is based on the principles of Kaizen which continuously and aggressively eliminates waste in every aspect of our business. DBS focuses the entire organization on achieving breakthrough results that create competitive advantages in quality, delivery and performance – advantages that are passed on to you. Through these advantages Thomson is able to provide you faster times to market as well as unsurpassed product selection, service, reliability and productivity.

Local Support Around the Globe

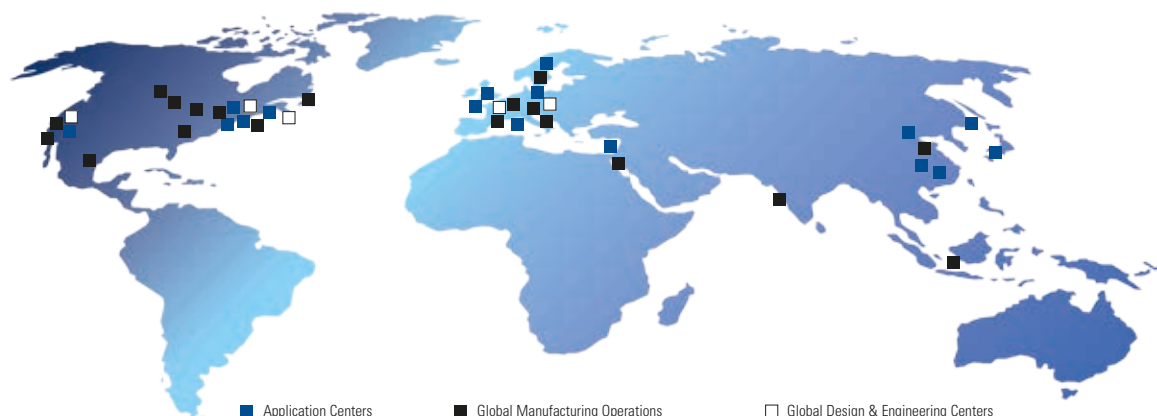
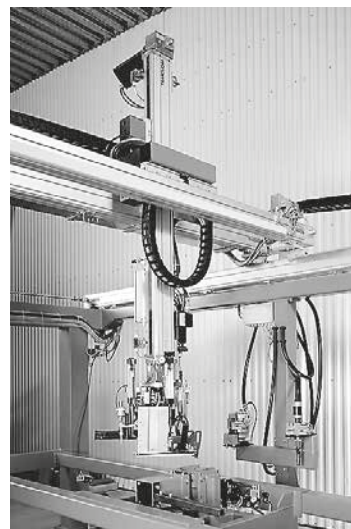
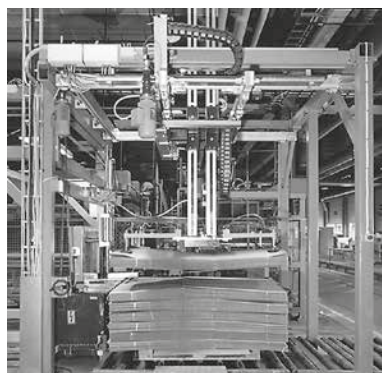
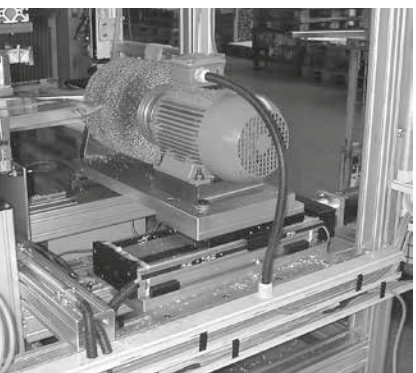
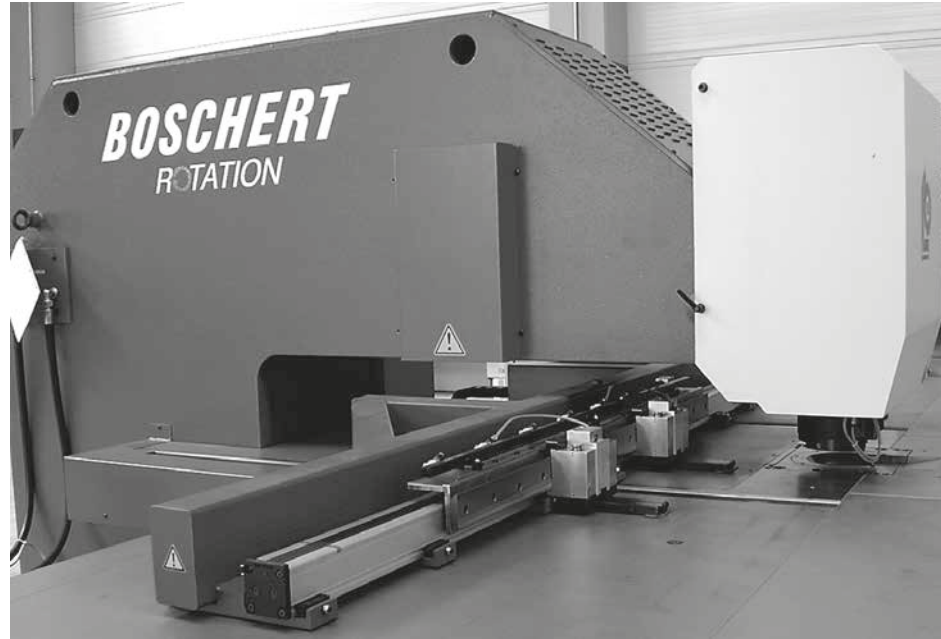
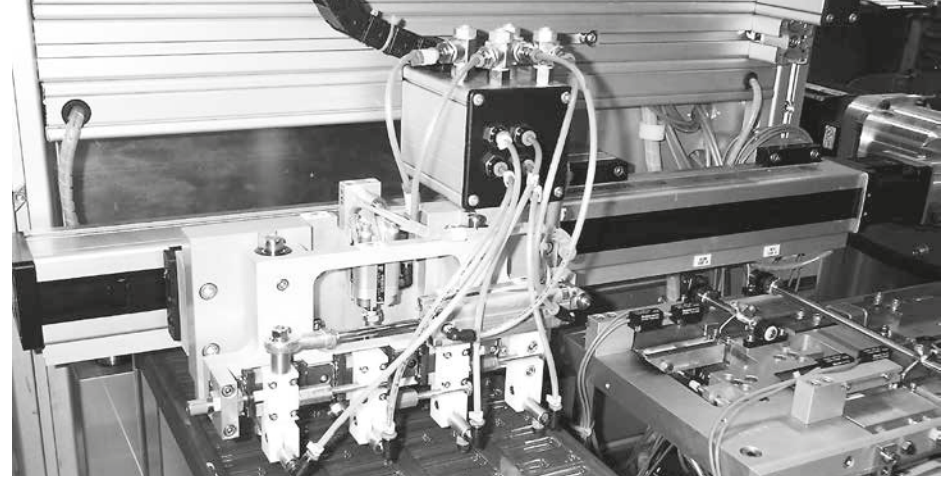
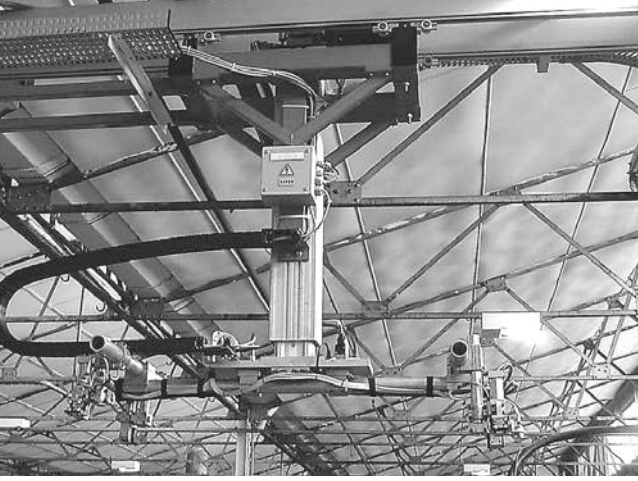


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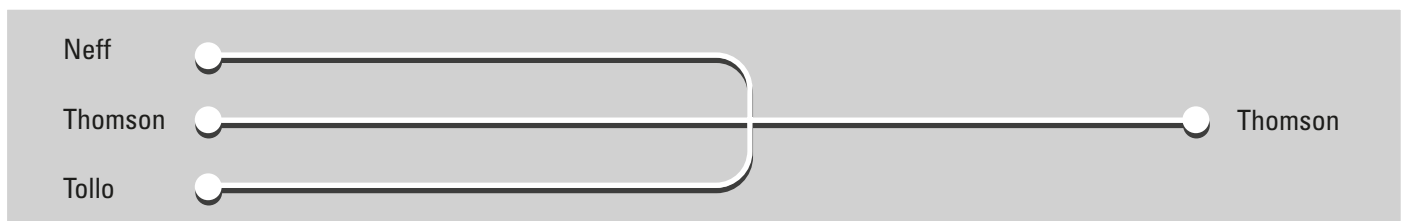
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Thomson

The optimal balance of performance, life and cost

The unmatched breadth of the Thomson linear motion system product line comes from the consolidation of three world-reknowned brands: Thomson, Neff and Tollo. We are product innovators with decades of application experience. Unbiased ownership of the multiple motion system technologies enables Thomson to provide you with the optimal balance of performance versus installed cost for your application.



Thomson introduced the first ball screw actuator into an aviation application in 1939 and invented the anti-friction Linear Ball Bushing® Bearing in 1945. Thomson has been a market leader with an increasing portfolio of linear motion technologies ever since.

Founded in 1905, Neff offered products for the linear motion market and, over the decades, became a market leader in ball screw technology. The first linear motion system from Neff was presented in 1981 at the FAMETA show in Stuttgart.

Tollo began in 1981 as a lifting equipment manufacturer. The product line grew rapidly thereafter and, in 1982, Tollo presented their first linear motion system at the Technical Fair in Stockholm.

Thomson has consolidated the most competitive and complementary products from each brand into the most advanced, most comprehensive product portfolio available today. The range covers the smallest and most compact linear motion systems to the biggest and most robust. Our wide range of guide and drive systems can be configured economically and can also work in harsh environments, at high speeds, and in high precision applications.

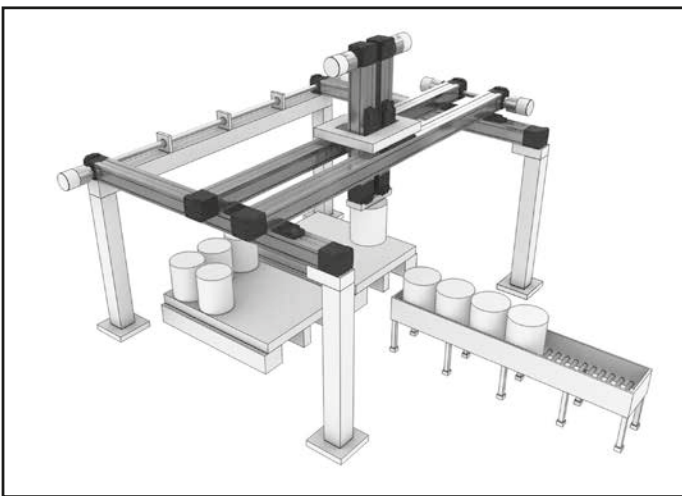
Thomson is linear motion, optimized.



Linear Motion Systems at Work

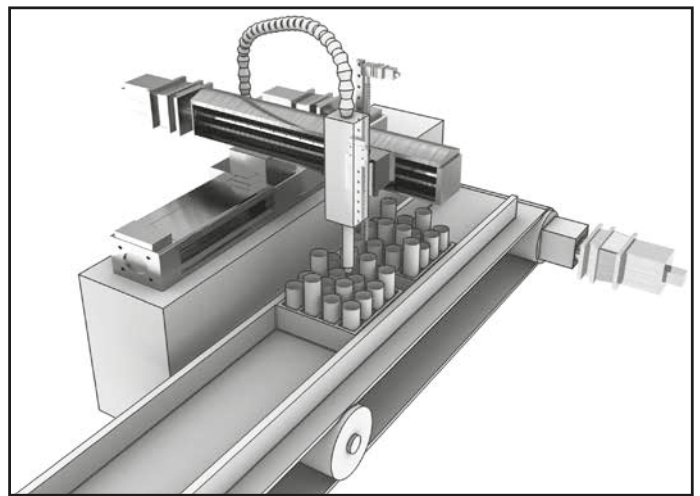
Application Examples

Thomson Linear Motion Systems can be used in almost all industries . The breadth of our range makes it possible to find the optimum solution for most applications imaginable. If the standard range is not enough, Thomson is happy to discuss a custom solution that meets your needs. Below is a small selection of applications where linear motion systems have been used successfully. Contact us and we can show you many, many more.



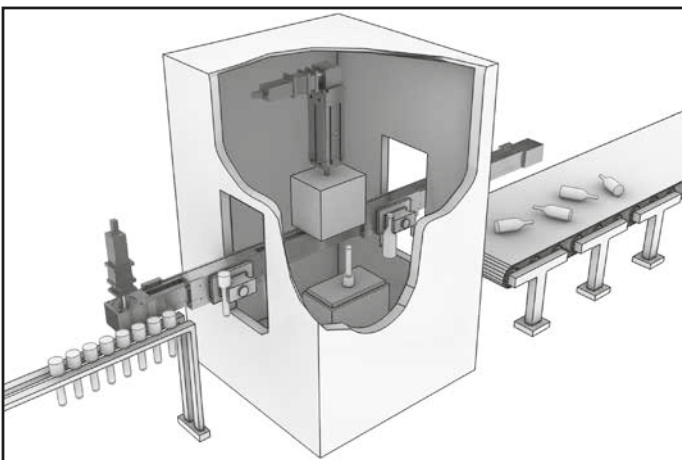
Handling

Linear motion systems are ideal for handling applications. Thomson has units suitable for the harsh environments in food and paper industries to the rigorous cleanliness demands found in the medical and electronics industries.



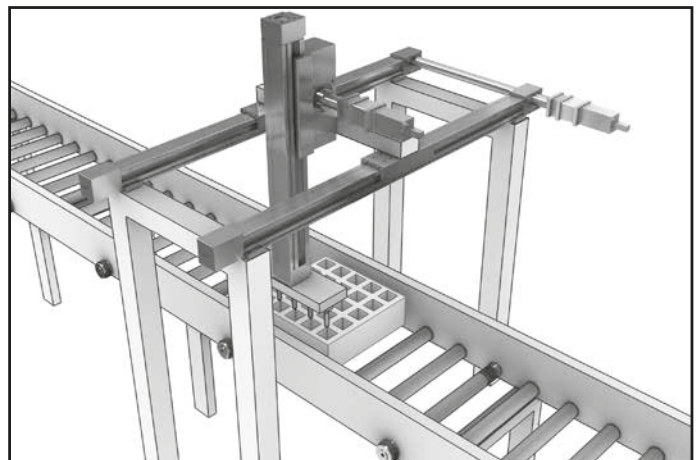
Medical and laboratory

In this application a robot made of linear motion systems is used to pick samples from test tubes of different heights. Thomson has the small, quiet, quick and accurate units you need to build this type of equipment.



Transportation and transfer

Whenever you may need to move something from one place to another a linear motion system can be the answer. Here a moulding machine is fed and emptied at high speed.



Packaging, filling and dispensing

To fill, close, stack, label or print on boxes or other containers of almost any size and weight is easily done with linear motion systems.

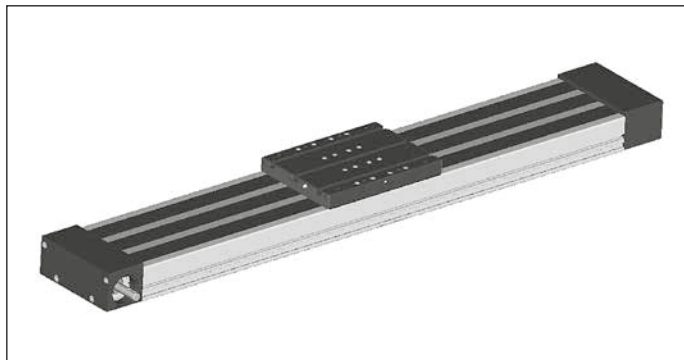
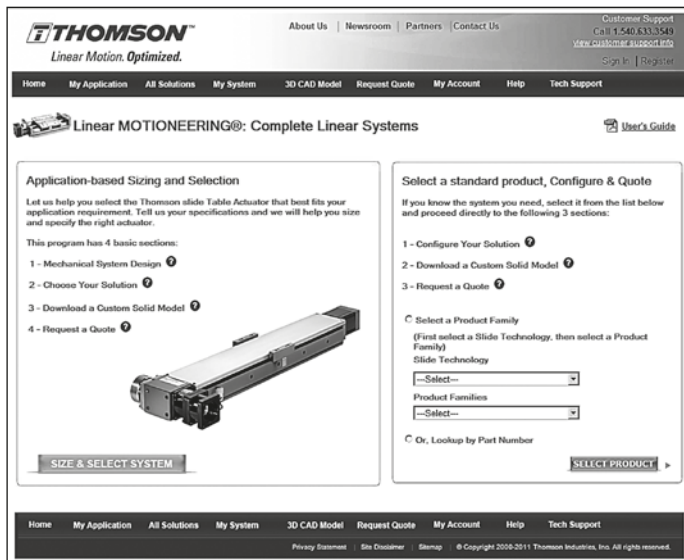
Simple Product Selection with Linear Motioneering®

On-Line Product Selection

The Linear Motioneering sizing and selection tool is designed to make it simple to choose the right linear motion system for your application. Linear Motioneering is very easy to use, just enter the basic parameters for your application and watch as Linear Motioneering does all the work. Linear Motioneering calculates application parameters through a comprehensive set of algorithms and compares your results to our product database to determine an optimized solution set.

To determine which linear motion system is best suited for your application you just enter the application parameters in seven simple steps into Linear Motioneering. Once a product solution is selected, choose from a wide assortment of accessories, motors, and motor mounts.

The program will output a 2D drawing or an interactive 3D model, list prices, delivery times, and ordering information. In your account you can see your quote history. Please visit www.linearmotioneering.com for more information.



Seven simple steps

1. Visit www.linearmotioneering.com
2. Create an account
3. Enter the system orientation
4. Enter the positioning requirements
5. Enter any environmental conditions
6. Enter the load and the forces
7. Enter the move profile requirements

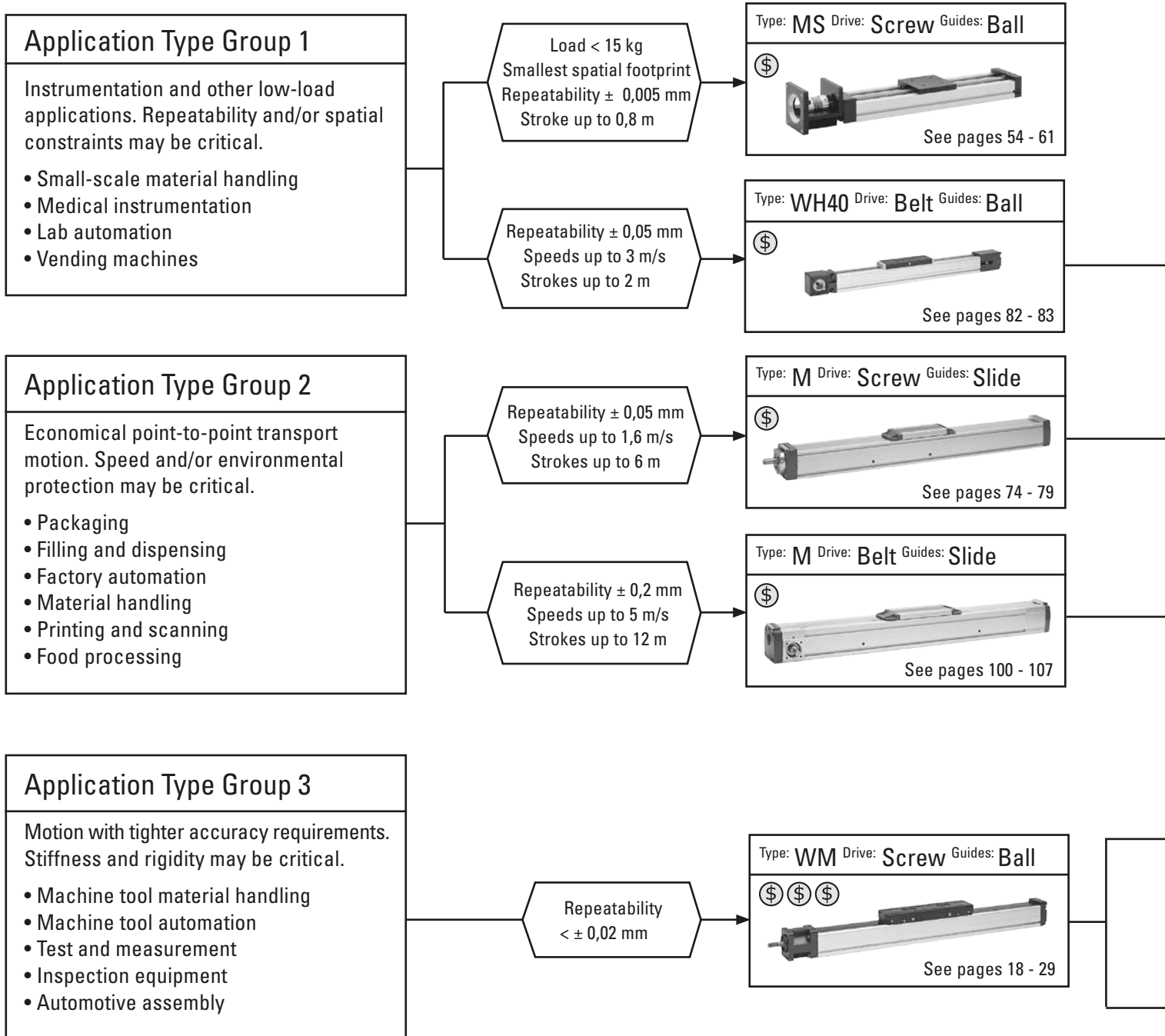
Outputs

1. 2D drawings or interactive 3D models
2. List prices
3. Delivery times
4. Ordering information

Linear Motion System Group Selection Chart

How to select appropriate product group

Thomson linear motion systems offers two drive options (screw or belt drive) and three carriage guidance options (ball, slide or wheel guides). The chart below provides reference to the ideal product combination based on the general application type.



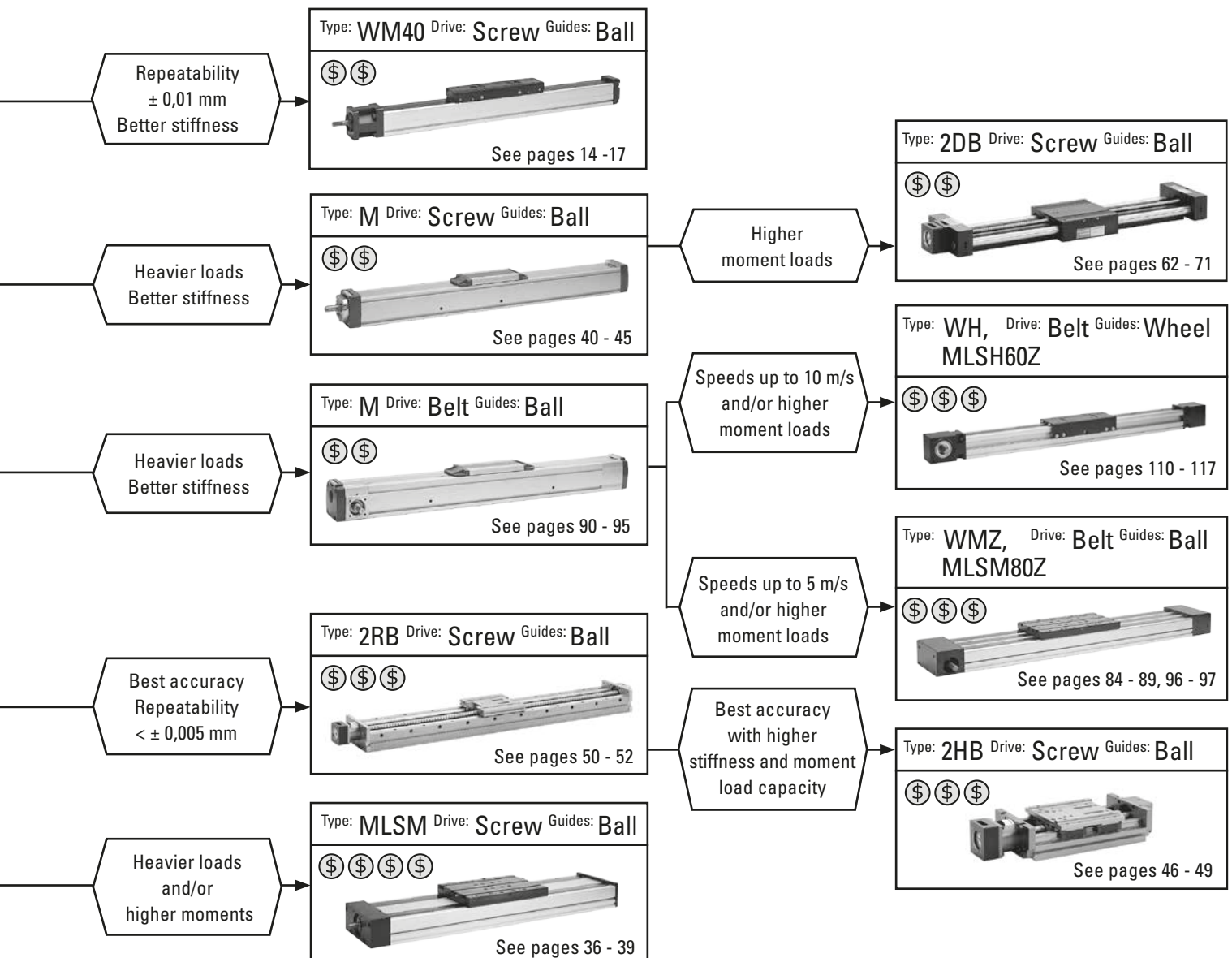
Linear Motion System Group Selection Chart

How to select appropriate product group

How to use the selection chart

1. Choose the one of the three general application type groups that match your application the best.
2. Move right in the chart until you identified a possible unit type for your needs.
3. Look up the unit type in the catalog and see if there is a size or version among them that match.
4. If you find a match, go to step 5. If not, go back to the chart and identify the next possible unit type and repeat.
5. Confirm the choice by performing the necessary calculations. The Linear Motion Sizing and Selection Tool or the Thomson customer support team can help you with this.

| Cost indicator legend | |
|-----------------------|--------------|
| \$ | Lowest cost |
| \$ \$ | |
| \$ \$ \$ | |
| \$ \$ \$ \$ | Highest cost |



Linear Motion Systems with Lead or Ball Screw Drive and Ball Guide

Overview

PowerLine WM



Features

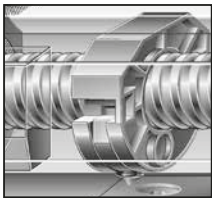
- Can be installed in any orientation
- Patented guide system
- Patented self-adjusting plastic cover band
- Patented screw support system

| Parameter | | WM40S | WM40D | WM60D | WM60S | WM60X | WM80D | WM80S | WM120D |
|--|-------|-----------------|------------------|------------------|-----------------|------------------|------------------|-----------------|------------------|
| Profile size (width × height) | [mm] | 40 × 40 | 40 × 40 | 60 × 60 | 60 × 60 | 60 × 60 | 80 × 80 | 80 × 80 | 120 × 120 |
| Stroke length (S _{max}), maximum | [mm] | 2000 | 2000 | 11000 | 5000 | 10340 | 11000 | 5000 | 11000 |
| Linear speed, maximum | [m/s] | 0,25 | 0,25 | 2,5 | 2,5 | 0,25 | 2,5 | 2,5 | 2,0 |
| Dynamic carriage load (F _z), maximum | [N] | 600 | 600 | 2000 | 1400 | 2000 | 3000 | 2100 | 6000 |
| Remarks | | single ball nut | double ball nuts | double ball nuts | single ball nut | left/right screw | double ball nuts | single ball nut | double ball nuts |
| Page | | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 |

WM-Series Technical Presentation

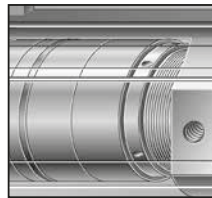
Screw support

Patented screw support system permits high speeds at long stroke lengths while reducing the available stroke with a minimum.



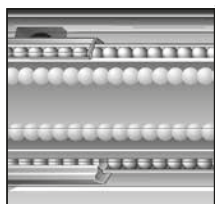
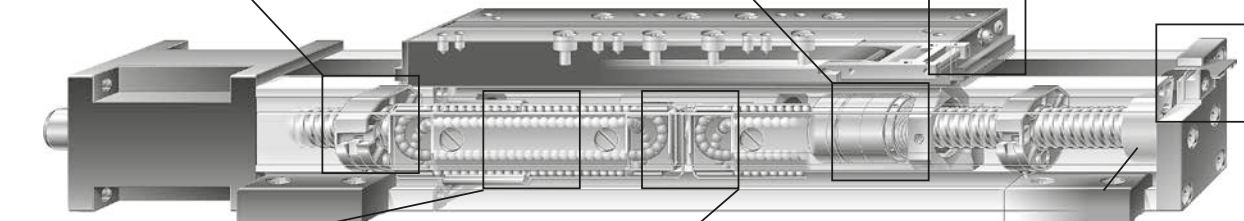
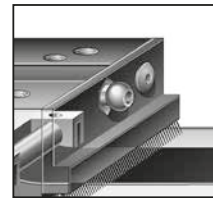
Double ball nuts

Double pre-tensioned ball nuts improve the accuracy and allow re-tensioning, increasing the lifetime of the unit.



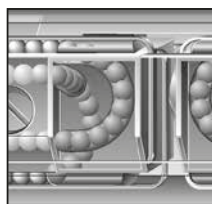
Central lubrication

One central lubrication point on the carriage services the entire unit resulting in a minimum maintenance requirement.



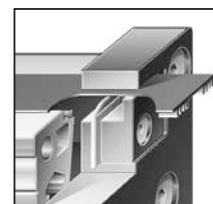
Ball guides

Integrated patented ball guides with hardened steel tracks for optimum performance.



Ball cages

The balls in the ball guides are protected by a ball cage which ensures a long life.



Cover band

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

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guide

Overview

PowerLine WV



Features

- Can be installed in any orientation
- Patented self-adjusting plastic cover band
- Patented screw support system
- The units require external guides

| Parameter | | WV60 | WV80 | WV120 |
|-------------------------------------|-------|---|---|---|
| Profile size (width × height) | [mm] | 60 × 60 | 80 × 80 | 120 × 120 |
| Stroke length (Smax), maximum | [mm] | 11000 | 11000 | 11000 |
| Linear speed, maximum | [m/s] | 2,5 | 2,5 | 2,0 |
| Dynamic carriage load (Fz), maximum | [N] | - | - | - |
| Remarks | | double ball nuts the units has no guides | double ball nuts the units has no guides | double ball nuts the units has no guides |
| Page | | 30 | 32 | 34 |

ForceLine MLSM



Features

- Can be installed in any orientation
- Patented guide system
- Patented plastic cover band
- Patented screw support system

| Parameter | | MLSM60D | MLSM80D |
|-------------------------------------|-------|------------------|------------------|
| Profile size (width × height) | [mm] | 160 × 65 | 240 × 85 |
| Stroke length (Smax), maximum | [mm] | 5500 | 5200 |
| Linear speed, maximum | [m/s] | 2,5 | 2,0 |
| Dynamic carriage load (Fz), maximum | [N] | 6000 | 8000 |
| Remarks | | double ball nuts | double ball nuts |
| Page | | 36 | 38 |

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guide

Overview

Movopart M



Features

- Can be installed in any orientation
- Self-adjusting stainless steel cover band
- Internal ball guides
- Wash down protected versions available

| Parameter | | M55 | M75 | M100 |
|-------------------------------------|-------|-----------------|-----------------|-----------------|
| Profile size (width × height) | [mm] | 58 × 55 | 86 × 75 | 108 × 100 |
| Stroke length (Smax), maximum | [mm] | 3000 | 4000 | 6000 |
| Linear speed, maximum | [m/s] | 1,6 | 1,0 | 1,25 |
| Dynamic carriage load (Fz), maximum | [N] | 400 | 1450 | 3000 |
| Remarks | | single ball nut | single ball nut | single ball nut |
| Page | | 40 | 42 | 44 |

2HB



Features

- Can be installed in any orientation
- High load capabilities
- Low profile height
- Preloaded ballscrew and bearing carriages offer high stiffness / rigidity
- Corrosion resistant options available.

| Parameter | | 2HB10 | 2HB20 |
|-------------------------------------|-------|-------------------------------------|-------------------------------------|
| Profile size (width × height) | [mm] | 100 × 60 | 200 × 90 |
| Stroke length (Smax), maximum | [mm] | 1375 | 2760 |
| Linear speed, maximum | [m/s] | 0,47 | 0,95 |
| Dynamic carriage load (Fz), maximum | [N] | 8000 | 34000 |
| Remarks | | bellows or shroud options available | bellows or shroud options available |
| Page | | 46 | 48 |

2RB



Features

- Can be installed in any orientation
- High load capabilities
- Low profile height
- Preloaded ballscrew and Super Smart bearing configuration provides stiffness / rigidity
- Corrosion resistant options available.

| Parameter | | 2RB12 | 2RB16 |
|-------------------------------------|-------|--------------------------|--------------------------|
| Profile size (width × height) | [mm] | 130 × 40 | 160 × 48 |
| Stroke length (Smax), maximum | [mm] | 1951 | 2815 |
| Linear speed, maximum | [m/s] | 0,47 | 0,73 |
| Dynamic carriage load (Fz), maximum | [N] | 1760 | 5176 |
| Remarks | | bellows option available | bellows option available |
| Page | | 50 | 52 |

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guide

Overview

MicroStage MS



Features

- Compact, lightweight package
- Stainless steel leadscrew with anti-backlash nut offers precise repeatability
- Segmented linear bearings provide smooth motion
- Corrosion resistant options available

| Parameter | | MS25 | MS33 | MS46L | MS46B |
|-------------------------------------|-------|--------------------------|--------------------------|--------------------------|--------------------------|
| Profile size (width × height) | [mm] | 50 × 25 | 60 × 33 | 86 × 46 | 86 × 46 |
| Stroke length (Smax), maximum | [mm] | 705,5 | 704 | 821,3 | 821,3 |
| Linear speed, maximum | [m/s] | 0,85 | 1,02 | 0,83 | 0,83 |
| Dynamic carriage load (Fz), maximum | [N] | 100 | 150 | 450 | 450 |
| Remarks | | bellows option available | bellows option available | bellows option available | bellows option available |
| Page | | 54 | 56 | 58 | 60 |

2DB



INCH INTERFACE

Features

- Integrated dual-rail, webbed shaft ideal for loading in all orientations
- Low-profile height
- Super Smart bushings with low friction for smooth motion
- Easy mounting
- Corrosion resistant options available

| Parameter | | 2DB08 | 2DB120 | 2DB12J | 2DB160 | 2DB16J |
|-------------------------------------|--------|------------------|--------------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|
| Profile size (width × height) | [in] | 4.5 × 1.625 | 6 × 2.125 | 6 × 2.562 | 7.5 × 2.625 | 7.5 × 3.062 |
| Stroke length (Smax), maximum | [in] | 41 | 63 | 63 | 84.5 | 84.5 |
| Linear speed, maximum | [in/s] | 33.3 | 10.0 | 25.0 | 8.3 | 41.67 |
| Dynamic carriage load (Fz), maximum | [lbs] | 336 | 2115 | 2115 | 3555 | 3555 |
| Remarks | | leadscrew driven | ballscrew driven integrated carriage | ballscrew driven modular carriage | ballscrew driven integrated carriage | ballscrew driven modular carriage |
| Page | | 62 | 64 | 66 | 68 | 70 |

WM40S

Ball Screw Drive, Ball Guide, Single Ball Nut

- » Ordering key - see page 191
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WM40S |
|---------------------------|---|
| Profile size (w × h) [mm] | 40 × 40 |
| Type of screw | ball screw with single nut |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

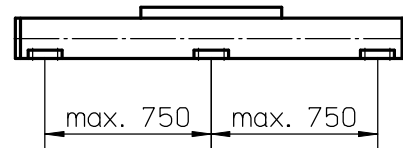
| Parameter | | WM40S |
|--|---------------------|----------------------|
| Stroke length (Smax), maximum | [mm] | 2000 |
| Linear speed, maximum | [m/s] | 0,25 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,02 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 1000 |
| Dynamic load (Fy), maximum | [N] | 450 |
| Dynamic load (Fz), maximum | [N] | 600 |
| Dynamic load torque (Mx), maximum | [Nm] | 10 |
| Dynamic load torque (My), maximum | [Nm] | 30 |
| Dynamic load torque (Mz), maximum | [Nm] | 30 |
| Drive shaft force (Frd), maximum | [N] | 100 |
| Drive shaft torque (Mta), maximum | [Nm] | 3 |
| Ball screw diameter (do) | [mm] | 12 |
| Ball screw lead (p) | [mm] | 5 |
| Weight of unit with zero stroke of every 100 mm of stroke of each carriage | [kg] | 1,50 0,30 0,36 |

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

| Input speed [rpm] | Screw lead [mm] |
|-------------------|-----------------|
| | p = 5 |
| 150 | 0,3 |
| 1500 | 0,5 |
| 3000 | 0,8 |

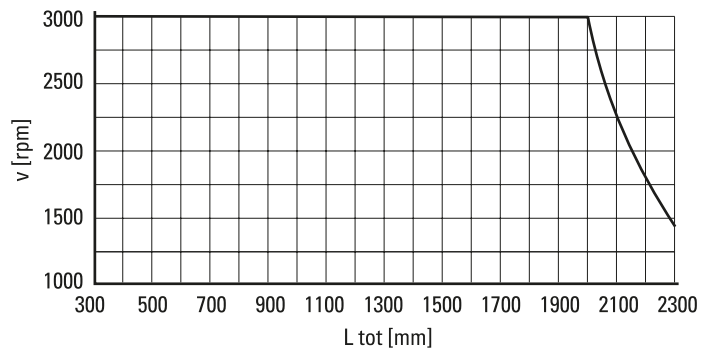
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

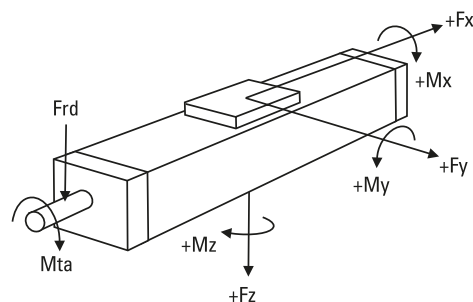


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Critical Speed



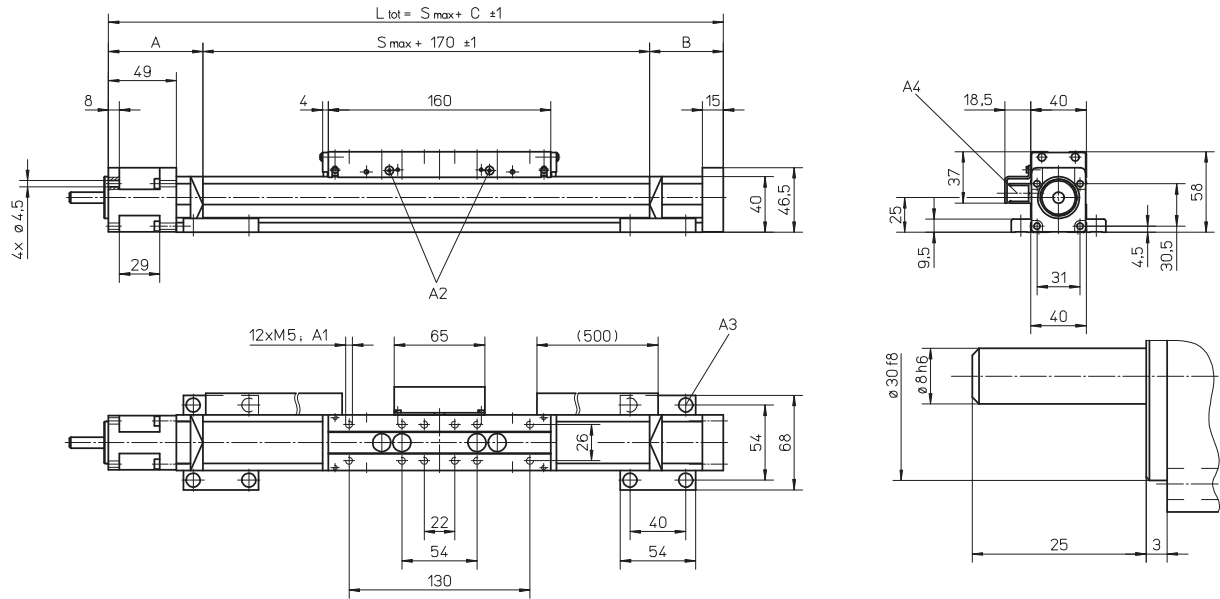
Definition of Forces



WM40S

Ball Screw Drive, Ball Guide, Single Ball Nut

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



A1: depth 7

A2: lubricating nipple on both sides DIN3405 D 1/A

A3: socket cap screw ISO4762-M5×12 8.8

A4: ENF inductive sensor rail kit (optional - see page 172)

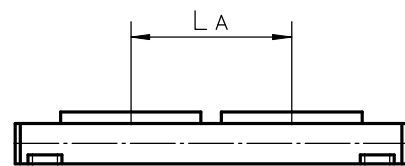
| Stroke length (S _{max}) [mm] | A [mm] | B [mm] | C [mm] |
|--|--------|--------|-----------|
| 0 – 500 (0 – 450) | 65 | 35 | 270 (320) |
| 501 – 1100 (451 – 1050) | 65 | 45 | 280 (330) |
| 1101 – 2000 (1051 – 1950) | 70 | 60 | 300 (350) |

Values between brackets = for units with long carriage

Double Carriages

| Parameter | | WM40S |
|--|------|----------------------------|
| Minimum distance between carriages (L _A) | [mm] | 175 |
| Dynamic load (F _y), maximum | [N] | 900 |
| Dynamic load (F _z), maximum | [N] | 1200 |
| Dynamic load torque (M _y), maximum | [Nm] | L A ¹ × 0,45 |
| Dynamic load torque (M _z), maximum | [Nm] | L A ¹ × 0,6 |
| Force required to move second carriage | [N] | 4 |
| Total length (L _{tot}) | [mm] | S _{max} + C + L A |

¹ Value in mm



WM40D

Ball Screw Drive, Ball Guide, Double Ball Nuts, Long Carriage

- » Ordering key - see page 191
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WM40D |
|---------------------------|---|
| Profile size (w × h) [mm] | 40 × 40 |
| Type of screw | ball screw with double nuts |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

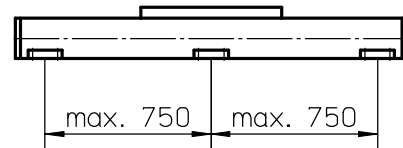
| Parameter | | WM40D |
|--|---------------------|----------------------|
| Stroke length (Smax), maximum | [mm] | 1950 |
| Linear speed, maximum | [m/s] | 0,25 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,01 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 1000 |
| Dynamic load (Fy), maximum | [N] | 450 |
| Dynamic load (Fz), maximum | [N] | 600 |
| Dynamic load torque (Mx), maximum | [Nm] | 10 |
| Dynamic load torque (My), maximum | [Nm] | 30 |
| Dynamic load torque (Mz), maximum | [Nm] | 30 |
| Drive shaft force (Frd), maximum | [N] | 100 |
| Drive shaft torque (Mta), maximum | [Nm] | 3 |
| Ball screw diameter (do) | [mm] | 12 |
| Ball screw lead (p) | [mm] | 5 |
| Weight of unit with zero stroke of every 100 mm of stroke of each carriage | [kg] | 1,90 0,30 0,60 |

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

| Input speed [rpm] | Screw lead [mm] |
|-------------------|-----------------|
| | p = 5 |
| 150 | 0,4 |
| 1500 | 0,6 |
| 3000 | 0,9 |

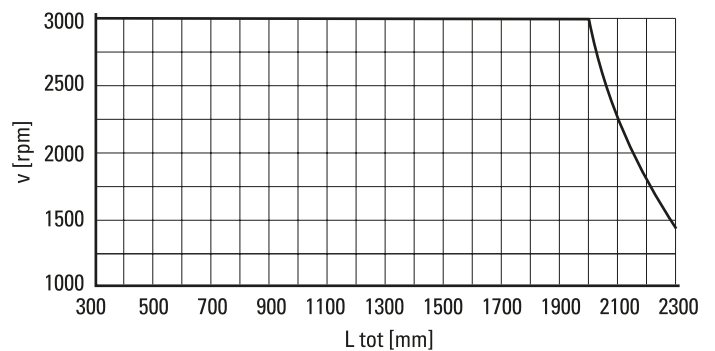
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

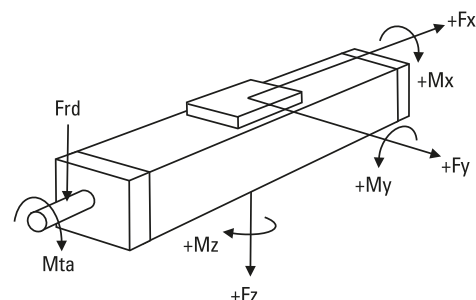


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Critical Speed



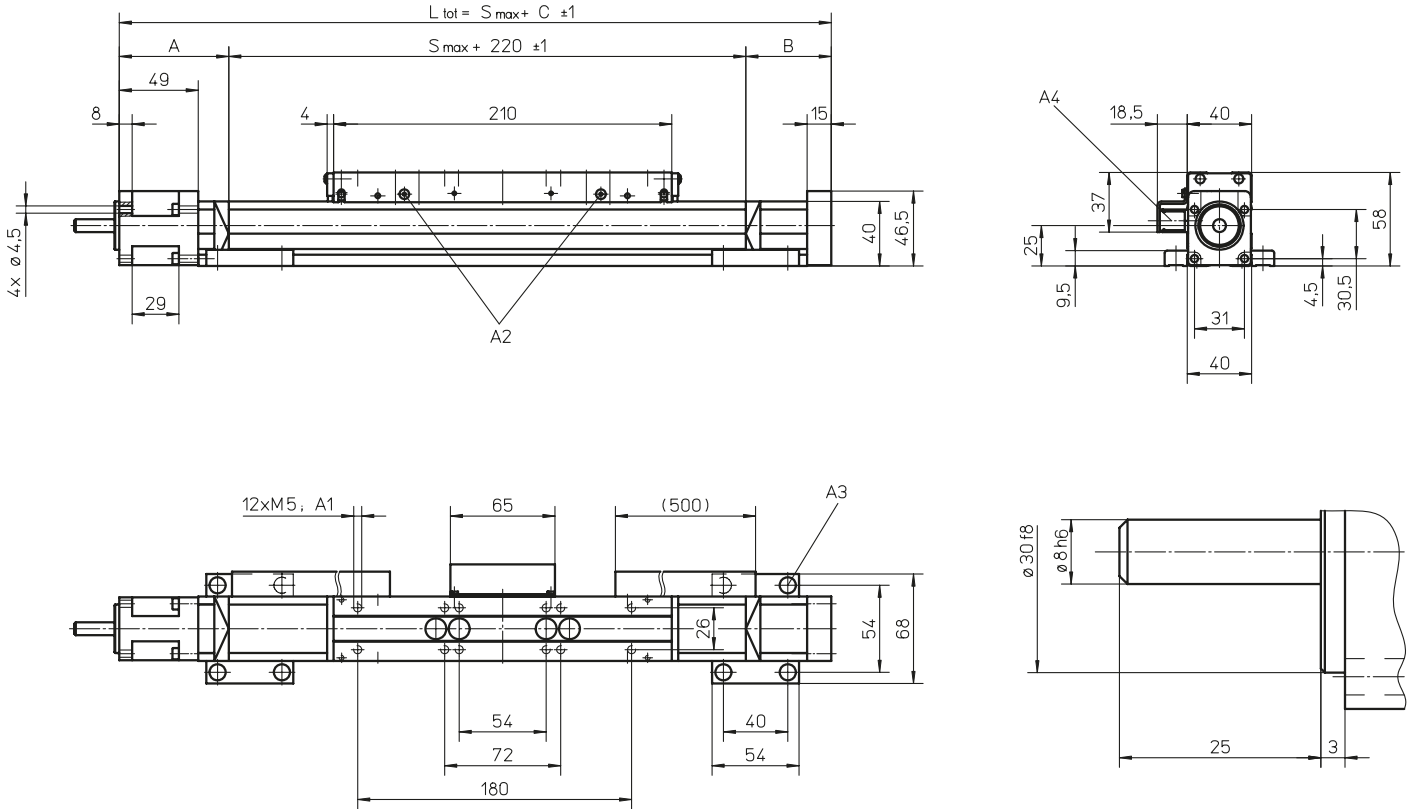
Definition of Forces



WM40D

Ball Screw Drive, Ball Guide, Double Ball Nuts, Long Carriage

| | |
|-------------------|-------------------|
| Dimensions | Projection |
| METRIC | |



A1: depth 6
A2: lubricating nipple on both sides DIN3405 D 1/A

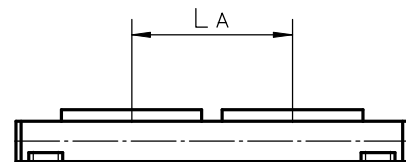
A3: socket cap screw ISO4762-M5×12 8.8
A4: ENF inductive sensor rail kit (optional - see page 172)

| Stroke length (S _{max}) [mm] | A [mm] | B [mm] | C [mm] |
|--|--------|--------|--------|
| 0 – 500 | 65 | 35 | 320 |
| 501 – 1100 | 65 | 45 | 330 |
| 1101 – 2000 | 70 | 60 | 350 |

Double Long Carriages

| Parameter | WM40D |
|---|----------------------------|
| Minimum distance between carriages (L _A) [mm] | 225 |
| Dynamic load (F _y), maximum [N] | 900 |
| Dynamic load (F _z), maximum [N] | 1200 |
| Dynamic load torque (M _y), maximum [Nm] | L A ¹ × 0,45 |
| Dynamic load torque (M _z), maximum [Nm] | L A ¹ × 0,6 |
| Force required to move second carriage [N] | 4 |
| Total length (L _{tot}) [mm] | S _{max} + C + L A |

¹ Value in mm



WM60D

Ball Screw Drive, Ball Guide, Double Ball Nuts

- » Ordering key - see page 191
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WM60D |
|---------------------------|---|
| Profile size (w × h) [mm] | 60 × 60 |
| Type of screw | ball screw with double nut |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

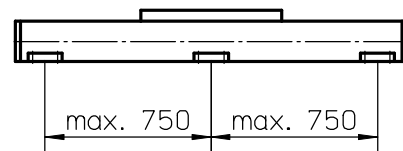
| Parameter | | WM60D |
|-----------------------------------|---------------------|-----------|
| Stroke length (Smax), maximum | [mm] | 11000 |
| screw lead 5, 20 mm | | 5000 |
| screw lead 50 mm | | |
| Linear speed, maximum | [m/s] | 2,5 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,01 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 4000 |
| Dynamic load (Fy), maximum | [N] | 2000 |
| Dynamic load (Fz), maximum | [N] | 2000 |
| Dynamic load torque (Mx), maximum | [Nm] | 100 |
| Dynamic load torque (My), maximum | [Nm] | 200 |
| Dynamic load torque (Mz), maximum | [Nm] | 200 |
| Drive shaft force (Frd), maximum | [N] | 500 |
| Drive shaft torque (Mta), maximum | [Nm] | 35 |
| Ball screw diameter (do) | [mm] | 20 |
| Ball screw lead (p) | [mm] | 5, 20, 50 |
| Weight | [kg] | |
| of unit with zero stroke | | 6,16 |
| of every 100 mm of stroke | | 0,65 |
| of each carriage | | 1,99 |

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

| Input speed [rpm] | Screw lead [mm] | | |
|-------------------|-----------------|--------|--------|
| | p = 5 | p = 20 | p = 50 |
| 150 | 0,8 | 1,3 | 1,6 |
| 1500 | 1,4 | 2,0 | 2,4 |
| 3000 | 1,8 | 2,3 | 2,6 |

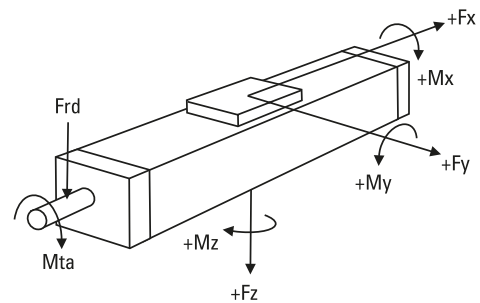
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



A mounting clamp must be installed at least every 750 mm to be able to operate at 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 consist of two profiles where the joint between the two profiles must be adequately supported on both sides.

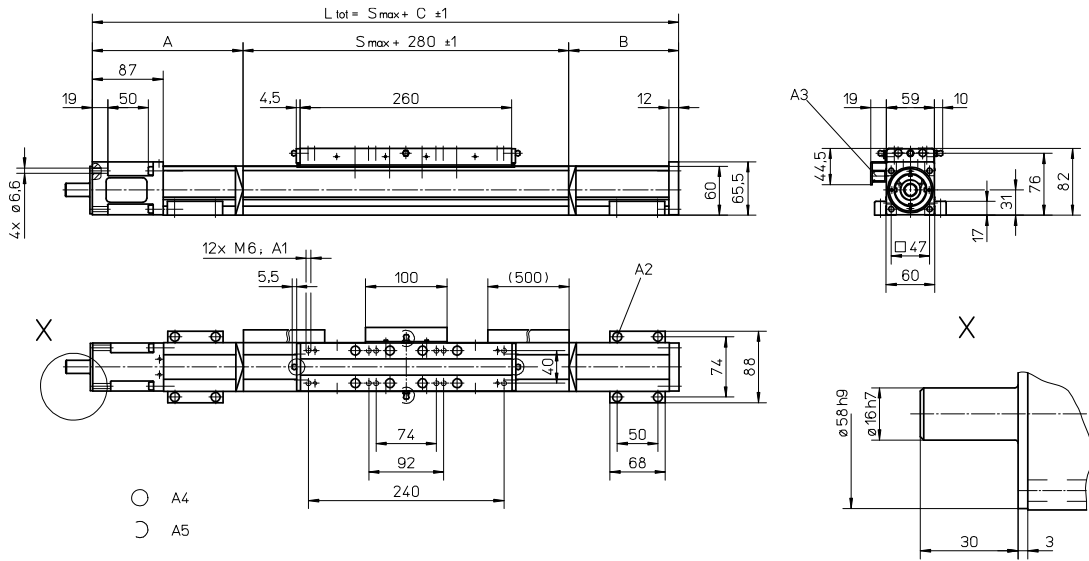
Definition of Forces



WM60D

Ball Screw Drive, Ball Guide, Double Ball Nuts

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



- A1: depth 11
- A2: socket cap screw ISO4762-M6x20 8.8
- A3: ENF inductive sensor rail kit (optional - see page 172)

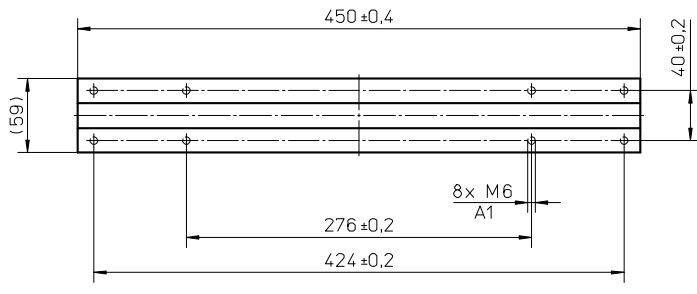
- A4: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature
- A5: can be changed over to one of the three alternative lubricating points by the customer

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|-----------|
| 0 - 695 (0 - 505) | 115 | 65 | 460 (650) |
| 696 - 1335 (506 - 1145) | 165 | 115 | 560 (750) |
| 1336 - 2075 (1146 - 1885) | 185 | 135 | 600 (790) |
| 2076 - 2780 (1886 - 2590) | 210 | 160 | 650 (840) |

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|-----------------------------|--------------------------|--------|-----------|
| 2781 - 3545 (2591 - 3355) | 230 | 180 | 690 (880) |
| 3546 - 4285 (3366 - 4095) | 250 | 200 | 730 (920) |
| 4286 - 5015 (4096 - 4825) | 275 | 225 | 780 (970) |
| 5016 - 11000 (4826 - 10810) | contact customer service | | |

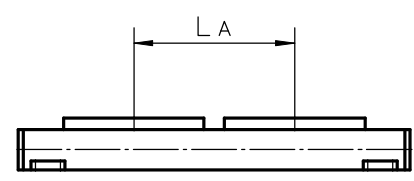
Values between brackets = for units with long carriage

| Long Carriage | | |
|-----------------------------------|------|-------|
| Parameter | | WM60D |
| Carriage length | [mm] | 450 |
| Dynamic load torque (My), maximum | [Nm] | 500 |
| Dynamic load torque (Mz), maximum | [Nm] | 500 |
| Weight | [kg] | 3,1 |



A1: depth 11

| Double Carriages | | |
|---|------|----------------------|
| Parameter | | WM60D |
| Minimum distance between carriages (LA) | [mm] | 335 |
| Dynamic load (Fy), maximum | [N] | 4000 |
| Dynamic load (Fz), maximum | [N] | 4000 |
| Dynamic load torque (My), maximum | [Nm] | L A ¹ × 2 |
| Dynamic load torque (Mz), maximum | [Nm] | L A ¹ × 2 |
| Force required to move second carriage | [N] | 20 |
| Total length (L tot) | [mm] | Smax + C + L A |



¹ Value in mm

WM60S

Ball Screw Drive, Ball Guide, Single Ball Nut, Short Carriage

- » Ordering key - see page 191
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WM60S |
|---------------------------|---|
| Profile size (w × h) [mm] | 60 × 60 |
| Type of screw | ball screw with single nut |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

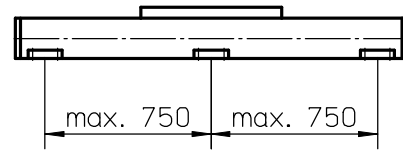
| Parameter | | WM60S |
|---------------------------------------|---------------------|-----------|
| Stroke length (Smax), maximum | [mm] | 5000 |
| Linear speed, maximum | [m/s] | 2,5 |
| Acceleration, maximum | [m/s ²] | 10 |
| Repeatability | [± mm] | 0,02 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 2800 |
| Dynamic load (Fy), maximum | [N] | 1400 |
| Dynamic load (Fz), maximum | [N] | 1400 |
| Dynamic load torque (Mx), maximum | [Nm] | 50 |
| Dynamic load torque (My), maximum | [Nm] | 100 |
| Dynamic load torque (Mz), maximum | [Nm] | 100 |
| Drive shaft force (Frd), maximum | [N] | 500 |
| Drive shaft torque (Mta), maximum | [Nm] | 35 |
| Ball screw diameter (d ₀) | [mm] | 20 |
| Ball screw lead (p) | [mm] | 5, 20, 50 |
| Weight | [kg] | |
| of unit with zero stroke | | 3,80 |
| of every 100 mm of stroke | | 0,65 |
| of each carriage | | 1,00 |

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

| Input speed [rpm] | Screw lead [mm] | | |
|-------------------|-----------------|--------|--------|
| | p = 5 | p = 20 | p = 50 |
| 150 | 0,7 | 1,0 | 1,4 |
| 1500 | 1,1 | 1,6 | 2,0 |
| 3000 | 1,5 | 1,8 | 2,2 |

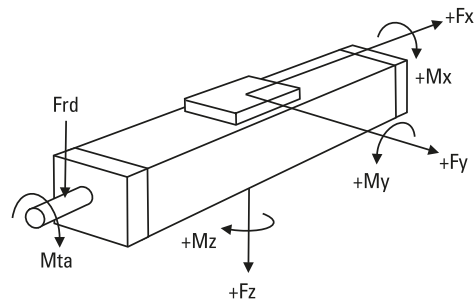
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



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

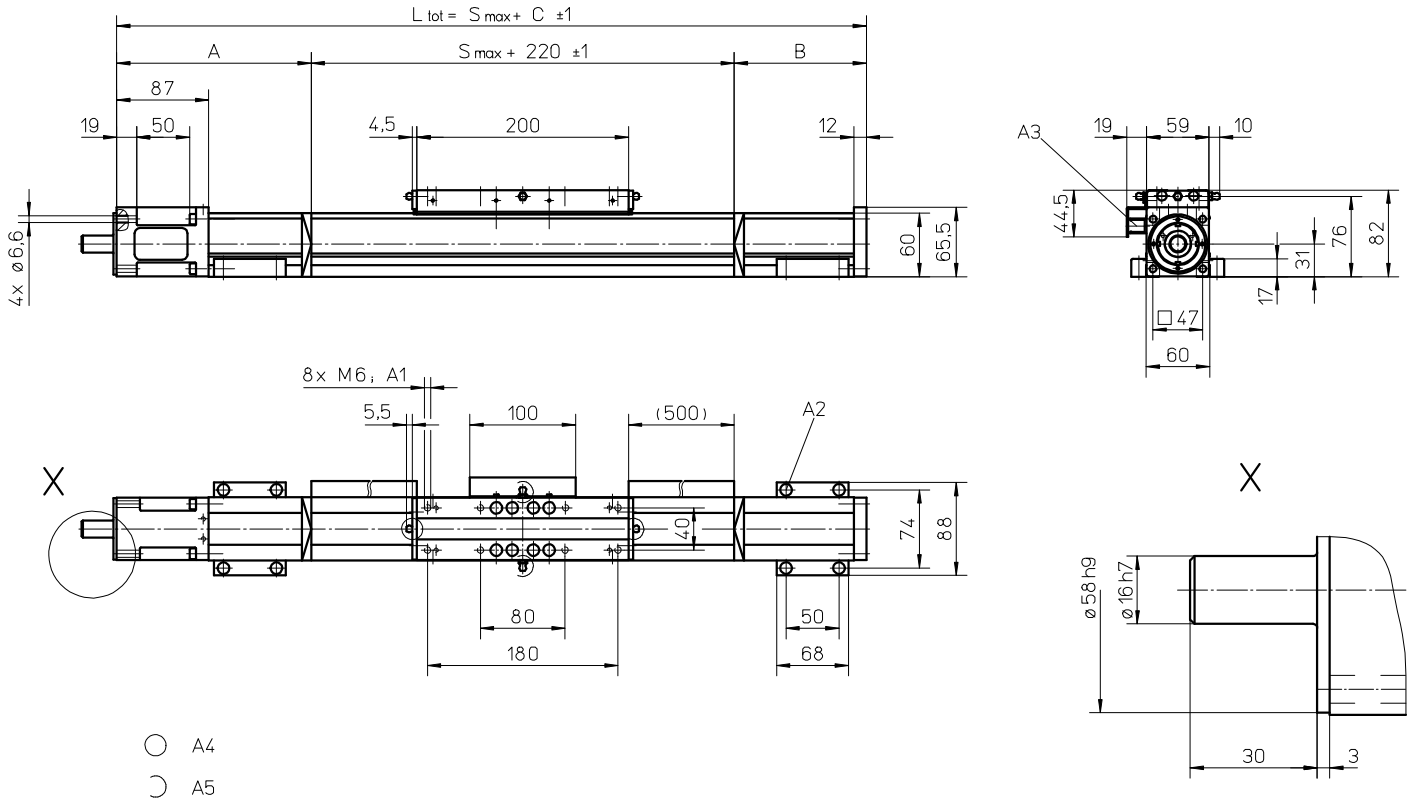
Definition of Forces



WM60S

Ball Screw Drive, Ball Guide, Single Ball Nut, Short Carriage

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



- A4
- A5

A1: depth 11
 A2: socket cap screw ISO4762-M6×20 8.8
 A3: ENF inductive sensor rail kit (optional - see page 172)

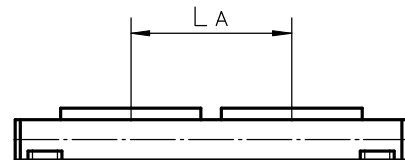
A4: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature
 A5: can be changed over to one of the three alternative lubricating points by the customer

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|--------|
| 0 - 580 | 95 | 20 | 335 |
| 581 - 1140 | 110 | 60 | 390 |
| 1141 - 1805 | 130 | 80 | 430 |
| 1806 - 2460 | 155 | 105 | 480 |

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|--------|
| 2461 - 3125 | 175 | 125 | 520 |
| 3126 - 3780 | 200 | 150 | 570 |
| 3781 - 4445 | 220 | 170 | 610 |
| 4446 - 5000 | 240 | 190 | 650 |

Double Short Carriages

| Parameter | WM60S |
|---|---------------------------------------|
| Minimum distance between carriages (L _A) [mm] | 255 |
| Dynamic load (F _y), maximum [N] | 2800 |
| Dynamic load (F _z), maximum [N] | 2800 |
| Dynamic load torque (M _y), maximum [Nm] | L _A ¹ × 1,4 |
| Dynamic load torque (M _z), maximum [Nm] | L _A ¹ × 1,4 |
| Force required to move second carriage [N] | 18 |
| Total length (L _{tot}) [mm] | S _{max} + C + L _A |



¹ Value in mm

WM60X

Ball Screw Drive, Ball Guide, Left/Right Moving Carriages

- » Ordering key - see page 191
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WM60X |
|---------------------------|---|
| Profile size (w × h) [mm] | 60 × 60 |
| Type of screw | ball screw with double nut |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

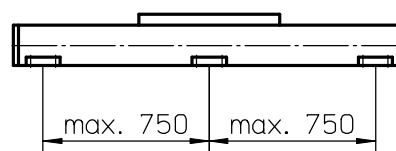
| Parameter | | WM60X |
|---------------------------------------|---------------------|--------|
| Stroke length (Smax), maximum | [mm] | 10340 |
| Linear speed, maximum | [m/s] | 0,25 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,01 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 4000 |
| Dynamic load (Fy), maximum | [N] | 2000 |
| Dynamic load (Fz), maximum | [N] | 2000 |
| Dynamic load torque (Mx), maximum | [Nm] | 100 |
| Dynamic load torque (My), maximum | [Nm] | 200 |
| Dynamic load torque (Mz), maximum | [Nm] | 200 |
| Drive shaft force (Frd), maximum | [N] | 500 |
| Drive shaft torque (Mta), maximum | [Nm] | 35 |
| Ball screw diameter (d ₀) | [mm] | 20 |
| Ball screw lead (p) | [mm] | 5 |
| Weight | [kg] | |
| of unit with zero stroke | | 10,33 |
| of every 100 mm of stroke | | 0,65 |
| of each carriage | | 1,99 |

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

| Input speed [rpm] | Screw lead [mm] |
|-------------------|-----------------|
| | p = 5 |
| 150 | 1,6 |
| 1500 | 2,8 |
| 3000 | 3,6 |

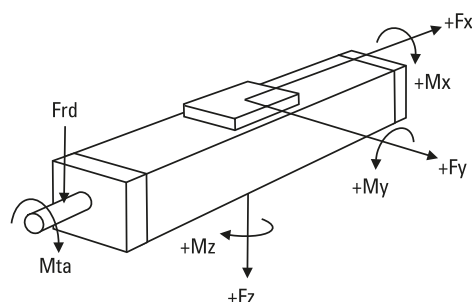
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



A mounting clamp must be installed at least every 750 mm to be able to operate at 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 5400 mm consist of two profiles where the joint between the two profiles must be adequately supported on both sides.

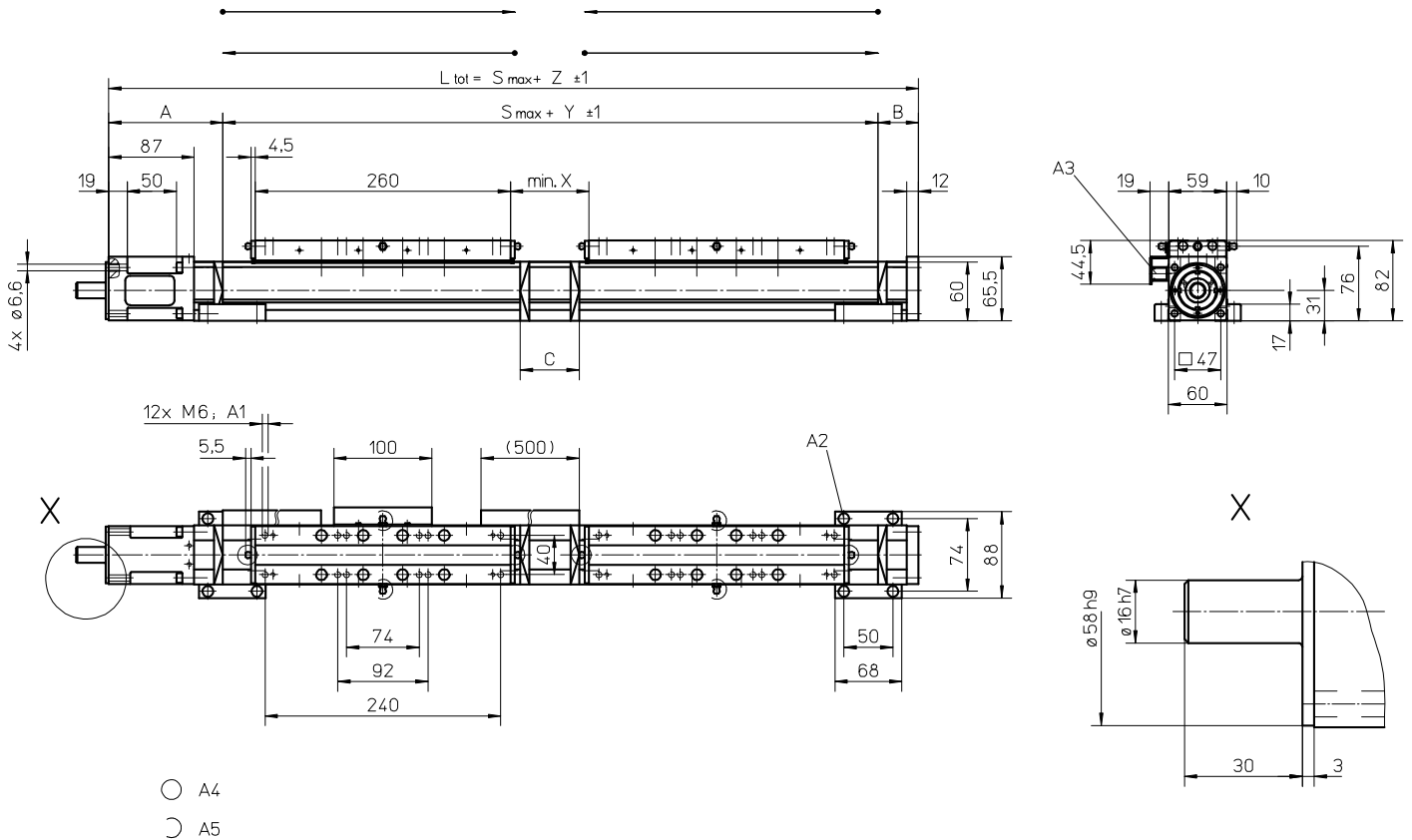
Definition of Forces



WM60X

Ball Screw Drive, Ball Guide, Left/Right Moving Carriages

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



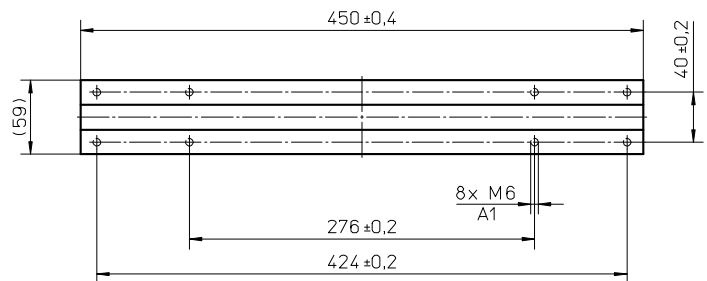
A1: depth 11
 A2: socket cap screw ISO4762-M6x20 8.8
 A3: ENF inductive sensor rail kit (optional - see page 172)

A4: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature
 A5: can be changed over to one of the three alternative lubricating points by the customer

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] | X [mm] | Y [mm] | Z [mm] |
|-----------------------------|--------------------------|--------|--------|--------|--------|--------|
| 0 - 1390 (0 - 1200) | 115 | 65 | 60 | 80 | 620 | 800 |
| 1391 - 2670 (1201 - 2480) | 165 | 115 | 210 | 230 | 770 | 1050 |
| 2671 - 4150 (2481 - 3960) | 185 | 135 | 250 | 270 | 810 | 1130 |
| 4151 - 5560 (3961 - 5370) | 210 | 160 | 300 | 320 | 860 | 1230 |
| 5561 - 10340 (5371 - 10150) | contact customer service | | | | | |

Values between brackets = for units with long carriage

| Long Carriage | |
|--|-------|
| Parameter | WM60X |
| Carriage length [mm] | 450 |
| Dynamic load torque (My), maximum [Nm] | 500 |
| Dynamic load torque (Mz), maximum [Nm] | 500 |
| Weight [kg] | 3,1 |



A1: depth 11

WM80D

Ball Screw Drive, Ball Guide, Double Ball Nuts

- » Ordering key - see page 191
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WM80D |
|---------------------------|---|
| Profile size (w × h) [mm] | 80 × 80 |
| Type of screw | ball screw with double nuts |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

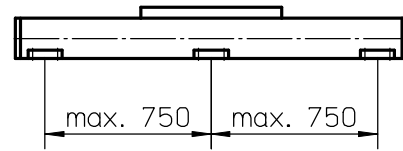
| Parameter | | WM80D |
|---|---------------------|-----------------------|
| Stroke length (Smax), maximum screw lead 5, 10, 20 mm screw lead 50 mm | [mm] | 11000 5000 |
| Linear speed, maximum | [m/s] | 2,5 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,01 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 5000 |
| Dynamic load (Fy), maximum | [N] | 3000 |
| Dynamic load (Fz), maximum | [N] | 3000 |
| Dynamic load torque (Mx), maximum | [Nm] | 350 |
| Dynamic load torque (My), maximum | [Nm] | 300 |
| Dynamic load torque (Mz), maximum | [Nm] | 300 |
| Drive shaft force (Frd), maximum | [N] | 700 |
| Drive shaft torque (Mta), maximum | [Nm] | 55 |
| Ball screw diameter (d ₀) | [mm] | 25 |
| Ball screw lead (p) | [mm] | 5, 10, 20, 50 |
| Weight of unit with zero stroke of every 100 mm of stroke of each carriage | [kg] | 11,57 1,08 4,26 |

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

| Input speed [rpm] | Screw lead [mm] | | | |
|-------------------|-----------------|--------|--------|--------|
| | p = 5 | p = 10 | p = 20 | p = 50 |
| 150 | 1,1 | 1,5 | 1,8 | 2,3 |
| 1500 | 1,7 | 2,1 | 2,3 | 3,0 |
| 3000 | 2,1 | 2,5 | 2,6 | 3,6 |

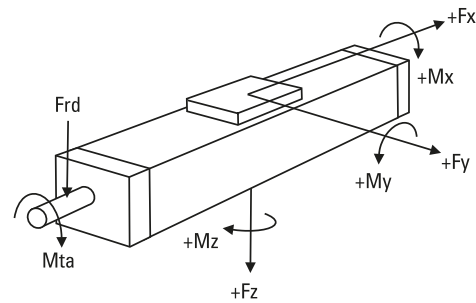
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



A mounting clamp must be installed at least every 750 mm to be able to operate at 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 consist of two profiles where the joint between the two profiles must be adequately supported on both sides.

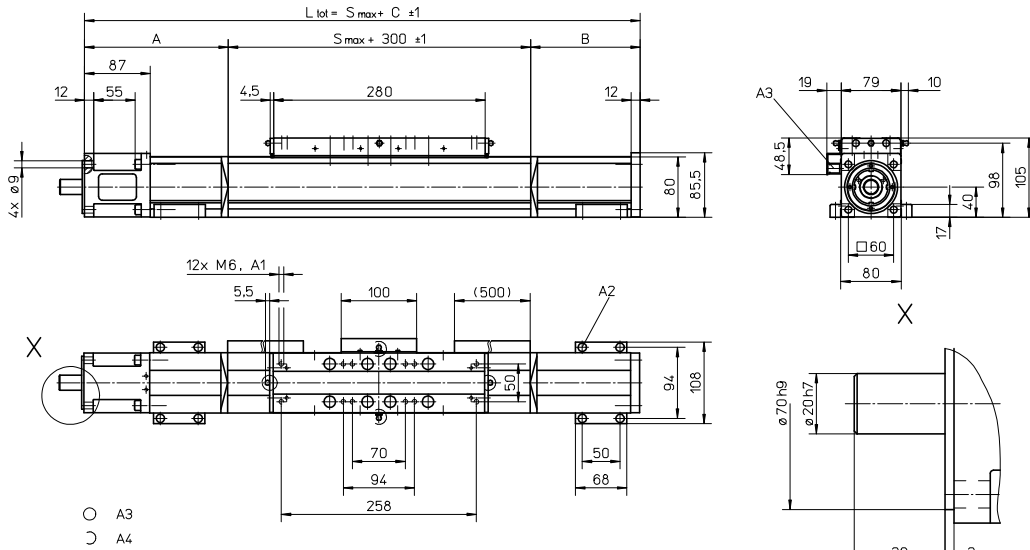
Definition of Forces



WM80D

Ball Screw Drive, Ball Guide, Double Ball Nuts

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



A1: depth 12 mm
 A2: socket cap screw ISO4762-M6x20 8.8
 A3: ENF inductive sensor rail kit (optional - see page 172)

A4: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature
 A5: can be changed over to one of three alternative lubrication points by customer

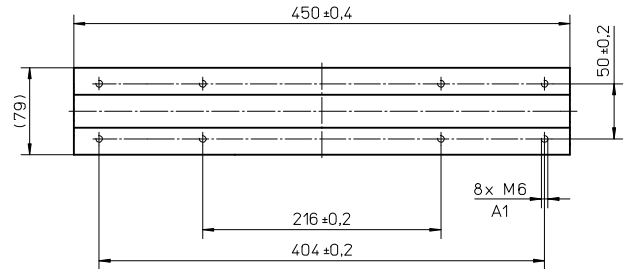
| Stroke length (S _{max}) [mm] | A [mm] | B [mm] | C [mm] |
|--|--------|--------|-----------|
| 0 - 780 (0 - 610) | 120 | 80 | 500 (670) |
| 781 - 1535 (611 - 1365) | 170 | 125 | 595 (765) |
| 1536 - 2375 (1366 - 2205) | 190 | 145 | 635 (805) |
| 2376 - 3205 (2206 - 3035) | 215 | 170 | 685 (855) |

Values between brackets = for units with long carriage

| Stroke length (S _{max}) [mm] | A [mm] | B [mm] | C [mm] |
|--|--------------------------|--------|-----------|
| 3206 - 4045 (3036 - 3875) | 235 | 190 | 725 (895) |
| 4046 - 4885 (3876 - 4715) | 255 | 210 | 765 (935) |
| 4886 - 5000 (4716 - 4830) | 280 | 235 | 815 (985) |
| 5001 - 11000 (4717 - 10830) | contact customer service | | |

Long Carriage

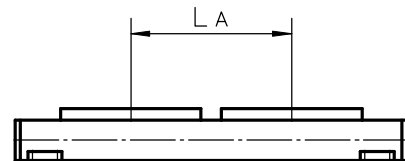
| Parameter | WM80D |
|---|-------|
| Carriage length [mm] | 450 |
| Dynamic load torque (M _y), maximum [Nm] | 750 |
| Dynamic load torque (M _z), maximum [Nm] | 750 |
| Weight [kg] | 6,4 |



A1: depth 12 mm

Double Carriages

| Parameter | WM80D |
|---|----------------------------|
| Minimum distance between carriages (L _A) [mm] | 360 |
| Dynamic load (F _y), maximum [N] | 6000 |
| Dynamic load (F _z), maximum [N] | 6000 |
| Dynamic load torque (M _y), maximum [Nm] | L A ¹ × 3 |
| Dynamic load torque (M _z), maximum [Nm] | L A ¹ × 3 |
| Force required to move second carriage [N] | 25 |
| Total length (L _{tot}) [mm] | S _{max} + C + L A |



¹ Value in mm

WM80S

Ball Screw Drive, Ball Guide, Singel Ball Nut, Short Carriage

- » Ordering key - see page 191
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WM80S |
|---------------------------|---|
| Profile size (w × h) [mm] | 80 × 80 |
| Type of screw | ball screw with single nut |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

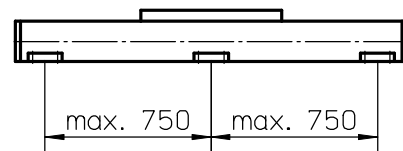
| Parameter | | WM80S |
|-----------------------------------|---------------------|---------------|
| Stroke length (Smax), maximum | [mm] | 5000 |
| Linear speed, maximum | [m/s] | 2,5 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,02 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 3500 |
| Dynamic load (Fy), maximum | [N] | 2100 |
| Dynamic load (Fz), maximum | [N] | 2100 |
| Dynamic load torque (Mx), maximum | [Nm] | 150 |
| Dynamic load torque (My), maximum | [Nm] | 180 |
| Dynamic load torque (Mz), maximum | [Nm] | 180 |
| Drive shaft force (Frd), maximum | [N] | 700 |
| Drive shaft torque (Mta), maximum | [Nm] | 55 |
| Ball screw diameter (do) | [mm] | 25 |
| Ball screw lead (p) | [mm] | 5, 10, 20, 50 |
| Weight | [kg] | |
| of unit with zero stroke | | 7,0 |
| of every 100 mm of stroke | | 1,1 |
| of each carriage | | 1,6 |

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

| Input speed [rpm] | Screw lead [mm] | | | |
|-------------------|-----------------|--------|--------|--------|
| | p = 5 | p = 10 | p = 20 | p = 50 |
| 150 | 0,9 | 1,1 | 1,3 | 2,0 |
| 1500 | 1,3 | 1,5 | 1,8 | 2,4 |
| 3000 | 1,7 | 1,8 | 2,0 | 2,9 |

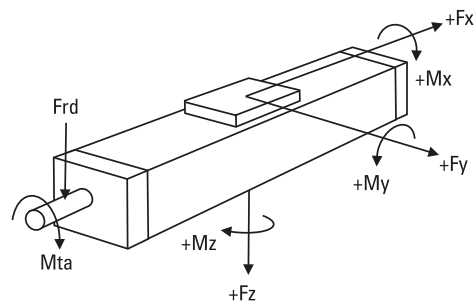
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



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

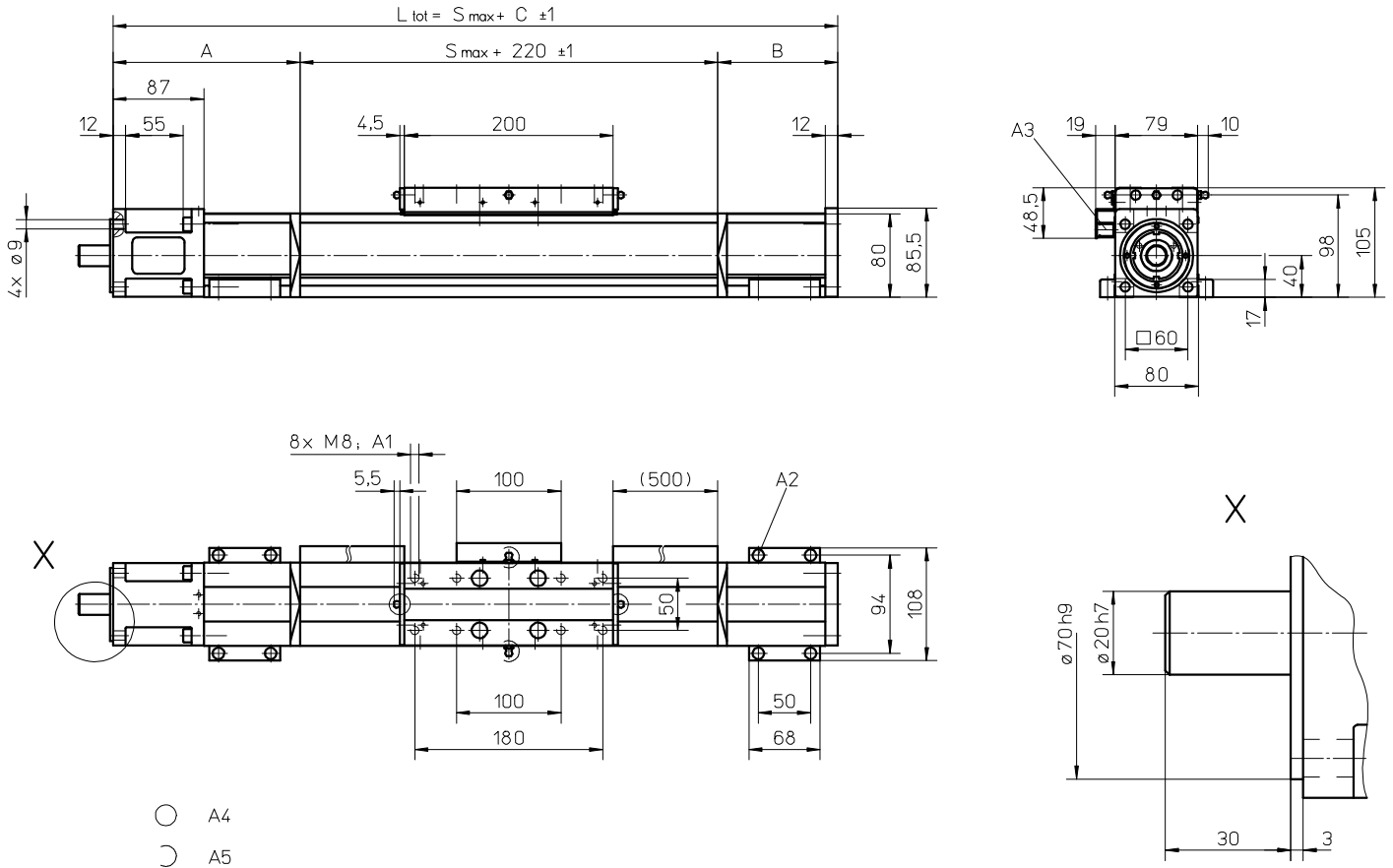
Definition of Forces



WM80S

Ball Screw Drive, Ball Guide, Singel Ball Nut, Short Carriage

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



A1: depth 12 mm
 A2: socket cap screw ISO4762-M6x20 8.8
 A3: ENF inductive sensor rail kit (optional - see page 172)

A4: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature
 A5: can be changed over to one of three alternative lubrication points by customer

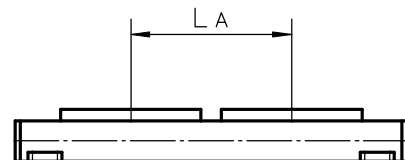
| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|--------|
| 0 - 680 | 95 | 35 | 350 |
| 681 - 1310 | 125 | 80 | 425 |
| 1311 - 2065 | 150 | 105 | 475 |
| 2066 - 2830 | 170 | 125 | 515 |

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|--------|
| 2831 - 3590 | 195 | 150 | 565 |
| 3591 - 4355 | 215 | 170 | 605 |
| 4356 - 5000 | 235 | 190 | 645 |

Double Carriages

| Parameter | | WM80S |
|---|------|------------------------|
| Minimum distance between carriages (LA) | [mm] | 280 |
| Dynamic load (Fy), maximum | [N] | 4200 |
| Dynamic load (Fz), maximum | [N] | 4200 |
| Dynamic load torque (My), maximum | [Nm] | L A ¹ × 2,1 |
| Dynamic load torque (Mz), maximum | [Nm] | L A ¹ × 2,1 |
| Force required to move second carriage | [N] | 22,5 |
| Total length (L tot) | [mm] | Smax + C + L A |

¹ Value in mm



WM120D

Ball Screw Drive, Ball Guide, Double Ball Nuts

- » Ordering key - see page 191
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WM120D |
|---------------------------|---|
| Profile size (w × h) [mm] | 120 × 120 |
| Type of screw | ball screw with double nuts |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

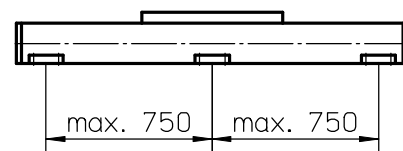
| Parameter | | WM120D |
|---|---------------------|-----------------------|
| Stroke length (Smax), maximum screw lead 5, 10, 20 mm screw lead 40 mm | [mm] | 11000 5000 |
| Linear speed, maximum | [m/s] | 2,0 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,01 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum screw lead 5, 10, 20 mm screw lead 40 mm | [N] | 12000 8000 |
| Dynamic load (Fy), maximum | [N] | 6000 |
| Dynamic load (Fz), maximum | [N] | 6000 |
| Dynamic load torque (Mx), maximum | [Nm] | 500 |
| Dynamic load torque (My), maximum | [Nm] | 600 |
| Dynamic load torque (Mz), maximum | [Nm] | 600 |
| Drive shaft force (Frd), maximum | [N] | 1000 |
| Drive shaft torque (Mta), maximum | [Nm] | 80 |
| Ball screw diameter (do) | [mm] | 32 |
| Ball screw lead (p) | [mm] | 5, 10, 20, 40 |
| Weight of unit with zero stroke of every 100 mm of stroke of each carriage | [kg] | 25,91 1,93 9,25 |

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

| Input speed [rpm] | Screw lead [mm] | | | |
|-------------------|-----------------|--------|--------|--------|
| | p = 5 | p = 10 | p = 20 | p = 40 |
| 150 | 1,4 | 2,0 | 2,3 | 2,4 |
| 1500 | 2,5 | 3,0 | 3,3 | 3,8 |
| 3000 | 3,0 | 3,7 | 4,0 | 4,3 |

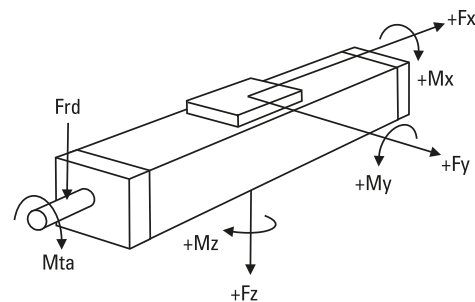
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



A mounting clamp must be installed at least every 750 mm to be able to operate at 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 5400 mm consist of two profiles where the joint between the two profiles must be adequately supported on both sides.

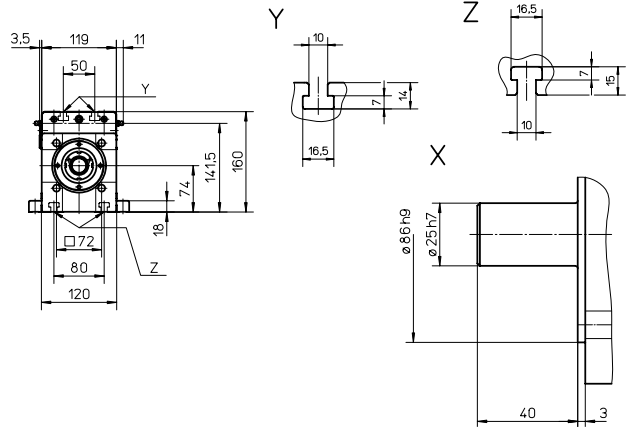
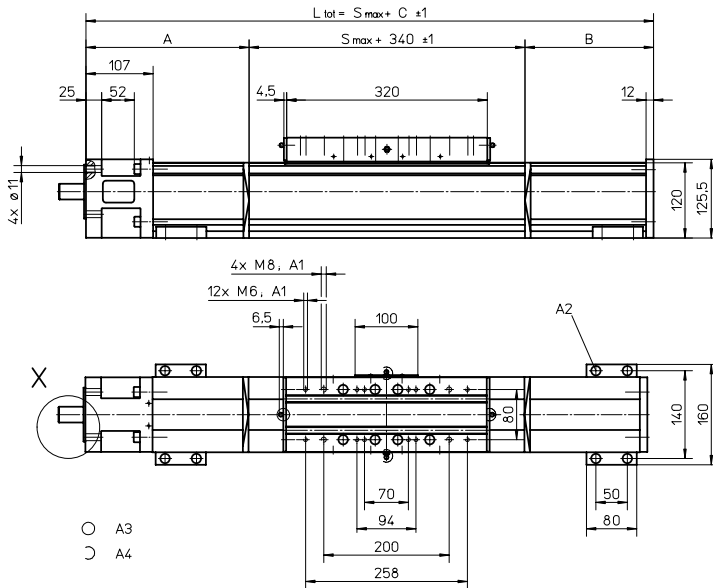
Definition of Forces



WM120D

Ball Screw Drive, Ball Guide, Double Ball Nuts

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



A1: depth 22
 A2: socket cap screw ISO4762-M8x20 8.8

A3: tapered lubricating nipple to DIN71412 M8x1 on fixed-bearing side as standard feature
 A4: can be changed over to one of the three alternative lubricating points by the customer

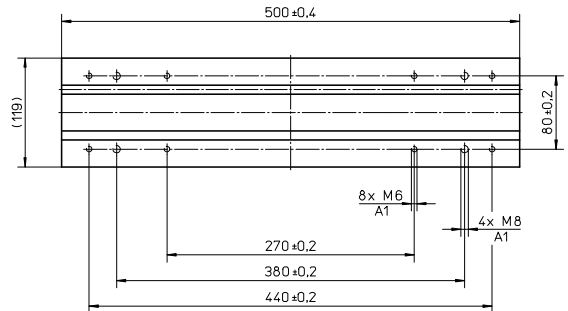
| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|------------|
| 0 - 890 (0 - 710) | 155 | 100 | 595 (775) |
| 891 - 1695 (711 - 1515) | 225 | 170 | 735 (915) |
| 1696 - 2625 (1516 - 2445) | 260 | 205 | 805 (985) |
| 2626 - 3555 (2446 - 3375) | 295 | 240 | 875 (1055) |

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|-----------------------------|--------------------------|--------|-------------|
| 3556 - 4485 (3376 - 4305) | 330 | 275 | 945 (1125) |
| 4486 - 5000 (4306 - 4820) | 365 | 310 | 1015 (1195) |
| 5001 - 11000 (4307 - 10820) | contact customer service | | |

Values between brackets = for units with long carriage

Long Carriage

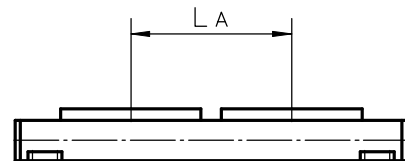
| Parameter | WM120D |
|--|--------|
| Carriage length [mm] | 500 |
| Dynamic load torque (My), maximum [Nm] | 1500 |
| Dynamic load torque (Mz), maximum [Nm] | 1500 |
| Weight [kg] | 14,2 |



A1: depth 22

Double Carriages

| Parameter | WM120D |
|--|---------------------|
| Minimum distance between carriages (LA) [mm] | 450 |
| Dynamic load (Fy), maximum [N] | 12000 |
| Dynamic load (Fz), maximum [N] | 12000 |
| Dynamic load torque (My), maximum [Nm] | $L A^1 \times 6$ |
| Dynamic load torque (Mz), maximum [Nm] | $L A^1 \times 6$ |
| Force required to move second carriage [N] | 30 |
| Total length (L tot) [mm] | $S_{max} + C + L A$ |



¹ Value in mm

WV60

Ball Screw Drive, No Guides

- » Ordering key - see page 192
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WV60 |
|---------------------------|---|
| Profile size (w × h) [mm] | 60 × 60 |
| Type of screw | ball screw with double nut |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

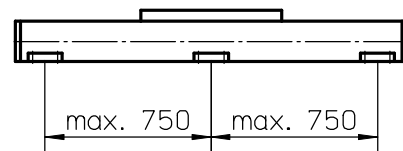
| Parameter | WV60 |
|---|------------------------------|
| Stroke length (S _{max}), maximum screw lead 5, 20 mm screw lead 50 mm | [mm] 11000 5000 |
| Linear speed, maximum | [m/s] 2,5 |
| Acceleration, maximum | [m/s ²] 20 |
| Repeatability | [± mm] 0,01 |
| Input speed, maximum | [rpm] 3000 |
| Operation temperature limits | [°C] 0 – 80 |
| Dynamic load (F _x), maximum | [N] 4000 |
| Dynamic load (F _y), maximum | [N] 0 |
| Dynamic load (F _z), maximum | [N] 0 |
| Dynamic load torque (M _x), maximum | [Nm] 0 |
| Dynamic load torque (M _y), maximum | [Nm] 0 |
| Dynamic load torque (M _z), maximum | [Nm] 0 |
| Drive shaft force (F _{rd}), maximum | [N] 500 |
| Drive shaft torque (M _{ta}), maximum | [Nm] 35 |
| Ball screw diameter (d _o) | [mm] 20 |
| Ball screw lead (p) | [mm] 5, 20, 50 |
| Weight of unit with zero stroke of every 100 mm of stroke of each carriage | [kg] 4,72 0,55 1,42 |

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

| Input speed [rpm] | Screw lead [mm] | | |
|-------------------|-----------------|--------|--------|
| | p = 5 | p = 20 | p = 50 |
| 150 | 0,7 | 0,9 | 1,1 |
| 1500 | 1,3 | 1,5 | 1,5 |
| 3000 | 1,7 | 1,9 | 2,1 |

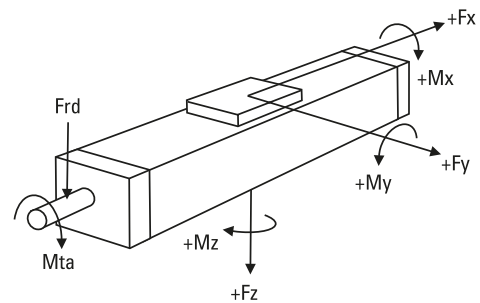
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



A mounting clamp must be installed at least every 750 mm to be able to operate at 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 consist of two profiles where the joint between the two profiles must be adequately supported on both sides.

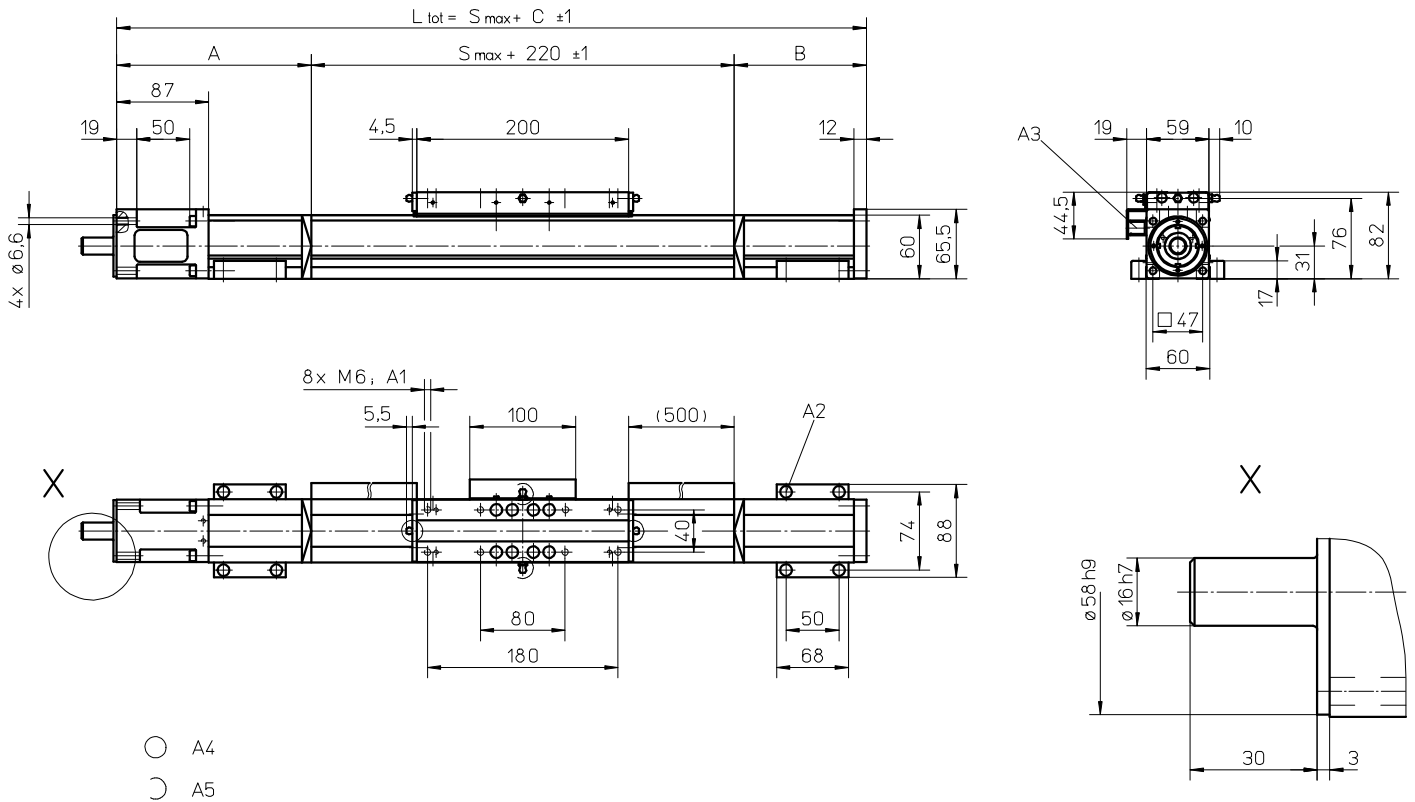
Definition of Forces



WV60

Ball Screw Drive, No Guides

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



- A4
- A5

A1: depth 11
 A2: socket cap screw ISO4762-M6×20 8.8
 A3: ENF inductive sensor rail kit (optional - see page 172)

A4: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature
 A5: can be changed over to one of the three alternative lubricating points by the customer

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|--------|
| 0 - 690 | 130 | 80 | 430 |
| 691 - 1415 | 155 | 105 | 480 |
| 1416 - 2155 | 175 | 125 | 520 |
| 2156 - 2885 | 200 | 150 | 570 |

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------------------------|--------|--------|
| 2886 - 3625 | 220 | 170 | 610 |
| 3626 - 4355 | 245 | 195 | 660 |
| 4256 - 5095 | 265 | 215 | 700 |
| 5096 - 11000 | contact customer service | | |

WV80

Ball Screw Drive, No Guides

- » Ordering key - see page 192
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WV80 |
|---------------------------|---|
| Profile size (w × h) [mm] | 80 × 80 |
| Type of screw | ball screw with double nuts |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

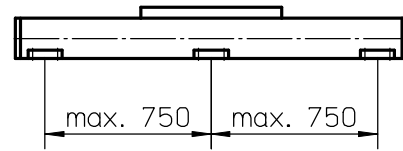
| Parameter | | WV80 |
|--|---------------------|---------------|
| Stroke length (Smax), maximum | [mm] | 11000 |
| screw lead 5, 10, 20 mm | | 5000 |
| screw lead 50 mm | | |
| Linear speed, maximum | [m/s] | 2,5 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,01 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (F _x), maximum | [N] | 5000 |
| Dynamic load (F _y), maximum | [N] | 0 |
| Dynamic load (F _z), maximum | [N] | 0 |
| Dynamic load torque (M _x), maximum | [Nm] | 0 |
| Dynamic load torque (M _y), maximum | [Nm] | 0 |
| Dynamic load torque (M _z), maximum | [Nm] | 0 |
| Drive shaft force (F _{rd}), maximum | [N] | 700 |
| Drive shaft torque (M _{ta}), maximum | [Nm] | 55 |
| Ball screw diameter (d ₀) | [mm] | 25 |
| Ball screw lead (p) | [mm] | 5, 10, 20, 50 |
| Weight | [kg] | |
| of unit with zero stroke | | 7,95 |
| of every 100 mm of stroke | | 0,99 |
| of each carriage | | 2,25 |

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

| Input speed [rpm] | Screw lead [mm] | | | |
|-------------------|-----------------|--------|--------|--------|
| | p = 5 | p = 10 | p = 20 | p = 50 |
| 150 | 0,9 | 1,1 | 1,3 | 1,4 |
| 1500 | 1,6 | 1,9 | 2,1 | 2,3 |
| 3000 | 2,0 | 2,4 | 2,6 | 3,0 |

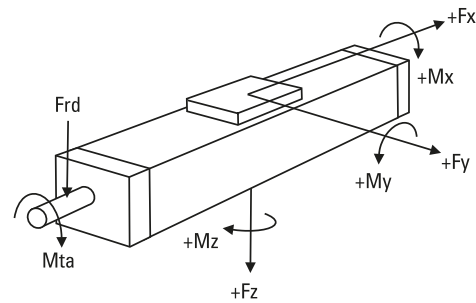
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



A mounting clamp must be installed at least every 750 mm to be able to operate at 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 consist of two profiles where the joint between the two profiles must be adequately supported on both sides.

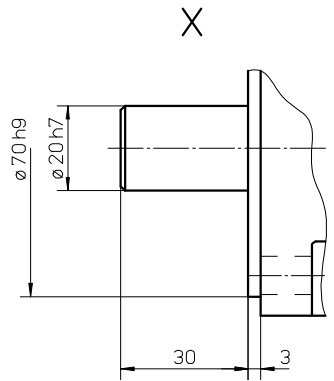
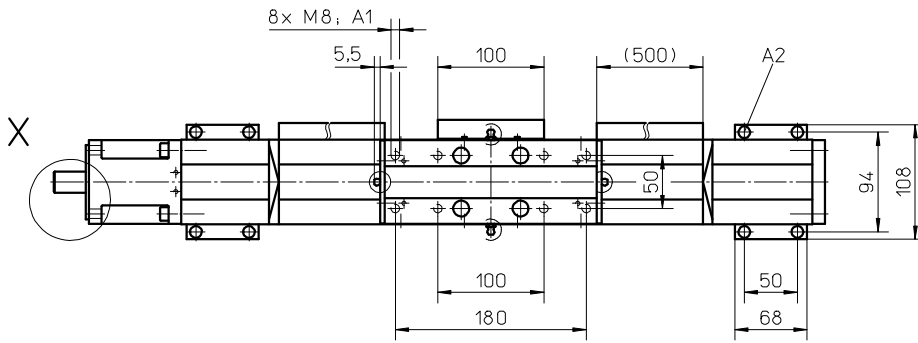
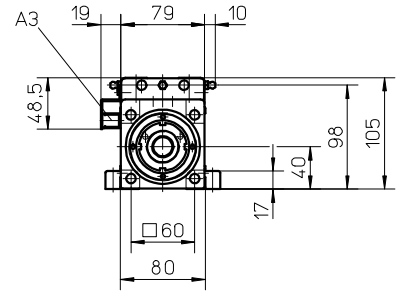
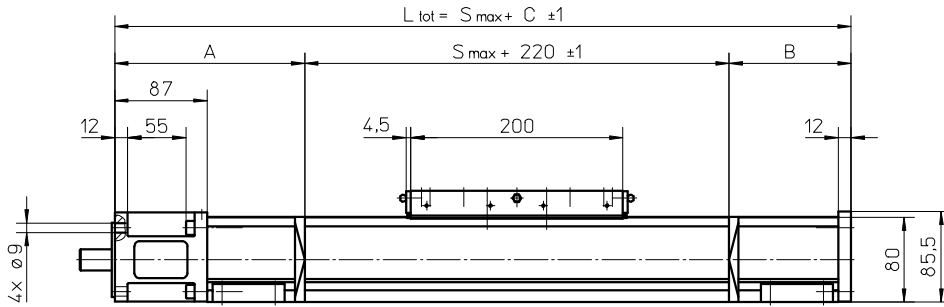
Definition of Forces



WV80

Ball Screw Drive, No Guides

| | |
|-------------------|-------------------|
| Dimensions | Projection |
| METRIC | |



- A4
- ⊂ A5

A1: depth 12 mm

A2: socket cap screw ISO4762-M6×20 8.8

A3: ENF inductive sensor rail kit (optional - see page 172)

A4: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature

A5: can be changed over to one of three alternative lubrication points by customer

| Stroke length (S _{max}) [mm] | A [mm] | B [mm] | C [mm] |
|--|--------|--------|--------|
| 0 - 775 | 125 | 50 | 395 |
| 776 - 1670 | 145 | 95 | 460 |
| 1671 - 2505 | 170 | 115 | 505 |
| 2506 - 3340 | 190 | 140 | 550 |

| Stroke length (S _{max}) [mm] | A [mm] | B [mm] | C [mm] |
|--|--------------------------|--------|--------|
| 3341 - 4175 | 210 | 160 | 590 |
| 4176 - 5015 | 235 | 180 | 635 |
| 5016 - 11000 | contact customer service | | |

WV120

Ball Screw Drive, No Guides

- » Ordering key - see page 192
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | WV120 |
|---------------------------|---|
| Profile size (w × h) [mm] | 120 × 120 |
| Type of screw | ball screw with double nuts |
| Carriage sealing system | self-adjusting plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

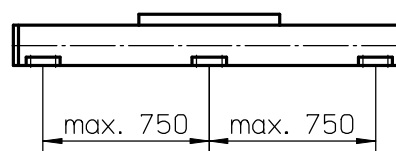
| Parameter | | WV120 |
|---------------------------------------|---------------------|---------------|
| Stroke length (Smax), maximum | [mm] | 11000 |
| screw lead 5, 10, 20 mm | | 5000 |
| screw lead 40 mm | | |
| Linear speed, maximum | [m/s] | 2,0 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,01 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 12000 |
| screw lead 5, 10, 20 mm | | 8000 |
| screw lead 40 mm | | |
| Dynamic load (Fy), maximum | [N] | 0 |
| Dynamic load (Fz), maximum | [N] | 0 |
| Dynamic load torque (Mx), maximum | [Nm] | 0 |
| Dynamic load torque (My), maximum | [Nm] | 0 |
| Dynamic load torque (Mz), maximum | [Nm] | 0 |
| Drive shaft force (Frd), maximum | [N] | 1000 |
| Drive shaft torque (Mta), maximum | [Nm] | 80 |
| Ball screw diameter (d ₀) | [mm] | 32 |
| Ball screw lead (p) | [mm] | 5, 10, 20, 40 |
| Weight | [kg] | |
| of unit with zero stroke | | 18,10 |
| of every 100 mm of stroke | | 1,94 |
| of each carriage | | 4,75 |

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

| Input speed [rpm] | Screw lead [mm] | | | |
|-------------------|-----------------|--------|--------|--------|
| | p = 5 | p = 10 | p = 20 | p = 40 |
| 150 | 1,0 | 1,1 | 1,4 | 1,5 |
| 1500 | 2,1 | 2,2 | 2,5 | 2,8 |
| 3000 | 2,4 | 2,6 | 3,0 | 3,5 |

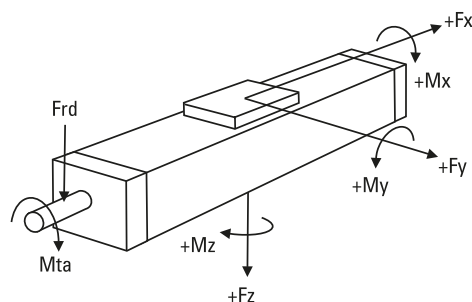
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



A mounting clamp must be installed at least every 750 mm to be able to operate at 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 5400 mm consist of two profiles where the joint between the two profiles must be adequately supported on both sides.

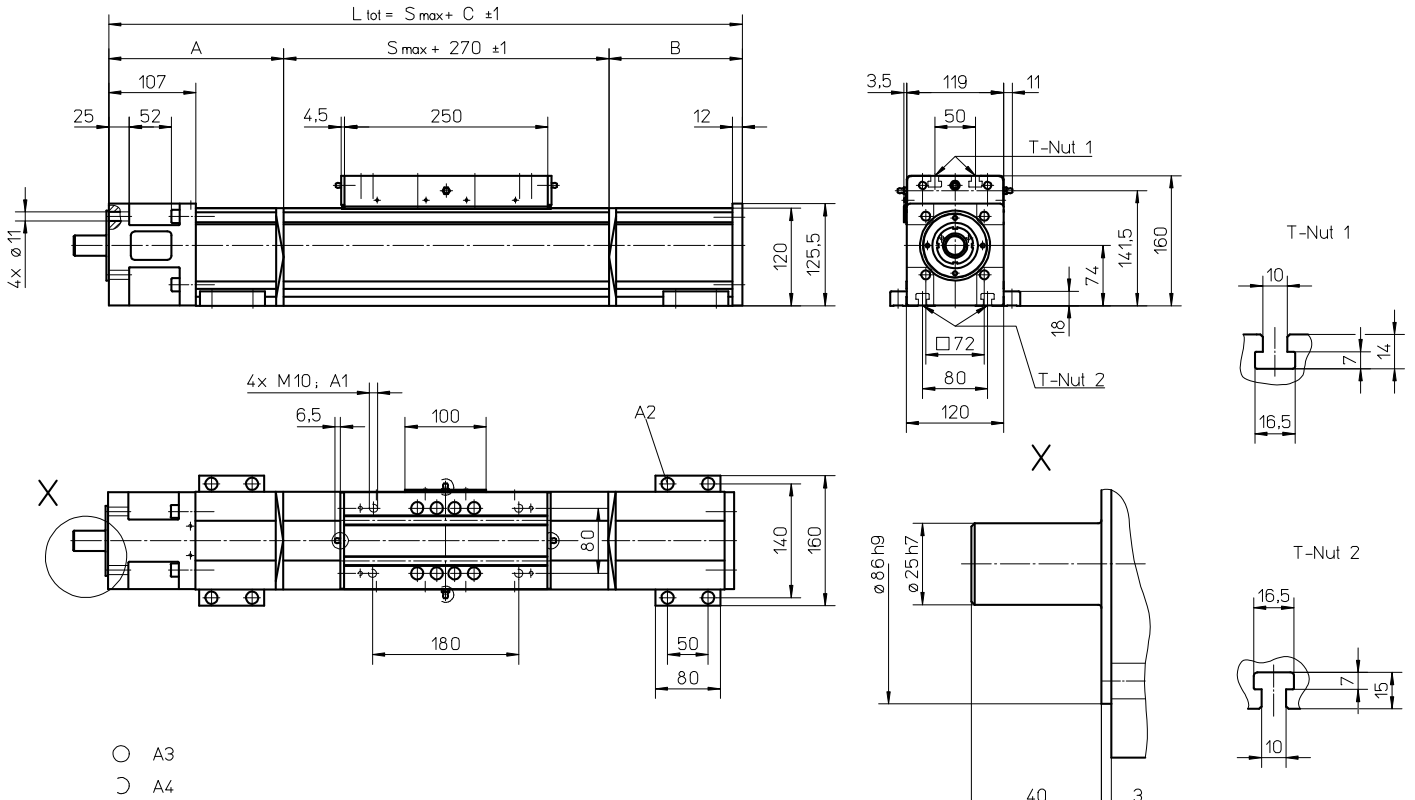
Definition of Forces



WV120

Ball Screw Drive, No Guides

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



- A3
- A4

A1: depth 22
 A2: socket cap screw ISO4762-M8×20 8.8

A3: tapered lubricating nipple to DIN71412 M8×1 on fixed-bearing side as standard feature
 A4: can be changed over to one of the three alternative lubricating points by the customer

| Stroke length (S _{max}) [mm] | A [mm] | B [mm] | C [mm] |
|--|--------|--------|--------|
| 0 - 940 | 145 | 50 | 465 |
| 941 - 1860 | 180 | 120 | 570 |
| 1861 - 2790 | 215 | 155 | 640 |
| 2791 - 3720 | 250 | 190 | 710 |

| Stroke length (S _{max}) [mm] | A [mm] | B [mm] | C [mm] |
|--|--------------------------|--------|--------|
| 3721 - 4650 | 285 | 225 | 780 |
| 4651 - 5000 | 320 | 255 | 845 |
| 5001 - 11000 | contact customer service | | |

MLSM60D

Ball Screw Drive, Ball Guide

- » Ordering key - see page 193
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | MLSM60D |
|---------------------------|---|
| Profile size (w × h) [mm] | 160 × 65 |
| Type of screw | ball screw with double nuts |
| Carriage sealing system | plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

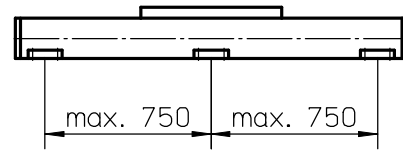
| Parameter | | MLSM60D |
|---------------------------------------|---------------------|---------------|
| Stroke length (Smax), maximum | [mm] | 5500 |
| Linear speed, maximum | [m/s] | 2,5 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,01 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 5000 |
| Dynamic load (Fy), maximum | [N] | 6000 |
| Dynamic load (Fz), maximum | [N] | 6000 |
| Dynamic load torque (Mx), maximum | [Nm] | 400 |
| Dynamic load torque (My), maximum | [Nm] | 460 |
| Dynamic load torque (Mz), maximum | [Nm] | 460 |
| Drive shaft force (Frd), maximum | [N] | 350 |
| Drive shaft torque (Mta), maximum | [Nm] | 60 |
| Ball screw diameter (d ₀) | [mm] | 25 |
| Ball screw lead (p) | [mm] | 5, 10, 20, 50 |
| Weight | [kg] | |
| of unit with zero stroke | | 14,40 |
| of every 100 mm of stroke | | 1,65 |
| of each carriage | | 5,70 |

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

| Input speed [rpm] | Screw lead [mm] | | | |
|-------------------|-----------------|--------|--------|--------|
| | p = 5 | p = 10 | p = 20 | p = 50 |
| 150 | 1,0 | 1,6 | 1,9 | 2,7 |
| 1500 | 1,6 | 2,2 | 2,3 | 3,4 |
| 3000 | 2,0 | 2,6 | 2,6 | 4,0 |

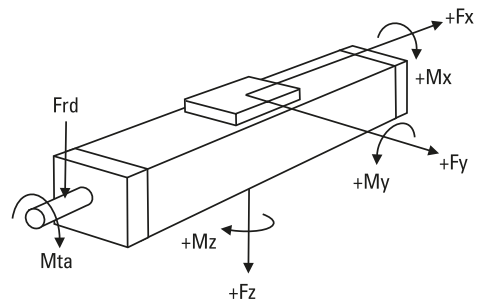
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



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

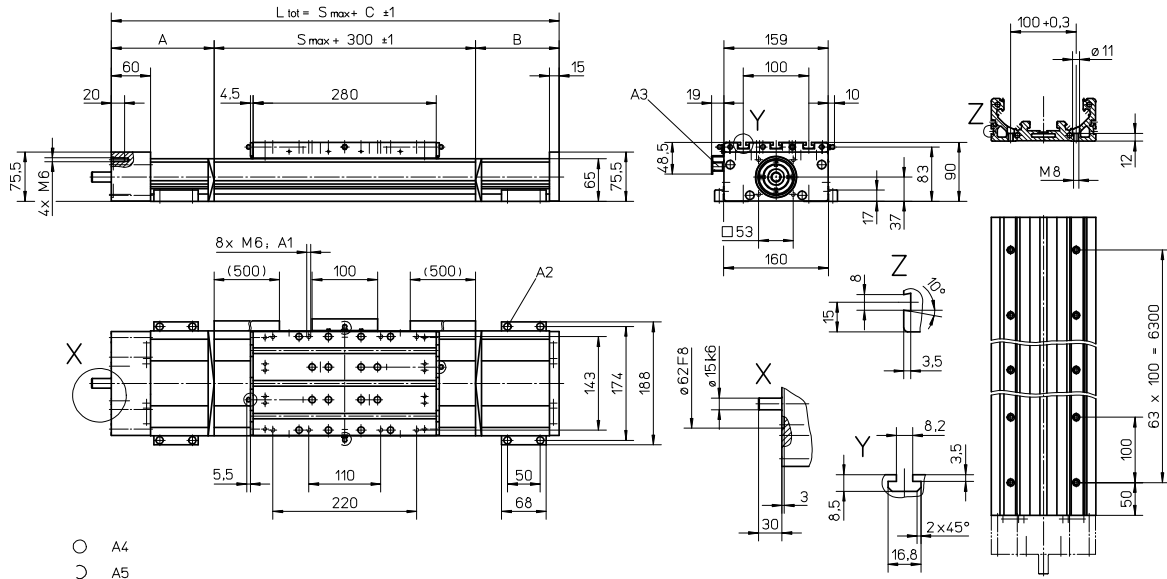
Definition of Forces



MLSM60D

Ball Screw Drive, Ball Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



- A4
- A5

A1: depth 10
 A2: socket cap screw ISO4762-M6x20 8.8
 A3: ENF inductive sensor rail kit (optional - see page 172)

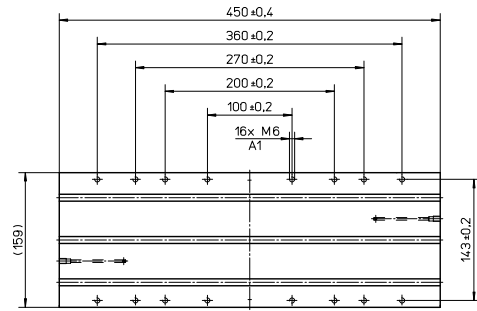
A4: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature
 A5: can be changed over to one of the three alternative lubricating points by the customer

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|-----------|
| 0 - 750 (0 - 580) | 90 | 45 | 435 (605) |
| 751 - 1220 (581 - 1050) | 105 | 90 | 495 (665) |
| 1221 - 1980 (1051 - 1810) | 125 | 110 | 535 (705) |
| 1981 - 2730 (1811 - 2560) | 150 | 135 | 585 (765) |

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|-----------|
| 2731 - 3490 (2561 - 3320) | 170 | 155 | 625 (795) |
| 3491 - 4240 (3321 - 4070) | 195 | 180 | 675 (845) |
| 4241 - 5000 (4071 - 4830) | 215 | 200 | 715 (885) |
| 5001 - 5500 (4831 - 5330) | 235 | 220 | 755 (925) |

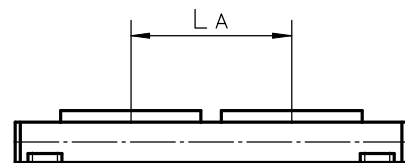
Values between brackets = for units with long carriage

| Long Carriage | | |
|-----------------------------------|------|---------|
| Parameter | | MLSM60D |
| Carriage length | [mm] | 450 |
| Dynamic load torque (My), maximum | [Nm] | 940 |
| Dynamic load torque (Mz), maximum | [Nm] | 940 |
| Weight | [kg] | 6,5 |



A1: depth 10

| Double Carriages | | |
|---|------|---------------|
| Parameter | | MLSM60D |
| Minimum distance between carriages (LA) | [mm] | 320 |
| Dynamic load (Fy), maximum | [N] | 12000 |
| Dynamic load (Fz), maximum | [N] | 12000 |
| Dynamic load torque (My), maximum | [Nm] | LA' × 6 |
| Dynamic load torque (Mz), maximum | [Nm] | LA' × 6 |
| Force required to move second carriage | [N] | 27 |
| Total length (L tot) | [mm] | Smax + C + LA |



¹ Value in mm

MLSM80D

Ball Screw Drive, Ball Guide

- » Ordering key - see page 193
- » Accessories - see page 135
- » Additional data - see page 182

General Specifications

| Parameter | MLSM80D |
|---------------------------|---|
| Profile size (w × h) [mm] | 240 × 85 |
| Type of screw | ball screw with double nuts |
| Carriage sealing system | plastic cover band |
| Screw supports | included in all units that require screw supports |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

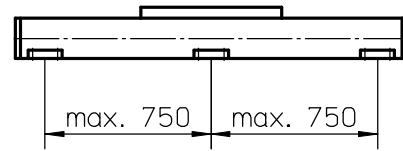
| Parameter | | MLSM80D |
|--|---------------------|---------------------|
| Stroke length (Smax), maximum | [mm] | 5200 |
| Linear speed, maximum | [m/s] | 2,0 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,01 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (F _x), maximum screw lead 5, 10, 20 mm screw lead 40 mm | [N] | 12000 8000 |
| Dynamic load (F _y), maximum | [N] | 8000 |
| Dynamic load (F _z), maximum | [N] | 8000 |
| Dynamic load torque (M _x), maximum | [Nm] | 780 |
| Dynamic load torque (M _y), maximum | [Nm] | 900 |
| Dynamic load torque (M _z), maximum | [Nm] | 900 |
| Drive shaft force (F _{rd}), maximum | [N] | 700 |
| Drive shaft torque (M _{ta}), maximum | [Nm] | 85 |
| Ball screw diameter (d ₀) | [mm] | 32 |
| Ball screw lead (p) | [mm] | 5, 10, 20, 40 |
| Weight of unit with zero stroke of every 100 mm of stroke of each carriage | [kg] | 29,5 2,7 11,5 |

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

| Input speed [rpm] | Screw lead [mm] | | | |
|-------------------|-----------------|--------|--------|--------|
| | p = 5 | p = 10 | p = 20 | p = 40 |
| 150 | 1,6 | 2,2 | 2,5 | 2,8 |
| 1500 | 2,7 | 3,2 | 3,4 | 4,0 |
| 3000 | 3,2 | 4,0 | 4,2 | 4,5 |

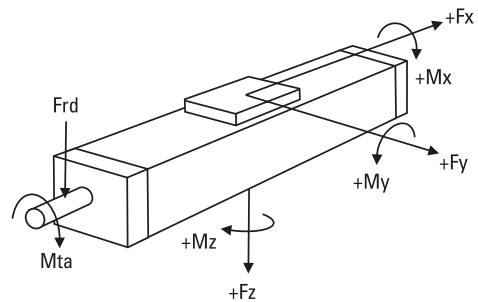
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile



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

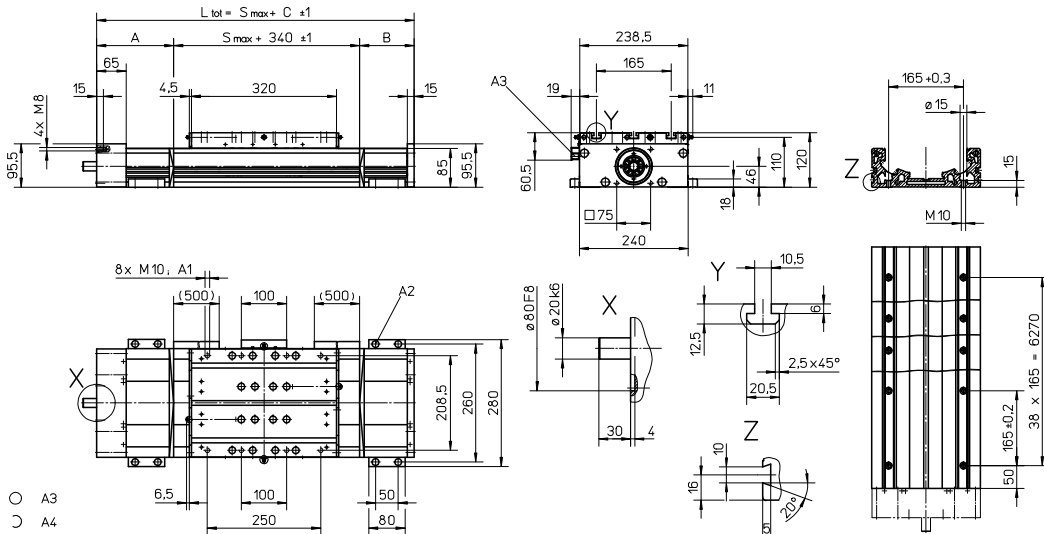
Definition of Forces



MLSM80D

Ball Screw Drive, Ball Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



- A1: depth 15
- A2: socket cap screw ISO4762-M8x20 8.8
- A3: ENF inductive sensor rail kit (optional - see page 172)

- A4: tapered lubricating nipple to DIN71412 M8x1 on fixed-bearing side as standard feature
- A5: can be changed over to one of the three alternative lubricating points by the customer

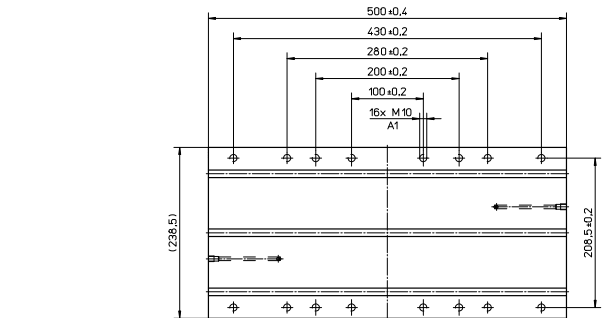
| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|-----------|
| 0 - 750 (0 - 570) | 100 | 90 | 530 (710) |
| 751 - 1140 (571 - 960) | 130 | 120 | 590 (770) |
| 1141 - 1880 (961 - 1700) | 160 | 150 | 650 (830) |
| 1881 - 2620 (1701 - 2440) | 190 | 180 | 710 (890) |

| Stroke length (Smax) [mm] | A [mm] | B [mm] | C [mm] |
|---------------------------|--------|--------|------------|
| 2621 - 3360 (2441 - 3180) | 220 | 210 | 770 (950) |
| 3361 - 4100 (3181 - 3920) | 250 | 240 | 830 (1010) |
| 4101 - 4840 (3921 - 4660) | 280 | 270 | 890 (1070) |
| 4841 - 5000 (4661 - 4820) | 310 | 300 | 950 (1130) |

Values between brackets = for units with long carriage

Long Carriage

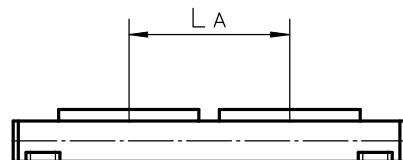
| Parameter | MLSM80D |
|--|---------|
| Carriage length [mm] | 500 |
| Dynamic load torque (My), maximum [Nm] | 1750 |
| Dynamic load torque (Mz), maximum [Nm] | 1750 |
| Weight [kg] | 16 |



A1: depth 15

Double Carriages

| Parameter | MLSM80D |
|--|---------------------|
| Minimum distance between carriages (LA) [mm] | 400 |
| Dynamic load (Fy), maximum [N] | 16000 |
| Dynamic load (Fz), maximum [N] | 16000 |
| Dynamic load torque (My), maximum [Nm] | $L A^1 \times 8$ |
| Dynamic load torque (Mz), maximum [Nm] | $L A^1 \times 8$ |
| Force required to move second carriage [N] | 35 |
| Total length (L tot) [mm] | $S_{max} + C + L A$ |



¹ Value in mm

M55

Ball Screw Drive, Ball Guide

» Ordering key - see page 194
» Accessories - see page 135
» Additional data - see page 182

General Specifications

| Parameter | M55 |
|---------------------------|---|
| Profile size (w × h) [mm] | 58 × 55 |
| Type of screw | ball screw with single nut |
| Carriage sealing system | self-adjusting steel cover band |
| Screw supports | number of screw supports to be specified by customer at order |
| Lubrication | lubrication of ball screw |
| Included accessories | none |

Performance Specifications

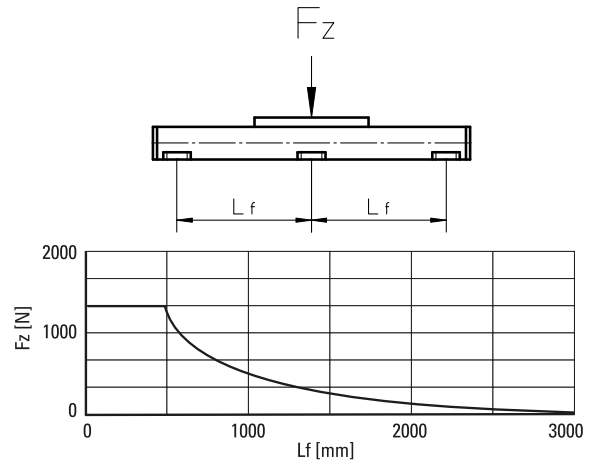
| Parameter | | M55 |
|-----------------------------------|---------------------|-----------|
| Stroke length (Smax), maximum | [mm] | 3000 |
| Linear speed, maximum | [m/s] | 1,6 |
| Acceleration, maximum | [m/s ²] | 8 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | 1000 |
| Dynamic load (Fy), maximum | [N] | 900 |
| Dynamic load (Fz), maximum | [N] | 900 |
| Dynamic load torque (Mx), maximum | [Nm] | 9 |
| Dynamic load torque (My), maximum | [Nm] | 48 |
| Dynamic load torque (Mz), maximum | [Nm] | 48 |
| Drive shaft force (Frd), maximum | [N] | 200 |
| Drive shaft torque (Mta), maximum | [Nm] | 12 |
| Screw diameter (d0) | [mm] | 16 |
| Screw lead (p) | [mm] | 5, 10, 20 |
| Weight | [kg] | |
| of unit with zero stroke | | 3,90 |
| of every 100 mm of stroke | | 0,56 |
| of carriage | | 1,20 |
| of option single screw support | | 0,83 |
| of option double screw supports | | 1,88 |

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

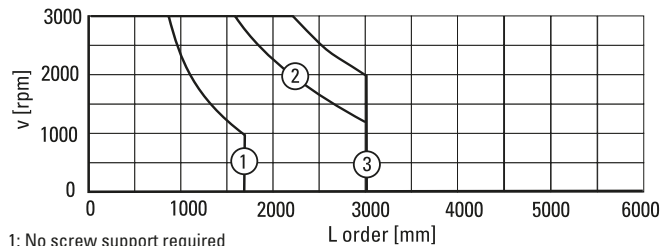
| Input speed [rpm] | Screw lead [mm] | | |
|---------------------------|-----------------|--------|--------|
| | p = 5 | p = 10 | p = 20 |
| 500 - no screw supports | 0,02 | 0,03 | 0,04 |
| 500 - with screw supports | 0,03 | 0,05 | 0,07 |

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

Deflection of the Profile

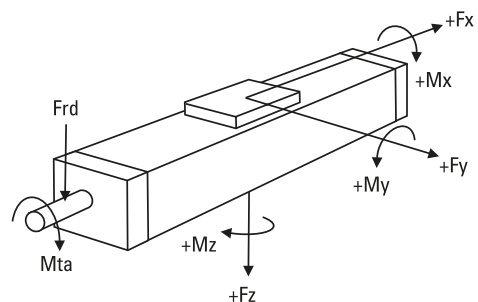


Critical Speed



1: No screw support required
2: Single screw support required
3: Double screw supports required

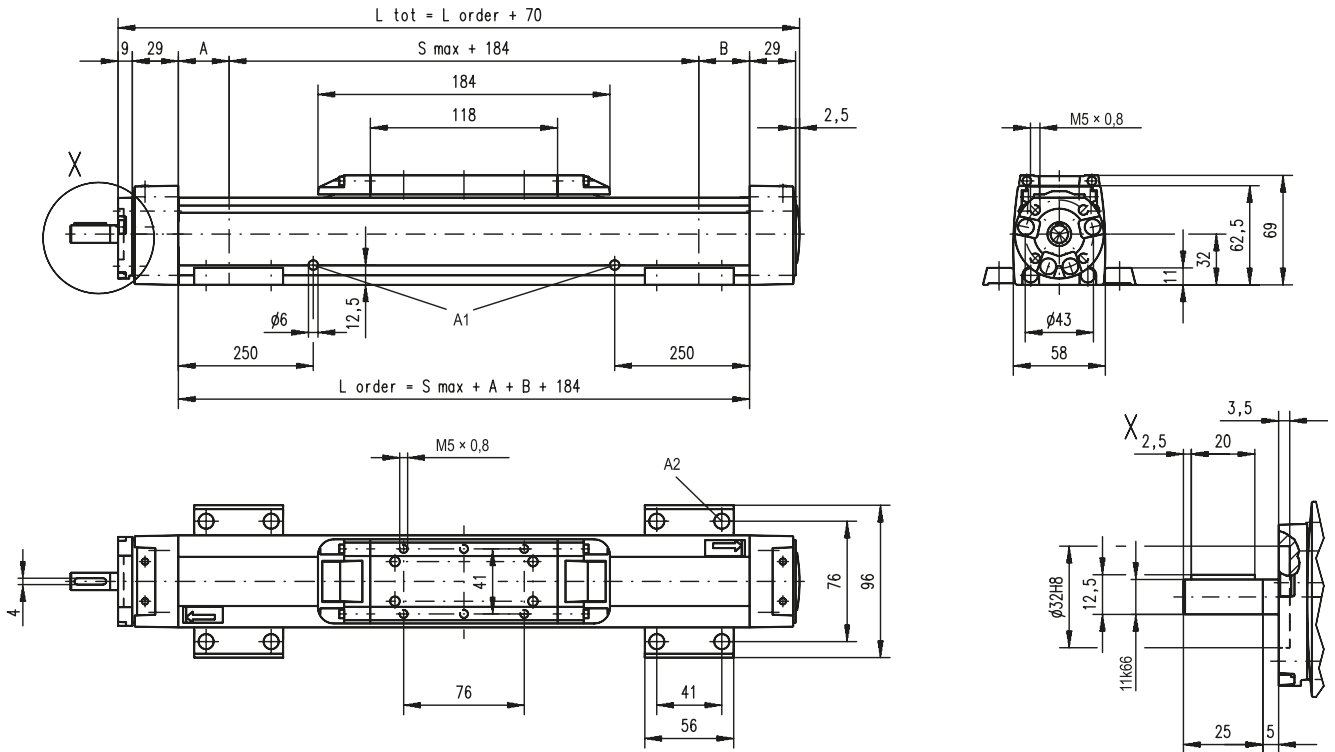
Definition of Forces



M55

Ball Screw Drive, Ball Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

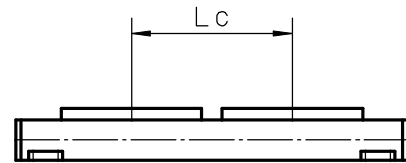


A1: lubrication holes
 A2: ø9,5/ø5,5 for socket head cap screw M5

| Screw support configuration | A [mm] | B [mm] | Ordering length (L_order) [mm] | Total length (L_tot) [mm] |
|-----------------------------|--------|--------|-------------------------------------|----------------------------|
| No screw support | 6 | 6 | $L_{order} = S_{max} + A + B + 184$ | $L_{tot} = L_{order} + 70$ |
| Single screw support | 40 | 40 | $L_{order} = S_{max} + A + B + 184$ | $L_{tot} = L_{order} + 70$ |
| Double screw supports | 92 | 92 | $L_{order} = S_{max} + A + B + 184$ | $L_{tot} = L_{order} + 70$ |

Double Carriages

| Parameter | M55 | |
|--|------|---------------------|
| Minimum distance between carriages (Lc) | [mm] | 200 |
| Dynamic load (Fy), maximum | [N] | 1350 |
| Dynamic load (Fz), maximum | [N] | 1350 |
| Dynamic load torque (My), maximum | [Nm] | $Lc^1 \times 0,675$ |
| Dynamic load torque (Mz), maximum | [Nm] | $Lc^1 \times 0,675$ |
| Force required to move second carriage | [N] | 2 |
| Weight of unit with zero stroke of carriages | [kg] | 6,5 2,4 |



| Screw support configuration | A [mm] | B [mm] | Ordering length (L_order) [mm] | Total length (L_tot) [mm] |
|-----------------------------|--------|--------|--|----------------------------|
| No screw support | 6 | 6 | $L_{order} = S_{max} + A + B + Lc + 184$ | $L_{tot} = L_{order} + 70$ |
| Single screw support | 40 | 40 | $L_{order} = S_{max} + A + B + Lc + 184$ | $L_{tot} = L_{order} + 70$ |
| Double screw supports | 92 | 92 | $L_{order} = S_{max} + A + B + Lc + 184$ | $L_{tot} = L_{order} + 70$ |

¹ Value in mm

M75

Ball Screw Drive, Ball Guide

» Ordering key - see page 194
» Accessories - see page 135
» Additional data - see page 182

General Specifications

| Parameter | M75 |
|---------------------------|---|
| Profile size (w × h) [mm] | 86 × 75 |
| Type of screw | ball screw with single nut |
| Carriage sealing system | self-adjusting steel cover band |
| Screw supports | number of screw supports to be specified by customer at order |
| Lubrication | lubrication of ball screw |
| Included accessories | none |

Performance Specifications

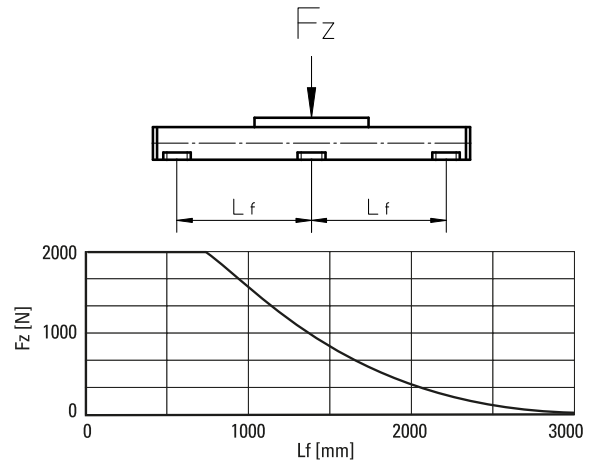
| Parameter | | M75 |
|-----------------------------------|---------------------|-------------|
| Stroke length (Smax), maximum | [mm] | 4000 |
| Linear speed, maximum | [m/s] | 1,0 |
| Acceleration, maximum | [m/s ²] | 8 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | 2500 |
| Dynamic load (Fy), maximum | [N] | 2000 |
| Dynamic load (Fz), maximum | [N] | 2000 |
| Dynamic load torque (Mx), maximum | [Nm] | 18 |
| Dynamic load torque (My), maximum | [Nm] | 130 |
| Dynamic load torque (Mz), maximum | [Nm] | 130 |
| Drive shaft force (Frd), maximum | [N] | 600 |
| Drive shaft torque (Mta), maximum | [Nm] | 30 |
| Screw diameter (d ₀) | [mm] | 20 |
| Screw lead (p) | [mm] | 5, 12,7, 20 |
| Weight | [kg] | |
| of unit with zero stroke | | 6,90 |
| of every 100 mm of stroke | | 1,05 |
| of carriage | | 2,50 |
| of option single screw support | | 1,70 |
| of option double screw supports | | 3,58 |

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

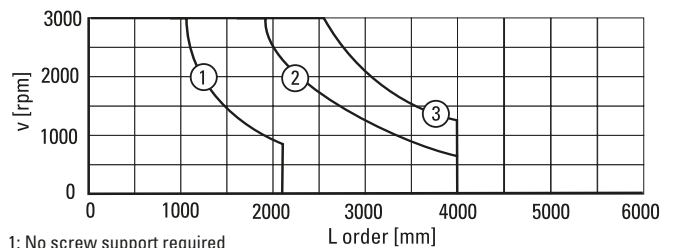
| Input speed [rpm] | Screw lead [mm] | | |
|---------------------------|-----------------|----------|--------|
| | p = 5 | p = 12,7 | p = 20 |
| 500 - no screw supports | 0,04 | 0,1 | 0,16 |
| 500 - with screw supports | 0,06 | 0,12 | 0,2 |

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

Deflection of the Profile

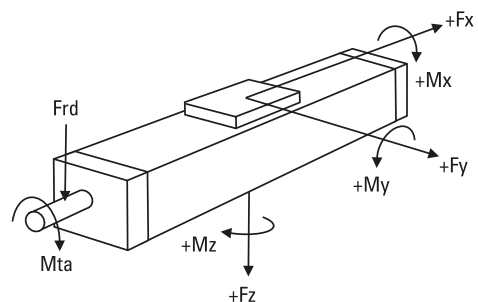


Critical Speed



1: No screw support required
2: Single screw support required
3: Double screw supports required

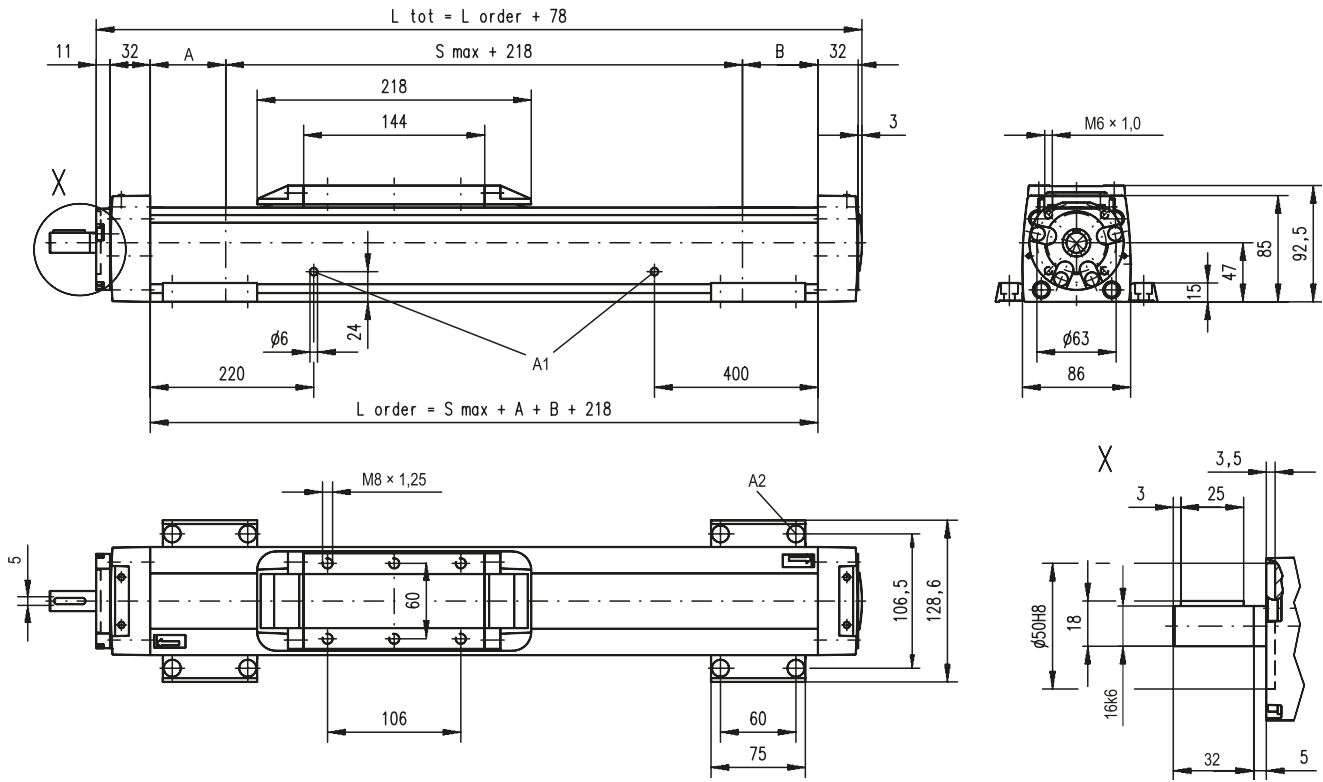
Definition of Forces



M75

Ball Screw Drive, Ball Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

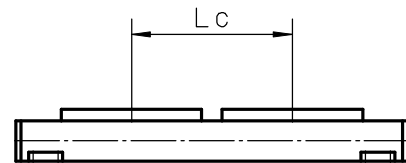


A1: lubrication holes
 A2: ø13,5/ø8,5 for socket head cap screw M8

| Screw support configuration | A [mm] | B [mm] | Ordering length (L_order) [mm] | Total length (L_tot) [mm] |
|-----------------------------|--------|--------|-------------------------------------|----------------------------|
| No screw support | 5 | 5 | $L_{order} = S_{max} + A + B + 218$ | $L_{tot} = L_{order} + 78$ |
| Single screw support | 60 | 60 | $L_{order} = S_{max} + A + B + 218$ | $L_{tot} = L_{order} + 78$ |
| Double screw supports | 126 | 126 | $L_{order} = S_{max} + A + B + 218$ | $L_{tot} = L_{order} + 78$ |

Double Carriages

| Parameter | M75 |
|---|--------------------|
| Minimum distance between carriages (Lc) [mm] | 250 |
| Dynamic load (Fy), maximum [N] | 3000 |
| Dynamic load (Fz), maximum [N] | 3000 |
| Dynamic load torque (My), maximum [Nm] | $L_c^1 \times 1,5$ |
| Dynamic load torque (Mz), maximum [Nm] | $L_c^1 \times 1,5$ |
| Force required to move second carriage [N] | 2 |
| Weight of unit with zero stroke of carriages [kg] | 12,2 5,0 |



| Screw support configuration | A [mm] | B [mm] | Ordering length (L_order) [mm] | Total length (L_tot) [mm] |
|-----------------------------|--------|--------|---|----------------------------|
| No screw support | 5 | 5 | $L_{order} = S_{max} + A + B + L_c + 218$ | $L_{tot} = L_{order} + 78$ |
| Single screw support | 60 | 60 | $L_{order} = S_{max} + A + B + L_c + 218$ | $L_{tot} = L_{order} + 78$ |
| Double screw supports | 126 | 126 | $L_{order} = S_{max} + A + B + L_c + 218$ | $L_{tot} = L_{order} + 78$ |

¹ Value in mm

M100

Ball Screw Drive, Ball Guide

» Ordering key - see page 194
» Accessories - see page 135
» Additional data - see page 182

General Specifications

| Parameter | M100 |
|---------------------------|---|
| Profile size (w × h) [mm] | 108 × 100 |
| Type of screw | ball screw with single nut |
| Carriage sealing system | self-adjusting steel cover band |
| Screw supports | number of screw supports to be specified by customer at order |
| Lubrication | lubrication of ball screw |
| Included accessories | none |

Performance Specifications

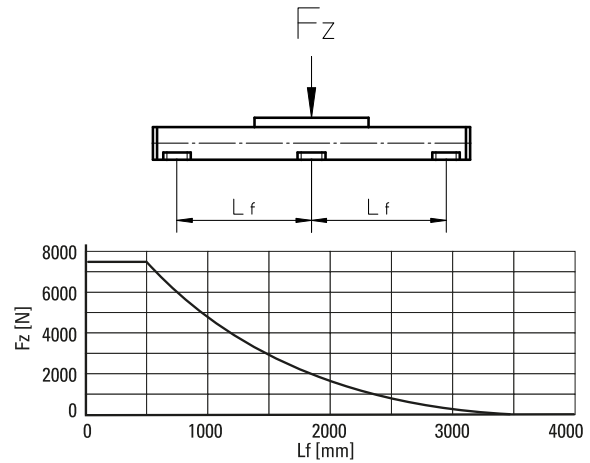
| Parameter | | M100 |
|-----------------------------------|---------------------|-----------|
| Stroke length (Smax), maximum | [mm] | 6000 |
| Linear speed, maximum | [m/s] | 1,25 |
| Acceleration, maximum | [m/s ²] | 8 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | 5000 |
| Dynamic load (Fy), maximum | [N] | 5000 |
| Dynamic load (Fz), maximum | [N] | 5000 |
| Dynamic load torque (Mx), maximum | [Nm] | 60 |
| Dynamic load torque (My), maximum | [Nm] | 400 |
| Dynamic load torque (Mz), maximum | [Nm] | 400 |
| Drive shaft force (Frd), maximum | [N] | 1000 |
| Drive shaft torque (Mta), maximum | [Nm] | 45 |
| Screw diameter (d ₀) | [mm] | 25 |
| Screw lead (p) | [mm] | 5, 10, 25 |
| Weight | [kg] | |
| of unit with zero stroke | | 14,3 |
| of every 100 mm of stroke | | 1,72 |
| of carriage | | 4,00 |
| of option single screw support | | 1,86 |
| of option double screw supports | | 4,42 |

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

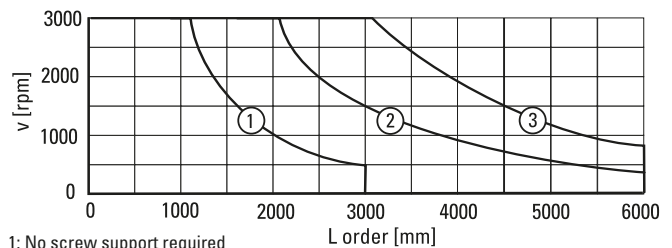
| Input speed [rpm] | Screw lead [mm] | | |
|---------------------------|-----------------|--------|--------|
| | p = 5 | p = 10 | p = 25 |
| 500 - no screw supports | 0,08 | 0,14 | 0,32 |
| 500 - with screw supports | 0,1 | 0,16 | 0,37 |

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

Deflection of the Profile

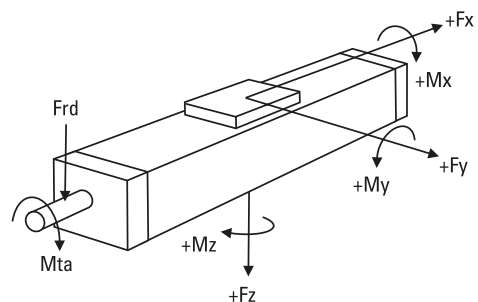


Critical Speed



1: No screw support required
2: Single screw support required
3: Double screw supports required

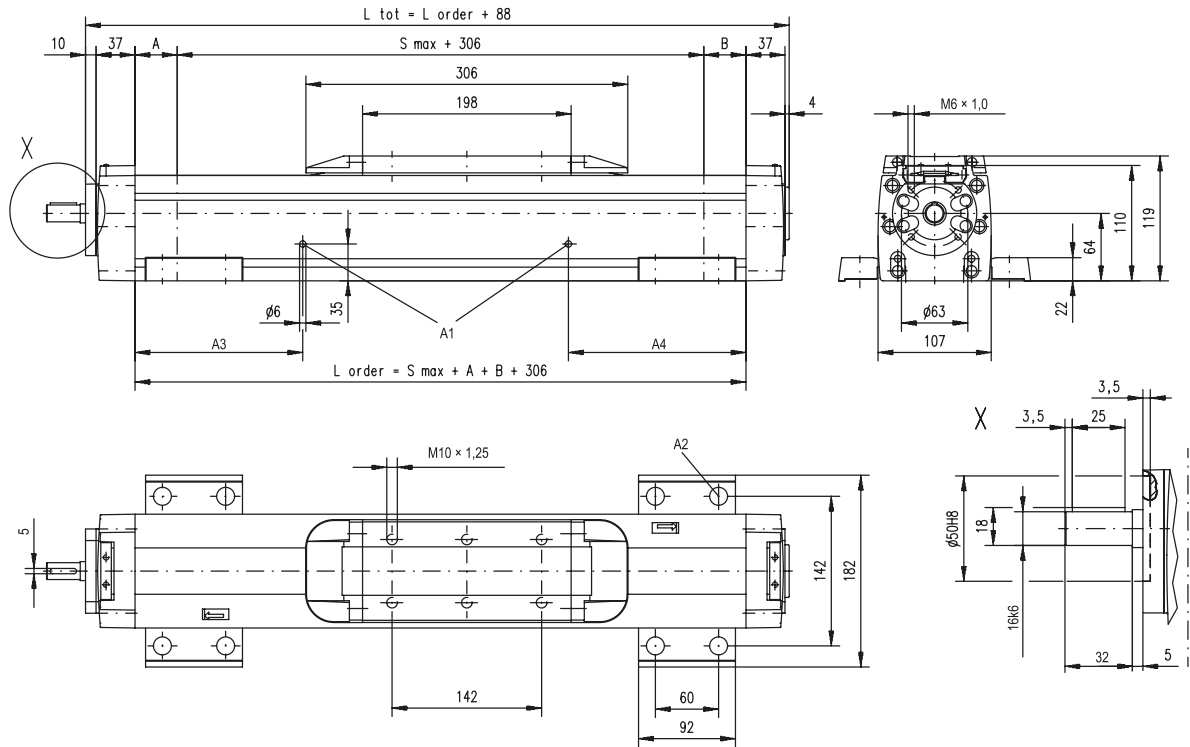
Definition of Forces



M100

Ball Screw Drive, Ball Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



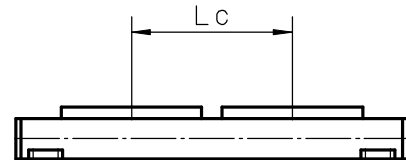
A1: lubrication holes
 A2: $\varnothing 17/\varnothing 10,5$ for socket head cap screw M10

A3: 100 (L order \leq 1 m), 320 (L order $>$ 1 m)
 A4: 100 (L order \leq 1 m), 430 (L order $>$ 1 m)

| Screw support configuration | A [mm] | B [mm] | Ordering length (L order) [mm] | Total length (L tot) [mm] |
|-----------------------------|--------|--------|-------------------------------------|----------------------------|
| No screw support | 1 | 1 | $L_{order} = S_{max} + A + B + 306$ | $L_{tot} = L_{order} + 88$ |
| Single screw support | 31 | 31 | $L_{order} = S_{max} + A + B + 306$ | $L_{tot} = L_{order} + 88$ |
| Double screw supports | 86 | 86 | $L_{order} = S_{max} + A + B + 306$ | $L_{tot} = L_{order} + 88$ |

Double Carriages

| Parameter | M100 | |
|---|------|---------------------|
| Minimum distance between carriages (Lc) [mm] | [mm] | 350 |
| Dynamic load (Fy), maximum [N] | [N] | 7500 |
| Dynamic load (Fz), maximum [N] | [N] | 7500 |
| Dynamic load torque (My), maximum [Nm] | [Nm] | $L_c^1 \times 3,75$ |
| Dynamic load torque (Mz), maximum [Nm] | [Nm] | $L_c^1 \times 3,75$ |
| Force required to move second carriage [N] | [N] | 2 |
| Weight of unit with zero stroke of carriages [kg] | [kg] | 25,3 8,0 |



| Screw support configuration | A [mm] | B [mm] | Ordering length (L order) [mm] | Total length (L tot) [mm] |
|-----------------------------|--------|--------|---|----------------------------|
| No screw support | 1 | 1 | $L_{order} = S_{max} + A + B + L_c + 306$ | $L_{tot} = L_{order} + 88$ |
| Single screw support | 31 | 31 | $L_{order} = S_{max} + A + B + L_c + 306$ | $L_{tot} = L_{order} + 88$ |
| Double screw supports | 86 | 86 | $L_{order} = S_{max} + A + B + L_c + 306$ | $L_{tot} = L_{order} + 88$ |

¹ Value in mm

2HB10

Ball Screw Drive, Ball Guide

» Ordering key - see page 195
» Accessories - see page 135

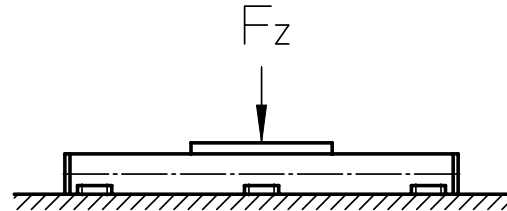
General Specifications

| Parameter | 2HB10 |
|---------------------------|-----------------------------------|
| Profile size (w × h) [mm] | 100 × 60 |
| Type of screw | ball screw |
| Carriage sealing system | none (optional shroud or bellows) |
| Screw supports | none |
| Lubrication | lubrication of screw and guides |
| Included accessories | RediMount™ kit |

Performance Specifications

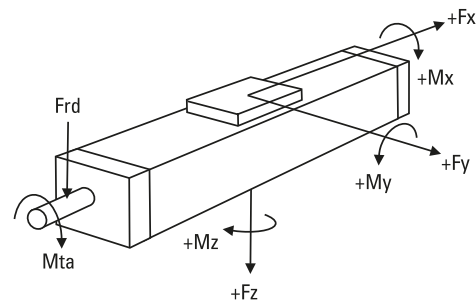
| Parameter | | 2HB10 |
|-----------------------------------|---------------------|----------|
| Stroke length (Smax), maximum | [mm] | 1375 |
| Linear speed, maximum | [m/s] | 0,47 |
| Acceleration, maximum | [m/s ²] | 9,8 |
| Repeatability | [± mm] | 0,005 |
| Input speed, maximum | [rpm] | 2800 |
| Operation temperature limits | [°C] | -20 – 80 |
| Dynamic load (Fx), maximum | [N] | 2100 |
| Dynamic load (Fy), maximum | [N] | 8000 |
| Dynamic load (Fz), maximum | [N] | 8000 |
| Dynamic load torque (Mx), maximum | [Nm] | 279 |
| Dynamic load torque (My), maximum | [Nm] | 216 |
| Dynamic load torque (Mz), maximum | [Nm] | 216 |
| Drive shaft force (Frd), maximum | [N] | 533 |
| Drive shaft torque (Mta), maximum | [Nm] | 1,86 |
| Ball screw diameter (do) | [mm] | 16 |
| Ball screw lead (p) | [mm] | 5, 10 |
| Weight | [kg] | |
| of unit with zero stroke | | 2,59 |
| of every 100 mm of stroke | | 0,69 |
| of each carriage | | 0,82 |

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

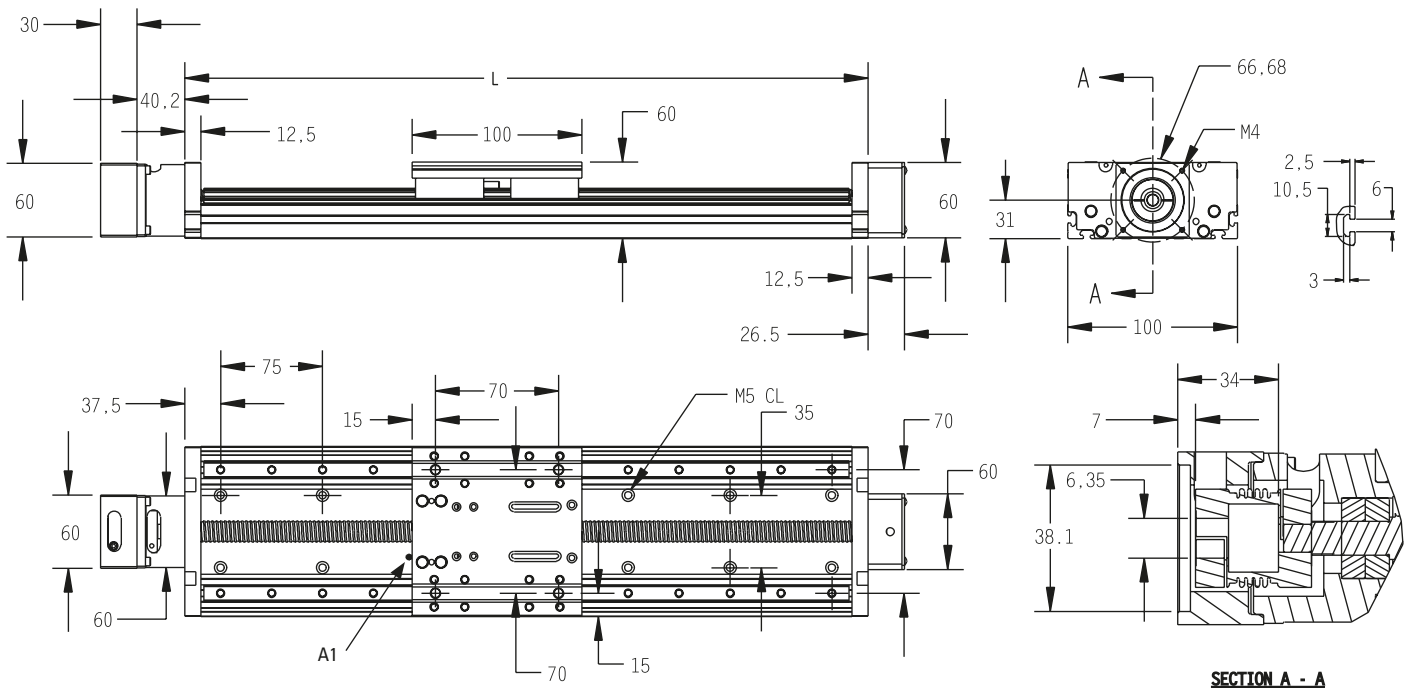
Definition of Forces



2HB10

Ball Screw Drive, Ball Guide

| Dimensions | Projection |
|------------|------------|
| METRIC | |



A1: lubrication nipple (using the unit with the nipple mounted makes the stroke 10 mm shorter).

Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

Ordering Length (L) and Maximum Stroke (Smax)

$$L = S_{max} + 125$$

2HB20

Ball Screw Drive, Ball Guide

» Ordering key - see page 195
» Accessories - see page 135

General Specifications

| Parameter | 2HB20 |
|---------------------------|-----------------------------------|
| Profile size (w × h) [mm] | 200 × 90 |
| Type of screw | ball screw |
| Carriage sealing system | none (optional shroud or bellows) |
| Screw supports | none |
| Lubrication | lubrication of screw and guides |
| Included accessories | RediMount™ kit |

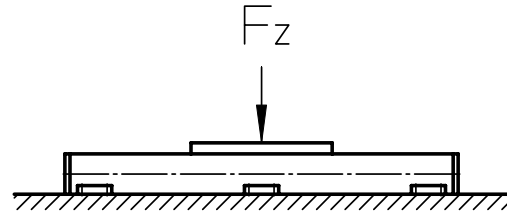
Performance Specifications

| Parameter | 2HB20 |
|-----------------------------------|-------------------------|
| Stroke length (Smax), maximum | [mm] 2760 |
| Linear speed, maximum | [m/s] 0,75 |
| Acceleration, maximum | [m/s ²] 9,8 |
| Repeatability | [± mm] 0,005 |
| Input speed, maximum | [rpm] 1800 |
| Operation temperature limits | [°C] -20 – 80 |
| Dynamic load (Fx), maximum | [N] 4697 |
| Dynamic load (Fy), maximum | [N] 34000 |
| Dynamic load (Fz), maximum | [N] 34000 |
| Dynamic load torque (Mx), maximum | [Nm] 2463 |
| Dynamic load torque (My), maximum | [Nm] 1903 |
| Dynamic load torque (Mz), maximum | [Nm] 1903 |
| Drive shaft force (Frd), maximum | [N] 533 |
| Drive shaft torque (Mta), maximum | [Nm] 15,5 |
| Ball screw diameter (do) | [mm] 25 |
| Ball screw lead (p) | [mm] 5, 10, 25 |
| Weight | [kg] |
| of unit with zero stroke | 13,32 |
| of every 100 mm of stroke | 1,70 |
| of each carriage | 4,47 |

¹ Value for the complete unit

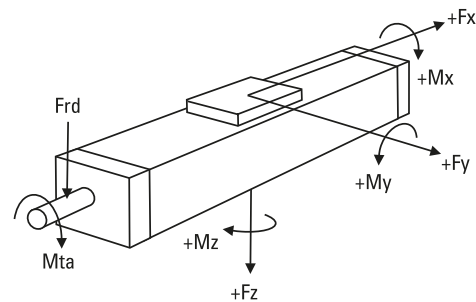
² Value for the ball guide only

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

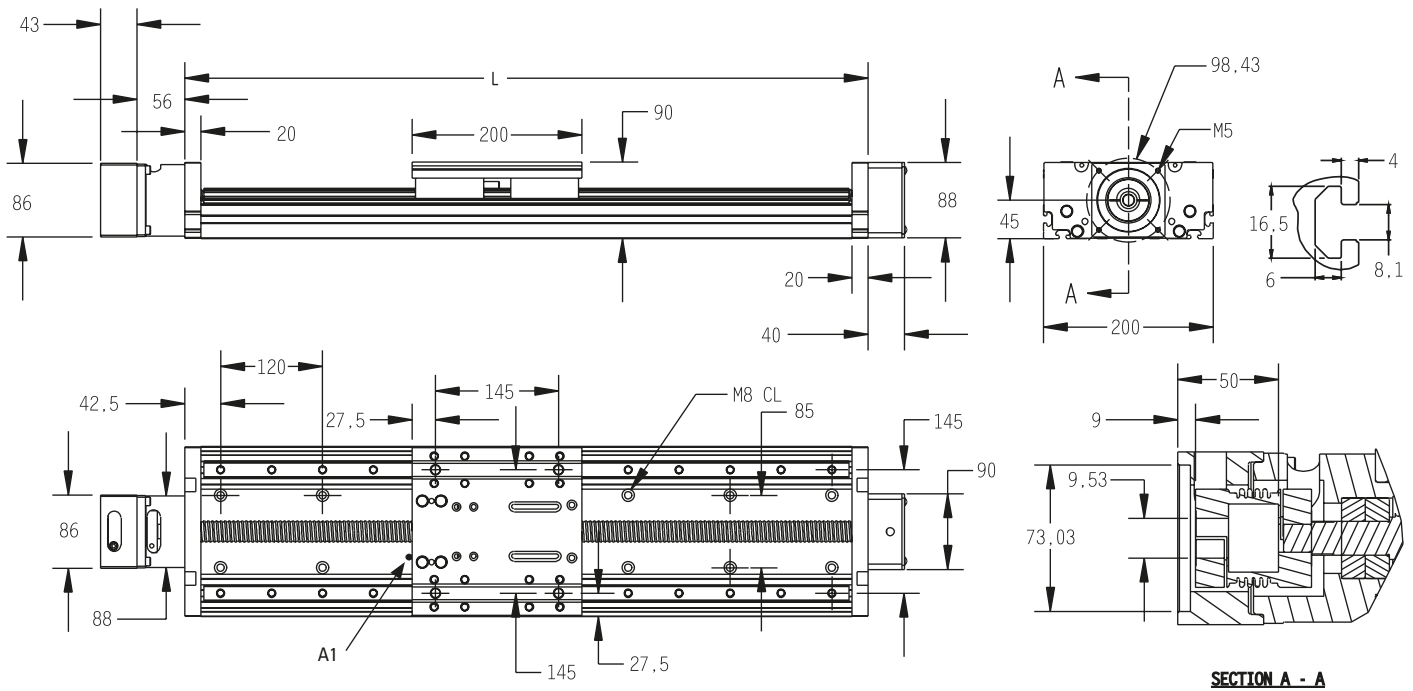
Definition of Forces



2HB20

Ball Screw Drive, Ball Guide

| Dimensions | Projection |
|------------|------------|
| METRIC | |



A1: lubrication nipple (using the unit with the nipple mounted makes the stroke 10 mm shorter).

Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

Ordering Length (L) and Maximum Stroke (Smax)

$$L = S_{max} + 240$$

2RB12

Ball Screw Drive, Ball Guide

» Ordering key - see page 196
» Accessories - see page 135

General Specifications

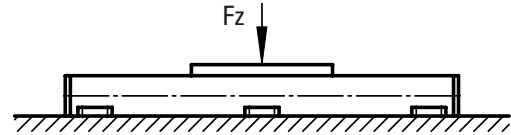
| Parameter | 2RB12 |
|--|----------------------------------|
| Profile size (w × h) [mm] ¹ | 130 × 40 |
| Type of screw | ball screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

¹ Base width × carriage height.

Performance Specifications

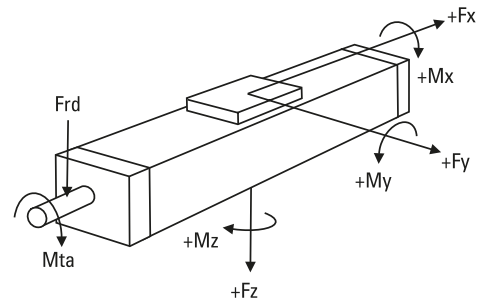
| Parameter | | 2RB12 |
|--|---------------------|----------------|
| Stroke length (S _{max}), maximum | [mm] | 1951 |
| Linear speed, maximum | [m/s] | 0,47 |
| Acceleration, maximum | [m/s ²] | 9,8 |
| Repeatability | [± mm] | 0,005 |
| Accuracy | [± mm] | 0,025 / 300 mm |
| Input speed, maximum | [rpm] | 2800 |
| Operation temperature limits | [°C] | -20 – 80 |
| Dynamic load (F _x), maximum | [N] | 2100 |
| Dynamic load (F _y), maximum | [N] | 880 |
| Dynamic load (F _z), maximum | [N] | 1760 |
| Dynamic load torque (M _x), maximum | [Nm] | 65,5 |
| Dynamic load torque (M _y), maximum | [Nm] | 76,8 |
| Dynamic load torque (M _z), maximum | [Nm] | 38,4 |
| Drive shaft force (F _{rd}), maximum | [N] | 533 |
| Drive shaft torque (M _{ta}), maximum | [Nm] | 1,86 |
| Ball screw diameter (d ₀) | [mm] | 16 |
| Ball screw lead (p) | [mm] | 5, 10 |
| Weight | [kg] | |
| of unit with zero stroke | | 3,88 |
| of every 100 mm of stroke | | 0,93 |
| of each carriage | | 1,32 |

Deflection of the Profile




The unit must be continuously supported by a machined surface under its entire length.

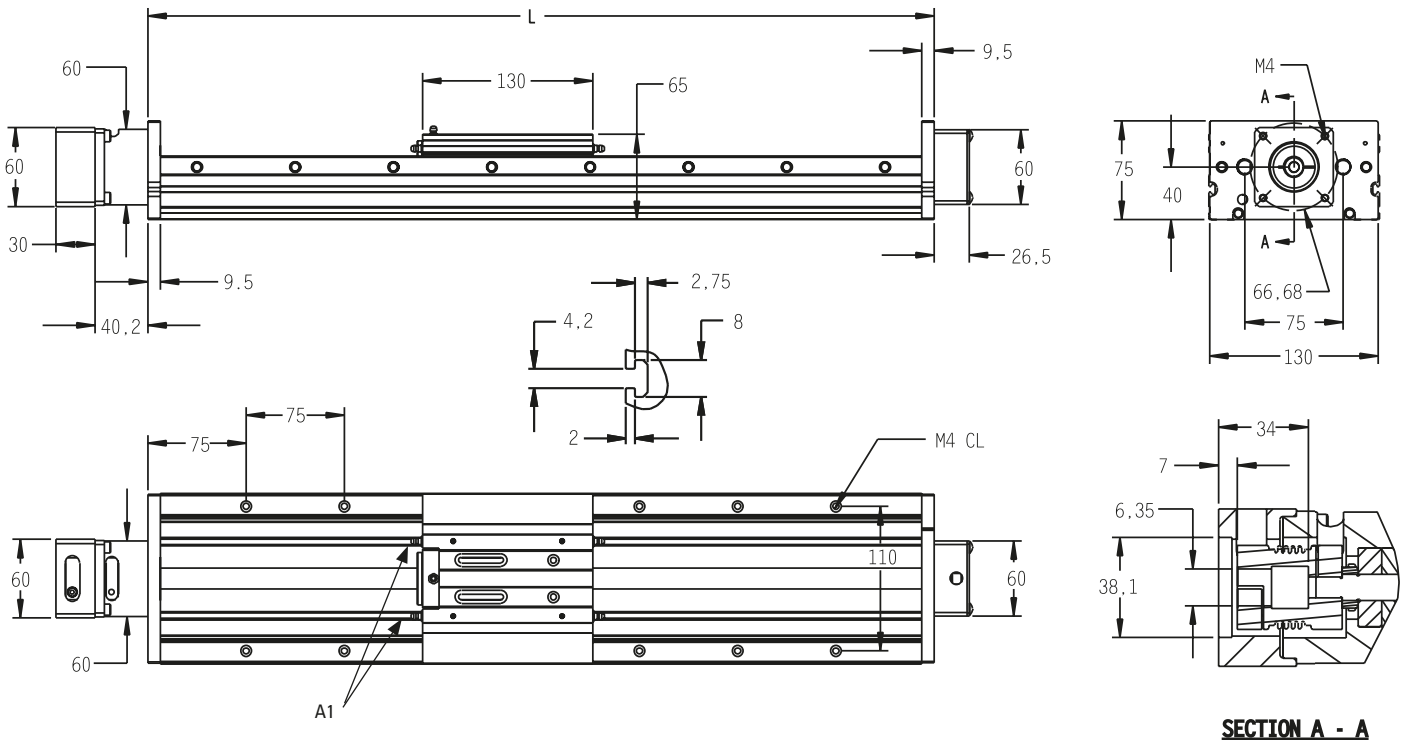
Definition of Forces



2RB12

Ball Screw Drive, Ball Guide

| Dimensions | Projection |
|------------|---|
| METRIC |  |



A1: lubrication nipples (using the unit with the nipples mounted makes the stroke 10 mm shorter).

Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

| Ordering Length (L) and Maximum Stroke (Smax) |
|---|
| $L = S_{max} + 149$ |

2RB16

Ball Screw Drive, Ball Guide

» Ordering key - see page 196
» Accessories - see page 135

General Specifications

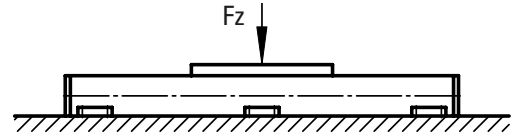
| Parameter | 2RB16 |
|--|----------------------------------|
| Profile size (w × h) [mm] ¹ | 160 × 48 |
| Type of screw | ball screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

¹ Base width × carriage height.

Performance Specifications

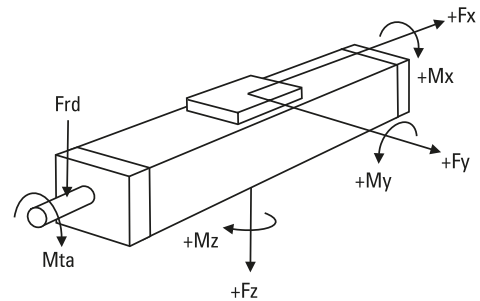
| Parameter | | 2RB16 |
|---------------------------------------|---------------------|----------------|
| Stroke length (Smax), maximum | [mm] | 2815 |
| Linear speed, maximum | [m/s] | 0,73 |
| Acceleration, maximum | [m/s ²] | 9,8 |
| Repeatability | [± mm] | 0,005 |
| Accuracy | [± mm] | 0,025 / 300 mm |
| Input speed, maximum | [rpm] | 2200 |
| Operation temperature limits | [°C] | -20 – 80 |
| Dynamic load (Fx), maximum | [N] | 2998 |
| Dynamic load (Fy), maximum | [N] | 2588 |
| Dynamic load (Fz), maximum | [N] | 5176 |
| Dynamic load torque (Mx), maximum | [Nm] | 243 |
| Dynamic load torque (My), maximum | [Nm] | 299 |
| Dynamic load torque (Mz), maximum | [Nm] | 150 |
| Drive shaft force (Frd), maximum | [N] | 533 |
| Drive shaft torque (Mta), maximum | [Nm] | 2,66 |
| Ball screw diameter (d ₀) | [mm] | 20 |
| Ball screw lead (p) | [mm] | 5, 10, 20 |
| Weight | [kg] | |
| of unit with zero stroke | | 6,17 |
| of every 100 mm of stroke | | 1,44 |
| of each carriage | | 2,25 |

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

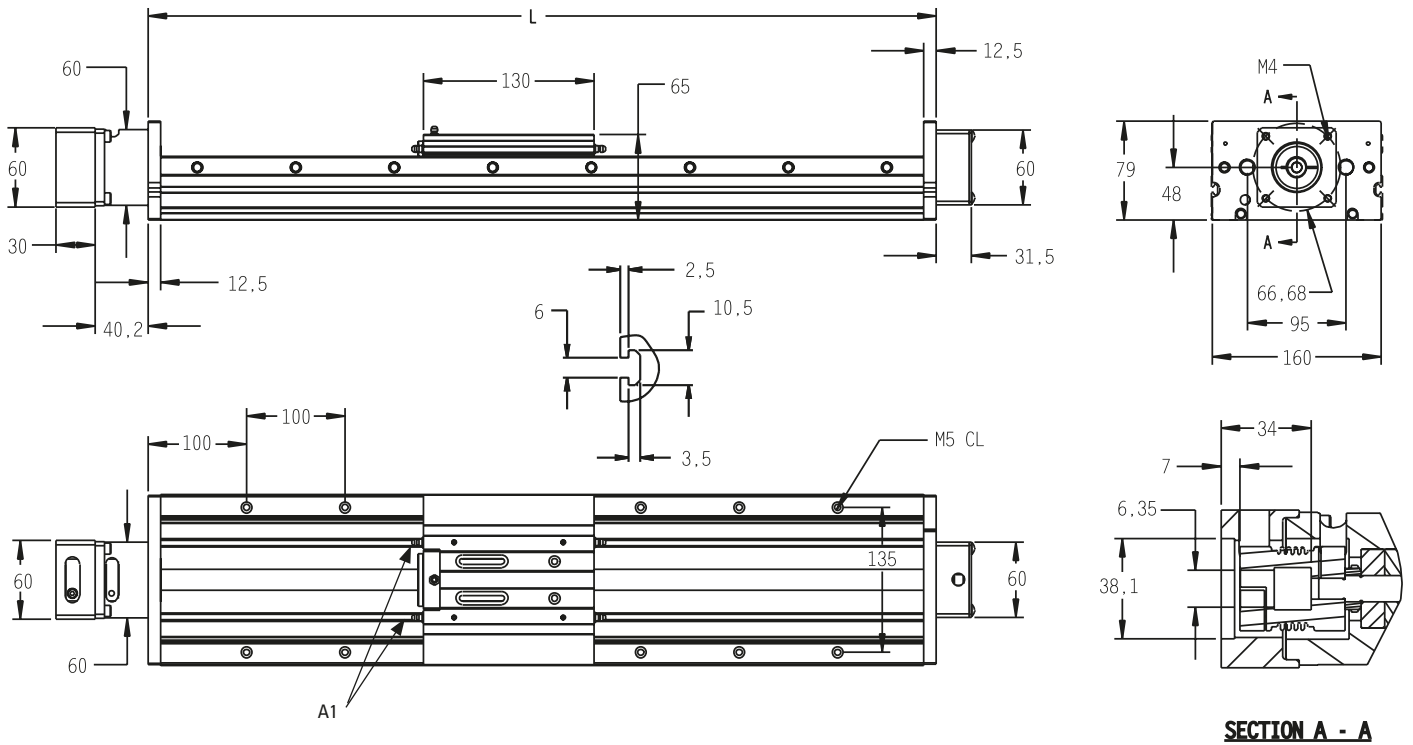
Definition of Forces



2RB16

Ball Screw Drive, Ball Guide

| Dimensions | Projection |
|------------|------------|
| METRIC | |



A1: lubrication nipples (using the unit with the nipples mounted makes the stroke 10 mm shorter).

Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

Ordering Length (L) and Maximum Stroke (Smax)

$$L = S_{max} + 185$$

MS25

Lead Screw Drive, Ball Guide

» Ordering key - see page 197
» Accessories - see page 135

General Specifications

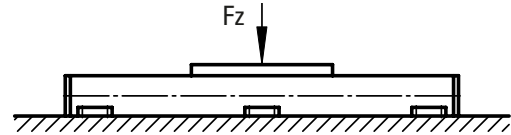
| Parameter | MS25 |
|--|----------------------------------|
| Profile size (w × h) [mm] ¹ | 50 × 25 |
| Type of screw | lead screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

¹ Base width × carriage height.

Performance Specifications

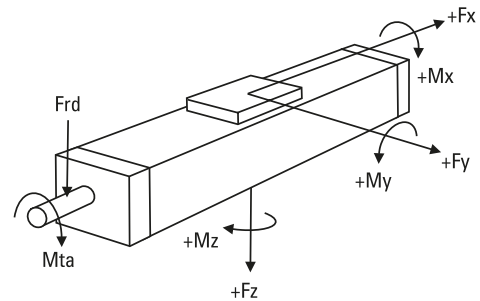
| Parameter | | MS25 |
|-----------------------------------|---------------------|---|
| Stroke length (Smax), maximum | [mm] | 705,5 |
| Linear speed, maximum | [m/s] | 0,85 |
| Acceleration, maximum | [m/s ²] | 9,8 |
| Repeatability | [± mm] | 0,005 |
| Accuracy | [± mm] | 0,18 / 300 mm |
| Input speed, maximum | [rpm] | 2000 |
| Operation temperature limits | [°C] | -20 – 80 |
| Dynamic load (Fx), maximum | [N] | 17,8 |
| Dynamic load (Fy), maximum | [N] | 100 |
| Dynamic load (Fz), maximum | [N] | 100 |
| Dynamic load torque (Mx), maximum | [Nm] | 1,4 |
| Dynamic load torque (My), maximum | [Nm] | 1,3 |
| Dynamic load torque (Mz), maximum | [Nm] | 2,7 |
| Drive shaft force (Frd), maximum | [N] | 222 |
| Drive shaft torque (Mta), maximum | [Nm] | 0,08 |
| Lead screw diameter (d0) | [mm] | 6,35 |
| Lead screw lead (p) | | |
| inch leads | [inch] | 0,025, 0,05, 0,062, 0,2, 0,25, 0,5, 1,0 |
| metric leads | [mm] | 1,5, 2, 3 |
| Weight | [kg] | |
| of unit with zero stroke | | 0,47 |
| of every 100 mm of stroke | | 0,18 |
| of each carriage | | 0,065 |

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

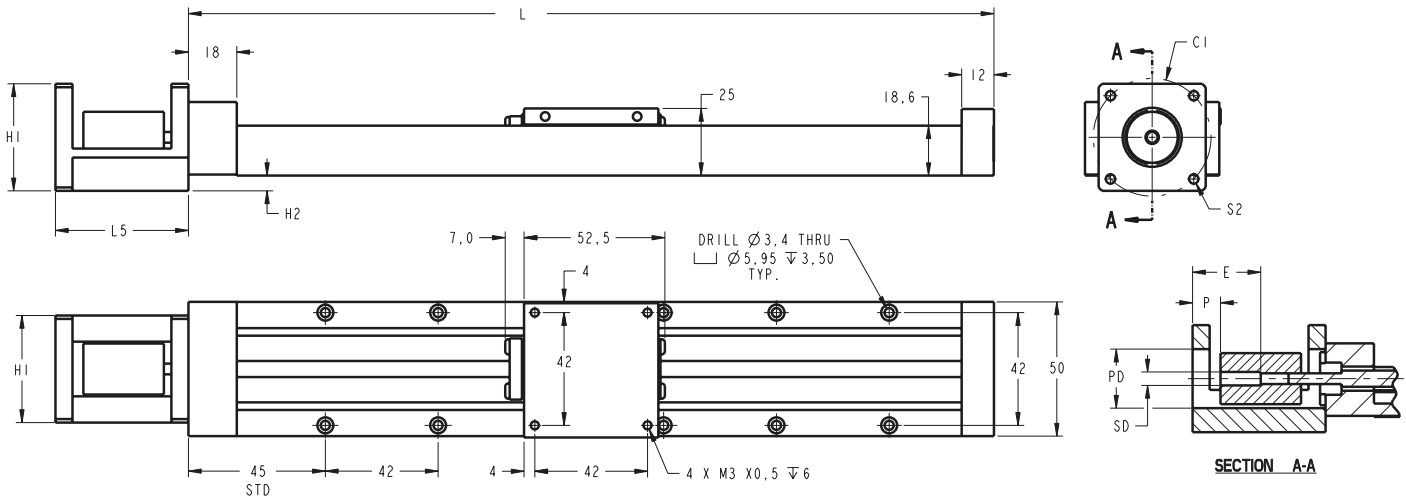
Definition of Forces



MS25

Lead Screw Drive, Ball Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



Ordering Length (L) and Maximum Stroke (Smax)
 $L = S_{max} + 95$

| Motor block frame size ¹ | H1 | H2 | SD | PD | P | E (max.) | S2 | L5 | C1 |
|-------------------------------------|------|------|------|------|------|----------|---------|------|------|
| NEMA-17 | 39,9 | 5,7 | 5,0 | 22,0 | 10,4 | 28,0 | ∅ 0,136 | 49,5 | 43,8 |
| NEMA-23 | 57,2 | 14,3 | 6,35 | 38,2 | 14,5 | 33,0 | M4 | 55,9 | 66,7 |

¹ Other sizes are easily configured. See www.linearmotioneering.com for the motor mounting configurator.

MS33

Lead Screw Drive, Ball Guide

» Ordering key - see page 197
» Accessories - see page 135

General Specifications

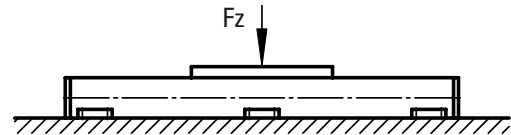
| Parameter | MS33 |
|--|----------------------------------|
| Profile size (w × h) [mm] ¹ | 60 × 33 |
| Type of screw | lead screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

¹ Base width × carriage height.

Performance Specifications

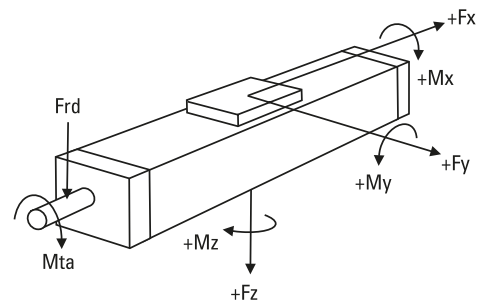
| Parameter | | MS33 |
|-----------------------------------|---------------------|---|
| Stroke length (Smax), maximum | [mm] | 704 |
| Linear speed, maximum | [m/s] | 1,02 |
| Acceleration, maximum | [m/s ²] | 9,8 |
| Repeatability | [± mm] | 0,005 |
| Accuracy | [± mm] | 0,18 / 300 mm |
| Input speed, maximum | [rpm] | 2000 |
| Operation temperature limits | [°C] | -20 – 80 |
| Dynamic load (Fx), maximum | [N] | 80,1 |
| Dynamic load (Fy), maximum | [N] | 150 |
| Dynamic load (Fz), maximum | [N] | 150 |
| Dynamic load torque (Mx), maximum | [Nm] | 2,8 |
| Dynamic load torque (My), maximum | [Nm] | 2,5 |
| Dynamic load torque (Mz), maximum | [Nm] | 5,1 |
| Drive shaft force (Frd), maximum | [N] | 222 |
| Drive shaft torque (Mta), maximum | [Nm] | 0,43 |
| Lead screw diameter (d0) | [mm] | 9,525 |
| Lead screw lead (p) | | |
| inch leads | [inch] | 0,0625, 0,1, 0,125, 0,2, 0,375, 0,5, 1,0, 1,2 |
| metric leads | [mm] | 2 |
| Weight | [kg] | |
| of unit with zero stroke | | 0,69 |
| of every 100 mm of stroke | | 0,31 |
| of each carriage | | 0,12 |

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

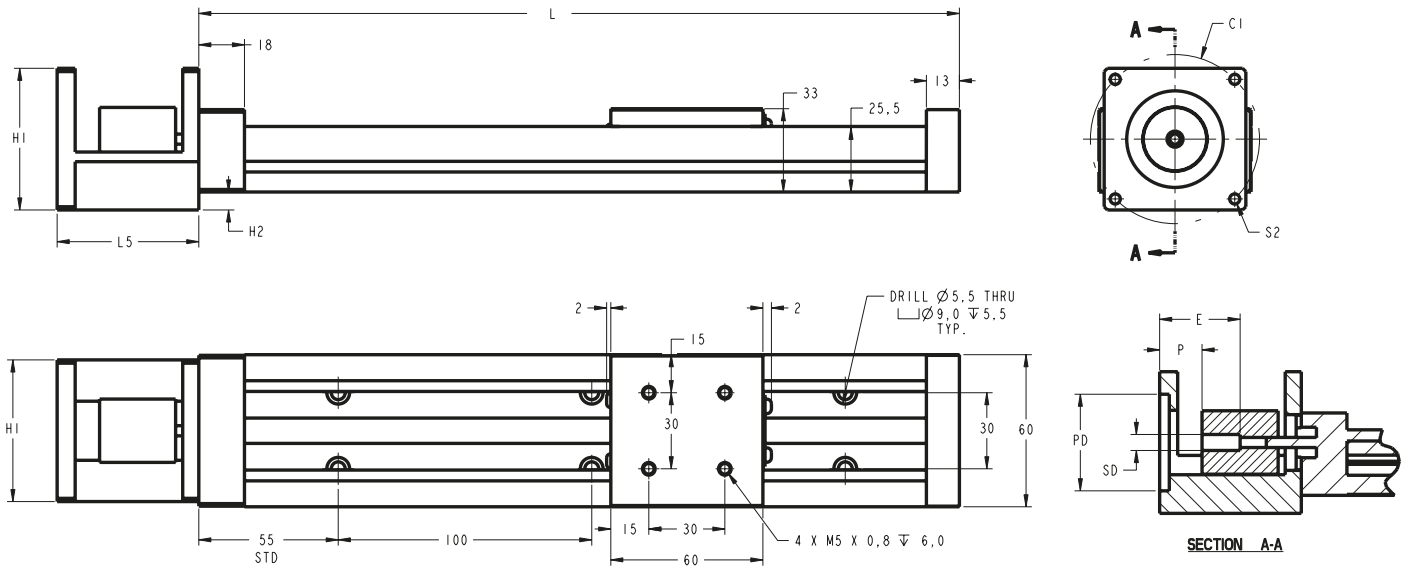
Definition of Forces



MS33

Lead Screw Drive, Ball Guide

| Dimensions | Projection |
|------------|------------|
| METRIC | |



Ordering Length (L) and Maximum Stroke (Smax)

$L = S_{max} + 96$

| Motor block frame size ¹ | H1 | H2 | SD | PD | P | E (max.) | S2 | L5 | C1 |
|-------------------------------------|------|------------------|------|------|------|----------|---------|------|------|
| NEMA-17 | 39,9 | 1,2 ² | 5,0 | 22,0 | 7,8 | 28,0 | ∅ 0,136 | 49,5 | 43,8 |
| NEMA-23 | 57,2 | 7,5 | 6,35 | 38,2 | 14,0 | 33,0 | M4 | 55,9 | 66,7 |

¹ Other sizes are easily configured. See www.linearmotioneering.com for the motor mounting configurator.

² Above base.

MS46L

Lead Screw Drive, Ball Guide

» Ordering key - see page 198
» Accessories - see page 135

General Specifications

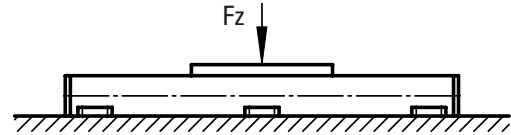
| Parameter | MS46L |
|--|----------------------------------|
| Profile size (w × h) [mm] ¹ | 86 × 46 |
| Type of screw | lead screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

¹ Base width × carriage height.

Performance Specifications

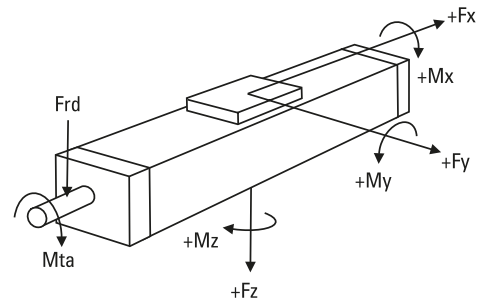
| Parameter | | MS46L |
|-----------------------------------|---------------------|---------------|
| Stroke length (Smax), maximum | [mm] | 821,3 |
| Linear speed, maximum | [m/s] | 0,83 |
| Acceleration, maximum | [m/s ²] | 9,8 |
| Repeatability | [± mm] | 0,005 |
| Accuracy | [± mm] | 0,25 / 300 mm |
| Input speed, maximum | [rpm] | 2000 |
| Operation temperature limits | [°C] | -20 – 80 |
| Dynamic load (Fx), maximum | [N] | 133,4 |
| Dynamic load (Fy), maximum | [N] | 450 |
| Dynamic load (Fz), maximum | [N] | 450 |
| Dynamic load torque (Mx), maximum | [Nm] | 13,9 |
| Dynamic load torque (My), maximum | [Nm] | 11,6 |
| Dynamic load torque (Mz), maximum | [Nm] | 23,6 |
| Drive shaft force (Frd), maximum | [N] | 533 |
| Drive shaft torque (Mta), maximum | [Nm] | 0,59 |
| Lead screw diameter (d0) | [mm] | 12 |
| Lead screw lead (p) | [mm] | 3, 10, 25 |
| Weight | [kg] | |
| of unit with zero stroke | | 2,21 |
| of every 100 mm of stroke | | 0,65 |
| of each carriage | | 0,30 |

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

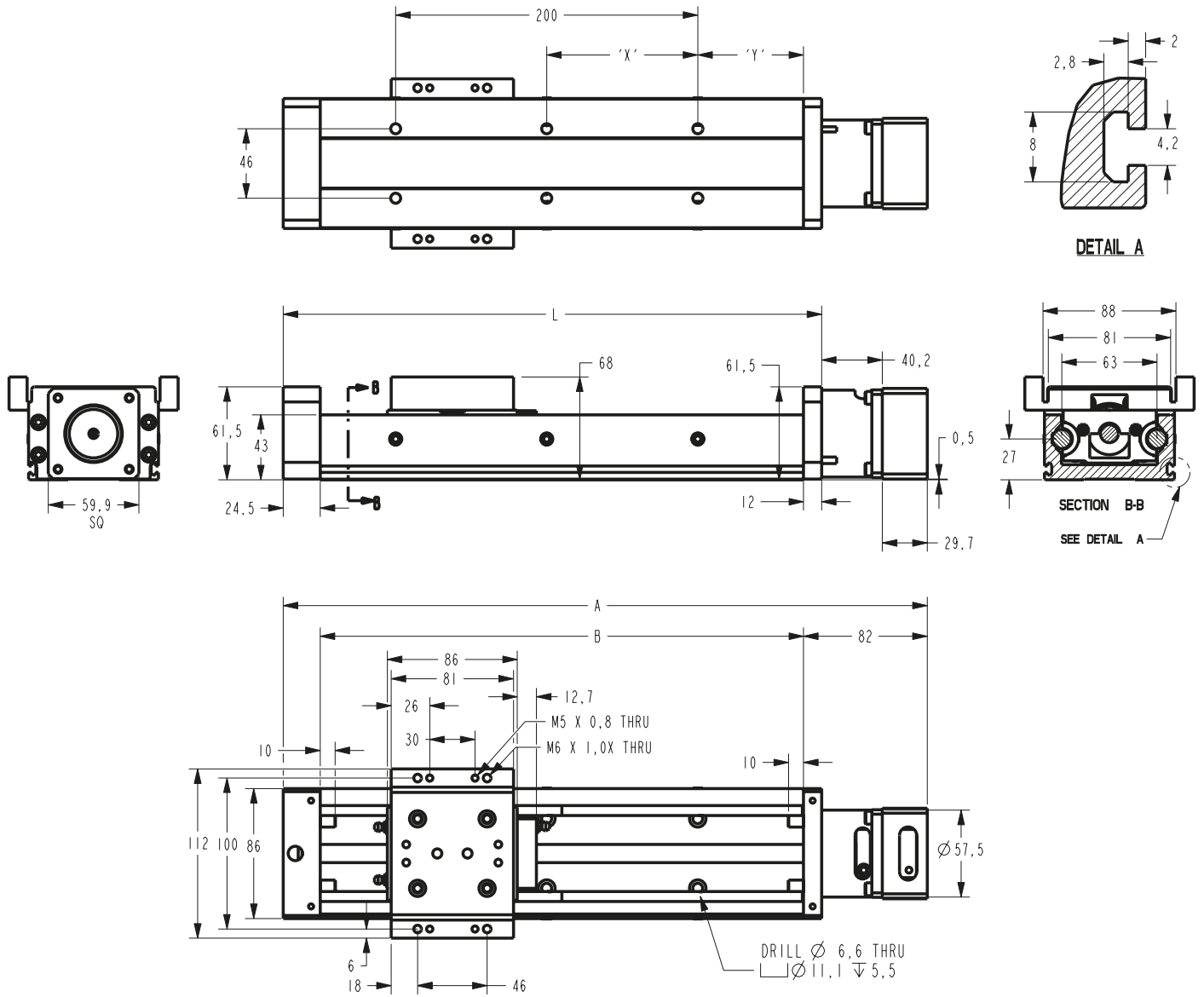
Definition of Forces



MS46L

Lead Screw Drive, Ball Guide

| Dimensions | Projection |
|------------|------------|
| METRIC | |



Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

| Ordering Length (L) and Maximum Stroke (Smax) | Total Length (A) and Profile Length (B) | |
|---|---|----------------|
| $L = S_{max} + 143$ | $A = L + 82,0$ | $B = L - 36,5$ |

MS46B

Ball Screw Drive, Ball Guide

» Ordering key - see page 198
» Accessories - see page 135

General Specifications

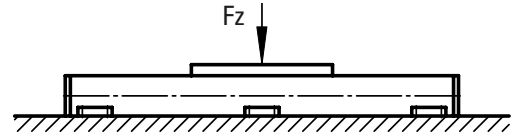
| Parameter | MS46B |
|--|----------------------------------|
| Profile size (w × h) [mm] ¹ | 86 × 46 |
| Type of screw | ball screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

¹ Base width × carriage height.

Performance Specifications

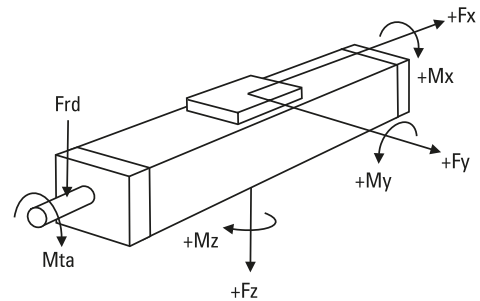
| Parameter | | MS46B |
|---------------------------------------|---------------------|----------------|
| Stroke length (Smax), maximum | [mm] | 821,3 |
| Linear speed, maximum | [m/s] | 0,5 |
| Acceleration, maximum | [m/s ²] | 9,8 |
| Repeatability | [± mm] | 0,005 |
| Accuracy | [± mm] | 0,025 / 300 mm |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | -20 – 80 |
| Dynamic load (Fx), maximum | [N] | 1730 |
| Dynamic load (Fy), maximum | [N] | 450 |
| Dynamic load (Fz), maximum | [N] | 450 |
| Dynamic load torque (Mx), maximum | [Nm] | 13,9 |
| Dynamic load torque (My), maximum | [Nm] | 11,6 |
| Dynamic load torque (Mz), maximum | [Nm] | 23,6 |
| Drive shaft force (Frd), maximum | [N] | 533 |
| Drive shaft torque (Mta), maximum | [Nm] | 1,53 |
| Ball screw diameter (d ₀) | [mm] | 12 |
| Ball screw lead (p) | [mm] | 5, 10 |
| Weight | [kg] | |
| of unit with zero stroke | | 2,21 |
| of every 100 mm of stroke | | 0,65 |
| of each carriage | | 0,30 |

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

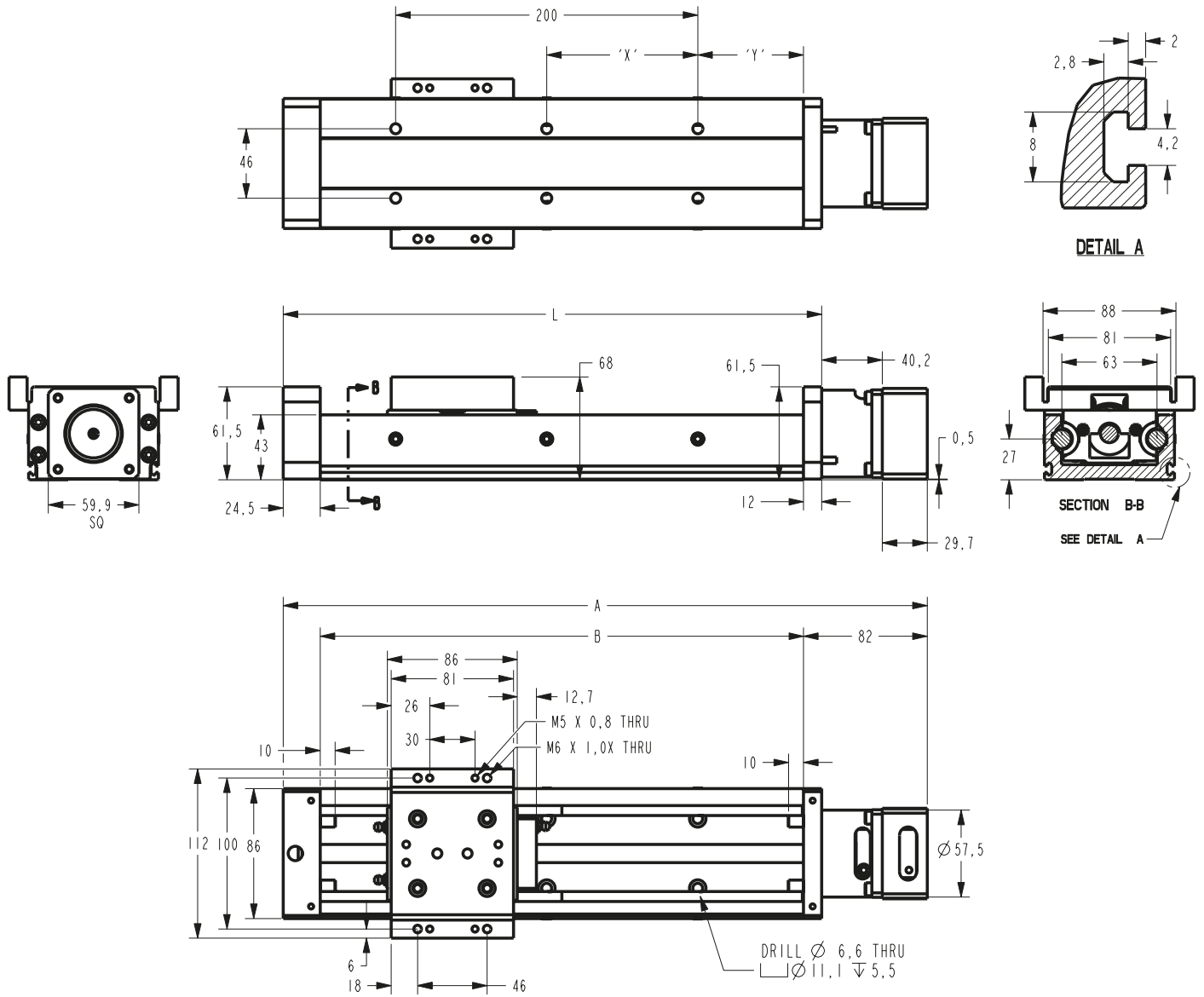
Definition of Forces



MS46B

Ball Screw Drive, Ball Guide

| Dimensions | Projection |
|------------|------------|
| METRIC | |



Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

| Ordering Length (L) and Maximum Stroke (Smax) | Total Length (A) and Profile Length (B) | |
|---|---|----------------|
| $L = S_{max} + 143$ | $A = L + 82,0$ | $B = L - 36,5$ |

2DB08

Lead Screw Drive, Ball Guide – Inch Interface

» Ordering key - see page 199
» Accessories - see page 135

General Specifications

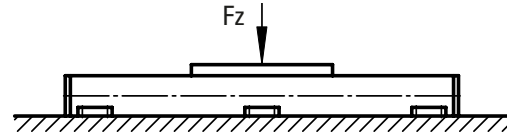
| Parameter | 2DB08 |
|-----------------------------|----------------------------------|
| Profile size (w × h) [inch] | 4.50 × 1.625 |
| Type of screw | lead screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

Performance Specifications

| Parameter | | 2DB08 |
|---|------------------------|-------------------------|
| Stroke length (Smax), maximum | [inch] | 41 |
| Linear speed, maximum | [inch/sec] | 33.3 |
| Acceleration, maximum | [inch/s ²] | 385 |
| Repeatability | [± inch] | 0.0002 |
| Accuracy | [± inch] | 0.007 / 11.81 in |
| Input speed, maximum | [rpm] | 2000 |
| Operation temperature limits | [°F] | -4 – 176 |
| Dynamic load (Fx), maximum | [lbs] | 20 |
| Dynamic load (Fy), maximum | [lbs] | 168 |
| Dynamic load (Fz), maximum | [lbs] | 336 |
| Dynamic load torque (Mx), maximum | [lbf-in] | 500 |
| Dynamic load torque (My), maximum | [lbf-in] | 500 |
| Dynamic load torque (Mz), maximum | [lbf-in] | 250 |
| Drive shaft force (Frd), maximum ¹ | [lbf] | 50 |
| Drive shaft torque (Mta), maximum | [lbf-in] | 3.54 |
| Lead screw diameter (d0) | [inch] | 0.375 |
| Lead screw lead (p) | [inch] | 0.1, 0.25, 0.5, 0.75, 1 |
| Weight | [lb] | |
| of unit with zero stroke | | 5.93 |
| of every 100 mm of stroke | | 1.16 |
| of each carriage | | 1.89 |

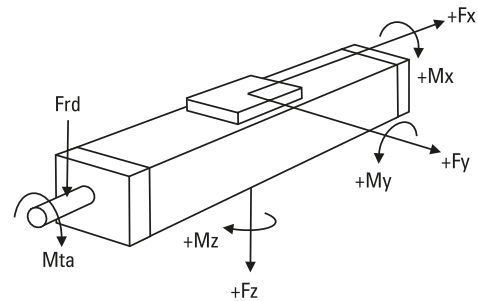
¹ With radial mount option only.

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

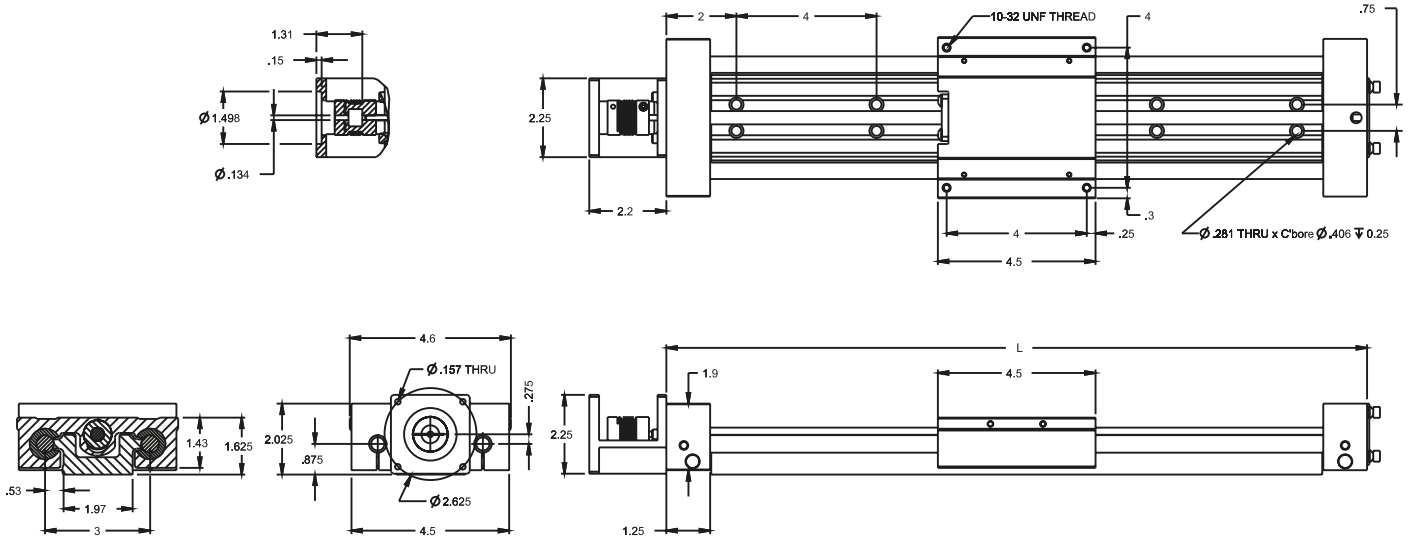
Definition of Forces



2DB08

Lead Screw Drive, Ball Guide – Inch Interface

| Dimensions | Projection |
|------------|------------|
| INCH | |



Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

Ordering Length (L) and Maximum Stroke (Smax)

$$L = S_{max} + 7.0$$

2DB120

Ball Screw Drive, Ball Guide – Inch Interface

» Ordering key - see page 199
» Accessories - see page 135

General Specifications

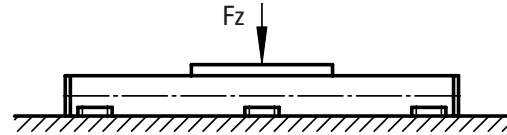
| Parameter | 2DB120 |
|-----------------------------|----------------------------------|
| Profile size (w × h) [inch] | 6 × 2.125 |
| Type of screw | ball screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

Performance Specifications

| Parameter | | 2DB120 |
|--|------------------------|------------------|
| Stroke length (Smax), maximum | [inch] | 63 |
| Linear speed, maximum | [inch/sec] | 10.0 |
| Acceleration, maximum | [inch/s ²] | 385 |
| Repeatability standard nut preloaded nut | [± inch] | 0.0020 0.0002 |
| Accuracy | [± inch] | 0.002 / 12 in |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°F] | -4 – 176 |
| Dynamic load (Fx), maximum | [lbs] | 190 |
| Dynamic load (Fy), maximum | [lbs] | 1058 |
| Dynamic load (Fz), maximum | [lbs] | 2115 |
| Dynamic load torque (Mx), maximum | [lbf-in] | 4150 |
| Dynamic load torque (My), maximum | [lbf-in] | 4150 |
| Dynamic load torque (Mz), maximum | [lbf-in] | 2071 |
| Drive shaft force (Frd), maximum ¹ | [lbf] | 120 |
| Drive shaft torque (Mta), maximum | [lbf-in] | 6.73 |
| Ball screw diameter (do) | [inch] | 0.5 |
| Ball screw lead (p) | | 0.631 |
| Weight | [lb] | |
| of unit with zero stroke | | 13.17 |
| of every 100 mm of stroke | | 2.30 |
| of each carriage | | 4.29 |

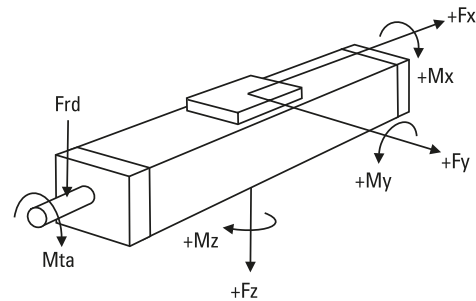
¹ With radial mount option only.

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

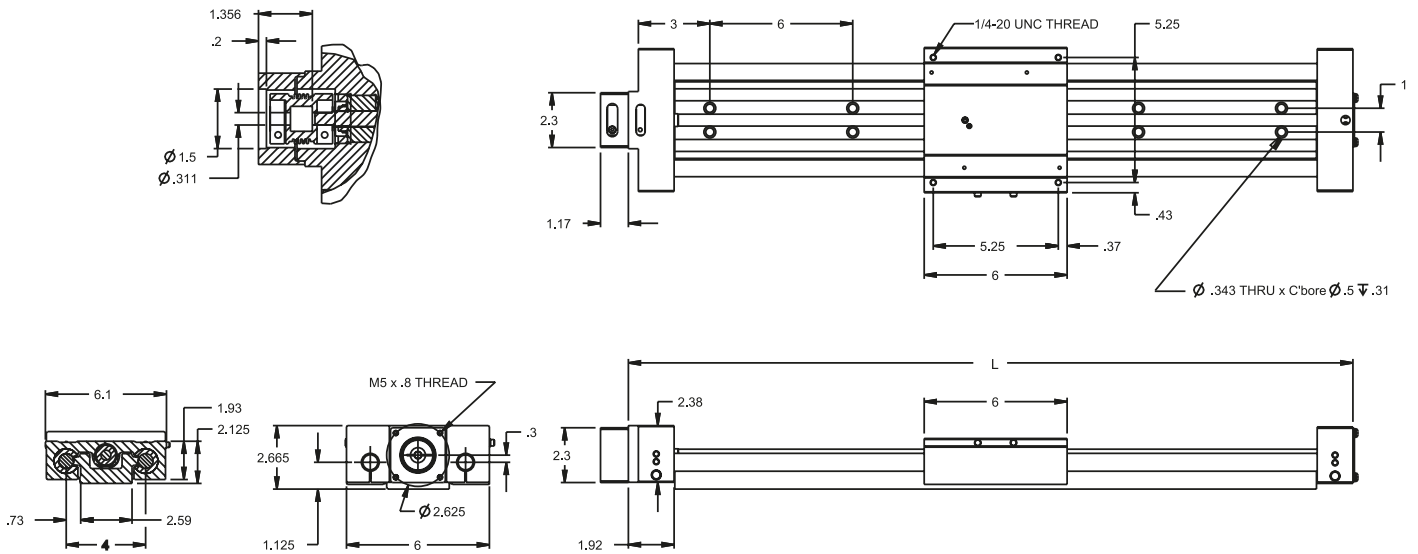
Definition of Forces



2DB120

Ball Screw Drive, Ball Guide – Inch Interface

| Dimensions | Projection |
|------------|---|
| INCH |  |



Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

Ordering Length (L) and Maximum Stroke (Smax)

$$L = S_{max} + 9.0$$

2DB12J

Ball Screw Drive, Ball Guide – Inch Interface

» Ordering key - see page 199
» Accessories - see page 135

General Specifications

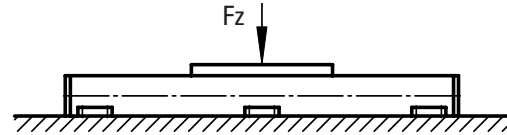
| Parameter | 2DB12J |
|-----------------------------|----------------------------------|
| Profile size (w × h) [inch] | 6 × 2.562 |
| Type of screw | ball screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

Performance Specifications

| Parameter | | 2DB12J |
|---|------------------------|---------------|
| Stroke length (Smax), maximum | [inch] | 63 |
| Linear speed, maximum | [inch/sec] | 25.0 |
| Acceleration, maximum | [inch/s ²] | 385 |
| Repeatability | [± inch] | 0.0002 |
| Accuracy | [± inch] | 0.002 / 12 in |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°F] | -4 – 176 |
| Dynamic load (Fx), maximum | [lbs] | 375 |
| Dynamic load (Fy), maximum | [lbs] | 1058 |
| Dynamic load (Fz), maximum | [lbs] | 2115 |
| Dynamic load torque (Mx), maximum | [lbf-in] | 4150 |
| Dynamic load torque (My), maximum | [lbf-in] | 4150 |
| Dynamic load torque (Mz), maximum | [lbf-in] | 2071 |
| Drive shaft force (Frd), maximum ¹ | [lbf] | 120 |
| Drive shaft torque (Mta), maximum | [lbf-in] | 33.19 |
| Ball screw diameter (do) | [inch] | 0.50 |
| Ball screw lead (p) | [inch] | 0.5 |
| Weight | [lb] | |
| of unit with zero stroke | | 13.58 |
| of every 100 mm of stroke | | 2.296 |
| of each carriage | | 4.850 |

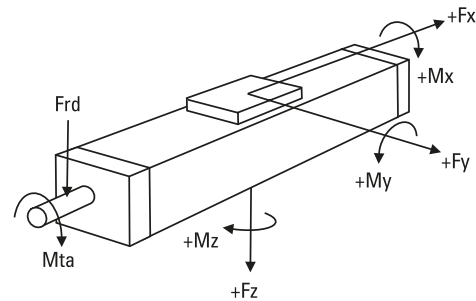
¹ With radial mount option only.

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

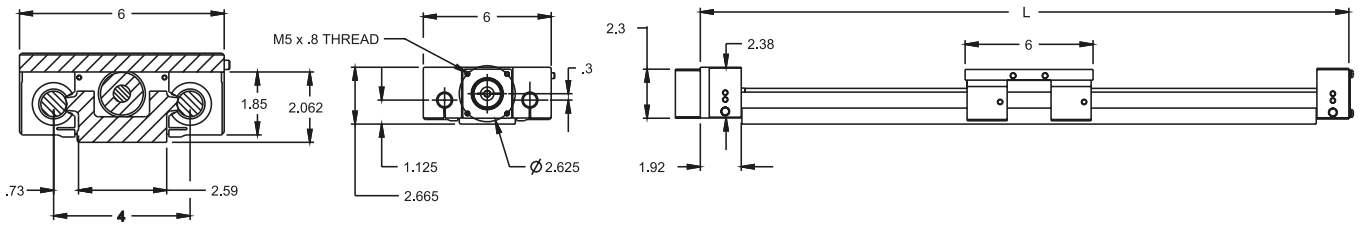
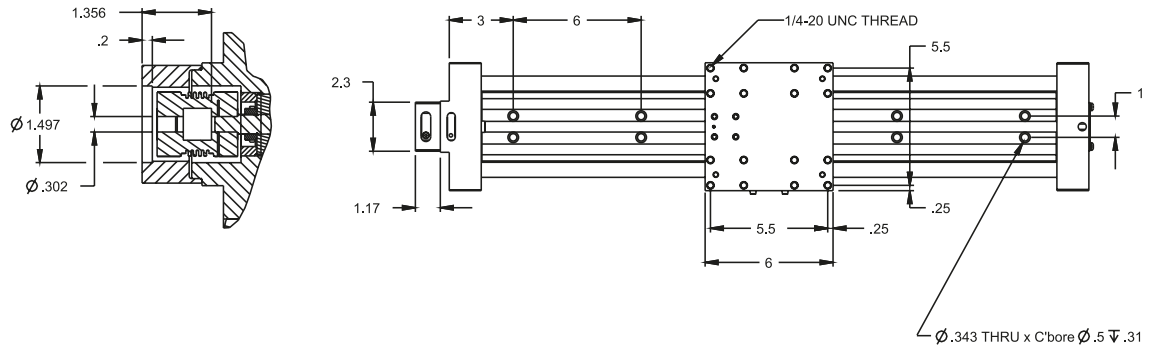
Definition of Forces



2DB12J

Ball Screw Drive, Ball Guide – Inch Interface

| Dimensions | Projection |
|------------|------------|
| INCH | |



Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

Ordering Length (L) and Maximum Stroke (Smax)

$$L = S_{max} + 9.0$$

2DB160

Ball Screw Drive, Ball Guide – Inch Interface

» Ordering key - see page 199
» Accessories - see page 135

General Specifications

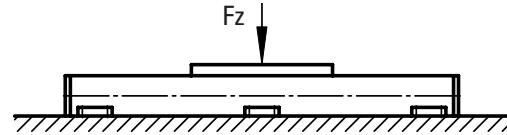
| Parameter | 2DB160 |
|-----------------------------|----------------------------------|
| Profile size (w × h) [inch] | 7.5 × 2.625 |
| Type of screw | ball screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

Performance Specifications

| Parameter | | 2DB160 |
|--|------------------------|------------------|
| Stroke length (Smax), maximum | [inch] | 84.5 |
| Linear speed, maximum | [inch/sec] | 8.3 |
| Acceleration, maximum | [inch/s ²] | 385 |
| Repeatability standard nut preloaded nut | [± inch] | 0.0020 0.0002 |
| Accuracy | [± inch] | 0.002 / 12 in |
| Input speed, maximum | [rpm] | 2500 |
| Operation temperature limits | [°F] | -4 – 176 |
| Dynamic load (Fx), maximum | [lbs] | 350 |
| Dynamic load (Fy), maximum | [lbs] | 1777 |
| Dynamic load (Fz), maximum | [lbs] | 3555 |
| Dynamic load torque (Mx), maximum | [lbf-in] | 8850 |
| Dynamic load torque (My), maximum | [lbf-in] | 8450 |
| Dynamic load torque (Mz), maximum | [lbf-in] | 4195 |
| Drive shaft force (Frd), maximum ¹ | [lbf] | 120 |
| Drive shaft torque (Mta), maximum | [lbf-in] | 12.39 |
| Ball screw diameter (do) | | |
| inch diameters | [inch] | 0.75 |
| metric diameters | [mm] | 20 |
| Ball screw lead (p) | | |
| inch leads | [inch] | 0.2 |
| metric leads | [mm] | 5,0 |
| Weight | [lb] | |
| of unit with zero stroke | | 26.74 |
| of every 100 mm of stroke | | 3.86 |
| of each carriage | | 8.61 |

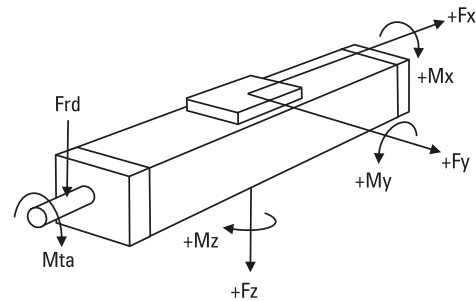
¹ With radial mount option only.

Deflection of the Profile



The unit must be continuously supported by a machined surface under its entire length.

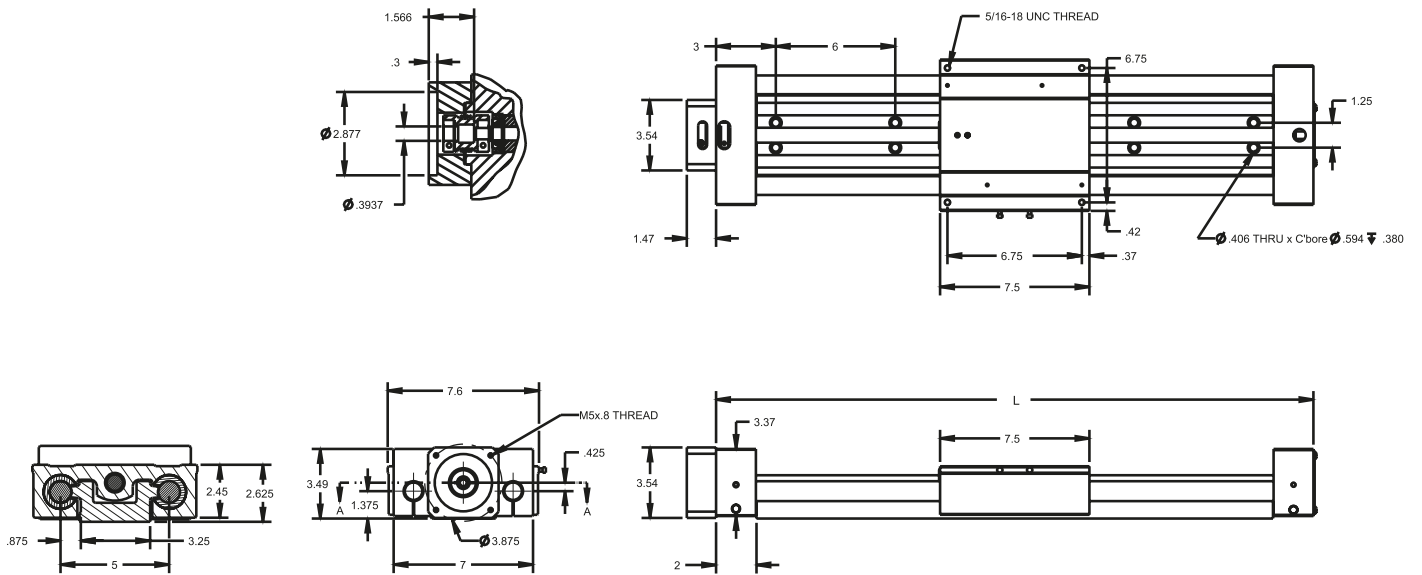
Definition of Forces



2DB160

Ball Screw Drive, Ball Guide – Inch Interface

| Dimensions | Projection |
|------------|------------|
| INCH | |



Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

Ordering Length (L) and Maximum Stroke (Smax)

$$L = S_{max} + 11.5$$

2DB16J

Ball Screw Drive, Ball Guide – Inch Interface

» Ordering key - see page 199
» Accessories - see page 135

General Specifications

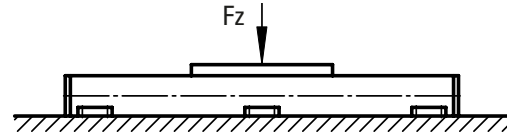
| Parameter | 2DB16J |
|-----------------------------|----------------------------------|
| Profile size (w × h) [inch] | 7.5 × 3.062 |
| Type of screw | ball screw |
| Carriage sealing system | none (optional bellows) |
| Screw supports | none |
| Lubrication | lubrication of screws and guides |
| Included accessories | RediMount™ kit |

Performance Specifications

| Parameter | | 2DB16J |
|---|------------------------|---------------|
| Stroke length (Smax), maximum | [inch] | 84.5 |
| Linear speed, maximum | [inch/sec] | 41.67 |
| Acceleration, maximum | [inch/s ²] | 385 |
| Repeatability | [± inch] | 0.0002 |
| Accuracy | [± inch] | 0.002 / 12 in |
| Input speed, maximum | [rpm] | 2500 |
| Operation temperature limits | [°F] | -4 – 176 |
| Dynamic load (Fx), maximum | [lbs] | 350 |
| Dynamic load (Fy), maximum | [lbs] | 1777 |
| Dynamic load (Fz), maximum | [lbs] | 3555 |
| Dynamic load torque (Mx), maximum | [lbf-in] | 8877 |
| Dynamic load torque (My), maximum | [lbf-in] | 8098 |
| Dynamic load torque (Mz), maximum | [lbf-in] | 4053 |
| Drive shaft force (Frd), maximum ¹ | [lbf] | 120 |
| Drive shaft torque (Mta), maximum | [lbf-in] | 30.98 |
| Ball screw diameter (do) | [inch] | 0.631, 0.750 |
| Ball screw lead (p) | [inch] | 0.5, 1.0 |
| Weight | [lb] | |
| of unit with zero stroke | | 25.73 |
| of every 100 mm of stroke | | 3.86 |
| of each carriage | | 7.70 |

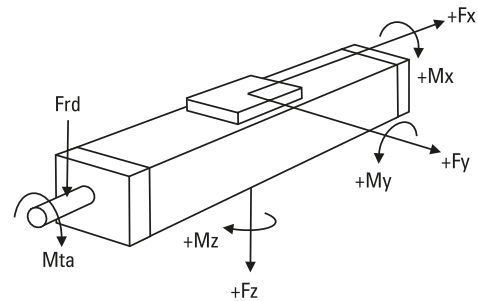
¹ With radial mount option only.

Deflection of the Profile



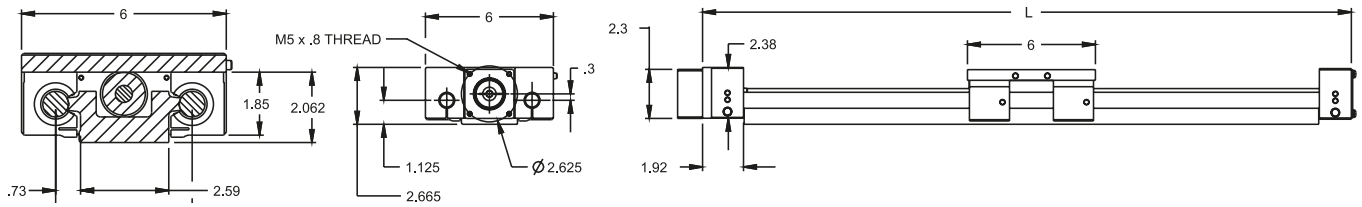
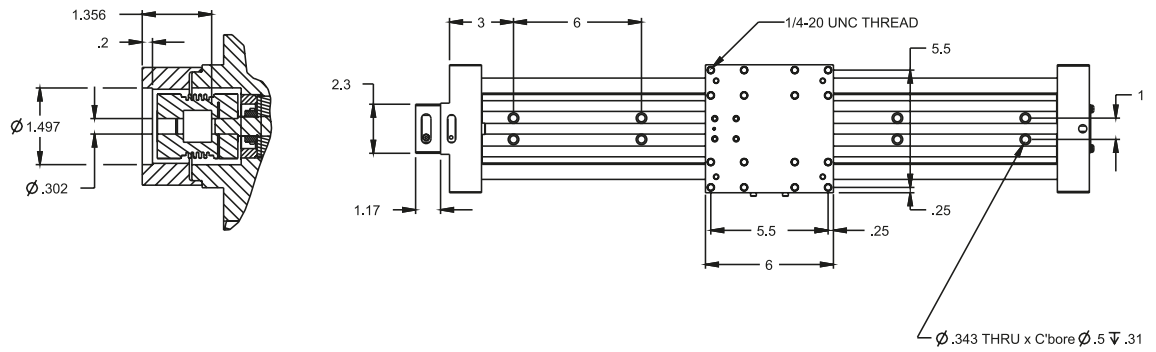
The unit must be continuously supported by a machined surface under its entire length.

Definition of Forces



2DB16J

Ball Screw Drive, Ball Guide – Inch Interface



Standard NEMA23 motor dimensions are shown. Other mounting sizes are available and easily configured. Please see www.linearmotioneering.com for details.

Ordering Length (L) and Maximum Stroke (Smax)

$$L = S_{max} + 11.5$$

Linear Motion Systems with Ball Screw Drive and Slide Guide

Overview

Movopart M



Features

- Can be installed in any orientation
- Self-adjusting stainless steel cover band
- Patented internal self-adjusting prism slide guides
- Wash down protected versions available.

| Parameter | | M55 | M75 | M100 |
|-------------------------------------|-------|-----------------|-----------------|-----------------|
| Profile size (width × height) | [mm] | 58 × 55 | 86 × 75 | 108 × 100 |
| Stroke length (Smax), maximum | [mm] | 3000 | 4000 | 6000 |
| Linear speed, maximum | [m/s] | 1,0 | 1,6 | 1,6 |
| Dynamic carriage load (Fz), maximum | [N] | 400 | 1485 | 3005 |
| Remarks | | single ball nut | single ball nut | single ball nut |
| Page | | 74 | 76 | 78 |

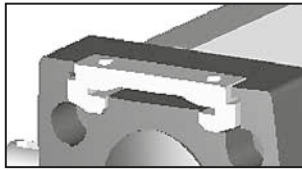
Linear Motion Systems with Ball Screw Drive and Slide Guide

Overview

M-Series Technical Presentation

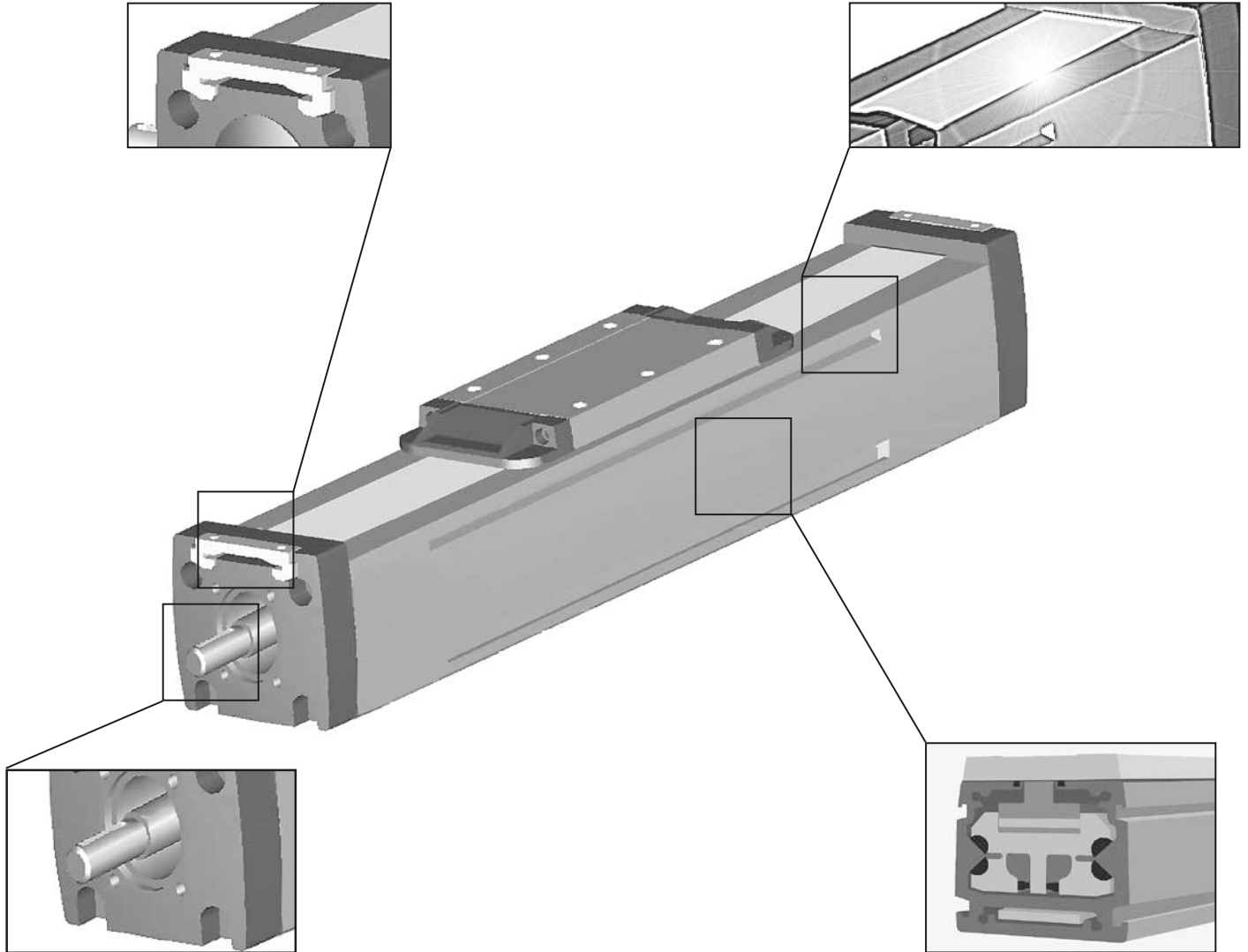
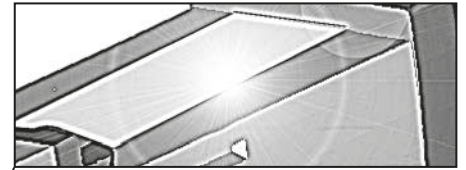
Cover band

The self-adjusting magnetically sealed stainless steel cover band protects the unit from the penetration of dirt, dust and liquids.



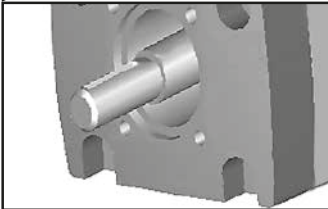
Environmental protection

The standard unit can operate in harsh environments but is also available in a wash down version for environments that are dusty, dirty and/or wet.



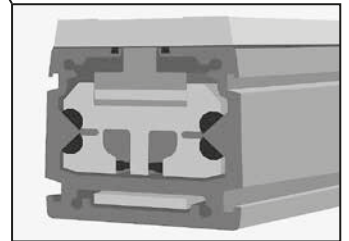
Ball screw drive

The ball screw ensures high accuracy and efficiency and the optional screw supports enable higher speeds.



Prism slide guides

The patented self aligning prism slide guides are accurate, durable and are resistant to vibrations and shock loads.



M55

Ball Screw Drive, Slide Guide

» Ordering key - see page 200
» Accessories - see page 135
» Additional data - see page 183

General Specifications

| Parameter | M55 |
|---------------------------|---|
| Profile size (w × h) [mm] | 58 × 55 |
| Type of screw | ball screw with single nut |
| Carriage sealing system | self-adjusting steel cover band |
| Screw supports | number of screw supports to be specified by customer at order |
| Lubrication | lubrication of ball screw |
| Included accessories | none |

Performance Specifications

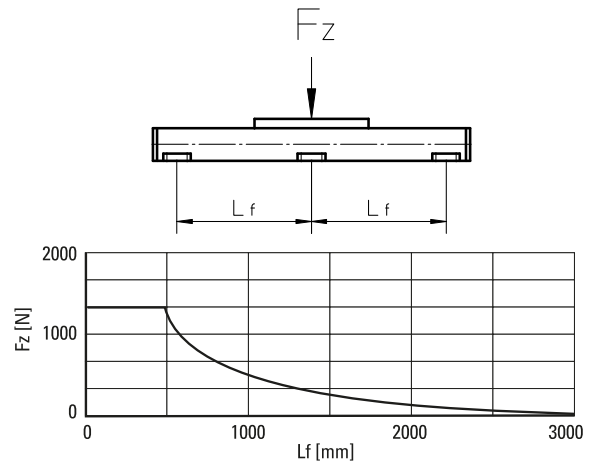
| Parameter | | M55 |
|-----------------------------------|---------------------|-----------|
| Stroke length (Smax), maximum | [mm] | 3000 |
| Linear speed, maximum | [m/s] | 1,0 |
| Acceleration, maximum | [m/s ²] | 8 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | 1000 |
| Dynamic load (Fy), maximum | [N] | 400 |
| Dynamic load (Fz), maximum | [N] | 400 |
| Dynamic load torque (Mx), maximum | [Nm] | 9 |
| Dynamic load torque (My), maximum | [Nm] | 23 |
| Dynamic load torque (Mz), maximum | [Nm] | 23 |
| Drive shaft force (Frd), maximum | [N] | 200 |
| Drive shaft torque (Mta), maximum | [Nm] | 12 |
| Screw diameter (d ₀) | [mm] | 16 |
| Screw lead (p) | [mm] | 5, 10, 20 |
| Weight | [kg] | |
| of unit with zero stroke | | 3,06 |
| of every 100 mm of stroke | | 0,44 |
| of carriage | | 1,20 |
| of option single screw support | | 0,83 |
| of option double screw supports | | 1,88 |

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

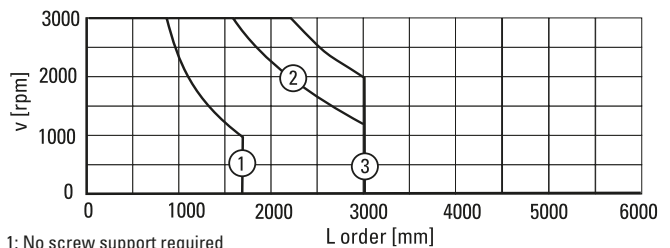
| Input speed [rpm] | Screw lead [mm] | | |
|---------------------------|-----------------|--------|--------|
| | p = 5 | p = 10 | p = 20 |
| 500 - no screw supports | 0,10 | 0,15 | 0,30 |
| 500 - with screw supports | 0,13 | 0,27 | 0,45 |

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

Deflection of the Profile

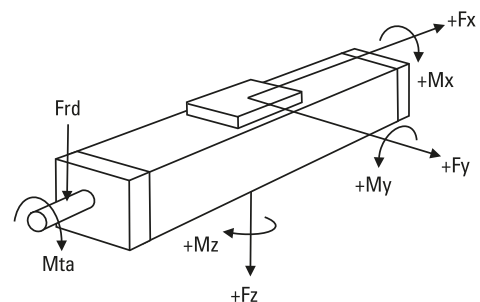


Critical Speed



1: No screw support required
2: Single screw support required
3: Double screw supports required

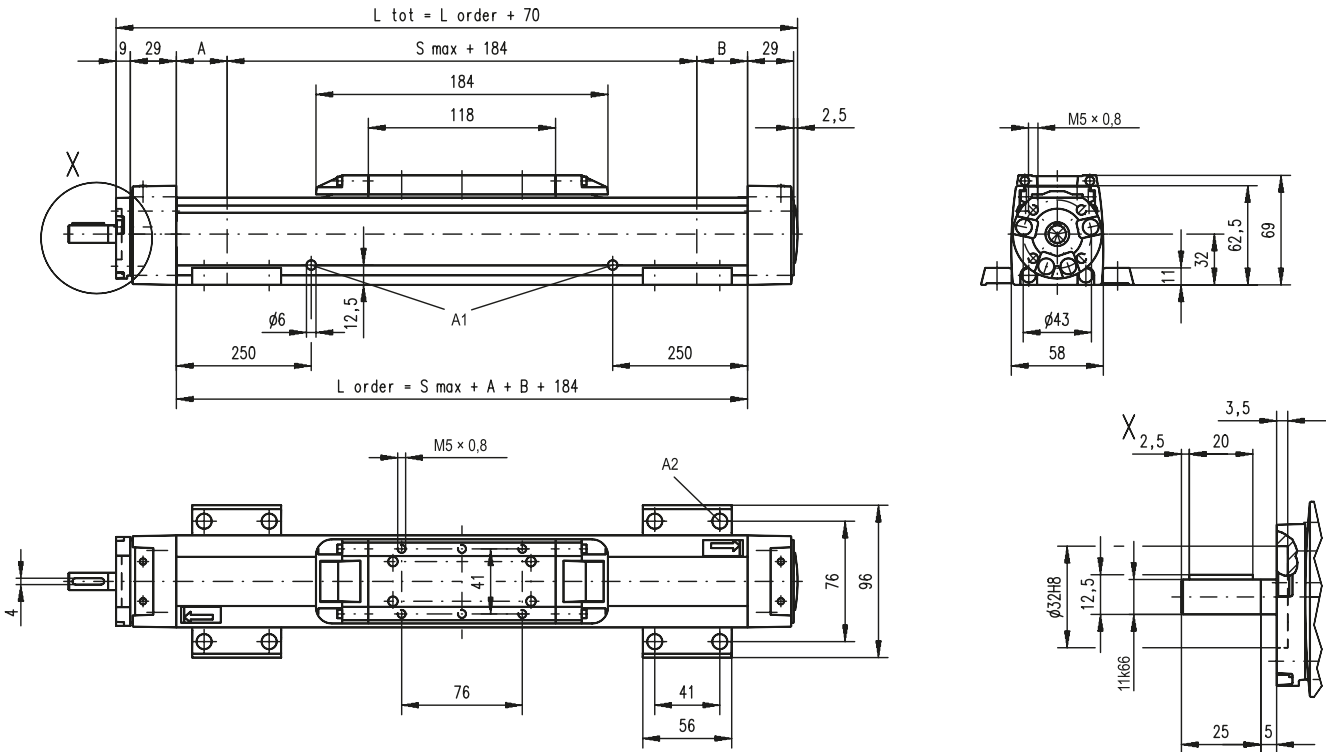
Definition of Forces



M55

Ball Screw Drive, Slide Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

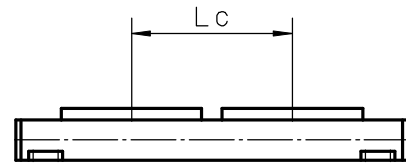


A1: lubrication holes
 A2: $\varnothing 9,5/\varnothing 5,5$ for socket head cap screw M5

| Screw support configuration | A [mm] | B [mm] | Ordering length (L order) [mm] | Total length (L tot) [mm] |
|-----------------------------|--------|--------|-------------------------------------|----------------------------|
| No screw support | 6 | 6 | $L_{order} = S_{max} + A + B + 184$ | $L_{tot} = L_{order} + 70$ |
| Single screw support | 32 | 32 | $L_{order} = S_{max} + A + B + 184$ | $L_{tot} = L_{order} + 70$ |
| Double screw supports | 83 | 83 | $L_{order} = S_{max} + A + B + 184$ | $L_{tot} = L_{order} + 70$ |

Double Carriages

| Parameter | M55 | |
|--|------|--------------------|
| Minimum distance between carriages (Lc) | [mm] | 200 |
| Dynamic load (Fy), maximum | [N] | 600 |
| Dynamic load (Fz), maximum | [N] | 600 |
| Dynamic load torque (My), maximum | [Nm] | $L_c^1 \times 0,3$ |
| Dynamic load torque (Mz), maximum | [Nm] | $L_c^1 \times 0,3$ |
| Force required to move second carriage | [N] | 35 |
| Weight of unit with zero stroke of carriages | [kg] | 5,14 2,40 |



| Screw support configuration | A [mm] | B [mm] | Ordering length (L order) [mm] | Total length (L tot) [mm] |
|-----------------------------|--------|--------|---|----------------------------|
| No screw support | 6 | 6 | $L_{order} = S_{max} + A + B + L_c + 184$ | $L_{tot} = L_{order} + 70$ |
| Single screw support | 32 | 32 | $L_{order} = S_{max} + A + B + L_c + 184$ | $L_{tot} = L_{order} + 70$ |
| Double screw supports | 83 | 83 | $L_{order} = S_{max} + A + B + L_c + 184$ | $L_{tot} = L_{order} + 70$ |

¹ Value in mm

M75

Ball Screw Drive, Slide Guide

» Ordering key - see page 200
» Accessories - see page 135
» Additional data - see page 183

General Specifications

| Parameter | M75 |
|---------------------------|---|
| Profile size (w × h) [mm] | 86 × 75 |
| Type of screw | ball screw with single nut |
| Carriage sealing system | self-adjusting steel cover band |
| Screw supports | number of screw supports to be specified by customer at order |
| Lubrication | lubrication of ball screw |
| Included accessories | none |

Performance Specifications

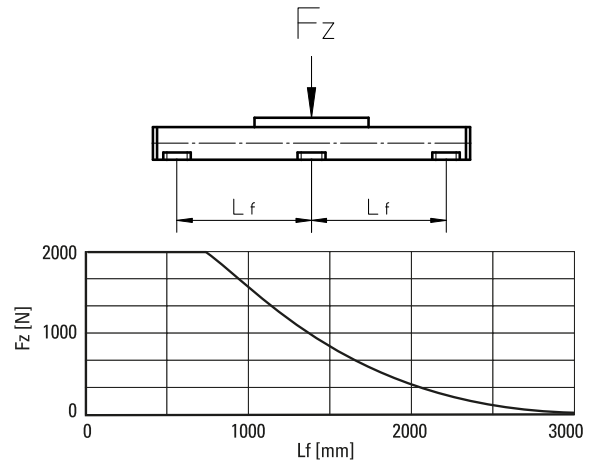
| Parameter | | M75 |
|-----------------------------------|---------------------|-------------|
| Stroke length (Smax), maximum | [mm] | 4000 |
| Linear speed, maximum | [m/s] | 1,6 |
| Acceleration, maximum | [m/s ²] | 8 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 5000 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | 2500 |
| Dynamic load (Fy), maximum | [N] | 1485 |
| Dynamic load (Fz), maximum | [N] | 1485 |
| Dynamic load torque (Mx), maximum | [Nm] | 49 |
| Dynamic load torque (My), maximum | [Nm] | 85 |
| Dynamic load torque (Mz), maximum | [Nm] | 85 |
| Drive shaft force (Frd), maximum | [N] | 600 |
| Drive shaft torque (Mta), maximum | [Nm] | 30 |
| Screw diameter (d ₀) | [mm] | 20 |
| Screw lead (p) | [mm] | 5, 12,7, 20 |
| Weight | [kg] | |
| of unit with zero stroke | | 6,07 |
| of every 100 mm of stroke | | 0,82 |
| of carriage | | 1,70 |
| of option single screw support | | 1,70 |
| of option double screw supports | | 3,58 |

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

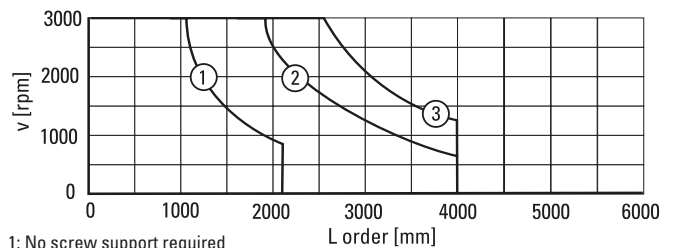
| Input speed [rpm] | Screw lead [mm] | | |
|---------------------------|-----------------|----------|--------|
| | p = 5 | p = 12,7 | p = 20 |
| 500 - no screw supports | 0,10 | 0,24 | 0,37 |
| 500 - with screw supports | 0,15 | 0,39 | 0,57 |

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

Deflection of the Profile

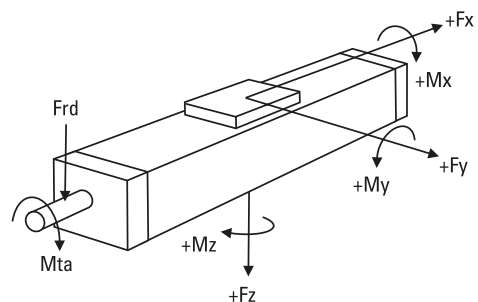


Critical Speed



1: No screw support required
2: Single screw support required
3: Double screw supports required

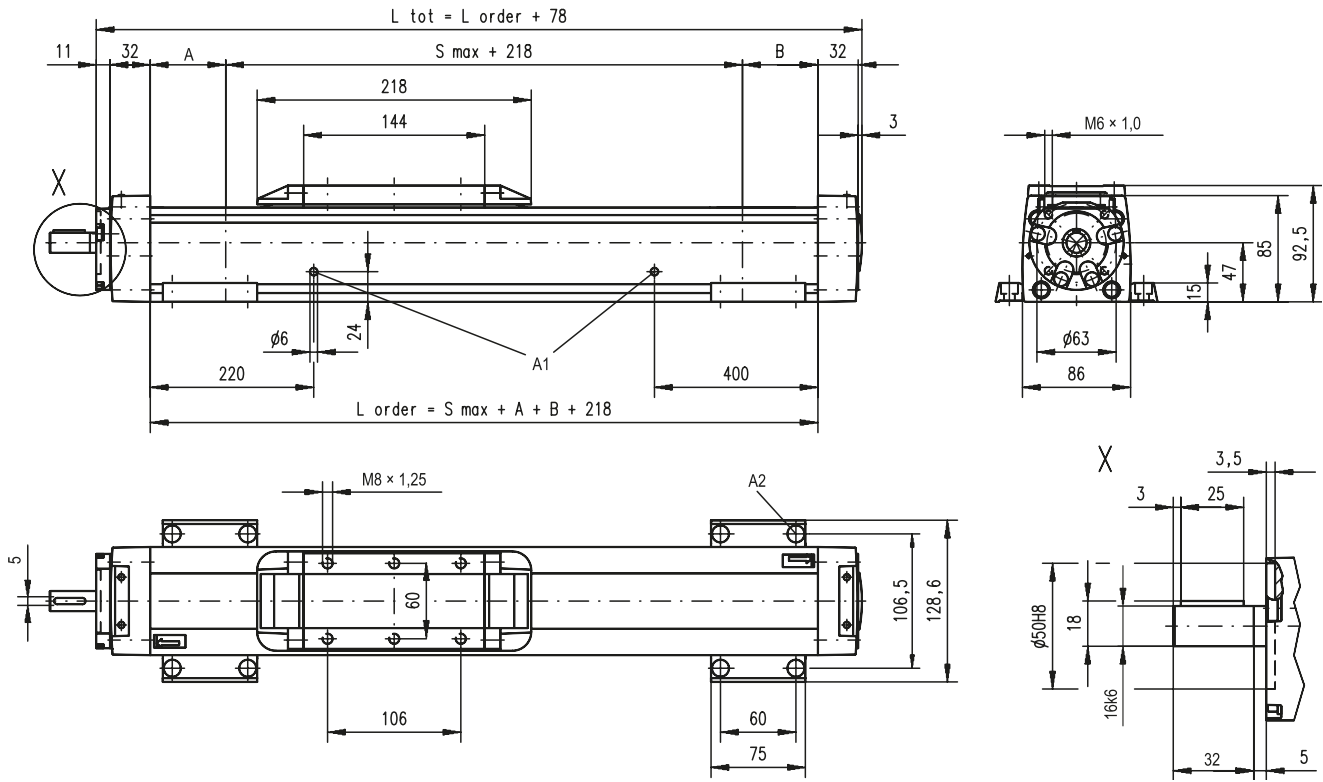
Definition of Forces



M75

Ball Screw Drive, Slide Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

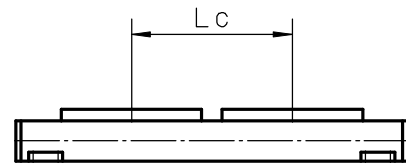


A1: lubrication holes
 A2: ø13,5/ø8,5 for socket head cap screw M8

| Screw support configuration | A [mm] | B [mm] | Ordering length (L_order) [mm] | Total length (L_tot) [mm] |
|-----------------------------|--------|--------|-------------------------------------|----------------------------|
| No screw support | 5 | 5 | $L_{order} = S_{max} + A + B + 218$ | $L_{tot} = L_{order} + 78$ |
| Single screw support | 60 | 60 | $L_{order} = S_{max} + A + B + 218$ | $L_{tot} = L_{order} + 78$ |
| Double screw supports | 126 | 126 | $L_{order} = S_{max} + A + B + 218$ | $L_{tot} = L_{order} + 78$ |

Double Carriages

| Parameter | M75 |
|---|----------------------|
| Minimum distance between carriages (Lc) [mm] | 250 |
| Dynamic load (Fy), maximum [N] | 2227 |
| Dynamic load (Fz), maximum [N] | 2227 |
| Dynamic load torque (My), maximum [Nm] | $L_c^1 \times 1,114$ |
| Dynamic load torque (Mz), maximum [Nm] | $L_c^1 \times 1,114$ |
| Force required to move second carriage [N] | 40 |
| Weight of unit with zero stroke of carriages [kg] | 9,82 3,40 |



| Screw support configuration | A [mm] | B [mm] | Ordering length (L_order) [mm] | Total length (L_tot) [mm] |
|-----------------------------|--------|--------|---|----------------------------|
| No screw support | 5 | 5 | $L_{order} = S_{max} + A + B + L_c + 218$ | $L_{tot} = L_{order} + 78$ |
| Single screw support | 60 | 60 | $L_{order} = S_{max} + A + B + L_c + 218$ | $L_{tot} = L_{order} + 78$ |
| Double screw supports | 126 | 126 | $L_{order} = S_{max} + A + B + L_c + 218$ | $L_{tot} = L_{order} + 78$ |

¹ Value in mm

M100

Ball Screw Drive, Slide Guide

- » 0» Ordering key - see page 200
- » Accessories - see page 135
- » Additional data - see page 183

General Specifications

| Parameter | M100 |
|---------------------------|---|
| Profile size (w × h) [mm] | 108 × 100 |
| Type of screw | ball screw with single nut |
| Carriage sealing system | self-adjusting steel cover band |
| Screw supports | number of screw supports to be specified by customer at order |
| Lubrication | lubrication of ball screw |
| Included accessories | none |

Performance Specifications

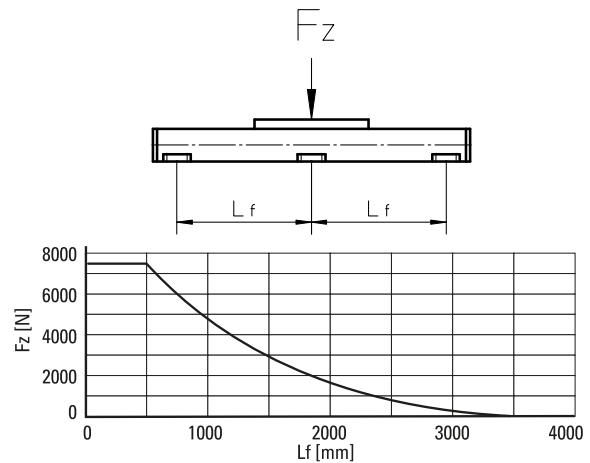
| Parameter | | M100 |
|-----------------------------------|---------------------|-----------|
| Stroke length (Smax), maximum | [mm] | 6000 |
| Linear speed, maximum | [m/s] | 1,6 |
| Acceleration, maximum | [m/s ²] | 8 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 4000 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | 5000 |
| Dynamic load (Fy), maximum | [N] | 3005 |
| Dynamic load (Fz), maximum | [N] | 3005 |
| Dynamic load torque (Mx), maximum | [Nm] | 117 |
| Dynamic load torque (My), maximum | [Nm] | 279 |
| Dynamic load torque (Mz), maximum | [Nm] | 279 |
| Drive shaft force (Frd), maximum | [N] | 1000 |
| Drive shaft torque (Mta), maximum | [Nm] | 45 |
| Screw diameter (d ₀) | [mm] | 25 |
| Screw lead (p) | [mm] | 5, 10, 25 |
| Weight | [kg] | |
| of unit with zero stroke | | 12,87 |
| of every 100 mm of stroke | | 1,42 |
| of carriage | | 3,50 |
| of option single screw support | | 1,86 |
| of option double screw supports | | 4,42 |

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

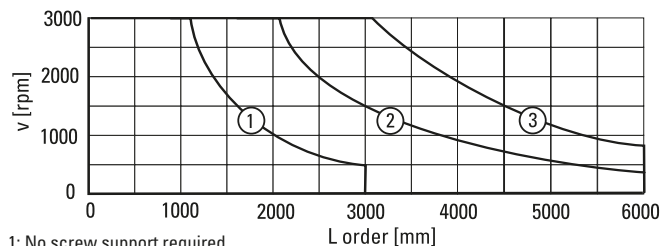
| Input speed [rpm] | Screw lead [mm] | | |
|---------------------------|-----------------|--------|--------|
| | p = 5 | p = 10 | p = 25 |
| 500 - no screw supports | 0,15 | 0,25 | 0,55 |
| 500 - with screw supports | 0,25 | 0,40 | 0,85 |

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

Deflection of the Profile

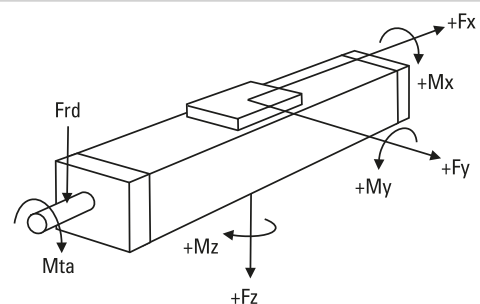


Critical Speed



- 1: No screw support required
- 2: Single screw support required
- 3: Double screw supports required

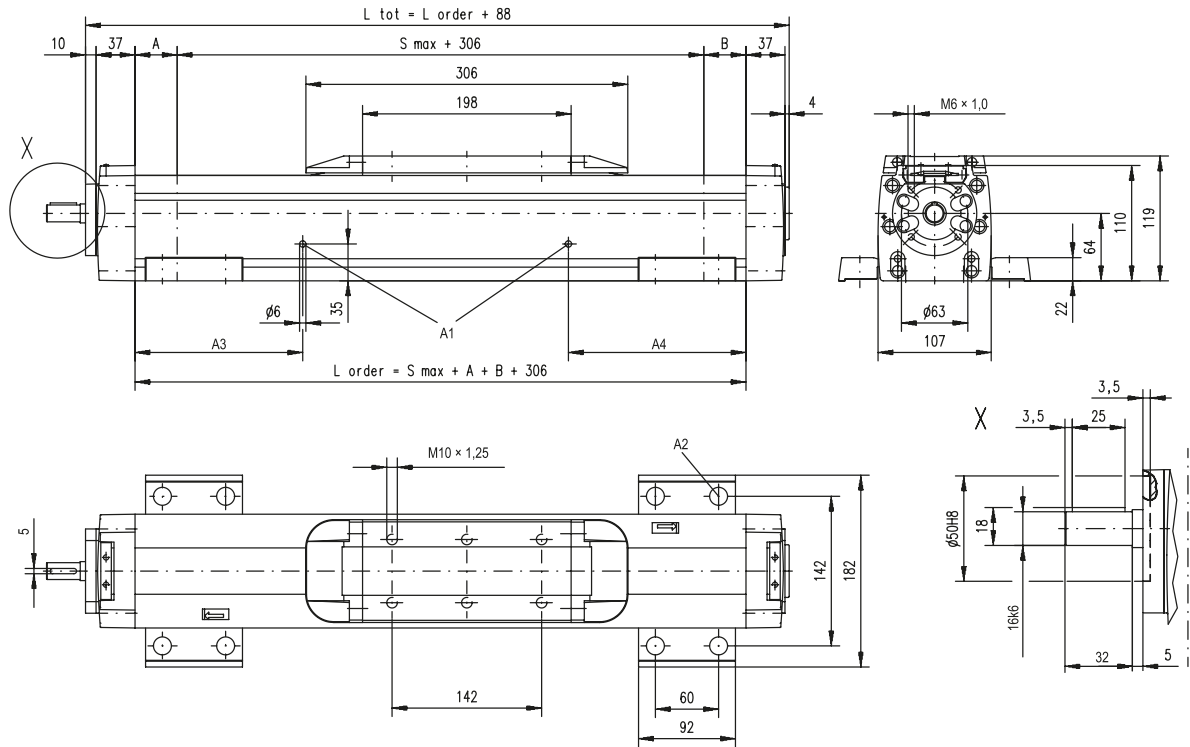
Definition of Forces



M100

Ball Screw Drive, Slide Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



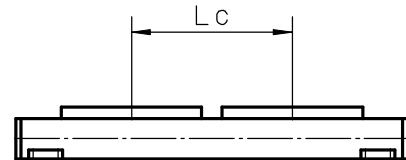
A1: lubrication holes
 A2: ø17/ø10,5 for socket head cap screw M10

A3: 100 (L_order ≤ 1 m), 320 (L_order > 1 m)
 A4: 100 (L_order ≤ 1 m), 430 (L_order > 1 m)

| Screw support configuration | A [mm] | B [mm] | Ordering length (L_order) [mm] | Total length (L_tot) [mm] |
|-----------------------------|--------|--------|-------------------------------------|----------------------------|
| No screw support | 1 | 1 | $L_{order} = S_{max} + A + B + 306$ | $L_{tot} = L_{order} + 88$ |
| Single screw support | 31 | 31 | $L_{order} = S_{max} + A + B + 306$ | $L_{tot} = L_{order} + 88$ |
| Double screw supports | 86 | 86 | $L_{order} = S_{max} + A + B + 306$ | $L_{tot} = L_{order} + 88$ |

Double Carriages

| Parameter | M100 |
|---|----------------------|
| Minimum distance between carriages (Lc) [mm] | 350 |
| Dynamic load (Fy), maximum [N] | 4508 |
| Dynamic load (Fz), maximum [N] | 4508 |
| Dynamic load torque (My), maximum [Nm] | $L_c^1 \times 2,254$ |
| Dynamic load torque (Mz), maximum [Nm] | $L_c^1 \times 2,254$ |
| Force required to move second carriage [N] | 45 |
| Weight of unit with zero stroke of carriages [kg] | 21,34 7,00 |



| Screw support configuration | A [mm] | B [mm] | Ordering length (L_order) [mm] | Total length (L_tot) [mm] |
|-----------------------------|--------|--------|---|----------------------------|
| No screw support | 1 | 1 | $L_{order} = S_{max} + A + B + L_c + 306$ | $L_{tot} = L_{order} + 88$ |
| Single screw support | 31 | 31 | $L_{order} = S_{max} + A + B + L_c + 306$ | $L_{tot} = L_{order} + 88$ |
| Double screw supports | 86 | 86 | $L_{order} = S_{max} + A + B + L_c + 306$ | $L_{tot} = L_{order} + 88$ |

¹ Value in mm

Linear Motion Systems with Belt Drive and Ball Guide

Overview

SpeedLine WH



Features

- Can be installed in any orientation
- Stroke up to 2 m
- Acceleration up to 40 m/s²
- Compact

| Parameter | | WH40 |
|--|-------|---------------|
| Profile size (width × height) | [mm] | 40 × 40 |
| Stroke length (S _{max}), maximum | [mm] | 2000 |
| Linear speed, maximum | [m/s] | 3,0 |
| Dynamic carriage load (F _z), maximum | [N] | 600 |
| Remarks | | no cover band |
| Page | | 82 |

PowerLine WMZ



Features

- Can be installed in any orientation
- Stroke up to 5,5 m
- Speed up to 5 m/s
- Patented plastic cover band

| Parameter | | WM60Z | WM80Z |
|--|-------|---------|---------|
| Profile size (width × height) | [mm] | 60 × 60 | 80 × 80 |
| Stroke length (S _{max}), maximum | [mm] | 4000 | 5500 |
| Linear speed, maximum | [m/s] | 2,5 | 5,0 |
| Dynamic carriage load (F _z), maximum | [N] | 1400 | 2100 |
| Remarks | | - | - |
| Page | | 84 | 86, 88 |

Movopart M



Features

- Can be installed in any orientation
- Self-adjusting stainless steel cover band
- Stroke up to 12 m
- Wash down protected versions available.

| Parameter | | M55 | M75 | M100 |
|--|-------|---------|---------|-----------|
| Profile size (width × height) | [mm] | 58 × 55 | 86 × 75 | 108 × 100 |
| Stroke length (S _{max}), maximum | [mm] | 7000 | 12000 | 12000 |
| Linear speed, maximum | [m/s] | 5,0 | 5,0 | 5,0 |
| Dynamic carriage load (F _z), maximum | [N] | 750 | 1750 | 4000 |
| Remarks | | - | - | - |
| Page | | 90 | 92 | 94 |

Linear Motion Systems with Belt Drive and Ball Guide

Overview

ForceLine MLSM



Features

- Can be installed in any orientation
- Patented plastic cover band
- High load capabilities
- Low profile height

| Parameter | | MLSM80Z |
|-------------------------------------|-------|----------|
| Profile size (width × height) | [mm] | 240 × 85 |
| Stroke length (Smax), maximum | [mm] | 5900 |
| Linear speed, maximum | [m/s] | 5,0 |
| Dynamic carriage load (Fz), maximum | [N] | 6400 |
| Remarks | | - |
| Page | | 96 |

WMZ-Series Technical Presentation

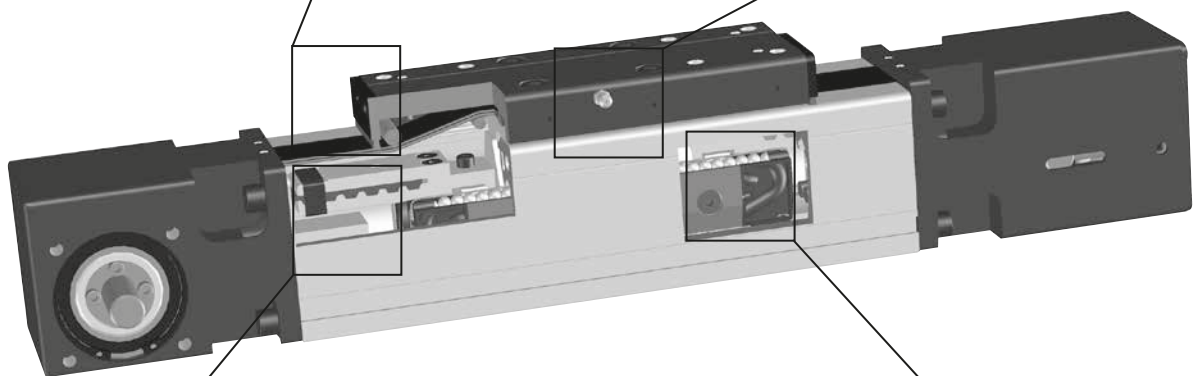
Cover band

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



Central lubrication

One central lubrication point on the carriage services the entire unit resulting in a minimum maintenance requirement.



Belt drive

The belt is protected from the outside ensuring long, accurate and safe operation.



Ball guides

Integrated patented ball guides with hardened steel tracks for optimum performance.

WH40

Belt Drive, Ball Guide

- » Ordering key - see page 201
- » Accessories - see page 135
- » Additional data - see page 183

General Specifications

| Parameter | WH40 |
|----------------------------|---|
| Profile size (w × h) [mm] | 40 × 40 |
| Type of belt | 10 AT 5 |
| Carriage sealing system | none |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

| Parameter | | WH40 |
|-----------------------------------|---------------------|------------------|
| Stroke length (Smax), maximum | [mm] | 2000 |
| Linear speed, maximum | [m/s] | 3,0 |
| Acceleration, maximum | [m/s ²] | 40 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 1800 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 315 ¹ |
| Dynamic load (Fy), maximum | [N] | 450 |
| Dynamic load (Fz), maximum | [N] | 600 |
| Dynamic load torque (Mx), maximum | [Nm] | 10 |
| Dynamic load torque (My), maximum | [Nm] | 30 |
| Dynamic load torque (Mz), maximum | [Nm] | 30 |
| Drive shaft force (Frd), maximum | [N] | 100 |
| Drive shaft torque (Mta), maximum | [Nm] | 6 |
| Pulley diameter | [mm] | 31,83 |
| Stroke per shaft revolution | [mm] | 100 |
| Weight | [kg] | |
| of unit with zero stroke | | 1,19 |
| of every 100 mm of stroke | | 0,15 |
| of each carriage | | 0,28 |

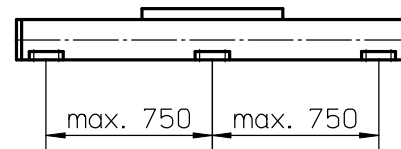
¹ See diagram Force Fx

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

| Input speed [rpm] | Idle torque [Nm] |
|-------------------|------------------|
| 150 | 0,1 |
| 900 | 0,3 |
| 1800 | 0,6 |

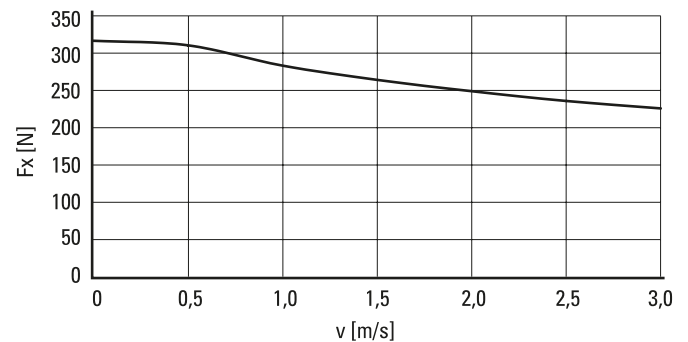
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

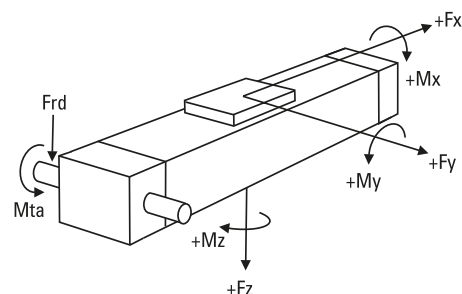


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Force Fx as a Function of the Speed

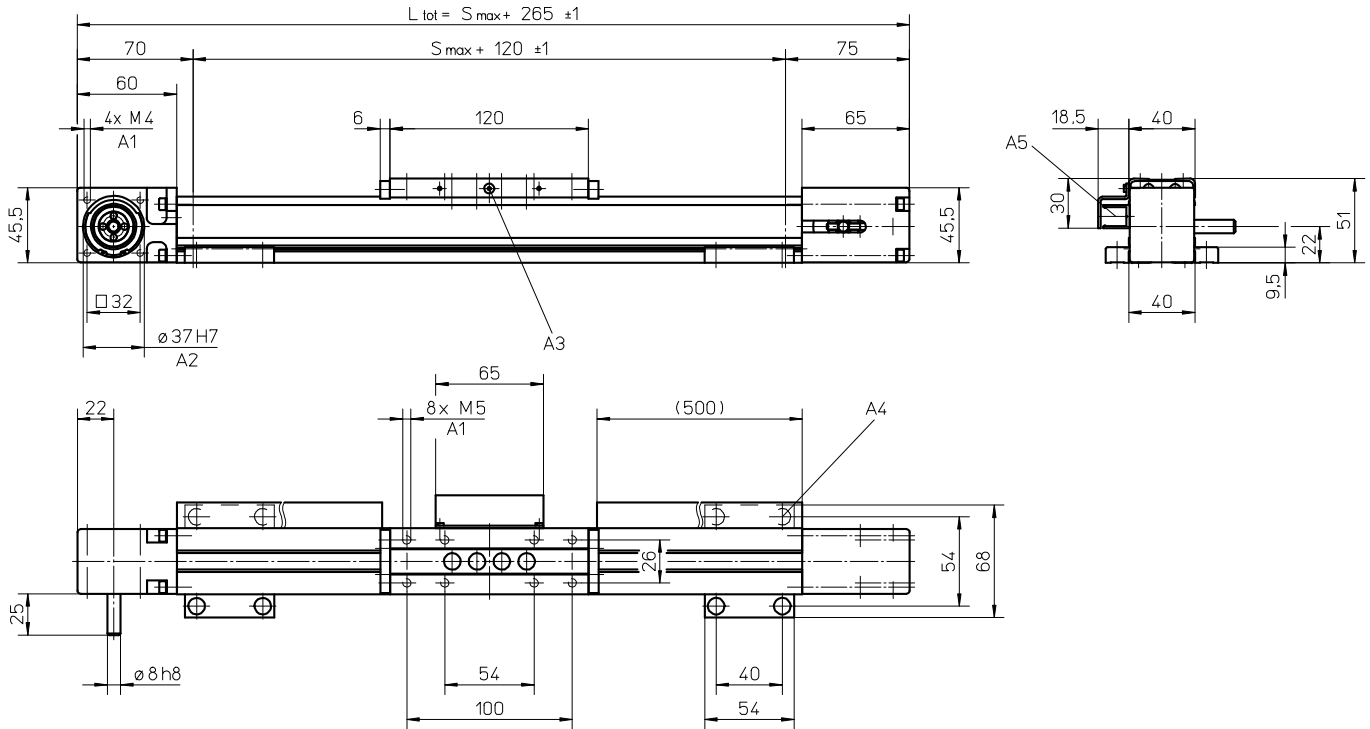


Definition of Forces



WH40

Belt Drive, Ball Guide

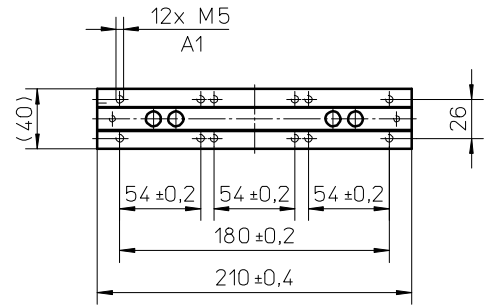


A1: depth 10
 A2: depth 3
 A3: lubricating nipple on both sides

A4: socket cap screw ISO4762-M5×12 8.8
 A5: ENF inductive sensor rail kit (optional - see page 172)

Long Carriage

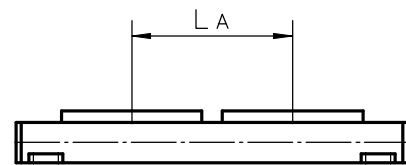
| Parameter | WH40 | |
|-----------------------------------|------|------|
| Carriage length | [mm] | 210 |
| Dynamic load torque (My), maximum | [Nm] | 50 |
| Dynamic load torque (Mz), maximum | [Nm] | 50 |
| Weight | [kg] | 0,43 |



A1: depth 10

Double Carriages

| Parameter | WH40 | |
|---|------|-----------------------|
| Minimum distance between carriages (LA) | [mm] | 135 |
| Dynamic load (Fy), maximum | [N] | 900 |
| Dynamic load (Fz), maximum | [N] | 1200 |
| Dynamic load torque (My), maximum | [Nm] | $L A^1 \times 0,45$ |
| Dynamic load torque (Mz), maximum | [Nm] | $L A^1 \times 0,60$ |
| Force required to move second carriage | [N] | 2 |
| Total length (L tot) | [mm] | $S_{max} + 265 + L A$ |



¹ Value in mm

WM60Z

Belt Drive, Ball Guide, Short Carriage

- » Ordering key - see page 202
- » Accessories - see page 135
- » Additional data - see page 183

General Specifications

| Parameter | WM60Z |
|----------------------------|---|
| Profile size (w × h) [mm] | 60 × 60 |
| Type of belt | 20 ATL 5 |
| Carriage sealing system | self-adjusting plastic cover band |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

| Parameter | | WM60Z |
|-----------------------------------|---------------------|-------------------|
| Stroke length (Smax), maximum | [mm] | 4000 |
| Linear speed, maximum | [m/s] | 2,5 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 1250 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 850 |
| Dynamic load (Fy), maximum | [N] | 1400 ¹ |
| Dynamic load (Fz), maximum | [N] | 1400 |
| Dynamic load torque (Mx), maximum | [Nm] | 25 |
| Dynamic load torque (My), maximum | [Nm] | 50 |
| Dynamic load torque (Mz), maximum | [Nm] | 50 |
| Drive shaft force (Frd), maximum | [N] | 150 |
| Drive shaft torque (Mta), maximum | [Nm] | 17 |
| Pulley diameter | [mm] | 38,20 |
| Stroke per shaft revolution | [mm] | 120 |
| Weight | [kg] | |
| of unit with zero stroke | | 4,30 |
| of every 100 mm of stroke | | 0,45 |
| of each carriage | | 1,25 |

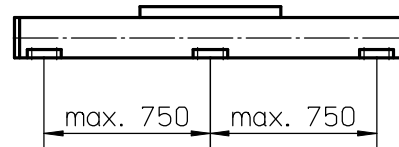
¹ See diagram Force Fx

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

| Input speed [rpm] | Idle torque [Nm] |
|-------------------|------------------|
| 150 | 1,6 |
| 600 | 2,5 |
| 1250 | 3,0 |

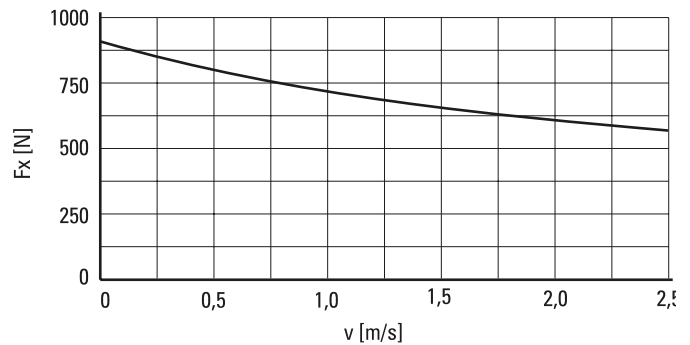
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

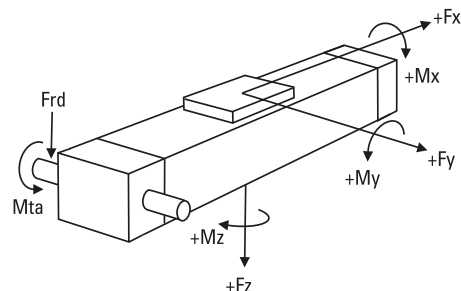


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Force Fx as a Function of the Speed



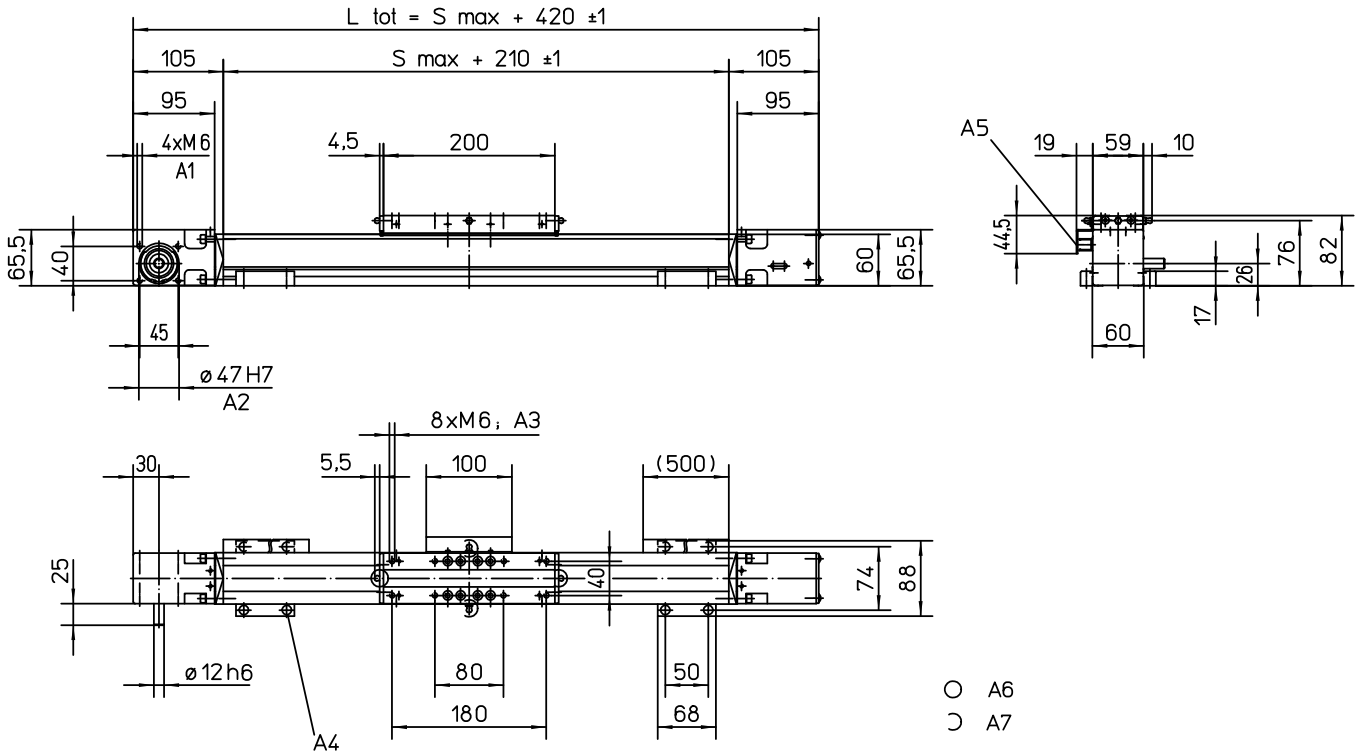
Definition of Forces



WM60Z

Belt Drive, Ball Guide, Short Carriage

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

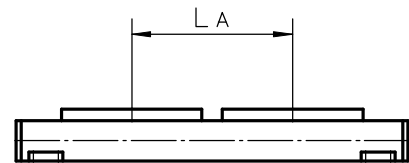


- A1: depth 15
- A2: depth 4
- A3: depth 11
- A4: socket cap screw ISO4762-M6x20 8.8

- A5: ENF inductive sensor rail kit (optional - see page 172)
- A6: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature
- A7: can be changed over to one of three alternative lubrications points by the customer

| Double Short Carriages | | WM60Z |
|--|------|------------------------------|
| Parameter | | |
| Minimum distance between carriages (L _A) | [mm] | 255 |
| Dynamic load (F _y), maximum | [N] | 2800 |
| Dynamic load (F _z), maximum | [N] | 2800 |
| Dynamic load torque (M _y), maximum | [Nm] | L A ¹ × 1,4 |
| Dynamic load torque (M _z), maximum | [Nm] | L A ¹ × 1,4 |
| Force required to move second carriage | [N] | 18 |
| Total length (L _{tot}) | [mm] | S _{max} + 420 + L A |

¹ Value in mm



WM80Z

Belt Drive, Ball Guide, Standard Carriage

- » Ordering key - see page 202
- » Accessories - see page 135
- » Additional data - see page 183

General Specifications

| Parameter | WM80Z |
|----------------------------|---|
| Profile size (w × h) [mm] | 80 × 80 |
| Type of belt | 25 AT 10 |
| Carriage sealing system | self-adjusting plastic cover band |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

| Parameter | | WM80Z |
|-----------------------------------|---------------------|-------------------|
| Stroke length (Smax), maximum | [mm] | 5400 |
| Linear speed, maximum | [m/s] | 5,0 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 885 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 1470 |
| Dynamic load (Fy), maximum | [N] | 3000 ¹ |
| Dynamic load (Fz), maximum | [N] | 3000 |
| Dynamic load torque (Mx), maximum | [Nm] | 150 |
| Dynamic load torque (My), maximum | [Nm] | 300 |
| Dynamic load torque (Mz), maximum | [Nm] | 300 |
| Drive shaft force (Frd), maximum | [N] | 600 |
| Drive shaft torque (Mta), maximum | [Nm] | 40 |
| Pulley diameter | [mm] | 54,11 |
| Stroke per shaft revolution | [mm] | 170 |
| Weight | [kg] | |
| of unit with zero stroke | | 11,2 |
| of every 100 mm of stroke | | 0,8 |
| of each carriage | | 3,4 |

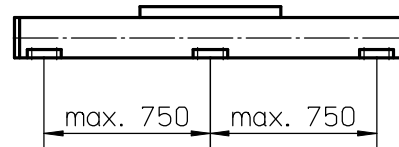
¹ See diagram Force Fx

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

| Input speed [rpm] | Idle torque [Nm] |
|-------------------|------------------|
| 150 | 6,5 |
| 450 | 7,7 |
| 885 | 9,3 |

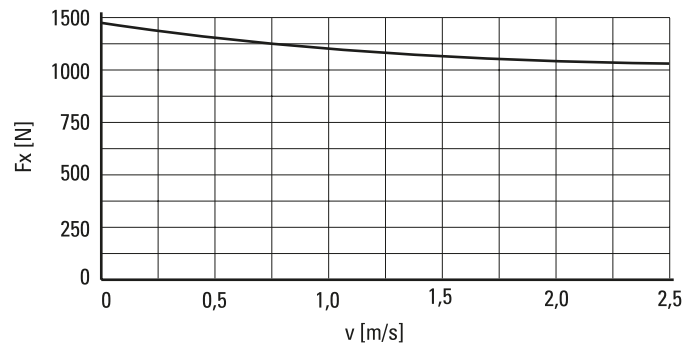
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

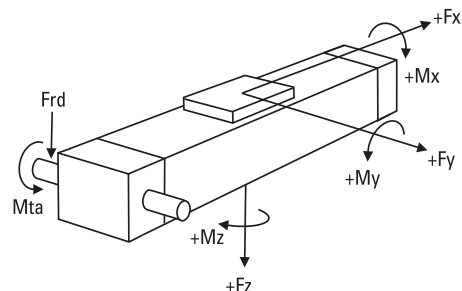


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Force Fx as a Function of the Speed



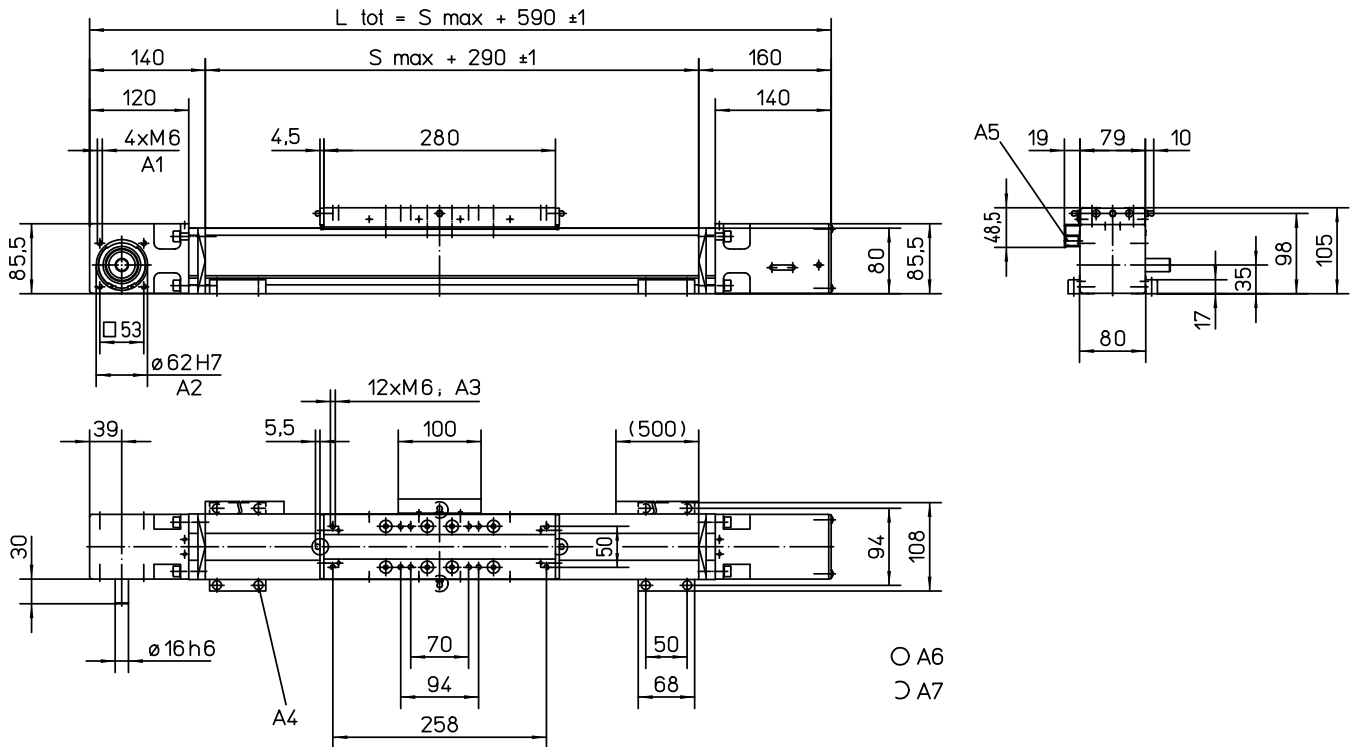
Definition of Forces



WM80Z

Belt Drive, Ball Guide, Standard Carriage

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

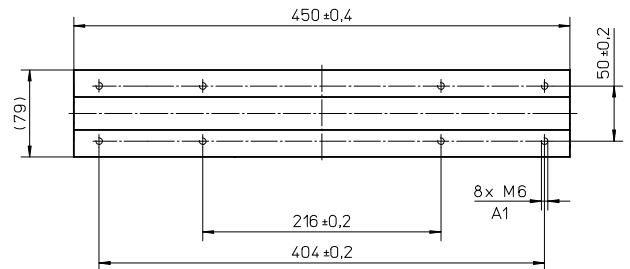


- A1: depth 15
- A2: depth 2,5
- A3: depth 12
- A4: socket cap screw ISO4762-M6x20 8.8

- A5: ENF inductive sensor rail kit (optional - see page 172)
- A6: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature
- A7: can be changed over to one of three alternative lubrications points by the customer

Long Carriage

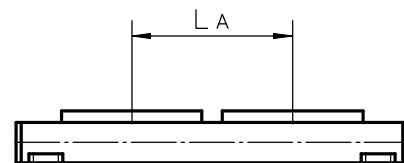
| Parameter | | WM80Z |
|--|------|-------|
| Carriage length | [mm] | 450 |
| Dynamic load torque (M_y), maximum | [Nm] | 750 |
| Dynamic load torque (M_z), maximum | [Nm] | 750 |
| Weight | [kg] | 5,1 |



A1: depth 12 mm

Double Carriages

| Parameter | | WM80Z |
|--|------|-----------------------|
| Minimum distance between carriages (L_A) | [mm] | 360 |
| 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] | 25 |
| Total length (L_{tot}) | [mm] | $S_{max} + 590 + L_A$ |



¹ Value in mm

WM80Z

Belt Drive, Ball Guide, Short Carriage

- » Ordering key - see page 202
- » Accessories - see page 135
- » Additional data - see page 183

General Specifications

| Parameter | WM80Z |
|----------------------------|---|
| Profile size (w × h) [mm] | 80 × 80 |
| Type of belt | 25 AT 10 |
| Carriage sealing system | self-adjusting plastic cover band |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

| Parameter | | WM80Z |
|-----------------------------------|---------------------|-------------------|
| Stroke length (Smax), maximum | [mm] | 5500 |
| Linear speed, maximum | [m/s] | 5,0 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 885 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 1470 |
| Dynamic load (Fy), maximum | [N] | 2100 ¹ |
| Dynamic load (Fz), maximum | [N] | 2100 |
| Dynamic load torque (Mx), maximum | [Nm] | 68 |
| Dynamic load torque (My), maximum | [Nm] | 135 |
| Dynamic load torque (Mz), maximum | [Nm] | 135 |
| Drive shaft force (Frd), maximum | [N] | 600 |
| Drive shaft torque (Mta), maximum | [Nm] | 40 |
| Pulley diameter | [mm] | 54,11 |
| Stroke per shaft revolution | [mm] | 170 |
| Weight | [kg] | |
| of unit with zero stroke | | 9,2 |
| of every 100 mm of stroke | | 0,8 |
| of each carriage | | 2,1 |

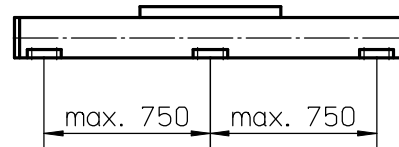
¹ See diagram Force Fx

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

| Input speed [rpm] | Idle torque [Nm] |
|-------------------|------------------|
| 150 | 4,0 |
| 450 | 5,4 |
| 885 | 6,2 |

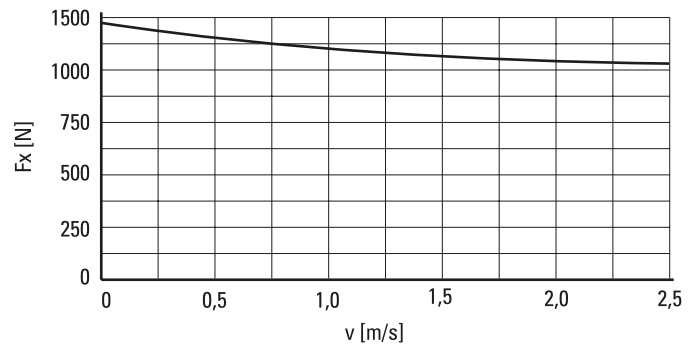
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

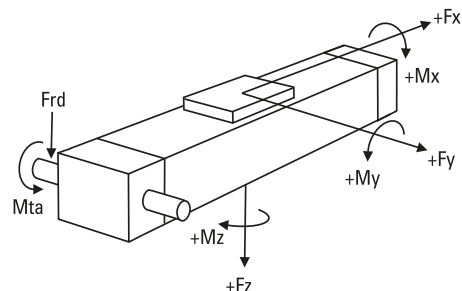


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Force Fx as a Function of the Speed



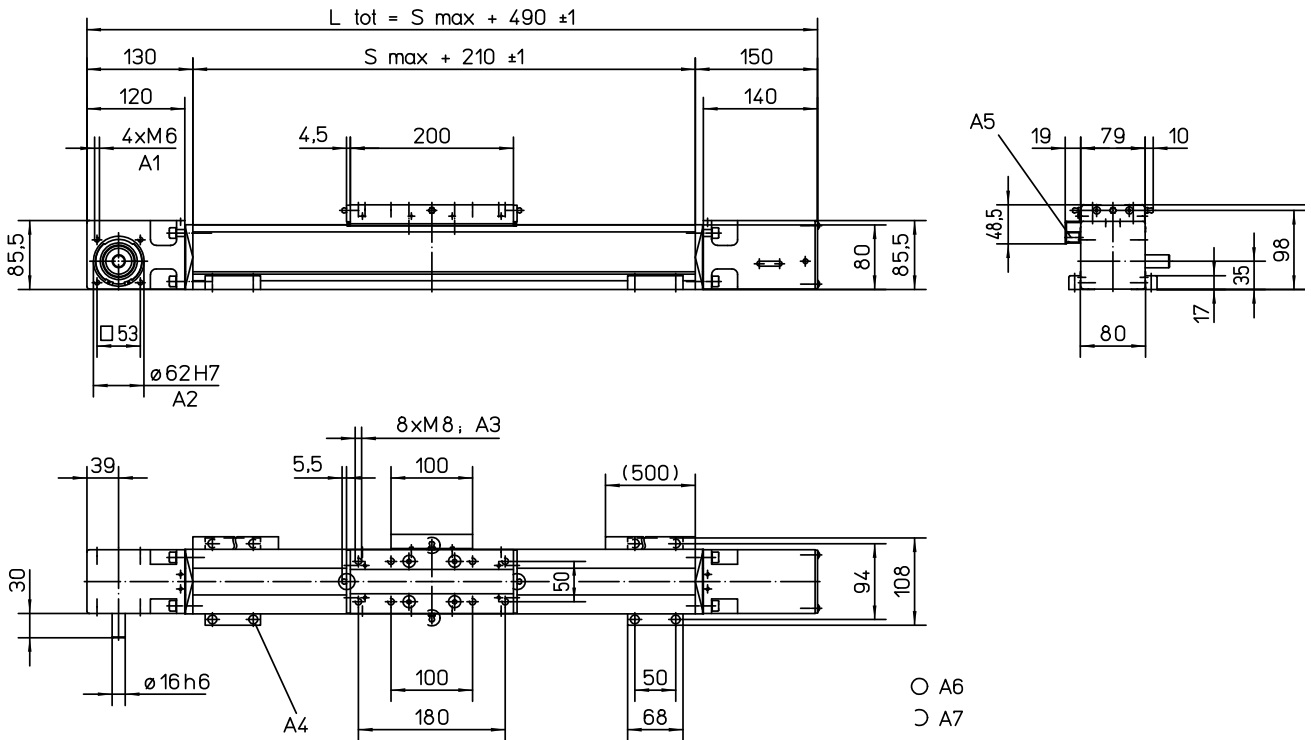
Definition of Forces



WM80Z

Belt Drive, Ball Guide, Short Carriage

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



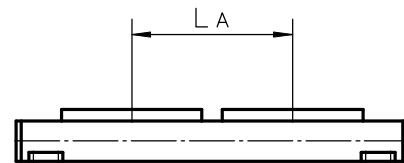
- A1: depth 15
- A2: depth 2,5
- A3: depth 12
- A4: socket cap screw ISO4762-M6x20 8.8

- A5: ENF inductive sensor rail kit (optional - see page 172)
- A6: tapered lubricating nipple to DIN71412 AM6 on fixed-bearing side as standard feature
- A7: can be changed over to one of three alternative lubrications points by the customer

Double Short Carriages

| Parameter | | WM80Z |
|--|------|------------------------------|
| Minimum distance between carriages (L _A) | [mm] | 280 |
| Dynamic load (F _y), maximum | [N] | 4200 |
| Dynamic load (F _z), maximum | [N] | 4200 |
| Dynamic load torque (M _y), maximum | [Nm] | L A ¹ × 2,1 |
| Dynamic load torque (M _z), maximum | [Nm] | L A ¹ × 2,1 |
| Force required to move second carriage | [N] | 22,5 |
| Total length (L _{tot}) | [mm] | S _{max} + 490 + L A |

¹ Value in mm



M55

Belt Drive, Ball Guide

- » Ordering key - see page 203
- » Accessories - see page 135
- » Additional data - see page 183

General Specifications

| Parameter | M55 |
|----------------------------|--|
| Profile size (w × h) [mm] | 58 × 55 |
| Type of belt | 22-STD SM5-HP |
| Carriage sealing system | self-adjusting steel cover band |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | lubrication of ball guide carriages |
| Included accessories | none |

Performance Specifications

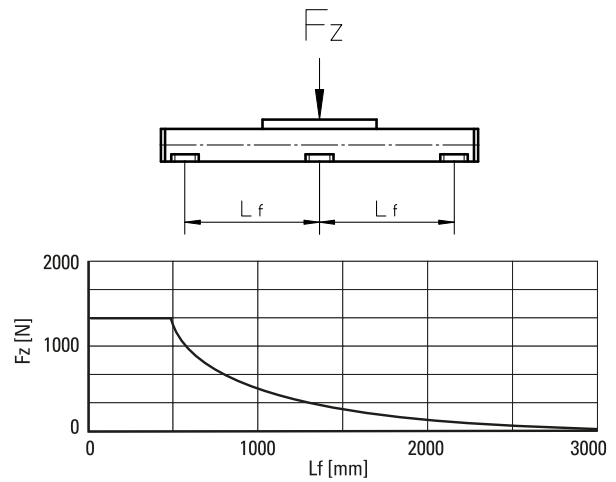
| Parameter | | M55 |
|-----------------------------------|---------------------|----------|
| Stroke length (Smax), maximum | [mm] | 7000 |
| Linear speed, maximum | [m/s] | 5,0 |
| Acceleration, maximum | [m/s ²] | 40 |
| Repeatability | [± mm] | 0,1 |
| Input speed, maximum | [rpm] | 2850 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | |
| < 2,5 m/s | | 400 |
| > 2,5 m/s | | 200 |
| Dynamic load (Fy), maximum | [N] | 750 |
| Dynamic load (Fz), maximum | [N] | 750 |
| Dynamic load torque (Mx), maximum | [Nm] | 5 |
| Dynamic load torque (My), maximum | [Nm] | 29 |
| Dynamic load torque (Mz), maximum | [Nm] | 29 |
| Drive shaft force (Frd), maximum | [N] | 200 |
| Drive shaft torque (Mta), maximum | [Nm] | 12 |
| Pulley diameter | [mm] | 33,42 |
| Stroke per shaft revolution | [mm] | 105 |
| Weight | [kg] | |
| of unit with zero stroke | | 4,80 |
| of every 100 mm of stroke | | 0,53 |
| of carriage | | 1,20 |

Carriage Idle Torque (M idle) [Nm]

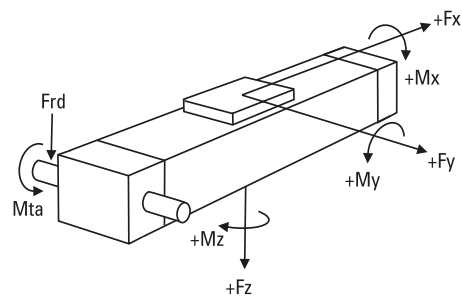
| Input speed [rpm] | Single Carriage | Double Carriages |
|-------------------|-----------------|------------------|
| 150 | 1,0 | 1,9 |

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

Deflection of the Profile



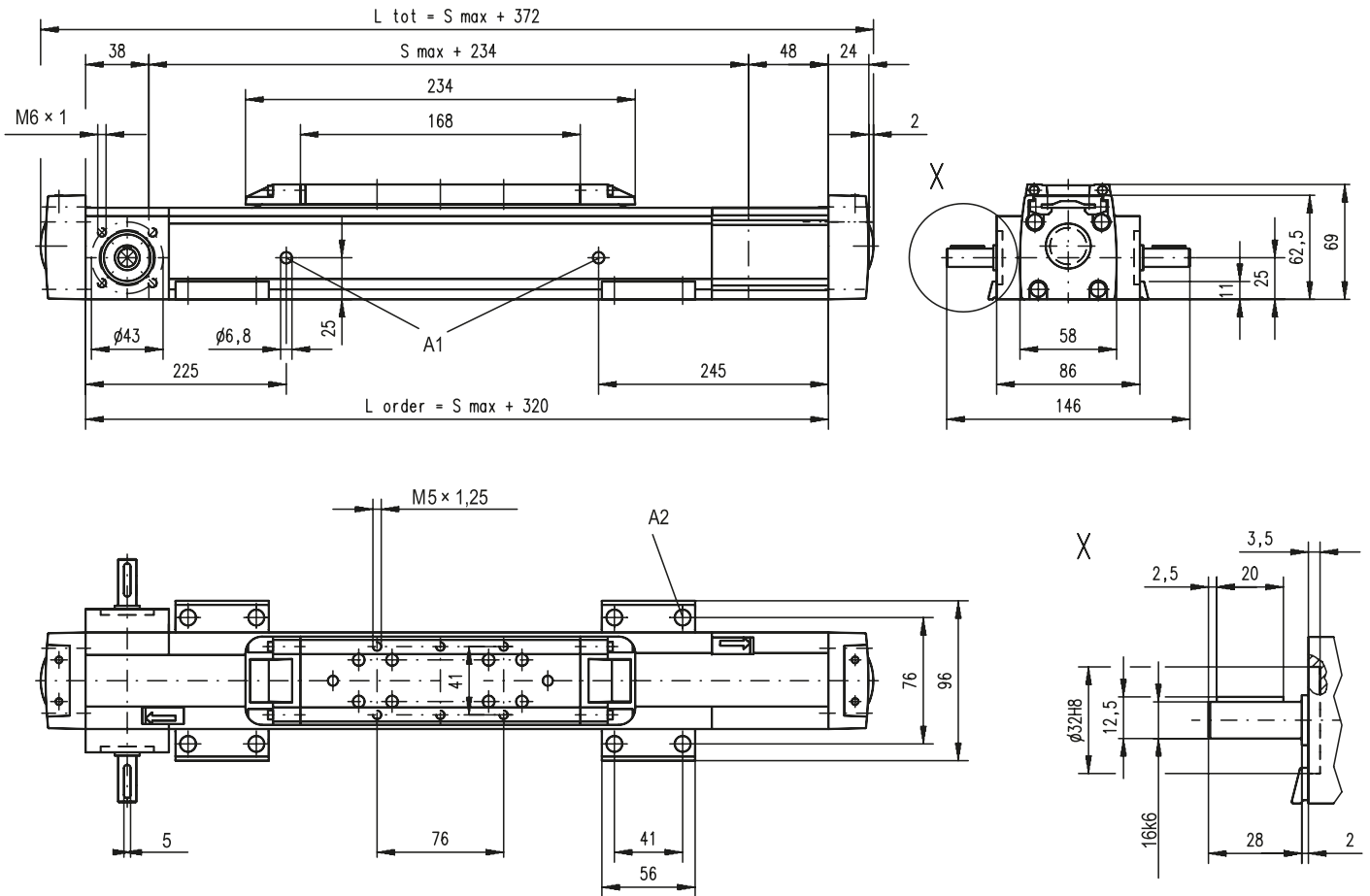
Definition of Forces



M55

Belt Drive, Ball Guide

| Dimensions | Projection |
|------------|------------|
| METRIC | |

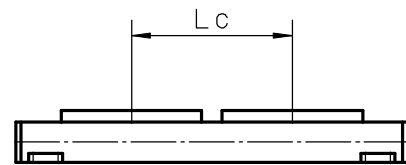


A1: lubrication holes
 A2: ø9,5/ø5,5 for socket head cap screw M5

Double Carriages

| Parameter | | M55 |
|--|------|------------------------|
| Minimum distance between carriages (Lc) | [mm] | 250 |
| Dynamic load (Fy), maximum | [N] | 1125 |
| Dynamic load (Fz), maximum | [N] | 1125 |
| Dynamic load torque (My), maximum | [Nm] | Lc ¹ × 0,56 |
| Dynamic load torque (Mz), maximum | [Nm] | Lc ¹ × 0,56 |
| Force required to move second carriage | [N] | 2 |
| Ordering length (L order) | [mm] | Smax + Lc + 320 |
| Total length (L tot) | [mm] | L order + 52 |
| Weight of unit with zero stroke of carriages | [kg] | 7,06 2,40 |

¹ Value in mm



M75

Belt Drive, Ball Guide

- » Ordering key - see page 203
- » Accessories - see page 135
- » Additional data - see page 183

General Specifications

| Parameter | M75 / T75 |
|----------------------------|--|
| Profile size (w × h) [mm] | 86 × 75 |
| Type of belt | STD5-40 |
| Carriage sealing system | self-adjusting steel cover band |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | lubrication of ball guide carriages |
| Included accessories | none |

Performance Specifications

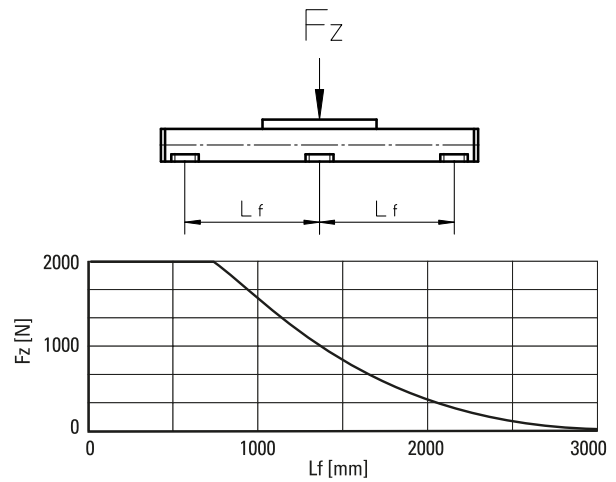
| Parameter | | M75 |
|-----------------------------------|---------------------|----------|
| Stroke length (Smax), maximum | [mm] | 12000 |
| Linear speed, maximum | [m/s] | 5,0 |
| Acceleration, maximum | [m/s ²] | 40 |
| Repeatability | [± mm] | 0,1 |
| Input speed, maximum | [rpm] | 2300 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | |
| < 2,5 m/s | | 900 |
| > 2,5 m/s | | 450 |
| Dynamic load (Fy), maximum | [N] | 1750 |
| Dynamic load (Fz), maximum | [N] | 1750 |
| Dynamic load torque (Mx), maximum | [Nm] | 16 |
| Dynamic load torque (My), maximum | [Nm] | 84 |
| Dynamic load torque (Mz), maximum | [Nm] | 84 |
| Drive shaft force (Frd), maximum | [N] | 600 |
| Drive shaft torque (Mta), maximum | [Nm] | 30 |
| Pulley diameter | [mm] | 41,38 |
| Stroke per shaft revolution | [mm] | 130 |
| Weight | [kg] | |
| of unit with zero stroke | | 7,50 |
| of every 100 mm of stroke | | 0,88 |
| of carriage | | 2,00 |

Carriage Idle Torque (M idle) [Nm]

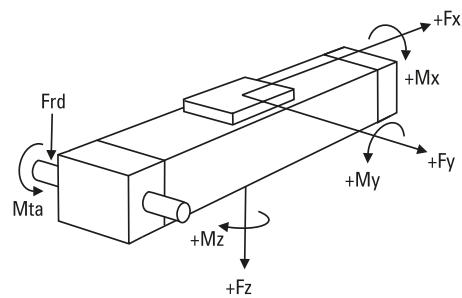
| Input speed [rpm] | Single Carriage | Double Carriages |
|-------------------|-----------------|------------------|
| 150 | 1,0 | 1,9 |

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

Deflection of the Profile



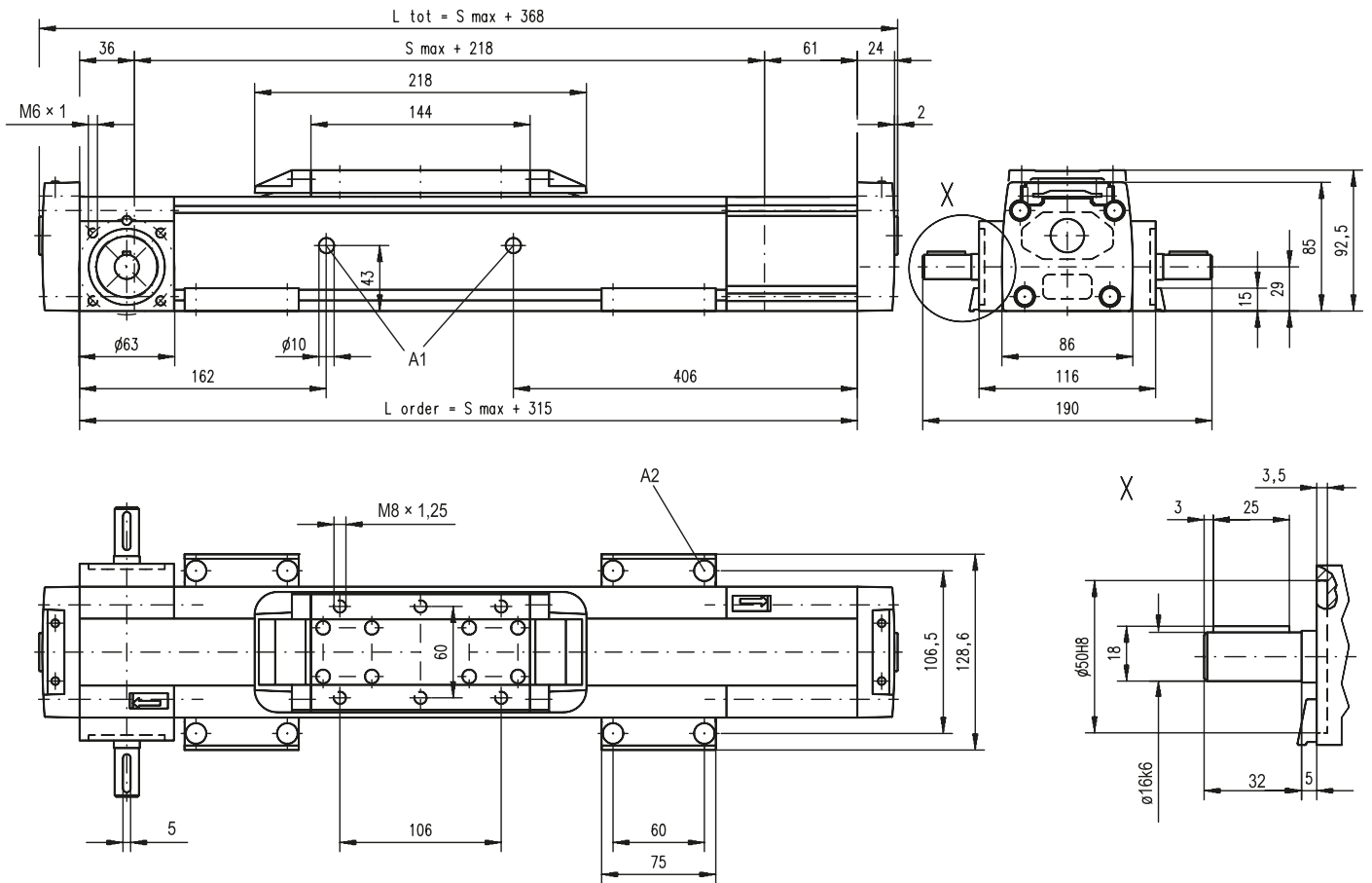
Definition of Forces



M75

Belt Drive, Ball Guide

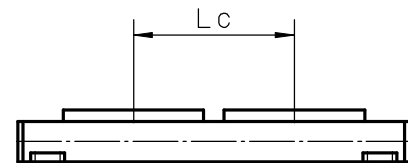
| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



A1: lubrication holes
 A2: $\phi 13,5/\phi 8,5$ for socket head cap screw M8

Double Carriages

| Parameter | | M75 |
|--|------|-----------------------|
| Minimum distance between carriages (Lc) | [mm] | 250 |
| Dynamic load (Fy), maximum | [N] | 2625 |
| Dynamic load (Fz), maximum | [N] | 2625 |
| Dynamic load torque (My), maximum | [Nm] | $L_c^1 \times 1,313$ |
| Dynamic load torque (Mz), maximum | [Nm] | $L_c^1 \times 1,313$ |
| Force required to move second carriage | [N] | 2 |
| Ordering length (L order) | [mm] | $S_{max} + L_c + 315$ |
| Total length (L tot) | [mm] | $L_{order} + 52$ |
| Weight of unit with zero stroke of carriages | [kg] | 11,67 4,00 |



¹ Value in mm

M100

Belt Drive, Ball Guide

- » Ordering key - see page 203
- » Accessories - see page 135
- » Additional data - see page 183

General Specifications

| Parameter | M100 |
|----------------------------|--|
| Profile size (w × h) [mm] | 108 × 100 |
| Type of belt | STD8-50 |
| Carriage sealing system | self-adjusting steel cover band |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | lubrication of ball guide carriages |
| Included accessories | none |

Performance Specifications

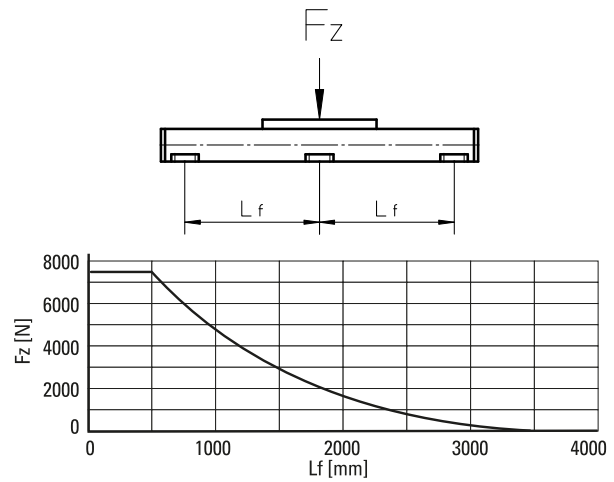
| Parameter | | M100 |
|-----------------------------------|---------------------|----------|
| Stroke length (Smax), maximum | [mm] | 12000 |
| Linear speed, maximum | [m/s] | 5,0 |
| Acceleration, maximum | [m/s ²] | 40 |
| Repeatability | [± mm] | 0,1 |
| Input speed, maximum | [rpm] | 1700 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | |
| < 2,5 m/s | | 1250 |
| > 2,5 m/s | | 625 |
| Dynamic load (Fy), maximum | [N] | 4000 |
| Dynamic load (Fz), maximum | [N] | 4000 |
| Dynamic load torque (Mx), maximum | [Nm] | 43 |
| Dynamic load torque (My), maximum | [Nm] | 280 |
| Dynamic load torque (Mz), maximum | [Nm] | 280 |
| Drive shaft force (Frd), maximum | [N] | 1000 |
| Drive shaft torque (Mta), maximum | [Nm] | 45 |
| Pulley diameter | [mm] | 56,02 |
| Stroke per shaft revolution | [mm] | 176 |
| Weight | [kg] | |
| of unit with zero stroke | | 11,61 |
| of every 100 mm of stroke | | 1,43 |
| of carriage | | 2,20 |

Carriage Idle Torque (M idle) [Nm]

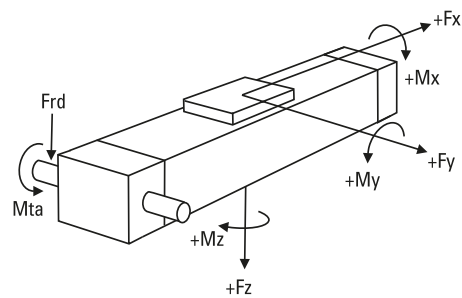
| Input speed [rpm] | Single Carriage | Double Carriages |
|-------------------|-----------------|------------------|
| 150 | 1,6 | 3,1 |

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

Deflection of the Profile



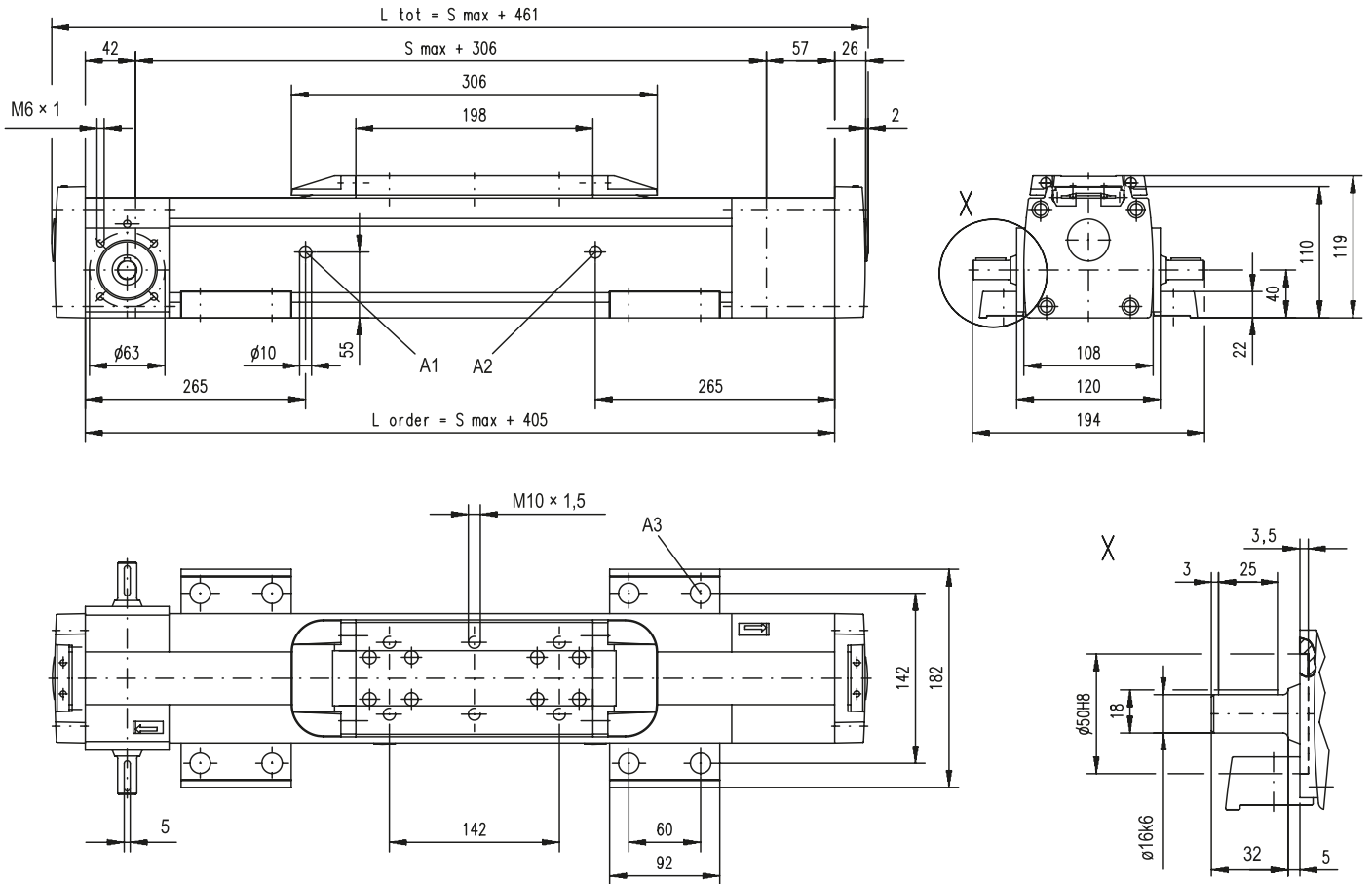
Definition of Forces



M100

Belt Drive, Ball Guide

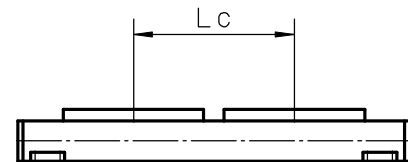
| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



A1: lubrication hole
 A2: lubrication hole (no hole if L order is < 856 mm)
 A3: $\varnothing 17/\varnothing 10,5$ for socket head cap screw M10

Double Carriages

| Parameter | | M100 |
|--|------|----------------------|
| Minimum distance between carriages (Lc) | [mm] | 350 |
| Dynamic load (Fy), maximum | [N] | 6000 |
| Dynamic load (Fz), maximum | [N] | 6000 |
| Dynamic load torque (My), maximum | [Nm] | $Lc^1 \times 3$ |
| Dynamic load torque (Mz), maximum | [Nm] | $Lc^1 \times 3$ |
| Force required to move second carriage | [N] | 2 |
| Ordering length (L order) | [mm] | $S_{max} + Lc + 405$ |
| Total length (L tot) | [mm] | $L_{order} + 56$ |
| Weight of unit with zero stroke of carriages | [kg] | 18,92 4,40 |



¹ Value in mm

MLSM80Z

Belt Drive, Ball Guide

- » Ordering key - see page 204
- » Accessories - see page 135
- » Additional data - see page 183

General Specifications

| Parameter | MLSM80Z |
|----------------------------|---|
| Profile size (w × h) [mm] | 240 × 85 |
| Type of belt | 75 ATL 10 |
| Carriage sealing system | plastic cover band |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

| Parameter | | MLSM80Z |
|--|---------------------|--------------------|
| Stroke length (Smax), maximum | [mm] | 5900 |
| Linear speed, maximum | [m/s] | 5,0 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,05 |
| Input speed, maximum | [rpm] | 1500 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 5000 ¹ |
| Dynamic load (Fy), maximum | [N] | 6400 |
| Dynamic load (Fz), maximum | [N] | 6400 |
| Dynamic load torque (Mx), maximum | [Nm] | 600 |
| Dynamic load torque (My), maximum | [Nm] | 720 |
| Dynamic load torque (Mz), maximum | [Nm] | 720 |
| 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] | 30,8 2,2 9,6 |

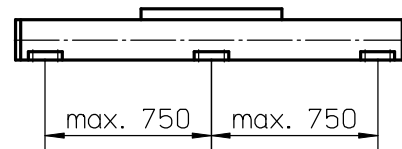
¹ See diagram Force Fx

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

| Input speed [rpm] | Idle torque [Nm] |
|-------------------|------------------|
| 150 | 8,5 |
| 750 | 12 |
| 1500 | 14,5 |

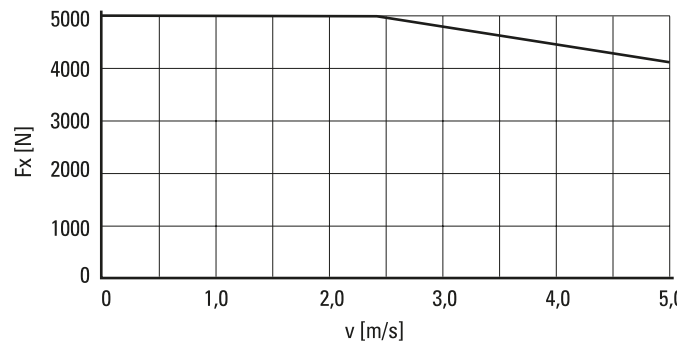
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

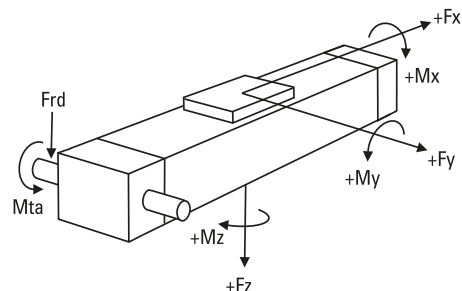


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Force Fx as a Function of the Speed



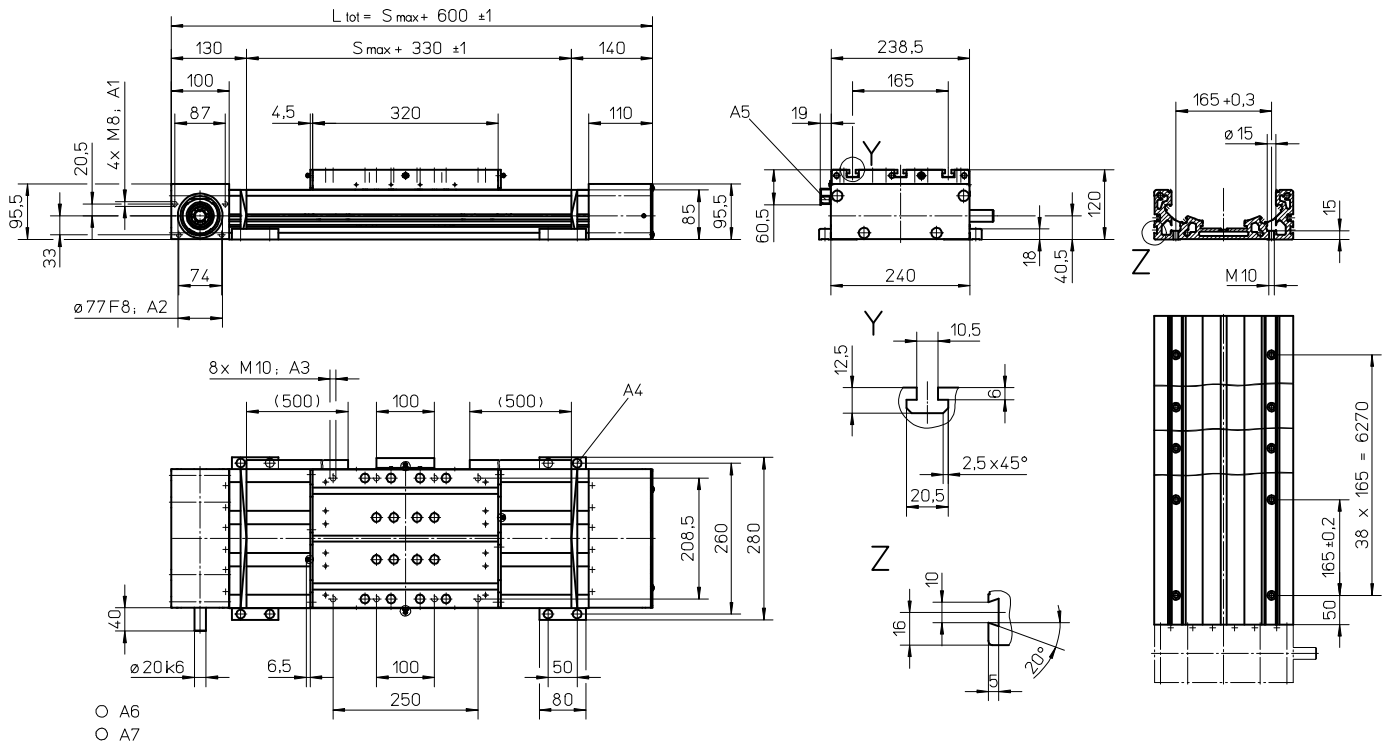
Definition of Forces



MLSM80Z

Belt Drive, Ball Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

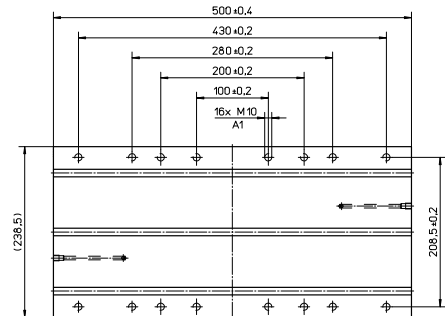


- A1: depth 18
- A2: depth 4
- A3: depth 15
- A4: socket cap screw ISO4762-M8x20 8.8

- A5: ENF inductive sensor rail kit (optional - see page 172)
- A6: tapered lubricating nipple to DIN71412 M8x1 on fixed-bearing side as standard feature
- A7: can be changed over to one of the three alternative lubricating points by the customer

Long Carriage

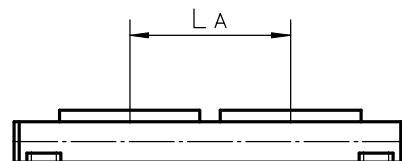
| Parameter | MLSM80Z | |
|-----------------------------------|---------|------|
| Carriage length | [mm] | 500 |
| Dynamic load torque (My), maximum | [Nm] | 1400 |
| Dynamic load torque (Mz), maximum | [Nm] | 1400 |
| Weight | [kg] | 14 |



A1: depth 15

Double Carriages

| Parameter | MLSM80Z | |
|---|---------|-----------------------|
| Minimum distance between carriages (LA) | [mm] | 400 |
| Dynamic load (Fy), maximum | [N] | 12800 |
| Dynamic load (Fz), maximum | [N] | 12800 |
| Dynamic load torque (My), maximum | [Nm] | $L A^1 \times 6,4$ |
| Dynamic load torque (Mz), maximum | [Nm] | $L A^1 \times 6,4$ |
| Force required to move second carriage | [N] | 35 |
| Total length (L tot) | [mm] | $S_{max} + 600 + L A$ |



¹ Value in mm

Linear Motion Systems with Belt Drive and Slide Guide

Overview

Movopart M



Features

- Can be installed in any orientation
- Patented self-adjusting prism slide guides
- Resistant to shock loads and vibrations
- Low cost

| Parameter | | M50 |
|-------------------------------------|-------|---------------|
| Profile size (width × height) | [mm] | 50 × 50 |
| Stroke length (Smax), maximum | [mm] | 5000 |
| Linear speed, maximum | [m/s] | 5,0 |
| Dynamic carriage load (Fz), maximum | [N] | 400 |
| Remarks | | no cover band |
| Page | | 100 |

Movopart M



Features

- Can be installed in any orientation
- Self-adjusting stainless steel cover band
- Patented self-adjusting prism slide guides
- Wash down and enhanced wash down protected versions available

| Parameter | | M55 | M75 | M100 |
|-------------------------------------|-------|---------|---------|-----------|
| Profile size (width × height) | [mm] | 58 × 55 | 86 × 75 | 108 × 100 |
| Stroke length (Smax), maximum | [mm] | 7000 | 12000 | 12000 |
| Linear speed, maximum | [m/s] | 5,0 | 5,0 | 5,0 |
| Dynamic carriage load (Fz), maximum | [N] | 400 | 1485 | 3005 |
| Remarks | | - | - | - |
| Page | | 102 | 104 | 106 |

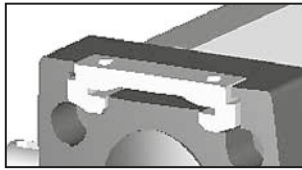
Linear Motion Systems with Belt Drive and Slide Guide

Overview

M-Series Technical Presentation

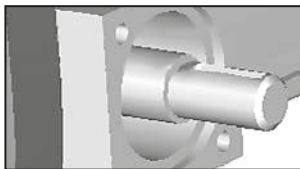
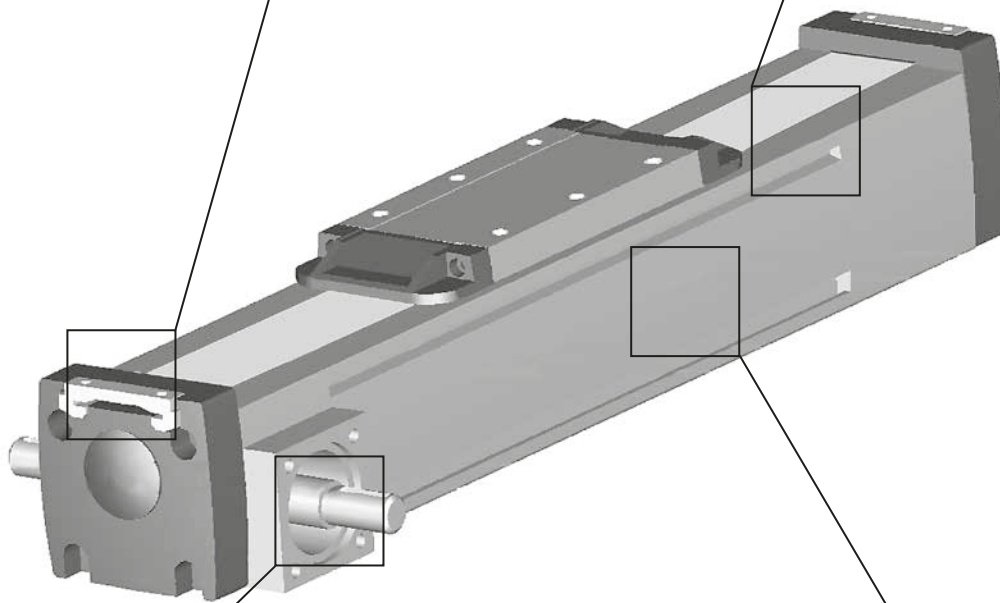
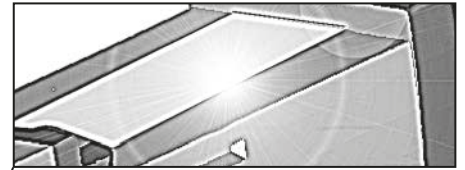
Cover band

The self-adjusting magnetically sealed stainless steel cover band protects the unit from the penetration of dirt, dust and liquids.



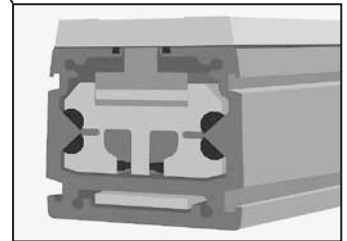
Environmental protection

The standard unit can operate in harsh environments but is also available in wash down or enhanced wash down protected versions for the toughest environments.



Belt drive

The belt runs on the inside of the profile and can easily be re-tensioned without removing the load from the carriage.



Prism slide guides

The patented self aligning prism slide guides are accurate, durable and are resistant to vibrations and shock loads.

M50

Belt Drive, Slide Guide

- » Ordering key - see page 205
- » Accessories - see page 135
- » Additional data - see page 184

General Specifications

| Parameter | M50 |
|----------------------------|--|
| Profile size (w × h) [mm] | 50 × 50 |
| Type of belt | GT 5MR-19 |
| Carriage sealing system | none |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | lubricated for life |
| Included accessories | none |

Performance Specifications

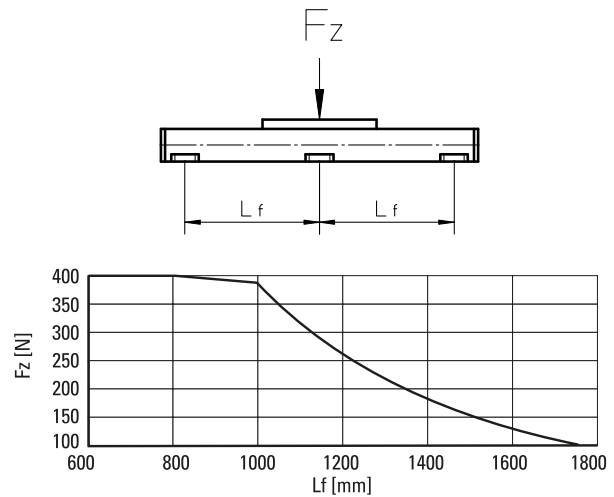
| Parameter | | M50 |
|-----------------------------------|---------------------|----------|
| Stroke length (Smax), maximum | [mm] | 5000 |
| Linear speed, maximum | [m/s] | 5,0 |
| Acceleration, maximum | [m/s ²] | 40 |
| Repeatability | [± mm] | 0,2 |
| Input speed, maximum | [rpm] | 2300 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | 400 |
| < 2,5 m/s | | 400 |
| > 2,5 m/s | | 200 |
| Dynamic load (Fy), maximum | [N] | 400 |
| Dynamic load (Fz), maximum | [N] | 400 |
| Dynamic load torque (Mx), maximum | [Nm] | 5 |
| Dynamic load torque (My), maximum | [Nm] | 21 |
| Dynamic load torque (Mz), maximum | [Nm] | 21 |
| Drive shaft force (Frd), maximum | [N] | 350 |
| Drive shaft torque (Mta), maximum | [Nm] | 10 |
| Pulley diameter | [mm] | 41,38 |
| Stroke per shaft revolution | [mm] | 130 |
| Weight | [kg] | |
| of unit with zero stroke | | 0,71 |
| of every 100 mm of stroke | | 0,96 |
| of carriage | | 0,33 |

Carriage Idle Torque (M idle) [Nm]

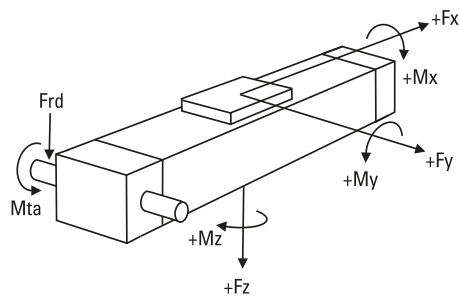
| Input speed [rpm] | Idle torque [Nm] |
|-------------------|------------------|
| 150 | 2,1 |

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

Deflection of the Profile



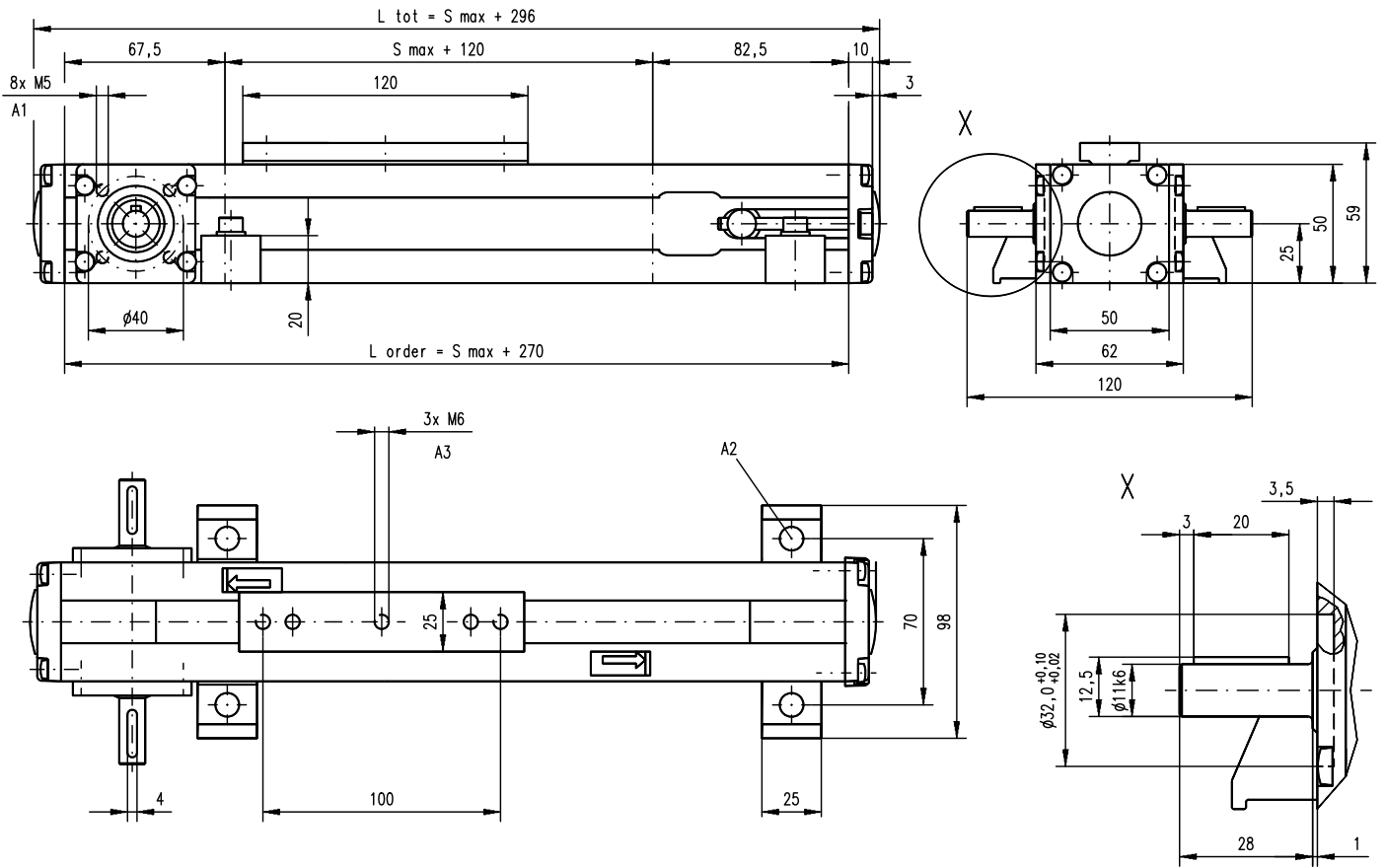
Definition of Forces



M50

Belt Drive, Slide Guide

| Dimensions | Projection |
|------------|------------|
| METRIC | |



- A1: depth 8,5
- A2: $\phi 6,5$ for M6 screw
- A3: depth 9, Heli coil

M55

Belt Drive, Slide Guide

- » Ordering key - see page 205
- » Accessories - see page 135
- » Additional data - see page 184

General Specifications

| Parameter | M55 |
|----------------------------|--|
| Profile size (w × h) [mm] | 58 × 50 |
| Type of belt | 22-STD SM5-HP |
| Carriage sealing system | self-adjusting steel cover band |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | lubricated for life |
| Included accessories | none |

Performance Specifications

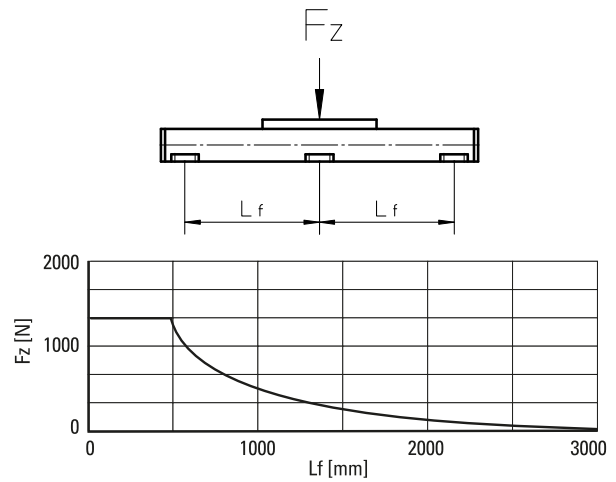
| Parameter | | M55 |
|-----------------------------------|---------------------|----------|
| Stroke length (Smax), maximum | [mm] | 7000 |
| Linear speed, maximum | [m/s] | 5,0 |
| Acceleration, maximum | [m/s ²] | 40 |
| Repeatability | [± mm] | 0,2 |
| Input speed, maximum | [rpm] | 2850 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | |
| < 2,5 m/s | | 400 |
| > 2,5 m/s | | 200 |
| Dynamic load (Fy), maximum | [N] | 400 |
| Dynamic load (Fz), maximum | [N] | 400 |
| Dynamic load torque (Mx), maximum | [Nm] | 9 |
| Dynamic load torque (My), maximum | [Nm] | 21 |
| Dynamic load torque (Mz), maximum | [Nm] | 21 |
| Drive shaft force (Frd), maximum | [N] | 200 |
| Drive shaft torque (Mta), maximum | [Nm] | 7 |
| Pulley diameter | [mm] | 33,42 |
| Stroke per shaft revolution | [mm] | 105 |
| Weight | [kg] | |
| of unit with zero stroke | | 4,10 |
| of every 100 mm of stroke | | 0,41 |
| of carriage | | 1,10 |

Carriage Idle Torque (M idle) [Nm]

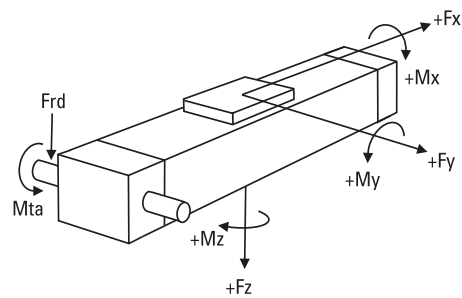
| Input speed [rpm] | Single Carriage | Double Carriages |
|-------------------|-----------------|------------------|
| 150 | 2,1 | 3,8 |

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

Deflection of the Profile



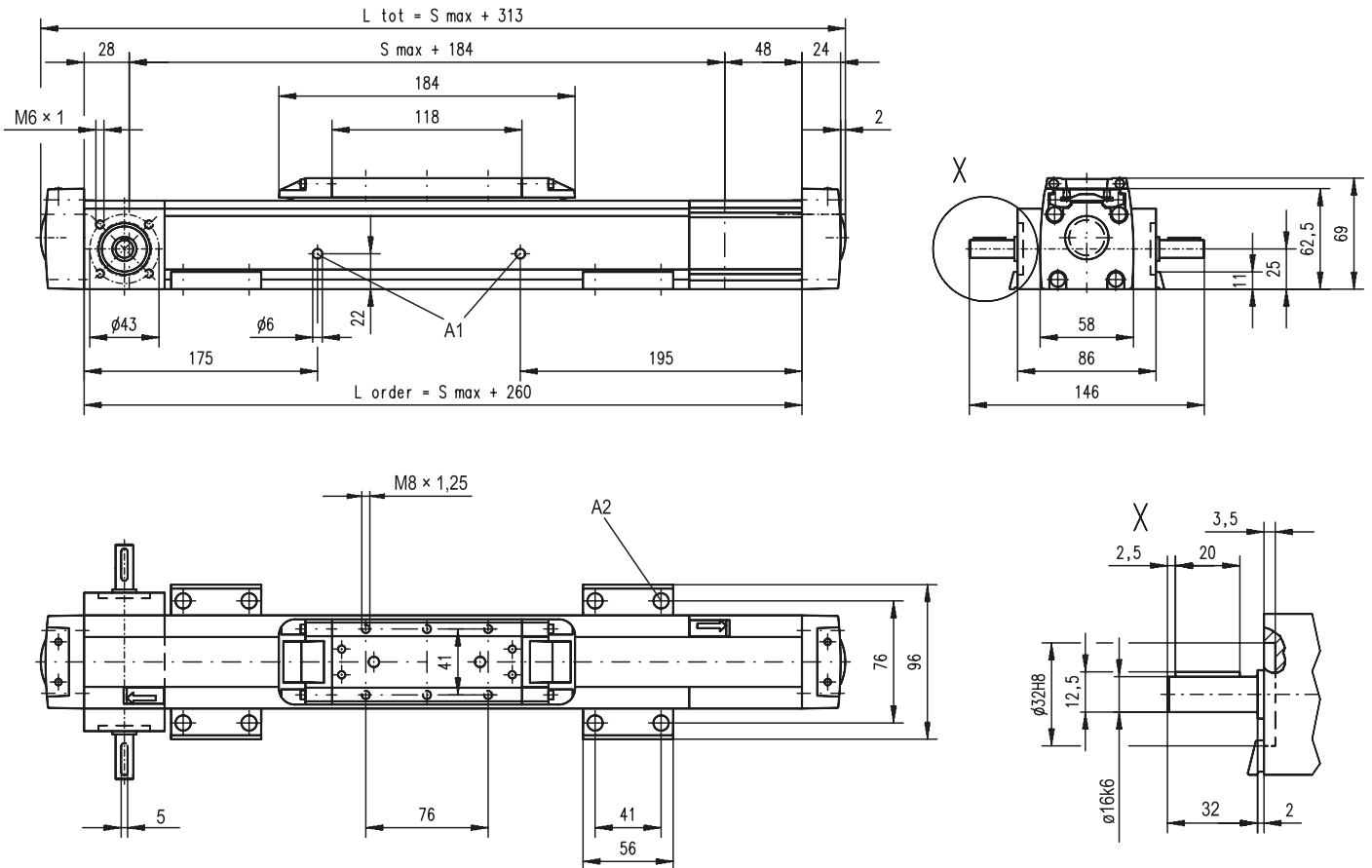
Definition of Forces



M55

Belt Drive, Slide Guide

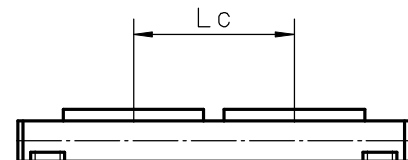
| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



A1: lubrication holes
 A2: ø9,5/ø5,5 for socket head cap screw M5

Double Carriages

| Parameter | | M55 |
|--|------|-----------------------|
| Minimum distance between carriages (Lc) | [mm] | 200 |
| Dynamic load (Fy), maximum | [N] | 600 |
| Dynamic load (Fz), maximum | [N] | 600 |
| Dynamic load torque (My), maximum | [Nm] | Lc ¹ × 0,3 |
| Dynamic load torque (Mz), maximum | [Nm] | Lc ¹ × 0,3 |
| Force required to move second carriage | [N] | 35 |
| Ordering length (L order) | [mm] | Smax + Lc + 260 |
| Total length (L tot) | [mm] | L order + 53 |
| Weight of unit with zero stroke of carriages | [kg] | 6,00 2,20 |



¹ Value in mm

M75

Belt Drive, Slide Guide

- » Ordering key - see page 205
- » Accessories - see page 135
- » Additional data - see page 184

General Specifications

| Parameter | M75 |
|----------------------------|--|
| Profile size (w × h) [mm] | 86 × 75 |
| Type of belt | STD5-40 |
| Carriage sealing system | self-adjusting steel cover band |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | lubricated for life |
| Included accessories | none |

Performance Specifications

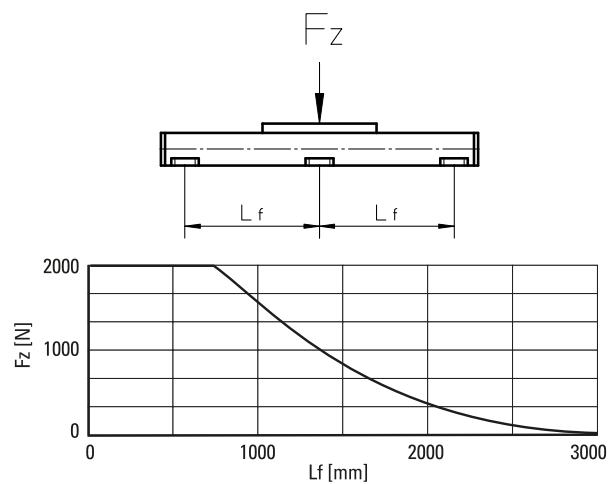
| Parameter | | M75 |
|-----------------------------------|---------------------|----------|
| Stroke length (Smax), maximum | [mm] | 12000 |
| Linear speed, maximum | [m/s] | 5,0 |
| Acceleration, maximum | [m/s ²] | 40 |
| Repeatability | [± mm] | 0,2 |
| Input speed, maximum | [rpm] | 2300 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | |
| < 2,5 m/s | | 900 |
| > 2,5 m/s | | 450 |
| Dynamic load (Fy), maximum | [N] | 1485 |
| Dynamic load (Fz), maximum | [N] | 1485 |
| Dynamic load torque (Mx), maximum | [Nm] | 49 |
| Dynamic load torque (My), maximum | [Nm] | 85 |
| Dynamic load torque (Mz), maximum | [Nm] | 85 |
| Drive shaft force (Frd), maximum | [N] | 600 |
| Drive shaft torque (Mta), maximum | [Nm] | 30 |
| Pulley diameter | [mm] | 41,38 |
| Stroke per shaft revolution | [mm] | 130 |
| Weight | [kg] | |
| of unit with zero stroke | | 6,30 |
| of every 100 mm of stroke | | 0,67 |
| of carriage | | 1,50 |

Carriage Idle Torque (M idle) [Nm]

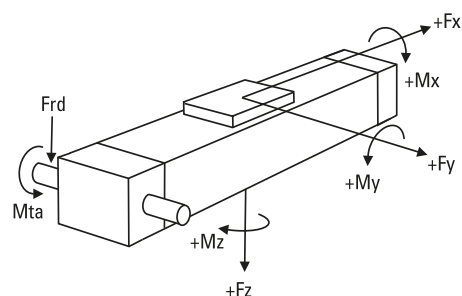
| Input speed [rpm] | Single Carriage | Double Carriages |
|-------------------|-----------------|------------------|
| 150 | 2,2 | 4,0 |

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

Deflection of the Profile



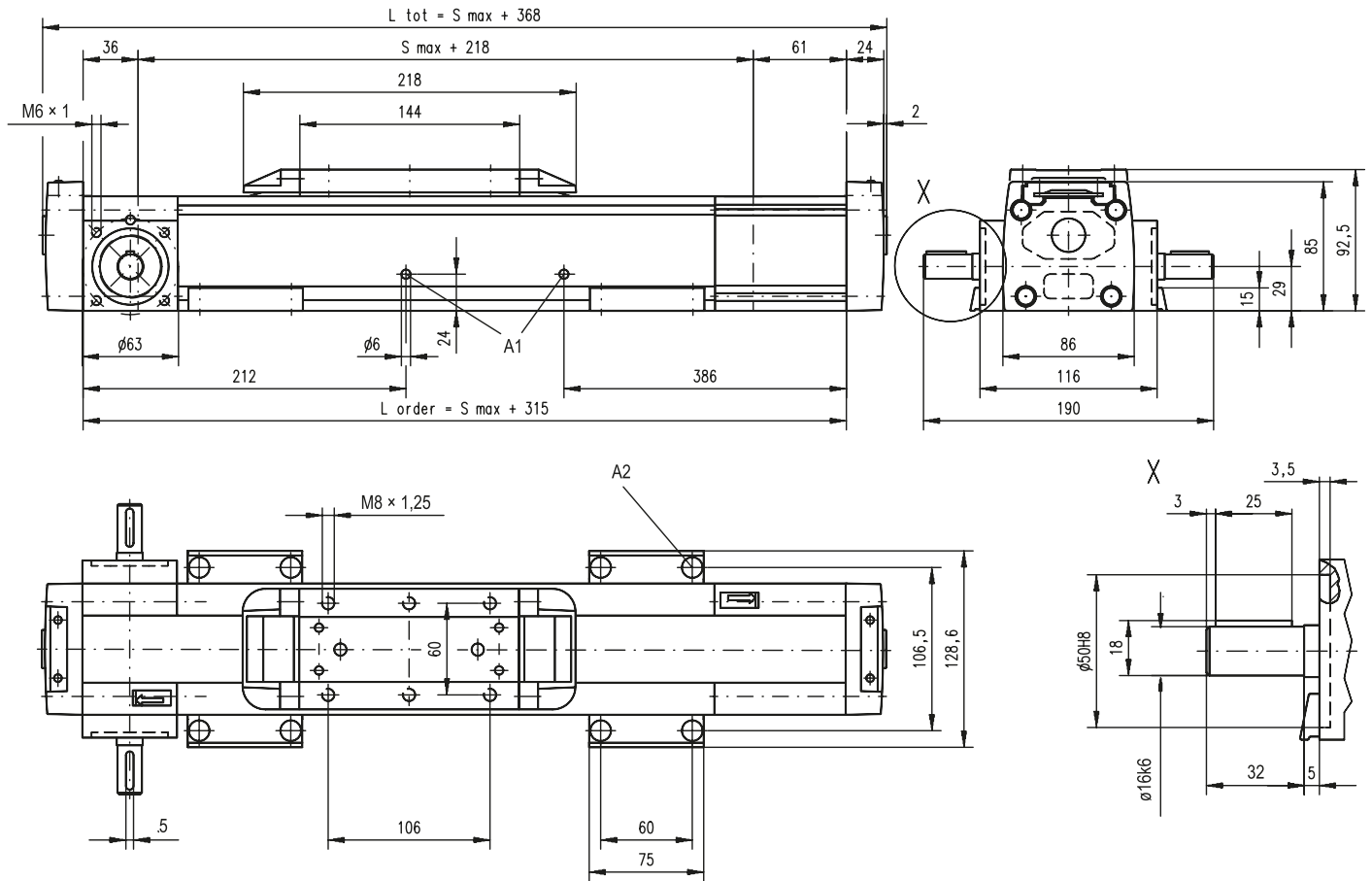
Definition of Forces



M75

Belt Drive, Slide Guide

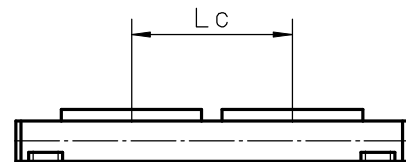
| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



A1: lubrication holes
 A2: $\varnothing 13,5/\varnothing 8,5$ for socket head cap screw M8

| Double Carriages | |
|---|----------------------|
| Parameter | M75 |
| Minimum distance between carriages (Lc) [mm] | 250 |
| Dynamic load (Fy), maximum [N] | 2227 |
| Dynamic load (Fz), maximum [N] | 2227 |
| Dynamic load torque (My), maximum [Nm] | $Lc^1 \times 1,114$ |
| Dynamic load torque (Mz), maximum [Nm] | $Lc^1 \times 1,114$ |
| Force required to move second carriage [N] | 40 |
| Ordering length (L order) [mm] | $S_{max} + Lc + 315$ |
| Total length (L tot) [mm] | $L_{order} + 53$ |
| Weight of unit with zero stroke of carriages [kg] | 9,50 |
| | 3,00 |

¹ Value in mm



M100

Belt Drive, Slide Guide

- » Ordering key - see page 205
- » Accessories - see page 135
- » Additional data - see page 184

General Specifications

| Parameter | M100 |
|----------------------------|--|
| Profile size (w × h) [mm] | 108 × 100 |
| Type of belt | STD8-50 |
| Carriage sealing system | self-adjusting steel cover band |
| Adjustable belt tensioning | the belt can be retensioned by the customer if necessary |
| Lubrication | lubricated for life |
| Included accessories | none |

Performance Specifications

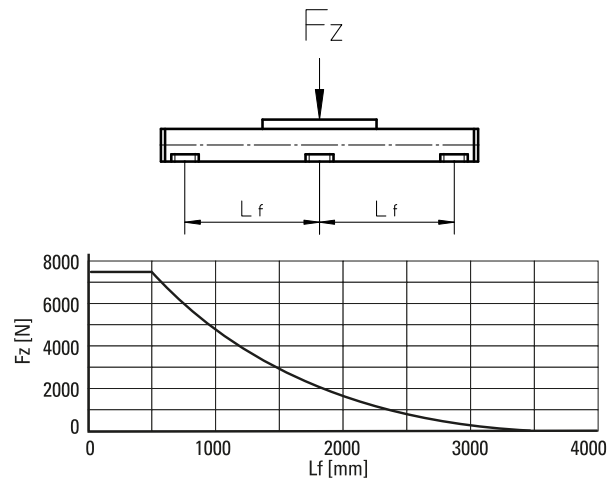
| Parameter | | M100 |
|-----------------------------------|---------------------|----------|
| Stroke length (Smax), maximum | [mm] | 12000 |
| Linear speed, maximum | [m/s] | 5,0 |
| Acceleration, maximum | [m/s ²] | 40 |
| Repeatability | [± mm] | 0,2 |
| Input speed, maximum | [rpm] | 1700 |
| Operation temperature limits | [°C] | -20 – 70 |
| Dynamic load (Fx), maximum | [N] | |
| < 2,5 m/s | | 1250 |
| > 2,5 m/s | | 625 |
| Dynamic load (Fy), maximum | [N] | 3005 |
| Dynamic load (Fz), maximum | [N] | 3005 |
| Dynamic load torque (Mx), maximum | [Nm] | 117 |
| Dynamic load torque (My), maximum | [Nm] | 279 |
| Dynamic load torque (Mz), maximum | [Nm] | 279 |
| Drive shaft force (Frd), maximum | [N] | 1000 |
| Drive shaft torque (Mta), maximum | [Nm] | 45 |
| Pulley diameter | [mm] | 56,02 |
| Stroke per shaft revolution | [mm] | 176 |
| Weight | [kg] | |
| of unit with zero stroke | | 11,10 |
| of every 100 mm of stroke | | 1,16 |
| of carriage | | 2,40 |

Carriage Idle Torque (M idle) [Nm]

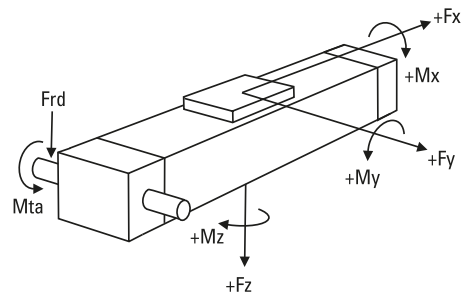
| Input speed [rpm] | Single Carriage | Double Carriages |
|-------------------|-----------------|------------------|
| 150 | 3,8 | 5,8 |

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

Deflection of the Profile



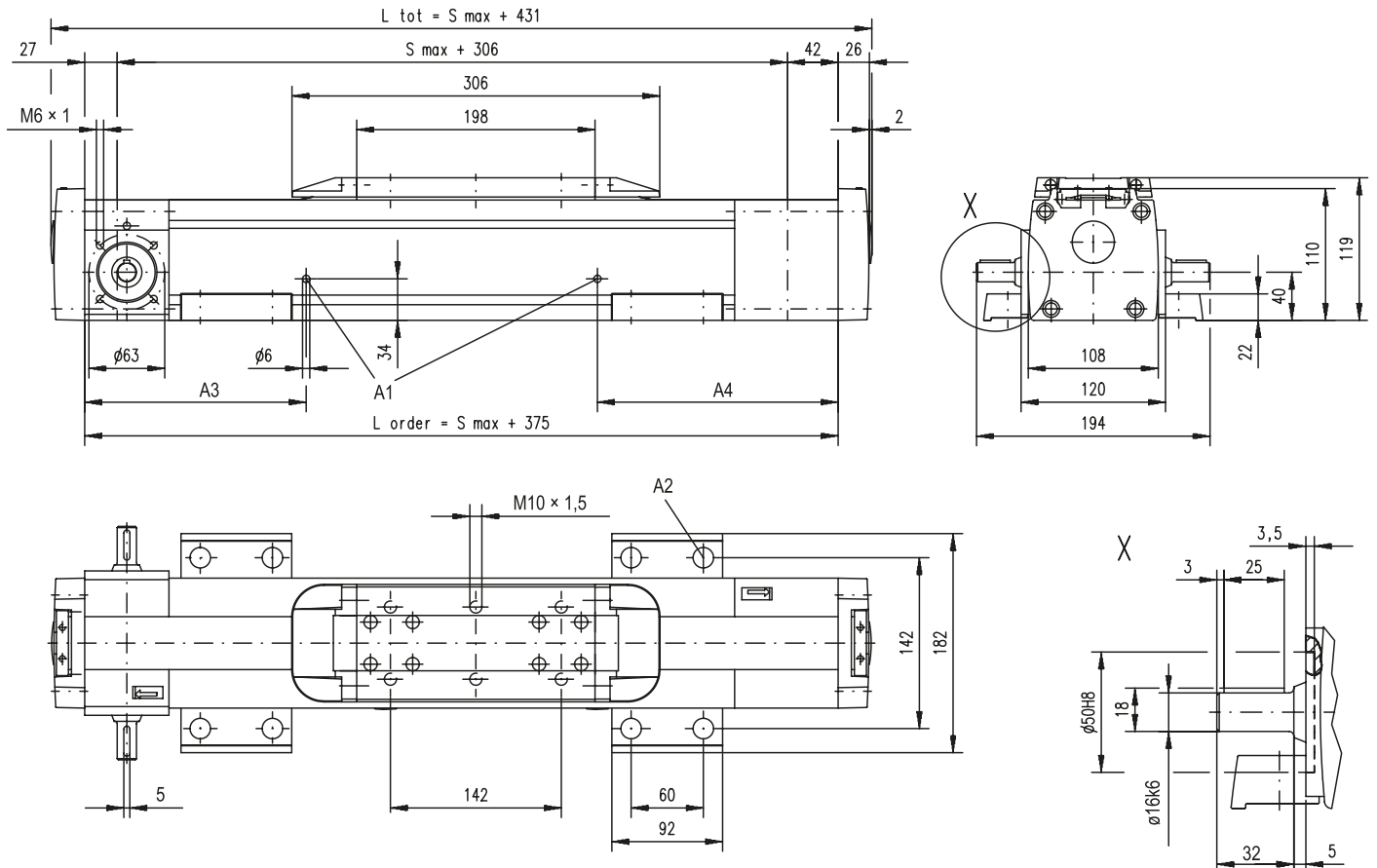
Definition of Forces



M100

Belt Drive, Slide Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

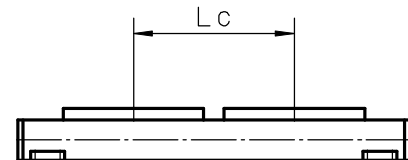


A1: lubrication holes
 A2: $\phi 17/\phi 10,5$ for socket head cap screw M10

A3: 170 (L order \leq 1 m), 270 (L order $>$ 1 m)
 A4: 186 (L order \leq 1 m), 436 (L order $>$ 1 m)

Double Carriages

| Parameter | | M100 |
|--|------|-----------------------|
| Minimum distance between carriages (Lc) | [mm] | 350 |
| Dynamic load (Fy), maximum | [N] | 4508 |
| Dynamic load (Fz), maximum | [N] | 4508 |
| Dynamic load torque (My), maximum | [Nm] | $L_c^1 \times 2,254$ |
| Dynamic load torque (Mz), maximum | [Nm] | $L_c^1 \times 2,254$ |
| Force required to move second carriage | [N] | 45 |
| Ordering length (L order) | [mm] | $S_{max} + L_c + 375$ |
| Total length (L tot) | [mm] | $L_{order} + 56$ |
| Weight of unit with zero stroke of carriages | [kg] | 17,40 4,80 |



¹ Value in mm

Linear Units with Belt Drive and Wheel Guide

Overview

SpeedLine WH



Features

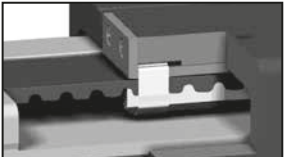
- Can be installed in any orientation
- Speed up to 11 m/s
- Acceleration up to 40 m/s²
- Stroke up to 11 m

| Parameter | | WH50 | WH80 | WH120 |
|-------------------------------------|-------|--|--|--|
| Profile size (width × height) | [mm] | 50 × 50 | 80 × 80 | 120 × 110 |
| Stroke length (Smax), 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 | | 110 | 112 | 114 |

WH-Series Technical Presentation

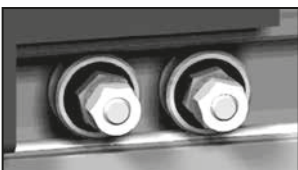
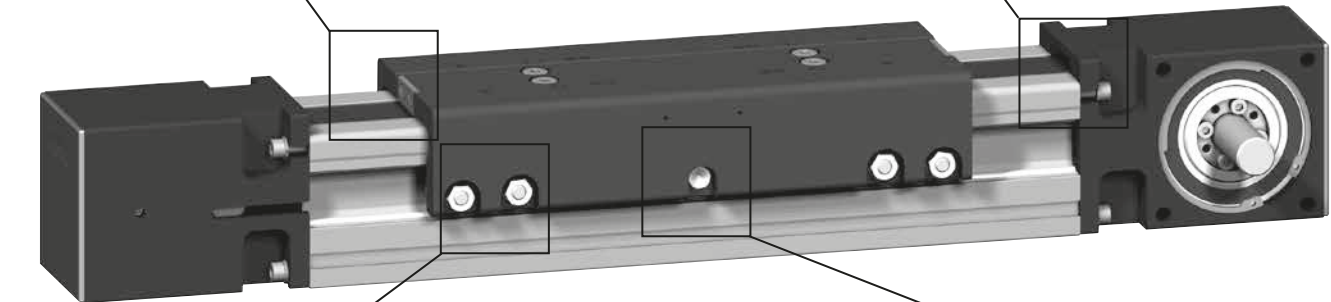
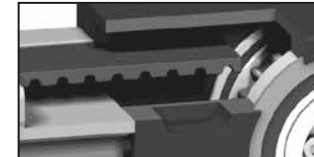
Belt tensioning

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 is easy and fast to access.

Linear Units with Belt Drive and Wheel Guide

Overview

Forceline **MLSH**



Features

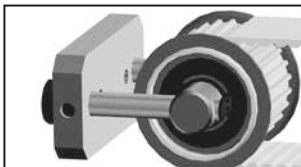
- Can be installed in any orientation
- Patented plastic cover band
- Speed up to 10 m/s
- Low profile height

| Parameter | | MLSH60Z |
|-------------------------------------|-------|-----------------------|
| Profile size (width × height) | [mm] | 160 × 65 |
| Stroke length (Smax), maximum | [mm] | 5500 |
| Linear speed, maximum | [m/s] | 10,0 |
| Dynamic carriage load (Fz), maximum | [N] | 3000 |
| Remarks | | internal wheel guides |
| Page | | 116 |

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.



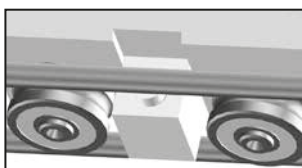
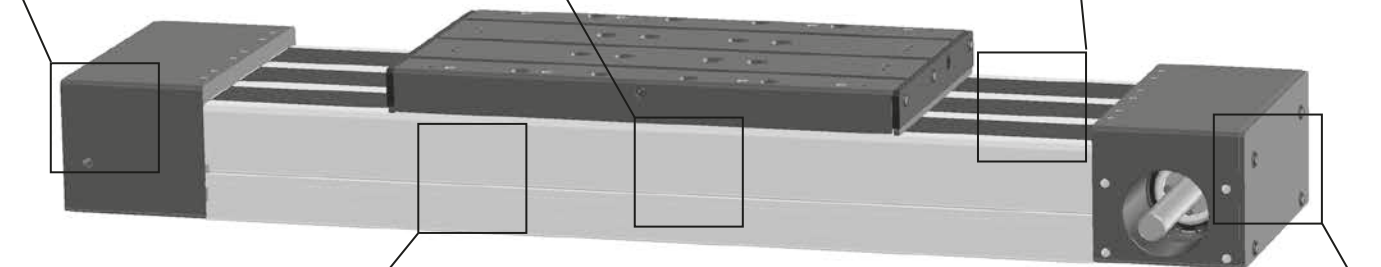
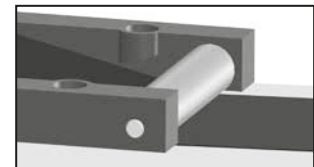
Belt drive

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



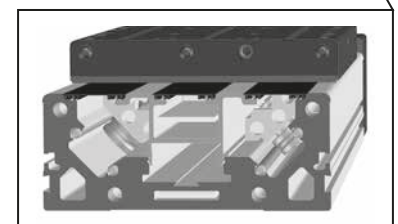
Cover band

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 206
- » Accessories - see page 135
- » Additional data - see page 184

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 (Smax), 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 (Fx), maximum | [N] | 670 ¹ |
| 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 | [N] | 150 |
| 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 | | 3,50 |
| of every 100 mm of stroke | | 0,44 |
| of each carriage | | 0,90 |

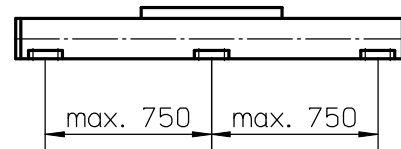
¹ See diagram Force Fx

Carriage Idle Torque, (M idle) [Nm]

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

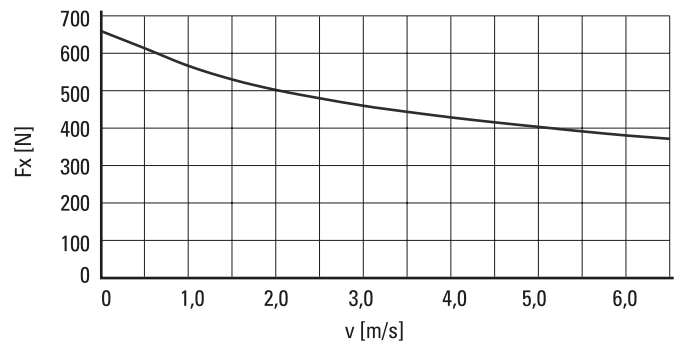
M idle = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

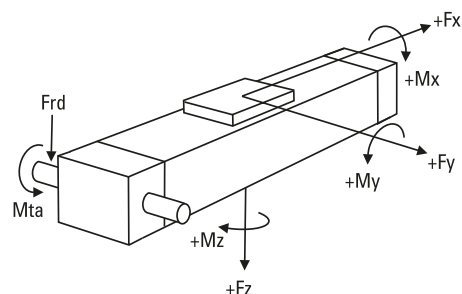


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Force Fx as a Function of the Speed



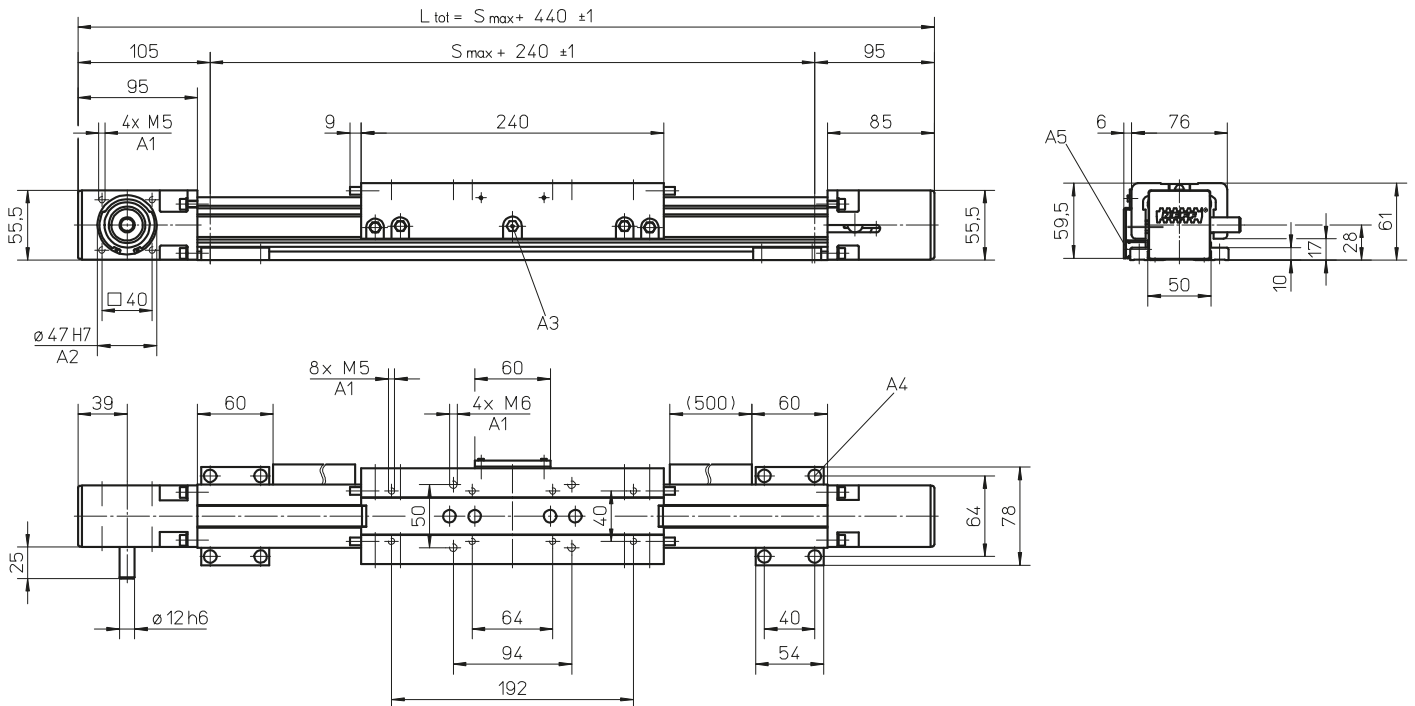
Definition of Forces



WH50

Belt Drive, Wheel Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

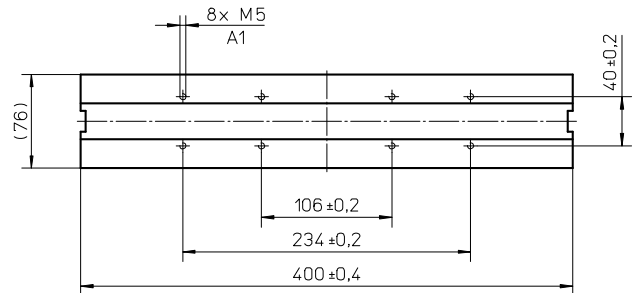


- A1: depth 10
- A2: depth 3
- A3: funnel type lubricating nipple DIN3405-M6x1-D1

- A4: socket cap screw ISO4762-M5x12 8.8
- A5: ENF inductive sensor rail kit (optional - see page 172)

Long Carriage

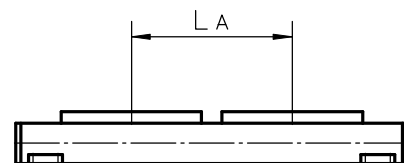
| Parameter | WH50 | |
|-----------------------------------|------|------|
| Carriage length | [mm] | 400 |
| Dynamic load torque (My), maximum | [Nm] | 130 |
| Dynamic load torque (Mz), maximum | [Nm] | 75 |
| Weight | [kg] | 1,47 |



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 206
- » Accessories - see page 135
- » Additional data - see page 184

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 (Smax), 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 ¹ |
| 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 | [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 of every 100 mm of stroke of each carriage | [kg] | 8,63 0,93 2,75 |

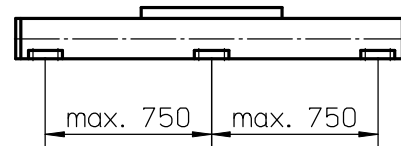
¹ See diagram Force Fx

Carriage Idle Torque, (M idle) [Nm]

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

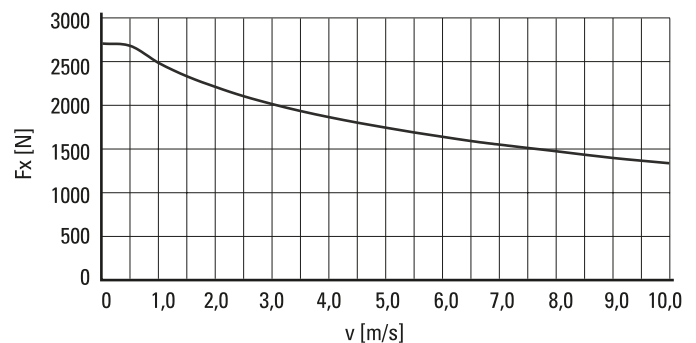
M idle = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

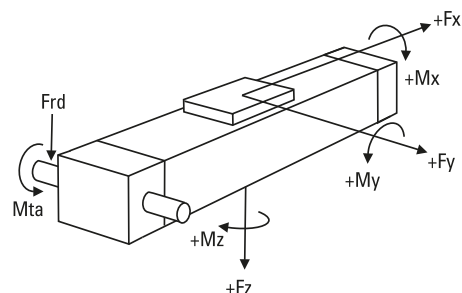


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information. Units with a profile length over 6300 mm consist of two profiles where the joint between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

Force Fx as a Function of the Speed



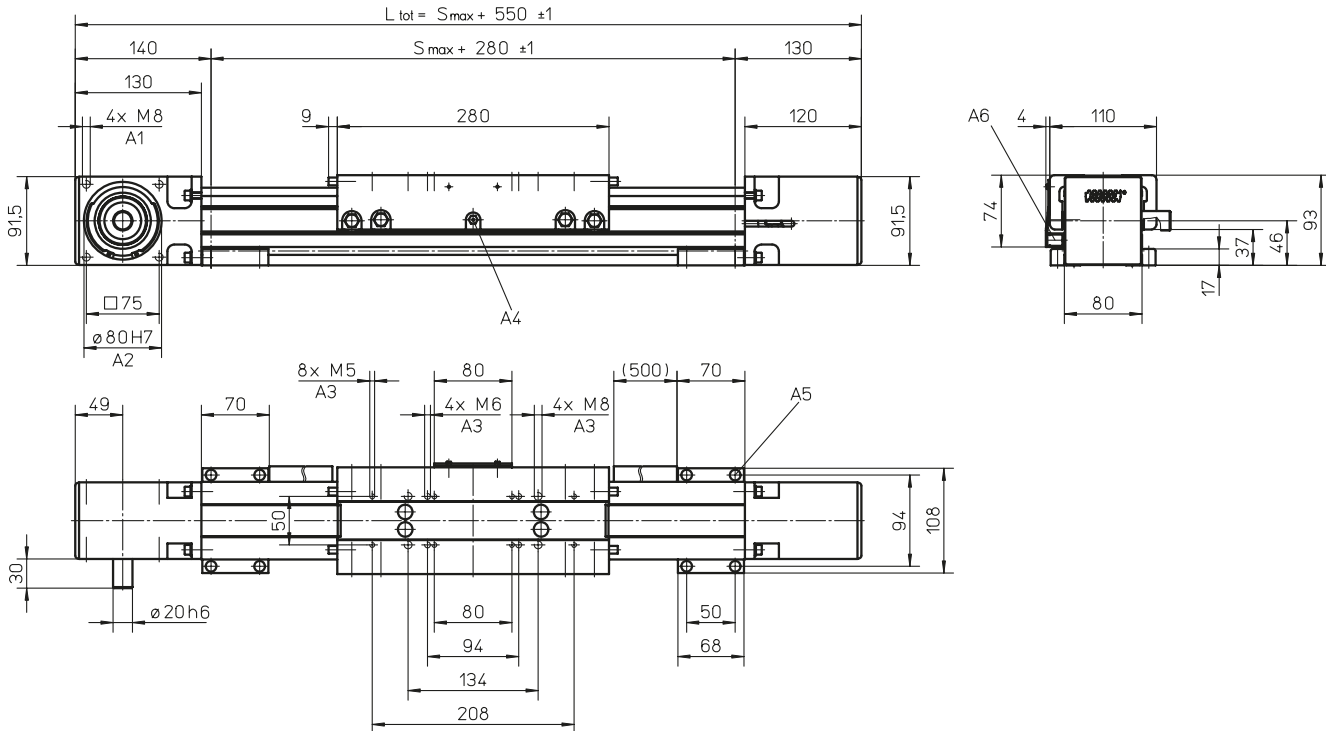
Definition of Forces



WH80

Belt Drive, Wheel Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

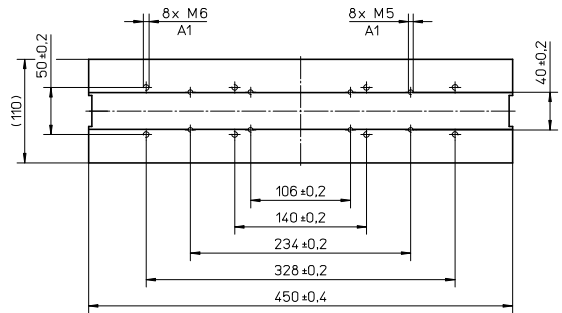


A1: depth 16
 A2: depth 2,5
 A3: depth 12

A4: funnel type lubricating nipple DIN3405-M6x1-D1
 A5: socket cap screw ISO4762-M6x20 8.8
 A6: ENF inductive sensor rail kit (optional - see page 172)

Long Carriage

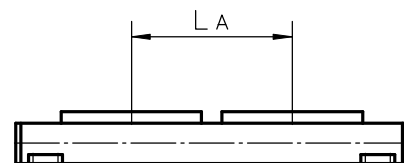
| Parameter | WH80 | |
|-----------------------------------|------|------|
| Carriage length | [mm] | 450 |
| Dynamic load torque (My), maximum | [Nm] | 345 |
| Dynamic load torque (Mz), maximum | [Nm] | 150 |
| Weight | [kg] | 3,43 |



A1: depth 12

Double Carriages

| Parameter | WH80 | |
|---|------|-----------------------|
| Minimum distance between carriages (LA) | [mm] | 300 |
| Dynamic load (Fy), maximum | [N] | 1764 |
| Dynamic load (Fz), maximum | [N] | 4200 |
| Dynamic load torque (My), maximum | [Nm] | $L A^1 \times 0,882$ |
| Dynamic load torque (Mz), maximum | [Nm] | $L A^1 \times 2,1$ |
| Force required to move second carriage | [N] | 20 |
| Total length (L tot) | [mm] | $S_{max} + 550 + L A$ |



¹ Value in mm

WH120

Belt Drive, Wheel Guide

- » Ordering key - see page 206
- » Accessories - see page 135
- » Additional data - see page 184

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 (Smax), 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 ¹ |
| Dynamic load (Fy), maximum | [N] | 4980 |
| Dynamic load (Fz), maximum | [N] | 9300 |
| Dynamic load torque (Mx), maximum | [Nm] | 500 |
| Dynamic load torque (My), maximum | [Nm] | 930 |
| Dynamic load torque (Mz), maximum | [Nm] | 500 |
| 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 | [kg] | |
| of unit with zero stroke | | 17,00 |
| of every 100 mm of stroke | | 1,64 |
| of each carriage | | 5,50 |

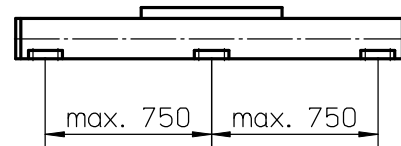
¹ See diagram Force Fx

Carriage Idle Torque, (M idle) [Nm]

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

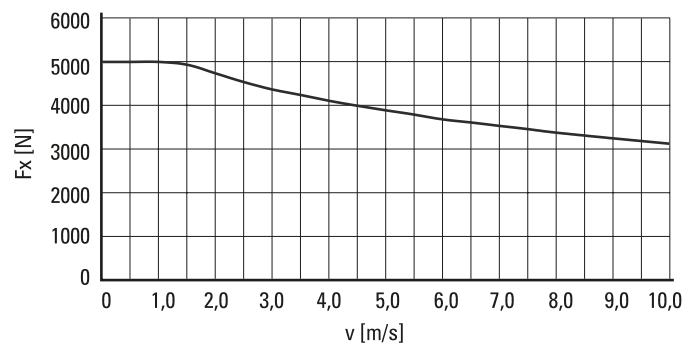
M idle = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

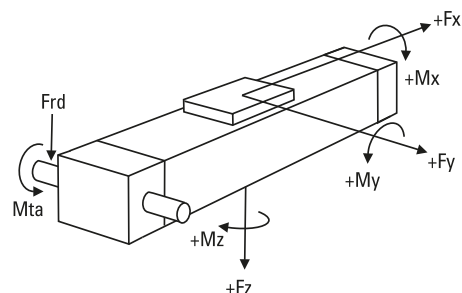


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information. Units with a profile length over 4900 mm consist of two profiles where the joint between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

Force Fx as a Function of the Speed



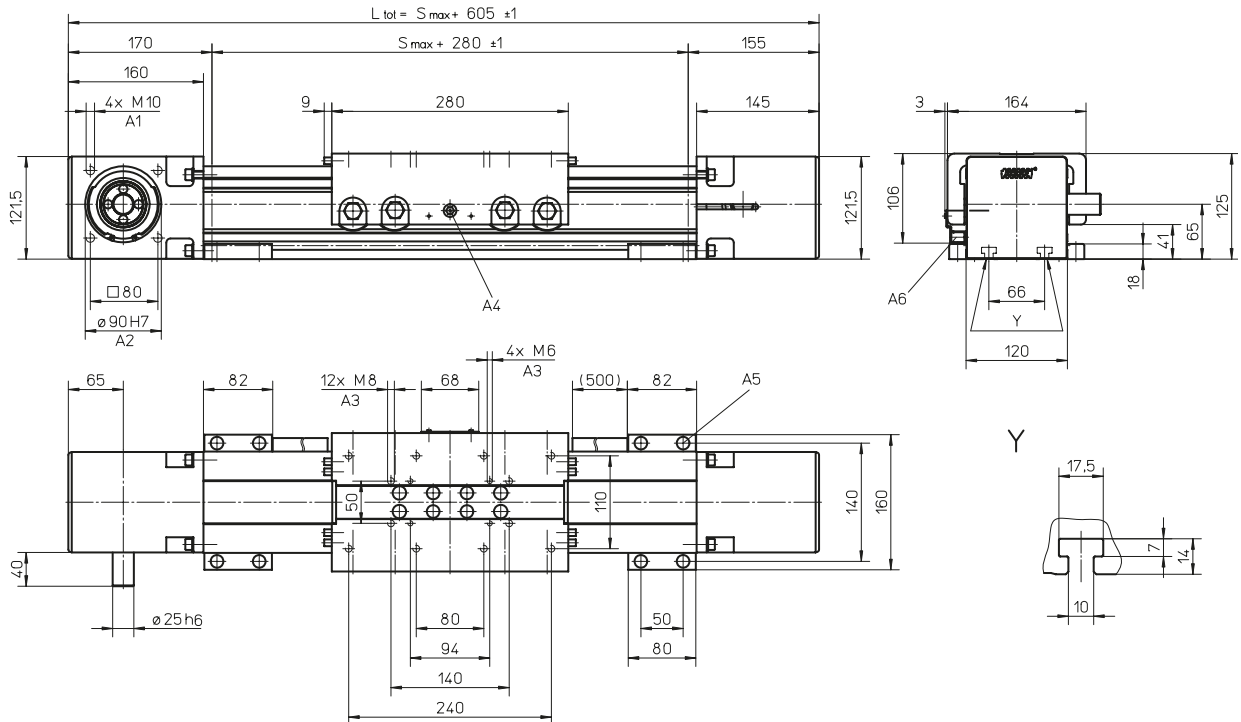
Definition of Forces



WH120

Belt Drive, Wheel Guide

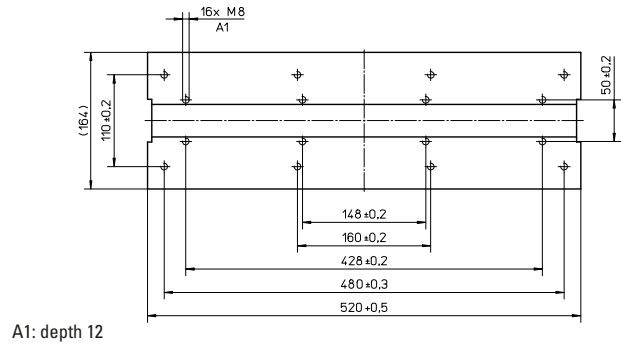
| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |



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

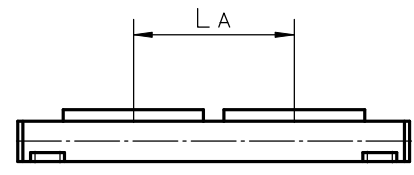
A4: funnel type lubricating nipple DIN3405-M6x1-D1
 A5: socket cap screw ISO4762-M8x20 8.8
 A6: ENF inductive sensor rail kit (optional - see page 172)

| Long Carriage | | |
|-----------------------------------|------|-------|
| Parameter | | WH120 |
| Carriage length | [mm] | 520 |
| Dynamic load torque (My), maximum | [Nm] | 1395 |
| Dynamic load torque (Mz), maximum | [Nm] | 750 |
| Weight | [kg] | 8,67 |



A1: depth 12

| Double Carriages | | |
|---|------|-----------------------|
| Parameter | | WH120 |
| Minimum distance between carriages (LA) | [mm] | 300 |
| Dynamic load (Fy), maximum | [N] | 9960 |
| Dynamic load (Fz), maximum | [N] | 18600 |
| Dynamic load torque (My), maximum | [Nm] | $L A^1 \times 4,98$ |
| Dynamic load torque (Mz), 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 207
- » Accessories - see page 135
- » Additional data - see page 184

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 (Smax), 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 (Fx), maximum | [N] | 1480 ¹ |
| Dynamic load (Fy), maximum | [N] | 3000 |
| Dynamic load (Fz), maximum | [N] | 3000 |
| Dynamic load torque (Mx), maximum | [Nm] | 165 |
| Dynamic load torque (My), maximum | [Nm] | 310 |
| Dynamic load torque (Mz), maximum | [Nm] | 310 |
| Drive shaft force (Frd), maximum | [N] | 200 |
| Drive shaft torque (Mta), 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 |

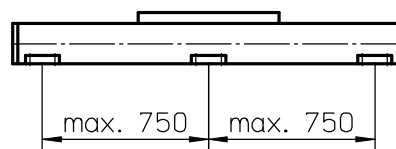
¹ See diagram Force Fx

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

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

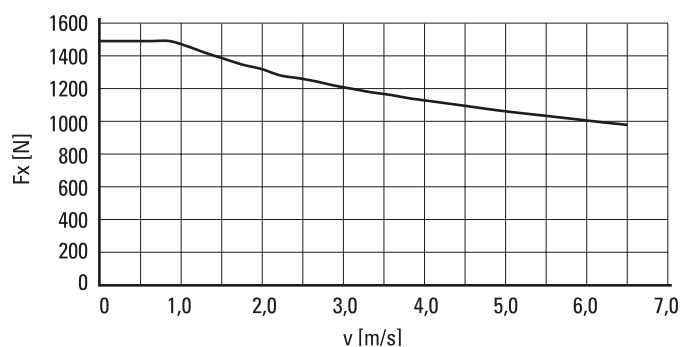
M_{idle} = the input torque needed to move the carriage with no load on it.

Deflection of the Profile

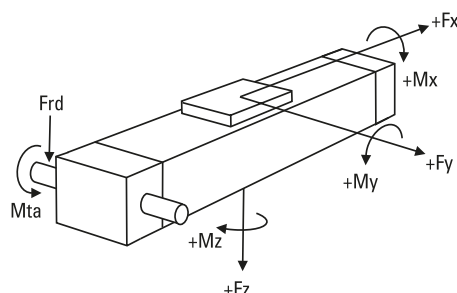


A mounting clamp must be installed at least every 750 mm to be able to operate at maximum load. Less clamps may be required if less load is being operated, see the additional technical data for more information.

Force Fx as a Function of the Speed



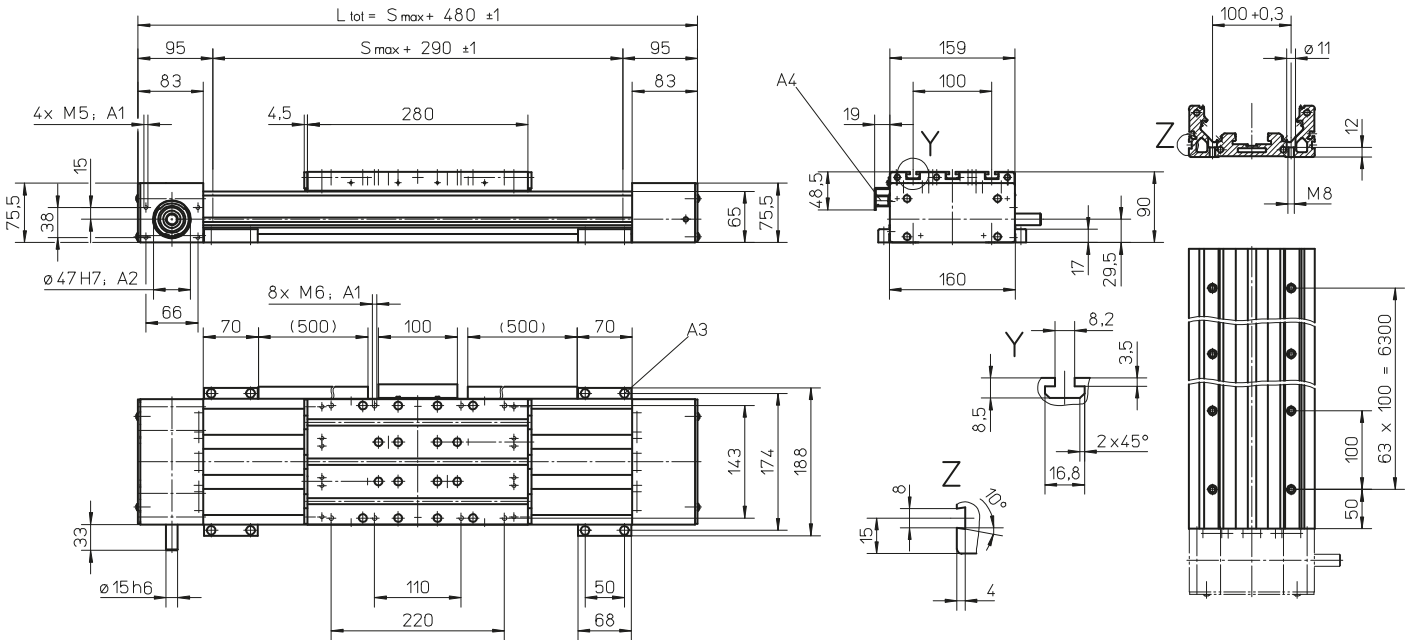
Definition of Forces



MLSH60Z

Belt Drive, Wheel Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

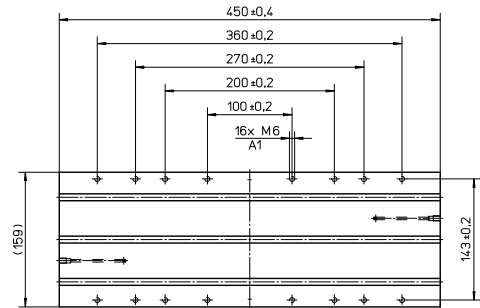


A1: depth 10
A2: depth 4

A3: socket cap screw ISO4762-M6x20 8.8
A4: ENF inductive sensor rail kit (optional - see page 172)

Long Carriage

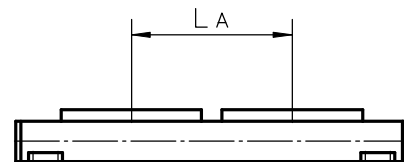
| Parameter | | MLSH60Z |
|-----------------------------------|------|---------|
| Carriage length | [mm] | 450 |
| Dynamic load torque (My), maximum | [Nm] | 585 |
| Dynamic load torque (Mz), maximum | [Nm] | 585 |
| Weight | [kg] | 6 |



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 × 3 |
| Dynamic load torque (M _z), maximum | [Nm] | L A ¹ × 3 |
| Force required to move second carriage | [N] | 10 |
| Total length (L _{tot}) | [mm] | S _{max} + 480 + L A |



¹ Value in mm

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 (S _{max}), maximum | [mm] | 1500 | 3000 |
| Linear speed, maximum | [m/s] | 6,5 | 10,0 |
| Dynamic load (F _x), 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 | | 120 | 122 |

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 | | 124 | 126 |

WHZ50

Belt Drive, Wheel Guide

- » Ordering key - see page 208
- » Accessories - see page 135
- » Additional data - see page 185

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

| Parameter | | WHZ50 |
|-----------------------------------|---------------------|------------------|
| Stroke length (Smax), maximum | [mm] | 1500 |
| 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 ¹ |
| 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 | [N] | 150 |
| 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 |

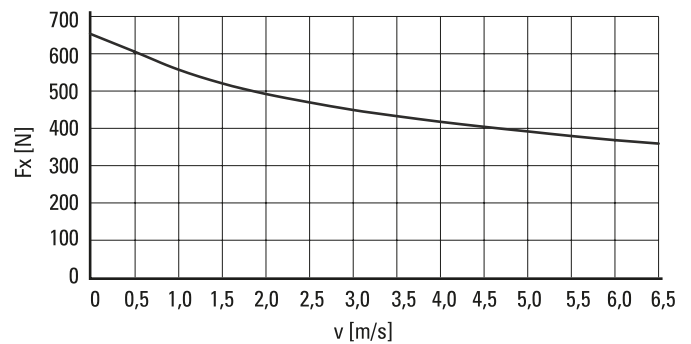
¹ See diagram Force Fx

Carriage Idle Torque, (M idle) [Nm]

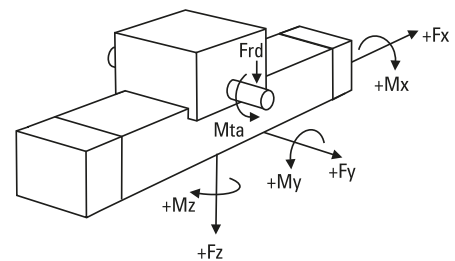
| Input speed [rpm] | Idle torque [Nm] |
|-------------------|------------------|
| 150 | 1,7 |
| 1500 | 2,4 |
| 3250 | 3,8 |

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

Force Fx as a Function of the Speed



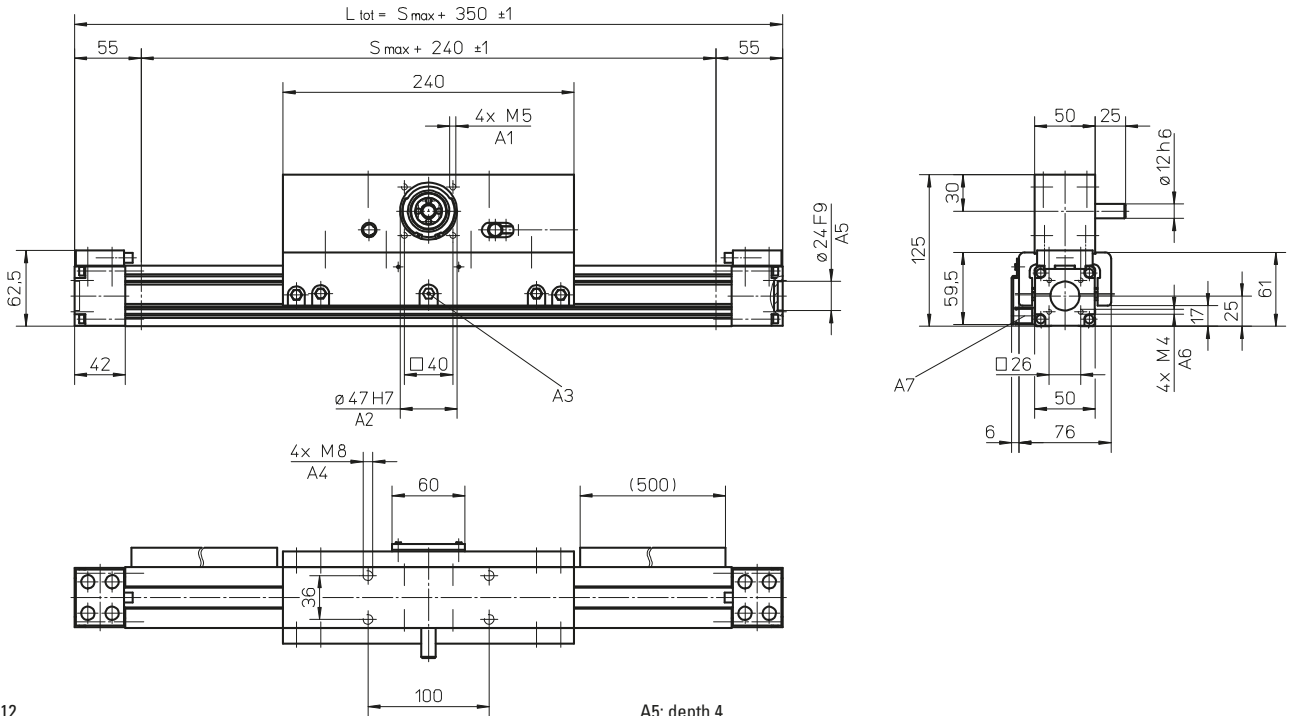
Definition of Forces



WHZ50

Belt Drive, Wheel Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

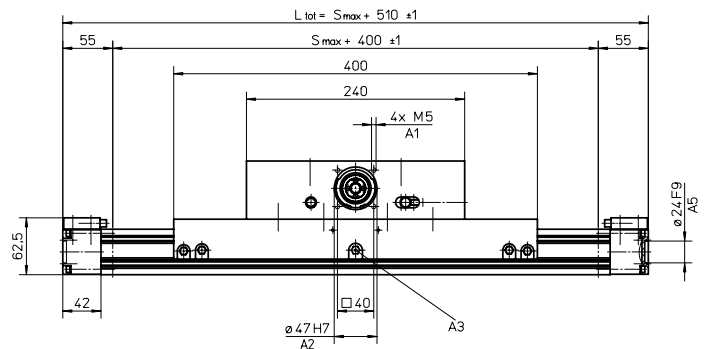


- A1: depth 12
- A2: depth 3,5
- A3: funnel type lubricating nipple DIN3405-M6x1-D1
- A4: depth 16

- A5: depth 4
- A6: depth 8
- A7: ENF inductive sensor rail kit (optional - see page 172)

Long Carriage

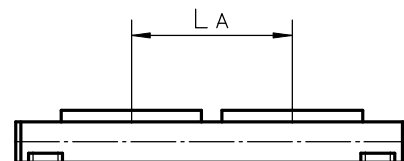
| Parameter | WHZ50 | |
|-----------------------------------|-------|-----|
| Carriage length | [mm] | 400 |
| Dynamic load torque (My), maximum | [Nm] | 130 |
| Dynamic load torque (Mz), maximum | [Nm] | 75 |
| Weight | [kg] | 3,3 |



- A1: depth 12
- A2: depth 3,5
- A3: funnel type lubricating nipple DIN3405-M6x1-D1
- A5: depth 4

Double Carriages²

| Parameter | WHZ50 | |
|--|-------|------------------------------|
| 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 (M _y), maximum | [Nm] | L A ¹ × 0,415 |
| Dynamic load torque (M _z), maximum | [Nm] | L A ¹ × 0,73 |
| Force required to move second carriage | [N] | 16 |
| Total length (L _{tot}) | [mm] | S _{max} + 350 + L A |



¹ Value in mm
² Second carriage is always a long carriage

WHZ80

Belt Drive, Wheel Guide

- » Ordering key - see page 208
- » Accessories - see page 135
- » Additional data - see page 185

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

| Parameter | | WHZ80 |
|-----------------------------------|---------------------|-------------------|
| Stroke length (Smax), maximum | [mm] | 3000 |
| 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 ¹ |
| 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 | [N] | 500 |
| 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 |

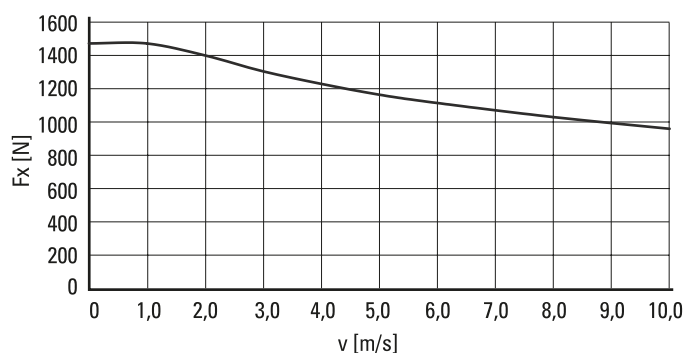
¹ See diagram Force Fx

Carriage Idle Torque, (M idle) [Nm]

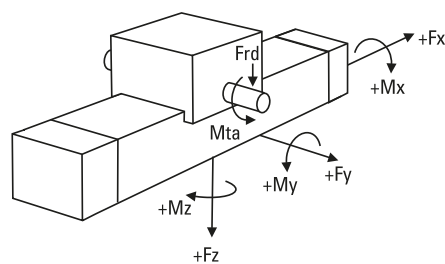
| Input speed [rpm] | Idle torque [Nm] |
|-------------------|------------------|
| 150 | 2,4 |
| 1500 | 3,5 |
| 3000 | 5,0 |

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

Force Fx as a Function of the Speed



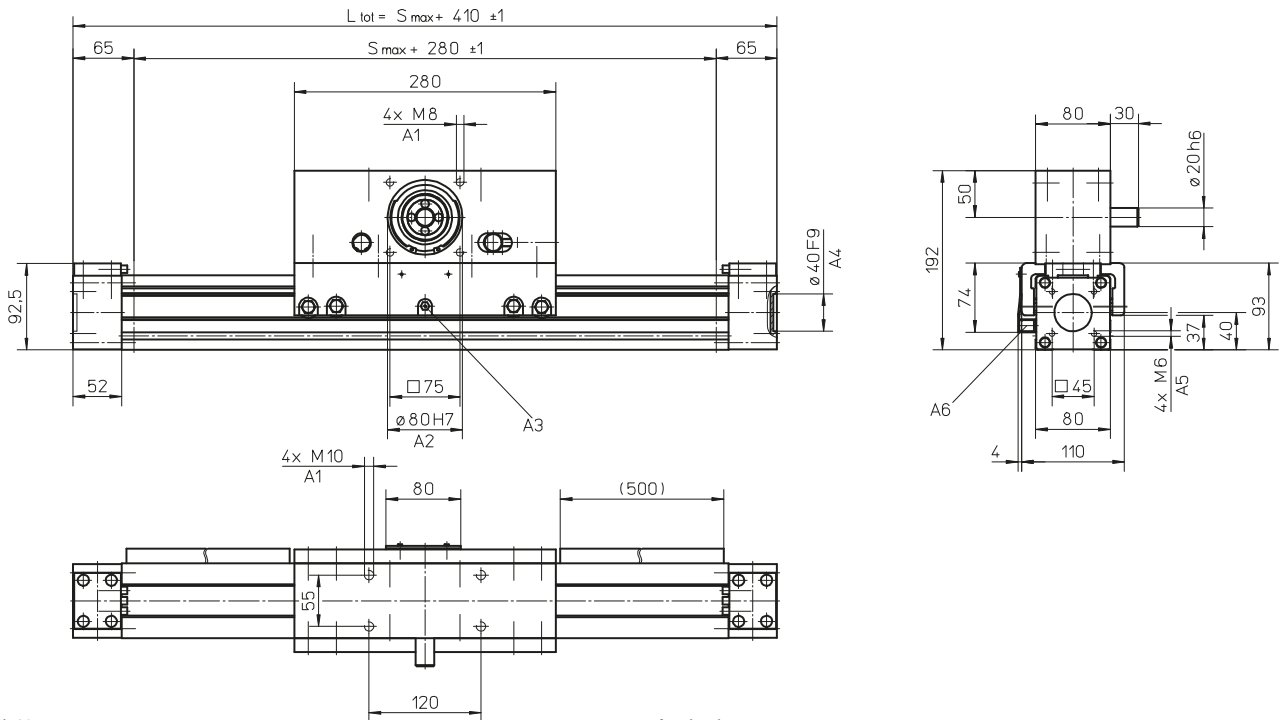
Definition of Forces



WHZ80

Belt Drive, Wheel Guide

| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

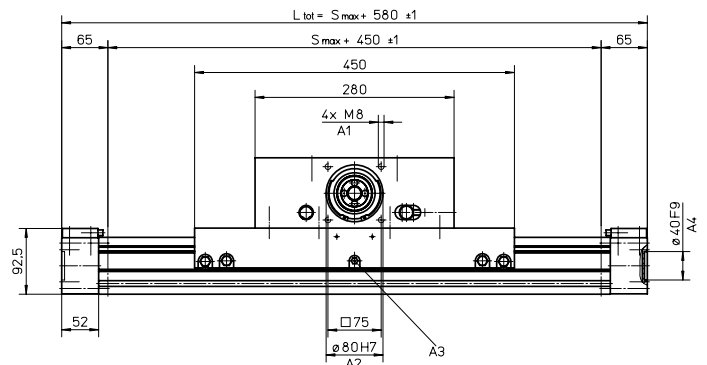


A1: depth 20
 A2: depth 3,5
 A3: funnel type lubricating nipple DIN3405-M6x1-D1

A4: depth 4
 A5: depth 15
 A6: ENF inductive sensor rail kit (optional - see page 172)

Long Carriage

| Parameter | WHZ80 | |
|-----------------------------------|-------|-----|
| Carriage length | [mm] | 450 |
| Dynamic load torque (My), maximum | [Nm] | 345 |
| Dynamic load torque (Mz), maximum | [Nm] | 150 |
| Weight | [kg] | 7,4 |

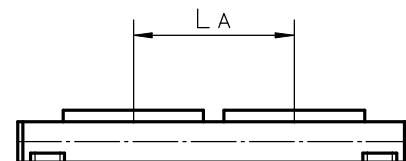


A1: depth 20
 A2: depth 3,5

A3: funnel type lubricating nipple DIN3405-M6x1-D1
 A4: depth 4

Double Carriages²

| Parameter | WHZ80 | |
|--|-------|---|
| Minimum distance between carriages (L _A) | [mm] | 300 |
| Dynamic load (F _y), maximum | [N] | 1764 |
| Dynamic load (F _z), maximum | [N] | 4200 |
| Dynamic load torque (M _y), maximum | [Nm] | L _A ¹ × 0,882 |
| Dynamic load torque (M _z), maximum | [Nm] | L _A ¹ × 2,1 |
| Force required to move second carriage | [N] | 20 |
| Total length (L _{tot}) | [mm] | S _{max} + 410 + L _A |



¹ Value in mm
² Second carriage is always a long carriage

Z2

Ball Screw Drive, Slide Guide

» Ordering key - see page 208
» Accessories - see page 135
» Additional data - see page 185

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

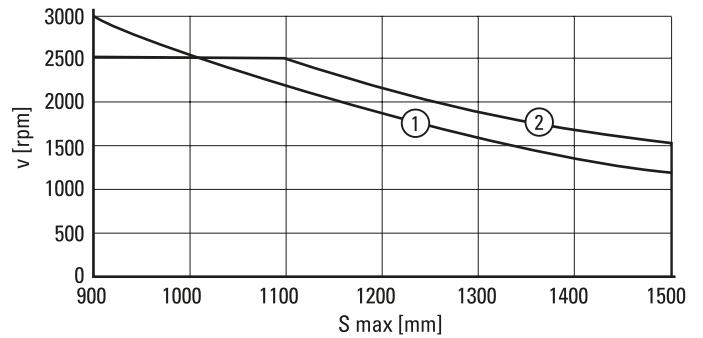
| Parameter | Z2 |
|--|---------------------|
| Stroke length (Smax), maximum [mm] | 1500 |
| Linear speed, maximum [m/s] | 1,25 |
| Acceleration, maximum [m/s ²] | 8 |
| Repeatability [± mm] | 0,1 |
| Input speed, maximum screw diameter/lead [mm] 25/10, 25/25 [rpm] | 3000 |
| screw diameter/lead [mm] 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] | 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 [N] | 1000 |
| screw diameter/lead [mm] 32/20 | 1200 |
| 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 (d ₀) / 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] | | |
|-------------------|------------------------------|------------------------------|------------------------------|
| | d ₀ = 25 / p = 10 | d ₀ = 25 / p = 25 | d ₀ = 32 / p = 20 |
| 500 | 0,7 | 1,9 | 1,5 |

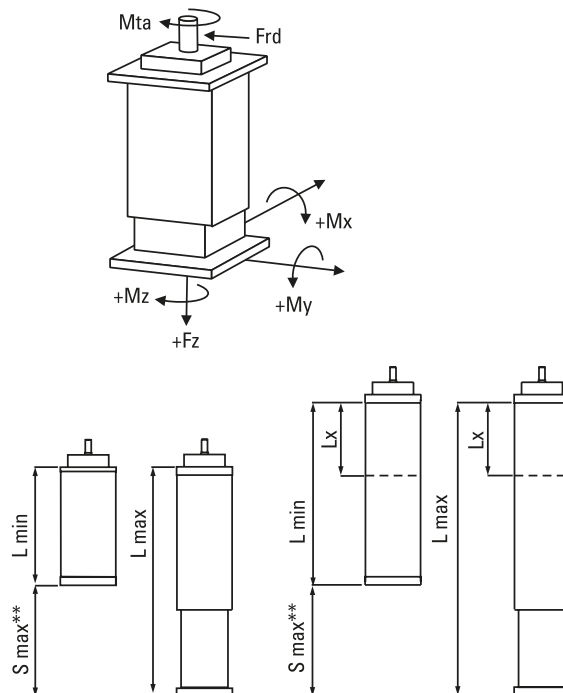
M_{idle} = the input torque needed to move the lifting profiles without any load.

Critical Speed



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

Definition of Forces and Stroke



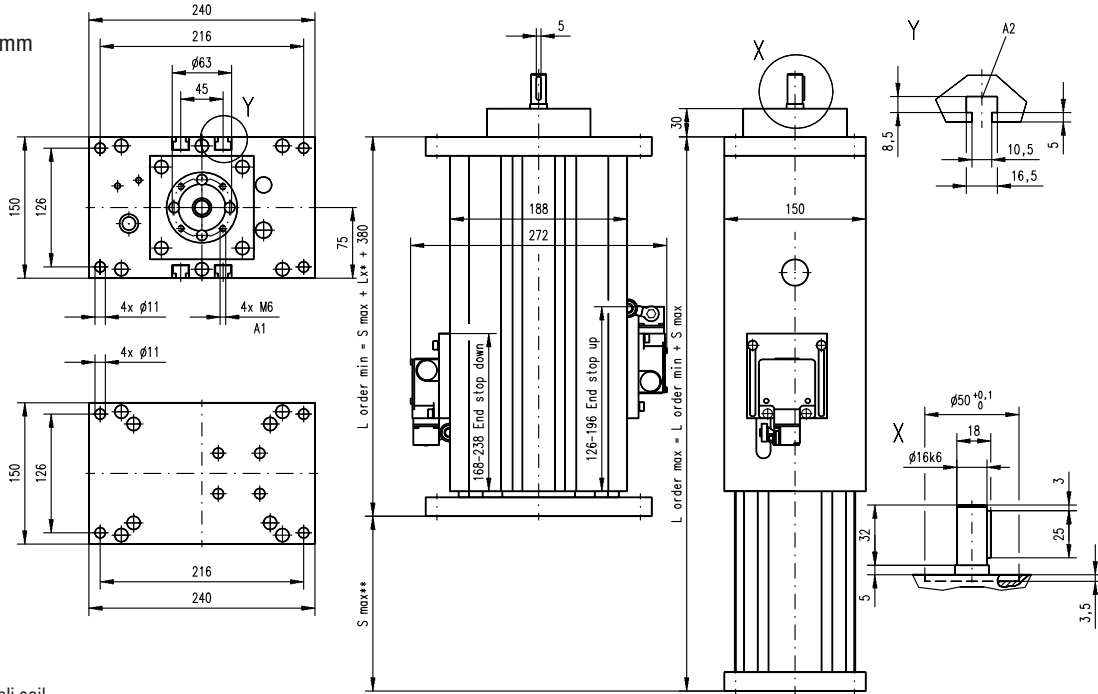
** Smax = maximum stroke between the mechanical ends of the unit. The practical stroke is normally 100 mm shorter to avoid running into the ends of the unit.

Z2

Ball Screw Drive, Slide Guide

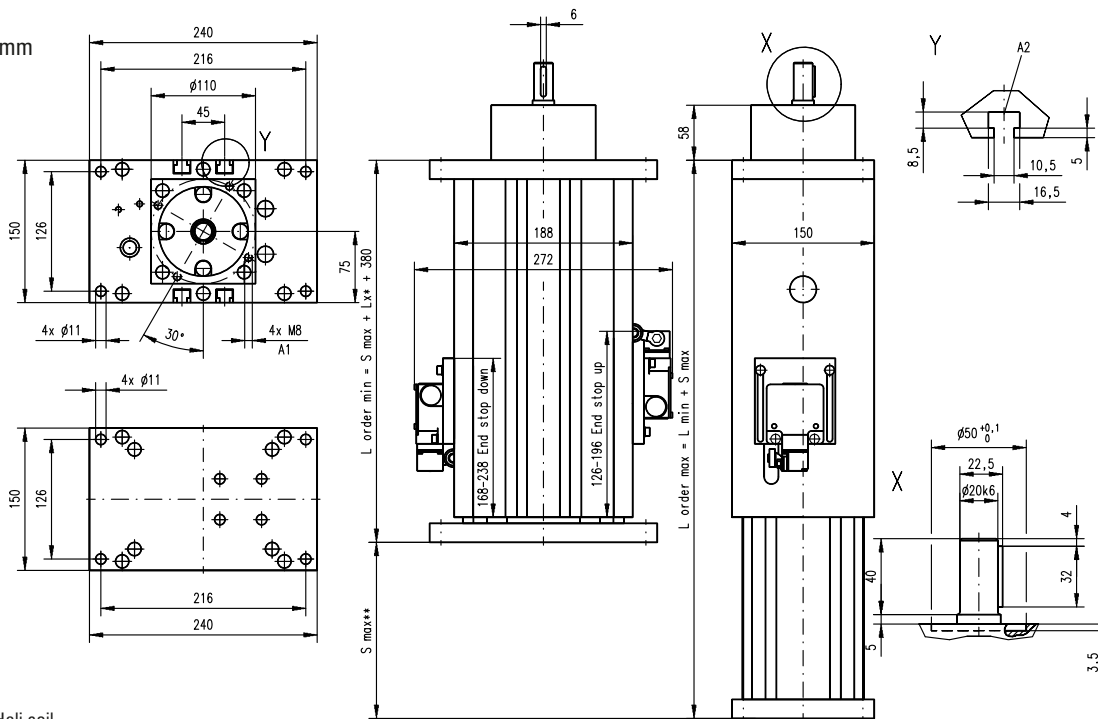
| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

MGZ2K25
screw $\varnothing 25$ mm



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

MGZ2K32
screw $\varnothing 32$ 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 208
» Accessories - see page 135
» Additional data - see page 185

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

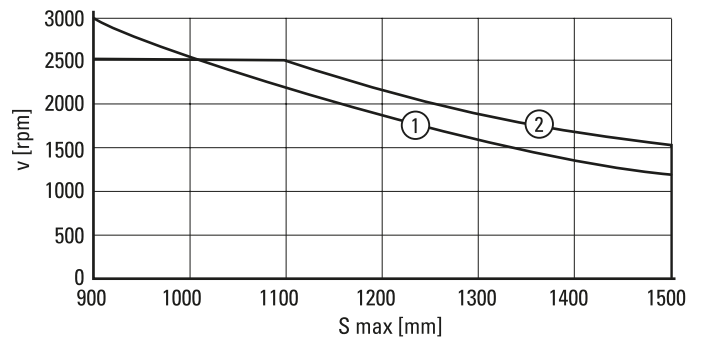
| Parameter | Z3 |
|--|---------------------|
| Stroke length (Smax), maximum [mm] | 1500 |
| Linear speed, maximum [m/s] | 1,25 |
| Acceleration, maximum [m/s ²] | 8 |
| Repeatability [± mm] | 0,1 |
| Input speed, maximum screw diameter/lead [mm] 25/10, 25/25 [rpm] | 3000 |
| screw diameter/lead [mm] 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 |
| 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 |

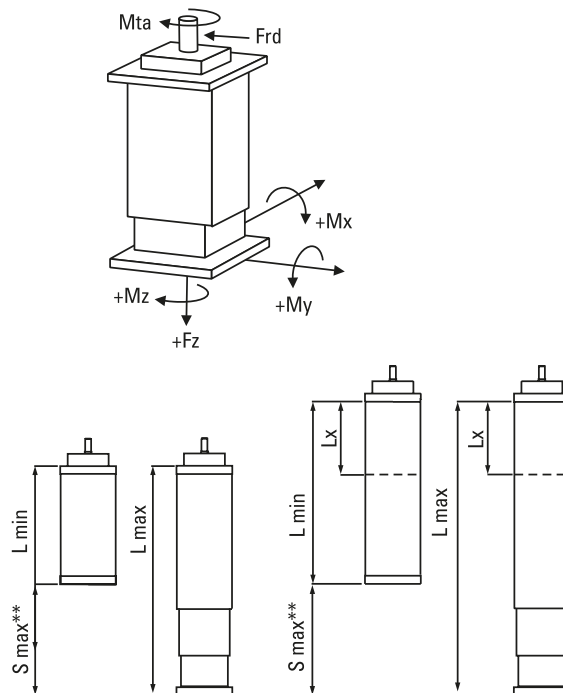
M idle = the input torque needed to move the lifting profiles without any load.

Critical Speed



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

Definition of Forces and Stroke



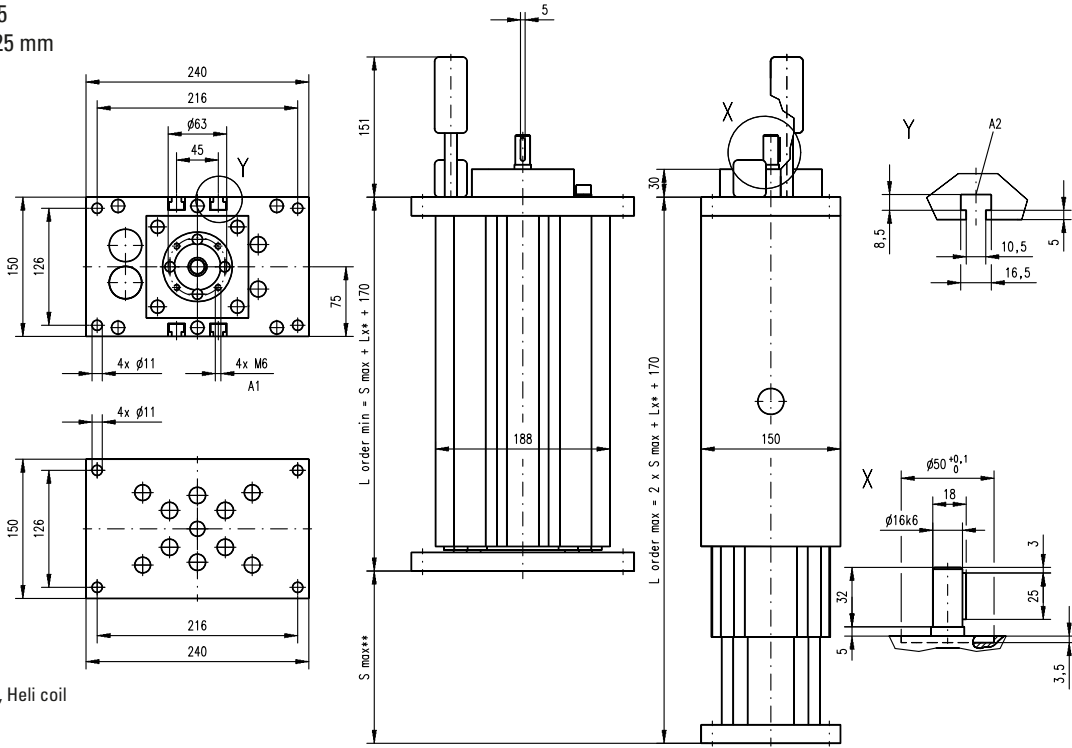
** Smax = maximum stroke between the mechanical ends of the unit. The practical stroke is normally 100 mm shorter to avoid running into the ends of the unit.

Z3

Ball Screw Drive, Slide Guide

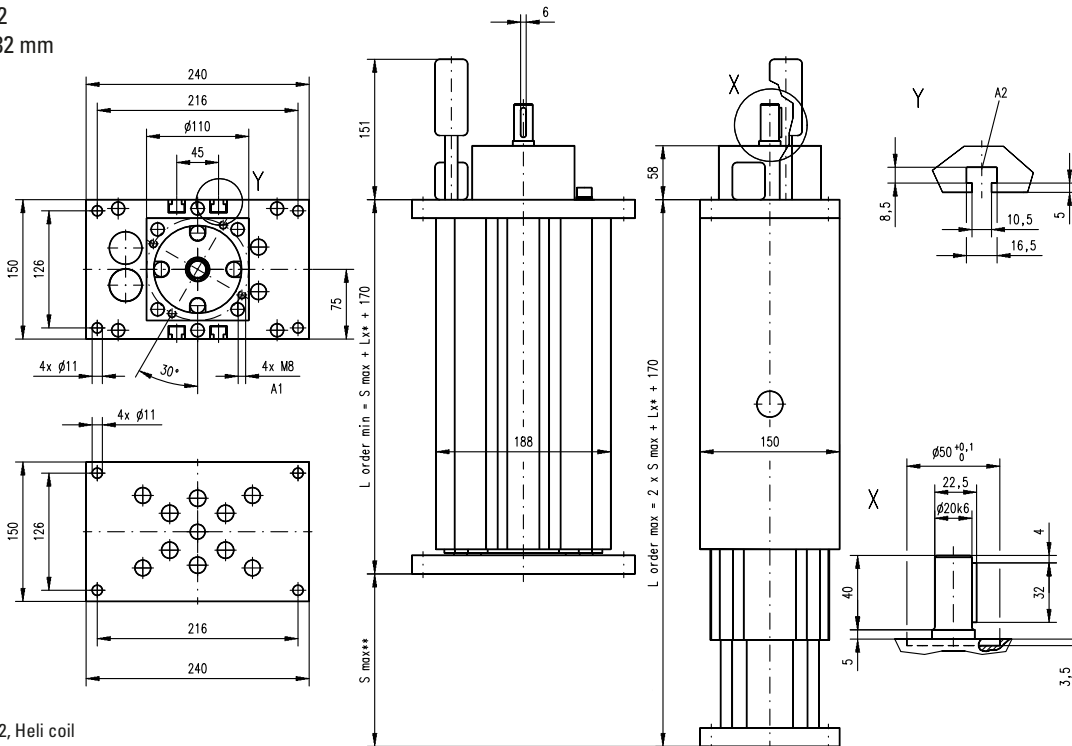
| | |
|------------|------------|
| Dimensions | Projection |
| METRIC | |

MGZ3K25
screw $\varnothing 25$ mm



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

MGZ3K32
screw $\varnothing 32$ 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).

Linear Rod Units

Overview

VarioLine WZ



Features

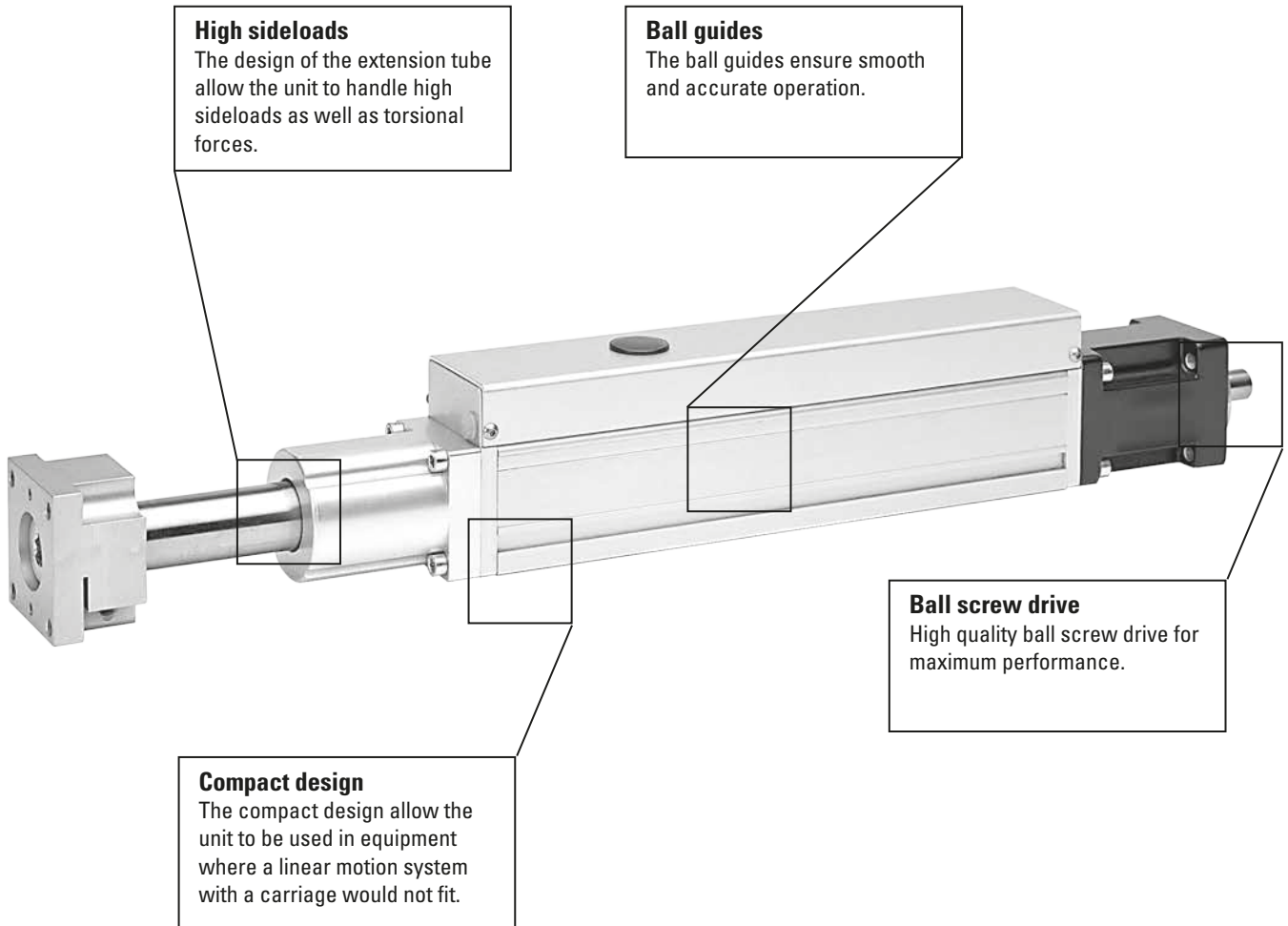
- Can be installed in any orientation
- Ball screw drive
- Ball guides
- Compact

| Parameter | | WZ60 | WZ80 |
|--|-------|---------|---------|
| Profile size (width × height) | [mm] | 60 × 60 | 80 × 80 |
| Stroke length (S _{max}), maximum | [mm] | 400 | 500 |
| Linear speed, maximum | [m/s] | 1,5 | 1,5 |
| Dynamic carriage load (F _x), maximum | [N] | 2800 | 3500 |
| Remarks | | - | - |
| Page | | 130 | 132 |

Linear Rod Units

Overview

WZ-Series Technical Presentation



WZ60

Ball Screw Drive, Ball Guide

- » Ordering key - see page 209
- » Accessories - see page 135
- » Additional data - see page 186

General Specifications

| Parameter | WZ60 |
|---------------------------|---|
| Profile size (w × h) [mm] | 60 × 60 |
| Type of screw | single nut ball screw |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

| Parameter | | WZ60 |
|-----------------------------------|---------------------|-------------------|
| Stroke length (Smax), maximum | [mm] | 400 |
| Linear speed, maximum | [m/s] | 1,5 |
| Acceleration, maximum | [m/s ²] | 20 |
| Repeatability | [± mm] | 0,02 |
| Input speed, maximum | [rpm] | 3000 |
| Operation temperature limits | [°C] | 0 – 80 |
| Dynamic load (Fx), maximum | [N] | 2800 |
| Dynamic load (Fy), maximum | [N] | 2000 ¹ |
| Dynamic load (Fz), maximum | [N] | 2000 ¹ |
| Dynamic load torque (Mx), maximum | [Nm] | 50 ¹ |
| Drive shaft force (Frd), maximum | [N] | 500 |
| Drive shaft torque (Mta), maximum | [Nm] | 30 |
| Ball screw diameter (do) | [mm] | 20 |
| Ball screw lead (p) | [mm] | 5, 20, 50 |
| Weight | [kg] | |
| of unit with zero stroke | | 4,5 |
| of every 100 mm of stroke | | 0,77 |
| of the rod with zero stroke | | 1,8 |
| of every 100 mm of rod | | 0,26 |

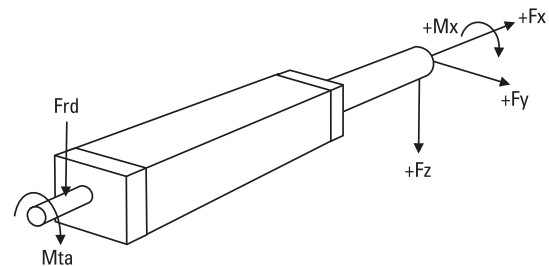
¹ Also see diagrams on next page

Rod Idle Torque (M_{idle}) [Nm]

| Input speed [rpm] | Screw lead [mm] | | |
|-------------------|-----------------|--------|--------|
| | p = 5 | p = 20 | p = 50 |
| 150 | 0,7 | 1,0 | 1,4 |
| 1500 | 1,1 | 1,6 | 2,0 |
| 3000 | 1,5 | 1,8 | 2,2 |

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

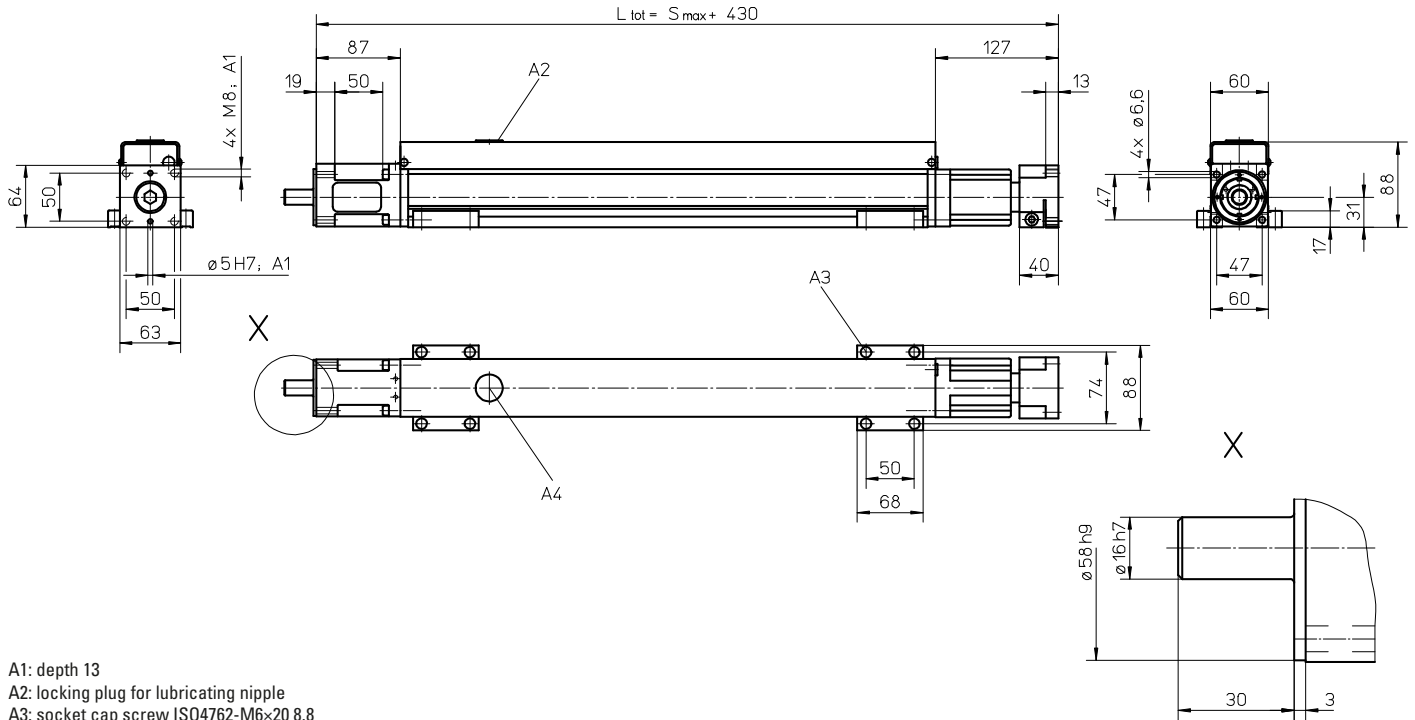
Definition of Forces



WZ60

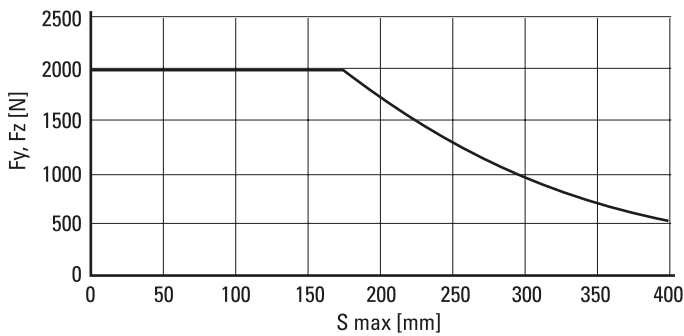
Ball Screw Drive, Ball Guide

| Dimensions | Projection |
|------------|------------|
| METRIC | |

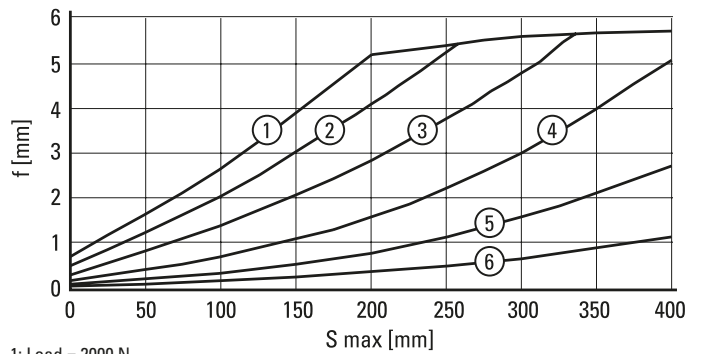


- A1: depth 13
- A2: locking plug for lubricating nipple
- A3: socket cap screw ISO4762-M6x20 8.8
- A4: tapered lubricating nipple to DIN71412 AM6 as standard feature

Maximum Rod Side Forces (F_y, F_z)

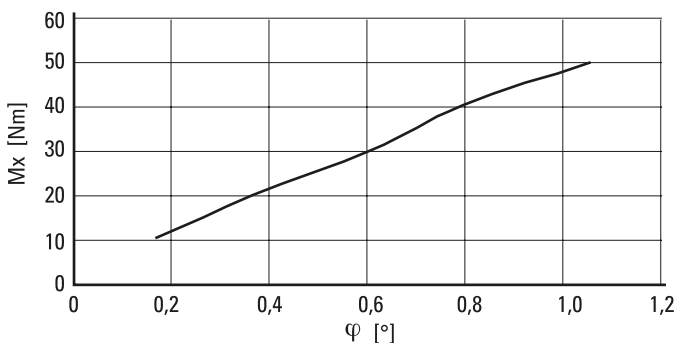


Deflection (f) of Rod due to F_y and F_z



- 1: Load = 2000 N
- 2: Load = 1500 N
- 3: Load = 1000 N
- 4: Load = 500 N
- 5: Load = 250 N
- 6: Load = 125 N

Torsion (ϕ) of Rod due to M_x



WZ80

Ball Screw Drive, Ball Guide

- » Ordering key - see page 209
- » Accessories - see page 135
- » Additional data - see page 186

General Specifications

| Parameter | WZ80 |
|---------------------------|---|
| Profile size (w × h) [mm] | 80 × 80 |
| Type of screw | single nut ball screw |
| Lubrication | central lubrication of all parts that require lubrication |
| Included accessories | 4 × mounting clamps |

Performance Specifications

| Parameter | WZ80 |
|--|-------------------|
| Stroke length (Smax), maximum [mm] | 500 |
| Linear speed, maximum [m/s] | 1,5 |
| Acceleration, maximum [m/s ²] | 20 |
| Repeatability [± mm] | 0,02 |
| Input speed, maximum [rpm] | 3000 |
| Operation temperature limits [°C] | 0 – 80 |
| Dynamic load (Fx), maximum [N] | 3500 |
| Dynamic load (Fy), maximum [N] | 3000 ¹ |
| Dynamic load (Fz), maximum [N] | 3000 ¹ |
| Dynamic load torque (Mx), maximum [Nm] | 150 ¹ |
| Drive shaft force (Frd), maximum [N] | 700 |
| Drive shaft torque (Mta), maximum [Nm] | 55 |
| Ball screw diameter (d ₀) [mm] | 25 |
| Ball screw lead (p) [mm] | 5, 10, 20, 50 |
| Weight [kg] | |
| of unit with zero stroke | 7,5 |
| of every 100 mm of stroke | 1,35 |
| of the rod with zero stroke | 3,0 |
| of every 100 mm of rod | 0,5 |

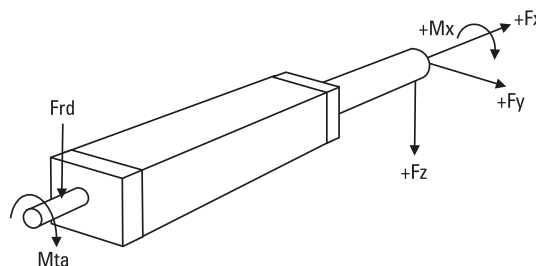
¹ Also see diagrams on next page

Rod Idle Torque (M_{idle}) [Nm]

| Input speed [rpm] | Screw lead [mm] | | | |
|-------------------|-----------------|--------|--------|--------|
| | p = 5 | p = 10 | p = 20 | p = 50 |
| 150 | 0,6 | 1,1 | 1,3 | 1,8 |
| 1500 | 1,1 | 1,5 | 1,6 | 2,2 |
| 3000 | 1,4 | 1,8 | 1,8 | 2,7 |

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

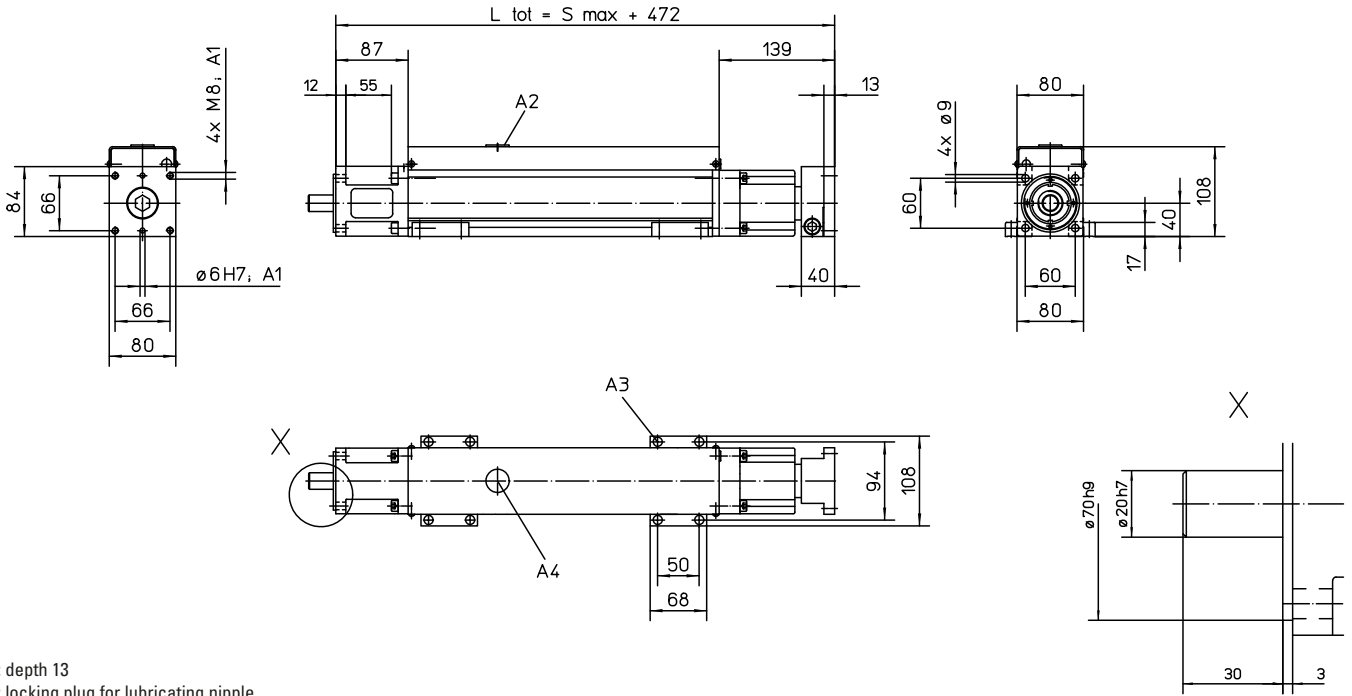
Definition of Forces



WZ80

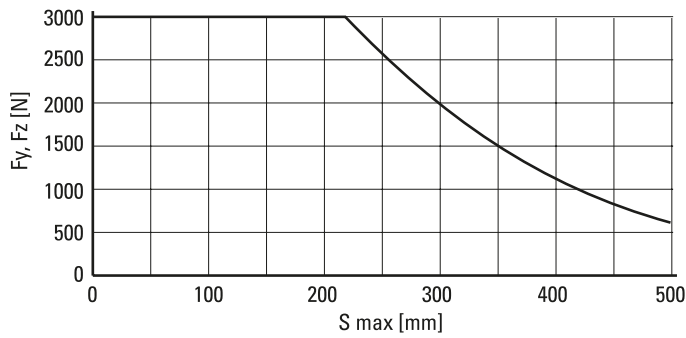
Ball Screw Drive, Ball Guide

| Dimensions | Projection |
|------------|------------|
| METRIC | |

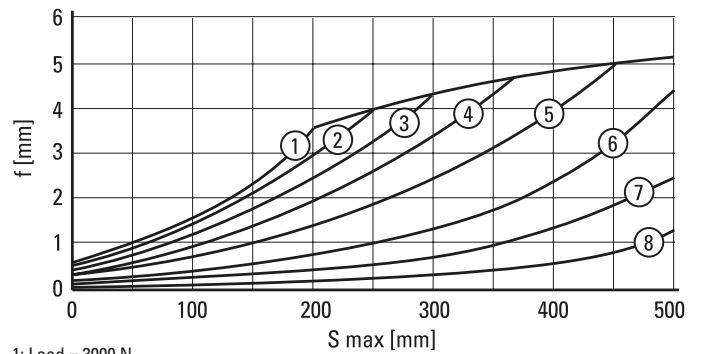


- A1: depth 13
- A2: locking plug for lubricating nipple
- A3: socket cap screw ISO4762-M6×20 8.8
- A4: tapered lubricating nipple to DIN71412 AM6 as standard feature

Maximum Rod Side Forces (F_y, F_z)

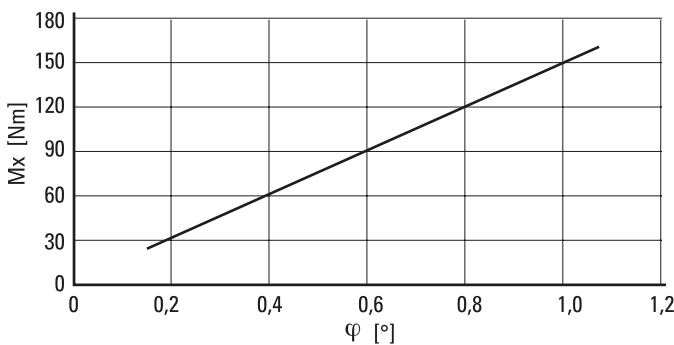


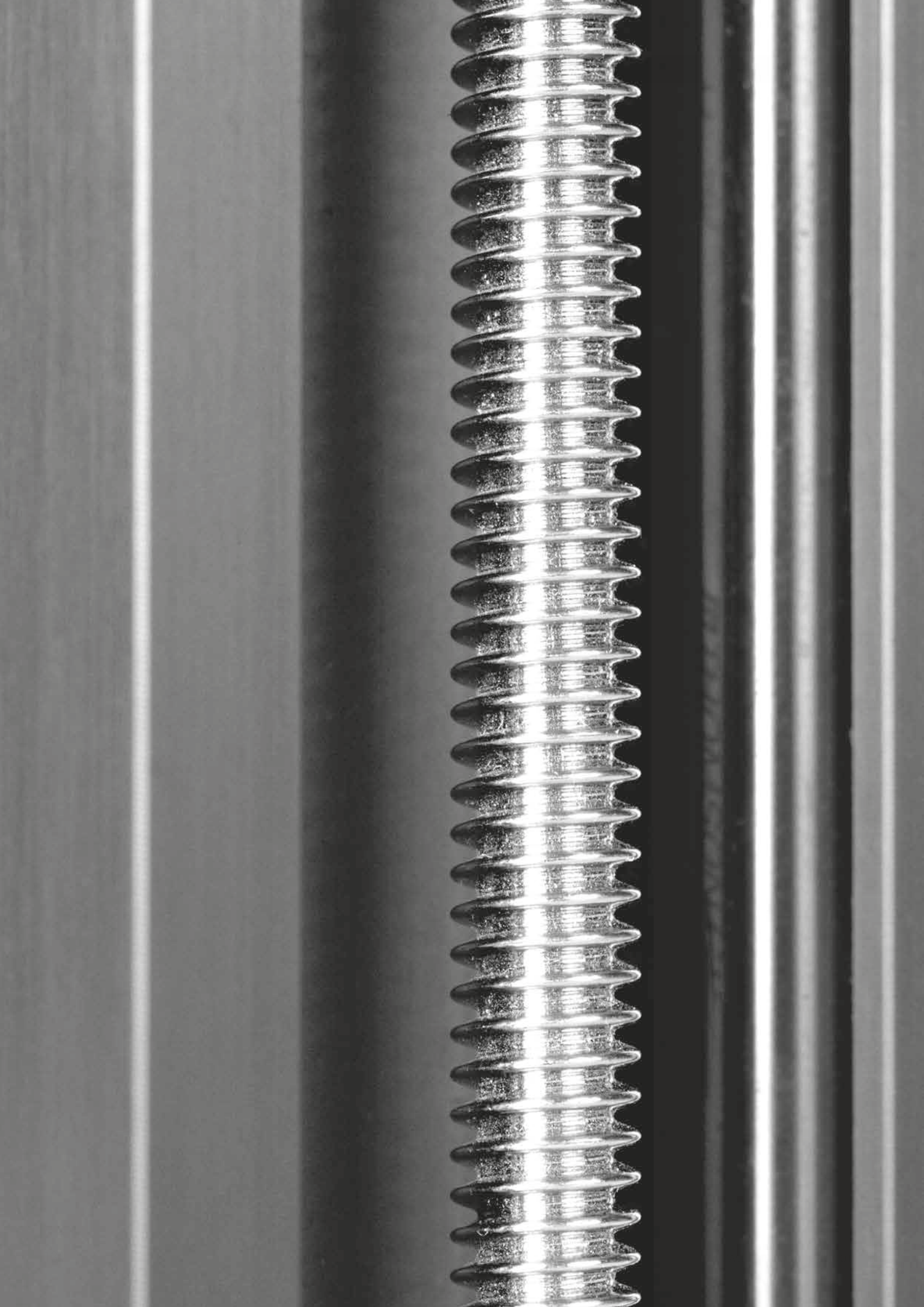
Deflection (f) of Rod due to F_y and F_z



- 1: Load = 3000 N
- 2: Load = 2500 N
- 3: Load = 2000 N
- 4: Load = 1500 N
- 5: Load = 1000 N
- 6: Load = 500 N
- 7: Load = 250 N
- 8: Load = 125 N

Torsion (ϕ) of Rod due to M_x





Accessories

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Accessories

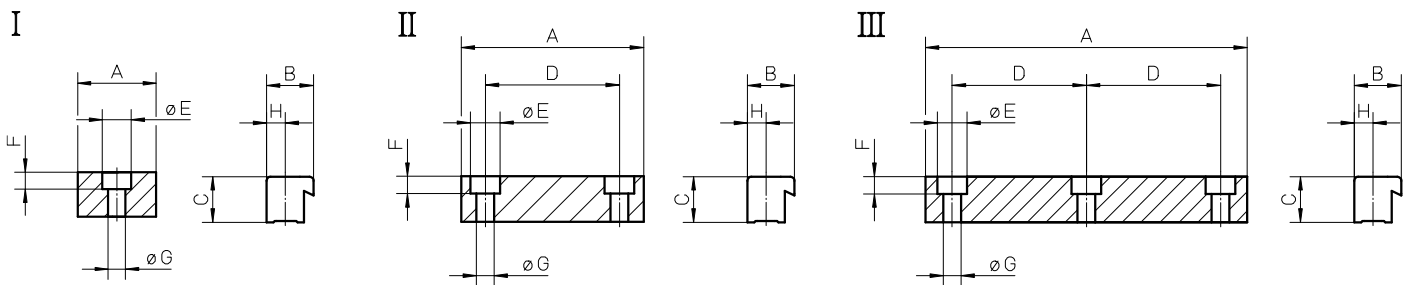
Mounting Kits

Mounting Clamps (single clamp)

| Unit type | I | II | III | A | B | C | D | øE | F | øG | H | Screws | Ms [Nm] |
|--------------------|----------|--------------|------------|--------|------|------|----|-----|------|------|------|-------------|---------|
| WH40 | – | 890 885 0001 | – | 54 | 16 | 9,5 | 40 | 10 | 5,7 | 5,5 | 7 | ISO4762-8.8 | 5,4 |
| WH50 | – | 890 885 0001 | – | 54 | 16 | 9,5 | 40 | 10 | 5,7 | 5,5 | 7 | ISO4762-8.8 | 5,4 |
| WH80 / WB60 | – | 890 190 02 | – | 68 | 17,5 | 17 | 50 | 11 | 6,5 | 6,6 | 7 | ISO4762-8.8 | 9 |
| WH120 | – | 890 192 13 | – | 80 | 25 | 18 | 50 | 15 | 8,5 | 9 | 10 | ISO4762-8.8 | 20 |
| WM40 / WB40 | – | 890 885 001 | – | 54 | 16 | 9,5 | 40 | 10 | 5,7 | 5,5 | 7 | ISO4762-8.8 | 5,4 |
| WM60 / WV60 / WZ60 | – | 890 190 02 | – | 68 | 17,5 | 17 | 50 | 11 | 6,5 | 6,6 | 7 | ISO4762-8.8 | 9 |
| WM80 / WV80 / WZ80 | – | 890 190 02 | – | 68 | 17,5 | 17 | 50 | 11 | 6,5 | 6,6 | 7 | ISO4762-8.8 | 9 |
| WM60Z / WM80Z | – | 890 190 02 | – | 68 | 17,5 | 17 | 50 | 11 | 6,5 | 6,6 | 7 | ISO4762-8.8 | 9 |
| WM120 / WV120 | – | 890 192 13 | – | 80 | 25 | 18 | 50 | 15 | 8,5 | 9 | 10 | ISO4762-8.8 | 20 |
| MLS60 | – | 890 190 02 | 890 192 26 | 68/120 | 17,5 | 17 | 50 | 11 | 6,5 | 6,6 | 7 | ISO4762-8.8 | 9 |
| MLS80 | – | 890 192 13 | 890 192 31 | 80/200 | 25 | 18 | 50 | 15 | 8,5 | 9 | 10 | ISO4762-8.8 | 20 |
| M50 ¹ | D312 248 | – | – | 25 | 30 | 20 | – | – | – | 6,5 | 14 | ISO4762-8.8 | 9,4 |
| M55 ¹ | D313 403 | D313 402 | – | 25/56 | 25,5 | 10,7 | 41 | 9,5 | 5,3 | 5,5 | 10,2 | ISO4762-8.8 | 5,5 |
| M75 ¹ | D312 747 | D312 748 | – | 30/75 | 28,5 | 15 | 60 | 14 | 8,5 | 8,5 | 11 | ISO4762-8.8 | 23 |
| M100 ¹ | D312 339 | D312 334 | – | 45/92 | 46,5 | 22 | 60 | 17 | 10,5 | 10,5 | 20 | ISO4762-8.8 | 45 |

¹ no screws included in the shipment of these clamps

Ms = tightening torque of screws



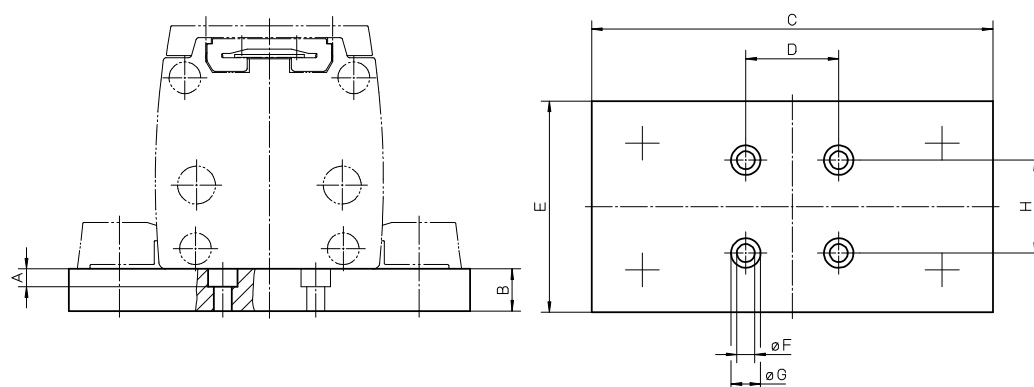
Accessories

Mounting Kits

Mounting Clamps with Plate¹

| Unit type | p/n | A | B | C | D | E | øF | øG | H |
|-----------|----------|-----|----|-----|----|-----|-----|----|----|
| M50 | D312 117 | 7 | 20 | 105 | 35 | 30 | 6,5 | 11 | – |
| M55 | D313 474 | 8,5 | 15 | 100 | 44 | 70 | 8,5 | 14 | 44 |
| M75 | D312 718 | 8,5 | 15 | 134 | 44 | 80 | 8,5 | 14 | 44 |
| M100 | D312 317 | 8,5 | 20 | 190 | 44 | 100 | 8,5 | 14 | 44 |

¹two mounting clamps of version II (see page 136) and screws to connect these to the plate are included in shipment



Accessories

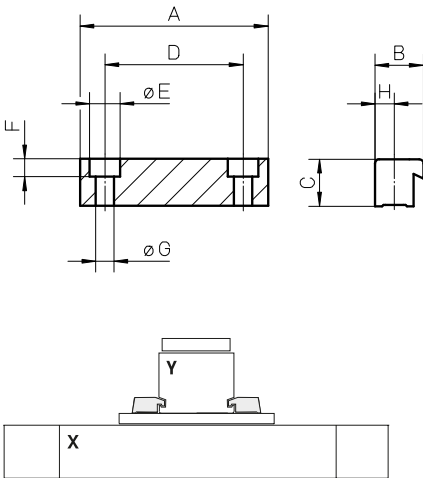
Mounting Kits

Mounting Clamps for Multi Axis Systems¹

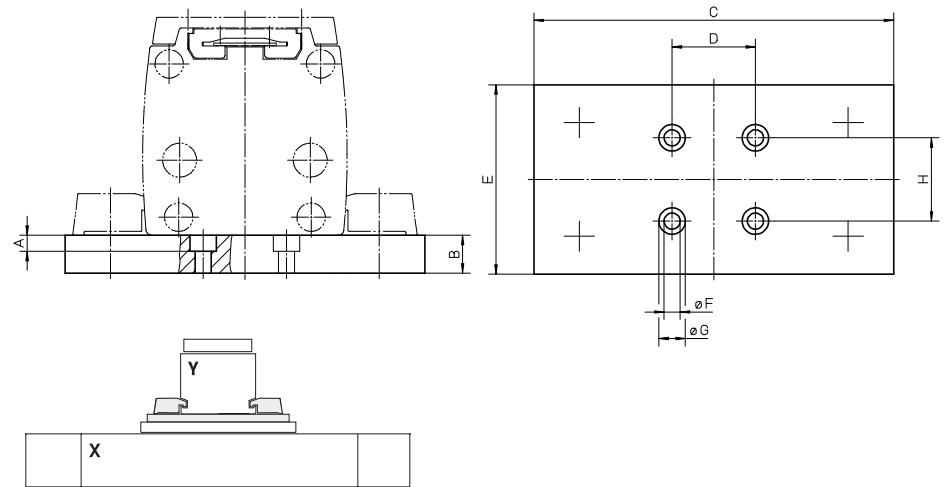
| Unit type X-axis | Unit type Y-axis | I | II | A | B | C | D | øE | F | øG | H |
|------------------|------------------|------------|----------|-----|------|------|-------|-----|----------|------|------|
| WM40 / WH40 | WM40 / WH40 | on request | - | - | - | - | - | - | - | - | - |
| WM60 | WM60 | 890 191 94 | - | 58 | 17,5 | 17 | 40 | 11 | 6,5 | 6,6 | 7 |
| M55 | M55 | D313 424 | - | 56 | 25,5 | 10,7 | 41 | 9,5 | 5,3 | 5,5 | 10,2 |
| M55 | M75 | - | D313 470 | 5,5 | 15 | 134 | 76 | 80 | 5,5 | 9,5 | 41 |
| M75 | M55 | - | D313 060 | - | 15 | 134 | 76 | 80 | M5 × 7,5 | - | 41 |
| M75 | M75 | D312 719 | - | 75 | 28,5 | 15 | 60 | 14 | 8,5 | 8,5 | 11 |
| M75 | M100 | - | D313 062 | 8,5 | 20 | 190 | 106 | 100 | 8,5 | 14 | 60 |
| M100 | M75 | - | D313 292 | - | 20 | 190 | 106,5 | 100 | M8 × 12 | - | 60 |
| M100 | M100 | D312 304 | - | 92 | 46,5 | 22 | 60 | 17 | 10,5 | 10,5 | 20 |

¹all necessary screws are included in the shipment

I



II

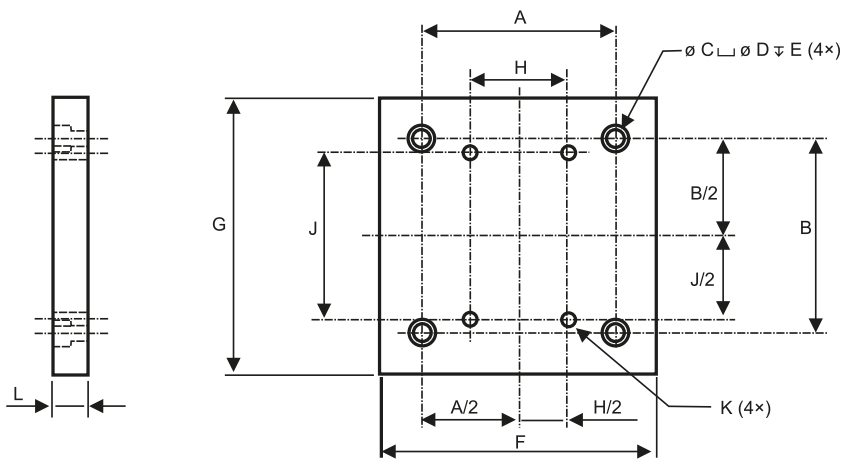


Accessories

Mounting Kits

Mounting Plates for Multi Axis Systems

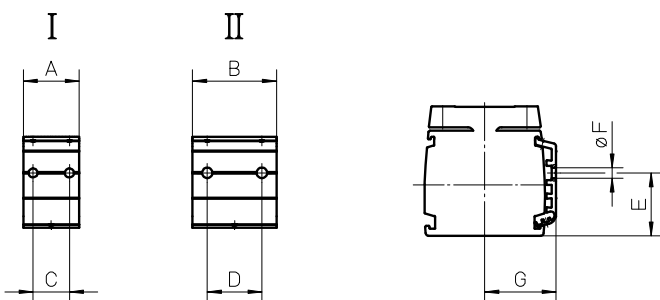
| Unit type X-axis | Unit type Y-axis | p/n | A | B | C | D | E | F | G | H | J | K | L |
|------------------|------------------|--------------|-----|-----|------|------|----|-----|-----|----|-----|----------------|------|
| MS33 | MS33 | MSXYP33-33 | 30 | 30 | 6 | 9 | 6 | 60 | 120 | 30 | 100 | M5 x 0,8 - 6H | 12,7 |
| MS33 | MS25 | MSXYP33-25 | 30 | 30 | 5,5 | 9 | 6 | 60 | 60 | 42 | 42 | M3 x 0,5 - 6H | 12,7 |
| 2HB10 | MS25 | 2HXYP10-MS25 | 70 | 70 | 5,5 | 9 | 6 | 100 | 100 | 42 | 42 | M3 x 0,5 - 6H | 12,7 |
| 2HB10 | MS33 | 2HXYP10-MS33 | 70 | 70 | 6 | 9 | 6 | 100 | 120 | 30 | 100 | M5 x 0,8 - 6H | 12,7 |
| 2HB10 | 2HB10 | 2HXYP10-10 | 70 | 70 | 5,5 | 9 | 6 | 100 | 100 | 35 | 75 | M5 x 0,8 - 6H | 12,7 |
| 2HB20 | 2HB10 | 2HXYP20-10 | 145 | 145 | 10,5 | 16,5 | 11 | 200 | 200 | 35 | 75 | M5 x 0,8 - 6H | 22 |
| 2HB20 | 2HB20 | 2HXYP20-10 | 145 | 145 | 10,5 | 16,5 | 11 | 200 | 200 | 85 | 120 | M8 x 1,25 - 6H | 22 |



Combinations for other units are available. Plates to connect X and Z axes are also available for the Microstage units size MS25 and MS33. Contact customer support for details.

Adapter Plates

| Unit type | I | II | A | B | C | D | E | øF | G |
|-----------|----------|----------|----|----|----|----|------|-----|----|
| M55 | D313 422 | D313 423 | 40 | 60 | 20 | 38 | 25,5 | 6,5 | 37 |
| M75 | D312 746 | - | 40 | - | 26 | - | 45 | 6,5 | 51 |
| M75 | - | D312 745 | - | 60 | - | 39 | 45 | 7,5 | 51 |
| M100 | D312 338 | - | 40 | - | 26 | - | 69 | 6,5 | 62 |
| M100 | - | D312 337 | - | 60 | - | 39 | 69 | 7,5 | 62 |



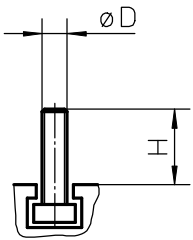
Adapter plates are fitted in the grooves along the profile and can be used to attach sensors, switches, cable ducts etc. to the unit.

Accessories

Mounting Kits

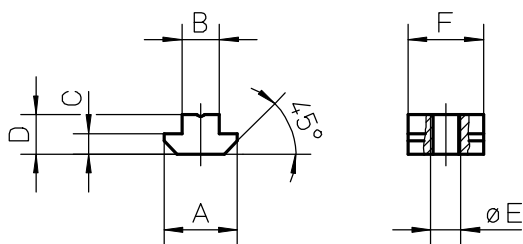
T-slot Bolts

| Unit type | p/n | øD | H |
|-----------|----------|-----|----|
| M50 | D312 221 | M5 | 14 |
| Z2 | D800 089 | M10 | 28 |
| Z3 | D800 089 | M10 | 28 |



T-slot Nuts

| Unit type | p/n | A | B | C | D | øE | F |
|---------------------|--------------|------|-----|------|------|----|----|
| ZB | D900 151 | 18 | 11 | 1,5 | 6,3 | M6 | 25 |
| ZB | D900 150 | 18 | 11 | 1,5 | 6,3 | M8 | 25 |
| MLS60 | 920 303 0037 | 16 | 8 | 4 | 6 | M6 | 16 |
| MLS80 | 920 303 0039 | 19,5 | 10 | 5,5 | 10,5 | M8 | 20 |
| WH120 | 911 044 19 | 15 | 10 | 6 | 12 | M8 | 15 |
| WM120 | 911 044 19 | 15 | 10 | 6 | 12 | M8 | 15 |
| 2RB12, 2HB10, 2HB20 | TNUT-01-M3 | 7 | 4 | 1,75 | 3 | M3 | 9 |
| 2RB16, 2HB10 | TNUT-02-M4 | 9,5 | 5,5 | 2,25 | 4 | M4 | 12 |
| 2RB12 | TNUT-03-M4 | 12 | 7 | 2,5 | 5 | M4 | 15 |
| 2RB16, 2HB20 | TNUT-04-M4 | 16,5 | 7,9 | 4,8 | 6 | M4 | 16 |
| 2RB16, 2HB20 | TNUT-04-M5 | 16,5 | 7,9 | 4,8 | 6 | M5 | 16 |
| 2RB16, 2HB20 | TNUT-04-M6 | 16,5 | 7,9 | 4,8 | 6 | M6 | 16 |

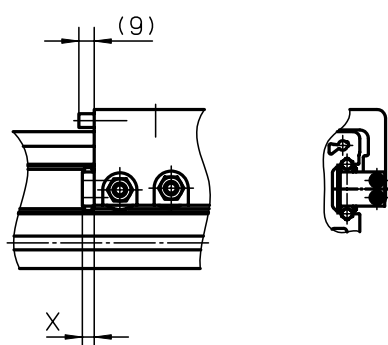


Accessories

Cover and Protection Kits

FA Felt Pad Wiper

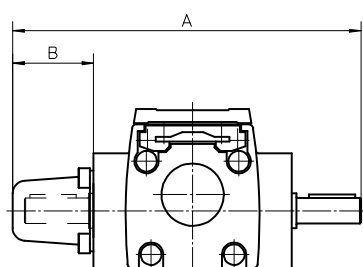
| Unit type | Number of carriages on the unit | p/n | X |
|-----------|---------------------------------|------------------|---|
| WH50 | 1 | 890 885 0064 | 6 |
| WH50 | 2 | 2 × 890 885 0064 | 6 |
| WH80 | 1 | 890 890 0069 | 7 |
| WH80 | 2 | 2 × 890 890 0069 | 7 |
| WH120 | 1 | 890 895 0058 | 8 |
| WH120 | 2 | 2 × 890 895 0058 | 8 |
| WHZ50 | 1 | 890 885 0064 | 6 |
| WHZ50 | 2 | 2 × 890 885 0064 | 6 |
| WHZ80 | 1 | 890 890 0069 | 7 |
| WHZ80 | 2 | 2 × 890 890 0069 | 7 |



The felt pad wipers remove dust and dirt from the guides and are located on the carriage(s). They may increase the driving torque slightly but do not reduce the stroke of the unit. The felt pad wipers come mounted from factory.

Shaft Protection Cover

| Unit type | p/n | A | B |
|-----------|----------|-----|----|
| M50 | D312 201 | 126 | 35 |
| M55 | D312 201 | 151 | 35 |
| M75 | D700 178 | 198 | 45 |
| M100 | D700 178 | 202 | 45 |



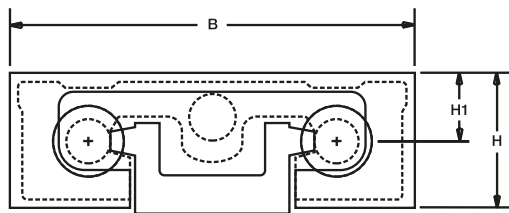
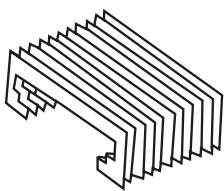
The shaft protection cover is used to cover shafts which are not being used. The covers are fitted by the customer.

Accessories

Cover and Protection Kits

Protective Bellows type 2D

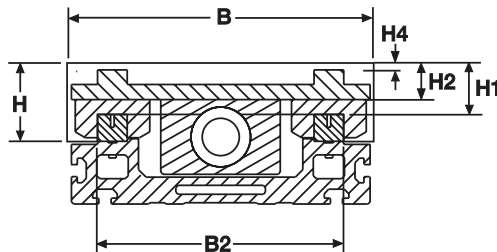
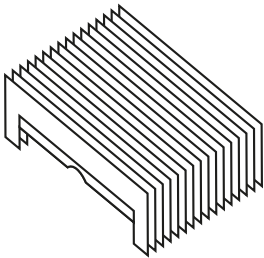
| Unit type | p/n | H | H1 | B |
|-----------|------------|----|------|-------|
| 2DB08 | BEL-2DB-08 | 48 | 34 | 130 |
| 2DB12 | BEL-2D-12 | 61 | 36,5 | 152,5 |
| 2DB12 | BEL-2D-16 | 73 | 43 | 190,5 |



Bellows protect the unit from dirt and dust. Note that the bellows option reduces the available stroke of the unit by 28%. Bellows can be ordered and mounted at the factory - see ordering key. Bellows can also be ordered separately and fitted by the customer. In that case, order two pieces of bellows where the length of each bellows piece = stroke length of the unit \times 0.86.

Protective Bellows type 2H

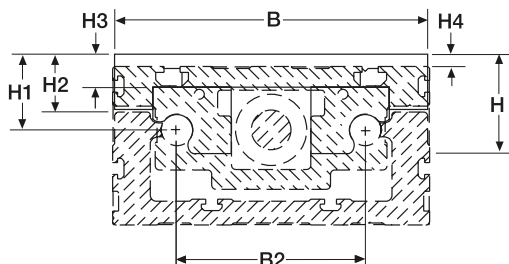
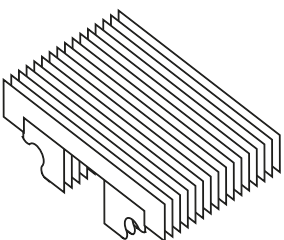
| Unit type | p/n | B | B2 | H | H1 | H2 | H4 |
|-----------|-----------|-----|-----|----|----|----|----|
| 2HB10 | BEL-2H-10 | 103 | 81 | 26 | 11 | 10 | 0 |
| 2HB20 | BEL-2H-20 | 199 | 167 | 48 | 30 | 15 | 5 |



Bellows protect the unit from dirt and dust. Note that the bellows option reduces the available stroke of the unit by 28%. Bellows can be ordered and mounted at the factory - see ordering key. Bellows can also be ordered separately and fitted by the customer. In that case, order two pieces of bellows where the length of each bellows piece = stroke length of the unit \times 0.86.

Protective Bellows type 2R

| Unit type | p/n | B | B2 | H | H1 | H2 | H3 | H4 |
|-----------|-----------|-----|----|----|----|----|----|----|
| 2RB12 | BEL-2R-12 | 128 | 75 | 48 | 37 | 29 | 15 | 12 |
| 2RB16 | BEL-2R-16 | 158 | 95 | 52 | 43 | 30 | 15 | 10 |



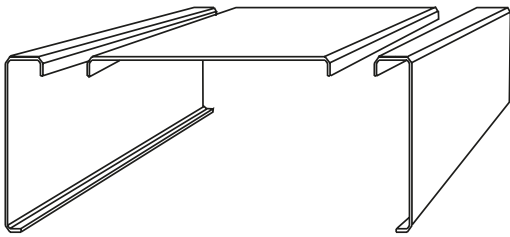
Bellows protect the unit from dirt and dust. Note that the bellows option reduces the available stroke of the unit by 28%. Bellows can be ordered and mounted at the factory - see ordering key. Bellows can also be ordered separately and fitted by the customer. In that case, order two pieces of bellows where the length of each bellows piece = stroke length of the unit \times 0.86.

Accessories

Cover and Protection Kits

Protective Shrouds

| Unit type | |
|-----------|--|
| 2HB10 | see ordering key of the unit for order or www.linearmotioneering.com |
| 2HB20 | see ordering key of the unit for order or www.linearmotioneering.com |



The protective shrouds are made of metal and protect the drive mechanism of the unit from dust and dirt but leave the guides unprotected. Shrouds do not reduce the stroke of the unit but they will add 4 mm to the width of the unit. Shrouds are ordered mounted from factory and are stated in the ordering key of the unit.

Accessories

Cover and Protection Kits

Environment Protection Option Type S1 and S2, compatability table

| Unit type | Drive type | Guide type | S1 | S2 | Ordering |
|---------------------|------------|------------|----|----|--|
| M55 | ball screw | slide | • | | see ordering key of the unit for order |
| M55 | belt drive | slide | • | • | see ordering key of the unit for order |
| | | ball | • | | see ordering key of the unit for order |
| M75 | ball screw | slide | • | | see ordering key of the unit for order |
| M75 | belt drive | slide | • | • | see ordering key of the unit for order |
| | | ball | • | | see ordering key of the unit for order |
| M100 | ball screw | slide | • | | see ordering key of the unit for order |
| M100 | belt drive | slide | • | • | see ordering key of the unit for order |
| | | ball | • | | see ordering key of the unit for order |
| WM60 / WM80 / WM120 | ball screw | ball | • | | see ordering key of the unit for order |
| WV60 / WV80 / WV120 | ball screw | no guide | • | | see ordering key of the unit for order |
| WH50 / WH80 / WH120 | belt drive | wheel | • | • | see ordering key of the unit for order |
| WHZ50 / WHZ80 | belt drive | wheel | • | | see ordering key of the unit for order |

The S1 and S2 environment protection options can be ordered for some units. All performance data and the life expectancy are the same as for standard units except for WH and WHZ units (contact customer service for more information). S1 can be ordered for both ball screw and belt driven units with ball, slide or wheel guides while S2 only is possible for belt driven units with slide or wheel guides. Never use chemical agents and/or cleaning detergents before contacting your local Thomson customer service for advise.

S1 - Wash down protection

Typical places where S1 is used are in slaughter houses, dairy plants, food plants or in any other light wash down application.

S2 - Enhanced wash down protection

Typical places where S2 is used are in moderately wet areas such as in paper mills, galvanising equipment, food industries or in any other harsh environment application where enhanced wash down capabilities are required.

Environment Protection Options Type S1 and S2, technical specification

| Item | S1 | S2 |
|---|---------------------------------------|---------------------------------------|
| External screws, bolts and nuts | stainless material class A2 or better | stainless material class A4 or better |
| Internal screws, bolts and nuts | standard material | stainless material class A2 or better |
| Drive shaft, ball screw driven units | standard material | - |
| Drive shaft, belt driven units | stainless material SS2333 or better | stainless material SS2343 or better |
| Tension wheel shaft | standard material | stainless material SS2333 or better |
| Bearings type | standard bearings | 2RS |
| Bearing sealings, belt driven units | radial sealings | radial sealings |
| Surface treatment of machined extruded aluminum parts | none | anodising |
| Surface treatment of machined casted aluminum parts | none | anodising |
| Cam rollers and idler shafting (WH and WHZ units) | standard material | stainless material |
| Belt retainer (WH units) | none | stainless material |

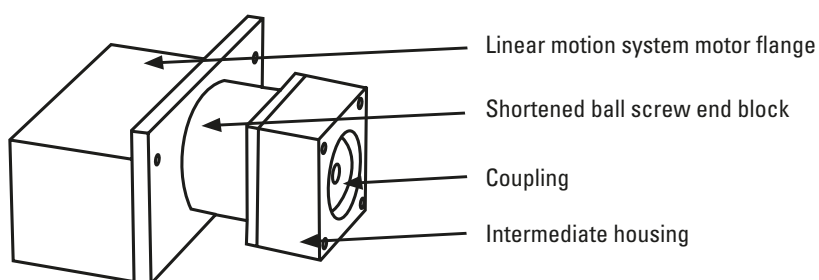
Accessories

Motors, Gears and Transmission Kits

RediMount™ Motor Mount System, NEMA compatability table

| NEMA size | NEMA 17 | NEMA 23 | NEMA 34 | NEMA 42 |
|--------------|--------------|---------|---------|---------|
| Motor code * | 505 | 001 | 002 | 003 |
| MS25 | x | x | | |
| MS33 | x | x | | |
| MS46 | | x | x | |
| 2HB10 | | x | x | |
| 2HB20 | | | x | x |
| 2RB12 | | x | x | |
| 2RB16 | | x | x | |
| 2DB08 | x (code 523) | x | | |
| 2DB12 | | x | x | |
| 2DB16 | | x | x | |

* See ordering keys for details.



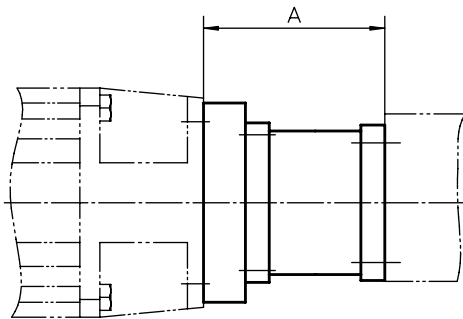
The standard NEMA motor mount sizes are listed above for reference. The Thomson RediMount™ System allows the linear units to be mounted to a wide variety of motor manufacturers and sizes. Many of these combinations can be found at www.linearmotioneering.com. Contact customer support for other motor sizes and their corresponding motor code.

Accessories

Motors, Gears and Transmission Kits

Bell House Flanges for IEC Motors

| Unit type | IEC63 B14 | A | IEC71 B14 | A | IEC80 B14 | A | IEC90 B14 | A | IEC100/112 B14 | A |
|--------------|-----------|----|-----------|----|-----------|-----|-----------|-----|----------------|---|
| M50 | D390 820 | 64 | D390 821 | 71 | – | – | – | – | – | – |
| M55 | D390 820 | 64 | D390 821 | 71 | – | – | – | – | – | – |
| M75 | – | – | D390 823 | 83 | D390 912 | 101 | D390 916 | 101 | – | – |
| M100 (MG10K) | – | – | D390 823 | 83 | D390 913 | 101 | D390 917 | 101 | – | – |
| M100 (MG10B) | – | – | D390 823 | 83 | D390 912 | 101 | D390 916 | 101 | – | – |



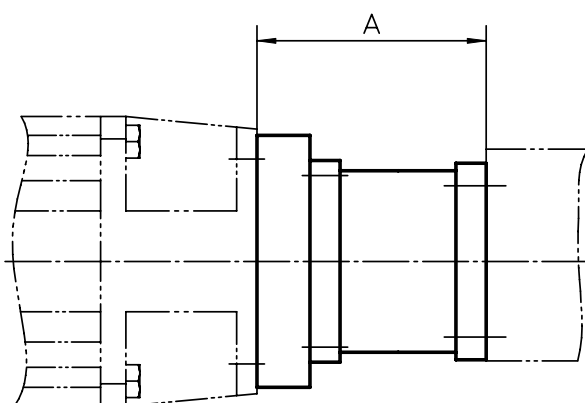
The bell house flange includes a matching coupling. Note! Keep in mind that heavy motors will need extra support in order not to break the flange or gear due to the load torque created.

Accessories

Motors, Gears and Transmission Kits

MGK Bell House Flanges for AKM Servo Motors

| Unit type | AKM3 • D-AN | A | AKM4 • D-AN | A | AKM5 • D-AN | A | AKM6 • D-AN | A | AKM7 • D-AN | A |
|--------------------|--------------|----|--------------|----|--------------|-----|--------------|-----|--------------|-----|
| WM40 | 891 092 1264 | 71 | – | – | – | – | – | – | – | – |
| WB40 | 891 092 1263 | 63 | – | – | – | – | – | – | – | – |
| WB60 | 891 092 1265 | 75 | – | – | – | – | – | – | – | – |
| WM60 / WV60 / WZ60 | 891 092 1109 | 79 | 891 092 1262 | 89 | 891 092 1261 | 103 | – | – | – | – |
| WM80 / WV80 / WZ80 | D321 759 | 80 | D321 404 | 91 | 891 092 1259 | 101 | 891 092 1258 | 117 | – | – |
| WM120 / WV120 | – | – | – | – | 891 092 0143 | 113 | 891 092 1257 | 121 | D321 281 | 143 |
| MLSM60 | – | – | 891 092 0909 | 88 | 891 092 1260 | 98 | – | – | – | – |
| MLSM80 | – | – | – | – | – | – | 891 092 1256 | 111 | 891 092 1254 | 133 |
| M55 (MG06K) | D390 930 | 73 | D389 939 | 92 | – | – | – | – | – | – |
| M75 (MG07K) | D390 966 | 83 | D390 926 | 93 | D390 909 | 107 | – | – | – | – |
| M75 (MG07B) | D390 966 | 83 | D390 926 | 93 | D390 909 | 107 | – | – | – | – |
| M100 (MG10K) | D390 966 | 83 | D390 927 | 93 | D390 910 | 107 | – | – | – | – |
| M100 (MG10B) | D390 966 | 83 | D390 926 | 93 | D390 909 | 107 | – | – | – | – |



The bell house flange includes a matching coupling. Flanges for other units or motor sizes available on request, contact customer service. Note! Keep in mind that heavy motors will need extra support in order not to break the flange or gear due to the load torque created.

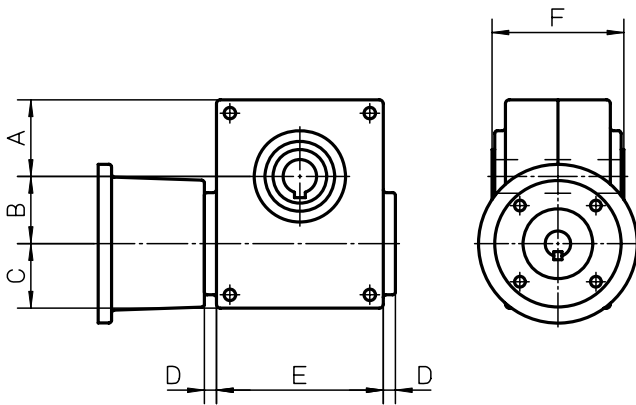
Accessories

Motors, Gears and Transmission Kits

BS40 Worm Gears, dimensions

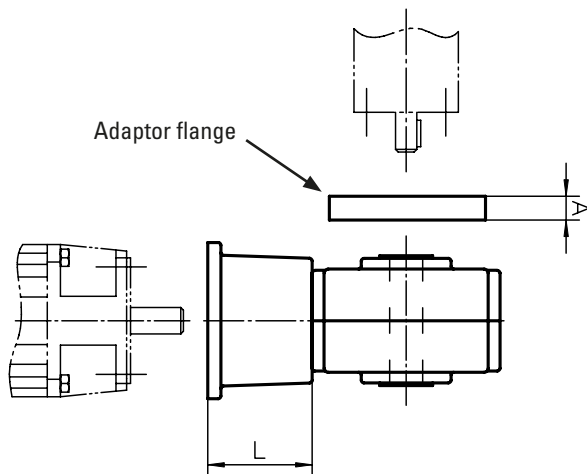
| Gear | A | B | C | D | E | F |
|------|----|----|----|----|-----|----|
| BS40 | 54 | 40 | 46 | 10 | 100 | 92 |

The worm gear includes the gear, the bell house and a matching coupling.



BS40 Worm Gears, compatibility table

| Unit | BS40 | IEC71B14 | IEC80B14 | IEC90B14 | A | L |
|--------------|------|----------|----------|----------|----|----|
| Z2 (MGZ2K32) | • | • | | | 17 | 58 |
| Z2 (MGZ2K32) | • | | • | | 17 | 68 |



To be able to install the gear to the unit an adaptor flange must be used between the gear and the unit. The adaptor flange is ordered separately.

Accessories

Motors, Gears and Transmission Kits

BS40 Worm Gears, ordering key

| | 1 | 2 | 3 |
|---|--|------------|---|
| Example | BS40 | -10 | -71 |
| 1. Type and size of worm gear BS40 = BS40 worm gear | 2. Gear ratio -3 = 3:1 -5,5 = 5,5:1 -7,5 = 7,5:1 -10 = 10:1 -15 = 15:1 -20 = 20:1 -24 = 24:1 -30 = 30:1 -40 = 40:1 -48 = 48:1 -60 = 60:1 | | 6. Motor size no code = without bell house and coupling -71 = IEC71B14 -80 = IEC80B14 |

Adaptor flanges for BS40 Worm Gears, part numbers

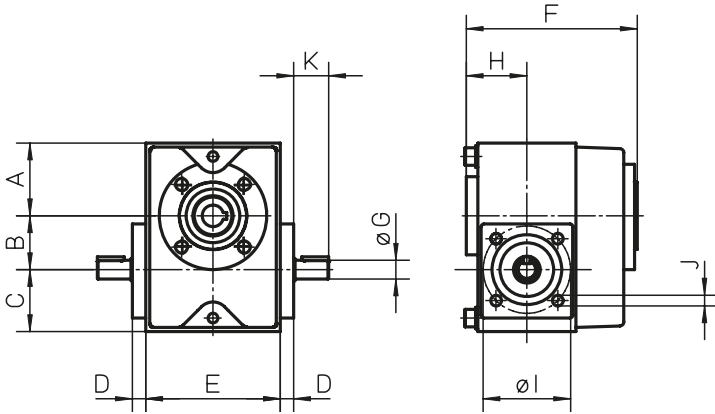
| Unit | p/n |
|--------------|----------|
| Z2 (MGZ2K32) | D606 250 |

Accessories

Motors, Gears and Transmission Kits

TBS40 Worm Gears, dimensions

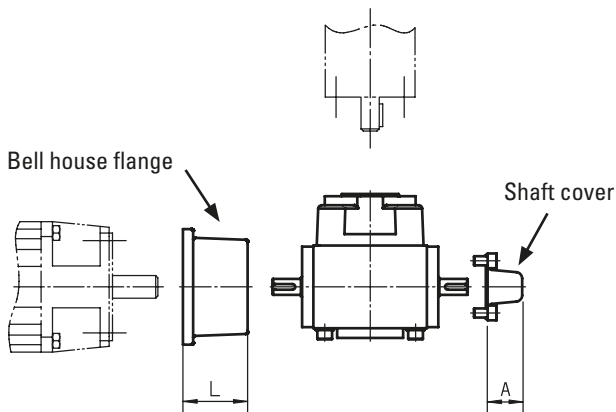
| Gear | A | B | C | D | E | F | øG | H | øI | J | K |
|-------|----|----|----|----|-----|-----|------|----|----|---------|----|
| TBS40 | 54 | 40 | 46 | 10 | 100 | 125 | 14j6 | 45 | 65 | M8 (4×) | 25 |



The worm gear is installed directly to the unit and requires no intermediate coupling between the two.

TBS40 Worm Gears, compatibility table

| Unit | TBS40 | IEC71B14 | IEC80B14 | A | L |
|--------------|-------|----------|----------|----|----|
| Z2 (MGZ2K25) | • | • | | 32 | 58 |
| Z2 (MGZ2K25) | • | | • | 32 | 68 |
| Z3 (MGZ3K25) | • | • | | 32 | 58 |
| Z3 (MGZ3K25) | • | | • | 32 | 68 |
| M75 | • | • | | 32 | 58 |
| M75 | • | | • | 32 | 68 |
| M100 | • | • | | 32 | 58 |
| M100 | • | | • | 32 | 68 |



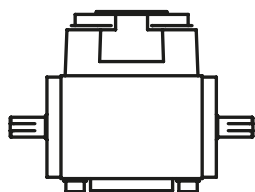
To be able to install the gear to the motor a bell house flange must be used between the gear and the motor. The bell house flange, which includes a matching coupling, is ordered separately. A shaft cover can be ordered to cover the second primary shaft on the gear in case it is not being used.

Accessories

Motors, Gears and Transmission Kits

TBS40 Worm Gears, ordering key

| | 1 | 2 | 3 |
|---|--|----|------------------------------|
| Example | TBS40 | -3 | -216 |
| 1. Type and size of worm gear TBS40 = TBS40 worm gear | 2. Gear ratio -3 = 3:1 -5,5 = 5,5:1 -7,5 = 7,5:1 -10 = 10:1 -15 = 15:1 -20 = 20:1 -24 = 24:1 -30 = 30:1 -40 = 40:1 -48 = 48:1 -60 = 60:1 | | 3. Fixed code -216 |



Bell house flanges for TBS40 Worm Gears, part numbers

| Motor size | p/n |
|------------|----------|
| IEC71B14 | D701 011 |
| IEC80B14 | D701 015 |



Shaft Cover for TBS40 Worm Gears, part numbers

| Gear type | p/n |
|-----------|----------|
| TBS40 | D701 020 |



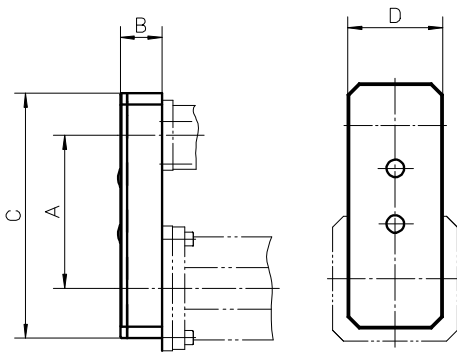
Accessories

Motors, Gears and Transmission Kits

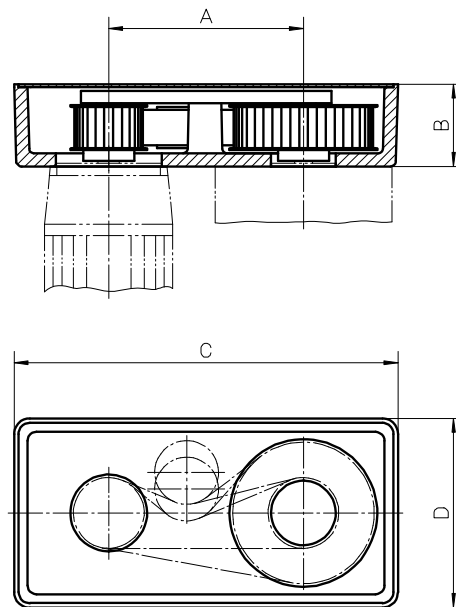
RT Belt Gears, dimensions

| Gear | A | B | C | D |
|------|-----|----|-----|-----|
| RT40 | 110 | 30 | 176 | 68 |
| RT60 | 175 | 74 | 345 | 170 |
| RT80 | 175 | 74 | 345 | 170 |

RT40



RT60/80



RT Belt Gears, data

| Gear | i | n_{max} [rpm] | M_{max} [Nm] | M_{idle} [Nm] | η | J [kgm ²] | Weight [kg] |
|------|-----|-----------------|----------------|-----------------|--------|-----------------------|-------------|
| RT40 | 1:1 | 3000 | 1,75 | 0,3 | 0,80 | 0,000025 | 0,62 |
| RT60 | 1:1 | 3000 | 15 | 0,7 | 0,85 | 0,000438 | 5,6 |
| RT60 | 2:1 | 3000 | 15 | 0,7 | 0,85 | 0,001011 | 7,1 |
| RT80 | 1:1 | 3000 | 30 | 0,7 | 0,85 | 0,000465 | 5,5 |
| RT80 | 2:1 | 3000 | 30 | 0,7 | 0,85 | 0,001038 | 7 |

i = gear ratio
 n_{max} = max. input speed
 M_{max} = max. input torque
 M_{idle} = idle torque
 η = efficiency factor
J = inertia

Accessories

Motors, Gears and Transmission Kits

RT Belt Gears, compatability table

| Gear | WH40 / WM40 | WM60 / WV60 / WZ60 / MLSM60D | WH80 / WM80 / WV80 / WM120 / WV120 / MLSM60D / MLSM80D |
|------|-------------|------------------------------|--|
| RT40 | • | | |
| RT60 | | • | |
| RT80 | | | • |

RT Belt Gears, ordering key

| | 1 | 2 | 3 | 4 | 5 |
|---------|-------------|-----------|-------------|-------------|------------|
| Example | RT80 | -2 | -••• | -P-N | -05 |

1. Type and size of belt gear

RT40 = RT belt gear size 40
 RT60 = RT belt gear size 60
 RT80 = RT belt gear size 80

2. Gear ratio

-1 = 1:1
 -2 = 2:1

3. Motor code

-••• = alphanumeric motor code (e.g. -AK5).
 There are several motors that fit each gear and the list of suitable motors is continuously being updated. Please contact customer support for help to see which motors are currently are on the list or if your preferred motor can be added to the list.

4. Type of mounting

-P-M = gear supplied mounted to the unit
 -P-N = gear supplied unmounted

5. Compatible unit type

-01 = WH40
 -02 = WH50
 -03 = WH80
 -04 = WH120
 -05 = WM40
 -06 = WM60
 -07 = WM80
 -08 = WM120
 -09 = WV60
 -10 = WV80
 -11 = WV120
 -12 = WHZ50
 -13 = WHZ80
 -14 = WZ60
 -15 = WZ80
 -16 = MLSH60Z
 -18 = MLSM80Z
 -19 = MLSM60D
 -20 = MLSM80D

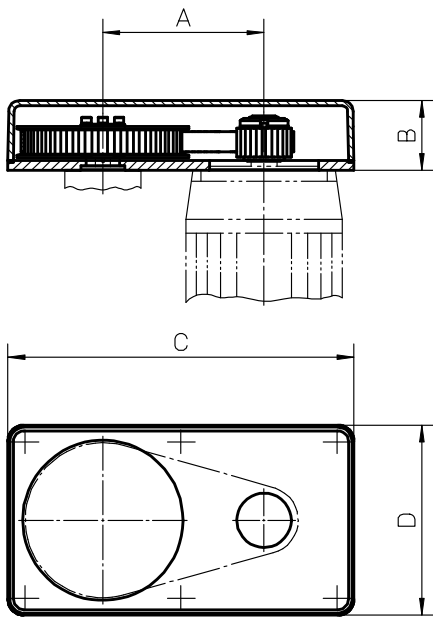
Accessories

Motors, Gears and Transmission Kits

BGM Belt Gears, dimensions

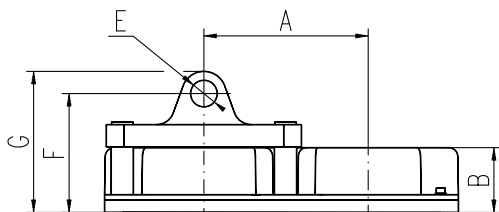
| Gear | A | B | C | D | øE | F | G | H | I | J |
|-------|-------|----|-----|-----|-------|-----|-----|----|-------|-----|
| BGM09 | 118,7 | 52 | 255 | 140 | 20 H9 | 95 | 115 | 60 | – | – |
| BGM41 | 155,2 | 70 | 305 | 165 | 25 H9 | 122 | 147 | 70 | – | – |
| BGM81 | 200 | 73 | 399 | 224 | 30 H9 | 134 | 159 | 90 | 90H14 | 170 |

BGM09/41/81 - WITHOUT CLEVIS OPTION

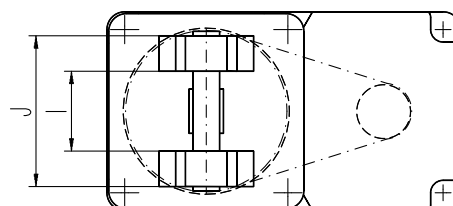
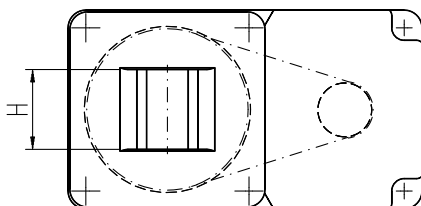
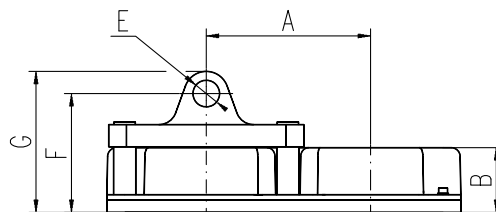


The belt gear comes in parts and is assembled to the unit and motor by the customer.

BGM09/41/81 - WITH CLEVIS OPTION TYPE S



BGM81 - WITH CLEVIS OPTION TYPE R



Accessories

Motors, Gears and Transmission Kits

BGM Belt Gears, data

| Gear | i | n_{max} [rpm] | M_{max} [Nm] | η | J [kgm ²] | Weight [kg] |
|-------|--------|-----------------|----------------|--------|-----------------------|-------------|
| BGM09 | 1,04:1 | 4000 | 4,1 | 0,85 | 0,000102 | 2 |
| BGM09 | 1,85:1 | 4000 | 4,1 | 0,85 | 0,000112 | 2,1 |
| BGM09 | 2,85:1 | 4000 | 4,1 | 0,85 | 0,000213 | 2,5 |
| BGM41 | 1:1 | 4000 | 22,0 | 0,85 | 0,000438 | 3,4 |
| BGM41 | 2:1 | 4000 | 15,8 | 0,85 | 0,000342 | 3,7 |
| BGM41 | 3:1 | 4000 | 16,7 | 0,85 | 0,000583 | 4,6 |
| BGM81 | 1:1 | 4000 | 29,0 | 0,85 | 0,000836 | 12,1 |
| BGM81 | 2,25:1 | 4000 | 32,3 | 0,85 | 0,001051 | 12,9 |
| BGM81 | 3,13:1 | 4000 | 30,3 | 0,85 | 0,001439 | 14 |

i = gear ratio
 n_{max} = max. input speed
 M_{max} = max. input torque
 η = efficiency factor
 J = inertia

BGM Belt Gears, compatability table

| Gear | WM/VZ60 | WM/V80 | WM/V120 | MLSM80D | WB60 | M50 | M55 | M75 | M100 | Z2 |
|-------|---------|--------|---------|---------|------|-----|-----|-----|------|----|
| BGM09 | • | | | | • | • | • | • | | |
| BGM41 | • | • | | | | | | • | • | • |
| BGM81 | | | • | • | | | | | | |

BGM Belt Gears, ordering keys

See next page for ordering keys.

Accessories

Motors, Gears and Transmission Kits

BGM 09 Belt Gears, ordering key

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------|--------------|-----------|------------|------------|----------|------------|----------|------------|
| Example | BGM09 | -2 | -CC | 063 | P | 050 | X | +XX |

1. Type and size of belt gear

BGM09 = BGM belt gear size 09

2. Gear ratio

-1 = 1,04:1

-2 = 1,85:1

-3 = 2,85:1

3. Type of couplings

-CC = conical couplings

4. Motor size¹

063 = IEC 63 B14

071 = IEC 71 B14

S80 = servo motor size 80

AK4 = servo motor type AKM 4

5. Type of mounting

P = standard

6. Compatible unit type

W06 = WM60, WV60, WZ60

WB6 = WB60

050 = M50

060 = M55

070 = M75

7. Clevis option

X = no clevis option

S = clevis option type S

8. Protection

+XX = standard

+S1 = wash down protection

¹This is only a selection of all motors that fit this gear. Please contact customer support to see if your preferred motor fits the gear.

BGM 41 Belt Gears, ordering key

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------|--------------|-----------|------------|------------|----------|------------|----------|------------|
| Example | BGM41 | -1 | -CC | 071 | P | 070 | X | +S1 |

1. Type and size of belt gear

BGM41 = BGM belt gear size 41

2. Gear ratio

-1 = 1:1

-2 = 2:1

-3 = 3:1

3. Type of couplings

-CC = conical couplings

4. Motor size¹

071 = IEC 71 B14

080 = IEC 80 B14

S80 = servo motor size 80

S95 = servo motor size 95

AK5 = servo motor type AKM 5

5. Type of mounting

P = standard

6. Compatible unit type

W06 = WM60, WV60, WZ60

W08 = WM80, WV80

070 = M75

10B = M100 (MF/G10B)

10K = M100 (MF/G10K/C/D)

7. Clevis option

X = no clevis option

S = clevis option type S

8. Protection

+XX = standard

+S1 = wash down protection

¹This is only a selection of all motors that fit this gear. Please contact customer support to see if your preferred motor fits the gear.

Accessories

Motors, Gears and Transmission Kits

BGM 81 Belt Gears, ordering key

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------|--------------|-----------|------------|------------|----------|------------|----------|------------|
| Example | BGM81 | -1 | -CC | 090 | P | M8D | X | +XX |

1. Type and size of belt gear

BGM81 = BGM belt gear size 81

2. Gear ratio

-1 = 1:1

-2 = 2,25:1

-3 = 3,13:1

3. Type of couplings

-CC = conical couplings

4. Motor size¹

090 = IEC 90 B14

100 = IEC 100/121 B14

A20 = servo motor size A200

AK6 = servo motor type AKM 6

5. Type of mounting

P = standard

6. Compatible unit type

W12 = WM120, WV120

M8D = MLSM80D

7. Clevis option

X = no clevis option

S = clevis option type S

R = clevis option type R

8. Protection

+XX = standard

+S1 = wash down protection

¹This is only a selection of all motors that fit this gear. Please contact customer support to see if your preferred motor fits the gear.

Accessories

Motors, Gears and Transmission Kits

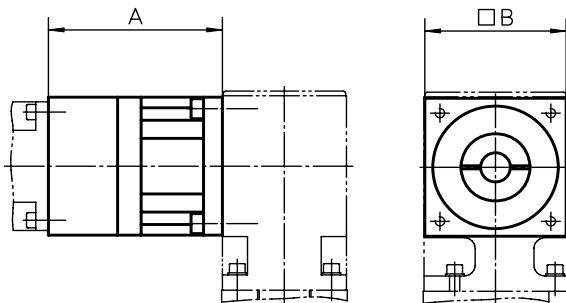
Micron DT, DTR Planetary Gears, compatibility and dimensions

| Unit | Gear | i | □A | B | C | □D | E | Weight [kg] | Backlash [arc min] | Efficiency [%] |
|-------|-----------|--------------|-------|-----|-------|-------|-----|-------------|--------------------|----------------|
| WH50 | DT60-SS | 3:1 - 10:1 | 89,7 | 60 | – | – | – | 1 | 8 | 90 |
| | DT60-DS | 15:1 - 100:1 | 106,9 | 60 | – | – | – | 1,2 | 9 | 85 |
| | DTR60-SS | 5:1 - 50:1 | – | – | 110,2 | 104,1 | 60 | 2,5 | 9 | 90 |
| | DTR60-DS | 60:1 - 500:1 | – | – | 127,3 | 104,1 | 60 | 2,7 | 9 | 85 |
| WH80 | DT90-SS | 3:1 - 10:1 | 110,9 | 90 | – | – | – | 3 | 9 | 90 |
| | DT90-DS | 15:1 - 100:1 | 133,5 | 90 | – | – | – | 3,7 | 9 | 85 |
| | DTR90-SS | 5:1 - 50:1 | – | – | 145,4 | 138,2 | 90 | 4,8 | 9 | 90 |
| | DTR90-DS | 60:1 - 500:1 | – | – | 168,0 | 138,2 | 90 | 5,5 | 9 | 85 |
| WH120 | DT115-SS | 3:1 - 10:1 | 136,4 | 110 | – | – | – | 12,7 | 8 | 90 |
| | DT115-DS | 15:1 - 100:1 | 167,4 | 110 | – | – | – | 16,2 | 9 | 85 |
| | DTR115-SS | 5:1 - 50:1 | – | – | 185,7 | 173,5 | 115 | 11 | 8 | 90 |
| | DTR115-DS | 60:1 - 500:1 | – | – | 216,7 | 173,5 | 115 | 12 | 9 | 85 |
| WM60Z | DT60-SS | 3:1 - 10:1 | 89,7 | 60 | – | – | – | 1 | 8 | 90 |
| | DT60-DS | 15:1 - 100:1 | 106,9 | 60 | – | – | – | 1,2 | 9 | 85 |
| | DTR60-SS | 5:1 - 50:1 | – | – | 110,2 | 104,1 | 60 | 2,5 | 9 | 90 |
| | DTR60-DS | 60:1 - 500:1 | – | – | 127,3 | 104,1 | 60 | 2,7 | 9 | 85 |
| WM80Z | DT90-SS | 3:1 - 10:1 | 110,9 | 90 | – | – | – | 3 | 9 | 90 |
| | DT90-DS | 15:1 - 100:1 | 133,5 | 90 | – | – | – | 3,7 | 9 | 85 |
| | DTR90-SS | 5:1 - 50:1 | – | – | 145,4 | 138,2 | 90 | 4,8 | 9 | 90 |
| | DTR90-DS | 60:1 - 500:1 | – | – | 168,0 | 138,2 | 90 | 5,5 | 9 | 85 |

Micron DT and DTR planetary gears comes mounted on the unit from factory.

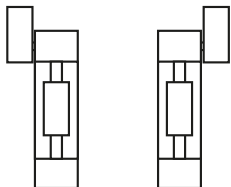
i = gear ratio

DT

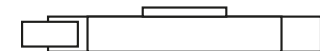


Left side

Right side



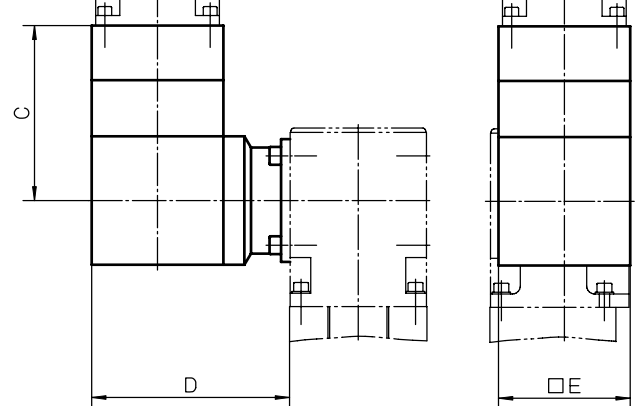
Position 1



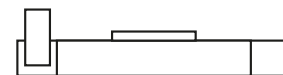
Position 3



DTR



Position 2



Position 4



Accessories

Motors, Gears and Transmission Kits

Micron DT, DTR Planetary Gears, how to order

When ordering a DT or DTR planetary gear you need to state the size and type of gear, which side of the unit the gear shall be installed, the gear ratio and which motor that you wish to use. For DTR you also must state the preferred mounting position of the gear. With this information we can check if your choice of motor is possible or not and give you the correct ordering code for the gear.

Micron DT, ordering data

1. Size of planetary gear

DT60
DT90
DT115

2. Type of gear

-SS
-DS

3. Mounting side of the unit

Left
Right

4. Gear ratio

3:1 (only for -SS models)
5:1 (only for -SS models)
10:1 (only for -SS models)
15:1 (only for -DS models)
25:1 (only for -DS models)
30:1 (only for -DS models)
50:1 (only for -DS models)
100:1 (only for -DS models)

5. Motor

Specify your choice of motor.

Micron DTR, ordering data

1. Type and size of planetary gear

DTR60
DTR90
DTR115

2. Type of gear

-SS
-DS

3. Mounting position of the gear

Position 1
Position 2
Position 3
Position 4

4. Mounting side of the unit

Left
Right

5. Gear ratio

5:1 (only for -SS models)
6:1 (only for -SS models)
9:1 (only for -SS models)
10:1 (only for -SS models)
12:1 (only for -SS models)
15:1 (only for -SS models)
20:1 (only for -SS models)
25:1 (only for -SS models)
30:1 (only for -SS models)
40:1 (only for -SS models)
50:1 (only for -SS models)
60:1 (only for -DS models)
75:1 (only for -DS models)
90:1 (only for -DS models)
100:1 (only for -DS models)
120:1 (only for -DS models)
125:1 (only for -DS models)
150:1 (only for -DS models)
200:1 (only for -DS models)
250:1 (only for -DS models)
300:1 (only for -DS models)
400:1 (only for -DS models)
500:1 (only for -DS models)

6. Motor

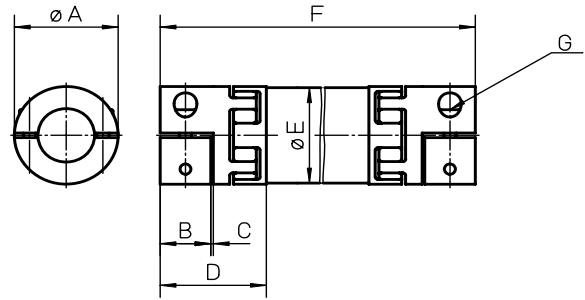
Specify your choice of motor.

Accessories

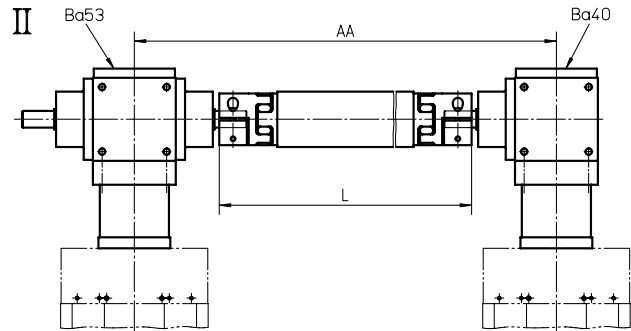
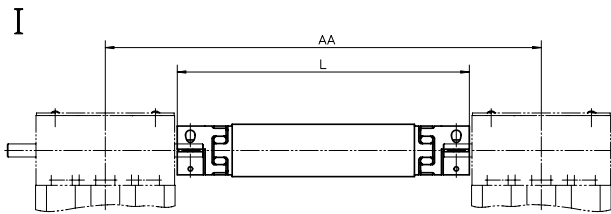
Motors, Gears and Transmission Kits

VWZ Intermediate Shafts, dimensions

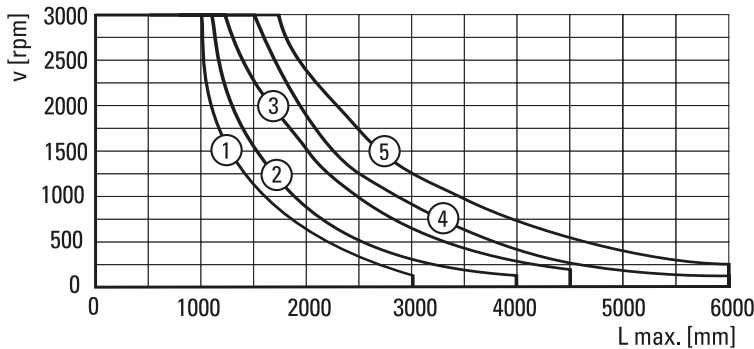
| Shaft | øA | B | C | D | øE | F min. | G |
|---------|-----|----|-----|----|-----|--------|-----|
| VWZ-30 | 32 | 15 | 1,5 | 34 | 30 | 99 | M4 |
| VWZ-40 | 42 | 17 | 1,5 | 46 | 40 | 133 | M5 |
| VWZ-60 | 56 | 30 | 2 | 63 | 60 | 177 | M6 |
| VWZ-60V | 67 | 35 | 2 | 73 | 60 | 205 | M8 |
| VWZ-80 | 82 | 40 | 2 | 84 | 80 | 249 | M10 |
| VWZ-100 | 102 | 50 | 2 | 97 | 100 | 283 | M12 |



The VWZ intermediate shafts can be installed in two ways. Either directly to belt driven units (I) or to screw driven units using KRG bevel gears (II) of type VL0, VL1 or VL2. The intermediate shaft includes tube and couplings.



Critical Speed of Shaft



- 1: VWZ-30
- 2: VWZ-40
- 3: VWZ-60 and VWZ-60V
- 4: VWZ-80
- 5: VWZ-100

VWZ Intermediate Shafts, data

| Shaft | Mmax [Nm] | Gs [kg/m] | Gc [kg] | Js [kgm ² /m] | Jc [kgm ²] | Ms [Nm] |
|---------|-----------|-----------|---------|--------------------------|------------------------|---------|
| VWZ-30 | 4,8 | 0,58 | 0,14 | 0,00011 | 0,00001 | 4 |
| VWZ-40 | 6,4 | 0,76 | 0,36 | 0,00020 | 0,00008 | 8 |
| VWZ-60 | 22,7 | 0,97 | 0,94 | 0,00080 | 0,00024 | 15 |
| VWZ-60V | 60,6 | 0,97 | 1,42 | 0,00080 | 0,00046 | 35 |
| VWZ-80 | 122,7 | 2,00 | 2,98 | 0,00300 | 0,00240 | 70 |
| VWZ-100 | 169,7 | 2,47 | 4,62 | 0,00580 | 0,00600 | 120 |

Mmax = max. shaft torque
Gs = weight of shaft

Gc = weight of coupling
Js = inertia of shaft

Jc = inertia of coupling
Ms = tightening torque

Accessories

Motors, Gears and Transmission Kits

VWZ Intermediate Shafts, compatibility table

| Unit | I | II | VWZ-30 | VWZ-40 | VWZ-60 | VWZ-60V | VWZ-80 | VWZ-100 | AA [mm] |
|-----------------------------------|---|-----|--------|--------|--------|---------|--------|---------|--------------|
| WH40 | • | | | • | | | | | AA = L + 56 |
| WH50 / WHZ50 | • | | | | • | | | | AA = L + 54 |
| WM60Z | • | | | | • | | | | AA = L + 64 |
| WH80 / WHZ80 | • | | | | | • | | | AA = L + 84 |
| WH120 | • | | | | | | | • | AA = L + 124 |
| WM80Z | • | | | | | • | | | AA = L + 84 |
| MLSH60Z | • | | | | | • | | | AA = L + 164 |
| WB40 / WM40 | | VL0 | • | | | | | | AA = L + 170 |
| WB60 | | VL1 | | | • | | | | AA = L + 184 |
| WM60 / WV60 / WZ60 | | VL1 | | | • | | | | AA = L + 184 |
| WM80 / WV80 / MLSM60D | | VL1 | | | | • | | | AA = L + 176 |
| MLSM80Z | • | | | | | | • | | AA = L + 244 |
| WM120 / WV120 / MLSM60D / MLSM80D | | VL2 | | | | | • | | AA = L + 244 |

AA = C/C distance between units

L = total length of shaft and coupling assembly

VWZ Intermediate Shafts, ordering key

| | 1 | 2 | 3 |
|---------|---------|-----|-------|
| Example | VWZ-060 | -02 | -0700 |

1. Intermediate shaft size

VWZ-030 = VWZ-30
 VWZ-040 = VWZ-40
 VWZ-060 = VWZ-60
 VWZ-06V = VWZ-60V
 VWZ-080 = VWZ-80
 VWZ-100 = VWZ-100

2. Type of unit and type of mounting

-01 = WH40 for type I mounting
 -02 = WH50 / WHZ50 for type I mounting
 -03 = WM80Z for type I mounting
 -04 = WH80 / WHZ80 for type I mounting
 -05 = WH120 for type I mounting
 -06 = WM60Z for type I mounting
 -07 = MLSH60Z for type I mounting
 -08 = WB40 / WM40 for type II mounting on VLO gears
 -09 = WB60 for type II mounting on VL1 gears
 -10 = WM60 / WV60 / WZ60 for type II mounting on VL1 gears
 -11 = WM80 / WV80 / MLSM60D for type II mounting on VL1 gears
 -12 = MLSM80Z for type I mounting
 -13 = WM120 / WV120 / MLSM60D / MLSM80D for type II mounting on VL2 gears

3. C/C distance between units (AA)

-•••• = distance in mm

Accessories

Motors, Gears and Transmission Kits

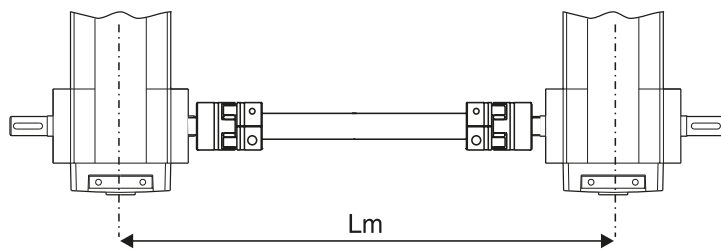
DSP Intermediate Shafts, data

| Shaft | Weight of shaft [kg] | Max. speed [rpm] | Shaft diameter [mm] |
|---------|-----------------------|------------------|---------------------|
| DSP-05B | $0,3 + 1,3 \times Lm$ | 1500 | 20 |
| DSP-06B | $0,3 + 1,3 \times Lm$ | 1500 | 20 |
| DSP-07B | $0,6 + 2,6 \times Lm$ | 1500 | 30 |
| DSP-10B | $0,6 + 2,6 \times Lm$ | 1500 | 30 |
| DSB--ZB | $0,6 + 2,6 \times Lm$ | 1500 | 30 |
| DSP-TBS | $0,6 + 2,6 \times Lm$ | 1500 | 30 |

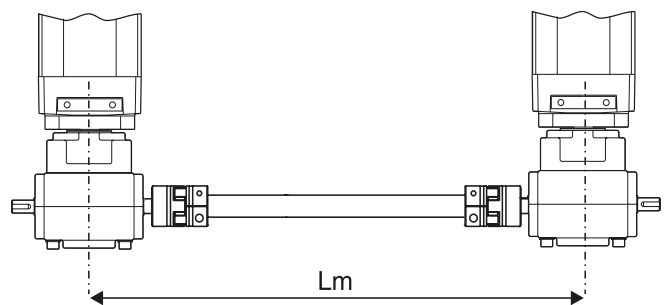
Lm = C/C distance between units in cm

The DSP intermediate shaft can be installed directly between two belt driven units or between two screw driven units using a TBS worm gear. Couplings and tube are included in the shipment. Support bearings may need to be installed if the critical speed of the shaft is exceeded. See diagram. Support bearings can be ordered from your local bearing supplier.

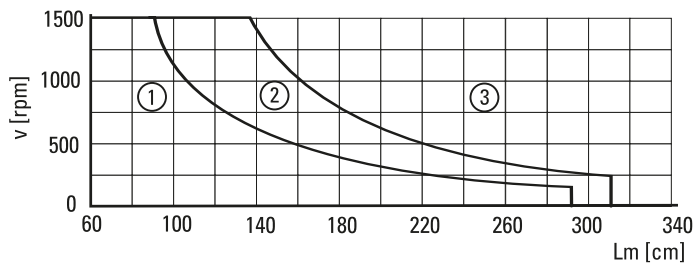
DSP-05B/06B/07B/10B/-ZB



DSP-TBS



Critical Speed of Shaft



- 1: No support bearing required
- 2: Support bearing required for DSP-05B and DSP-06B
- 3: Support bearing always required

Accessories

Motors, Gears and Transmission Kits

DSP Intermediate Shafts, compatability table

| Unit | Drive type | DSP-05B | DSP-06B | DSP-07B | DSP-10B | DSP--ZB | DSP-TBS |
|------|------------|---------|---------|---------|---------|---------|---------|
| M50 | belt | • | | | | | |
| M55 | belt | | • | | | | |
| M75 | belt | | | • | | | |
| M100 | belt | | | | • | | |
| ZB | belt | | | | | • | |
| M55 | screw | | | | | | • |
| M75 | screw | | | | | | • |
| M100 | screw | | | | | | • |

DSP Intermediate Shafts, ordering key

| | 1 | 2 |
|---------|---------|------|
| Example | DSP-06B | -305 |

1. Intermediate shaft size and type

DSP-05B = for belt driven M50 units
 DSP-06B = for belt driven M55 units
 DSP-07B = for belt driven M75 units
 DSP-10B = for belt driven M100 units
 DSP--ZB = for belt driven ZB units
 DSP-TBS = for screw driven M55, M75 or M100 units with TBS worm gear

2. C/C distance between units in cm (Lm)

- • • • = length in cm

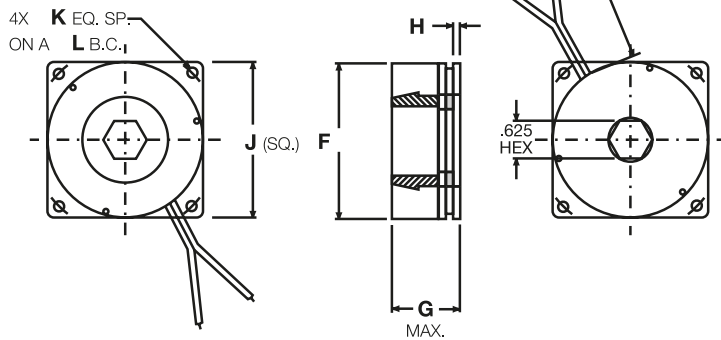
Accessories

Motors, Gears and Transmission Kits

Spring Set Brake

| Unit type | p/n | Nema size | Static torque [lbf-in] | Supply voltage [VDC] | Dimensions [in] | | | | | | | Brake hub p/n ¹ | Brake adaptor p/n |
|--------------|--------|-----------|------------------------|----------------------|-----------------|------|------|------|------|-------|-----|----------------------------|-------------------|
| | | | | | F | G | H | J | K | L | HEX | | |
| 2DB08 | TEB23A | 23 | NEMA 23 | 24 | 2.25 | 1.10 | 0.11 | 2.25 | 0.22 | 2.625 | 5/8 | HEXHUB23A | MB08-23 |
| 2DB12 | TEB23B | 23 | NEMA 23 | 24 | 2.25 | 1.10 | 0.11 | 2.25 | 0.22 | 2.625 | 5/8 | HEXHUB23B | none required |
| 2HB10, 2RB12 | TEB23D | 23 | NEMA 23 | 24 | 2.25 | 1.10 | 0.11 | 2.25 | 0.22 | 2.625 | 5/8 | HEXHUB23D | none required |
| 2RB16 | TEB23E | 23 | NEMA 23 | 24 | 2.25 | 1.10 | 0.11 | 2.25 | 0.22 | 2.625 | 5/8 | HEXHUB23E | none required |
| 2DB16 | TEB34A | 34 | NEMA 34 | 24 | 2.25 | 1.10 | 0.11 | 3.25 | 0.22 | 3.875 | 5/8 | HEXHUB34A | none required |
| 2HB20 | TEB34C | 34 | NEMA 34 | 24 | 2.25 | 1.31 | 0.11 | 3.25 | 0.22 | 3.875 | 7/8 | HEXHUB34A | none required |

¹ Hub included in spring set brake



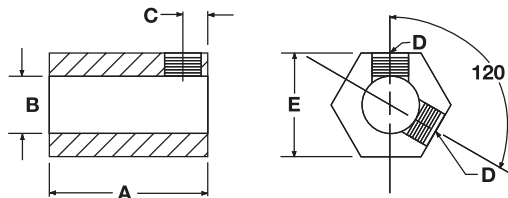
Mounts to support end of 2HB, 2RB, and 2DB units. The brake engages upon loss of power and provides resistance to back drive rotation of ball screws due to gravitational forces when power is interrupted to the brake unit. They are pre-burnished for maximum torque capacity and come with standard NEMA 23, 34 or 42 mounting patterns for easy field retrofit. Compact size minimizes change to the overall system envelope. The 2HB, 2RB, and 2DB ordering keys can be configured with the brake as part of the assembly. See ordering keys or www.linearmotioneering.com for details. The part numbers listed here are for the brake parts as separate items.

Spring Set Brake Hubs

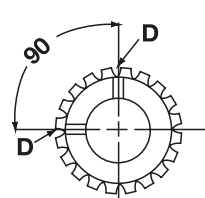
| Brake type | p/n | Unit type | Set screw torque [in-lb] ¹ | Dimensions [in (mm)] | | | | |
|------------|-----------|--------------|---------------------------------------|----------------------|------|------|--------|-----|
| | | | | A | B | C | D | E |
| TEB23A | HEXHUB23A | 2DB08 | 36 | 1.53 | 3/16 | 0.15 | #10/32 | 5/8 |
| TEB23B | HEXHUB23B | 2DB12 | 36 | 1.31 | 1/4 | 0.26 | #10/32 | 5/8 |
| TEB23D | HEXHUB23D | 2HB10, 2RB12 | 36 | (20) | (8) | (5) | M4 | 5/8 |
| TEB23E | HEXHUB23E | 2RB16 | 36 | (20) | (20) | (5) | M4 | 5/8 |
| TEB34A | HEXHUB34A | 2DB16 | 36 | 1.67 | 3/8 | 0.44 | #10/32 | 5/8 |
| TEB34C | HEXHUB34A | 2HB20 | 36 | (32) | 14 | (6) | M5 | 7/8 |

¹ It is suggested a serviceable thread locking compound be used.

HEXHUB •••



SPLHUB42A



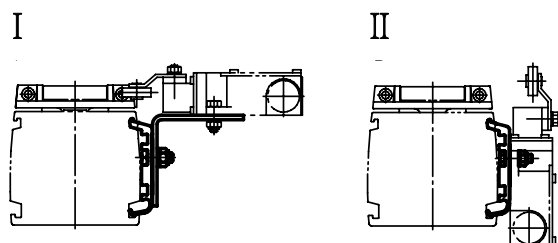
Accessories

Electrical Feedback Devices

Limit Switch Brackets¹

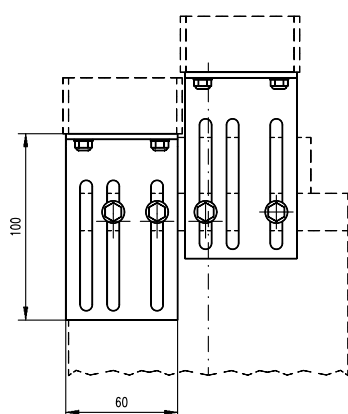
| Unit type | I | For limit switch type | II | For limit switch type |
|-----------|----------|-----------------------|----------|-----------------------|
| M50 | D393 035 | ZCM-D21 | – | – |
| M55 | D313 427 | ZCM-D21 | D313 428 | ZCM-D21 |
| M75 | D312 860 | XCK-M115 | D312 861 | XCK-M115 |
| M100 | D312 330 | XCK-M115 | D312 331 | XCK-M115 |

¹ No limit switches included in the shipment.



Limit Switch Brackets for Z3

| Unit type | p/n | For limit switch type |
|-----------|----------|-----------------------|
| Z3 | D800 042 | XCK-M115 |



The limit switch brackets are adjustable in height. The limit switches on the brackets are operated by the maximum extended and maximum retracted end of stroke bars on top of the Z3 units. Two brackets are required.

Limit Switches

| Switch type | p/n | Protection degree | Contacts | Cable |
|-------------|----------|-------------------|----------|---------|
| XCK-M115 | D535 107 | IP67 | NO + NC | – |
| ZCM-D21 | D535 102 | IP67 | NO + NC | 1 meter |

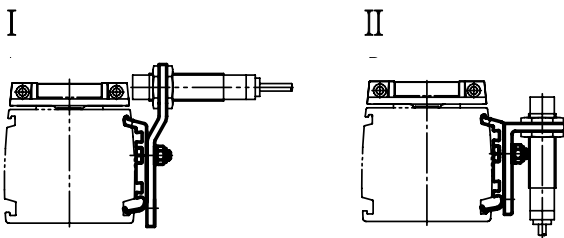
Accessories

Electrical Feedback Devices

Sensor Brackets for Cylindrical Sensors¹

| Unit type | I | For sensor diameter | II | For sensor diameter |
|-----------|----------|---------------------|----------|---------------------|
| M55 | D313 429 | M12 | D313 430 | M12 |
| M75 | D312 862 | M18 | D312 863 | M18 |
| M100 | D312 332 | M18 | D312 333 | M18 |

¹ no sensors included in the shipment



Cylindrical Inductive Sensors

| Sensor type | p/n | Diameter | Input voltage | Max. current | Protection degree | Contacts | Cable |
|-------------|----------|----------|---------------|--------------|-------------------|----------|-----------|
| PNP | D535 085 | M12 | 12 - 48 Vdc | 0,2 A | IP67 | NO | connector |
| PNP | D535 089 | M18 | 12 - 48 Vdc | 0,2 A | IP67 | NO | connector |

Cylindrical Inductive Sensor Connectors

| For sensor diameter | p/n |
|---------------------|----------|
| M12 | D535 092 |
| M18 | D535 091 |

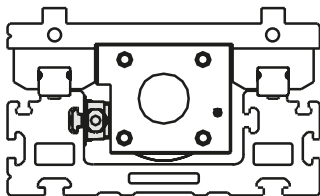
Accessories

Electrical Feedback Devices

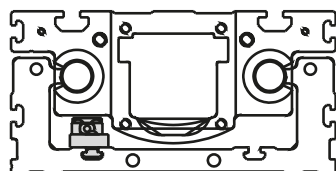
| Sensor Packages | | | | | | | | |
|-----------------|---------------------------------------|---------------|-------------|------------------|------------------------|----------------------|------------------|---------------|
| Unit type | Package type | p/n | Output type | Output operation | Frequency ¹ | Supply voltage [VDC] | Cable length [m] | Sdetract [mm] |
| 2HB10 | One home sensor | LSP2HBM10-N-1 | NPN | NO | 1 × V | 12 - 24 | 5 | - |
| | | LSP2HBM10-P-1 | PNP | NO | 1 × V | 12 - 24 | 5 | - |
| | Two limit switch sensors | LSP2HBM10-N-2 | NPN | NC | 2 × S | 12 - 24 | 5 | 30 |
| | | LSP2HBM10-P-2 | PNP | NC | 2 × S | 12 - 24 | 5 | 30 |
| | One home and two limit switch sensors | LSP2HBM10-N-3 | NPN | 1 × NC, 2 × NO | 1 × V, 2 × S | 12 - 24 | 5 | 30 |
| | | LSP2HBM10-P-3 | PNP | 1 × NC, 2 × NO | 1 × V, 2 × S | 12 - 24 | 5 | 30 |
| 2HB20 | One home sensor | LSP2HBM20-N-1 | NPN | NO | 1 × V | 12 - 24 | 5 | - |
| | | LSP2HBM20-P-1 | PNP | NO | 1 × V | 12 - 24 | 5 | - |
| | Two limit switch sensors | LSP2HBM20-N-2 | NPN | NC | 2 × S | 12 - 24 | 5 | 30 |
| | | LSP2HBM20-P-2 | PNP | NC | 2 × S | 12 - 24 | 5 | 30 |
| | One home and two limit switch sensors | LSP2HBM20-N-3 | NPN | 1 × NC, 2 × NO | 1 × V, 2 × S | 12 - 24 | 5 | 30 |
| | | LSP2HBM20-P-3 | PNP | 1 × NC, 2 × NO | 1 × V, 2 × S | 12 - 24 | 5 | 30 |
| 2RB12 | One home sensor | LSP2RM12-N-1 | NPN | NO | 1 × V | 12 - 24 | 5 | - |
| | | LSP2RM12-P-1 | PNP | NO | 1 × V | 12 - 24 | 5 | - |
| | Two limit switch sensors | LSP2RM12-N-2 | NPN | NC | 2 × S | 12 - 24 | 5 | 35 |
| | | LSP2RM12-P-2 | PNP | NC | 2 × S | 12 - 24 | 5 | 35 |
| | Home and limit switch sensors | LSP2RM12-N-3 | NPN | 1 × NC, 2 × NO | 1 × V, 2 × S | 12 - 24 | 5 | 35 |
| | | LSP2RM12-P-3 | PNP | 1 × NC, 2 × NO | 1 × V, 2 × S | 12 - 24 | 5 | 35 |
| 2RB16 | One home sensor | LSP2RM16-N-1 | NPN | NO | 1 × V | 12 - 24 | 5 | - |
| | | LSP2RM16-P-1 | PNP | NO | 1 × V | 12 - 24 | 5 | - |
| | Two limit switch sensors | LSP2RM16-N-2 | NPN | NC | 2 × S | 12 - 24 | 5 | 35 |
| | | LSP2RM16-P-2 | PNP | NC | 2 × S | 12 - 24 | 5 | 35 |
| | One home and two limit switch sensors | LSP2RM16-N-3 | NPN | 1 × NC, 2 × NO | 1 × V, 2 × S | 12 - 24 | 5 | 35 |
| | | LSP2RM16-P-3 | PNP | 1 × NC, 2 × NO | 1 × V, 2 × S | 12 - 24 | 5 | 35 |

¹ V = varied frequency. S = standard frequency.

LIMIT SWITCH POSITION 2HBE



LIMIT SWITCH POSITION 2RB



Each 2HB and 2RB can be equipped with sensors inside of the profile where they are protected from mechanical damage. The systems are provided with access holes on each side of each end plate for passage of the sensor package cable. Using limit switch sensors will reduce the effective stroke. The standard position will approximately reduce the stroke by the distance listed in the Sdetract column. The 2HB, 2RB, 2HE and 2RE ordering keys can be configured with the limit switches and/or a home sensor as part of the assembly. See ordering keys or www.linearmotioneering.com for details. The part numbers listed above are for the limit switches and/or home sensors as a separate items.

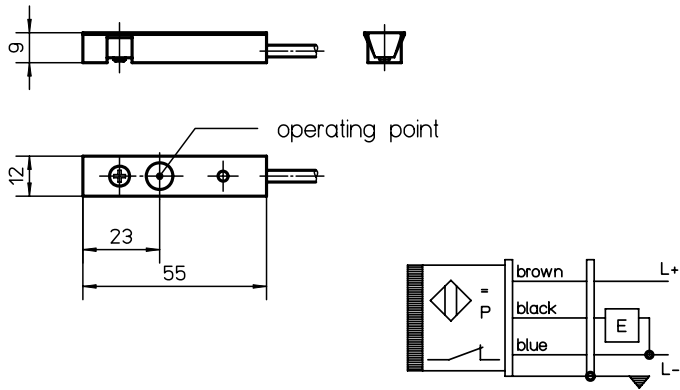
Accessories

Electrical Feedback Devices

EN2 Inductive Sensors, part numbers

| Sensor type | Cable length [m] | p/n |
|-----------------|------------------|--------------|
| Normally closed | 2 | 671 545 0305 |
| Normally open | 2 | 671 545 0304 |
| Normally closed | 10 | 671 545 0307 |
| Normally open | 10 | 671 545 0306 |

To be able to mount the EN2 inductive sensors on a unit the ENT14x16 sensor rail is required (see page 178) except for units WM120 and WV120 where they can be fitted directly to the profile of the unit.

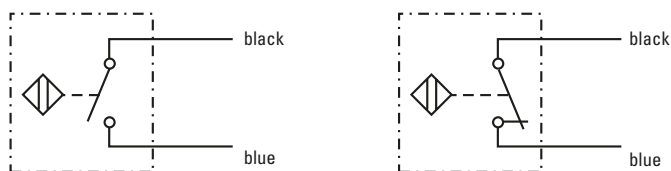


EN2 Inductive Sensors, data

| Parameter | | EN2 |
|--------------------------|-------|----------|
| Supply voltage | [Vdc] | 10 – 30 |
| Max. load current | [A] | 0,2 |
| Operating distance | [mm] | 2 |
| LED indicator for switch | | yes |
| Protection class | | IP67 |
| Cable type | | screened |
| Weight | [kg] | |
| with cable L = 2 m | | 0,04 |
| with cable L = 10 m | | 0,19 |

Magnetic Sensors, data

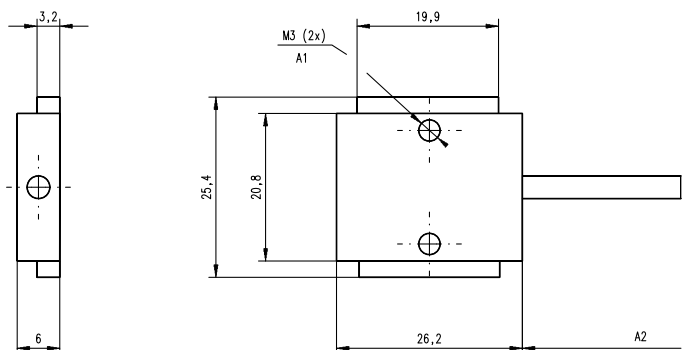
| Parameter | | |
|------------------------------|--------------------|----------|
| Max. power | [W] | 10 |
| Max. voltage | [Vdc] | 100 |
| Max. current | [A] | 0,5 |
| LED indicator for switch | | no |
| Protection class | | IP67 |
| Cable length | [m] | 3 |
| Cable cross section | [mm ²] | 2 × 0,15 |
| Operating temperature limits | [°C] | -25 – 65 |
| Weight | [kg] | 0,050 |



Magnetic Sensors, part numbers

| Sensor type | suitable units | p/n |
|-----------------|----------------|----------|
| Normally closed | M50, Z2, Z3 | D535 071 |
| Normally open | M50, Z2, Z3 | D535 070 |

On M50 the magnetic sensors are mounted directly in the sensor slot of the profiles of the units and require no mounting bracket while Z2 and Z3 require magnetic sensor mounting brackets. The sensor is fixed in position by two M3 size locking screws (A1). The cable (A2) is molded into the sensor.

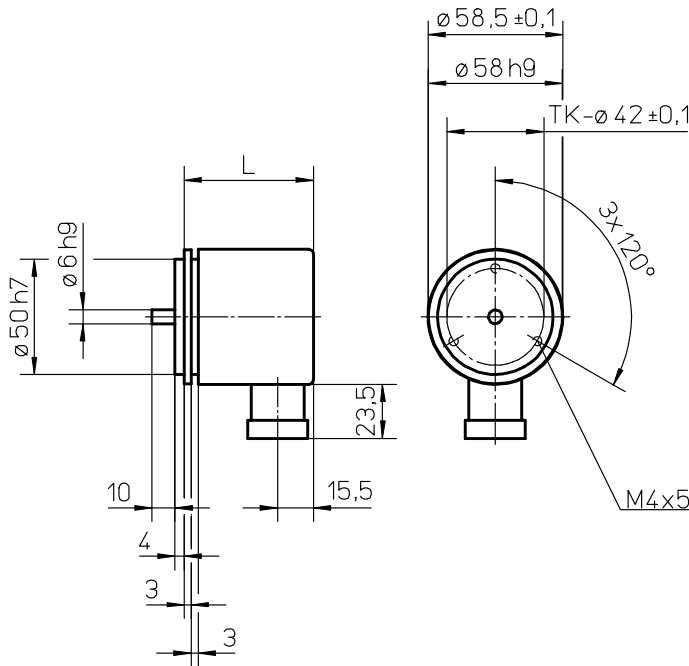


Accessories

Electrical Feedback Devices

| IG602 Encoders, data | |
|---|--------------------------|
| Parameter | IG602 |
| Supply voltage [Vdc] Type 1 Type 2 | 5 ±10% 10 – 30 |
| Output type Type 1 Type 2 | line driver push-pull |
| Pulses per revolution [ppr] Type 1 Type 2 | 100 – 2500 100 – 600 |
| Length (L) [mm] Type 1 Type 2 | 51,5 56,0 |
| Weight [kg] Type 1 Type 2 | 0,36 0,36 |

The IG602 encoders come with mounting screws but no coupling or connector. To be able to mount the encoder to the unit, the unit must have a shaft for encoders. See the ordering keys of the units. The encoders can also be ordered mounted to the unit from factory. See ADG encoder option kit on page 174.



| IG602 Encoders, part numbers | | | |
|------------------------------|----------------------|-----------------------|--------------|
| Encoder type | Supply voltage [Vdc] | Pulses per revolution | p/n |
| Type 1 | 5 | 100 | 671 521 0194 |
| Type 1 | 5 | 200 | 671 521 0195 |
| Type 1 | 5 | 500 | 671 521 0196 |
| Type 1 | 5 | 600 | 671 521 0197 |
| Type 1 | 5 | 1000 | 671 521 0198 |
| Type 1 | 5 | 1250 | 671 521 0199 |
| Type 1 | 5 | 1500 | 671 521 0200 |
| Type 1 | 5 | 2000 | 671 521 0192 |
| Type 1 | 5 | 2500 | 671 521 0201 |
| Type 2 | 10 – 30 | 100 | 671 521 0193 |
| Type 2 | 10 – 30 | 200 | 671 521 0202 |
| Type 2 | 10 – 30 | 500 | 671 521 0203 |
| Type 2 | 10 – 30 | 600 | 671 521 0204 |

| STE001 Encoder Connector, data | |
|--------------------------------|------------|
| Parameter | STE001 |
| Number of poles | 12 |
| Protection class | IP67 |
| Execution | jack |
| Cable entrance | straight |
| Weight [kg] | 0,04 |
| Part number | 6715600153 |

| Encoder Cable, data | |
|---------------------|--------------|
| Parameter | p/n |
| 5 m cable length | 671 555 0068 |
| 10 m cable length | 671 555 0069 |

The encoder cables come fitted with a STE001 encoder connector in one of the ends.

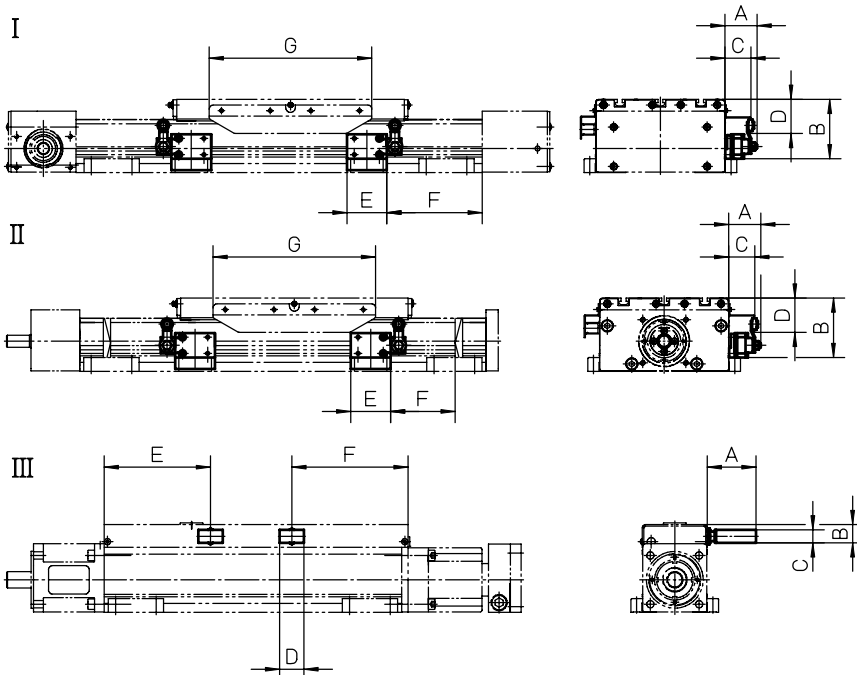
Accessories

Electrical Feedback Devices

ES Limit Switch Option Kit

| Unit type | I | II | III | A | B | C | D | E | F | G |
|--------------------|---|----|-----|----|------|----|----|-----|---------|-----|
| WH50 ¹ | • | | | 34 | 60,5 | 10 | 26 | 49 | 58,5 | 196 |
| WH80 | • | | | 31 | 76 | 10 | 39 | 49 | 78,5 | 196 |
| WH120 | • | | | 34 | 88 | 10 | 51 | 49 | 78,5 | 196 |
| WHZ50 | • | | | 34 | 61 | 10 | 26 | 49 | 58,5 | 196 |
| WHZ80 | • | | | 31 | 76 | 10 | 39 | 49 | 78,5 | 196 |
| WM60 | | • | | 40 | 69 | 32 | 38 | 50 | 63 | 200 |
| WM80 | | • | | 40 | 73 | 32 | 42 | 50 | 79 | 200 |
| WM120 | | • | | 40 | 89 | 32 | 58 | 50 | 94 | 200 |
| WM60Z | • | | | 40 | 69 | 32 | 38 | 50 | 73 | 200 |
| WM80Z ² | • | | | 40 | 73 | 32 | 42 | 50 | 99 (89) | 200 |
| WV60 | | • | | 40 | 69 | 32 | 38 | 50 | 33 | 200 |
| WV80 | | • | | 40 | 73 | 32 | 42 | 50 | 39 | 200 |
| WV120 | | • | | 40 | 89 | 32 | 58 | 50 | 59 | 200 |
| MLSM60D | | • | | 40 | 73 | 32 | 32 | 50 | 79 | 200 |
| MLSH60Z | • | | | 40 | 73 | 32 | 42 | 50 | 79 | 200 |
| MLSM80D | | • | | 40 | 85 | 32 | 54 | 50 | 101 | 200 |
| MLSM80Z | | • | | 40 | 85 | 32 | 54 | 50 | 101 | 200 |
| WZ60 ¹ | | | • | 60 | 22,5 | 16 | 30 | 113 | 53 | – |
| WZ80 ¹ | | | • | 60 | 22,5 | 16 | 30 | 112 | 84 | – |

¹ limit switches for these units can not be moved. On all other units the switches can be re-positioned by the customer. ² Value in brackets = for short carriage.



The ES limit switch assembly is an option that is mounted at the factory. The limit switches are placed 10 mm from the mechanical ends of the unit. Each limit switch has one NO and one NC contact with positive opening action. Protection degree is IP67. Type I and II switches can be repositioned along the profile by the customer. Note! the ES limit switch option and any of the sensor rail options ENT14x16, ENF14x16 or ENK can not be mounted on the same side of the unit.

Accessories

Electrical Feedback Devices

ES Limit Switch Option Kit, ordering key

| | 1 | 2 | 3 | 4 |
|---------|--------------|-----------|------------|------------|
| Example | ESK07 | -L | -01 | -10 |

1. Compatible unit

- ESK02 = WH50
- ESK03 = WH80
- ESK04 = WH120
- ESK05 = WM40
- ESK06 = WM60 / WM60Z
- ESK07 = WM80 / WM80Z
- ESK08 = WM120
- ESK09 = WV60
- ESK10 = WV80
- ESK11 = WV120
- ESK12 = WHZ50
- ESK13 = WHZ80
- ESK14 = WZ60
- ESK15 = WZ80
- ESK16 = MLSH60Z
- ESK18 = MLSM80Z
- ESK19 = MLSM60D
- ESK20 = MLSM80D

2. Mounting side of the unit

- L = left side
- R = right side

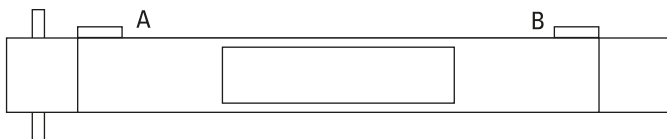
3. Switch configuration on side A

- 00 = no switch on side A
- 01 = switch with 1 m cable
- 05 = switch with 5 m cable
- 10 = switch with 10 m cable

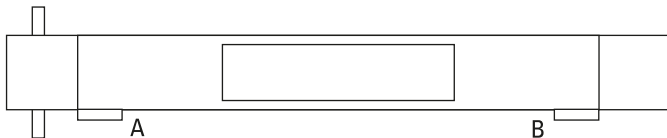
4. Switch configuration on side B

- 00 = no switch on side B
- 01 = switch with 1 m cable
- 05 = switch with 5 m cable
- 10 = switch with 10 m cable

ES-••-R-••-••



ES-••-L-••-••

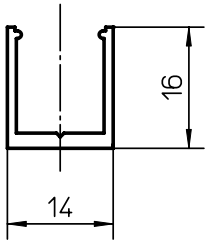


Accessories

Electrical Feedback Devices

ENT14x16 Inductive Sensor Rail

| Unit type | p/n |
|---|--------------|
| WH40 / WH50 / WH80 / WH120 / WHZ50 / WHZ80 / WM40 / WM60 / WM80 / WM60Z / WM80Z / WV60 / WV80 / MLSM60D / MLSM80D / MLSH60Z / MLSM80Z / WZ60 / WZ80 / WB40 / WB60 | 671 545 0283 |

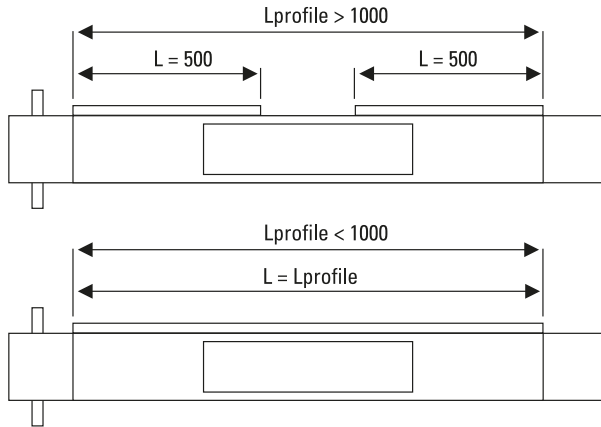
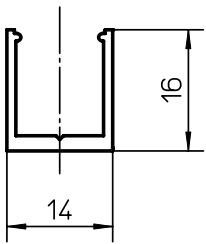


The ENT14x16 inductive sensor rail is mounted to the side of a unit or along any type of beam or profile. Sensors of type EN2 can be mounted in the rail. The rail can also serve as a cable duct for the sensor cables. The rail is sealed with a cover which comes with the rail. The rail comes in lengths of max 3000 mm. Drilling in the profile of the unit is required when mounting the rail. When ordering, specify part number and length of the rail. Note1! WM120 and WV120 units do not require any rail as the EN2 sensors can be fitted directly to the profile of the units. Note2! ES limit switch option and ENT14x16 rail can not be mounted on the same side of the unit.

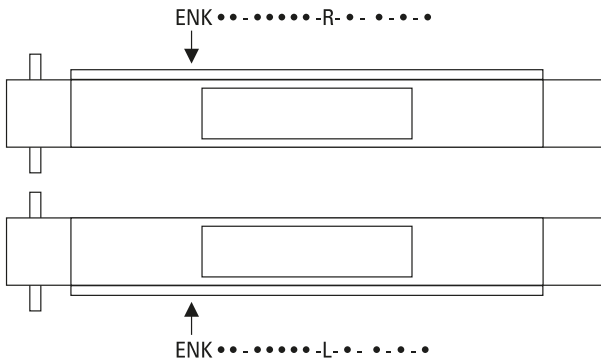
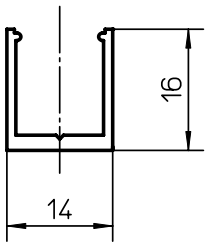
ENF and ENK Inductive Sensor Rail Option Kit, compatibility table

| Unit type | ENF / ENK |
|---|-----------|
| WH40 / WH50 / WH80 / WH120 / WHZ50 / WHZ80 / WM40 / WM60 / WM80 / WM60Z / WM80Z / WV60 / WV80 / MLSM60D / MLSM80D / MLSH60Z / MLSM80Z / WZ60 / WZ80 / WB40 / WB60 | . |

ENF



ENK



The ENF and ENK inductive sensor rail option kits are mounted at the factory. The ENF option consists of two 500 mm long ENT14x16 sensor rails mounted in each end of the unit on the left or right side of the profile. In cases where the unit is too short to allow two 500 mm sensor rails to be mounted, then one rail is mounted along the entire profile of the unit. The ENK option also consists of ENT14 x16 sensor rails but the ENK option has sensor profiles that run along the entire profile of the unit. In the shipment of both ENF and ENK the specified amount and type of EN2 sensors are included. The sensors are fitted to the sensor rail by the customer at the desired positions. Note1! WM120 and WV120 units do not require any ENF or ENK options as the EN2 sensors can be fitted directly to the profile of the units. Note2! The ES limit switch option and ENF rail can not be mounted on the same side of the unit.

Accessories

Electrical Feedback Devices

ENK and ENF Inductive Sensor Rail Option Kit, ordering key

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------|--------------|-----------|---------------|-----------|-----------|-----------|-----------|-----------|
| Example | ENK16 | -S | -04000 | -R | -2 | -0 | -1 | -6 |

1. Type of rail and compatible unit

ENK01 = ENK rail for WH40
 ENK02 = ENK rail for WH50
 ENK03 = ENK rail for WH80
 ENK04 = ENK rail for WH120
 ENK05 = ENK rail for WM40
 ENK06 = ENK rail for WM60 / WV60
 ENK07 = ENK rail for WM80 / WV80
 ENK08 = ENK rail for WM120 / WV120
 ENK09 = ENK rail for WM60Z
 ENK10 = ENK rail for WM80Z
 ENK11 = ENK rail for WHZ50
 ENK12 = ENK rail for WHZ80
 ENK13 = ENK rail for WZ60
 ENK14 = ENK rail for WZ80
 ENK15 = ENK rail for MLSH60Z
 ENK17 = ENK rail for MLSM80Z
 ENK18 = ENK rail for MLSM60D
 ENK19 = ENK rail for MLSM80D
 ENK20 = ENK rail for WB40
 ENK21 = ENK rail for WB60

ENF01 = ENF rail for WH40
 ENF02 = ENF rail for WH50
 ENF03 = ENF rail for WH80
 ENF04 = ENF rail for WH120
 ENF05 = ENF rail for WM40
 ENF06 = ENF rail for WM60 / WV60
 ENF07 = ENF rail for WM80 / WV80
 ENF08 = ENF rail for WM120 / WV120
 ENF09 = ENF rail for WM60Z
 ENF10 = ENF rail for WM80Z
 ENF11 = ENF rail for WHZ50
 ENF12 = ENF rail for WHZ80
 ENF13 = ENF rail for WZ60
 ENF14 = ENF rail for WZ80
 ENF15 = ENF rail for MLSH60Z
 ENF17 = ENF rail for MLSM80Z
 ENF18 = ENF rail for MLSM60D
 ENF19 = ENF rail for MLSM80D
 ENF20 = ENF rail for WB40
 ENF21 = ENF rail for WB60

2. Number of carriages

-S = single carriage
 -D = double carriages

3. Total length of unit (L tot)

-••••• = distance in mm

4. Mounting side of the unit

-L = left side
 -R = right side

5. Number of EN2 sensors with NC contact and 2 m cable

-• = 0 – 9 sensors / normally closed / 2 m cable

6. Number of EN2 sensors with NO contact and 2 m cable

-• = 0 – 9 sensors / normally open / 2 m cable

7. Number of EN2 sensors with NC contact and 10 m cable

-• = 0 – 9 sensors / normally closed / 10 m cable

8. Number of EN2 sensors with NO contact and 10 m cable

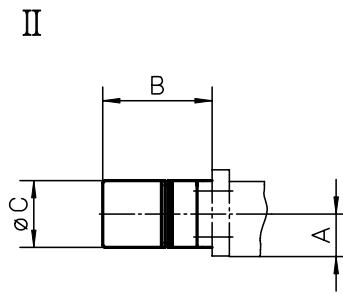
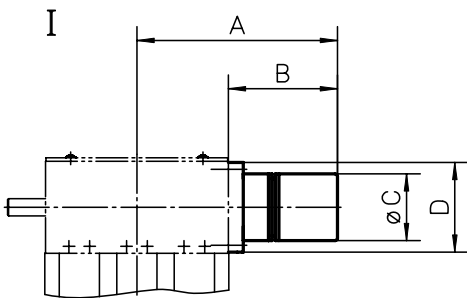
-• = 0 – 9 sensors / normally open / 10 m cable

Accessories

Electrical Feedback Devices

ADG Encoder Option Kit

| Unit type | Mounting type I | Mounting type II | A | B | ∅C | D |
|--------------|-----------------|------------------|-------|-----|------|-----------|
| WH40 | • | | 115 | 95 | 58,5 | ∅60 |
| WH50 / WHZ50 | • | | 120 | 96 | 58,5 | 50 × 50 |
| WH80 / WHZ80 | • | | 139 | 100 | 58,5 | 90 × 90 |
| WH120 | • | | 153 | 93 | 58,5 | 100 × 100 |
| WM40 | | • | 25 | 95 | 58,5 | – |
| WM60 | | • | 31 | 95 | 58,5 | – |
| WM80 | | • | 40 | 95 | 58,5 | – |
| WM120 | | • | 74 | 95 | 58,5 | – |
| WM60Z | • | | 124 | 94 | 58,5 | 60 × 60 |
| WM80Z | • | | 138 | 98 | 58,5 | 65 × 65 |
| WB40 | | • | 20,8 | 95 | 58,5 | – |
| WB60 | | • | 32,5 | 95 | 58,5 | – |
| MLSM60D | | • | 37 | 95 | 58,5 | – |
| MLSM80D | | • | 46 | 95 | 58,5 | – |
| MLSH60Z | • | | 174,5 | 95 | 58,5 | 78 × 59 |
| MLSM80Z | • | | 214,5 | 95 | 58,5 | 100 × 80 |



The ADG encoder option kit is an option that is mounted to the unit at the factory. It includes an IG602 encoder, a STE001 encoder connector and an encoder mounting flange with coupling. Cable can also be supplied in 5 or 10 meter lengths.

Accessories

Electrical Feedback Devices

ADG Encoder Option Kit, ordering key

| | 1 | 2 | 3 |
|---------|---------------|-----------------|------------|
| Example | ADG-08 | -05-0600 | -00 |

1. Compatible unit

ADG-01 = WH40
 ADG-02 = WH50 / WHZ50
 ADG-03 = WH80 / WHZ80
 ADG-04 = WH120
 ADG-05 = WM40
 ADG-06 = WM60 / WV60
 ADG-07 = WM80 / WV80
 ADG-08 = WM120 / WV120
 ADG-09 = WM60Z
 ADG-10 = WM80Z
 ADG-11 = MLSH60Z
 ADG-13 = MLSM80Z
 ADG-14 = MLSM60D
 ADG-15 = MLSM80D
 ADG-16 = WB40
 ADG-17 = WB60

2. Supply voltage and number of pulses

-05-0100 = 5 volts, 100 pulses per revolution
 -05-0200 = 5 volts, 200 pulses per revolution
 -05-0500 = 5 volts, 500 pulses per revolution
 -05-0600 = 5 volts, 600 pulses per revolution
 -05-1000 = 5 volts, 1000 pulses per revolution
 -05-1250 = 5 volts, 1250 pulses per revolution
 -05-2000 = 5 volts, 2000 pulses per revolution
 -05-2500 = 5 volts, 2500 pulses per revolution
 -24-0100 = 10 - 30 volts, 100 pulses per revolution
 -24-0200 = 10 - 30 volts, 200 pulses per revolution
 -24-0500 = 10 - 30 volts, 500 pulses per revolution
 -24-0600 = 10 - 30 volts, 600 pulses per revolution

3. Cable and connector configuration

-00 = no cable only STE001 encoder connector
 -05 = 5 m cable with STE001 encoder connector in one of the ends
 -10 = 10 m cable with STE001 encoder connector in one of the ends

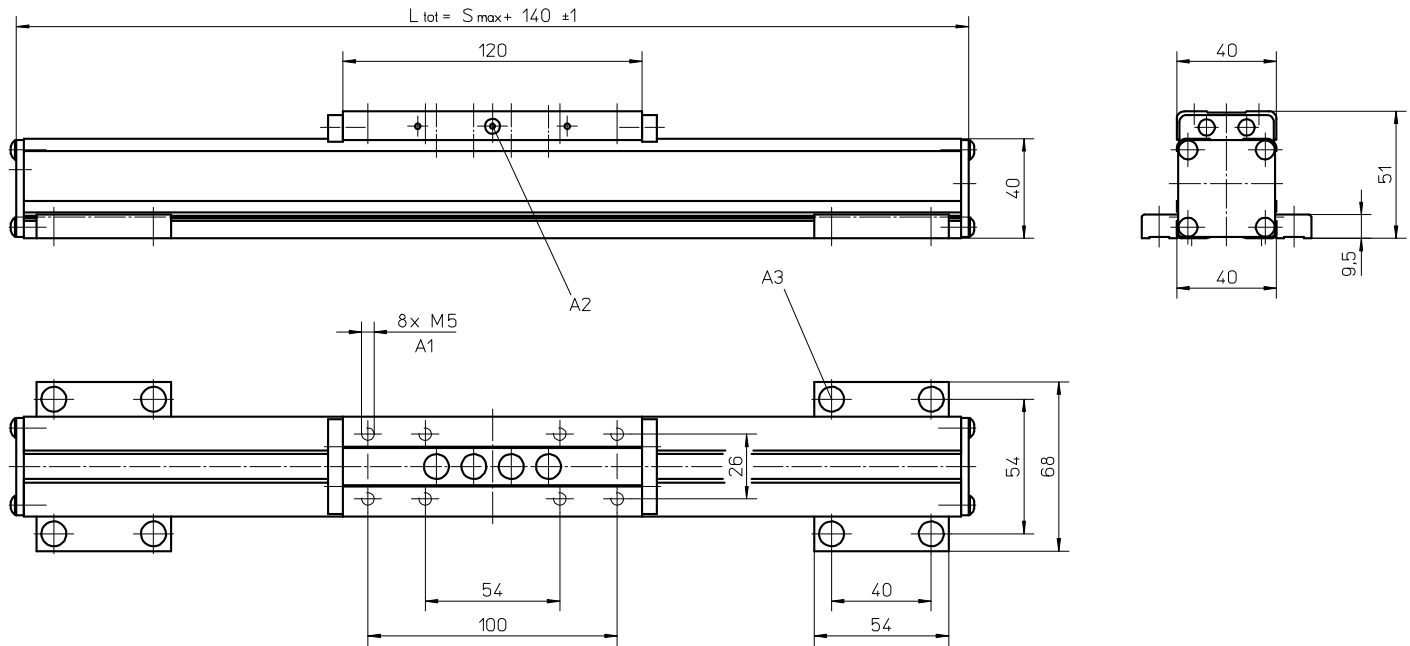
Accessories

Non Driven Linear Motion Systems

| Dimensions | Projection |
|------------|------------|
| METRIC | |

WH40N

» Ordering key - see page 210
» Technical data - see page 82



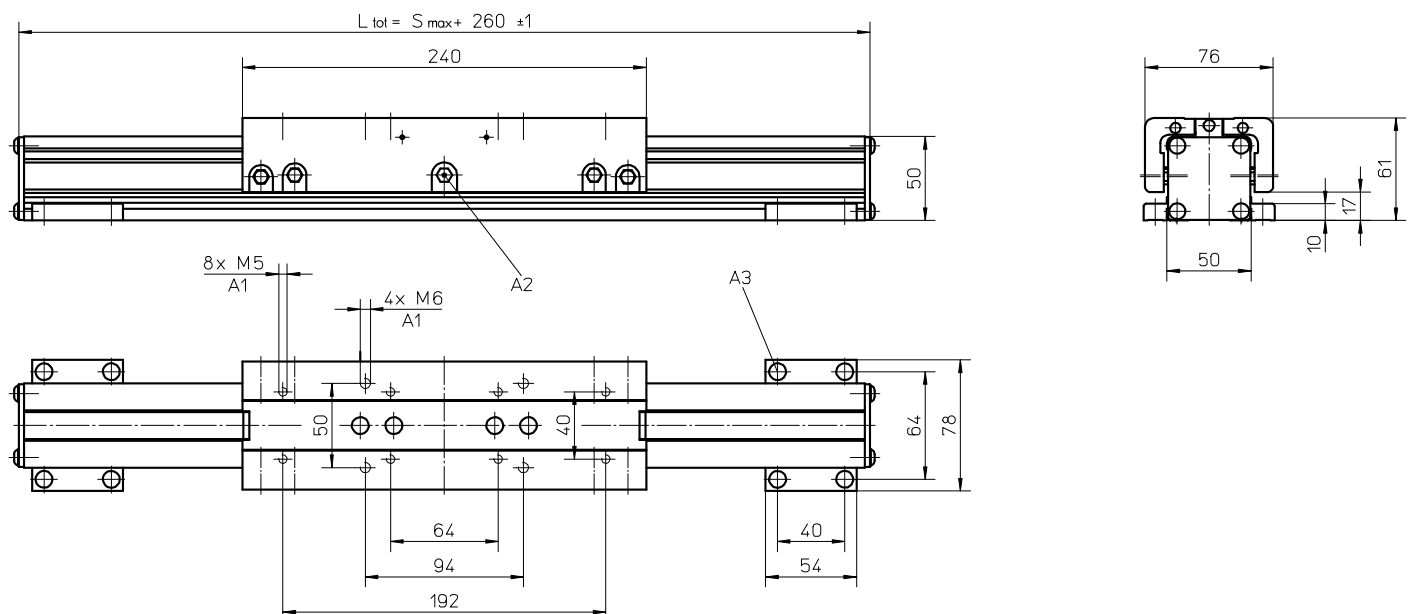
A1: depth 10
A2: lubricating nipple on both sides DIN3405 D 1/A

A3: socket cap screw ISO4762-M5x12 8.8

WH50N

» Ordering key - see page 210
» Technical data - see page 110

| Dimensions | Projection |
|------------|------------|
| METRIC | |



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

A3: socket cap screw ISO4762-M5x12 8.8

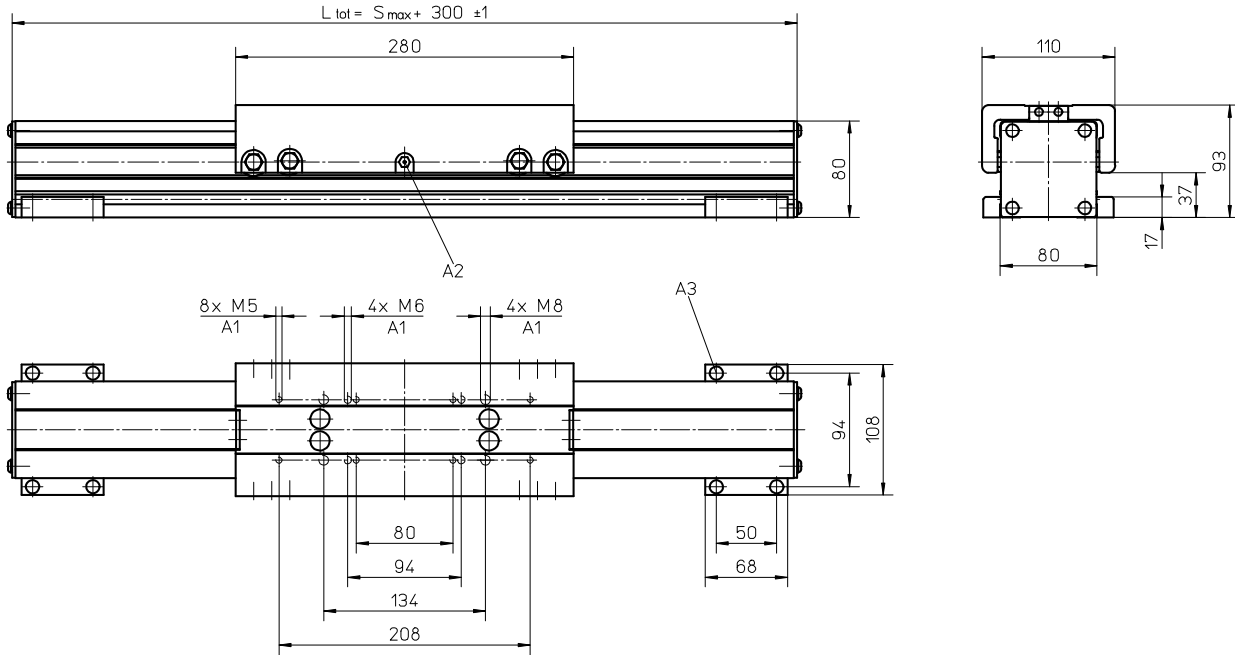
Accessories

Non Driven Linear Motion Systems

| Dimensions | Projection |
|------------|------------|
| METRIC | |

WH80N

» Ordering key - see page 210
 » Technical data - see page 112



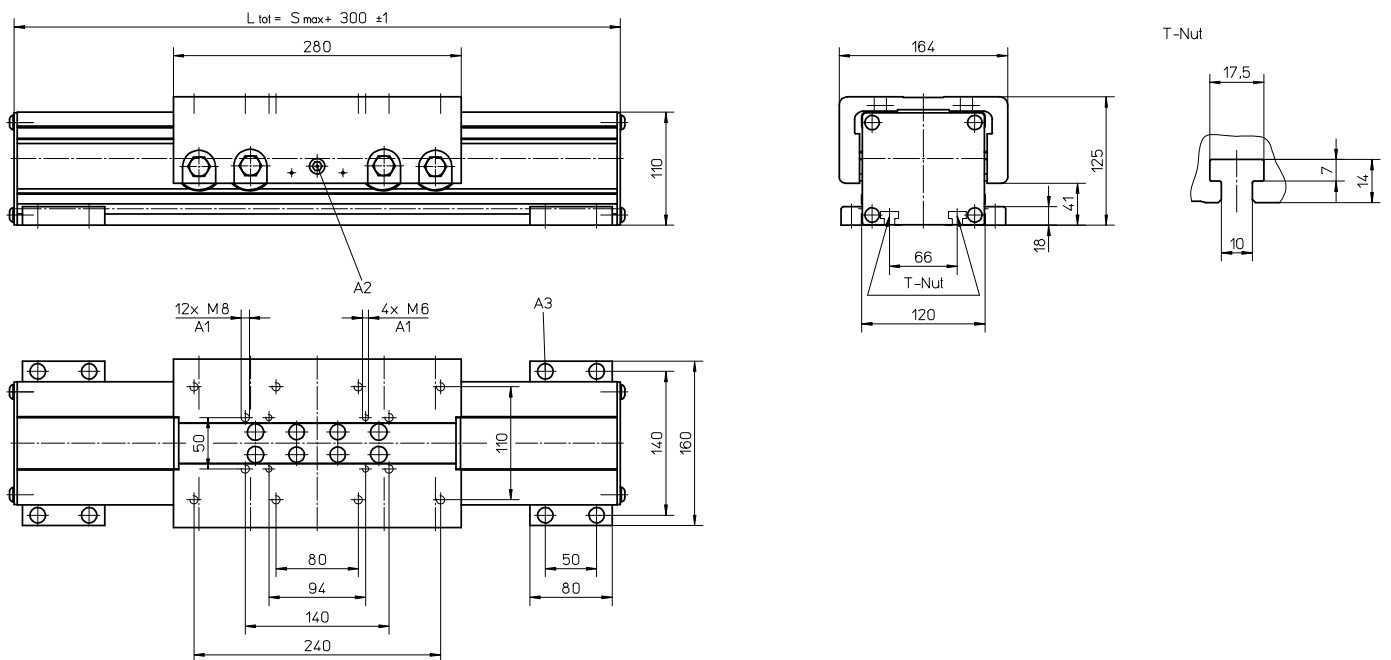
A1: depth 12
 A2: funnel type lubricating nipple DIN3405-M6x1-D1

A3: socket cap screw ISO4762-M6x20 8.8

WH120N

» Ordering key - see page 210
 » Technical data - see page 114

| Dimensions | Projection |
|------------|------------|
| METRIC | |



A1: depth 12
 A2: funnel type lubricating nipple DIN3405-M6x1-D1

A3: socket cap screw ISO4762-M8x20 8.8

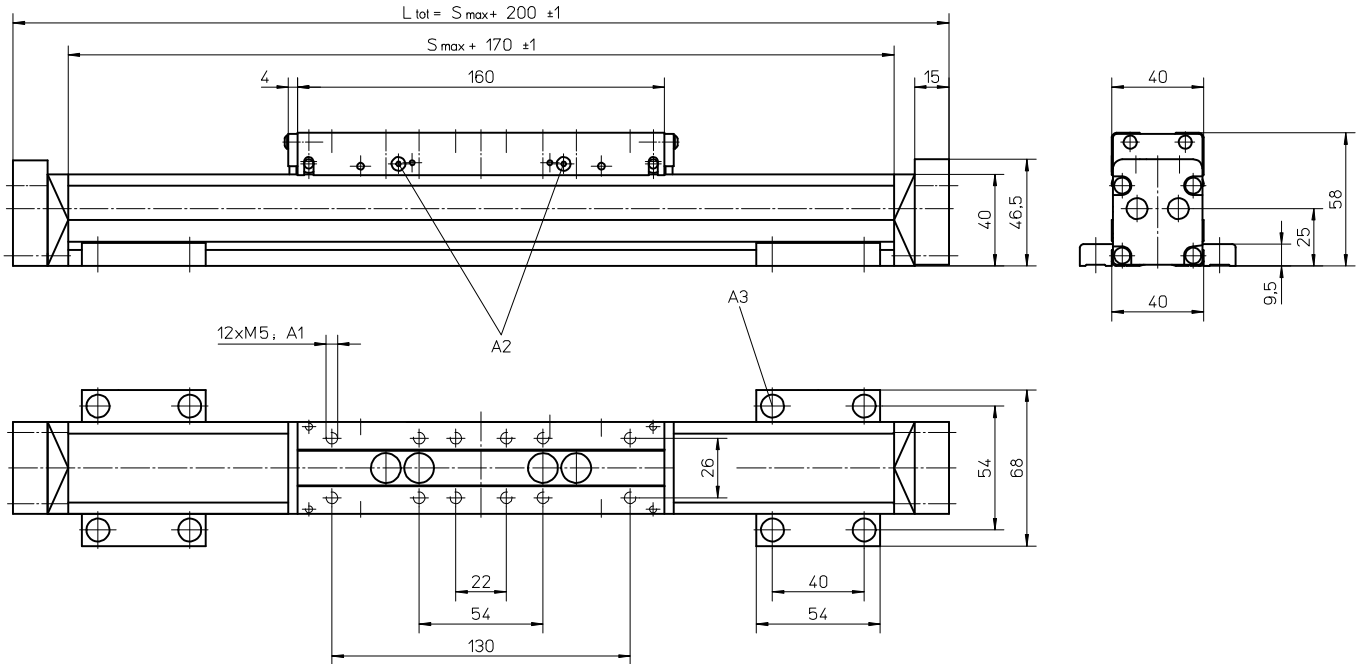
Accessories

Non Driven Linear Motion Systems

| Dimensions | Projection |
|------------|------------|
| METRIC | |

WM40N

» Ordering key - see page 210
» Technical data - see page 14



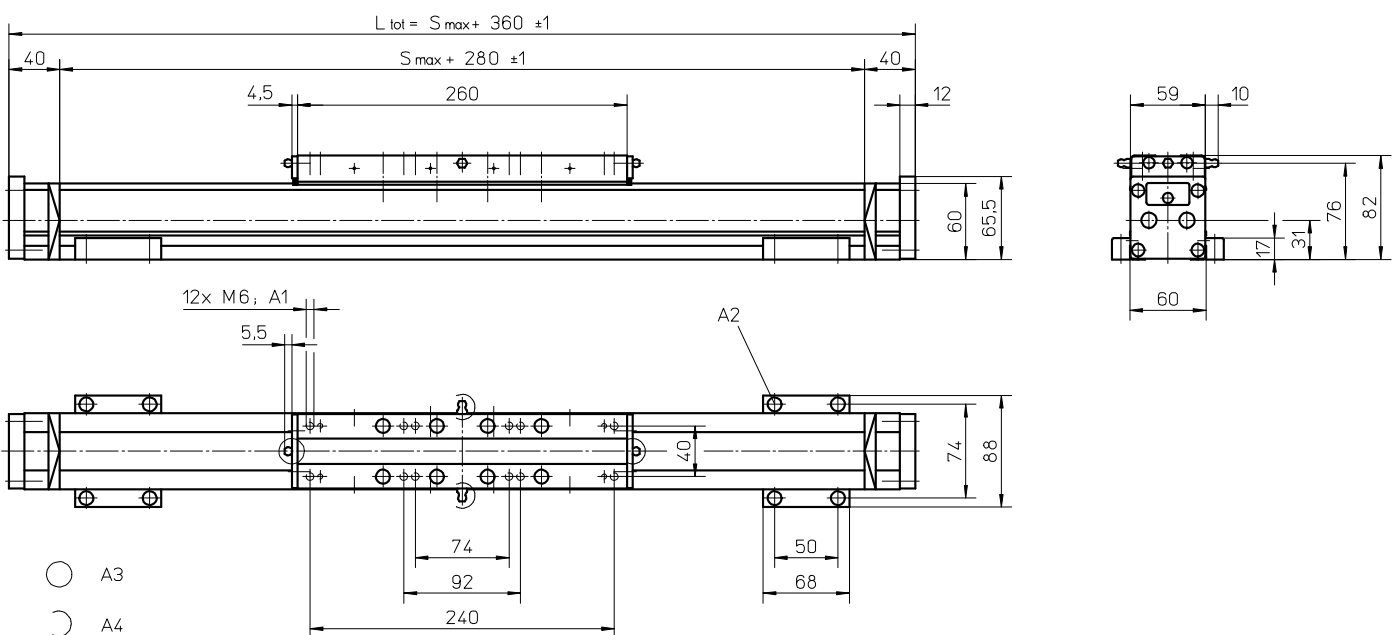
A1: depth 7
A2: lubricating nipple on both sides DIN3405 D 1/A

A3: socket cap screw ISO4762-M5x12 8.8

WM60N

» Ordering key - see page 210
» Technical data - see page 18

| Dimensions | Projection |
|------------|------------|
| METRIC | |



A1: depth 11
A2: socket cap screw ISO4762-M6x20 8.8

A3: tapered lubricating nipple to DIN71412 AM6
A4: can be changed over to one of the three alternative lubricating points by the customer

Accessories

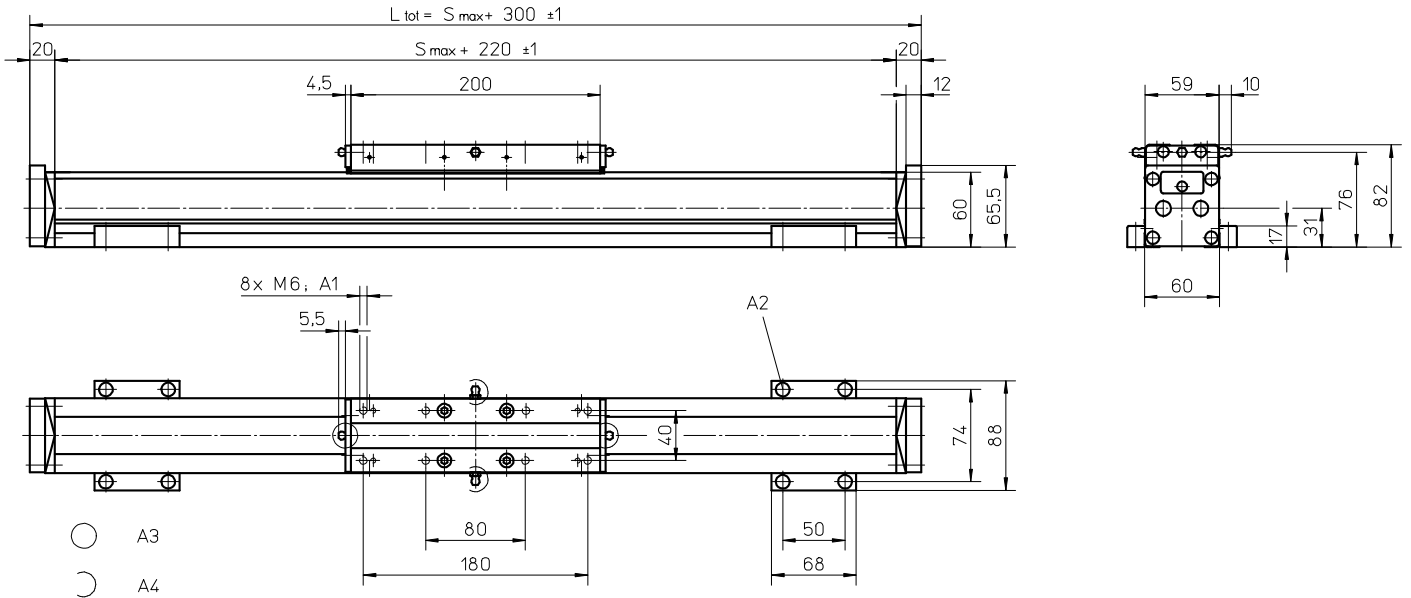
Non Driven Linear Motion Systems

| Dimensions | Projection |
|------------|------------|
| METRIC | |

WM60N with Single Short Carriage

» Ordering key - see page 210

» Technical data - see page 20



A1: depth 11
A2: socket cap screw ISO4762-M6x20 8.8

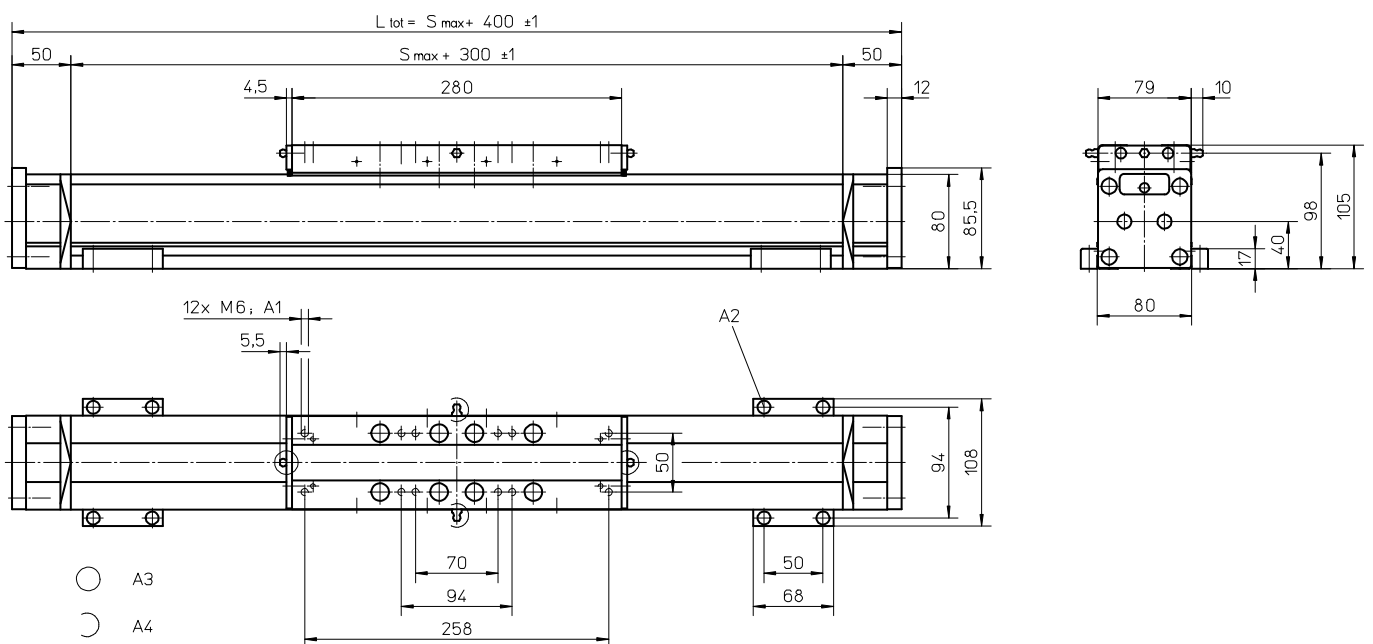
A3: tapered lubricating nipple to DIN71412 AM6
A4: can be changed over to one of the three alternative lubricating points by the customer

WM80N

» Ordering key - see page 210

» Technical data - see page 24

| Dimensions | Projection |
|------------|------------|
| METRIC | |



A1: depth 12
A2: socket cap screw ISO4762-M6x20 8.8

A3: tapered lubricating nipple to DIN71412 AM6
A4: can be changed over to one of the three alternative lubricating points by the customer

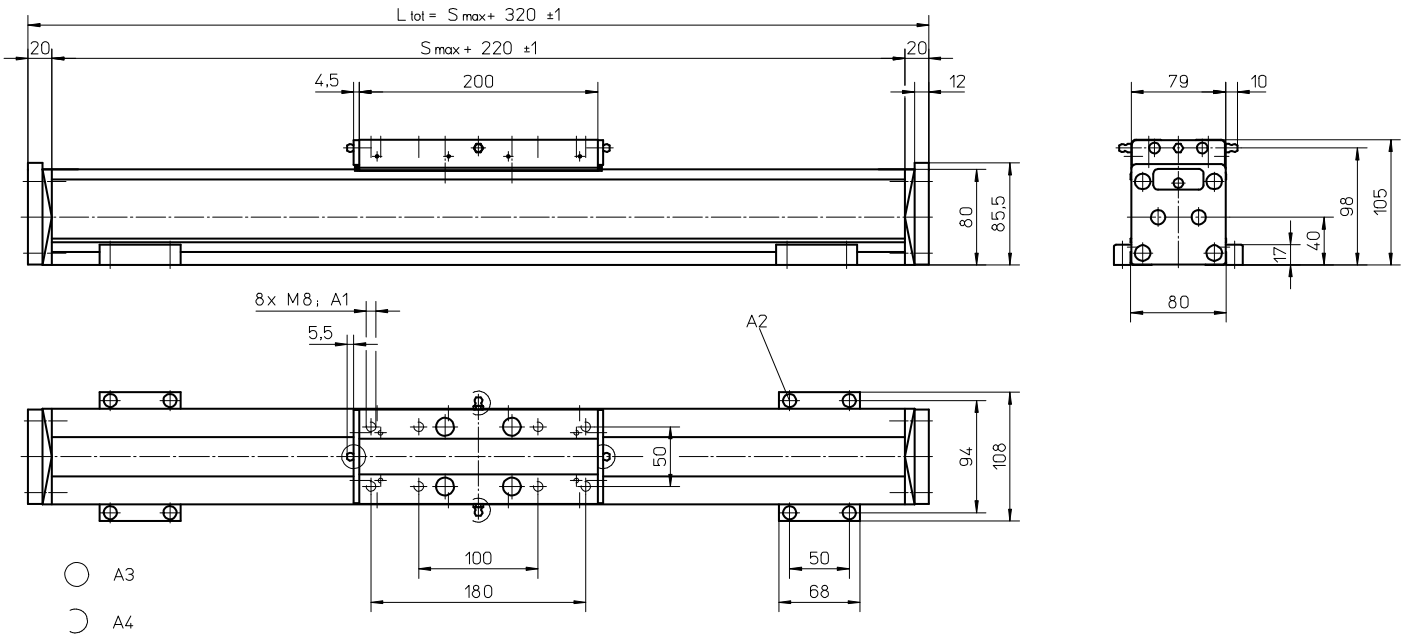
Accessories

Non Driven Linear Motion Systems

| Dimensions | Projection |
|------------|------------|
| METRIC | |

WM80N with Single Short Carriage

» Ordering key - see page 210
» Technical data - see page 26



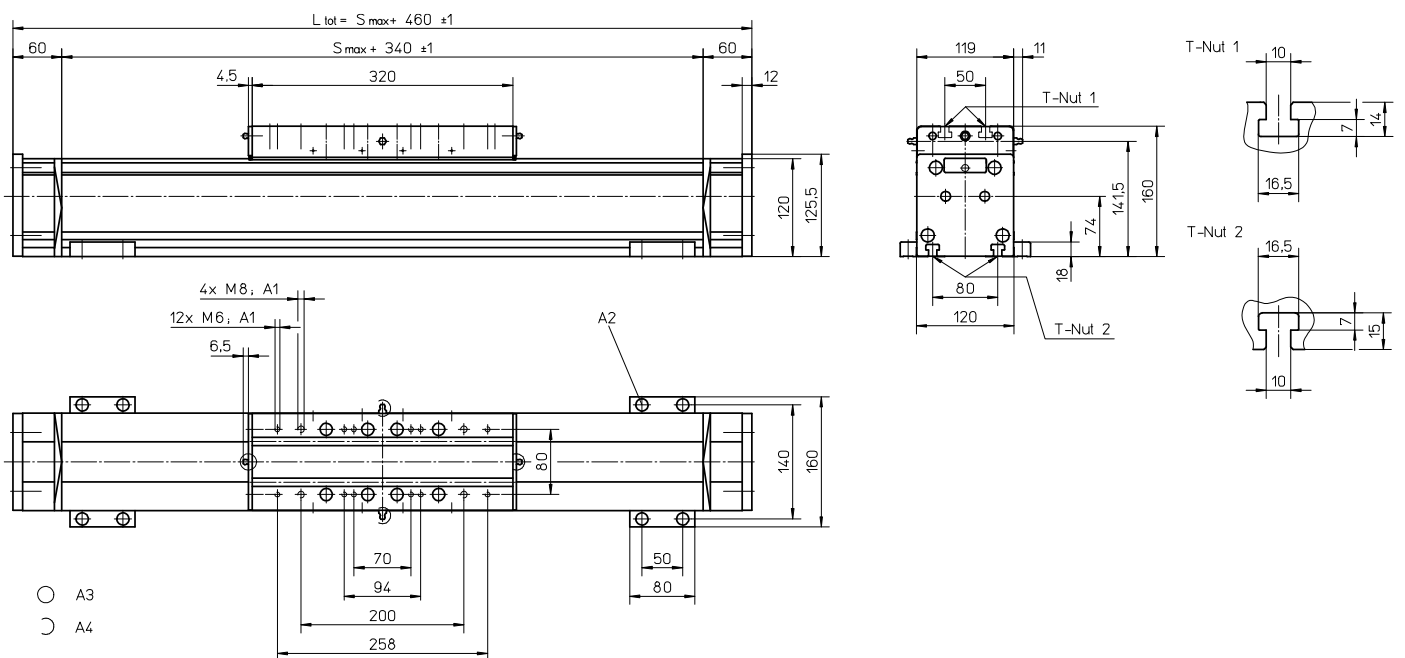
A1: depth 12
A2: socket cap screw ISO4762-M6x20 8.8

A3: tapered lubricating nipple to DIN71412 AM6
A4: can be changed over to one of the three alternative lubricating points by the customer

WM120N

» Ordering key - see page 210
» Technical data - see page 34

| Dimensions | Projection |
|------------|------------|
| METRIC | |



A1: depth 22
A2: socket cap screw ISO4762-M8x20 8.8

A3: tapered lubricating nipple to DIN71412 M8x1
A4: can be changed over to one of the three alternative lubricating points by the customer

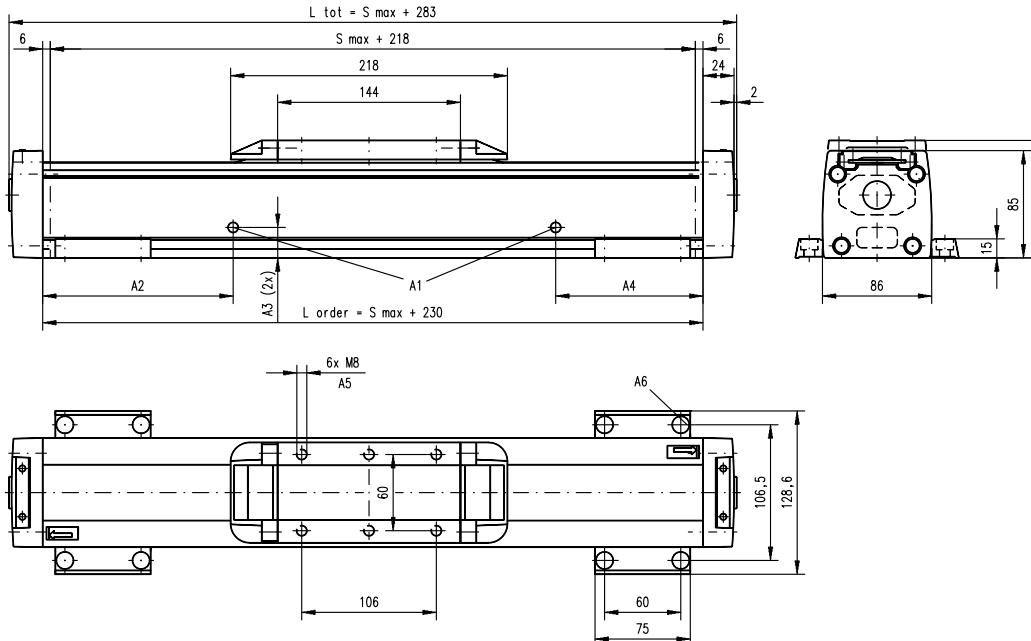
Accessories

Non Driven Linear Motion Systems

| Dimensions | Projection |
|------------|------------|
| METRIC | |

M75N

» Ordering key - see page 211
 » Technical data - see page 42



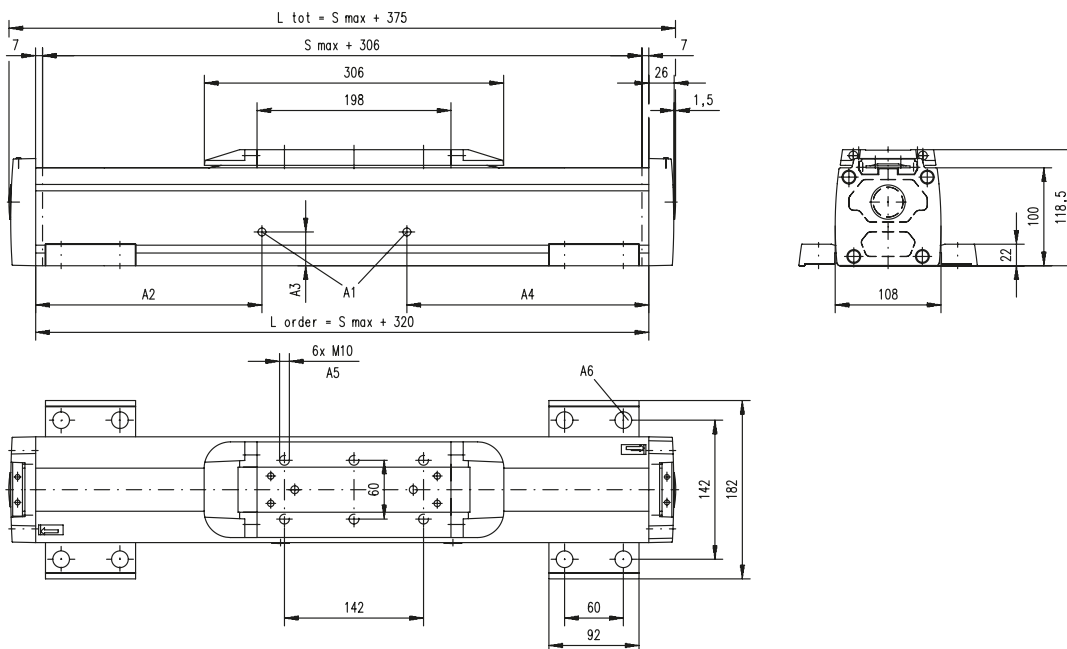
A1: lubrication holes $\phi 6$ (MG07N), $\phi 10$ (MF07N)
 A2: 150 (MG07N), 100 (MF07N)
 A3: 24 (MG07N), 43 (MF07N)

A4: 300 (MG07N), 320 (MF07N)
 A5: depth 8 Heli coil
 A6: $\phi 13,5 / \phi 8,5$ for socket head cap screw M8

M100N

» Ordering key - see page 211
 » Technical data - see page 44

| Dimensions | Projection |
|------------|------------|
| METRIC | |



A1: lubrication holes $\phi 6$ (MG10N), $\phi 10$ (MF10N)
 A2: 100 if L_order is equal or < 1 m, 200 if L_order > 1 m (MG10N), 265 (MF10N)
 A3: 34,5 (MG10N), 56,5 (MF10N)

A4: 100 if L_order is equal or < 1 m, 350 if L_order > 1 m (MG10N)
 265 if L_order is equal or > 0,7 m, no hole if L_order < 0,7 m (MF10N)
 A5: depth 10 Heli coil
 A6: $\phi 17 / \phi 10,5$ for socket head cap screw M10

Additional Technical Data

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guides

| Technical Data | | | | | | | | | |
|---|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Parameter | | WM40S | WM40D | WM60D | WM60S | WM60X | WM80D | WM80S | WM120D |
| Geometrical moment of inertia of the profile (Iy) | [mm ⁴] | 10,8 × 10 ⁴ | 10,8 × 10 ⁴ | 5,8 × 10 ⁵ | 5,8 × 10 ⁵ | 5,8 × 10 ⁵ | 1,85 × 10 ⁶ | 1,85 × 10 ⁶ | 7,7 × 10 ⁶ |
| Geometrical moment of inertia of the profile (Iz) | [mm ⁴] | 13,4 × 10 ⁴ | 13,4 × 10 ⁴ | 5,9 × 10 ⁵ | 5,9 × 10 ⁵ | 5,9 × 10 ⁵ | 1,94 × 10 ⁶ | 1,94 × 10 ⁶ | 9,4 × 10 ⁶ |
| Friction factor of the guide system (μ) | | 0,05 | 0,05 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| Efficiency of the unit | | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| Bending factor (b) | | 0,0003 | 0,0003 | 0,0003 | 0,0003 | 0,0003 | 0,0003 | 0,0003 | 0,0003 |
| Inertia of ball screw (j _{sp}) | [kgm ² /m] | 1,13 × 10 ⁻⁵ | 1,13 × 10 ⁻⁵ | 8,46 × 10 ⁻⁵ | 8,46 × 10 ⁻⁵ | 8,46 × 10 ⁻⁵ | 2,25 × 10 ⁻⁴ | 2,25 × 10 ⁻⁴ | 6,34 × 10 ⁻⁴ |
| Dynamic load rating of ball screw (C _x) | [N] | | | | | | | | |
| 05 mm lead | | 4400 | 4400 | 10500 | 10500 | 10500 | 12300 | 12300 | 21500 |
| 10 mm lead | | - | - | - | - | - | 13200 | 13200 | 33400 |
| 20 mm lead | | - | - | 11600 | 11600 | - | 13000 | 13000 | 29700 |
| 40 mm lead | | - | - | - | - | - | - | - | 14900 |
| 50 mm lead | | - | - | 8400 | 8400 | - | 15400 | 15400 | - |
| Dynamic load rating of ball guide (C _y) | [N] | 2 × 2650 | 2 × 2650 | 4 × 11495 | 2 × 12964 | 4 × 11495 | 4 × 14356 | 2 × 18723 | 4 × 18723 |
| Dynamic load rating of ball guide (C _z) | [N] | 2 × 3397 | 2 × 3397 | 4 × 10581 | 2 × 11934 | 4 × 10581 | 4 × 13739 | 2 × 17919 | 4 × 17919 |
| Distance between ball guide carriages (L _x) | [mm] | 87 | 136 | 141,7 | - | 141,7 | 154 | - | 186 |
| Distance between ball guide carriages (L _y) | [mm] | - | - | 35 | 35 | 35 | 49,75 | 49,75 | 80,75 |

| Parameter | | WV60 | WV80 | WV120 | MLSM60D | MLSM80D |
|---|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Geometrical moment of inertia of the profile (Iy) | [mm ⁴] | 5,8 × 10 ⁵ | 1,85 × 10 ⁶ | 7,7 × 10 ⁶ | 1,19 × 10 ⁶ | 3,77 × 10 ⁶ |
| Geometrical moment of inertia of the profile (Iz) | [mm ⁴] | 5,9 × 10 ⁵ | 1,94 × 10 ⁶ | 9,4 × 10 ⁶ | 1,08 × 10 ⁷ | 4,71 × 10 ⁷ |
| Friction factor of the guide system (μ) | | no guides | no guides | no guides | 0,1 | 0,1 |
| Efficiency of the unit | | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| Bending factor (b) | | 0,0003 | 0,0003 | 0,0003 | 0,0003 | 0,0003 |
| Inertia of ball screw (j _{sp}) | [kgm ² /m] | 8,46 × 10 ⁻⁵ | 2,25 × 10 ⁻⁴ | 6,34 × 10 ⁻⁴ | 2,25 × 10 ⁻⁴ | 6,34 × 10 ⁻⁴ |
| Dynamic load rating of ball screw (C _x) | [N] | | | | | |
| 05 mm lead | | 10500 | 12300 | 21500 | 12300 | 21500 |
| 10 mm lead | | - | 13200 | 33400 | 13200 | 33400 |
| 20 mm lead | | 11600 | 13000 | 29700 | 13000 | 29700 |
| 25 mm lead | | - | - | 14900 | - | - |
| 40 mm lead | | - | - | - | - | 14900 |
| 50 mm lead | | 8400 | 15400 | - | 15400 | - |
| Dynamic load rating of ball guide (C _y) | [N] | no guides | no guides | no guides | 4 × 13770 | 4 × 17965 |
| Dynamic load rating of ball guide (C _z) | [N] | no guides | no guides | no guides | 4 × 13770 | 4 × 17965 |
| Distance between ball guide carriages (L _x) | [mm] | no guides | no guides | no guides | 163 | 185 |
| Distance between ball guide carriages (L _y) | [mm] | no guides | no guides | no guides | 105 | 164 |

Additional Technical Data

Linear Motion Systems with Ball Screw and Slide Guides

| Technical Data | | | | |
|---|-----------------------|------------------------|------------------------|------------------------|
| Parameter | | M55 | M75 | M100 |
| Geometrical moment of inertia of the profile (Iy) | [mm ⁴] | 4,27 × 10 ⁵ | 1,9 × 10 ⁶ | 5,54 × 10 ⁶ |
| Geometrical moment of inertia of the profile (Iz) | [mm ⁴] | 3,4 × 10 ⁵ | 1,15 × 10 ⁶ | 3,86 × 10 ⁶ |
| Friction factor of the guide system (μ) | | 0,15 | 0,15 | 0,15 |
| Efficiency | | | | |
| ball nut unit | | 0,8 | 0,8 | 0,8 |
| composite nut unit | | 0,5 | 0,5 | 0,5 |
| Bending factor (b) | | 0,0005 | 0,0005 | 0,0005 |
| Inertia of ball screw (Jsp) | [kgm ² /m] | 4,1 × 10 ⁻⁵ | 1,6 × 10 ⁻⁴ | 2,5 × 10 ⁻⁴ |
| Dynamic load rating of ball screw (Cx) | [N] | | | |
| 05 mm lead | | 9300 | 10400 | 12500 |
| 05,8 mm lead | | 5420 | - | - |
| 08 mm lead | | - | - | - |
| 10 mm lead | | 15400 | - | 20600 |
| 12,7 mm lead | | - | 17960 | - |
| 20 mm lead | | 1900 | 10400 | - |
| 25 mm lead | | - | - | 11800 |
| 32 mm lead | | 2000 | - | - |

Linear Motion Systems with Belt Drive and Ball Guides

| Technical Data | | | | | | | | |
|---|---------------------|------------------------|-------------------------|---------------------------------------|------------------------|------------------------|------------------------|--------------------------|
| Parameter | | WH40 | WM60Z | WM80Z | M55 | M75 | M100 | MLSM80Z |
| Geometrical moment of inertia of the profile (Iy) | [mm ⁴] | 12,6 × 10 ⁴ | 5,62 × 10 ⁵ | 1,85 × 10 ⁶ | 4,59 × 10 ⁵ | 1,9 × 10 ⁶ | 5,54 × 10 ⁶ | 3,77 × 10 ⁶ |
| Geometrical moment of inertia of the profile (Iz) | [mm ⁴] | 15,3 × 10 ⁴ | 5,94 × 10 ⁵ | 1,94 × 10 ⁶ | 3,56 × 10 ⁵ | 1,15 × 10 ⁶ | 3,86 × 10 ⁶ | 4,71 × 10 ⁷ |
| Friction factor of the guide system (μ) | | 0,05 | 0,1 | 0,1 | 0,02 | 0,02 | 0,02 | 0,1 |
| Efficiency of the unit | | 0,85 | 0,85 | 0,85 | 0,95 | 0,95 | 0,95 | 0,85 |
| Bending factor (b) | | 0,0005 | 0,0005 | 0,0005 | 0,0005 | 0,0005 | 0,0005 | 0,0005 |
| Specific mass of belt | [kg/m] | 0,032 | 0,074 | 0,14 | 0,09 | 0,16 | 0,31 | 0,517 |
| Inertia of pulleys (Jsyn) | [kgm ²] | 8,8 × 10 ⁻⁶ | 2,13 × 10 ⁻⁵ | 1,12 × 10 ⁻⁴ | 1,7 × 10 ⁻⁵ | 6,8 × 10 ⁻⁵ | 8,5 × 10 ⁻⁵ | 5,077 × 10 ⁻⁴ |
| Dynamic load rating of ball guide (Cy) | [N] | 2 × 2650 | 2 × 12964 | 4 × 18723 (2 × 18723) ¹ | 2 × 2717 | 2 × 8206 | 2 × 13189 | 4 × 17965 |
| Dynamic load rating of ball guide (Cz) | [N] | 2 × 3397 | 2 × 11934 | 2 × 17919 | 2 × 3484 | 2 × 15484 | 2 × 24885 | 4 × 17965 |
| Distance between ball guide carriages (Lx) | [mm] | 72 | - | - | 78 | 96 | 140 | 185 |
| Distance between ball guide carriages (Ly) | [mm] | - | 35 | 49,75 | - | - | - | 164 |

¹ Value in brackets = for short carriage.

Additional Technical Data

Linear Motion Systems with Belt Drive and Slide Guides

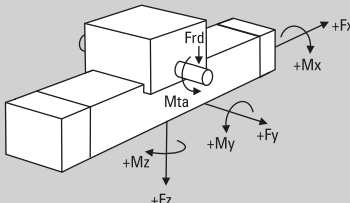
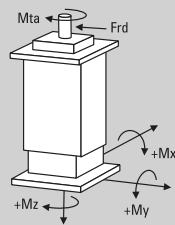
| Technical Data | | M50 | M55 | M75 | M100 |
|--|---------------------|------------------------|------------------------|------------------------|------------------------|
| Geometrical moment of inertia of the profile (I _y) | [mm ⁴] | 2,61 × 10 ⁵ | 4,59 × 10 ⁵ | 1,9 × 10 ⁶ | 5,54 × 10 ⁶ |
| Geometrical moment of inertia of the profile (I _z) | [mm ⁴] | 2,44 × 10 ⁵ | 3,56 × 10 ⁵ | 1,15 × 10 ⁶ | 3,86 × 10 ⁶ |
| Friction factor of the guide system (μ) | | 0,15 | 0,15 | 0,15 | 0,15 |
| Efficiency of the unit | | 0,85 | 0,85 | 0,85 | 0,85 |
| Bending factor (b) | | 0,0005 | 0,0005 | 0,0005 | 0,0005 |
| Specific mass of belt | [kg/m] | 0,086 | 0,09 | 0,16 | 0,31 |
| Inertia of pulleys (J _{syn}) | [kgm ²] | 3,1 × 10 ⁻⁵ | 1,7 × 10 ⁻⁵ | 6,8 × 10 ⁻⁵ | 8,5 × 10 ⁻⁵ |

Linear Motion Systems with Belt Drive and Wheel Guides

| Technical Data | | WH50 | WH80 | WH120 | MLSH60Z |
|--|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Geometrical moment of inertia of the profile (I _y) | [mm ⁴] | 3,3 × 10 ⁵ | 1,93 × 10 ⁶ | 6,69 × 10 ⁶ | 1,29 × 10 ⁶ |
| Geometrical moment of inertia of the profile (I _z) | [mm ⁴] | 2,65 × 10 ⁵ | 1,8 × 10 ⁶ | 6,88 × 10 ⁶ | 1,2 × 10 ⁷ |
| Friction factor of the guide system (μ) | | 0,1 | 0,1 | 0,1 | 0,1 |
| Efficiency of the unit | | 0,85 | 0,85 | 0,85 | 0,85 |
| Bending factor (b) | | 0,0005 | 0,0005 | 0,0005 | 0,0005 |
| Specific mass of belt | [kg/m] | 0,055 | 0,21 | 0,34 | 0,119 |
| Inertia of pulleys (J _{syn}) | [kgm ²] | 1,928 × 10 ⁻⁵ | 2,473 × 10 ⁻⁴ | 1,004 × 10 ⁻³ | 4,604 × 10 ⁻⁵ |
| Dynamic load rating of wheel guide (C _y) | [N] | - | - | - | 4 × 1266 |
| Dynamic load rating of wheel guide (C _z) | [N] | 4 × 1270 | 4 × 3670 | 4 × 16200 | 4 × 1266 |
| Distance between carriage wheels (L _x) | [mm] | 198 | 220 | 180 | 109 |
| Distance between carriage wheels (L _y) | [mm] | 39 | 65 | 97 | 102,5 |

Additional Technical Data

Linear Lifting Systems

| Technical Data | | WHZ50 | WHZ80 | Z2 | Z3 |
|---|---|------------------------|---|-----------------------|-----------------------|
| Geometrical moment of inertia of the profile (Ix) | [mm ⁴] | - | - | $1,87 \times 10^7$ | $1,87 \times 10^7$ |
| Geometrical moment of inertia of the profile (Iy) | [mm ⁴] | $3,3 \times 10^5$ | $1,93 \times 10^6$ | $2,19 \times 10^7$ | $2,19 \times 10^7$ |
| Geometrical moment of inertia of the profile (Iz) | [mm ⁴] | $2,65 \times 10^5$ | $1,8 \times 10^6$ | - | - |
| Dynamic load rating of ball screw (Fx) | [N] | belt drive | belt drive | - | - |
| Dynamic load rating of ball screw (Fz) | [N] | | | | |
| ball screw ø 25 lead 10 mm | | | | 21248 | 21248 |
| ball screw ø 25 lead 25 mm | | | | 11182 | 11182 |
| ball screw ø 32 lead 10 mm | | | | 47200 | 47200 |
| Friction factor of the guide system (μ) | | 0,1 | 0,1 | 0,15 | 0,15 |
| Efficiency of the unit | | 0,85 | 0,85 | 0,8 | 0,8 |
| Specific mass of belt | [kg/m] | 0,055 | 0,119 | - | - |
| Inertia of pulleys (Jsyn) | [kgm ²] | $6,906 \times 10^{-5}$ | $5,026 \times 10^{-4}$ | - | - |
| Inertia of ball screw (jsp) | [kgm ² /m] | | | | |
| ball screw ø 25 lead 10 | | - | - | $2,1 \times 10^{-4}$ | $2,1 \times 10^{-4}$ |
| ball screw ø 25 lead 25 | | - | - | $2,6 \times 10^{-4}$ | $2,6 \times 10^{-4}$ |
| ball screw ø 32 lead 10 | | - | - | $6,43 \times 10^{-4}$ | $6,43 \times 10^{-4}$ |
| Dynamic load rating of ball guide (Cx) | [N] | - | - | slide guide | slide guide |
| Dynamic load rating of ball guide (Cy) | [N] | 4×1270 | 4×3670 | slide guide | slide guide |
| Distance between ball guide carriages (Lx) | [mm] | 198 | 220 | - | - |
| Distance between ball guide carriages (Ly) | [mm] | 39 | 65 | slide guide | slide guide |
| Distance between ball guide carriages (Lz) | [mm] | - | - | slide guide | slide guide |
| Definition of forces |  | |  | | |

Additional Technical Data

Linear Rod Units

| Technical Data | | | |
|--|-----------------------|-------------------------|-------------------------|
| Parameter | | WZ60 | WZ80 |
| Geometrical moment of inertia of the profile (I _y) | [mm ⁴] | 5,8 × 10 ⁵ | 1,85 × 10 ⁶ |
| Geometrical moment of inertia of the profile (I _z) | [mm ⁴] | 5,9 × 10 ⁵ | 1,94 × 10 ⁶ |
| Friction factor of the guide system (μ) | | 0,1 | 0,1 |
| Efficiency of the unit | | 0,8 | 0,8 |
| Inertia of ball screw (j _{sp}) | [kgm ² /m] | | |
| 05 mm lead | | 8,46 × 10 ⁻⁵ | 2,25 × 10 ⁻⁴ |
| 10 mm lead | | - | 2,25 × 10 ⁻⁴ |
| 20 mm lead | | 8,46 × 10 ⁻⁵ | 2,25 × 10 ⁻⁴ |
| 25 mm lead | | - | - |
| 32 mm lead | | - | - |
| 40 mm lead | | - | - |
| 50 mm lead | | 8,46 × 10 ⁻⁵ | 2,25 × 10 ⁻⁴ |
| Dynamic load rating of ball screw (C _x) | [N] | | |
| 05 mm lead | | 10500 | 12300 |
| 10 mm lead | | - | 13200 |
| 20 mm lead | | 11600 | 13000 |
| 25 mm lead | | - | - |
| 32 mm lead | | - | - |
| 40 mm lead | | - | - |
| 50 mm lead | | 8400 | 15400 |
| Dynamic load rating of ball guide (C _y) | [N] | 2 × 12964 | 2 × 18723 |
| Dynamic load rating of ball guide (C _z) | [N] | 2 × 11943 | 2 × 17919 |
| Distance between ball guide carriages (L _x) | [mm] | - | - |
| Distance between ball guide carriages (L _y) | [mm] | 35 | 50 |
| Dynamic rating of the ball bushing | [N] | 8300 | 13700 |

Drive Calculations

Screw Driven Linear Motion Systems

Feed Force Formula [N]

$$F_x = m \times g \times \mu$$

- F_x = feed force [N]
 m = total mass to be moved [kg]¹
 g = acceleration due to gravity [m/s²]
 μ = friction factor specific for each unit

Acceleration Force Formula [N]

$$F_a = m \times a$$

- F_a = acceleration force [N]
 m = mass to be operated [kg]
 a = acceleration [m/s²]²

Power Formula [kW]

$$P = \frac{M_A \times n_{\max} \times 2 \times 3,14}{60 \times 1000}$$

- P = required power [kW]
 M_A = required drive moment [Nm]
 n_{\max} = maximum required rotational speed [rpm]

Drive Moment Formulas [Nm]

$$M_A = M_{\text{load}} + M_{\text{trans}} + M_{\text{rot}} + M_{\text{idle}}$$

$$M_{\text{load}} = \frac{F_x \times p}{2 \times 3,14 \times 1000}$$

$$M_{\text{trans}} = \frac{F_a \times p}{2 \times 3,14 \times 1000}$$

$$M_{\text{rot}} = j_{\text{sp}} \times \frac{2 \times 3,14 \times n_{\max} \times a \times 2}{V_{\max} \times 60 \times 1000}$$

$$M_{\text{idle}} = \text{see table for unit in question}$$

- M_A = required drive moment [Nm]
 M_{load} = moment as a result of various loads [N]
 M_{trans} = translational acceleration moment [Nm]
 M_{rot} = rotational acceleration moment [Nm]
 M_{idle} = carriage/rod idle torque [Nm]³
 F_x = feed force [N]
 p = screw lead [mm]
 F_a = maximum required acceleration force [N]
 j_{sp} = inertia of ball screw per meter [kgm²/m]⁴
 n_{\max} = maximum required rotational speed [rpm]
 a = maximum required acceleration [m/s²]
 V_{\max} = maximum required linear speed [m/s]

¹ The total mass is the mass of all masses to be moved (objects to be moved, carriage(s)/rod, screw).

² In vertical applications, the mass acceleration must be added to the acceleration due to gravity g (9,81 m/s²).

³ This value can be found in the carriage idle torque tables for each linear motion system.

⁴ This value can be found in the additional technical data tables.

Drive Calculations

Belt Driven Linear Motion Systems

Feed Force Formula [N]

$$F_x = m \times g \times \mu$$

Acceleration Force Formula [N]

$$F_a = m \times a$$

Power Formula [kW]

$$P = \frac{M_A \times n_{\max} \times 2 \times 3,14}{60 \times 1000}$$

Drive Moment Formulas [Nm]

$$M_A = M_{\text{load}} + M_{\text{trans}} + M_{\text{rot}} + M_{\text{idle}}$$

$$M_{\text{load}} = \frac{F_x \times d_o}{1000 \times 2}$$

$$M_{\text{trans}} = \frac{F_a \times d_o}{1000 \times 2}$$

$$M_{\text{rot}} = J_{\text{syn}} \times \frac{2 \times 3,14 \times n_{\max}}{60} \times \frac{a}{V_{\max}}$$

$$M_{\text{idle}} = \text{see table for unit in question}$$

F_x = feed force [N]
 m = total mass to be moved [kg] ¹
 g = acceleration due to gravity [m/s²]
 μ = friction factor specific for each unit

F_a = acceleration force [N]
 m = mass to be operated [kg]
 a = acceleration [m/s²] ²

P = required power [kW]
 M_A = required drive moment [Nm]
 n_{\max} = maximum required rotational speed [rpm]

M_A = required drive moment [Nm]
 M_{load} = moment as a result of various loads [N]
 M_{trans} = translational acceleration moment [Nm]
 M_{rot} = rotational acceleration moment [Nm]
 M_{idle} = carriage/rod idle torque [Nm] ³
 F_x = feed force [N]
 d_o = pulley diameter [mm] ⁴
 F_a = maximum required acceleration force [N]
 J_{syn} = idle torque of pulleys [kgm²] ⁵
 n_{\max} = maximum required rotational speed [rpm]
 a = maximum required acceleration [m/s²]
 V_{\max} = maximum required linear speed [m/s]

¹ The total mass is the mass of all masses to be moved (objects to be moved, carriage(s)/rod, belt).

² In vertical applications, the mass acceleration must be added to the acceleration due to gravity g (9,81 m/s²).

³ This value can be found in the carriage idle torque tables.

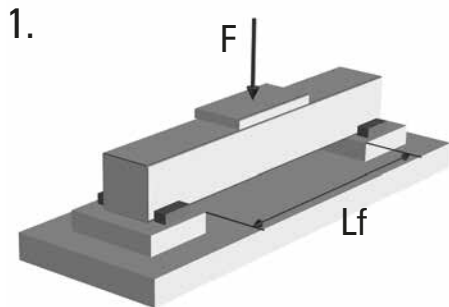
⁴ This value can be found in the performance specifications tables for each linear motion system.

⁵ This value can be found in the additional technical data tables.

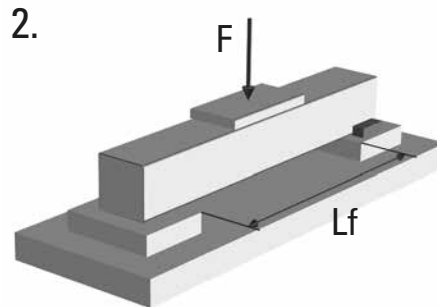
Deflection Calculations

How to calculate the deflection of the profile

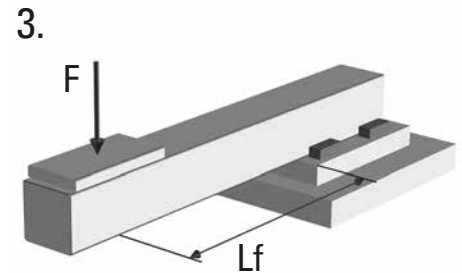
Load Cases



Profile supported in both ends.
Profile fixed at both sides.



Profile supported in both ends.
Profile fixed at one side.



Profile supported in one end.
Profile fixed at one side.

Permissible Profile Deflection Formula [mm]

$$f_h = L_f \times b$$

- f_h = permissible profile deflection [mm]
- L_f = length of profile being bent [mm]
- b = bending factor ¹

Profile Deflection Formulas [mm]

Load Case 1.

$$f_{max} = \frac{m'_{100} \times g \times L_f^4}{100 \times 384 \times EAI \times I_y} + \frac{(m_{ext} + m_c) \times g \times L_f^3}{192 \times EAI \times I_y}$$

Load Case 2.

$$f_{max} = \frac{m'_{100} \times g \times L_f^4}{100 \times 185 \times EAI \times I_y} + \frac{(m_{ext} + m_c) \times g \times L_f^3}{48 \times \sqrt{5} \times EAI \times I_y}$$

Load Case 3.

$$f_{max} = \frac{m'_{100} \times g \times L_f^4}{100 \times 8 \times EAI \times I_y} + \frac{(m_{ext} + m_c) \times g \times L_f^3}{3 \times EAI \times I_y}$$

- f_{max} = deflection of the profile [mm]
- m'_{100} = weight of every 100 mm of stroke [kg/mm]
- m_{ext} = external load on carriage [kg]
- m_c = weight of carriage(s) [kg] ²
- g = acceleration due to gravity [m/s²]
- EAI = elastic modulus of aluminium (70000 N/mm²)
- I_y = geometrical moment of inertia of the profile in Y direction [mm⁴] ¹

¹ This value can be found in the additional technical data tables.

² This value can be found in the performance specifications tables for each unit.

Conclusion Formulas

$f_h > f_{max}$ = deflection OK

$f_h < f_{max}$ = deflection not OK, L_f must be shorter

Deflection Calculations

Examples of calculations of the profile deflection

Example 1

Type of linear motion system:
WH80

Load case:
Case 1 - profile supported in both ends and fixed at both sides.

Load to be moved by carriage:
 $m_{ext} = 150$ kg

Distance between supports:
 $L_f = 600$ mm

Specific unit data:
 $m'_{100} = 0,93$ kg
 $m_c = 2,75$ kg
 $EAI = 70000$ N/mm²
 $I_y = 1,93 \times 10^6$ mm⁴
 $b = 0,0005$

Calculated values:
 $f_h = 0,3$ mm
 $f_{max} = 0,013$ mm

Conclusion:
 $f_h > f_{max} =$ deflection OK

Example 2

Type of linear motion system:
M55 (MF06B)

Load case:
Case 2 - profile supported in both ends and fixed at one side.

Load to be moved by carriage:
 $m_{ext} = 100$ kg

Distance between supports:
 $L_f = 600$ mm

Specific unit data:
 $m'_{100} = 0,53$ kg
 $m_c = 1,2$ kg
 $EAI = 70000$ N/mm²
 $I_y = 4,59 \times 10^5$ mm⁴
 $b = 0,0005$

Calculated values:
 $f_h = 0,3$ mm
 $f_{max} = 0,063$ mm

Conclusion:
 $f_h > f_{max} =$ deflection OK

Example 3

Type of linear motion system:
WM80

Load case:
Case 3 - profile supported and fixed at one end.

Load to be moved by carriage:
 $m_{ext} = 120$ kg

Distance between supports:
 $L_f = 400$ mm

Specific unit data:
 $m'_{100} = 1,08$ kg
 $m_c = 4,26$ kg
 $EAI = 70000$ N/mm²
 $I_y = 1,85 \times 10^6$ mm⁴
 $b = 0,0003$

Calculated values:
 $f_h = 0,12$ mm
 $f_{max} = 0,203$ mm

Conclusion:
 $f_h > f_{max} =$ deflection not OK

Ordering Keys

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guides

WM40S, WM40D, WM60S, WM60D, WM60X, WM80S, WM80D, WM120D

| | | | | | | | | |
|-----------|-------|-----|--------|--------|---|---|-------|----|
| Your Code | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Example | WM06D | 020 | -02545 | -03715 | A | Z | -0520 | S1 |

1. Type of unit

WM04S = WM40S unit with single ball nut
 WM04D = WM40D unit with double ball nuts
 WM06S = WM60S unit with single ball nut
 WM06D = WM60D unit with double ball nuts
 WM06X = WM60X unit with left/right screw
 WM08S = WM80S unit with single ball nut
 WM08D = WM80D unit with double ball nuts
 WM12D = WM120D unit with double ball nuts

2. Screw lead¹

005 = 5 mm
 010 = 10 mm
 020 = 20 mm
 040 = 40 mm
 050 = 50 mm

3. Maximum stroke (S_{max})

- = distance in mm

4. Total length of unit (L_{tot})

- = distance in mm

5. Drive shaft configuration²

A = single shaft without key way
 C = single shaft with key way
 G = double shafts, first without key way and second for encoder
 I = double shafts, first with key way and second for encoder

6. Type of carriage³

N = single standard carriage
 S = single short carriage
 L = single long carriage
 Z = double standard carriages
 Y = double short carriages
 M = double long carriages

7. Distance between double carriages

- 0000 = always for single carriages
 - = distance in mm

8. Protection option⁴

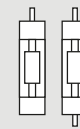
S1 = wash down protection (not available for WM04 units)

¹ See table below for available combinations of units and ball screw leads.

| Type of unit | Available screw leads [mm] | | | | |
|--------------|----------------------------|----|----|----|----|
| | 5 | 10 | 20 | 40 | 50 |
| WM04S | x | | | | |
| WM04D | x | | | | |
| WM06S | x | | x | | x |
| WM06D | x | | x | | x |
| WM06X | x | | | | |
| WM08S | x | x | x | | x |
| WM08D | x | x | x | | x |
| WM12D | x | x | x | x | |

² See below for the definition of shafts.

Single Double



³ See table below for available combinations of units and carriage types.

| Type of unit | Available carriage types | | | | | |
|--------------|--------------------------|---|---|---|---|---|
| | N | S | L | Z | Y | M |
| WM04S | x | | | x | | |
| WM04D | | | x | | | x |
| WM06S | | x | | | x | |
| WM06D | x | | x | x | | |
| WM06X | x | x | x | | | |
| WM08S | | x | | | x | |
| WM08D | x | | x | x | | |
| WM12D | x | | x | x | | |

⁴ Leave position blank if no additional protection is required.

Note! for ordering of options type EN, ES, KRG, RT, ADG and MGK, see accessory index on page 135.

Ordering Keys

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guides

WV60, WV80, WV120

| | | | | | | | | |
|-----------|-------|-----|--------|--------|---|---|-------|---|
| Your Code | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Example | WV08D | 020 | -02745 | -03295 | G | N | -0000 | |

1. Type of unit

WV06D = WV60 unit
WV08D = WV80 unit
WV12D = WV120 unit

2. Ball screw lead¹

005 = 5 mm
010 = 10 mm
020 = 20 mm
040 = 40 mm
050 = 50 mm

3. Maximum stroke (Smax)

-•••••= distance in mm

4. Total length of unit (L tot)

-•••••= distance in mm

5. Drive shaft configuration²

A = single shaft without key way
C = single shaft with key way
G = double shafts, first without key way and second for encoder
I = double shafts, first with key way and second for encoder

6. Type of carriage

N = single standard carriage

7. Distance between double carriages

- 0000 = always for single carriages

8. Protection option³

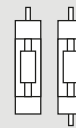
S1 = wash down protection

¹ See table below for available combinations of units and ball screw leads.

| Type of unit | Available screw leads [mm] | | | | |
|--------------|----------------------------|----|----|----|----|
| | 5 | 10 | 20 | 40 | 50 |
| WV60 | x | | x | | x |
| WV80 | x | x | x | | x |
| WV120 | x | x | x | x | |

² See below for the definition of shafts.

Single Double



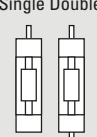
³ Leave position blank if no additional protection is required.

Note! for ordering of options type EN, ES, KRG, RT, ADG and MGK, see accessory index on page 135.

Ordering Keys

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guides

| MLSM60D, MLSM80D | | | | | | | |
|------------------|----------------|------------|---------------|---------------|----------|----------|--------------|
| Your Code | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Example | MLSM06D | 020 | -03800 | -04645 | C | L | -0000 |

| <p>1. Type of unit MLSM06D = MLSM60 unit MLSM08D = MLSM80 unit</p> <p>2. Ball screw lead 005 = 5 mm 010 = 10 mm 020 = 20 mm 040 = 40 mm 050 = 50 mm</p> <p>3. Maximum stroke (Smax) - ●●●●● = distance in mm</p> <p>4. Total length of unit (L tot) - ●●●●● = distance in mm</p> <p>5. Drive shaft configuration² A = single shaft without key way C = single shaft with key way G = double shafts, first without key way and second for encoder I = double shafts, first with key way and second for encoder</p> | <p>6. Carriage configuration N = single standard carriage L = single long carriage Z = double standard carriages</p> <p>7. Distance between double carriages - 0000 = always for single carriages - ●●●● = distance in mm</p> | <p>¹ See table below for available combinations of units and ball screw leads.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2" style="text-align: left;">Type of unit</th> <th colspan="5">Available screw leads [mm]</th> </tr> <tr> <th>5</th> <th>10</th> <th>20</th> <th>40</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>MLSM06D</td> <td>x</td> <td></td> <td>x</td> <td></td> <td>x</td> </tr> <tr> <td>MLSM08D</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> <td></td> </tr> </tbody> </table> <p>² See below for the definition of shafts.</p> <p style="text-align: center;">Single Double</p>  | Type of unit | Available screw leads [mm] | | | | | 5 | 10 | 20 | 40 | 50 | MLSM06D | x | | x | | x | MLSM08D | x | x | x | x | |
|--|--|--|--------------|----------------------------|----|--|--|--|---|----|----|----|----|---------|---|--|---|--|---|---------|---|---|---|---|--|
| Type of unit | Available screw leads [mm] | | | | | | | | | | | | | | | | | | | | | | | | |
| | 5 | 10 | 20 | 40 | 50 | | | | | | | | | | | | | | | | | | | | |
| MLSM06D | x | | x | | x | | | | | | | | | | | | | | | | | | | | |
| MLSM08D | x | x | x | x | | | | | | | | | | | | | | | | | | | | | |

Ordering Keys

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guides

M55, M75, M100

| | | | | | | | |
|-----------|-------------|-------------|----------|-----------|----------|------------|------------|
| Your Code | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Example | MF07 | K057 | C | 35 | S | 305 | +S1 |

1. Type of unit

MF06 = M55 unit
MF07 = M75 unit
MF10 = M100 unit

2. Ball screw type, lead and tolerance class²

K057 = ball nut, 5 mm, T7
K107 = ball nut, 10 mm, T7
K129 = ball nut, 12,7 mm, T9
K207 = ball nut, 20 mm, T7
K257 = ball nut, 25 mm, T7

3. Type of carriages

A = single standard carriage
C = double standard carriages

4. Distance between carriages (Lc)

00 = for all single standard carriage units
•• = distance in cm between carriages

5. Screw supports

X = no screw supports
S = single screw supports
D = double screw supports

6. Ordering length (L order)

••• = distance in cm

7. Protection option¹

+S1 = S1 wash down protection

¹ Leave position blank if no additional protection is required.

² See table below for available combinations of units and ball screw type, lead and tolerance.

| Ball screw type | Type of unit | | |
|-----------------|--------------|-----|------|
| | M55 | M75 | M100 |
| K057 | x | x | x |
| K107 | x | | x |
| K129 | | x | |
| K207 | x | x | |
| K257 | | | x |

Ordering Keys

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guides

2HB10, 2HB20

| Your Code | | | | | | | | | | | |
|-----------|-------|----|-------|------|---|-----|---|---|---|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Example | 2HB10 | HO | N1285 | -038 | N | 001 | A | 0 | A | 0 | 0 |

1. Type of unit

2HB10 = 2HB10 unit

2HB20 = 2HB20 unit

2. Ball screw diameter, lead and nut type

GO = 16 mm, 5 mm, preloaded (2HB10 only)

HO = 16 mm, 10 mm, preloaded (2HB10 only)

LO = 25 mm, 5 mm, preloaded (2HB20 only)

MO = 25 mm, 10 mm, preloaded (2HB20 only)

NO = 25 mm, 25 mm, preloaded (2HB20 only)

3. Ordering length (L)

N •••• = distance in mm

4. Y-distance

- 038 = standard distance in mm between motor end plate to first set of mounting holes on 2HB10

- 043 = standard distance in mm between motor end plate to first set of mounting holes on 2HB20

- •••• = custom distance in mm between motor end plate to first set of mounting holes

5. Brake option

N = no brake

B = brake

6. Motor flange ID

001 = NEMA 23

002 = NEMA 34

•••• = consult www.linearmotioneering.com for complete list of available standard motor flanges

7. Ball guide rail coating option

A = standard

D = duralloy

8. Ball guide carriage coating option

0 = standard

1 = duralloy

9. Profile cover option

A = none

B = bellows (bellows will reduce stroke length app. 28%)

C = shrouds

10. Hardware option

0 = alloy plated

1 = stainless steel

11. Home and end of stroke sensor option

0 = no sensors

1 = home sensor, NPN type

2 = end of stroke sensors, NPN type

3 = home and end of stroke sensors, NPN type

4 = home sensor, PNP type

5 = end of stroke sensors, PNP type

6 = home and end of stroke sensors, PNP type

Ordering Keys

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guides

2RB12, 2RB16

| Your Code | | | | | | | | | | | |
|-----------|-------|----|-------|------|---|-----|---|---|---|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Example | 2RB16 | JO | N1000 | -100 | N | 002 | B | 0 | A | 0 | 0 |

1. Type of unit

2RB12 = 2RB12 unit

2RB16 = 2RB16 unit

2. Ball screw diameter, lead and nut type

GO = 16 mm, 5 mm, preloaded (2RB12 only)

HO = 16 mm, 10 mm, preloaded (2RB12 only)

IO = 20 mm, 5 mm, preloaded (2RB16 only)

JO = 20 mm, 10 mm, preloaded (2RB16 only)

KO = 20 mm, 25 mm, preloaded (2RB16 only)

3. Ordering length (L)

N •••• = distance in mm

4. Y-distance

- 075 = standard distance in mm between motor end plate to first set of mounting holes on 2RB12

- 100 = standard distance in mm between motor end plate to first set of mounting holes on 2RB16

- •••• = custom distance in mm between motor end plate to first set of mounting holes

5. Brake option

N = no brake

B = brake

6. Motor flange ID

001 = NEMA 23

002 = NEMA 34

•••• = consult www.linearmotioneering.com for complete list of available standard motor flanges

7. Ball guide shaft coating option

A = standard, 60 Case

B = stainless steel (440C)

C = chrome plated

E = armoloy

8. Bearing option

0 = standard

1 = corrosion resistance

9. Profile cover option

A = none

B = bellows (bellows will reduce stroke length app. 28%)

10. Hardware option

0 = alloy plated

1 = stainless steel

11. Home and end of stroke sensor option

0 = no sensors

1 = home sensor, NPN type

2 = end of stroke sensors, NPN type

3 = home and end of stroke sensors, NPN type

4 = home sensor, PNP type

5 = end of stroke sensors, PNP type

6 = home and end of stroke sensors, PNP type

Ordering Keys

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guides

MS25, MS33

| Your Code | | | | | | | | | | | |
|-----------|------|----|-------|------|---|-----|---|---|---|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Example | MS25 | LC | N0300 | -056 | N | 505 | A | 0 | A | 0 | 0 |

1. Type of unit

MS25 = MS25 unit

MS33 = MS33 unit

2. Lead screw diameter, lead and nut type

LA = 0,25 inch, 0,025 in, preloaded

LB = 0,25 inch, 0,050 in, preloaded

LC = 0,25 inch, 0,062 in, preloaded

LD = 0,25 inch, 0,200 in, preloaded

LE = 0,25 inch, 0,250 in, preloaded

LF = 0,25 inch, 0,500 in, preloaded

LG = 0,25 inch, 1,000 in, preloaded

LH = 0,25 inch, 1,5 mm, preloaded

LI = 0,25 inch, 2,0 mm, preloaded

LJ = 0,25 inch, 3,0 mm, preloaded

3. Ordering length (L)

N•••• = distance in mm

4. Y-distance

- 056 = standard distance in mm between motor end plate to first set of mounting holes on MS25

- 075 = standard distance in mm between motor end plate to first set of mounting holes on MS33

- ••• = custom distance in mm between motor end plate to first set of mounting holes

5. Brake option

N = no brake

B = brake

6. Motor flange ID ¹

505 = NEMA 17

001 = NEMA 23

••• = consult www.linearmotioneering.com for complete list of available standard motor flanges

7. Linear guides shafting option

A = 60 case (1566)

B = stainless steel (440C)

C = chrome plated

E = armoloy

8. Bearing type option

0 = standard

1 = corrosion resistant

9. Profile cover option

A = none

B = bellows (bellows will reduce stroke length app. 28%)

10. Hardware option

0 = alloy plated

1 = stainless steel

11. Home and end of stroke limit switch option

7 = home position limit switch

8 = end of stroke limit switches

Ordering Keys

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guides

MS46L, MS46B

| | | | | | | | | | | | |
|-----------|------|----|-------|------|---|-----|---|---|---|----|----|
| Your Code | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Example | MS46 | BB | N0720 | -075 | N | 001 | A | 0 | A | 0 | 0 |

1. Type of unit

MS46 = MS46 unit

2. Type of screw, diameter, lead and nut type

LK = lead screw, 12 mm, 3 mm, preloaded

LL = lead screw, 12 mm, 10 mm, preloaded

LM = lead screw, 12 mm, 25 mm, preloaded

BP = ball screw, 12 mm, 5 mm, preloaded

BB = ball screw, 12 mm, 5 mm, non-preloaded

BQ = ball screw, 12 mm, 10 mm, preloaded

BR = ball screw, 12 mm, 10 mm, non-preloaded

3. Ordering length (L)

N •••• = distance in mm

4. Y-distance

- 075 = standard distance in mm between motor end plate to first set of mounting hole

- •••• = custom distance in mm

5. Brake option

N = no brake

B = brake

6. Motor flange ID

001 = NEMA 23

002 = NEMA 24

•••• = consult www.linearmotioneering.com for complete list of available standard motor flanges

7. Linear guides shafting option

A = 60 case (1566)

B = stainless steel (440C)

C = chrome plated

E = armoloy

8. Bearing type option

0 = standard

1 = corrosion resistant

9. Profile cover option

A = none

B = bellows (bellows will reduce stroke length app. 28%)

10. Hardware option

0 = alloy plated

1 = stainless steel

11. Home and end of stroke limit switch option

7 = home position limit switch

8 = end of stroke limit switches

Ordering Keys

Linear Motion Systems with Lead or Ball Screw Drive and Ball Guides

2DB08, 2DB12, 2DB16

| Your Code | | | | | | | | | | | |
|-----------|-------|----|-------|------|---|-----|---|---|---|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Example | 2DB12 | FO | N0250 | -300 | N | 002 | A | 0 | A | 0 | 0 |

1. Type of unit

2DB08 = 2DB08 unit

2DB12 = 2DB12 unit

2DB16 = 2DB16 unit

2. Screw type, diameter, lead and nut type

AO = leadscrew, 0.375 in, 0.100 in, non-preloaded (2DB08 only)

BO = leadscrew, 0.375 in, 0.250 in, non-preloaded (2DB08 only)

CO = leadscrew, 0.375 in, 0.500 in, non-preloaded (2DB08 only)

DO = leadscrew, 0.375 in, 1.000 in, non-preloaded (2DB08 only)

FO = ballscrew, 0.631 in, 0.200 in, non-preloaded (2DB12 only)

VO = ballscrew, 0.631 in, 0.200 in, preloaded (2DB12 only)

QJ = ballscrew, 0.500 in, 0.500 in, preloaded (2DB12 only)

GO = ballscrew, 0.750 in, 0.200 in, non-preloaded (2DB16 only)

WO = ballscrew, 0.750 in, 0.200 in, preloaded (2DB16 only)

RJ = ballscrew, 0.750 in, 0.500 in, preloaded (2DB16 only)

LJ = ballscrew, 0.631 in, 1.0 in, preloaded (2DB16 only)

DO = ballscrew, 20 mm, 5 mm, preloaded (2DB16 only)

3. Ordering length (L)

N•••• = distance in inch (e.g. 0250 = 25 inch)

4. Y-distance

- 200 = standard distance in inch between motor end plate to first set of mounting holes for 2DB08 (e.g. 200 = 2 in)

- 300 = standard distance in inch between motor end plate to first set of mounting holes for 2DB12 and 2DB16 (e.g. 300 = 3 in)

- ••• = custom distance in inch between motor end plate to first set of mounting holes

5. Brake option

N = no brake

B = brake

6. Motor flange ID

001 = NEMA 23

002 = NEMA 34

••• = consult www.linearmotioneering.com for complete list of available standard motor flanges

7. Ball guide shaft coating option

A = standard, 60 Case

B = stainless steel (440C)

C = chrome plated

E = armoloy

8. Bearing option

0 = standard

1 = corrosion resistance

9. Profile cover option

A = none

B = bellows (bellows will reduce stroke length app. 28%)

10. Hardware option

0 = alloy plated

1 = stainless steel

11. Home and end of stroke sensor option

0 = no sensors

1 = home sensor, NPN type

2 = end of stroke sensors, NPN type

3 = home and end of stroke sensors, NPN type

4 = home sensor, PNP type

5 = end of stroke sensors, PNP type

6 = home and end of stroke sensors, PNP type

Ordering Keys

Linear Motion Systems with Ball Screw Drive and Slide Guides

M55, M75, M100

| | | | | | | | |
|-----------|-------------|-------------|----------|-----------|----------|------------|------------|
| Your Code | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Example | MG07 | K057 | C | 35 | S | 305 | +S1 |

1. Type of unit

MG06 = M55 unit
MG07 = M75 unit
MG10 = M100 unit

2. Ball screw type, lead and tolerance class²

K057 = ball nut, 5 mm, T7
K107 = ball nut, 10 mm, T7
K129 = ball nut, 12,7 mm, T9
K207 = ball nut, 20 mm, T7
K257 = ball nut, 25 mm, T7

3. Type of carriages

A = single standard carriage
C = double standard carriages

4. Distance between carriages (Lc)

00 = for all single standard carriage units
•• = distance in cm between carriages

5. Screw supports

X = no screw supports
S = single screw supports
D = double screw supports

6. Ordering length (L order)

••• = distance in cm

7. Protection option¹

+S1 = S1 wash down protection

¹ Leave position blank if no additional protection is required.

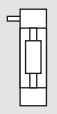
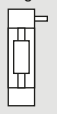
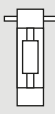
² See table below for available combinations of units and ball screw type, lead and tolerance.

| Ball screw type | Type of unit | | |
|-----------------|--------------|-----|------|
| | M55 | M75 | M100 |
| K057 | x | x | x |
| K107 | x | | x |
| K129 | | x | |
| K207 | x | x | |
| K257 | | | x |

Ordering Keys

Linear Motion Systems with Belt Drive and Ball Guides

| WH40 | | | | | | |
|-----------|-----------------|---------------|---------------|----------|----------|--------------|
| Your Code | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Example | WH04Z100 | -01400 | -01755 | H | L | -0400 |

| | | |
|--|---|---|
| <p>1. Type of unit WH04Z100 = WH40 unit</p> <p>2. Maximum stroke (Smax) - ••••• = distance in mm</p> <p>3. Total length of unit (L tot) - ••••• = distance in mm</p> <p>4. Drive shaft configuration¹ A = shaft on left side without key way B = shaft on right side without key way C = shaft on left side with key way D = shaft on right side with key way</p> | <p>E = shaft on left side without key way and shaft on right side with key way F = shaft on left side with key way and shaft on right side without key way G = shaft on left side without key way and shaft on right side for encoder H = shaft on left side for encoder and shaft on right side without key way I = shaft on left side with key way and shaft on right side for encoder J = shaft on left side for encoder and shaft on right side with key way L = shaft on both sides without key way M = shaft on both sides with key way W = hollow shaft on both sides with clamping unit</p> | <p>5. Carriage configuration N = single standard carriage L = single long carriage Z = double standard carriages</p> <p>6. Distance between double carriages - 0000 = always for single carriages - ••••• = distance in mm</p> <p>¹ See below for the definition of shafts.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>Left</p>  </div> <div style="text-align: center;"> <p>Right</p>  </div> <div style="text-align: center;"> <p>Both</p>  </div> </div> |
|--|---|---|

Note! for ordering of options type EN, ES, KRG, RT, ADG and MGK, see accessory index on page 133.

Ordering Keys

Linear Motion Systems with Belt Drive and Ball Guides

WM60Z, WM80Z

| | | | | | | |
|-----------|----------|--------|--------|---|---|-------|
| Your Code | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Example | WM08Z170 | -02545 | -03715 | D | L | -0000 |

1. Type of unit

WM06Z120 = WM60Z unit

WM08Z170 = WM80Z unit

2. Maximum stroke (Smax)

-••••• = distance in mm

3. Total length of unit (L tot)

-••••• = distance in mm

4. Drive shaft configuration¹

A = shaft on left side without key way

B = shaft on right side without key way

C = shaft on left side with key way

D = shaft on right side with key way

E = shaft on left side without key way and shaft on right side with key way

F = shaft on left side with key way and shaft on right side without key way

G = shaft on left side without key way and shaft on right side for encoder

H = shaft on left side for encoder and shaft on right side without key way

I = shaft on left side with key way and shaft on right side for encoder

J = shaft on left side for encoder and shaft on right side with key way

L = shaft on both sides without key way

M = shaft on both sides with key way

V = hollow shaft on both sides for Micron DT/DTR planetary gear option

5. Carriage configuration²

N = single standard carriage

S = single short carriage

L = single long carriage

Z = double standard carriages

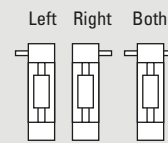
Y = double short carriages

6. Distance between double carriages

- 0000 = always for single carriages

-••••• = distance in mm

¹ See below for the definition of shafts.



² See table below for available combinations of units and carriage types.

| Type of unit | Available carriage types | | | | |
|--------------|--------------------------|---|---|---|---|
| | N | S | L | Z | Y |
| WM06Z | | x | | | x |
| WM08Z | x | x | x | x | x |

Ordering Keys

Linear Motion Systems with Belt Drive and Ball Guides

M55, M75, M100

| | | | | | | |
|-----------|-----------------|----------|-----------|----------|------------|------------|
| Your Code | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Example | MF06B105 | A | 00 | X | 450 | +S1 |

1. Type of unit

MF06B105 = M55 unit
 MF07B130 = M75 unit
 MF10B176 = M100 unit

2. Type of carriages

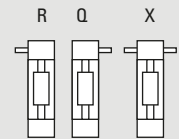
A = single standard carriage
 C = double standard carriages

3. Distance between carriages (Lc)

00 = for all single standard carriage units
 •• = distance in cm between carriages

4. Drive shaft configuration

R = shaft on the side as shown in picture
 Q = shaft on the side as shown in picture
 X = shaft on both sides



5. Ordering length (L order)

••• = distance in cm

6. Protection option¹

+S1 = S1 wash down protection

¹ Leave blank if no protection option required.

Ordering Keys

Linear Motion Systems with Belt Drive and Ball Guides

MLSM80Z

| | | | | | | |
|-----------|------------|--------|--------|---|---|-------|
| Your Code | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Example | MLSM08Z200 | -05000 | -05570 | A | N | -0000 |

1. Type of unit

MLSM08Z200 = MLSM80 unit

2. Maximum stroke (Smax)

-..... = distance in mm

3. Total length of unit (L tot)

-..... = distance in mm

4. Drive shaft configuration¹

A = shaft on left side without key way
 B = shaft on right side without key way
 C = shaft on left side with key way
 D = shaft on right side with key way
 E = shaft on left side without key way and shaft on right side with key way
 F = shaft on left side with key way and shaft on right side without key way
 G = shaft on left side without key way and shaft on right side for encoder
 H = shaft on left side for encoder and shaft on right side without key way
 I = shaft on left side with key way and shaft on right side for encoder
 J = shaft on left side for encoder and shaft on right side with key way
 L = shaft on both sides without key way
 M = shaft on both sides with key way

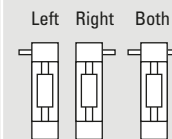
5. Carriage configuration

N = single standard carriage
 L = single long carriage
 Z = double standard carriages

6. Distance between double carriages

- 0000 = always for single carriages
 -..... = distance in mm

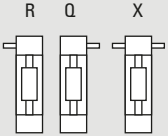
¹ See below for the definition of shafts.



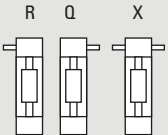
Ordering Keys

Linear Motion Systems with Belt Drive and Slide Guides

| M50 | | | | |
|-----------|-----------------|------------|----------|------------|
| Your Code | | | | |
| | 1 | 2 | 3 | 4 |
| Example | MG05B130 | A00 | R | 560 |

| | |
|--|--|
| <p>1. Type of unit MG05B130 = M50 unit</p> <p>2. Type of carriage A00 = single standard carriage</p> | <p>3. Drive shaft configuration R = shaft on the side as shown in picture Q = shaft on the side as shown in picture X = shaft on both sides</p>  <p>4. Ordering length (L order) ••• = distance in cm</p> |
|--|--|

| M55, M75, M100 | | | | | | |
|----------------|-----------------|----------|-----------|----------|------------|------------|
| Your Code | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Example | MG06B105 | A | 00 | X | 450 | +S2 |

| | |
|---|--|
| <p>1. Type of unit MG06B105 = M55 unit MG07B130 = M75 unit MG10B176 = M100 unit</p> <p>2. Type of carriages A = single standard carriage C = double standard carriages</p> <p>3. Distance between carriages (Lc) 00 = for all single standard carriage units •• = distance in cm between carriages</p> | <p>4. Drive shaft configuration R = shaft on the side as shown in picture Q = shaft on the side as shown in picture X = shaft on both sides</p>  <p>5. Ordering length (L order) ••• = distance in cm</p> <p>6. Protection option¹ +S1 = S1 wash down protection +S2 = S2 enhanced wash down protection</p> <p>¹ Leave blank if no protection option required.</p> |
|---|--|

Ordering Keys

Linear Motion Systems with Belt Drive and Wheel Guides

WH50, WH80, WH120

| Your Code | | | | | | | |
|-----------|----------|--------|--------|---|---|-------|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Example | WH08Z200 | -02300 | -02710 | J | L | -0000 | S1 |

1. Type of unit

WH05Z120 = WH50 unit
WH08Z200 = WH80 unit
WH12Z260 = WH120 unit

2. Maximum stroke (Smax)

- ●●●●● = distance in mm

3. Total length of unit (L tot)

- ●●●●● = distance in mm

4. Drive shaft configuration¹

A = shaft on left side without key way
B = shaft on right side without key way
C = shaft on left side with key way
D = shaft on right side with key way
E = shaft on left side without key way and shaft on right side with key way
F = shaft on left side with key way and shaft on right side without key way
G = shaft on left side without key way and shaft on right side for encoder
H = shaft on left side for encoder and shaft on right side without key way
I = shaft on left side with key way and shaft on right side for encoder
J = shaft on left side for encoder and shaft on right side with key way
K = hollow shaft on both sides without clamping unit
L = shaft on both sides without key way
M = shaft on both sides with key way
V = hollow shaft on both sides for Micron DT/DTR planetary gear option
W = hollow shaft on both sides with clamping unit

7. Protection option²

S1 = wash down protection

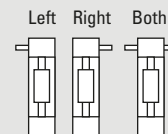
5. Carriage configuration

N = single standard carriage
L = single long carriage
Z = double standard carriages

6. Distance between double carriages

- 0000 = always for single carriages
- ●●●●● = distance in mm

¹ See below for the definition of shafts.



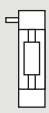
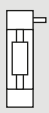
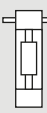
² Leave position blank if no additional protection is required.

Note! for ordering of options type EN, ES, KRG, RT, ADG and MGK, see accessory index on page 135.

Ordering Keys

Linear Motion Systems with Belt Drive and Wheel Guides

| MLSH60Z | | | | | | |
|-----------|-------------------|---------------|---------------|----------|----------|--------------|
| Your Code | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Example | MLSH06Z135 | -04500 | -05580 | D | Z | -0600 |

| | | |
|---|---|---|
| <p>1. Type of unit MLSH06Z135 = MLSH60 unit</p> <p>2. Maximum stroke (Smax) - = distance in mm</p> <p>3. Total length of unit (L tot) - = distance in mm</p> | <p>4. Drive shaft configuration¹ A = shaft on left side without key way B = shaft on right side without key way C = shaft on left side with key way D = shaft on right side with key way E = shaft on left side without key way and shaft on right side with key way F = shaft on left side with key way and shaft on right side without key way G = shaft on left side without key way and shaft on right side for encoder H = shaft on left side for encoder and shaft on right side without key way I = shaft on left side with key way and shaft on right side for encoder J = shaft on left side for encoder and shaft on right side with key way L = shaft on both sides without key way M = shaft on both sides with key way</p> | <p>5. Carriage configuration N = single standard carriage L = single long carriage Z = double standard carriages</p> <p>6. Distance between double carriages - 0000 = always for single carriages - = distance in mm</p> <p>¹ See below for the definition of shafts.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>Left</p>  </div> <div style="text-align: center;"> <p>Right</p>  </div> <div style="text-align: center;"> <p>Both</p>  </div> </div> |
|---|---|---|

Ordering Keys

Linear Lifting Units

WHZ50, WHZ80

| | | | | | | | |
|-----------|-----------|--------|--------|---|---|-------|---|
| Your Code | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Example | WHZ05Z120 | -01000 | -01410 | A | N | -0000 | |

1. Type of unit

WHZ05Z120 = WHZ50 unit
WHZ08Z200 = WHZ80 unit

2. Maximum stroke (Smax)

-••••• = distance in mm

3. Total length of unit (L tot)

-••••• = distance in mm

4. Drive shaft configuration¹

A = shaft on left side without key way
B = shaft on right side without key way
C = shaft on left side with key way
D = shaft on right side with key way
E = shaft on left side without key way and shaft on right side with key way
F = shaft on left side with key way and shaft on right side without key way
G = shaft on left side without key way and shaft on right side for encoder
H = shaft on left side for encoder and shaft on right side without key way
I = shaft on left side with key way and shaft on right side for encoder
J = shaft on left side for encoder and shaft on right side with key way
L = shaft on both sides without key way
M = shaft on both sides with key way
V = hollow shaft on both sides for Micron DT/DTR planetary gear option
W = hollow shaft on both sides with clamping unit

5. Carriage configuration

N = single standard carriage
L = single long carriage
Z = double standard carriages

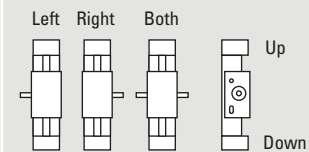
6. Distance between double carriages

-0000 = always for single carriages
-••••• = distance in mm

7. Protection option²

S1 = wash down protection

¹ See below for the definition of shafts and up and down.



² Leave position blank if no additional protection is required.

Note! for ordering of options type EN, ES, KRG, RT, ADG and MGK, see accessory index on page 135.

Z2, Z3

| | | | | |
|-----------|-------|-------|------|-----|
| Your Code | | | | |
| | 1 | 2 | 3 | 4 |
| Example | MGZ3K | 25259 | -250 | 450 |

1. Type of unit

MGZ2K = Z2 unit
MGZ3K = Z3 unit

2. Ball screw diameter, lead and tolerance class

25109 = 25 mm, 10 mm, T9
25259 = 25 mm, 25 mm, T9
32207 = 32 mm, 20 mm, T7

3. Minimum retracted length (L min)

-•••• = distance in cm

4. Maximum extended length (L max)

•••• = distance in cm

Ordering Keys

Linear Rod Units

WZ60, WZ80

| | | | | | | |
|-----------|-------|----|--------|--------|---|---|
| Your Code | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Example | WZ06S | 20 | -00350 | -00780 | C | N |

1. Type of unit

WZ06 = WZ60 unit
WZ08 = WZ80 unit

2. Ball screw lead

05 = 5 mm
10 = 10 mm
20 = 20 mm
50 = 50 mm

3. Maximum stroke (Smax)

-••••• = distance in mm

4. Total length of unit (L tot)

-•••• = distance in mm

5. Drive shaft configuration

A = shaft without key way
C = shaft with key way

6. Extension tube configuration

N = standard

¹ See table below for available combinations of units and screw leads.

| Type of unit | Available screw leads [mm] | | | |
|--------------|----------------------------|----|----|----|
| | 5 | 10 | 20 | 50 |
| WZ06 | x | | x | x |
| WZ08 | x | x | x | x |

Note! for ordering of options type EN, ES, KRG, RT and MGK, see accessory index on page 135.

Ordering Keys

Non Driven Linear Motion Systems

WH40N, WH50N, WH80N, WH120N

| | | | | | | |
|-----------|----------|--------|--------|---|---|-------|
| Your Code | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Example | WH04N000 | -04500 | -04640 | K | N | -0000 |

| | | |
|--|---|---|
| <p>1. Type of unit WH04N000 = WH40N unit WH05N000 = WH50N unit WH08N000 = WH80N unit WH12N000 = WH120N unit</p> | <p>2. Maximum stroke (Smax) - ••••• = distance in mm</p> <p>3. Total length of unit (L tot) - ••••• = distance in mm</p> <p>4. Drive shaft configuration¹ K = no shaft</p> | <p>5. Carriage configuration N = single standard carriage L = single long carriage Z = double standard carriages</p> <p>6. Distance between double carriages - 0000 = always for single carriages - ••••• = distance in mm</p> |
|--|---|---|

WM40N, WM60N, WM80N, WM120N

| | | | | | | |
|-----------|----------|--------|--------|---|---|-------|
| Your Code | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Example | WM08N000 | -07010 | -07210 | K | N | -0000 |

| <p>1. Type of unit WM04N000 = WM40N unit WM06N000 = WM60N unit WM08N000 = WM80N unit WM12N000 = WM120N unit</p> <p>2. Maximum stroke (Smax) - ••••• = distance in mm</p> <p>3. Total length of unit (L tot) - ••••• = distance in mm</p> | <p>4. Drive shaft configuration K = no shaft</p> <p>5. Type of carriage¹ N = single standard carriage S = single short carriage L = single long carriage Z = double standard carriages Y = double short carriages</p> <p>6. Distance between double carriages - 0000 = always for single carriages - ••••• = distance in mm</p> | <p>¹ See table below for available combinations of units and carriage types.</p> <table border="1"> <thead> <tr> <th rowspan="2">Type of unit</th> <th colspan="5">Available carriage types</th> </tr> <tr> <th>N</th> <th>S</th> <th>L</th> <th>Z</th> <th>Y</th> </tr> </thead> <tbody> <tr> <td>WM04N000</td> <td>x</td> <td></td> <td>x</td> <td>x</td> <td></td> </tr> <tr> <td>WM06N000</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> </tr> <tr> <td>WM08N000</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> <td>x</td> </tr> <tr> <td>WM12N000</td> <td>x</td> <td></td> <td>x</td> <td>x</td> <td></td> </tr> </tbody> </table> | Type of unit | Available carriage types | | | | | N | S | L | Z | Y | WM04N000 | x | | x | x | | WM06N000 | x | x | x | x | x | WM08N000 | x | x | x | x | x | WM12N000 | x | | x | x | |
|---|---|--|--------------|--------------------------|---|--|--|--|---|---|---|---|---|----------|---|--|---|---|--|----------|---|---|---|---|---|----------|---|---|---|---|---|----------|---|--|---|---|--|
| Type of unit | Available carriage types | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | N | S | L | Z | Y | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WM04N000 | x | | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WM06N000 | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WM08N000 | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WM12N000 | x | | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Ordering Keys

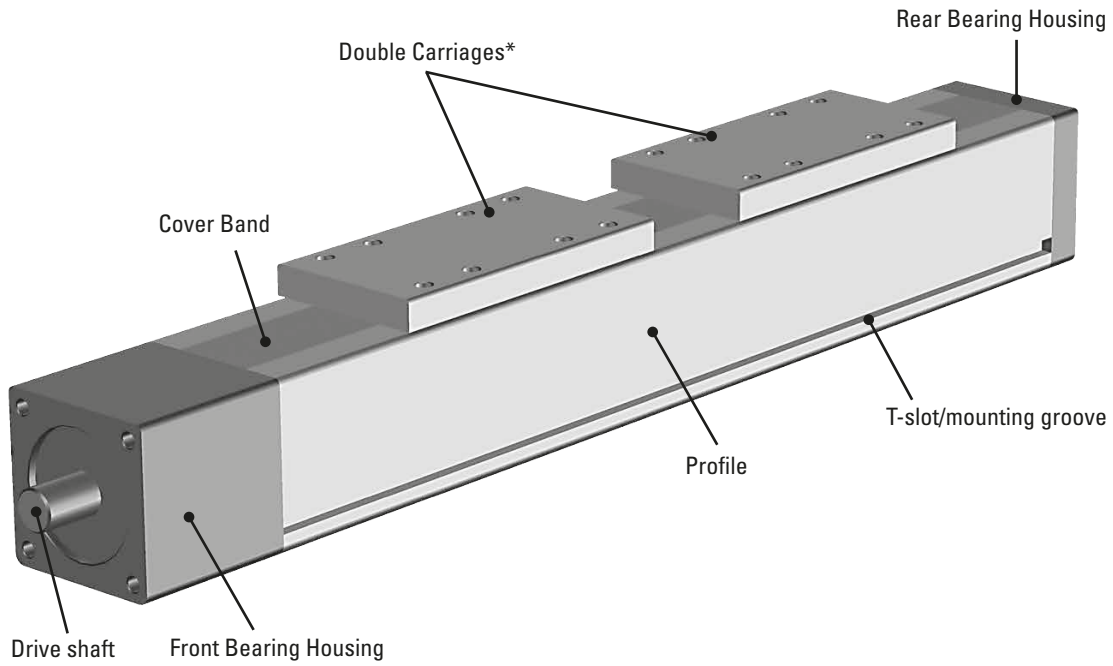
Non Driven Linear Motion Systems

| M75N, M100N | | | | | | |
|--|-----------------|---|-----------|--|------------|---|
| Your Code | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Example | MG10N000 | A | 00 | X | 450 | |
| 1. Type of unit MG07N000 = M75N unit with slide guides MG10N000 = M100N unit with slide guides MF07N000 = M75N unit with ball guides MF10N000 = M100N unit with ball guides | | 4. Screw supports X = no screw supports | | ¹ Leave blank if no protection option required. | | |
| 2. Type of carriages A = single standard carriage C = double standard carriages | | 5. Ordering length (L order) ••• = distance in cm | | | | |
| 3. Distance between carriages (Lc) 00 = for all single standard carriage units •• = distance in cm between carriages | | 6. Protection option¹ +S1 = wash down protection | | | | |

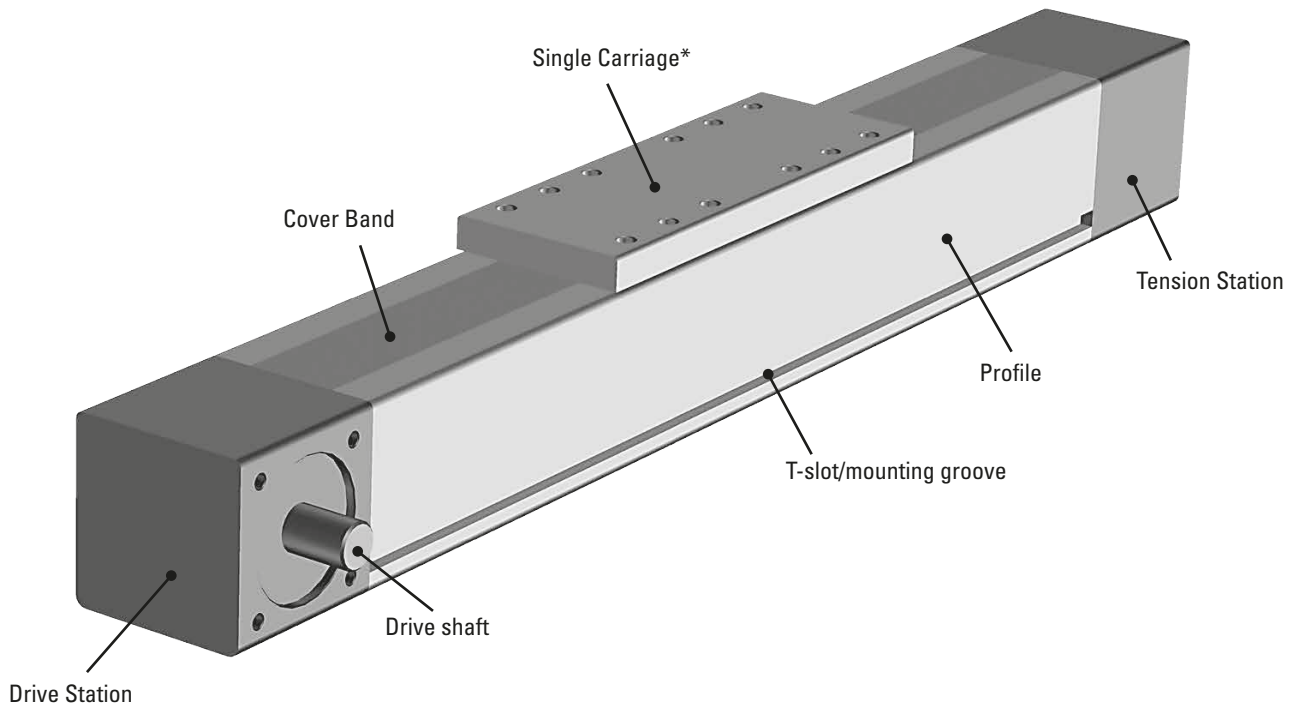
Terminology

Basic Linear Motion System Terminology

Screw Driven Unit



Belt Driven Unit



* Both screw and belt driven units can have single or double carriages.

Glossary

A - Belt D

Acceleration

Acceleration is a measure of the rate of speed change going from standstill (or a lower speed) to a higher speed. Please contact customer service if your application is critical to which acceleration rate is acceptable or needed.

Accuracy

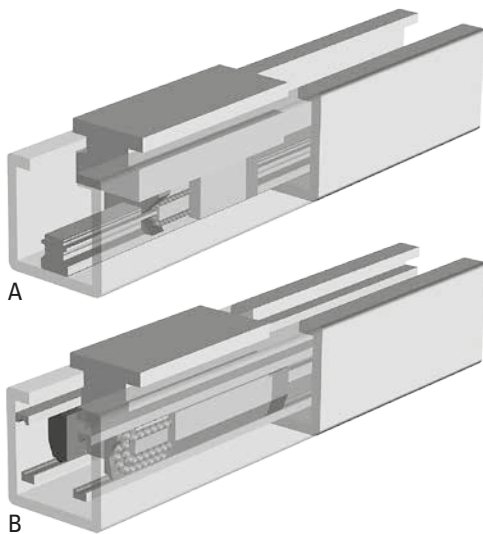
There are several types of accuracy and many different factors that will affect the overall accuracy of a system. Also see "Repeatability", "Positioning Accuracy", "Resolution", "Lead Accuracy" and "Backlash".

Backlash

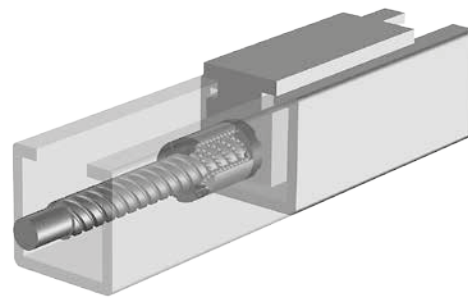
Backlash is the stack up of tolerances (play) within the leadscrew/belt transmission assembly and gearing which creates a dead band when changing directions. The result is that the motor can rotate some before any motion can be seen on the carriage when reversing the direction of the motor rotation. The backlash varies depending of the linear motion system model.

Ball Guides

A ball guide consists of a ball rail and a ball bushing. The ball rail is made of hardened steel and runs along the inside of the profile. The ball bushing is attached to the carriage of the unit and contains balls that roll against the rail. The balls in the bushing can be recirculating or have fixed ball positions depending on the type of ball guide. The recirculating type has a longer life and better load capability while the fixed type typically is much smaller. Thomson uses three major types of ball guides in its linear motion systems. Either the compact single rail type with recirculating ball bushing (A), the stronger double rail type also with recirculating ball bushings (B) or the fixed ball position ball bushings type (not shown) which require very little space and are used in the smallest units. Ball guides offer high accuracy, high loads and medium speed.



A ball screw is made up of a rotating screw and a moving ball nut. The ball nut is attached to the carriage of the unit. It does not have a normal thread, instead balls circulate inside the nut making it work as an efficient ball bearing that travels along the screw. Ball screws come in a large variety of leads, diameters and tolerance classes. The tolerance class (T3, T5, T7 or T9) indicates the lead tolerance of the screw. The lower the number, the higher the tolerance. High load capability and high accuracy are typical features of ball screw driven units.



Bearing Housing

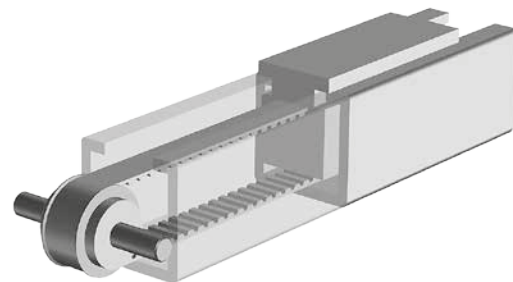
Screw driven units has two bearing housings, front and rear. The front bearing housing has a drive shaft while the rear has none. Sometimes however the rear housing can have an optional output shaft which is used to connect to an encoder.

Bell House Flange

A bell house flange is used when a motor should be connected directly to the drive shaft of a linear motion system, i.e when it is direct driven. The bell house has the bolt pattern of the motor flange in one end and the bolt pattern of the drive shaft flange in the other while the two shafts are joined by a coupling. Also see "Direct Drive".

Belt Drive

A belt drive consists of a toothed belt which is attached to the carriage of the unit. The belt runs between two pulleys positioned at either end of the profile. One pulley is attached to the motor via the drive shaft in the drive station while the other is mounted in a tension station. The belts are made of plastic reinforced with steel cords. High speeds, long stroke, low noise and low overall weight are typical features of belt driven units



Ball Screw Drive

Glossary

Belt G - C

Belt Gear

A belt gear consists of a timing belt that runs between two pulley wheels of different diameters. The difference between the diameters determines the gear ratio. Belt gears are quiet, have medium accuracy and require no maintenance but are susceptible to belt breakage under overload conditions.

Brake

None of the units are equipped with a brake or are self-locking which means that a vertical unit will drop the carriage/load if no external brake (such as a brake in the motor, etc.) is applied to the drive shaft. In the case of belt driven units care must be taken as the carriage/load will drop immediately in the case of a belt breakage. This is particularly important in vertical applications. You also may want to incorporate a brake in to the system to ensure fast and secure stops at an emergency stop or a power failure. In this case the brake should be of the failsafe type, i.e. a brake that is engaged when power is off and lifted when it is on.

Carriage

The carriage is the moving member which travel along the profile of the unit to which the load is attached. Some units can have multiple carriages in order to distribute the weight of the load over a greater distance, this will however reduce the available stroke for a given profile length. There are also units having the option of short or long carriage. The short can carry less weight than a standard one but has a slightly longer stroke for a given profile length while the longer works the other way around. It is possible to fix the carriage(s) to the foundation and let the profile act as the moving member if so desired. This is often the case in vertical applications where you let the profile lift and lower the load.

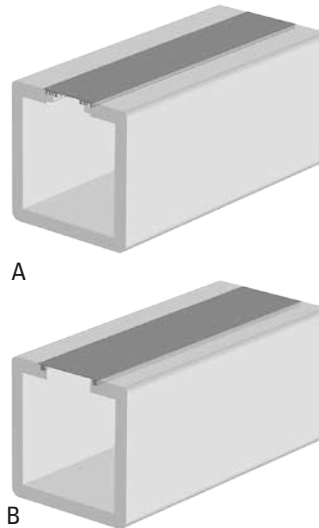
CE Certificate

Linear motion systems do not need and do therefore not have any CE certification. All Thomson linear motion systems are however designed in accordance with the CE regulations and comes with a manufacturers declaration to prove this. Once the linear motion system is used or made in to a machine it is the responsibility of the end customer to make sure the entire machine that the linear motion system is a part of is in accordance with the applicable CE regulations, produce the documents that proves this and apply a CE mark to the machine.

Cover Band

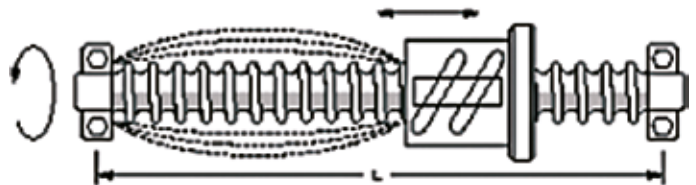
Cover bands are used on some units to protect them from the ingress of foreign objects through the opening in the profile where the carriage runs and can be made of plastic (A) or stainless steel (B). In the case of plastic the cover band seals the profile by snapping into small grooves running along the carriage opening. In the case of stainless steel the cover band seal the profile magnetically using magnet strips mounted on each side of the carriage opening. Some units also have a self-adjusting

cover band tensioning mechanism that eliminates any slack in the cover band that can occur from temperature changes, thus improving the sealing degree and the expected life of the cover band.



Critical Speed

All ball screws have a critical speed where the screw starts to vibrate and eventually bend or warp the screw. The exact limit is a function of how long the screw is and the speed. For some units this means that the allowed maximum speed found in the performance specifications can be higher than the critical speed when the stroke exceeds a certain distance. In this case, either the speed must be reduced to the critical speed, the amount of stroke must be reduced, or you must use the screw support option if the unit in question allows this. Otherwise you must select another unit that can manage the speed at that stroke. The critical speed limits can be found in the "Critical Speed" diagrams on the product pages of the units that this concern.



Customization

Despite the large range of linear motion systems offered by Thomson you may not find the exact unit to suit your application. But whatever your need is, Thomson is ready to help you to customize a unit according to your requirements. Please contact customer service for more information.

Cycle

One cycle is when the carriage has travelled back and forth over the complete stroke of the unit one time.

Glossary

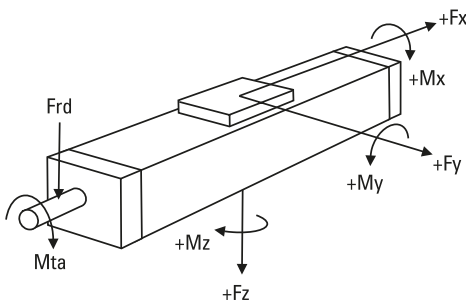
D - E

Deceleration

Deceleration is a measure of the rate of speed change going from a higher speed to a lower speed (or standstill). Please contact customer service if your application is critical to which deceleration rate is acceptable or needed.

Definition of Forces

The designations of the forces that acts on the unit are defined on the product page of each unit in the "Definition of Forces" drawing (see example below). Please always use the same definitions whenever communicating with Thomson.



Deflection of the Profile

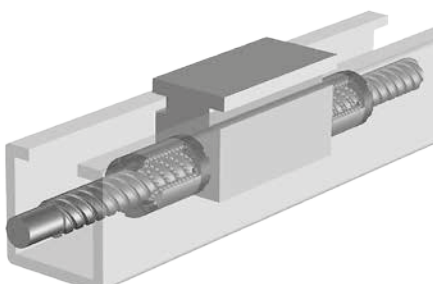
Some units require support along the whole profile whilst some are self supporting over a specified span. Further details can be found on the product data pages. The recommended support intervals should be followed to minimise deflection of the unit. The maximum distance between the support points is shown on the product data pages. The deflection of the unit can also be calculated using the information in the "Additional data and calculations" section.

Direct Drive

Direct drive means that there is no gearing between the motor and the drive shaft of the linear motion system. Instead the motor is connected to the unit directly via a coupling and an bell house adapter flange. Also see "Bell House Flange".

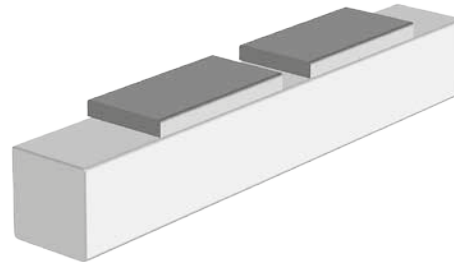
Double Ball Nuts

Using double ball nuts will increase the repeatability of the unit. The ball nuts are installed so that they are pre-tensioned against each other eliminating the play between the nuts and the screw. A double nut unit will have a slightly shorter stroke for a given overall length.



Double Carriages

Double carriage units have two carriages which gives them higher load capabilities than single carriage units. When ordering a double carriage unit the distance between the two carriages needs to be defined. This distance is called LA or Lc depending on the model.



Drive Shaft

The drive shaft is the shaft to which the motor is connected, either directly, via a bell house flange or via a gear box. There are many sizes and types of drive shafts, such as shafts with or without key way or hollow shafts, depending on the type and size of the unit. Belt driven units can often have two drive shafts (same or different type and size), one on each side of the drive station, while screw driven only have one pointing out of the end of the unit. Customized drive shafts are possible, please contact customer service for more information.

Drive Station

The drive station is the mechanical assembly in one of the ends of a belt driven unit where the drive shaft is situated.

Duty Cycle

All units are designed for a 100% duty cycle. However, where the unit runs at extreme load, speed, acceleration and temperature or for long operating periods the expected life time may be reduced.

Encoder Feedback

Encoders provide a digital output signal in the form of a square shaped pulse train that can be used to determine the position of the extension tube. The encoder signal in a servo motor system is connected to the motion control so that it can control the servo drive and hence close the position feedback loop.

End of Stroke Limit Switches

If a unit runs at speed to the ends of its stroke there is a risk of damage. Damage can be prevented by using end of stroke limit switches to detect and engage a brake and/or cut power to the motor when the unit nears the end of the unit. You must ensure that there is sufficient distance between the end of stroke limit switch and the end of the unit, to allow the carriage to come to a complete stop before colliding with the end. The required stopping distance depends on the speed and the load and will have to be calculated for each application. The stopping distance must be taken into account when defining the necessary stroke.

Glossary

G - M

Guides

Guides are in essence a form of linear bearings on which the carriage(s) travel. Thomson uses three main types of guides that all have different characteristics and which to choose depends on the demands of the application. Also see "Ball Guides", "Slide Guides" and "Wheel Guides".

Idle Torque

Idle torque is the torque needed to move the carriage with no load in it by rotating the drive shaft. The idle torque will vary with the input speed and the idle torque tables on the product pages gives a value for some speeds. The value given in the table is for a unit having a single carriage of standard length. If you need the exact value for another speed, multiple carriages or short/long carriages, please contact our customer service.

Inertia

Inertia is the property of an object to resist speed changes and is dependant on the shape and the mass of the object. The inertia is important when sizing and selecting and also when tuning a servo system to optimum performance. Consult customer service for more information.

Input Shaft

The input shaft is the shaft to which the power source (motor) is connected to on a gear box. Primary shaft is another term for this. Sometimes the drive shaft on a linear unit also is referred to as the input shaft.

Input Speed

Input speed is the rotational speed that the drive shaft/input shaft of a linear motion system or a gear box is subjected to.

Installation and Service Manual

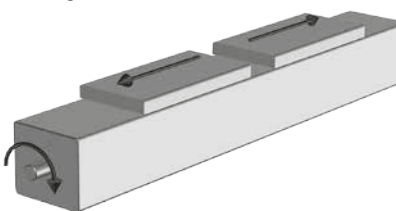
Each linear motion system has an installation and service manual to answer typical questions about mounting and servicing the unit.

Lead Accuracy

Lead accuracy is a measure of how accurate the lead of a ball screw is. For a ball screw with a lead of 25 mm, the screw should in theory move the nut 25 mm per each revolution. In reality there will be a deviation between the expected traveling distance and what is actually achieved. The deviation is typically for a ball screw 0,05 mm per 300 mm of stroke. Contact customer service for more information.

Left/right Moving Carriages

Units with left/right moving carriages have two carriages moving in opposite directions when the drive shaft is rotated. This type of unit has a ball screw where half of the screw has a left hand thread and the other half a right hand thread.



Lifetime Expectancy

When determining the lifetime for a linear motion system it is necessary to evaluate all forces and moments that are acting on the unit. The data and formulas given in this catalogue serve as a basis for this. For a more detailed lifetime calculation please use our sizing and selection software. Please contact us for further guidance.

Linear Lifting System

A linear lifting system is in essence a linear motion system specially designed for vertical lifting applications. Some units can be used in horizontal applications as well under certain criteria. Please contact us if you plan to mount a lifting unit in any other position than vertically with the load carrying plate pointing down.

Linear Motion System

A linear motion system is a mechanical assembly that translates the rotating motion of a motor to the linear motion of a carriage that travel along a load supporting beam/profile. Other names for linear motion systems are linear units, linear drive units and rodless actuators among others.

Load Rating

There are many types of load ratings that all needs to be considered. Normally when you speak about the load you refer to the load that the carriage will move; which is the dynamic load. But there may also be static, side, moment and forces from acceleration, deceleration, gravity and friction that are all equally important. For some units the load and load torque values are given for both the complete unit and the guiding system. The values for the complete unit are the values under which the unit can operate. The values for the guiding system should only be used when comparing different units and do not describe the actual performance of the complete unit.

Maintenance

Most units require lubrication. General lubrication requirements can be found in the general specifications table on the product data pages. The lubrication intervals, grease qualities and specific lubrication instructions can be found in the installation and service manual of each unit. No other regular maintenance is needed except for normal cleaning and inspection. Units with a cover band may also require irregular cover band replacement due to wear. The belt in belt driven units should not require re-tensioning under normal operating conditions.

Manufacturers Declaration

All Thomson linear motion systems comes with a manufacturers declaration to prove that it is built according to the CE regulations.

Mounting

Most units can be mounted in any direction. Any restrictions on mounting positions are shown on the product presentation pages at the beginning of each product category chapter. Even where units may be mounted in any direction there are some considerations. None of the units are self-locking which means that a vertical unit will drop the carriage/load if no

Glossary

N - Sc

external brake (such as a brake in the motor, etc.) is applied to the drive shaft of the unit. In the case of belt driven units care must be taken as the carriage/load will drop immediately in the case of a belt breakage. This is particularly important in vertical applications. All ball screw driven units are equipped with a safety nut to prevent the carriage/load being released in case of ball breakage.

Non Driven Linear Motion Systems

A non driven linear motion system has no drive shaft or any type of transmission. In reality a non driven linear motion system is a guide that has the same look and outer dimensions as the driven version. Normally a non driven unit is used together with a parallel working driven unit that are mechanically linked where the non driven unit help to share to load with the driven one.

Non Guided Linear Motion Systems

A non guided linear motion system has a drive shaft and a ball screw but no guides. In reality a non guided linear motion system is an enclosed ball screw assembly with a carriage that has the same look and outer dimensions as the driven version. Using a non guided unit requires some kind of external guide to which the carriage can be attached.

Operation and Storage Temperature

Operational temperature limits can be found in the performance tables on the product data pages. Units can be stored or transported within the same temperature range. Please contact us if the unit will be exposed to higher/lower temperatures than recommended during storage or transportation.

Output Shaft

The output shaft is the shaft on a gear box that is connected to object being driven by the gear box. Another term for output shaft is secondary shaft.

Packages and Multi Axis Kits

Thomson can offer complete pre-defined packages (linear motion system, gear and servo motor assembled and shipped with servo drive and cables) as well as mounting kits for the creation of two and three axis systems. Please contact us for further information.

Positioning Accuracy

Positioning accuracy is the error between the the expected and actual position and is the sum of all factors that will reduce the accuracy (i.e. repeatability, backlash, resolution, screw/belt accuracy, and the accuracy of the motor, drive and motion control system). Some of these factors, such as backlash and lead accuracy, can sometimes be compensated for in the software of the motion control system being used. Also see "Accuracy".

Position Feedback

The position of the carriage/rod/lifting profile can be obtained in many ways. The most common way is to equip the unit with an encoder or to use a motor which has a built in feed back device (encoder, resolver, etc.). To many units there are encoders or/and encoder mounting kits available. See the accessory chapter.

Repeatability

Repeatability is the ability for a positioning system to return to a location when approaching from the same distance, at the same speed and deceleration rate. Some of the factors that affect the repeatability are the angular repeatability of the motor, drive and motion control system, system friction and changes in load, speed and deceleration.

Resolution

Resolution is the smallest move increment that the system can perform. Some of the factors that affect the resolution are the angular repeatability of the motor, drive and motion control system, system friction, the drive train reduction, the lead/type of the ball screw/belt and changes in load, speed and deceleration.

Resolver

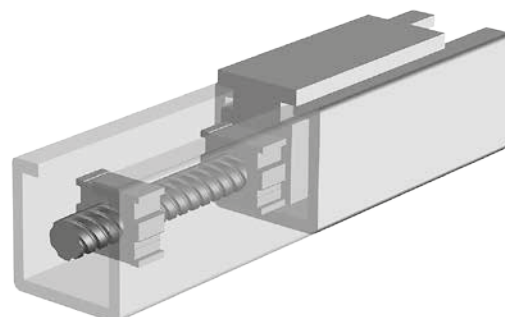
A resolver is basically a type of rotary electrical transformer used for measuring degrees of rotation and are commonly used on AC servo motors as a feedback device to control the commutation of the motor windings. The resolver is mounted to the end of motor shaft and when the motor rotates the resolver will transmit the position and direction of the rotor to the servo drive which then can control the motor. Most servo drives for AC servo motors on the market today can convert the resolver signal in to a pulse train (encoder signal simulation) which can be used by a motion control to determine and control the position of the motor. Also see "Encoder Feedback".

RoHS Compliance

The RoHS directive stands for "the restriction of the use of certain hazardous substances in electrical and electronic equipment". This directive bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants. All linear motion systems and accessories sold in the EU are RoHS compliant.

Screw Supports

Screw supports allow screw driven units to travel at high speed even when stroke becomes longer. The supports reduce the unsupported length of the screw, that otherwise would be subjected to vibrations. Screw supports come in single (one screw support on each side of the carriage) or double (two supports on each side) versions. Screw support units will have a slightly shorter stroke for a given overall length.

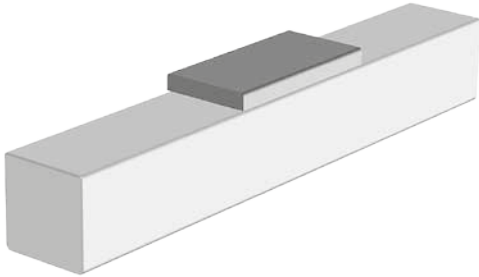


Glossary

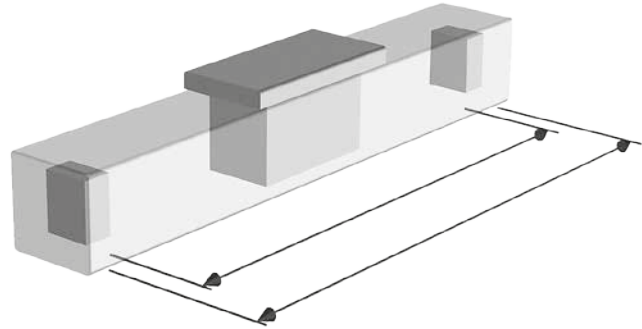
Si - W

Single Carriage

Single carriage units have one carriage. Some linear motion system models also have the option of long or short single carriage. The long carriage handle higher loads but will have a longer overall length for a given stroke.



the ends and also allow for some adjustment of the unit position at the mounting.

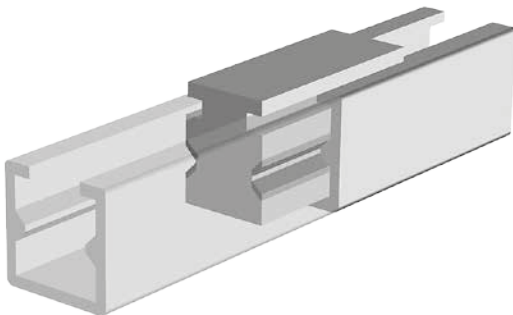


Sizing and Selection

This catalog can give you an overview of what Thomson can offer you and an indication of which products that may suit your application. But in order to get the best solution it is necessary to know your specific application and to carry out detailed sizing and selection calculations. Please contact customer service for further help.

Slide Guides

A slide guide consist of a guide attached to the inside of the profile and a slide bushing attached to the carriage. The guide can be made of different materials (e.g. polished hardened steel, anodized aluminium) while the bushing is made of a polymer material. There are two types of bushings, fixed and prism. Prism bushings can move in relation to the guide which results in longer life and higher load capabilities. Slide bushings are silent, simple, reliable and robust and can be used in dirty and dusty environments. They are also resistant to shock loads, have a long life expectancy and require little or no maintenance.

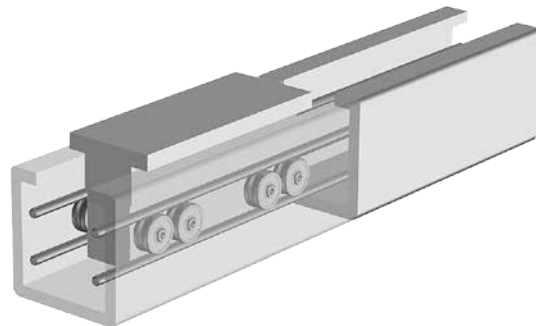


Tension Station

The tension station is the mechanical assembly situated in the opposite end of the drive station on a belt driven unit. The tension station has a mechanism that allows the belt pulley position to be adjusted thus changing the tension of the belt. Adjustment of the belt tension is normally only necessary when replacing a broken or worn out belt with a new.

Wheel Guides

A wheel guide consists of ball bearing wheels that run on a hardened steel rail. Wheel guides are a simple and robust guiding method offering high speeds, high loads and medium accuracy.



Stroke

The theoretical maximum stroke (S_{max}) is the length that the carriage can travel from one end of the unit to the other. However, using the maximum stroke means that the carriage will collide with the ends of the profile. The practical stroke is therefore shorter. We recommend that you specify a unit that have at least 100 mm longer stroke than the maximum stroke you need so that the unit can stop before colliding with

Working Environment

All units are designed for use in normal industrial environments. Units which have an open profile (i.e. have no cover band) are more sensitive to dust, dirt and fluids. These units require some kind of cover if they are used in environments where dust, dirt or fluids are present. Wash down or enhanced wash down protection can be ordered for our closed profile units. Please refer to the accessory pages. In all cases where a unit will be exposed to aggressive chemicals, heavy vibrations or other potentially harmful processes we recommend that you contact us for further advice.

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