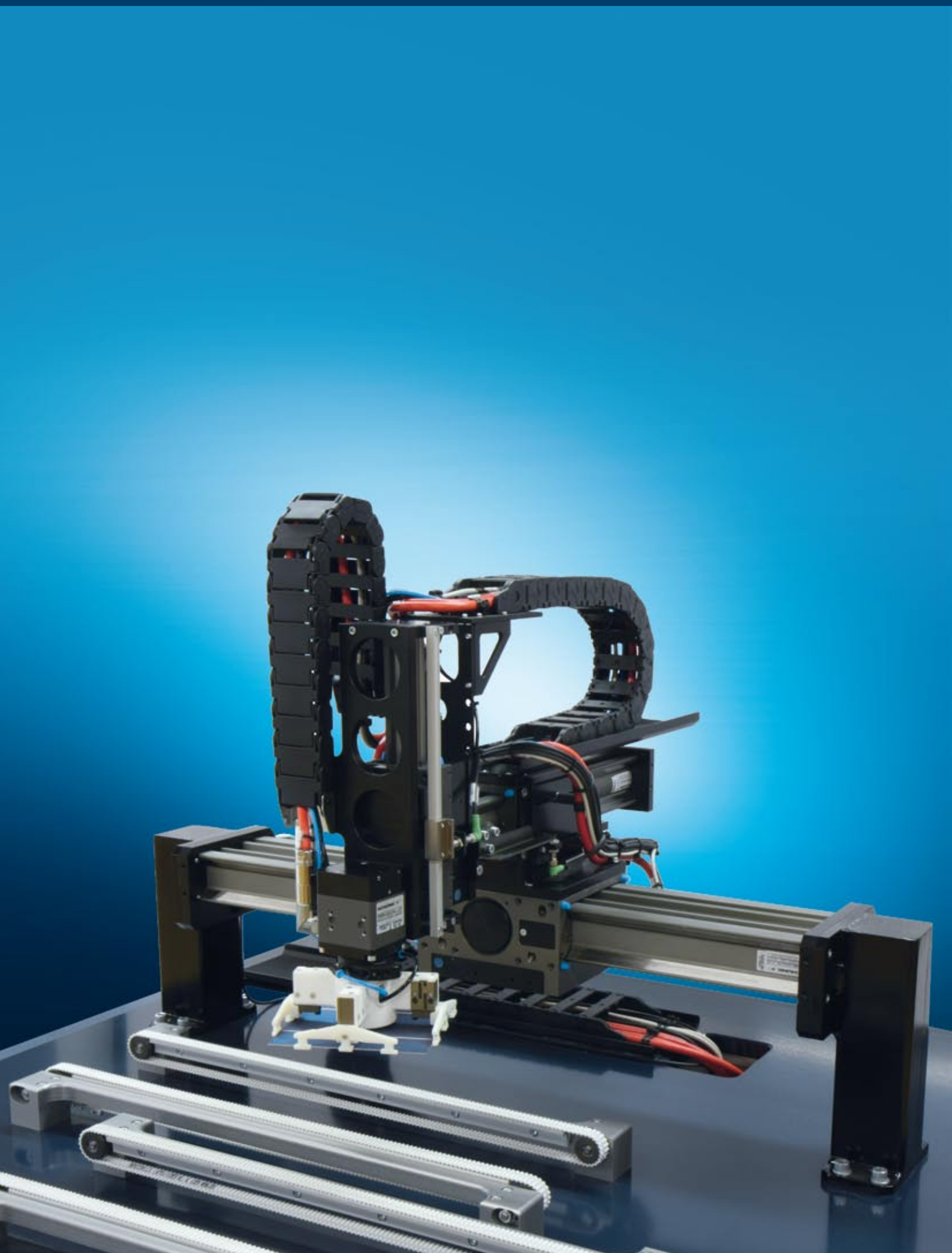


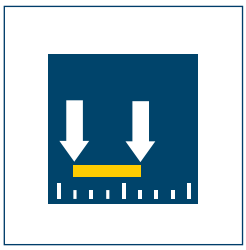
LINEAR AXES

Useful stroke
up to 3,800 mm

Driving force
up to 1,500 N

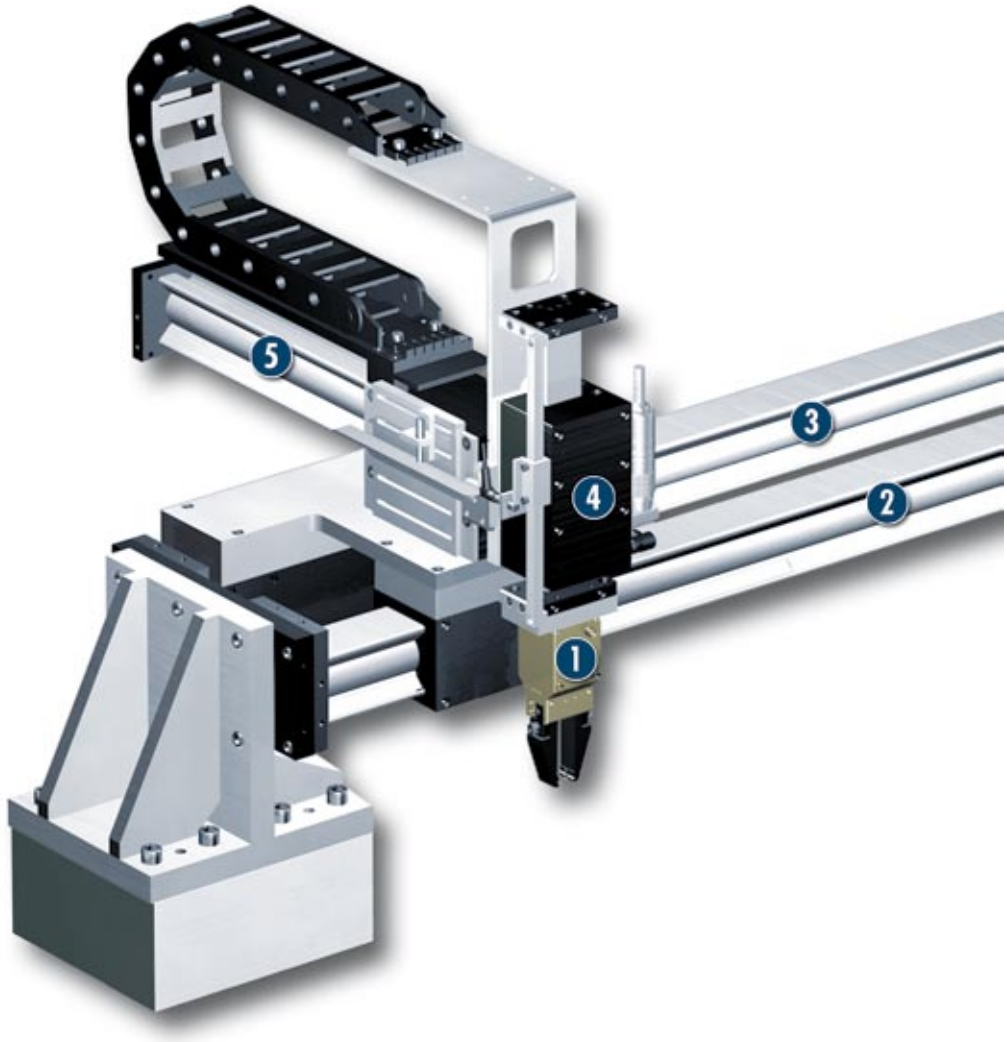
Deflection
0.1 mm .. 1 mm

Moment load
up to 900 Nm



Repeat accuracy
0.01 mm

Application example



Complete electrically powered triple-axis automatic insertion unit for small components

1. **MEG 050 EC Servo-electric 2-finger parallel gripper**
2. **Linear axis with direct drive MLD 100 N / stroke 400**
3. **Supporting axis**
4. **Short-stroke axis with direct drive MLD 100 K / stroke 50**
5. **Linear extension axis with direct drive MLD 100 N / stroke 300**

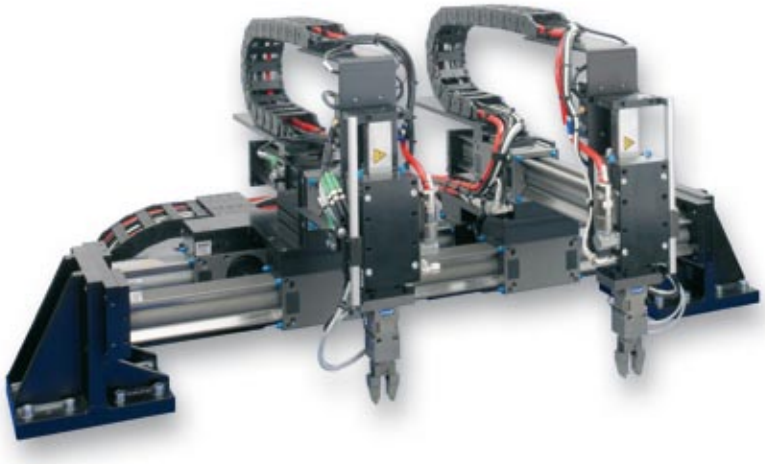
Linear axis with direct drive

and roller guide

Area of application

For highly dynamic applications that also require a high degree of repeat accuracy, e.g.
· Handling and assembly technology
· Measuring and testing technology
· Component marking and identification
· Component assembly and final inspection in microelectronics
· Medical technology

CAUTION:
The linear axes from the MLD series are unsuitable for use in ferro-magnetic environments, particularly in areas directly influenced by ferro-magnetic particles.



Your advantages and benefits

The linear direct drives require no further mechanical elements for force transmission.

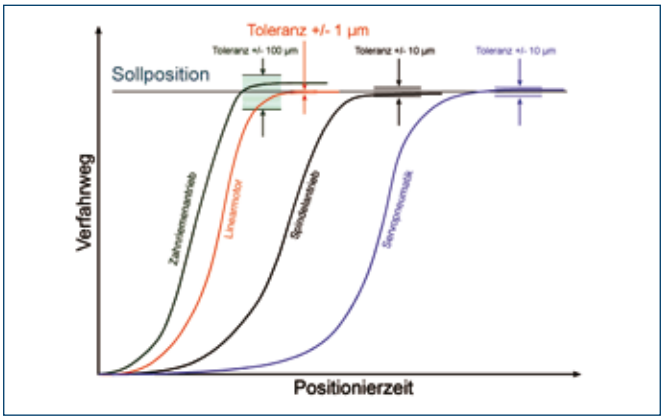
Almost no wearing parts
for long service life and reliability of the system.

No mechanical play between the drive elements
enabling high precision positioning

Low oscillations and high holding force
for the shortest positioning times and stable positioning

Integrated motor and measuring system in the axis
minimize interference contours and spare requirements

Multiple freely programmable slides on one profile guide
allow exceptionally compact and economical drive concepts

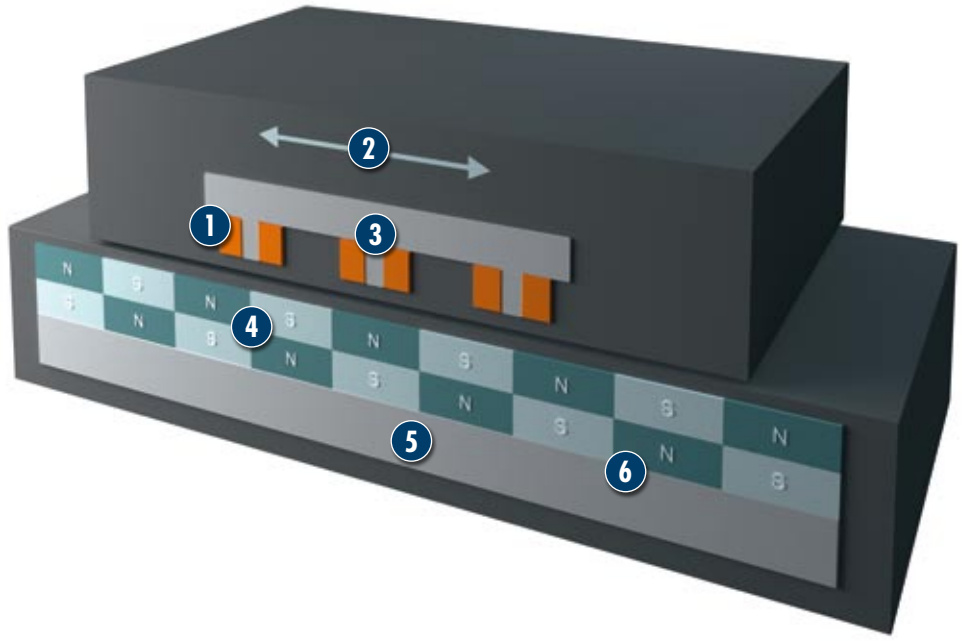


General information about the series

Dynamic and absolutely precise
The MLD axis modules with servo-electric linear direct drive combine positioning accuracy with maximum dynamics and a long lifetime. The axis range represents a sophisticated modular system with a wide range of accessories and allows a variety of axis combinations for different application areas.

For production reasons, the colors may vary from those shown in the catalog.

Functional principle



1 **Copper coil**
2 Directions of movement
3 Primary part
4 Permanent magnets
5 Iron mount
6 **Secondary part**

Description of function

You can manipulate the driving force, acceleration and speed of the slide by regulating the phase and the amplitude of the electrical current applied at the primary part. A direct measuring system, which is integrated in the axis, is used to determine the current position of the drive.

Options and special information

Pneumatic holding brake
for relieving the strain on the drive control

Additional motor slides
for special axis arrangements

Wipers
to protect the guide

Pneumatic weight compensation
to maintain all the benefits of the product even in vertical applications

Accessories

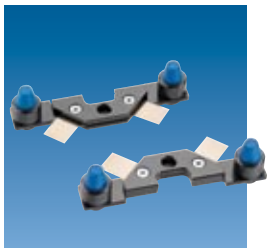
Accessories from SCHUNK – the suitable companion for the best functionality, reliability, and controlled production for all automation components.

Centering sleeves

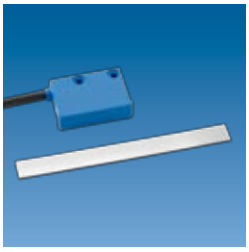
Individual sensor

Mechanical limit switches

Wipers



Stroke measuring system



Shock absorber

Drive controller

Brake, Brake valve

Commissioning software

Interfaces

Parallel interface	Sercos interface
Device Net	CANopen
Profibus	Sercos 3

Cable set

Connection cable for sensor systems

Cable tracks

ⓘ Please see the side views at the end of the respective size for information concerning specific sizes, availability, designation, and ID numbers. More detailed information about our range of accessories can be found on the following introductory pages and in the relevant option code lists.

General information about the series

Safety notes

Caution: magnetic field! This applies especially for persons with implanted medical devices, such as pacemakers, hearing aids, etc.

Ambient conditions

The modules are designed primarily for use in clean ambient conditions. Please note that the lifetime of the modules can be shortened if they are used in harsh ambient conditions and that SCHUNK cannot assume liability in such cases. Please contact us for assistance.

Series overview

Short stroke module
MLD K

Useful load up to 6 kg
Max. speed up to 4 m/s

Page 62

Linear axis (flat)
MLD FU

Useful load up to 20 kg
Max. speed 4 m/s

Page 78

Gantry axis (self-supporting)
MLD N

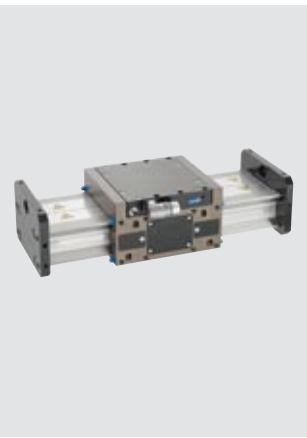
Useful load up to 35 kg
Max. speed 4 m/s

Page 86

Linear axis (supported)
MLD NU

Useful load up to 35 kg
Max. speed 4 m/s

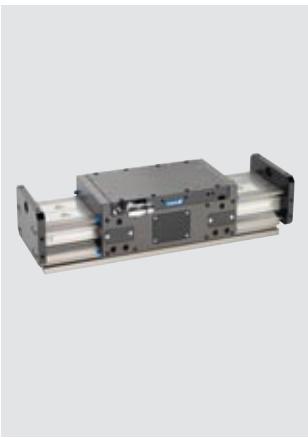
Page 94



Gantry axis (self-supporting)
MLD M

Useful load up to 40 kg
Max. speed 4 m/s

Page 102



Linear axis (supported)
MLD MU

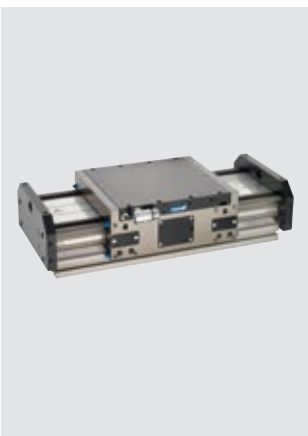
Useful load up to 40 kg
Max. speed 4 m/s

Page 112

Heavy load gantry axis (self-supporting)
MLD T

Useful load up to 50 kg
Max. speed 4 m/s

Page 122



Heavy load linear axis (supported)
MLD TU

Useful load up to 50 kg
Max. speed 4 m/s

Page 132

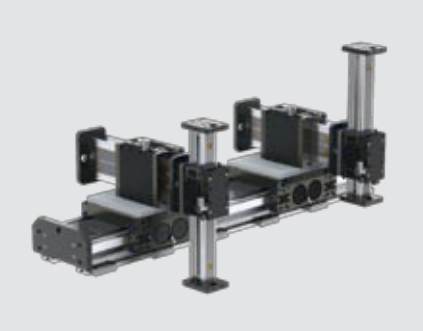
Configuration options

SCHUNK currently offers you numerous different handling systems whose usefulness has been proven in many applications. Please contact us for assistance.

Linear boom
Two-axis module for compact and dynamic motion sequences, e.g. pick & place applications

Surface gantry
The classic for large, three-dimensional working areas

Line gantry
Two-axis system for larger horizontal strokes and short vertical movements

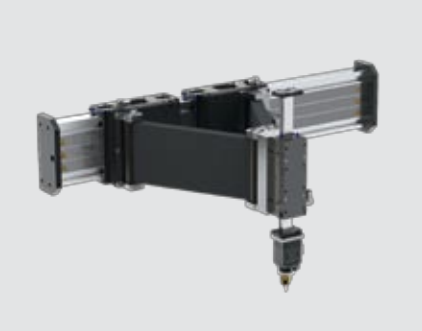


Quadriga
Compact 2x three-axis system with superimposed working areas for high throughput rates

Cross gantry
Three-axis system for use when the available space is limited

Quadrol
Double cross system for use where the available space is limited and there are high throughput rates

X-Y slide
Cross system for use where space is constricted in terms of the height



Special axis configuration to customer requirements
Thanks to the well-thought-out modularity of the individual systems, countless customer-specific solutions are possible

Three-axis boom
Three-axis system for compact three-dimensional working areas

Standard drive system
MLD linear direct axis with Bosch Rexroth INDRADRIVE drive control unit

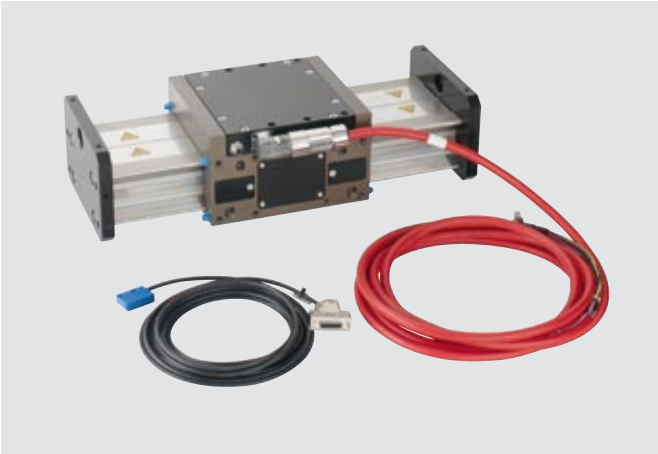
MLD linear direct axes are available with the innovative Bosch Rexroth IndraDrive drive control units as standard.

Scope of delivery:

We offer complete packages as standard, consisting of

- MLD linear direct axes
- Drive control units
- Commissioning software with parameter sets

.



Design:

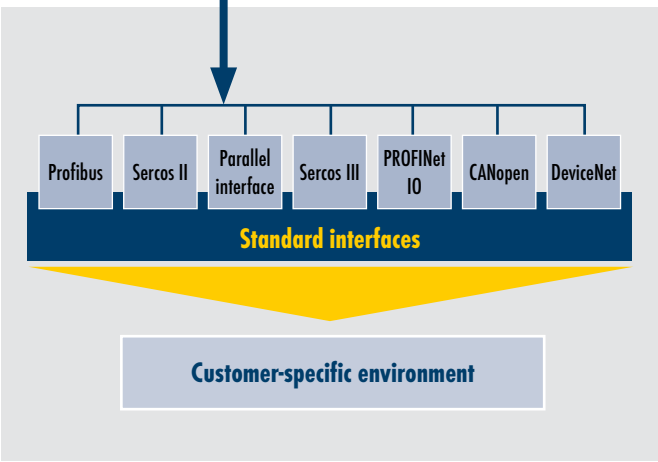
On request, the design of the MLD linear direct axes and drive control units can be optimized by our planners.

Parameter sets

The tested SCHUNK parameter sets provide an easy method of making basic settings.

INDRADRIVE, BASIC and ADVANCED control units

The IndraDrive drive control units can be connected to the customer's machine environment using popular field bus systems or the parallel interface.
All positioning tasks can be performed with a BASIC control unit and the basic firmware package.
The ADVANCED control unit also offers optional integrated safety engineering and greater flexibility in terms of the configuration.

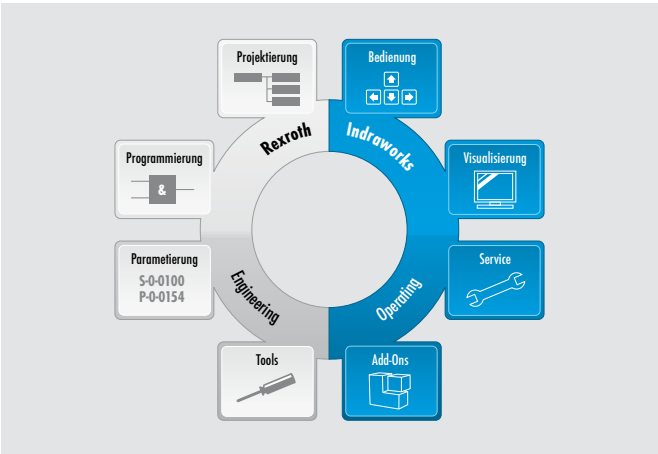


IndraMotion MLD (drive-based motion logic) combines drive functions, motion control and processing logic into a state of the art, open automation platform for modular machine concepts. Programming is possible in all IEC61131-3 languages.

Safety on Board. These days, safety concepts are increasingly being realized easily and economically using IndraDrive drive control units with certified safety engineering. The wide range of integrated safety functions, optionally available under the "Safety on Board" name, provides integrated safety in your application for commissioning, operation and service.

Commissioning software

The IndraWorks engineering tool from Rexroth is an excellent and powerful program for programming, configuration, commissioning and service.



MLD linear direct axis drive system

As an option, the MLD linear direct axes are also available in a version for Siemens SINAMICS S120 converters.
This provides direct access to the world of Siemens SINAMICS.

Scope of delivery:

SCHUNK offers complete packages as standard:
· MLD linear direct axes
· Converters
· Commissioning software with parameter sets

Siemens SINAMICS S120 converter

If MLD linear direct axes are integrated into a machine or device along with Siemens motors, the advantage is that the MLD linear direct axes can also be operated using Siemens SINAMICS converters.

Our planners will work with you to devise the size of the MLD linear direct axes and the converters and will determine the required sensor modules.

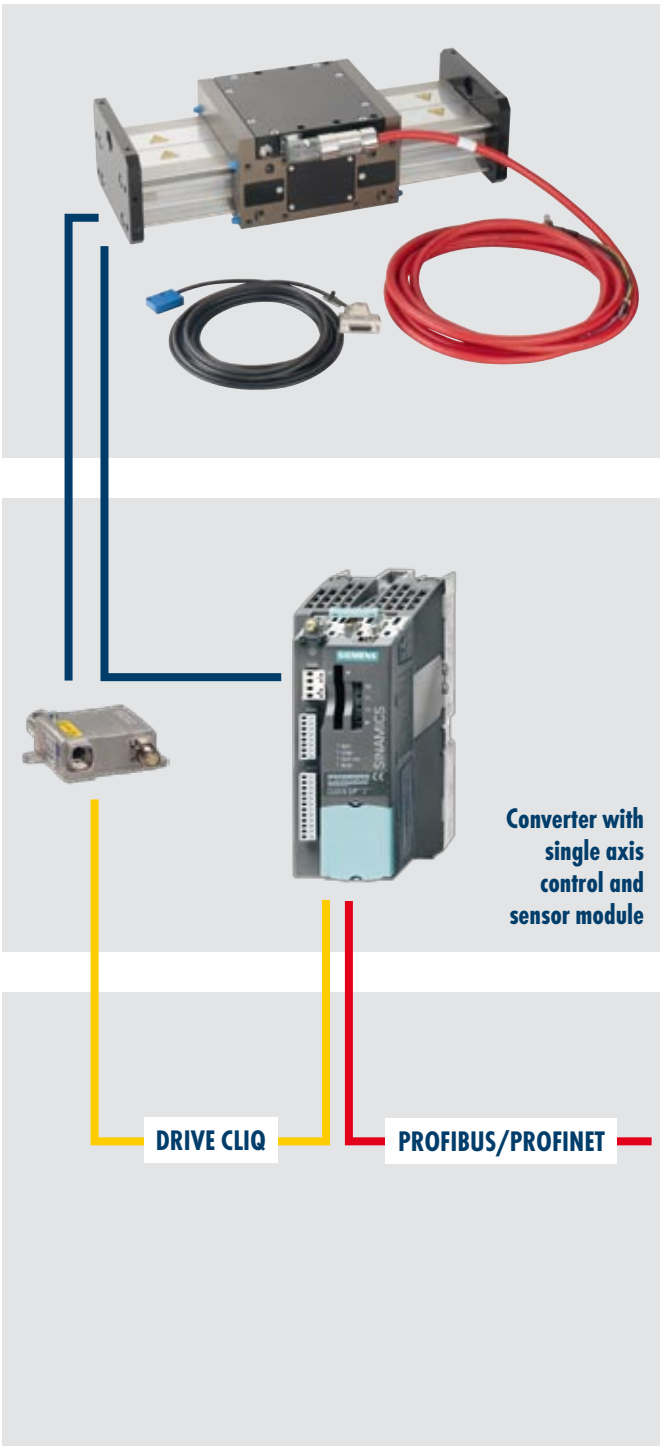
The sensor modules are connected to the Siemens components using DRIVE CLIQ and operated in a similar way to a Siemens motor.

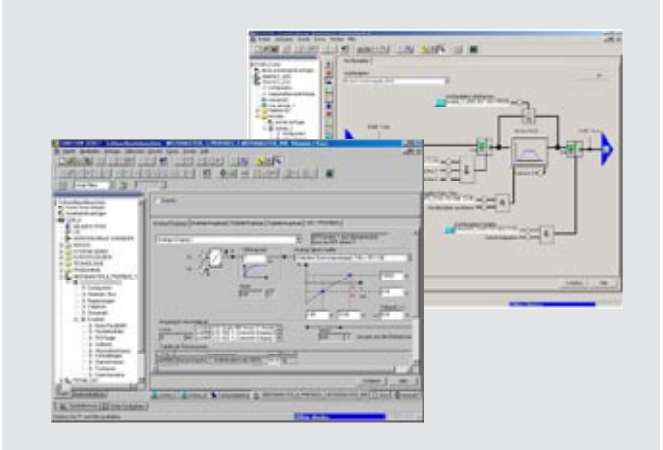
Parameter sets

Special parameter sets have been created for the Siemens SINAMICS converters, which can be used to easily configure the basic settings for axes.

Commissioning software

With STARTER, Siemens provides commissioning software for the SINAMICS converters, enabling the necessary settings to be made very easily.





Direct stroke measuring systems

Definition of resolution

The resolution of a stroke measuring system is the smallest movement of the measuring head relative to the scale that can be distinguished by the electronic processor. It depends on the graduation of the scale, the signal interpolation factor (internal or in the downstream electronics) and the type of evaluation in the meter.

Definition of accuracy

The accuracy of linear stroke measuring systems is specified using accuracy classes. It states the maximum accuracy tolerance, related to any 1m long section of the overall length of the material measure (measuring tape).

LE linear encoder

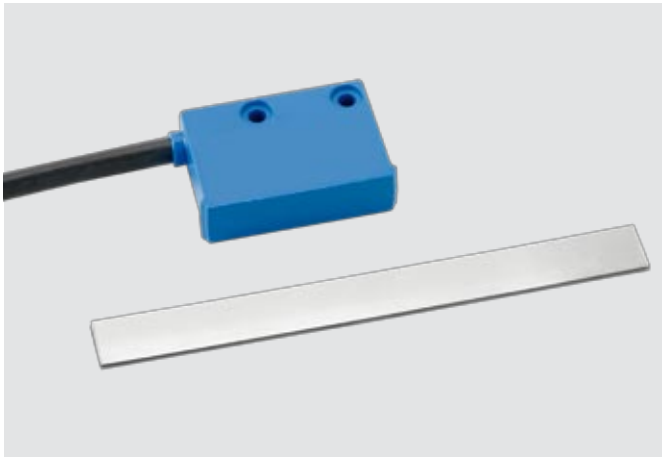
Magnetic incremental stroke measuring system

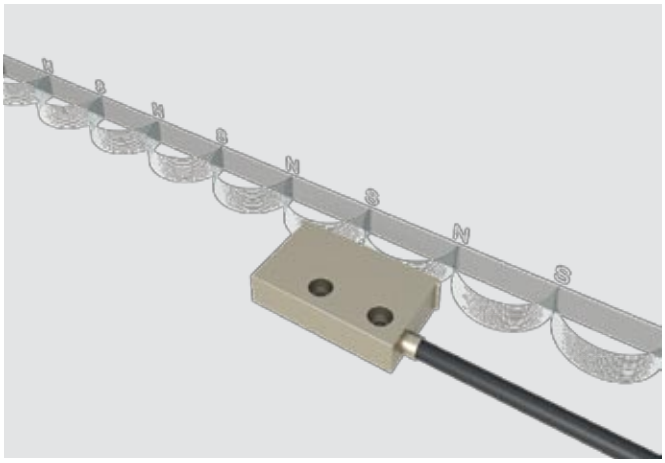
Technical properties

This stroke measuring system works on the principle of zero contact scanning of magnetic fields, and converts measured values into analog signals. It is a magnetically scanning incremental system, which achieves an adjustable resolution of up to 0.2 µm and position variations of max. 10 µm.

The zero contact scanning unit is particularly suitable for precise and highly dynamic applications in linear guide and power train technology. Zero contact and therefore wear free measured value acquisition is a robust and economical alternative to optical systems.

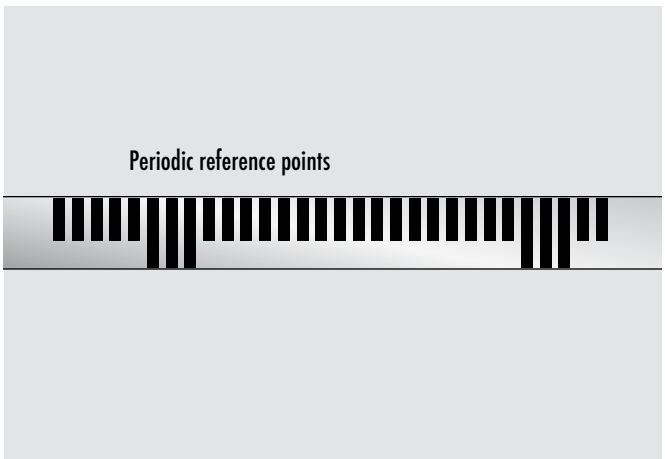
- Easy mounting
- Status LED indicator
- Signal period 1000 µm (analog)
- Scale MB 100
- Reference signal (optional)
- Insensitive to dust, chips, humidity





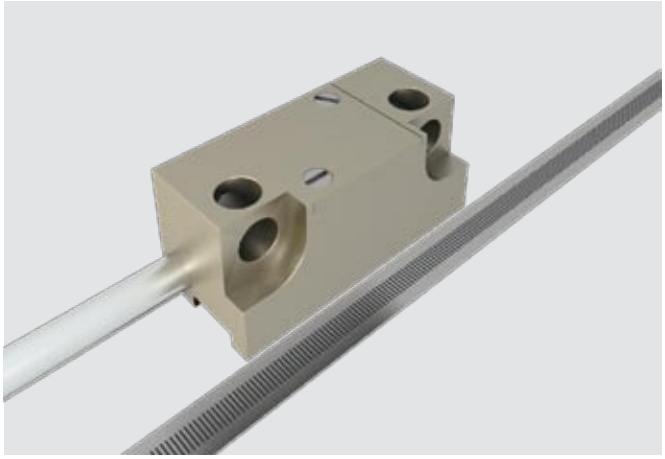
Functional principle

- The measuring tape consists of a magnetizable material.
- Magnets are magnetized at a spacing of 1 mm (period) in a magnetizer.
- The measuring head has 2 Hall-effect sensors, which change their voltage depending on the magnetic field.
- The SIN/COS signals are generated from these voltages as the output signal of the measuring head.
- Periodic or fixed analog reference signal optional



LIA linear measuring system

Optical incremental stroke measuring system



Technical properties

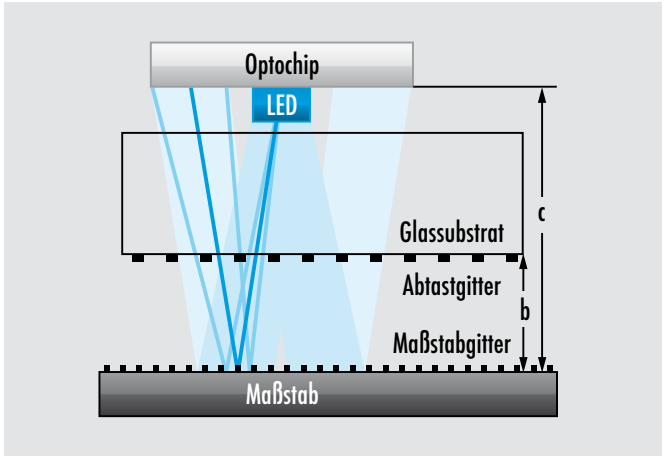
This stroke measuring system works on the principle of optical scanning of the scale by the measuring head. Measured values can be output both as analog signals and as rectangular signals with interpolation. Resolutions of up to 0,05µm and position variations of ± 2 µm can be achieved with no additional electronics.

The scanning unit is used where lengths need to be determined with maximum precision and resolution with no mechanical reaction on the measuring instrument.

- Compact installation dimensions
- Low weight
- High resolution
- Excellent accuracy
- High measuring speeds

Functional principle

of optical scanning for material measure



Functional principle

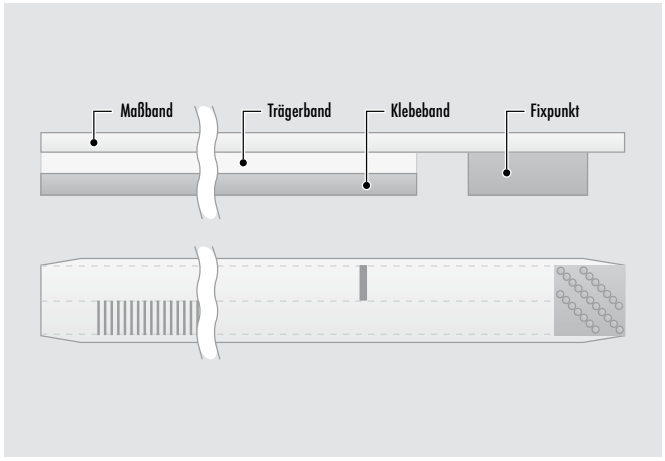
of material measure Mechanical decoupling of measuring tape underlayer and measuring tape results in defined thermal properties.

Ideal for use for

- Supporting materials with thermal expansion properties different than steel
- Measuring lengths of above 100 mm
- Stringent accuracy requirements

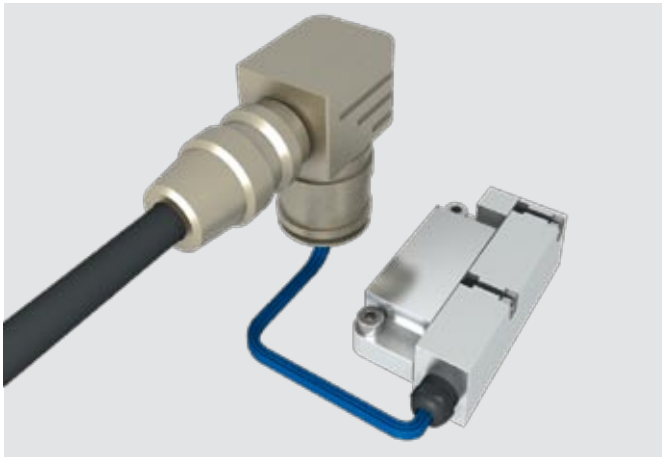
Additional special features:

- Graduation 20 µm
- Choice of measuring tape accuracy classes of ± 1 µm, ± 2 µm, ± 3 µm to ± 5 µm
- Compensation of offset and amplitude fluctuations (insensitive to contamination)
- Detection of end positions
- Various other options



MSA 111 linear measuring system

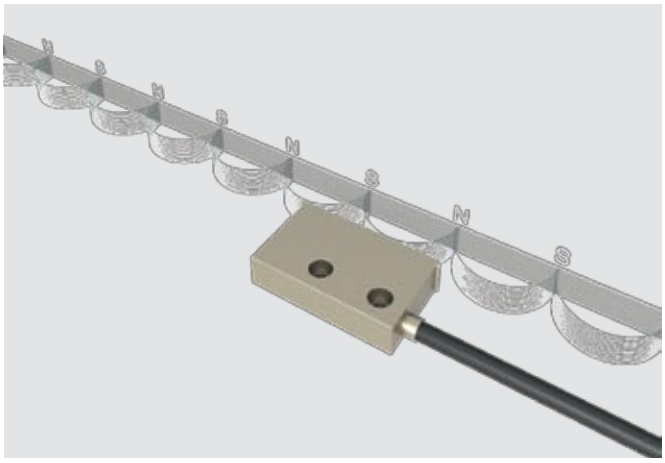
Magnetic absolute stroke measuring system



Technical properties

This stroke measuring system with absolute position detection has the notable property that after a shutdown or any other power failure, a sensor position is immediately detected, even if changed, and this value is used as a direct value for further processing. It also provides all the advantages of a magnetic and zero contact scanning principle that is insensitive to contamination.

- Actual position value is detected
- No reference run required
- No reference run required after power failure
- Increased availability of axes
- External electronic processor necessary

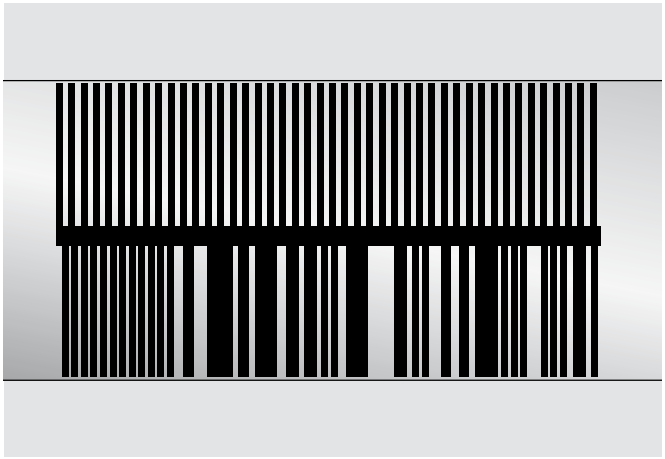


Additional special features:

- Max. resolution 1 µm
- Measuring tape accuracy classes max. 50 µm
- Repeat accuracy max. 5 µm
- Larger installation dimensions in axes
  (check interference contours; contact us for details)
- Electronic processor to be installed in control cabinet
- SSI interface, therefore only available in conjunction with Indradrive Advanced controller

Functional principle

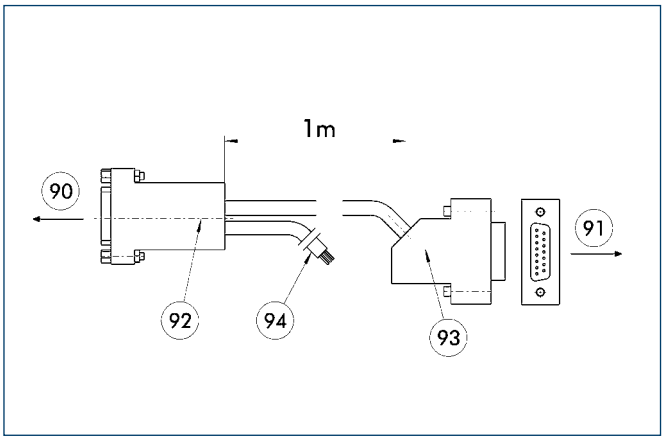
- Scanning of two tracks: one incremental and one absolute track



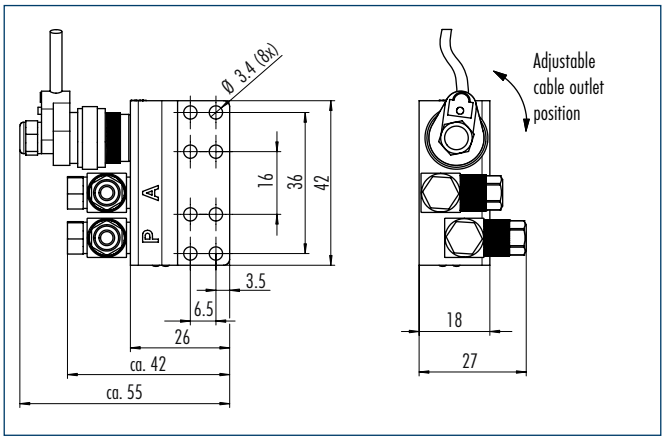
Measuring system selection matrix

	K axis	N axis	M axis	T axis	FU axis
Linear encoder LE 100; graduation 1 mm Reference mark at 20 mm intervals	Yes	Yes	Yes	Yes	Yes
Linear measuring system LIA 22; graduation 20 µm with reference mark and optical switching sensors	MLD 100/200K = Yes MLD 50K = No	Yes	Yes	Yes	No
Linear measuring system MSA 111; graduation 1 mm	Yes	Yes	Yes	Yes	Yes

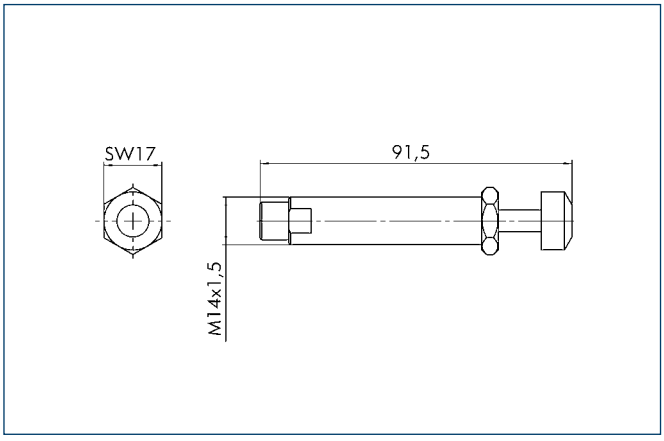
Cable - Optical measuring system



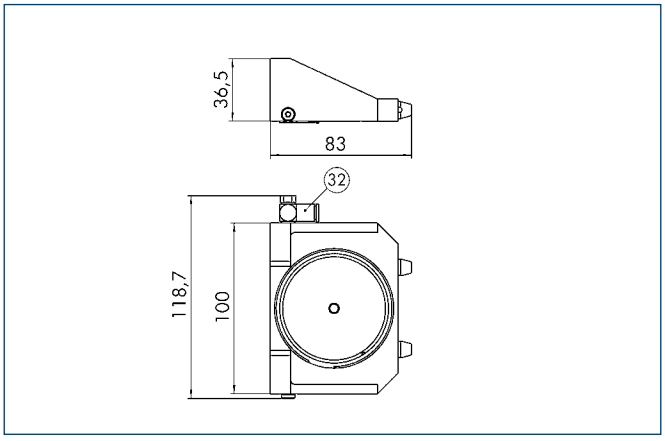
Brake valve



Shock absorber

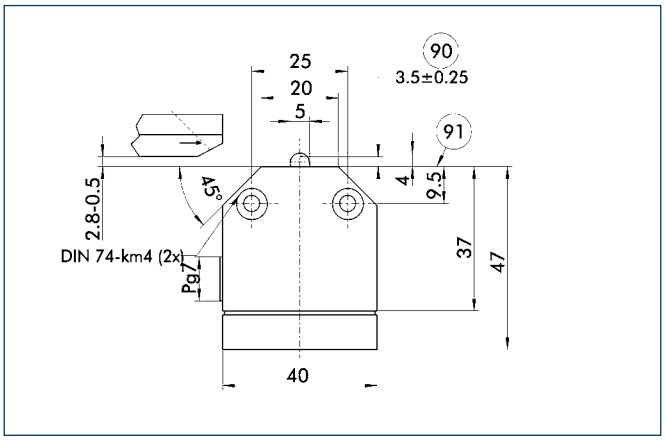


Additional brake (FU)



32 Compressed air connection

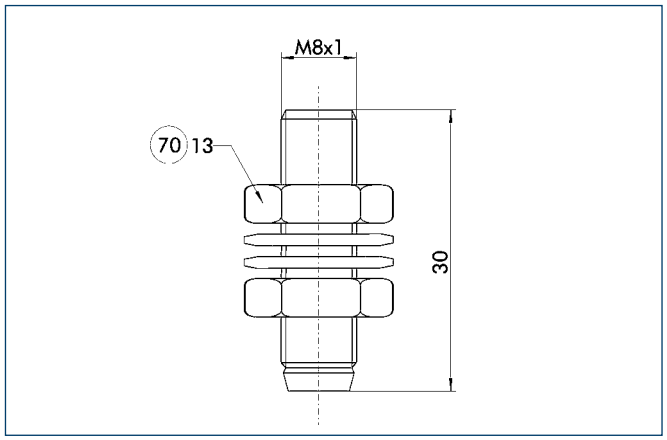
Mechanical limit switches



(90) Switching point
(91) Reference surface

Reproducibility	[mm]	± 0.05
Permissible ambient temperature	[°C]	-5 to +80
Protection class to DIN 40050		IP 67
Bounce time	[ms]	< 2
Insulation to VDE 0110		Group B
Rated voltage AC	[V]	250
Continuous current	[A]	5
Connection type		Screw connection
Contact system		Single pole changeover contact
Switching system		Step system

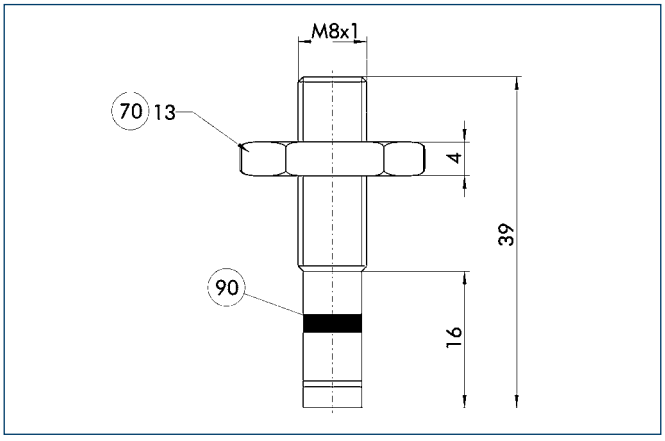
Inductive limit switches



(70) Width across flats

Contact type		PNP opener, 3-wire technology
Repeat accuracy	[mm]	0.1
Permissible ambient temperature	[°C]	-25 to +70
Protection class to IEC 529		IP 65
Switching frequency	[Hz]	1500
Operating voltage DC	[V]	10 to 30
Maximum current on contact	[mA]	200
Nominal switching distance	[mm]	1.5
Installation type		Flush
Display		LED in plug
Connection type		Right-angle plug
Cable length	[m]	5 (others on request)

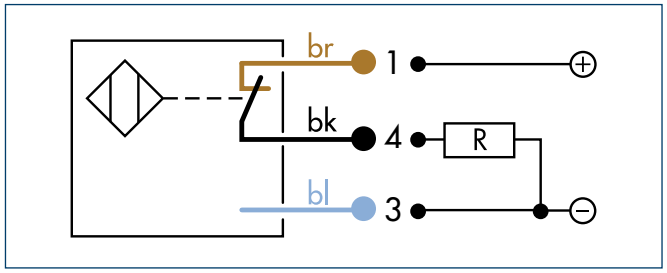
Inductive reference switch



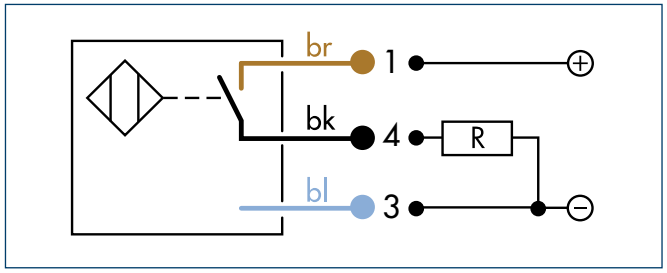
(70) Width across flats

Contact type		PNP closer, 3-wire technology
Repeat accuracy	[mm]	0.1
Permissible ambient temperature	[°C]	-25 to +70
Protection class to DIN 40050		IP 67
Switching frequency	[Hz]	1500
Operating voltage DC	[V]	10 to 30
Maximum current on contact	[mA]	200
Nominal switching distance	[mm]	0.5
Installation type		Flush
Connection type		Right-angle plug
Cable length	[m]	5 (others on request)

Opener circuit diagram



Closer circuit diagram



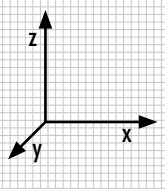
Company		Project	
Contact		Telephone	
ZIP, City		Fax	
Street		E-mail	

1. Task

Please provide an accurate description of the task.

2. Arrangement of application

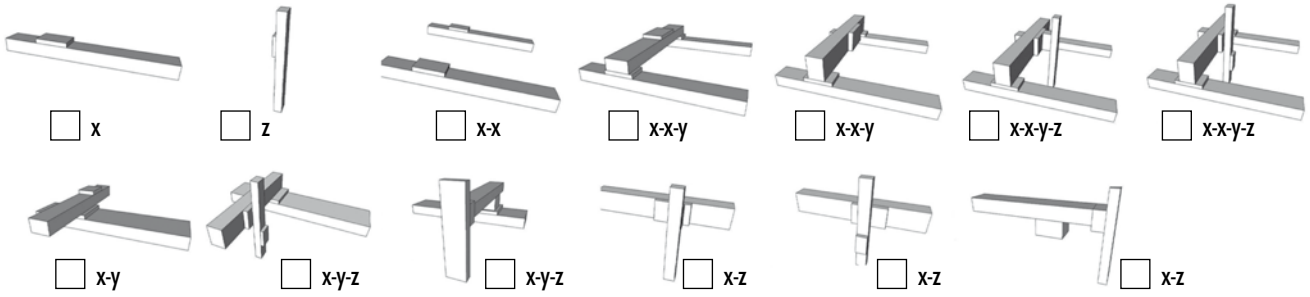
Please provide a sketch of the required process, specifying the dimensions and masses of the individual components.



3. Requirement information (please check)

☐ One-off application	☐ Technical improvement
☐ Series, number of units per year:	☐ Cost reduction
☐ New design	☐

4. Axis information - System configuration (please check)



				X-axis horizontal	Y-axis horizontal	Z-axis vertical
Basic information	Payload (load)		[kg]			
	Load projection (lever arm) of load at axis fixture	X direction	[mm]	Slide position: Top (1) Side (2) Bottom (3)		
		Y direction	[mm]			
		Z direction	[mm]			
	Slide position: Enter relevant number (1 - 3)					
	Attachment type: Slide moved (standard) / Axis moved (boom)			☐ Standard ☐ Boom	☐ Standard ☐ Boom	☐ Standard ☐ Boom
	Stroke (inc. over stroke)		[mm]			
	...of which useful stroke		[mm]			
Load	Additional force (e.g. process force)		[N]			
	Direction of additional force (axis and direction, e.g. Z+)					
Dynamics	Speed V_{max}		[m/s]			
	a_{max}		[m/s²]			
Emergency stop function				☐ Yes ☐ No		
Operating data	Total cycle time (inc. rest period)		[s]			
	Travel time as proportion of total cycle		[s]			
	Operating hours per year		[hrs] on [days]	hours on days		
Accuracy	Min. repeat accuracy		[mm]			
Environment	Temperature		[°C]			
	Air humidity		[%]			
	Dirt, interference fields, place of use					
Control	Control unit	Bosch Rexroth	Indradrive Basic	☐	☐	☐
			Indradrive Advanced	☐	☐	☐
			Indradrive Cs	☐	☐	☐
		Siemens	Sinamics	☐	☐	☐
		Other: _____				
	Interfaces			☐ Profibus ☐ Sercos III	☐ Profinet ☐ Parallel	☐ Sercos II ☐ _____
	Cable set			☐ 5 m ☐ 10 m ☐ 15 m ☐ 20 m	☐ 5 m ☐ 10 m ☐ 15 m ☐ 20 m	☐ 5 m ☐ 10 m ☐ 15 m ☐ 20 m

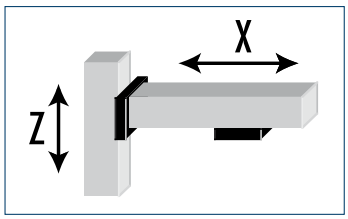
5. MLD axis options

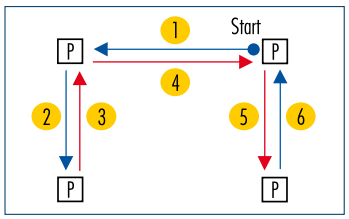
		X-axis horizontal	Y-axis horizontal	Z-axis vertical
MLD type: (N,K,T,M,FU) (please enter if defined)				
Active slides (with linear motor)	Number			
Passive slides (without linear motor)	Number			
Slide center distance for multiple slides	[mm]			
Stroke measuring system	Cable length and stroke measuring system interface based on controller selection			
	Magnetic measuring system (standard)	☐		
	Optical measuring system (maximum resolution)	☐		
	Absolute measuring system	☐		
Inductive reference switches		☐	☐	☐
Limit switches	Inductive limit switches	☐	☐	☐
	Mechanical limit switches	☐	☐	☐
Cable track		☐ Standard ☐ Wide	☐ Standard ☐ Wide	☐ Standard ☐ Wide
Brake		☐	☐	☐
Switching valve for brake		☐	☐	☐
Wipers		☐	☐	☐
Shock absorber		☐	☐	☐
Centering sleeves		☐	☐	☐
Special designs		☐ _____	☐ _____	☐ _____
Documentation	☐ Schunk standard design Language: English / Content: Assembly instructions, drawing(s), bill(s) of materials / Delivery format: PDFs on CD-ROM			
	☐ Special design (additional cost) Definition:			

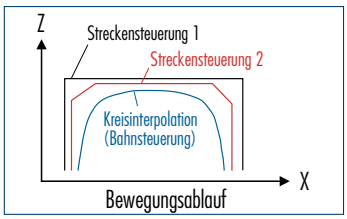
6. Cycle information

To calculate the optimum linear direct drive, it is import to define the future application in as much detail as possible in advance.

Example:
Pick & place application



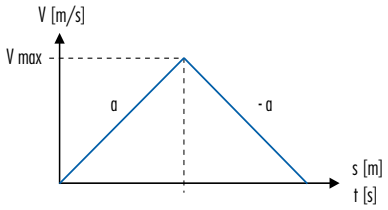




7. Cycle table (each system axis considered individually)

Cycle step	Axis	Travel [mm]	Permissible travel time [s]	Shutdown after positioning [s]	Useful load [kg]
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

8. Calculation basis

Definitions						Most extreme movement
Speed	v	[m/s]	Deadweight - slide	m_{dw}	[kg]	
Acceleration	a	[m/s²]	Additional mass - load	m_{add}	[kg]	
Travel	s	[m]	Counter force	F_{cnt}	[N or kgm/s2]	
Time	t	[s]	Theoretical force required	F_{the}	[N or kgm/s2]	
Total mass moved	m_{tot}	[kg]				

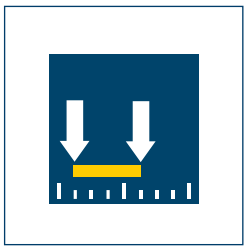
9. Formulae

Speed	$V = a \times t = \sqrt{2a \times s}$	Acceleration	$a = 2s / t^2 = V / t$
Travel	$s = a \times t^2 / 2 = v \times t$	Time	$t = V / a = 2s / v$
Mass moved	$m_{tot} = m_{dw} + m_{add}$	Force	$F_{the} = m_{tot} \times a + F_{cnt}$
Motor force	$F = (F_{the}$ + control reserve) x dynamic correction factor x on time factor		

Useful stroke
up to 400 mm

Driving force
up to 500 N

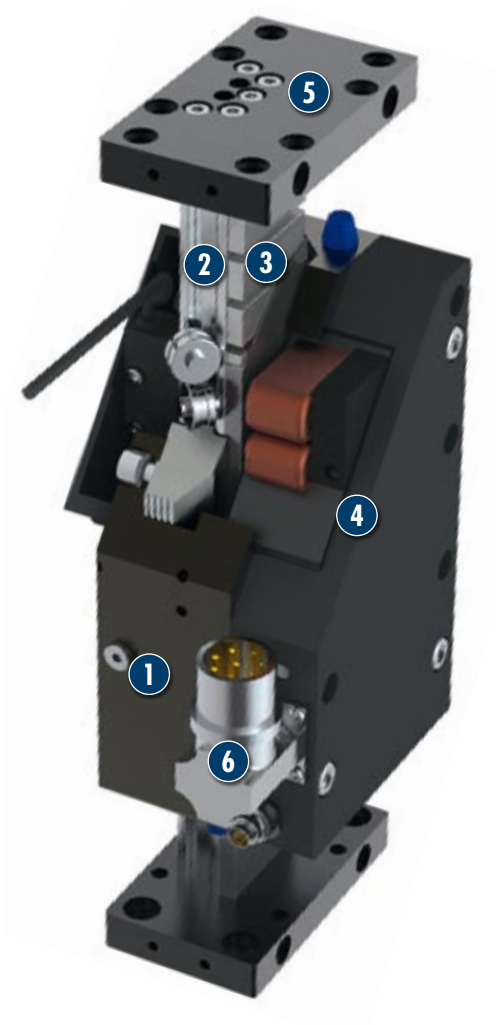
Deflection
up to 0.4 mm



Repeat accuracy
0.01 mm

Max. speed
Up to 4 m/s

Module design



1 **Holding brake**
Optional

2 **High precision, hardened and ground steel guide rails**
for optimum guidance properties and speeds

3 **Integrated secondary parts**
with high power magnets

4 **Compact primary part slide**
with mounting surfaces, roller shoes adjusted without play and integrated measuring system

5 **End plates**
for mounting sensors and shock absorbers

6 **Motor plug**
Choice of position right/left

Linear axis with direct drive

Standard short-stroke axis with integrated roller guide, primarily for vertical use

Area of application

The compact and light short-stroke module for extremely dynamic positioning

General information about the series

Drive

3-phase, electronically commutated AC synchronous linear motor.
Primary part 3-phase copper coil body, secondary part iron mount with permanent magnets and protective cover.

Stroke measuring system

Non-contact magnetic measuring system with integrated analog signal output, 1 Vss (insensitive to contamination)

Profile guide

Hardened and ground steel guidance

Guided slide

Free from play, adjustable roller bearing, primary part and measuring system read head directly integrated, attachments mounted and secured using thread and centering sleeves on both side surfaces, wipers as standard

Operating temperature

From 10°C to 40°C

Accessories

- Control units from Bosch Rexroth or Siemens (other manufacturers on request)
- Limit switching using either mechanical precision switches or inductive sensors; referencing using inductive sensors
- Cable track, pre-assembled and mounted on drive
- Adapter plates on request
- Reinforcing plates (version MLD KT)
- Pneumatic brake to secure waste in case of power failure or emergency stop; optionally with brake valve consisting of switching valve and cable
- Alternative stroke measuring systems

Acceleration

Up to 40 m/s^2

Useful loads

1 - 6 kg in vertical mode

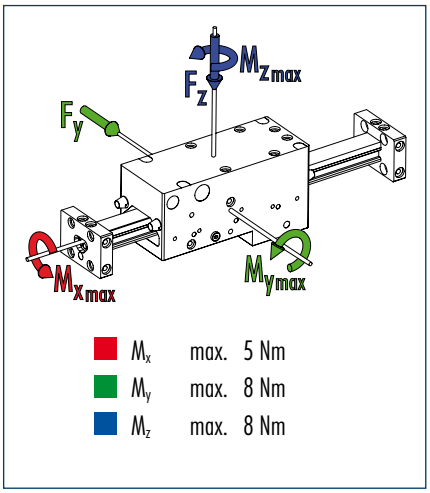
Warranty

24 months
ⓘ Refer to ambient conditions on our introductory pages

For production reasons, the colors may vary from those shown in the catalog.

MLD 50K

Moment load



M_x	max.	5 Nm
M_y	max.	8 Nm
M_z	max.	8 Nm

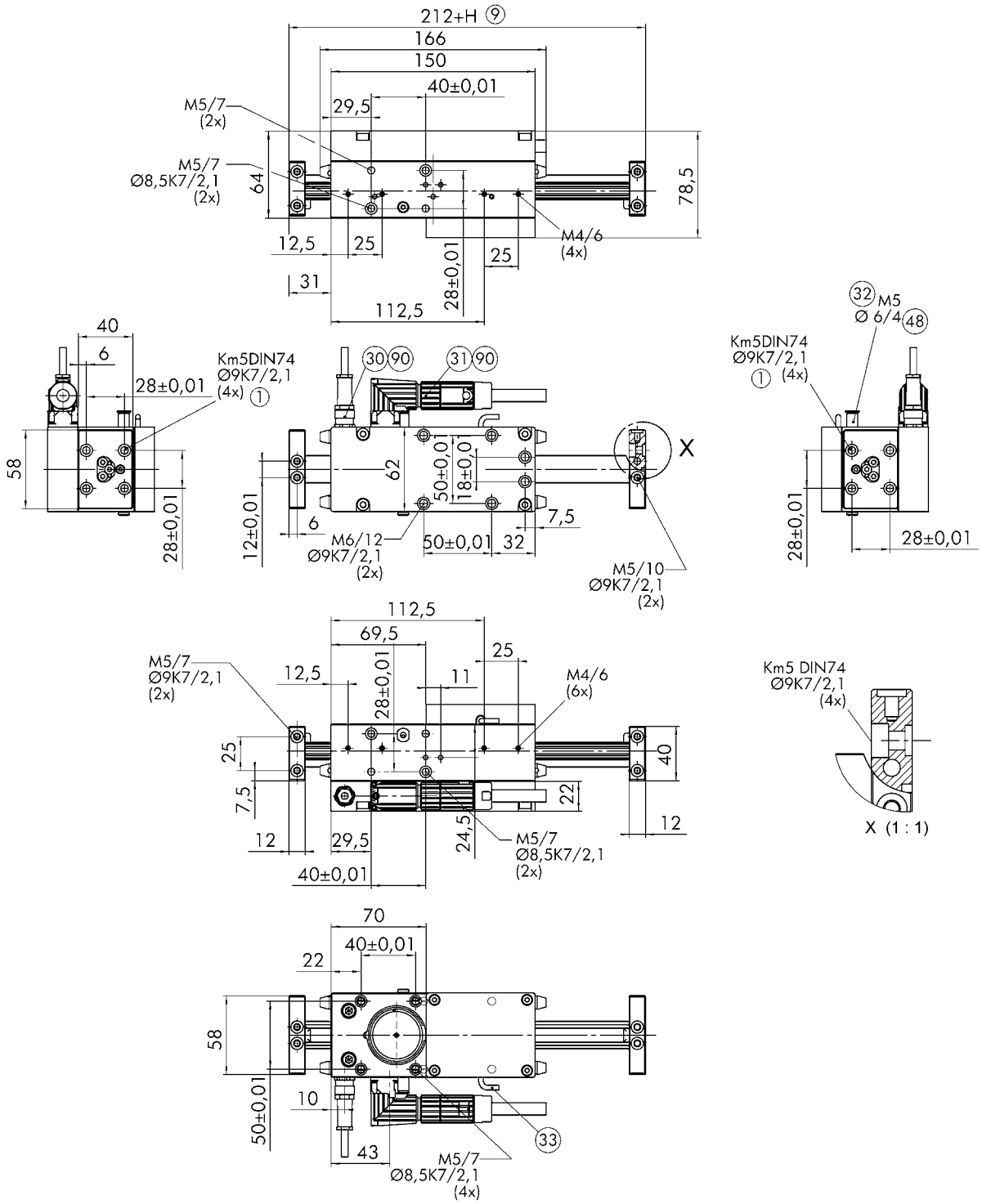
Technical data

Designation		MLD 50K	MLD 50KT
Max. driving force (*)	[N]	125	125
Rated force (**)	[N]	45	45
Max. speed	[m/s]	4	4
Max. acceleration	[m/s²]	40	40
Max. useful load (horizontal)	[kg]	1	1
Max. stroke	[mm]	200	200
Repeat accuracy (***)	[mm]	0.01	0.01
Measuring system resolution (controller-dependent)	[µm]	0.5	0.5
Max. current	(A_{eff})	4.1	4.1
Max. continuous current at standstill	(A_{eff})	1.1	1.1
Max. ambient temperature	[°C]	40	40
Max. surface temperature	[°C]	70	70
Weight of guided slide inc. motor	[kg]	1.7	1.7
Weight of end plates	[kg]	0.12	0.19
Profile / 100mm stroke	[kg]	0.2	0.31

(*) Depending on controller type used
(**) Depending on installation situation (heat dissipation)
(***) The specified repeat accuracies are only applicable at constant ambient temperatures.

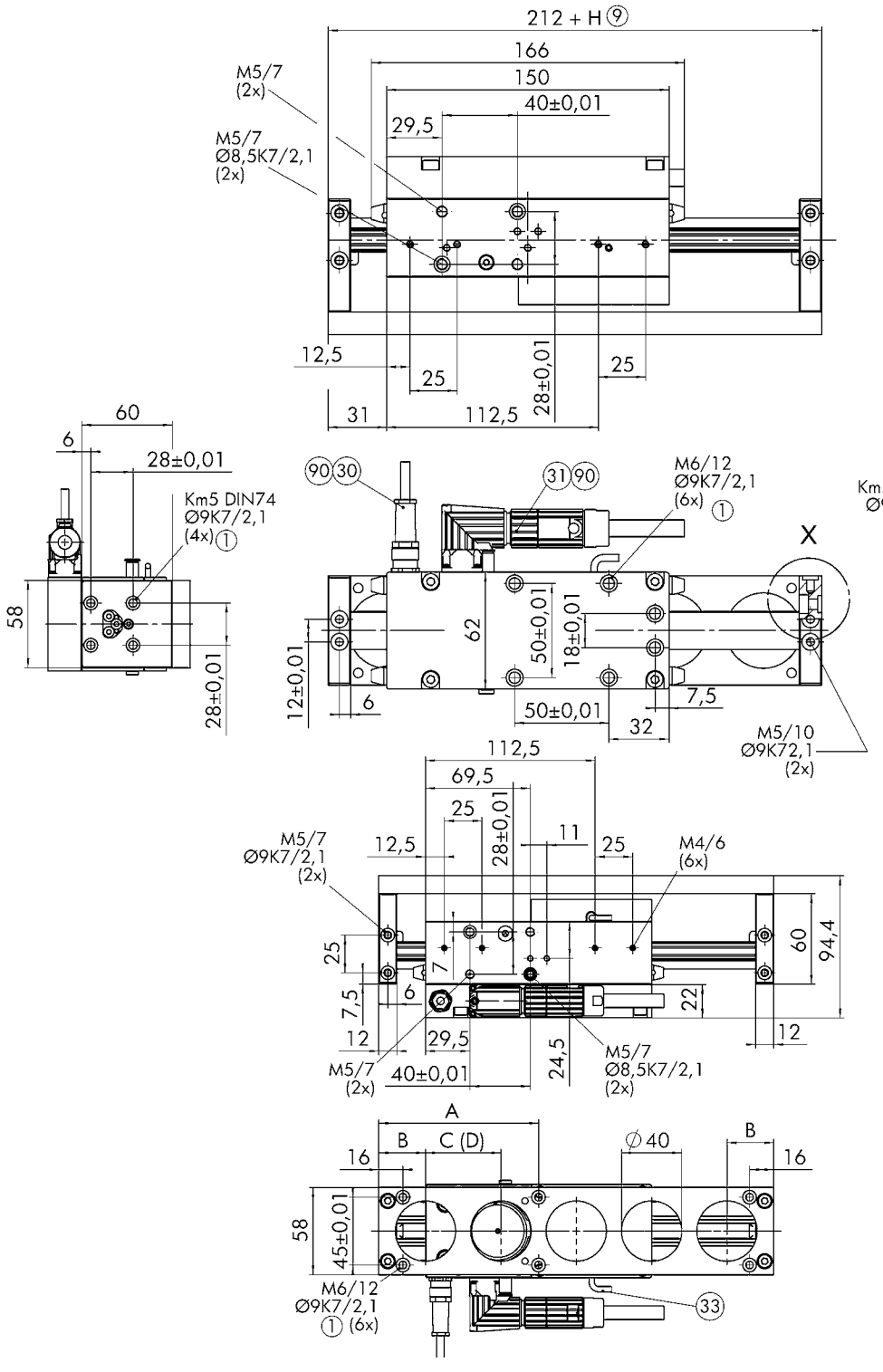
ⓘ The specified repeat accuracy applies at constant ambient temperatures.
Some of the specified forces can vary considerably when using different control units and with increasing travel speeds

Main views MLD 50K



① Linear unit connection
② Assembly connection
⑨ Useful stroke
㉚ Hall sensor connecting plug (if required)
㉛ Motor plug
㉜ Air connection for pneumatic holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter
㊿ Motor plug and Hall sensor on either right or left side

Main views MLD 50KT

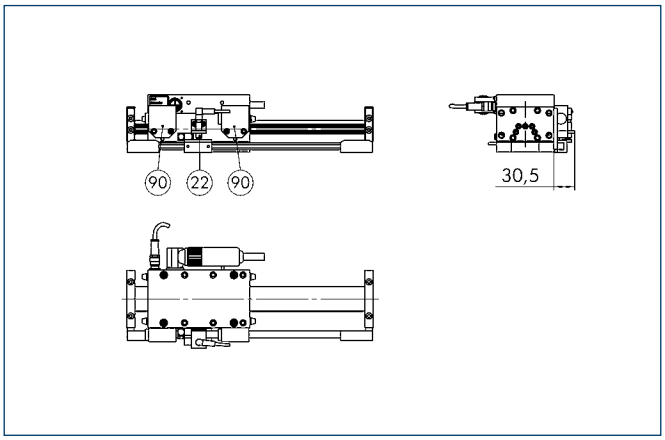


⑨

H	L	A	B	C	D
50	262	156	31	50	5
100	312	156	31	50	6
150	362	156	31	50	7
200	412	206	31	50	8

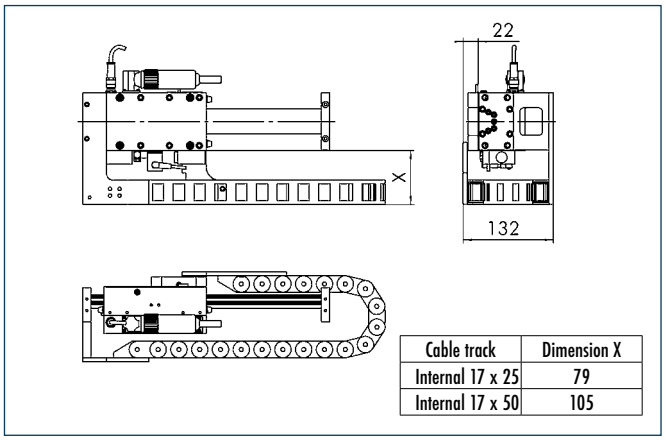
① Linear unit connection
② Assembly connection
⑨ Useful stroke
㉚ Hall sensor connecting plug (if required)
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter
㊿ Motor plug and Hall sensor on either right or left side

Limit and reference switches



(22) Reference switch
(90) Mechanical or inductive limit switch

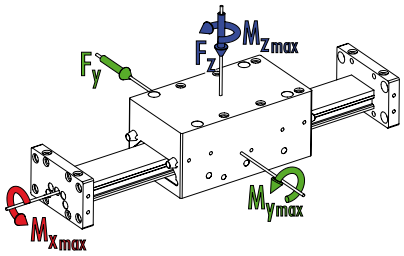
Cable track



Cable track	Dimension X
Internal 17 x 25	79
Internal 17 x 50	105

MLD 100K

Moment load



M_x	max. 10 Nm
M_y	max. 15 Nm
M_z	max. 15 Nm

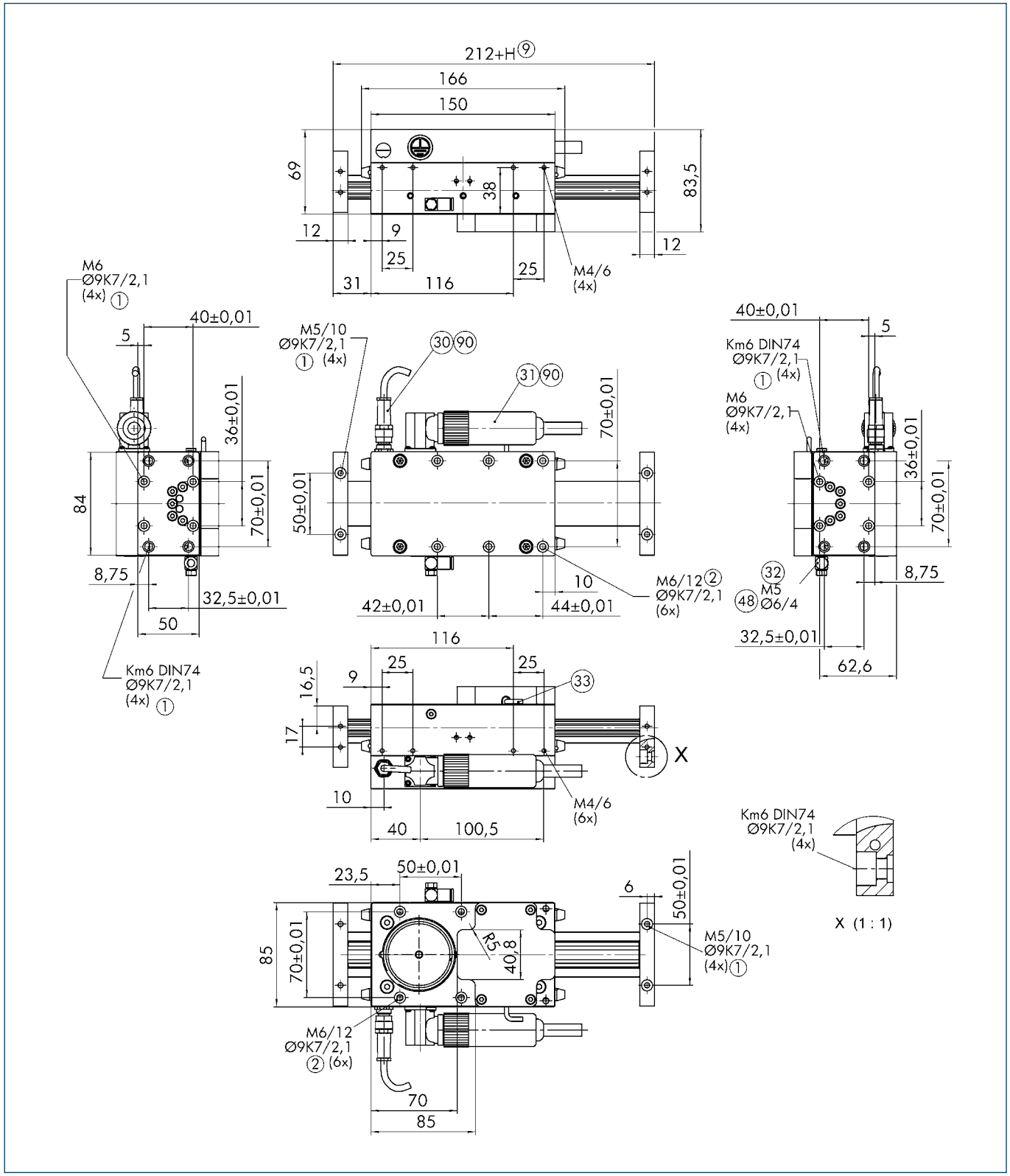
Technical data

Designation		MLD 100K	MLD 100KT
Max. driving force (*)	[N]	250	250
Rated force (**)	[N]	74	74
Max. speed	[m/s]	4	4
Max. acceleration	[m/s²]	40	40
Max. useful load (horizontal)	[kg]	3	3
Max. stroke	[mm]	400	400
Repeat accuracy (***)	[mm]	0.01	0.01
Measuring system resolution (controller-dependent)	[µm]	0.5	0.5
Max. current	(A_{eff})	8.1	8.1
Max. continuous current at standstill	(A_{eff})	2.1	2.1
Max. ambient temperature	[°C]	40	40
Max. surface temperature	[°C]	70	70
Weight of guided slide inc. motor	[kg]	2.4	2.4
Weight of end plates	[kg]	0.23	0.29
Profile / 100mm stroke	[kg]	0.34	0.47

(*) Depending on controller type used
(**) Depending on installation situation (heat dissipation)
(***) The specified repeat accuracies are only applicable at constant ambient temperatures.

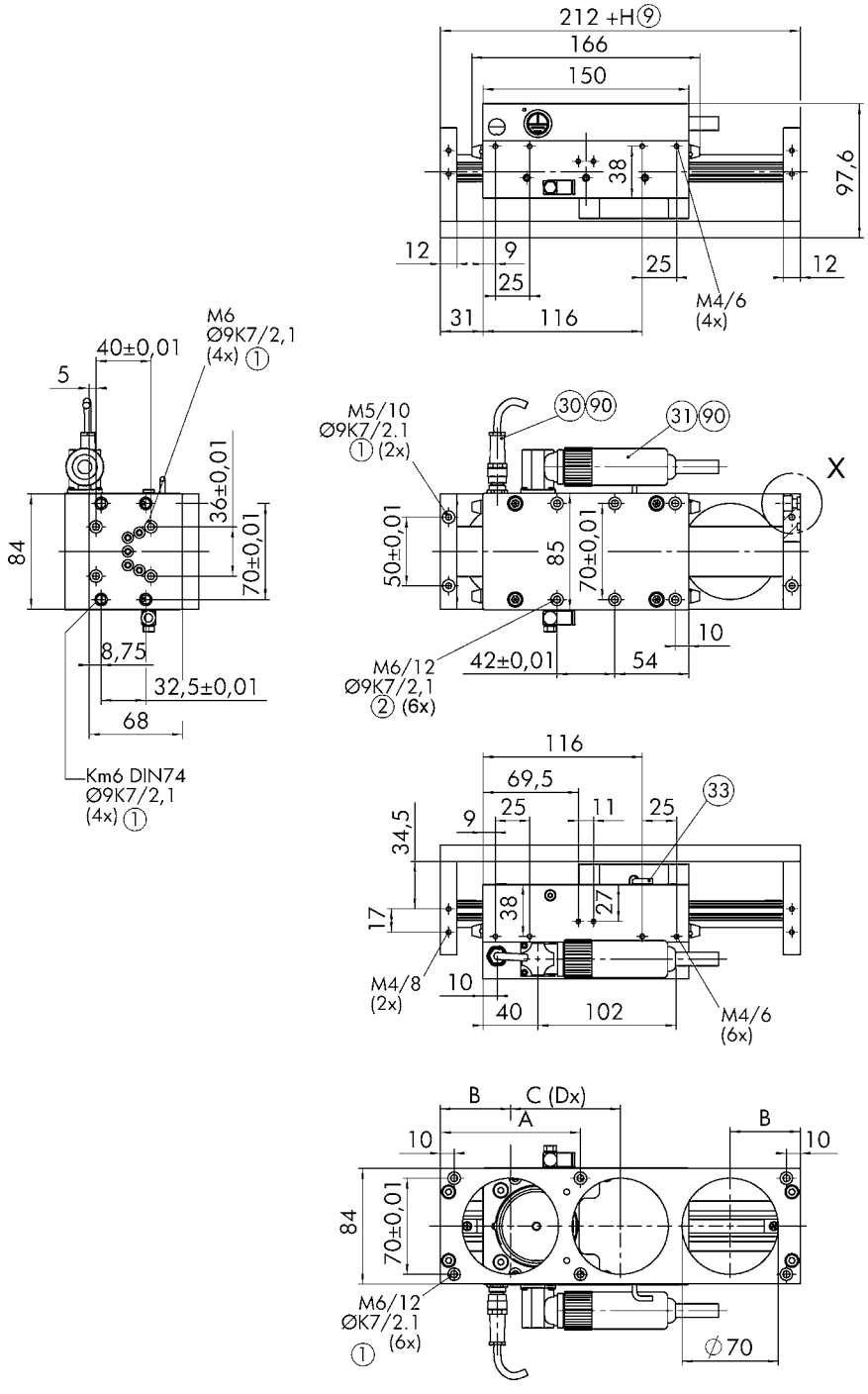
ⓘ The specified repeat accuracy applies at constant ambient temperatures.
Some of the specified forces can vary considerably when using different control units and with increasing travel speeds

Main views MLD 100K



① Linear unit connection
② Assembly connection
⑨ Useful stroke
㉚ Hall sensor connecting plug (if required)
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter
㊿ Motor plug and Hall sensor on either right or left side

Main views MLD 100KT

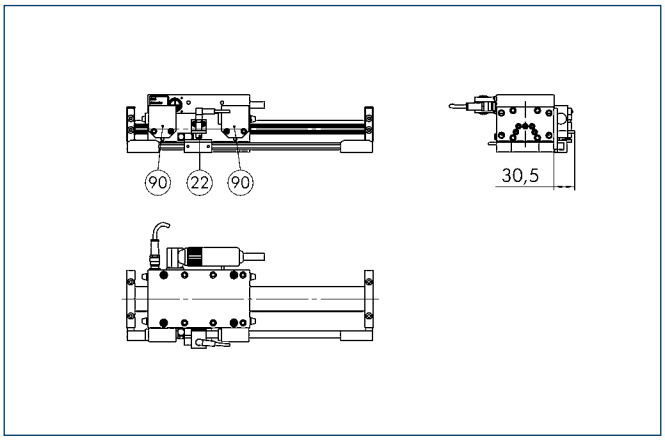


⑨

H	L	A	B	C	D
50	262	160	51	80	3
100	312	190	63,5	92,5	3
150	362	190	42,25	92,5	4
200	412	240	46	80	5
250	462	265	46	92,5	5
300	512	240	56	80	6

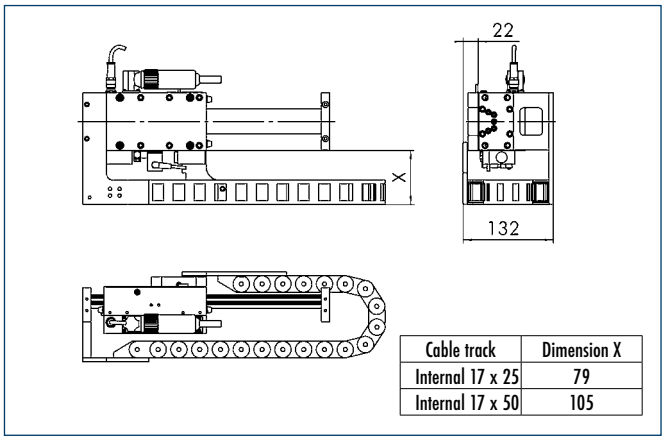
① Linear unit connection
② Assembly connection
⑨ Useful stroke
30 Hall sensor connecting plug (if required)
31 Motor plug
32 Pneumatic connection for holding brake
33 Cable for stroke measuring system
48 Hose diameter
90 Motor plug and Hall sensor on either right or left side

Limit and reference switches



(22) Reference switch
(90) Mechanical or inductive limit switch

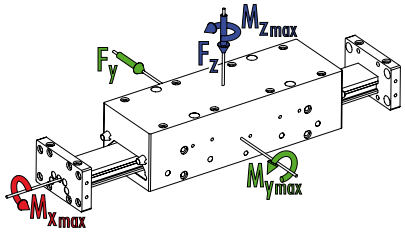
Cable track



Cable track	Dimension X
Internal 17 x 25	79
Internal 17 x 50	105

MLD 200K

Moment load



M_x	max. 20 Nm
M_y	max. 25 Nm
M_z	max. 25 Nm

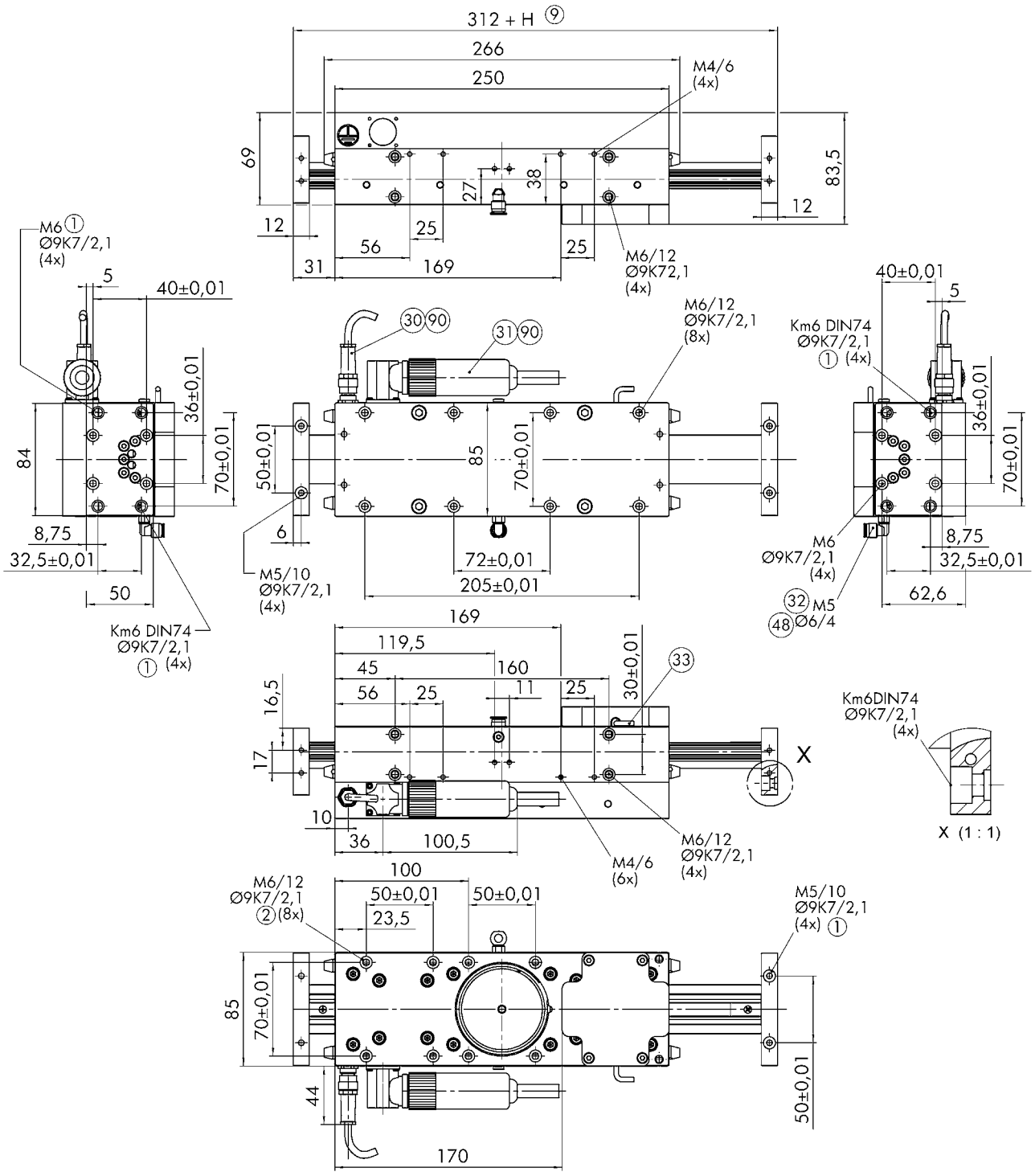
Technical data

Designation		MLD 200K	MLD 200KT
Max. driving force (*)	[N]	500	500
Rated force (**)	[N]	136	136
Max. speed	[m/s]	4	4
Max. acceleration	[m/s²]	40	40
Max. useful load (horizontal)	[kg]	6	6
Max. stroke	[mm]	300	300
Repeat accuracy (***)	[mm]	0.01	0.01
Measuring system resolution (controller-dependent)	[µm]	0.5	0.5
Max. current	(A_{eff})	16.2	16.2
Max. continuous current at standstill	(A_{eff})	3.8	3.8
Max. ambient temperature	[°C]	40	40
Max. surface temperature	[°C]	70	70
Weight of guided slide inc. motor	[kg]	4.0	4.0
Weight of end plates	[kg]	0.23	0.29
Profile / 100mm stroke	[kg]	0.34	0.47

(*) Depending on controller type used
(**) Depending on installation situation (heat dissipation)
(***) The specified repeat accuracies are only applicable at constant ambient temperatures.

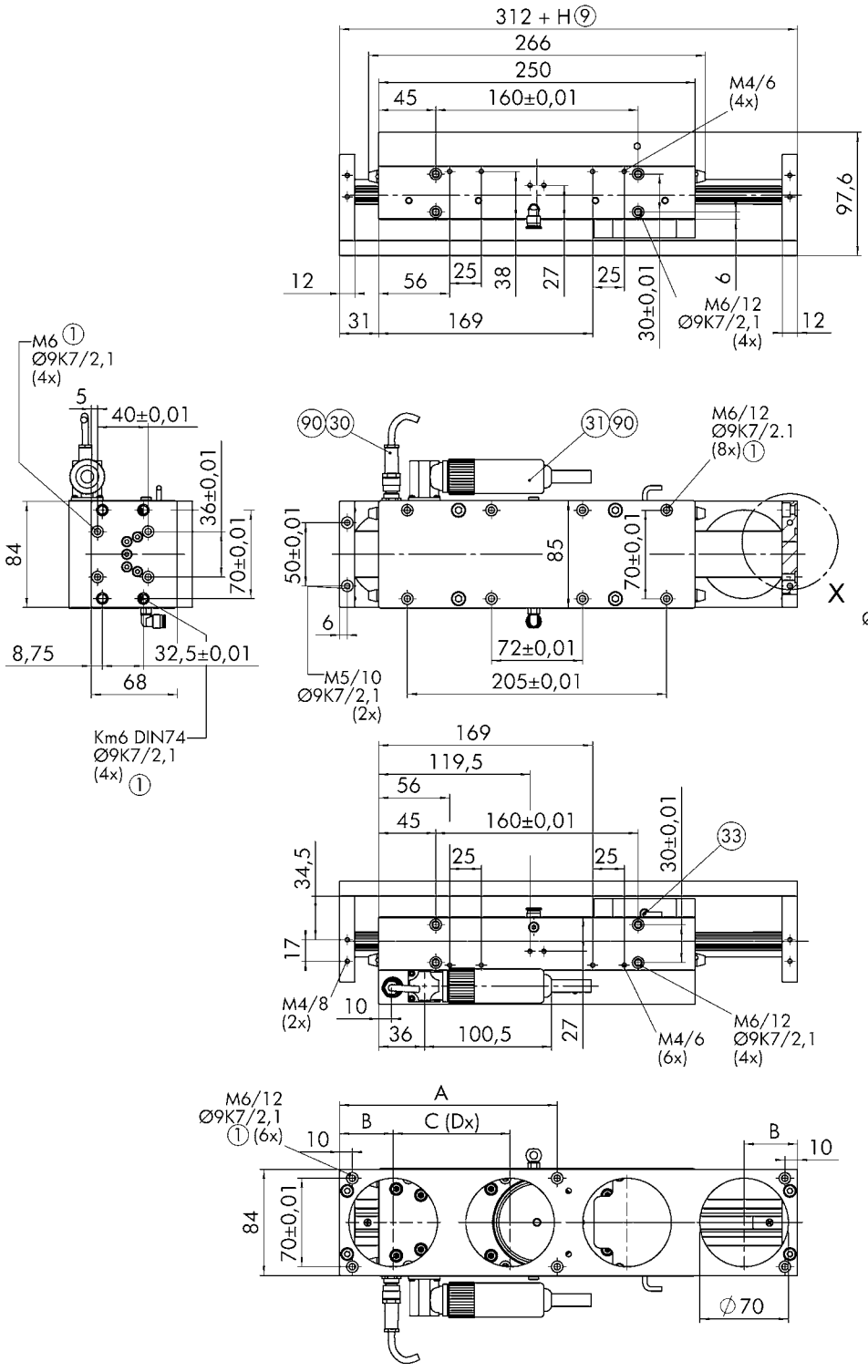
ⓘ The specified repeat accuracy applies at constant ambient temperatures.
Some of the specified forces can vary considerably when using different control units and with increasing travel speeds

Main views MLD 200K



① Linear unit connection
② Assembly connection
⑨ Useful stroke
㉚ Hall sensor connecting plug (if required)
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter
㊿ Motor plug and Hall sensor on either right or left side

Main views MLD 200KT

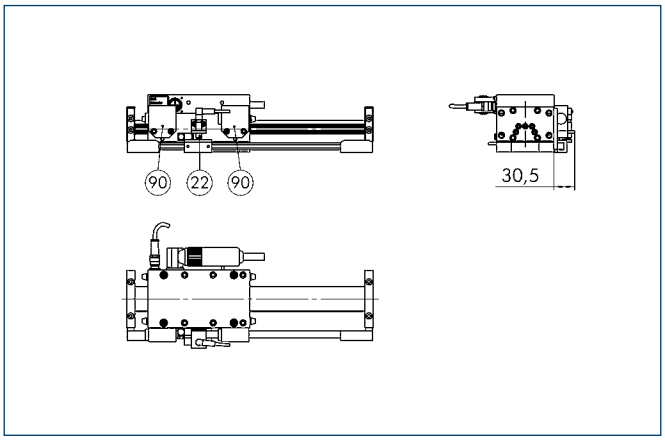


⑨

H	L	A	B	C	D
50	362	190	42.25	92,5	4
100	412	240	46	80	5
150	462	265	46	92,5	5
200	512	240	56	80	6
250	562	265	49.75	92,5	6
300	612	265	66	80	7

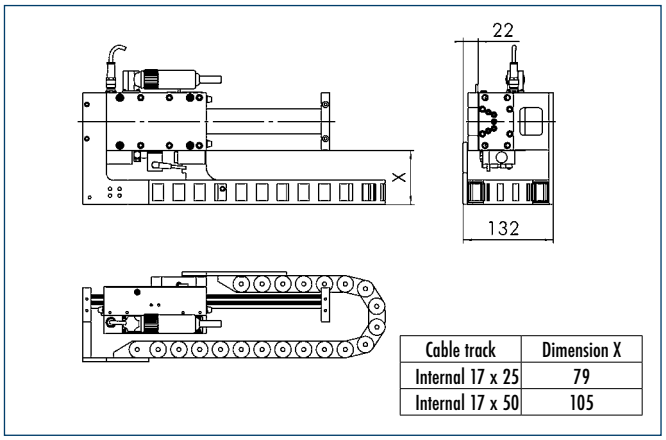
① Linear unit connection
② Assembly connection
⑨ Useful stroke
㉚ Hall sensor connecting plug (if required)
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter
㊿ Motor plug and Hall sensor on either right or left side

Limit and reference switches



(22) Reference switch
(90) Mechanical or inductive limit switch

Cable track



Cable track	Dimension X
Internal 17 x 25	79
Internal 17 x 50	105

MLD K(T) component option codes and ordering

Each axis is supplemented with the required options. Each option is made up of 4 digits. The first two digits indicate the axis type. These are identical for all options for an axis.* The last two digits indicate the selectable options or accessories.

Option digits for axis types:

MLD 50K = 30xx
MLD 100K = 31xx
MLD 200K = 32xx
MLD 50 KT = 33xx
MLD 100 KT = 34xx
MLD 200 KT = 35xx

Version	Description	Option
Active slide	1 slide	xx01
Motor for active slide with plug outlet	Left (completely assembled for INDRADRIVE)	xx03
	Right (completely assembled for INDRADRIVE)	xx04
	Left (completely assembled for SINAMICS)	xx58
	Right (completely assembled for SINAMICS)	xx59
Passive slide	1 slide	-
Holding brake	Mounted in 1 active slide	xx05
Brake valve inc. 10m cable	for 1 slide	xx06
Wipers	Mounted on slide as standard	-
Reference switch	Inductive reference switches	xx08
Limit switches	Inductive limit switches	xx11
	Mechanical limit switches	xx13
Cable track	Narrow, attachment on left	xx15
	Narrow, attachment on right	xx16
	Narrow, for 2 slides left/right	-
	Wide, attachment on left	xx18
	Wide, attachment on right	xx19
	Wide, for 2 slides left/right	-
Centering sleeves	D = 9K7 in enclosed pack	xx24 (n)**
Standard cable sets	INDR. / Basic cable set, 5m straight	xx32
	INDR. / Basic cable set, 10 m straight	xx33
	INDR. / Basic cable set, 15 m straight	xx34
	INDR. / Basic cable set, 20 m straight	xx35
	INDR. / Adv. cable set, 5m straight	xx36
	INDR. / Adv. cable set, 10 m straight	xx37
	INDR. / Adv. cable set, 15 m straight	xx38
	INDR. / Adv. cable set, 20 m straight	xx39
	Sinamics cable set, 5 m	xx40
	Sinamics cable set, 10 m	xx41
	Sinamics cable set, 15 m	xx42
	Sinamics cable set, 20 m	xx43
Measuring system mounting kit	Four-digit code: (e.g. 0132) generated from following code:	Digit 1: 0 Digit 2: Stroke measuring system type: 1 = Magnetic incremental linear unit 2 = Internal 3 = Absolute MSA 4 = Optical LIA*** Digit 3: Stroke measuring system cable length: (Corresponding to cable set length as standard) 1= 5m 2= 10m 3= 15m 4= 20m Digit 4: Drive controller cable version: (Corresponding to cable set version as standard) 1 = Internal 2 = BoschRexroth Indradrive BASIC 3 = BoschRexroth Indradrive ADVANCED 4 = SIEMENS Sinamics

Digit 1	Digit 2	Digit 3	Digit 4
0	1	3	2

Sample order

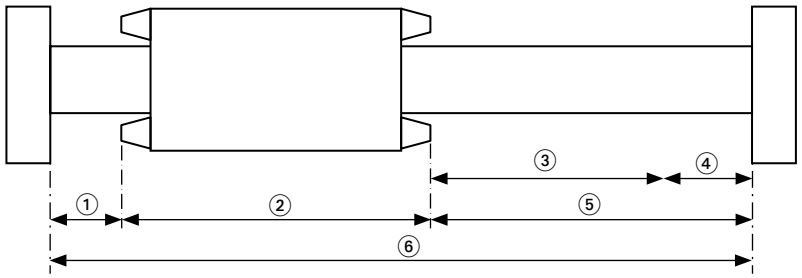
MLD 100KT	-	1	-	150	-	nnn	-	3404 - 3411 - 3416 -3424(6) - 3433 - 0132
Type of axis		Number of active slides		Useful stroke		Total length**** (added by Schunk)		List of required options

* The exception is the stroke measuring system option, which always appears last.

** Options with () contain the quantity of the options specified in brackets. For all options where the number automatically corresponds to the number of active slides, no quantity is specified.

*** CAUTION: Cannot be used for MLD 50K and MLD 50K

**** Total length = Profile length + 2x end plate The only lengths available as the profile length for this axis type - due to the magnet - are xx38mm and xx88mm. The profile length is made up of the useful stroke, the total of the slide lengths and the safety reserve typical for the axis (22 mm) and is extended to the next technically feasible length by Schunk project engineers (wipers and shock absorbers are also taken into account). The Schunk useful stroke specification may slightly exceed the required useful stroke due to the permissible profile length. The total length is supplemented.



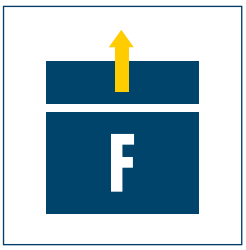
1. Safety reserve
2. Slide length
3. Stroke
4. Supplement to permissible profile length
5. Useful stroke
6. Profile length

Scope of delivery includes

3-phase, electronically commutated AC synchronous linear motor with primary and secondary part, measuring system, profile guide with guide rollers, slide, profile end plates and with or without Hall sensor depending on the drive concept. Please specify other options when ordering.

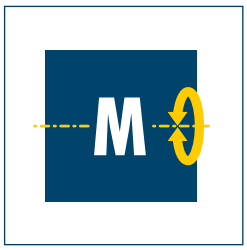
MLD FU/FUL

Useful stroke
up to 3,800mm

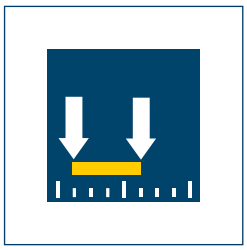


Driving force
270 .. 550 N

Maximum speed
Up to 4 m/s

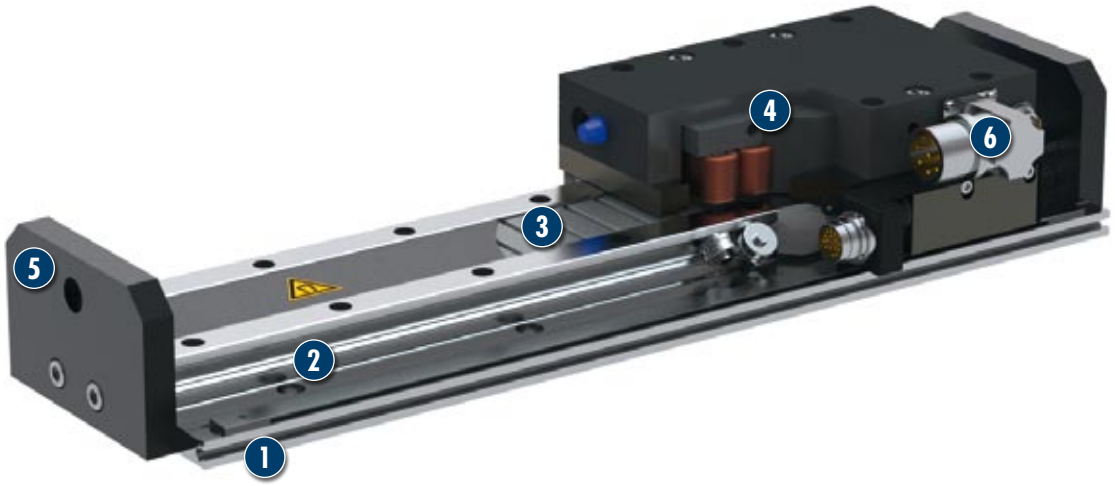


Moment load
Max. 120 Nm



Repeat accuracy
0.01 mm

Module design



1 **Supporting aluminum press-drawn section**
for higher useful loads

2 **Precise, polished spring steel guide rails**
for optimum guidance properties and speeds

3 **Integrated secondary parts**
with high power magnets

4 **Compact primary part slide**
with mounting surfaces, roller shoes adjusted without play and integrated measuring system

5 **End plates**
for mounting sensors and shock absorbers

6 **Motor plug**

Linear axis with direct drive

and roller guide with exceptionally flat design

Area of application

The axis module is suitable for low to medium loads with high dynamic requirements.

General information about the series

Drive

3-phase, electronically commutated AC synchronous linear motor.
Primary part 3-phase copper coil body, secondary part iron mount with permanent magnets and dirt cover.

Stroke measuring system

Non-contact magnetic measuring system with integrated analog signal output, 1 Vss (insensitive to contamination)

Profile guide

Aluminum press-drawn section with polished spring steel tracks with secondary part made of high power magnets

Guided slide

Needle bearing rollers with integrated felt wipers, slide adjustable without play, primary part and measuring system reading head directly integrated.
Attachments mounted and secured using thread and centering sleeves

Operating temperature

From 10 °C to 40 °C

Options

- Pneumatic brake for relieving the load on the linear motor, e.g. under influence of axial forces in target position
- Other independent motor slides on a common profile guide and with a linear measuring system
- Collision protection in case of programming errors is provided by corresponding limit switches
- Second passive guided slide for long attachments (free moving)
- Absolute stroke measuring system

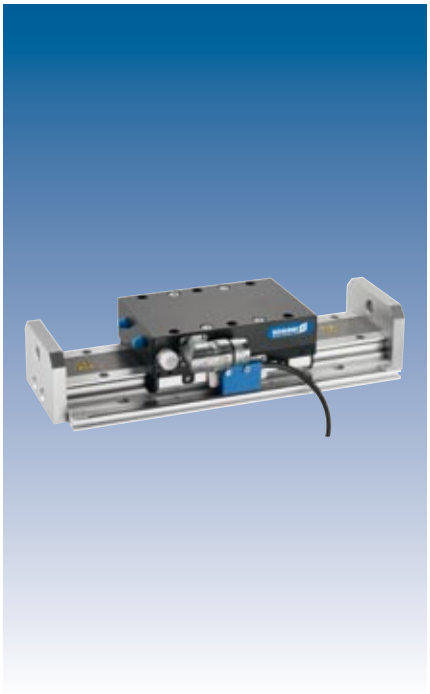
Accessories

- Control units from Bosch Rexroth or Siemens (other manufacturers on request)
- Limit switching with inductive sensors; referencing using inductive sensors
- Hydraulic shock absorbers on profile end plates to prevent inelastic collisions (size and number of shock absorbers depend on application)
- Cable track, pre-assembled and mounted on drive
- Adapter plates, bellow cover and stainless steel guide on request
- Pre-assembled cable sets in different lengths

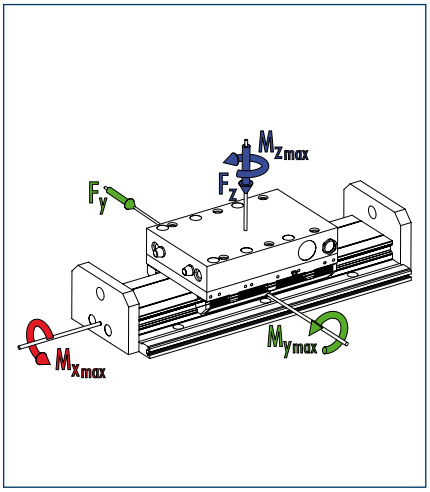
Warranty

24 months
ⓘ Refer to ambient conditions on our introductory pages

For production reasons, the colors may vary from those shown in the catalog.



Load data



	MLD 100FU	MLD 200FUL
M_x max. [Nm]	47	60
M_y max. [Nm]	37	120
M_z max. [Nm]	37	120

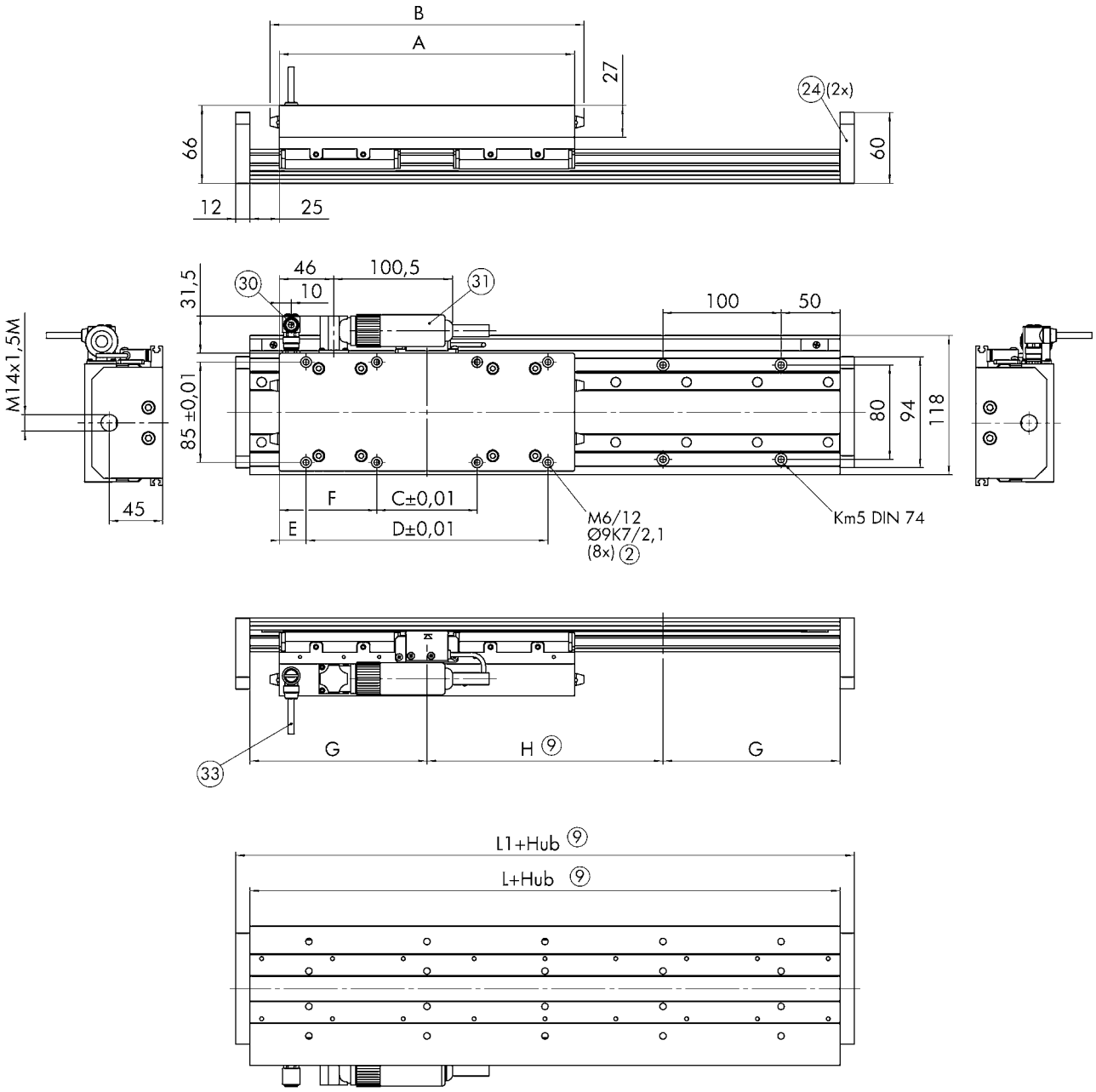
Technical data

Designation		MLD 100FU	MLD 200FUL
Max. driving force (*)	[N]	250	500
Rated force (**)	[N]	86	183
Max. speed	[m/s]	4	4
Max. acceleration	[m/s²]	40	40
Max. useful load (horizontal)	[kg]	10	30
Max. stroke	[mm]	3800	3700
Repeat accuracy (***)	[mm]	0.01	0.01
Measuring system resolution (controller-dependent)	[µm]	0.5	0.5
Max. current	(A_{eff})	8.1	16.2
Max. continuous current at standstill	(A_{eff})	2.2	3.9
Max. ambient temperature	[°C]	40	40
Max. surface temperature	[°C]	70	70
Weight of guided slide inc. motor	[kg]	2.2	3.6
Weight of end plates	[kg]	0.37	0.37
Profile / 100mm stroke	[kg]	0.77	0.77

(*) Depending on controller type used
(**) Depending on installation situation (heat dissipation)
(***) The specified repeat accuracies are only applicable at constant ambient temperatures.

ⓘ The specified repeat accuracy applies at constant ambient temperatures.
Some of the specified forces can vary considerably when using different control units and with increasing travel speeds

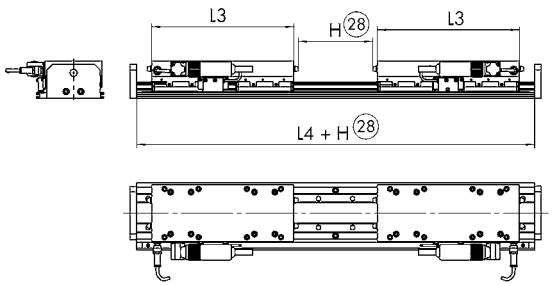
Main views



Type	A	B	C	D	E	F	G	L1	L2
MLD 100FU	150	166	52	104	21.5	21.5	100	224	200
MLD 200FUL	250	266	85	205	22.5	82.5	150	324	300

(2) Assembly connection
(9) Useful stroke
(24) Flange
(30) Hall sensor connecting plug
(31) Motor plug
(33) Cable for stroke measuring system

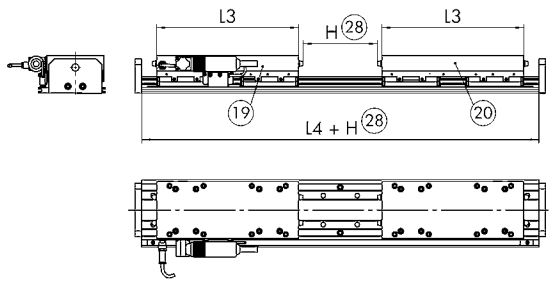
Second slide (third slide only on request)



Type	L3	L4
MLD 100FU	150	400
MLD 200FUL	250	600

28 Total stroke = 2 x stroke per slide

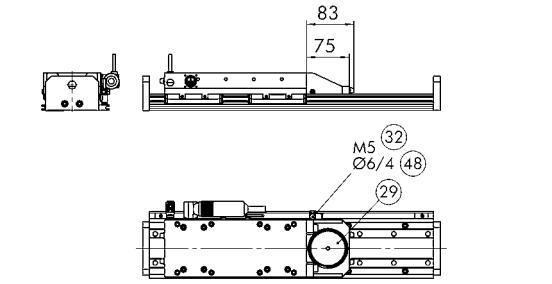
Second passive slide



Type	L3	L4
MLD 100FU	150	400
MLD 200FUL	250	600

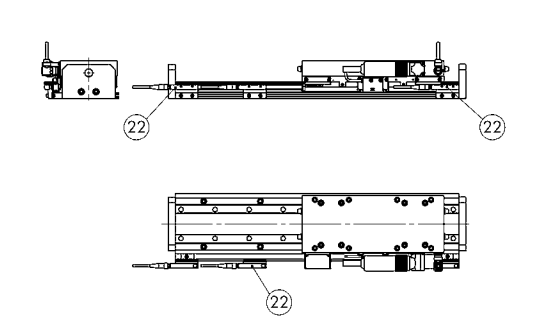
19 Powered slide
20 Passive slide
28 Total stroke = 2 x stroke per slide

Brake attachment



29 Brake
32 Compressed air connection
48 Hose diameter

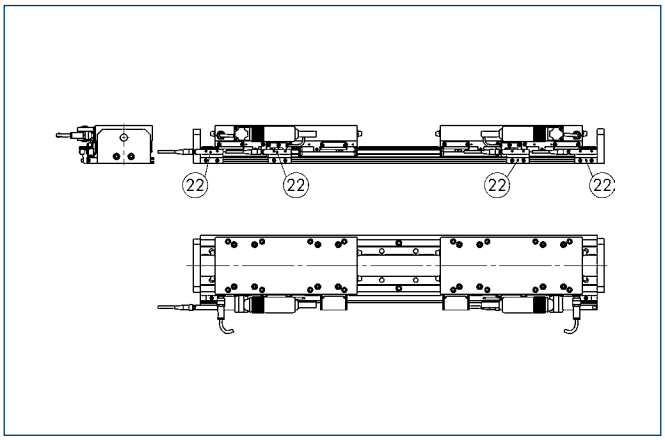
Limit and reference switch with one slide



22 Inductive reference switch

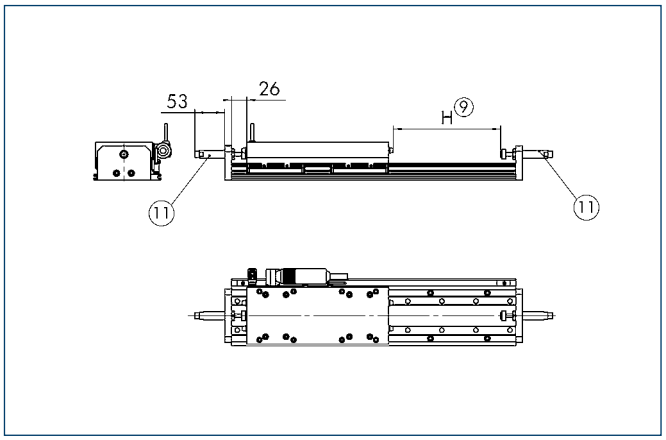
Figure : Left reference switch

Limit and reference switch with two slides



(22) Inductive reference switch

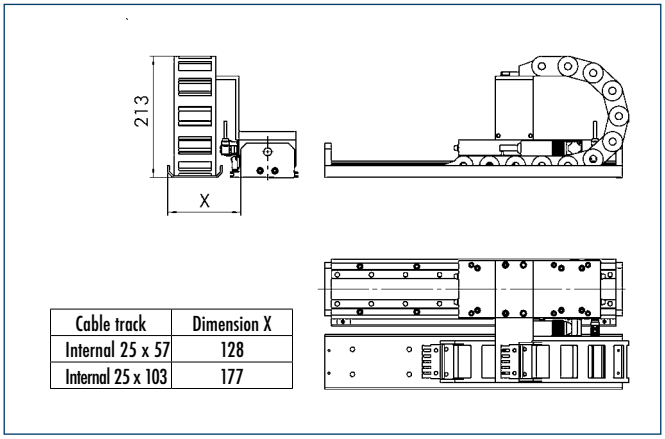
Shock absorber



(9) Useful stroke
(11) Shock absorber

ⓘ Shock absorbers shorten the useful stroke by 42 mm, as the shock absorbers may not be actuated during axis operation.

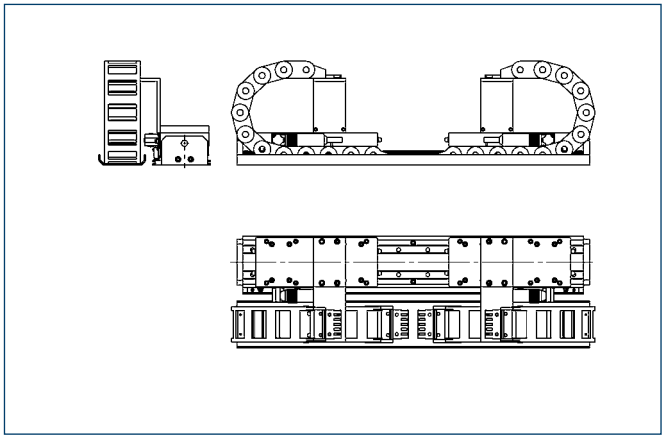
Cable track for one motor slide



Cable track	Dimension X
Internal 25 x 57	128
Internal 25 x 103	177

Figure : Cable track to left

Cable tracks for two motor slides



MLD FU(FUL) component option codes and ordering

Each axis is supplemented with the required options. Each option is made up of 4 digits. The first two digits indicate the axis type. These are identical for all options for an axis.* The last two digits indicate the selectable options or accessories.

Option digits for axis types:
MLD 100FU =81xx MLD 200 FUL = 82xx

Version	Description	Option
Active slide	1 slide	xx01
Motor for active slide with plug outlet	Left (completely assembled for INDRADRIVE)	xx03
	Right (completely assembled for INDRADRIVE)	xx04
	Left (completely assembled for SINAMICS)	xx58
	Right (completely assembled for SINAMICS)	xx59
Passive slide	1 slide	xx02 (n)**
Holding brake	Mounted in 1 active slide	xx05
Brake valve inc. 10m cable	for 1 slide	xx06
Wipers	mounted on slide	-
Reference switch	Inductive reference switches, left	xx08
	Inductive reference switches, right	xx09
	Inductive reference switches for 2 active slides	xx10
Limit switches	Inductive limit switches (right/left)	xx11
	Inductive limit switches for 2 active slides	xx12
	Mechanical limit switches (right/left)	-
Cable track	Narrow, attachment on left	xx15
	Narrow, attachment on right	xx16
	Narrow, for 2 slides left/right	xx17
	Wide, attachment on left	xx18
	Wide, attachment on right	xx19
	Wide, for 2 slides left/right	xx20
Shock absorber	2 units in set	xx21
	3 units in set (2 slides)	xx22
Clamping profiles	Mounting strips for axis profile	xx23 (n)**
Centering sleeves	D = 9K7 in enclosed pack	xx24 (n)**
Standard cable sets	INDR. / Basic cable set, 5m straight	xx32
	INDR. / Basic cable set, 10 m straight	xx33
	INDR. / Basic cable set, 15 m straight	xx81
	INDR. / Basic cable set, 20 m straight	xx35
	INDR. / Adv. cable set, 5m straight	xx36
	INDR. / Adv. cable set, 10 m straight	xx37
	INDR. / Adv. cable set, 15 m straight	xx38
	INDR. / Adv. cable set, 20 m straight	xx39
	Sinamics cable set, 5 m	xx40
	Sinamics cable set, 10 m	xx41
	Sinamics cable set, 15 m	xx42
	Sinamics cable set, 20 m	xx43
Measuring system mounting kit	Four-digit code: (e.g. 0132) generated from following code:	Digit 1: 0 / Digit 2: 1 = Magnetic incremental linear unit, 2 = Internal, 3 = Absolute MSA / Digit 3: 1= 5m, 2= 10m, 3= 15m, 4= 20m / Digit 4: 1 = Internal, 2 = BoschRexroth Indradrive BASIC, 3 = BoschRexroth Indradrive ADVANCED, 4 = SIEMENS Sinamics

Digit 1	Digit 2	Digit 3	Digit 4
0	1	3	2

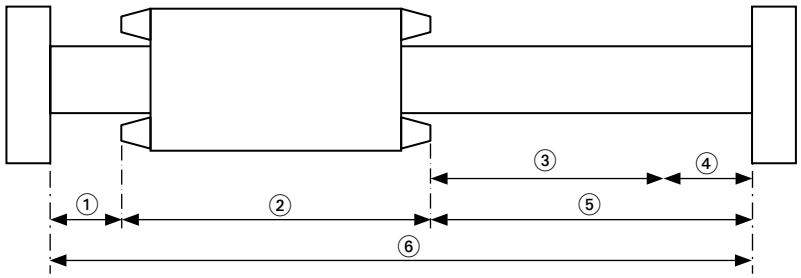
Sample order

MLD 100FU	-	1	-	150	-	nnn	-	8104 - 8111 - 8116 -8124(6) - 8133 - 0132
Type of axis		Number of active slides		Useful stroke		Total length*** (added by Schunk)		List of required options

* The exception is the stroke measuring system option, which always appears last.

** Options with () contain the quantity of the options specified in brackets. For all options where the number automatically corresponds to the number of active slides, no quantity is specified.

*** Total length = Profile length + 2x end plate The only length available as the profile length for this axis type - due to the magnet - is xx00mm.
The profile length is made up of the useful stroke, the total of the slide lengths and the safety reserve typical for the axis (34 mm) and is extended to the next technically feasible length by Schunk project engineers (wipers and shock absorbers are also taken into account). The Schunk useful stroke specification may slightly exceed the required useful stroke due to the permissible profile length. The total length is supplemented.

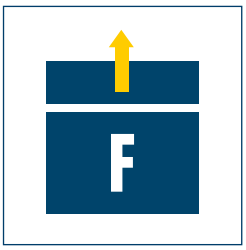


1. Safety reserve
2. Slide length
3. Stroke
4. Supplement to permissible profile length
5. Useful stroke
6. Profile length

Scope of delivery includes

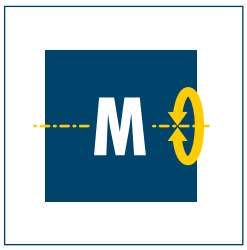
3-phase, electronically commutated AC synchronous linear motor with primary and secondary part, measuring system, profile guide with guide rollers, slide, profile end plates and with or without Hall sensor depending on the drive concept. Please specify other options when ordering.

Useful stroke
up to 2,800 mm

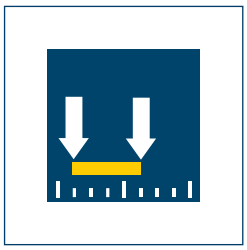


Driving force
up to 750 N

Deflection
0.1 mm .. 1 mm

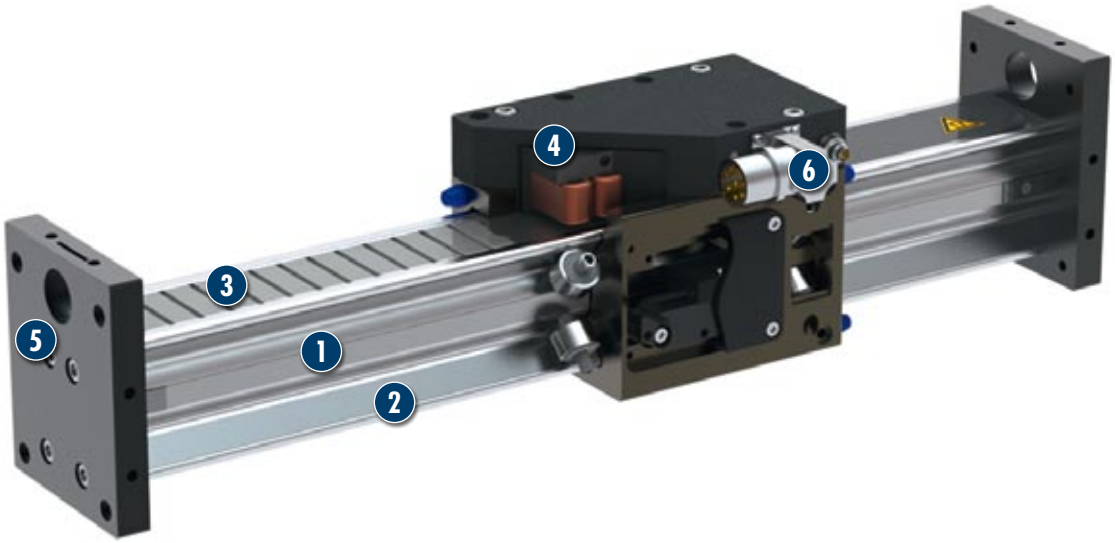


Moment load
up to 550 Nm



Repeat accuracy
0.01 mm

Module design



1 **Elongated X-shaped aluminum press-drawn section**
with high planar moments of inertia for maximum moment and shearing force load

2 **High precision, hardened and ground steel guide rails**
for optimum guidance properties and speeds

3 **Integrated secondary parts**
with high power magnets

4 **Compact primary part slide**
with mounting surfaces, rollers adjusted without play and integrated measuring system

5 **End plates**
for mounting sensors and shock absorbers

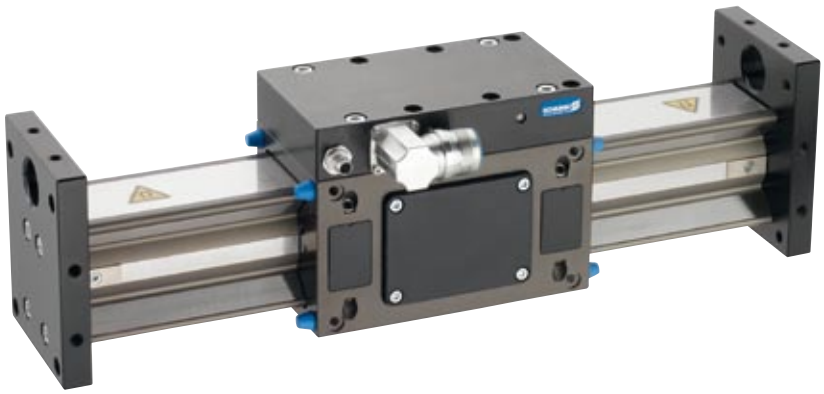
6 **Motor plug**

Linear axis with direct drive

and roller guide

Area of application

The self-supporting standard axis profile is designed for a huge range of applications.
It can be used as a gantry axis system with free moving slide or as a boom system in which the slide is fixed in place.



General information about the series

Drive

3-phase, electronically commutated AC synchronous linear motor.
Primary part 3-phase copper coil body, secondary part iron mount with permanent magnets and dirt cover.

Stroke measuring system

Non-contact magnetic measuring system with integrated analog signal output, 1 Vss (insensitive to contamination)

Profile guide

X-shaped aluminum press-drawn section with ground steel guide strips

Standard guided slide

Roller-guided slide adjustable with no play using cam, primary part and measuring system reading head directly integrated.
Attachments can be mounted and secured using thread and centering sleeves on three side surfaces.

Operating temperature

From 10 °C to 40 °C

Options

- Pneumatic brake to relieve load on linear motor, e.g. under influence of axial forces in target position or to secure waste for vertical axes in case of power failure or emergency stop.
- Second independent motor slide on a shared profile guide and with a linear measuring system.
  Collision protection in case of programming errors is provided by corresponding limit switches.
- Second passive guided slide for long attachments (free moving)
- Wipers for removing deposits on the guideways.
- Absolute stroke measuring system and optical stroke measuring systems for applications with very high accuracy

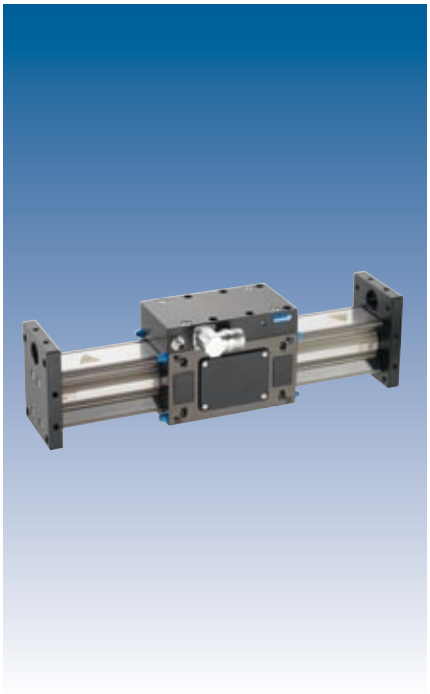
Accessories

- Control units from Bosch Rexroth and Siemens (other manufacturers on request)
- Limit switching using either mechanical precision switches or inductive sensors; referencing using inductive sensors
- Hydraulic shock absorbers on the profile end heads to prevent inelastic collisions
- Cable track, pre-assembled and mounted on drive
- Adapter plates, bellow cover and stainless steel guide on request

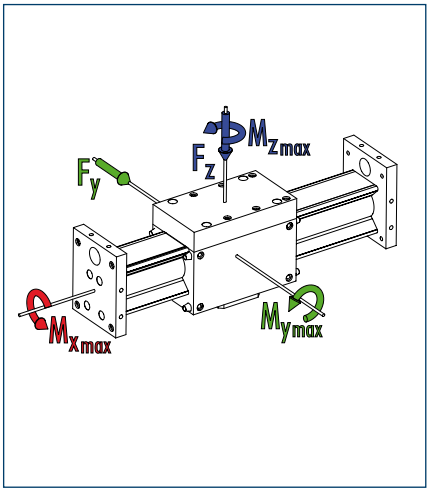
Warranty

24 months
ⓘ Refer to ambient conditions on our introductory pages

For production reasons, the colors may vary from those shown in the catalog.



Load data



	MLD N	MLD NL	MLD NG
M_x max. [Nm]	140	140	140
M_y max. [Nm]	200	400	400
M_z max. [Nm]	200	400	550

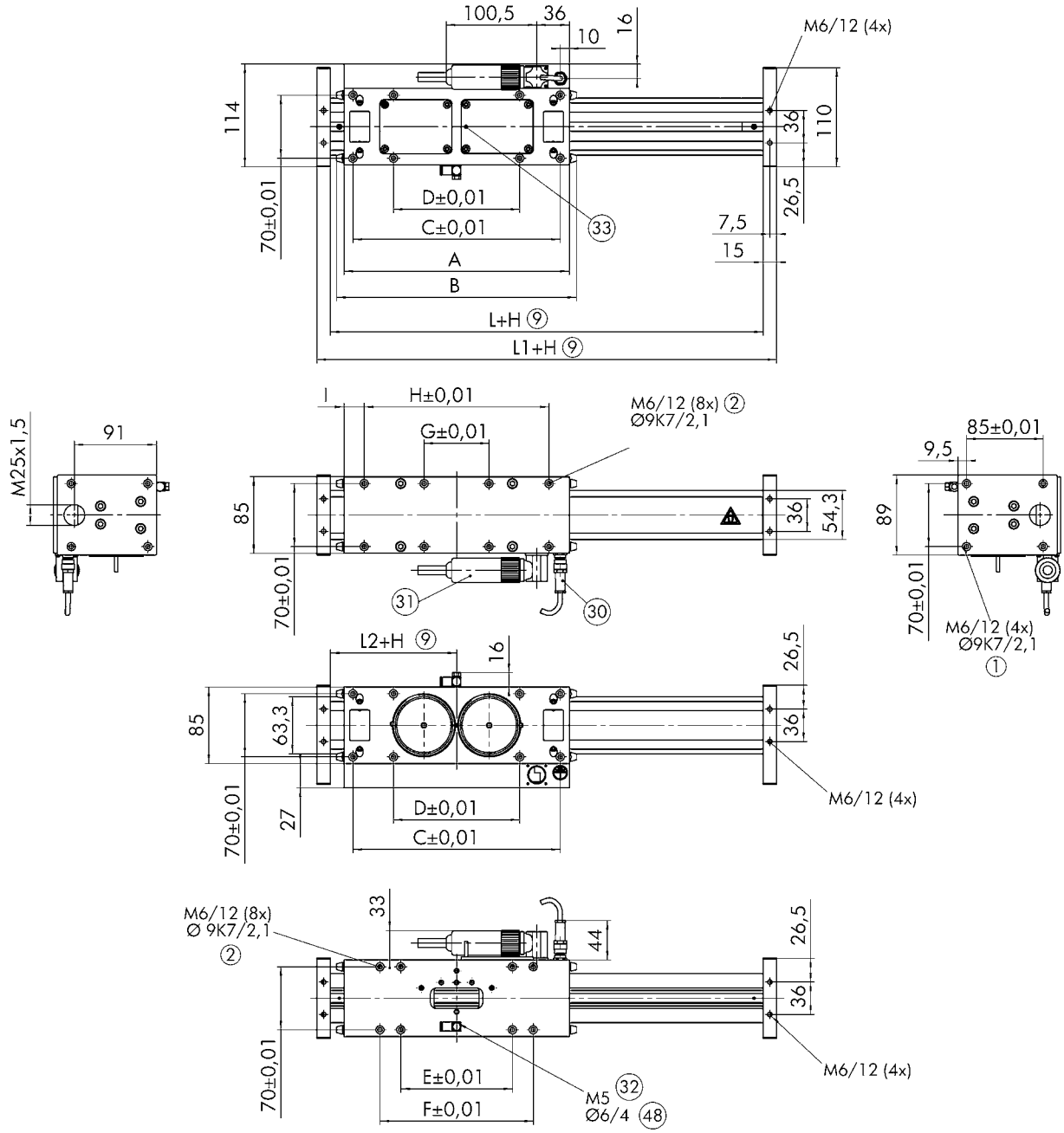
Technical data

Designation		MLD 100N	MLD 200NL	MLD 300NG
Max. driving force (*)	[N]	250	500	750
Rated force (**)	[N]	88	154	224
Max. speed	[m/s]	4	4	4
Max. acceleration	[m/s²]	40	40	40
Max. useful load (horizontal)	[kg]	15	25	35
Max. stroke	[mm]	2800	2700	2600
Repeat accuracy (***)	[mm]	0.01	0.01	0.01
Measuring system resolution (controller-dependent)	[µm]	0.5	0.5	0.5
Max. current	(A_{eff})	8.1	16.2	24.3
Max. continuous current at standstill	(A_{eff})	2.1	3.8	5.6
Max. ambient temperature	[°C]	40	40	40
Max. surface temperature	[°C]	70	70	70
Weight of guided slide inc. motor	[kg]	3.0	4.8	6.8
Weight of end plates	[kg]	0.75	0.75	0.75
Profile / 100mm stroke	[kg]	0.62	0.62	0.62

(*) Depending on controller type used
(**) Depending on installation situation (heat dissipation)
(***) The specified repeat accuracies are only applicable at constant ambient temperatures.

ⓘ The specified repeat accuracy applies at constant ambient temperatures.
Some of the specified forces can vary considerably when using different control units and with increasing travel speeds

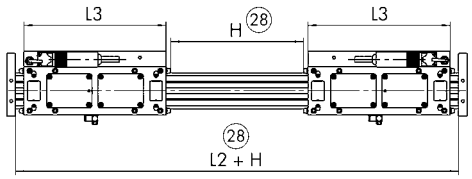
Main views



Type	A	B	C	D	E	F	G	H	I	L	L1	L2
MLD 100N	150	166	130		95		42	86	10	180	210	90
MLD 200NL	250	266	230	140	124	170	72	205	22.5	280	310	140
MLD 300NG	350	366	330	240	221		105	305	22.5	380	410	190

① Linear unit connection
② Assembly connection
⑨ Useful stroke
㉚ Hall sensor connecting plug
㉛ Motor plug
㉜ Compressed air connection
㉝ Cable for stroke measuring system
㊽ Hose diameter

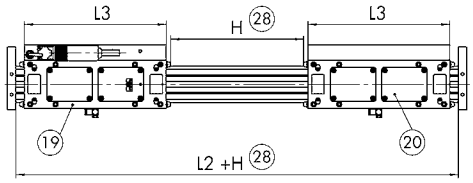
Second slide (third slide only on request)



Type	L2	L3
MLD 100N	380	150
MLD 200NL	580	250
MLD 300NG	780	350

28 Total stroke = 2 x stroke per slide

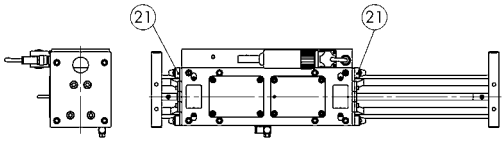
Second passive slide



Type	L2	L3
MLD 100N	380	150
MLD 200NL	480	250
MLD 300NG	580	350

19 Powered slide
20 Passive slide
28 Total stroke = 2 x stroke per slide

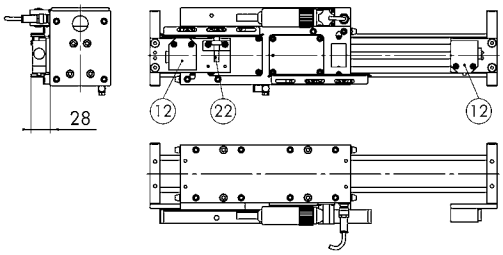
Wipers



21 Wipers

ⓘ Using wipers shortens the useful stroke by 22 mm.

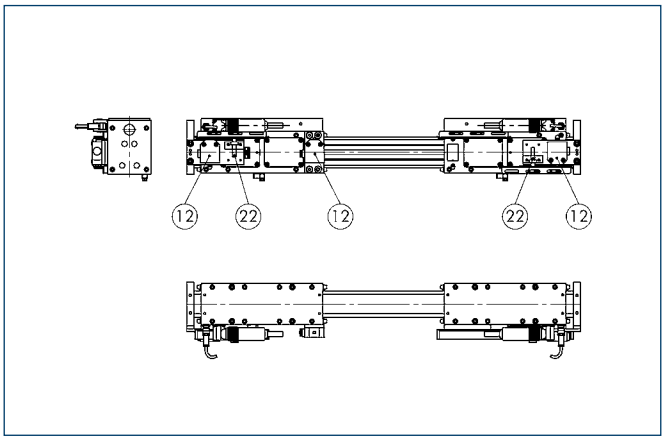
Limit and reference switch with one slide



12 Mechanical limit switches
22 Inductive reference switch

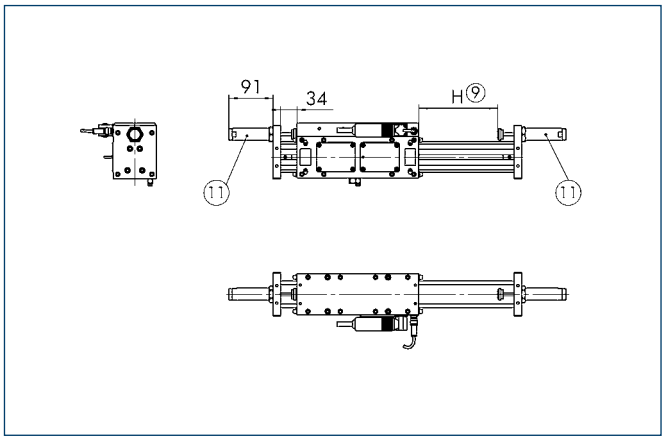
Figure : Left reference switch

Limit and reference switch with two slides



⑫ Mechanical limit switches
㉒ Inductive reference switch

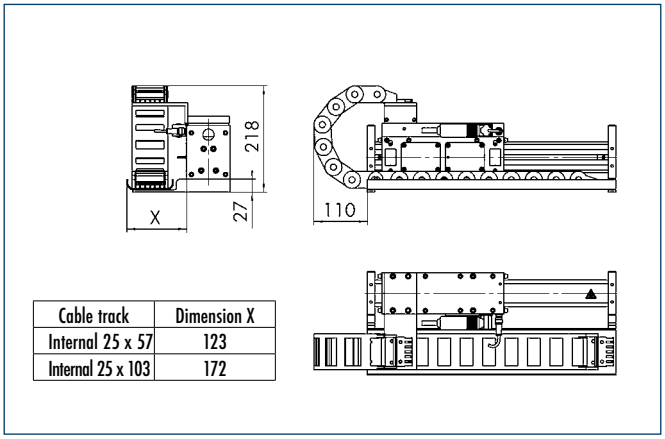
Shock absorber



⑨ Useful stroke
⑪ Shock absorber

ⓘ Shock absorbers shorten the useful stroke by 42 mm, as the shock absorbers may not be actuated during axis operation.

Cable track for one motor slide

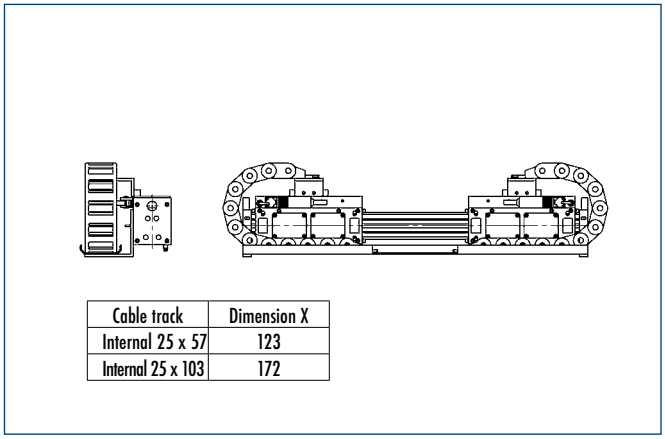


Cable track	Dimension X
Internal 25 x 57	123
Internal 25 x 103	172

Figure : Cable track to left

XYZ for cable track width 50 mm
XYZ for cable track width 100 mm

Cable tracks for two motor slides



Cable track	Dimension X
Internal 25 x 57	123
Internal 25 x 103	172

XYZ for cable track width 50 mm
XYZ for cable track width 100 mm

MLD N (NL/NG) component option codes and ordering

Each axis is supplemented with the required options. Each option is made up of 4 digits. The first two digits indicate the axis type. These are identical for all options for an axis.* The last two digits indicate the selectable options or accessories.

Option digits for axis types:
MLD 100N = 37xx
MLD 200NL = 38xx
MLD 300 NG = 39xx

Version	Description	Option
Active slide	1 slide	xx01
Motor for active slide with plug outlet	Left (completely assembled for INDRADRIVE)	xx03
	Right (completely assembled for INDRADRIVE)	xx04
	Left (completely assembled for SINAMICS)	xx58
	Right (completely assembled for SINAMICS)	xx59
Passive slide	1 slide	xx02 (n)**
Holding brake	Mounted in 1 active slide	xx05
Brake valve inc. 10m cable	for 1 slide	xx06
Wipers	mounted on slide	xx07
Reference switch	Inductive reference switches, left	xx08
	Inductive reference switches, right	xx09
	Inductive reference switches for 2 active slides	xx10
Limit switches	Inductive limit switches (right/left)	xx11
	Inductive limit switches for 2 active slides	xx12
	Mechanical limit switches (left/right)	xx13
	Mechanical limit switches for 2 active slides	xx14
Cable track	Narrow, attachment on left	xx15
	Narrow, attachment on right	xx16
	Narrow, for 2 slides left/right	xx17
	Wide, attachment on left	xx18
	Wide, attachment on right	xx19
	Wide, for 2 slides left/right	xx20
Shock absorber	2 units in set	xx21
	3 units in set (2 slides)	xx22
Centering sleeves	D = 9K7 in enclosed pack	xx24 (n)**
Standard cable sets	INDR. / Basic cable set, 5m straight	xx32
	INDR. / Basic cable set, 10 m straight	xx33
	INDR. / Basic cable set, 15 m straight	xx34
	INDR. / Basic cable set, 20 m straight	xx35
	INDR. / Adv. cable set, 5m straight	xx36
	INDR. / Adv. cable set, 10 m straight	xx37
	INDR. / Adv. cable set, 15 m straight	xx38
	INDR. / Adv. cable set, 20 m straight	xx39
	Sinamics cable set, 5 m	xx40
	Sinamics cable set, 10 m	xx41
	Sinamics cable set, 15 m	xx42
	Sinamics cable set, 20 m	xx43

Measuring system mounting kit

Four-digit code: (e.g. 0132) generated from following code:

	Digit 1	Digit 2	Digit 3	Digit 4
	0	1	3	2

Digit 1:
0

Digit 2: Stroke measuring system type:
1 = Magnetic incremental linear unit
2 = Internal
3 = Absolute MSA
4 = Optical LIA

Digit 3: Stroke measuring system cable length:
(Corresponding to cable set length as standard)
1= 5m
2= 10m
3= 15m
4= 20m

Digit 4: Drive controller cable version:
(Corresponding to cable set version as standard)
1 = Internal
2 = BoschRexroth Indradrive BASIC
3 = BoschRexroth Indradrive ADVANCED
4 = SIEMENS Sinamics

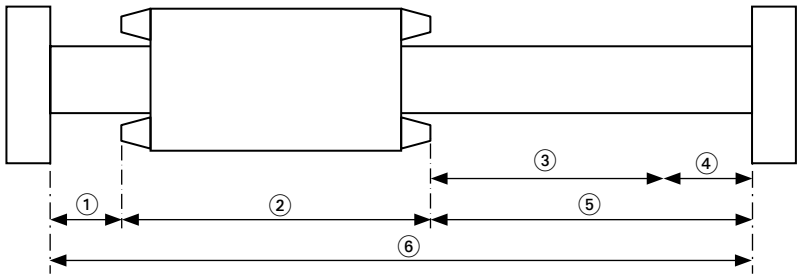
Sample order

MLD 100N	-	1	-	150	-	nnn	-	3704 - 3711 - 3716 -3724(6) - 3733 - 0132
Type of axis		Number of active slides		Useful stroke		Total length*** (added by Schunk)		List of required options

* The exception is the stroke measuring system option, which always appears last.

** Options with () contain the quantity of the options specified in brackets. For all options where the number automatically corresponds to the number of active slides, no quantity is specified.

*** Total length = Profile length + 2x end plate The only lengths available as the profile length for this axis type - due to the magnet - are xx05, xx20mm or xx80mm. The profile length is made up of the useful stroke, the total of the slide lengths and the safety reserve typical for the axis (14 mm) and is extended to the next technically feasible length by Schunk project engineers (wipers and shock absorbers are also taken into account). The Schunk useful stroke specification may slightly exceed the required useful stroke due to the permissible profile length. The total length is supplemented.

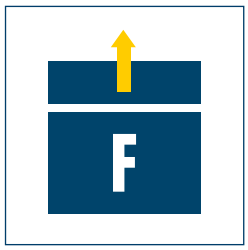


1. Safety reserve
2. Slide length
3. Stroke
4. Supplement to permissible profile length
5. Useful stroke
6. Profile length

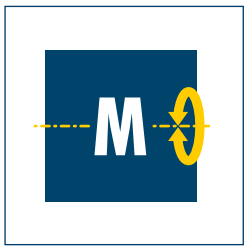
Scope of delivery includes

3-phase, electronically commutated AC synchronous linear motor with primary and secondary part, measuring system, profile guide with guide rollers, slide, profile end plates and with or without Hall sensor depending on the drive concept. Please specify other options when ordering.

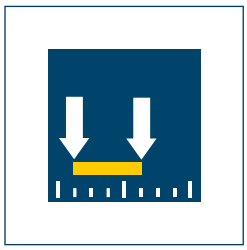
Useful stroke
up to 2,800 mm



Driving force
up to 750 N

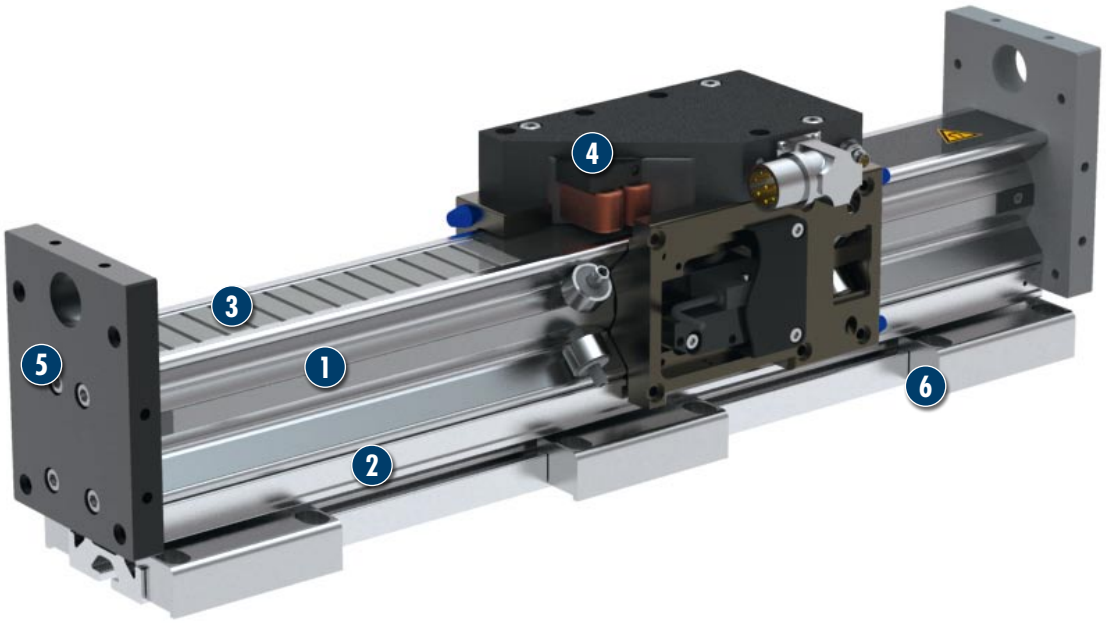


Moment load
up to 550 Nm



Repeat accuracy
0.01 mm

Module design



1 **Elongated X-shaped aluminum press-drawn section**
with high planar moments of inertia for maximum moment and shearing force load

2 **High precision, hardened and ground steel guide rails**
for optimum guidance properties and speeds

3 **Integrated secondary parts**
with high power magnets

4 **Compact primary part slide**
with mounting surfaces, rollers adjusted without play and integrated measuring system

5 **End plates**
for mounting sensors and shock absorbers

6 **Supported profile**
for higher useful loads

Linear axis with direct drive

and roller guide

Area of application

The stable axis module for higher load requirements.
An additional supporting profile allows the axis to be mounted at any point and contributes to reinforcing the axis in self-supporting applications.

General information about the series

Drive

3-phase, electronically commutated AC synchronous linear motor.
Primary part 3-phase copper coil body, secondary part iron mount with permanent magnets and dirt cover.

Stroke measuring system

Non-contact magnetic measuring system with integrated analog signal output, 1 Vss (insensitive to contamination)

Profile guide

X-shaped aluminum press-drawn section with ground steel guide strips

Standard guided slide

Roller-guided slide adjustable with no play using cam, primary part and measuring system reading head directly integrated.
Attachments can be mounted and secured using thread and centering sleeves on three side surfaces.

Operating temperature

From 10 °C to 40 °C

Options

- Pneumatic brake to relieve load on linear motor, e.g. under influence of axial forces in target position or to secure waste for vertical axes in case of power failure or emergency stop.
- Second independent motor slide on a shared profile guide and with a linear measuring system.
  Collision protection in case of programming errors is provided by corresponding limit switches.
- Second passive guided slide for long attachments (free moving)
- Wipers for removing deposits on the guideways.
- Absolute stroke measuring system and optical stroke measuring systems for applications with very high accuracy

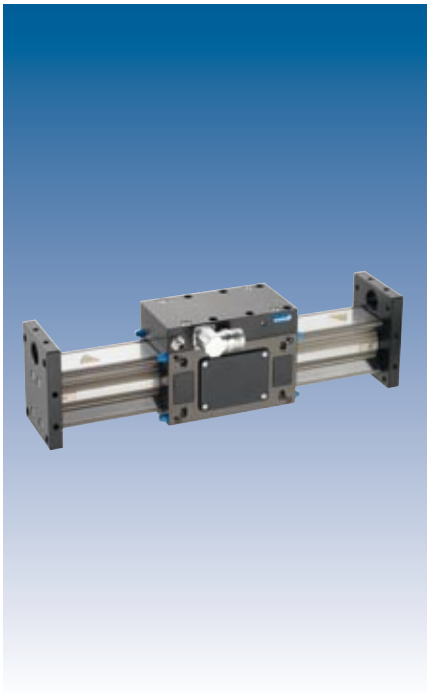
Accessories

- Control units from Bosch Rexroth and Siemens (other manufacturers on request)
- Limit switching using either mechanical precision switches or inductive sensors; referencing using inductive sensors
- Hydraulic shock absorbers on the profile end heads to prevent inelastic collisions
- Cable track, pre-assembled and mounted on drive
- Adapter plates, bellow cover and stainless steel guide on request

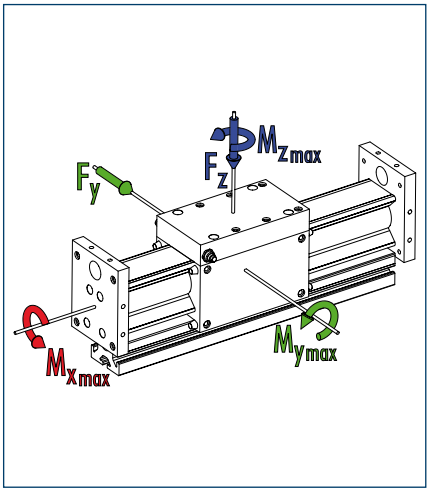
Warranty

24 months
ⓘ Refer to ambient conditions on our introductory pages

For production reasons, the colors may vary from those shown in the catalog.



Load data



	MLD NU	MLD NUL	MLD NUG
M_x max. [Nm]	140	140	140
M_y max. [Nm]	200	400	400
M_z max. [Nm]	200	400	550

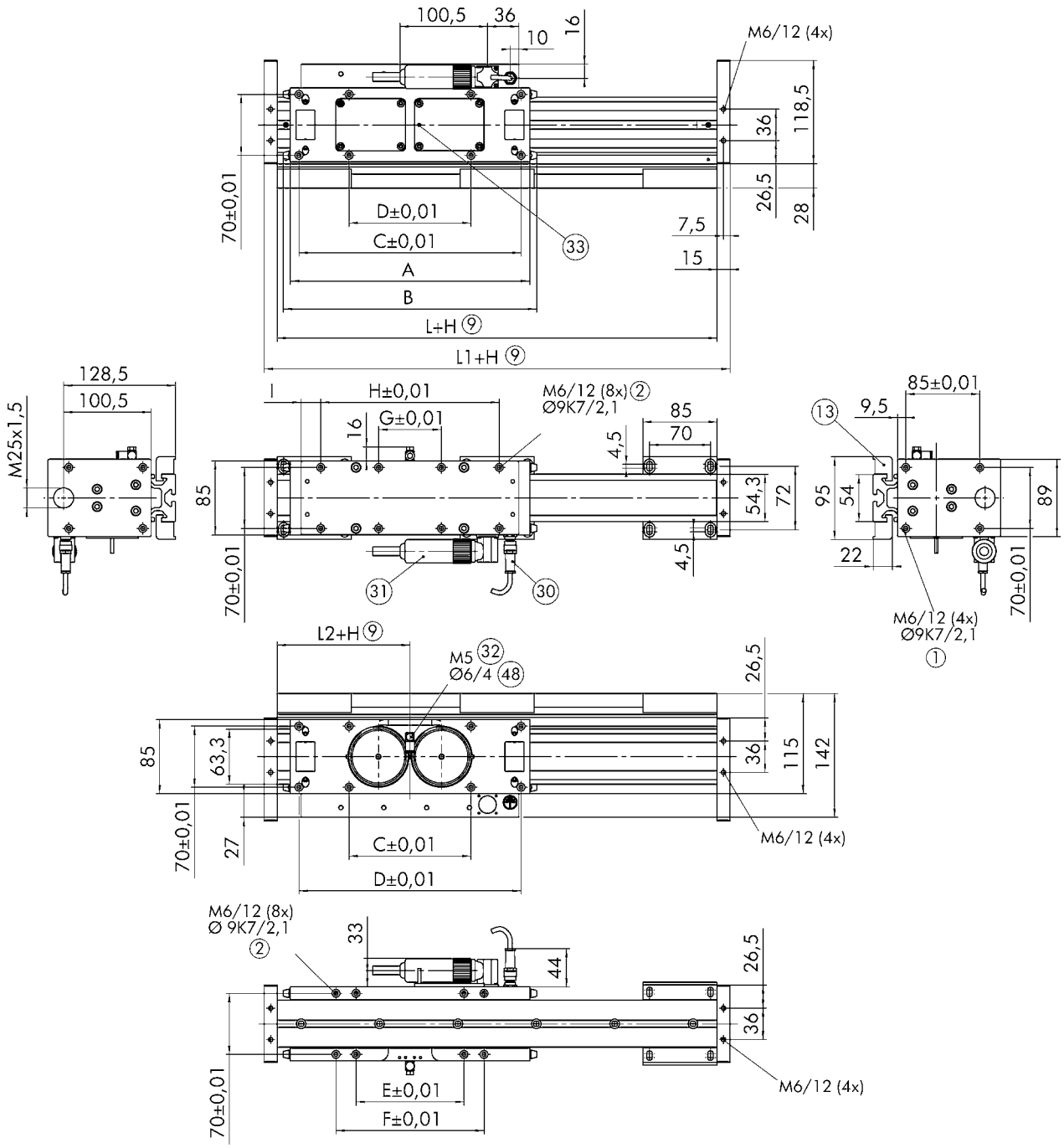
Technical data

Designation		MLD 100NU	MLD 200NUL	MLD 300NUG
Max. driving force (*)	[N]	250	500	750
Rated force (**)	[N]	80	143	206
Max. speed	[m/s]	4	4	4
Max. acceleration	[m/s²]	40	40	40
Max. useful load (horizontal)	[kg]	15	25	35
Max. stroke	[mm]	2800	2700	2600
Repeat accuracy (***)	[mm]	0.01	0.01	0.01
Measuring system resolution (controller-dependent)	[µm]	0.5	0.5	0.5
Max. current	(A_{eff})	8.1	16.2	24.3
Max. continuous current at standstill	(A_{eff})	2.1	3.8	5.6
Max. ambient temperature	[°C]	40	40	40
Max. surface temperature	[°C]	70	70	70
Weight of guided slide inc. motor	[kg]	3.0	4.7	6.4
Weight of end plates	[kg]	0.75	0.75	0.75
Profile / 100mm stroke	[kg]	1.05	1.05	1.05

(*) Depending on controller type used
(**) Depending on installation situation (heat dissipation)
(***) The specified repeat accuracies are only applicable at constant ambient temperatures.

ⓘ The specified repeat accuracy applies at constant ambient temperatures.
Some of the specified forces can vary considerably when using different control units and with increasing travel speeds

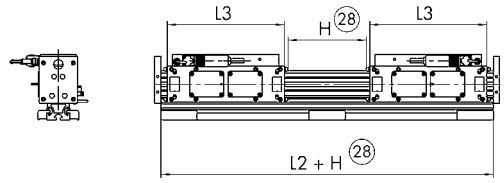
Main views



Type	A	B	C	D	E	F	G	H	I	L	L1	L2
MLD 100NU	175	191	155		155		150	86	10	205	235	102.5
MLD 200NUL	275	291	140	255	124	170	72	205	22.5	305	335	152.5
MLD 300NUG	350	366	240	330	221		105	305	22.5	405	435	202.5

① Linear unit connection
② Assembly connection
⑨ Useful stroke
⑬ Mounting block
㉚ Hall sensor connecting plug
㉛ Motor plug
㉜ Compressed air connection
㉝ Cable for stroke measuring system
㊽ Hose diameter

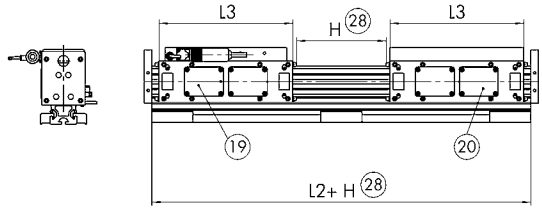
Second slide (third slide only on request)



Type	L2	L3
MLD 100NU	405	175
MLD 200NUL	605	275
MLD 300NUG	805	375

28 Total stroke = 2 x stroke per slide

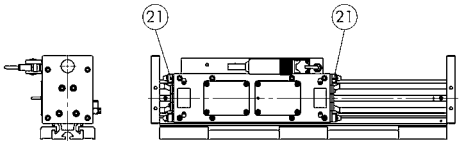
Second passive slide



Type	L2	L3
MLD 100NU	405	175
MLD 200NUL	605	275
MLD 300NUG	805	375

19 Powered slide
20 Passive slide
28 Total stroke = 2 x stroke per slide

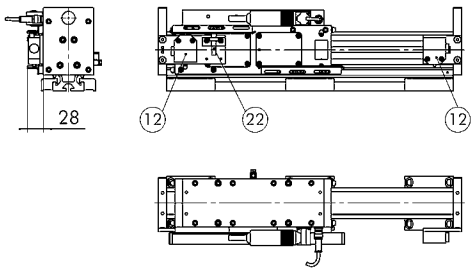
Wipers



21 Wipers

ⓘ Using wipers shortens the useful stroke by 22 mm.

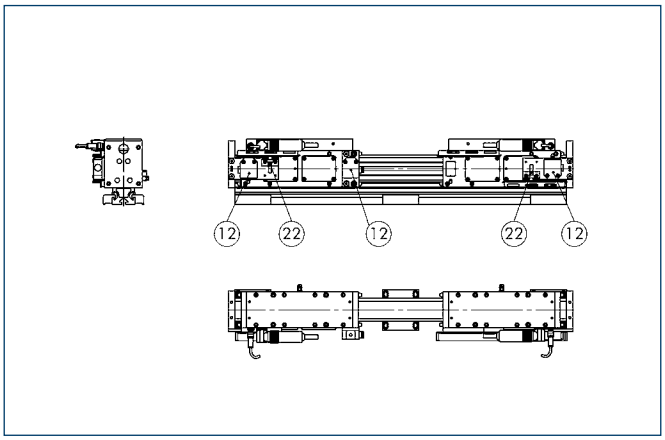
Limit and reference switch with one slide



12 Mechanical limit switches
22 Inductive reference switch

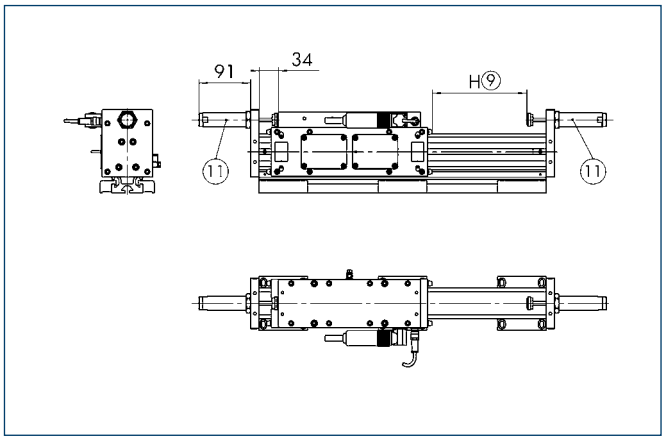
Figure : Left reference switch

Limit and reference switch with two slides



(12) Mechanical limit switches
(22) Inductive reference switch

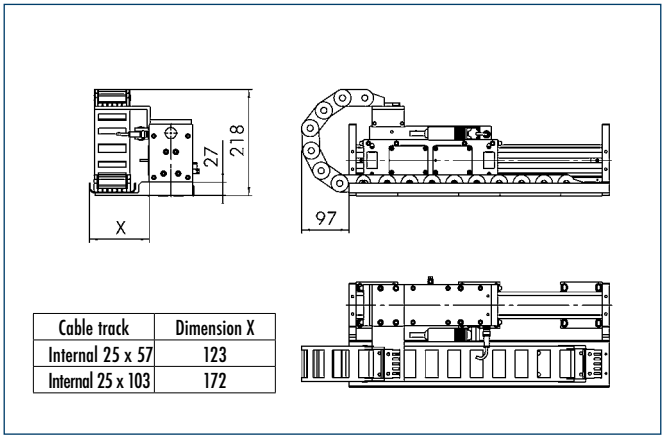
Shock absorber



(9) Useful stroke
(11) Shock absorber

ⓘ Shock absorbers shorten the useful stroke by 42 mm, as the shock absorbers may not be actuated during axis operation.

Cable track for one motor slide

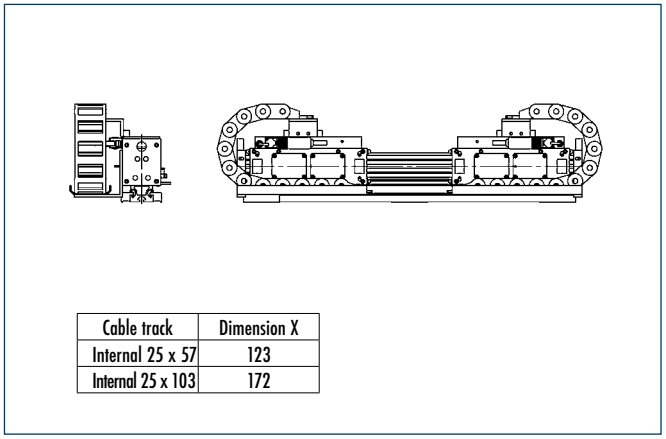


Cable track	Dimension X
Internal 25 x 57	123
Internal 25 x 103	172

Figure : Cable track to left

XYZ for cable track width 50 mm
XYZ for cable track width 100 mm

Cable tracks for two motor slides



Cable track	Dimension X
Internal 25 x 57	123
Internal 25 x 103	172

XYZ for cable track width 50 mm
XYZ for cable track width 100 mm

MLD NU (NUL/NUG) component option codes and ordering

Each axis is supplemented with the required options. Each option is made up of 4 digits. The first two digits indicate the axis type. These are identical for all options for an axis.* The last two digits indicate the selectable options or accessories.

Option digits for axis types:
MLD 100NU = 40xx
MLD 200NUL = 41xx
MLD 300 NUG = 42xx

Version	Description	Option
Active slide	1 slide	xx01
Motor for active slide with plug outlet	Left (completely assembled for INDRADRIVE)	xx03
	Right (completely assembled for INDRADRIVE)	xx04
	Left (completely assembled for SINAMICS)	xx58
	Right (completely assembled for SINAMICS)	xx59
Passive slide	1 slide	xx02 (n)**
Holding brake	Mounted in 1 active slide	xx05
Brake valve inc. 10m cable	for 1 slide	xx06
Wipers	mounted on slide	xx07
Reference switch	Inductive reference switches, left	xx08
	Inductive reference switches, right	xx09
	Inductive reference switches for 2 active slides	xx10
Limit switches	Inductive limit switches (right/left)	xx11
	Inductive limit switches for 2 active slides	xx12
	Mechanical limit switches (left/right)	xx13
	Mechanical limit switches for 2 active slides	xx14
Cable track	Narrow, attachment on left	xx15
	Narrow, attachment on right	xx16
	Narrow, for 2 slides left/right	xx17
	Wide, attachment on left	xx18
	Wide, attachment on right	xx19
	Wide, for 2 slides left/right	xx20
Shock absorber	2 units in set	xx21
	3 units in set (2 slides)	xx22
Clamping profiles	Mounting strips for axis profile	xx23 (n)**
Centering sleeves	D = 9K7 in enclosed pack	xx24 (n)**
Standard cable sets	INDR. / Basic cable set, 5m straight	xx32
	INDR. / Basic cable set, 10 m straight	xx33
	INDR. / Basic cable set, 15 m straight	xx34
	INDR. / Basic cable set, 20 m straight	xx35
	INDR. / Adv. cable set, 5m straight	xx36
	INDR. / Adv. cable set, 10 m straight	xx37
	INDR. / Adv. cable set, 15 m straight	xx38
	INDR. / Adv. cable set, 20 m straight	xx39
	Sinamics cable set, 5 m	xx40
	Sinamics cable set, 10 m	xx41
	Sinamics cable set, 15 m	xx42
	Sinamics cable set, 20 m	xx43
Measuring system mounting kit	Four-digit code: (e.g. 0132) generated from following code:	

Digit 1	Digit 2	Digit 3	Digit 4
0	1	3	2

Digit 1:	0
Digit 2: Stroke measuring system type:	1 = Magnetic incremental linear unit 2 = Internal 3 = Absolute MSA 4 = Optical LIA
Digit 3: Stroke measuring system cable length: (Corresponding to cable set length as standard)	1= 5m 2= 10m 3= 15m 4= 20m
Digit 4: Drive controller cable version: (Corresponding to cable set version as standard)	1 = Internal 2 = BoschRexroth Indradrive BASIC 3 = BoschRexroth Indradrive ADVANCED 4 = SIEMENS Sinamics

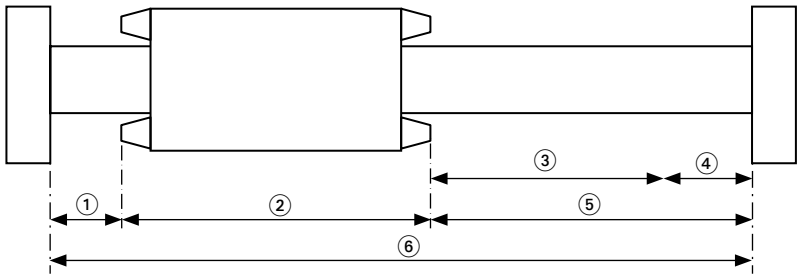
Sample order

MLD 100NU	-	1	-	150	-	nnn	-	4004 - 4011 - 4016 -4024(6) - 4033 - 0132
Type of axis		Number of active slides		Useful stroke		Total length*** (added by Schunk)		List of required options

* The exception is the stroke measuring system option, which always appears last.

** Options with () contain the quantity of the options specified in brackets. For all options where the number automatically corresponds to the number of active slides, no quantity is specified.

*** Total length = Profile length + 2x end plate The only lengths available as the profile length for this axis type - due to the magnet - are xx05mm, xx20mm or xx80mm. The profile length is made up of the useful stroke, the total of the slide lengths and the safety reserve typical for the axis (14 mm) and is extended to the next technically feasible length by Schunk project engineers (wipers and shock absorbers are also taken into account). The Schunk useful stroke specification may slightly exceed the required useful stroke due to the permissible profile length. The total length is supplemented.



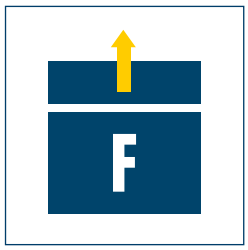
1. Safety reserve
2. Slide length
3. Stroke
4. Supplement to permissible profile length
5. Useful stroke
6. Profile length

Scope of delivery includes

3-phase, electronically commutated AC synchronous linear motor with primary and secondary part, measuring system, profile guide with guide rollers, slide, profile end plates and with or without Hall sensor depending on the drive concept. Please specify other options when ordering.

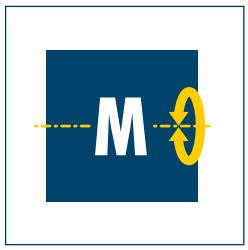
MLD M/ML

Useful stroke
up to 2,800mm

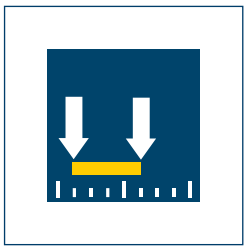


Driving force
up to 1,000 N

Maximum speed
Up to 4 m/s

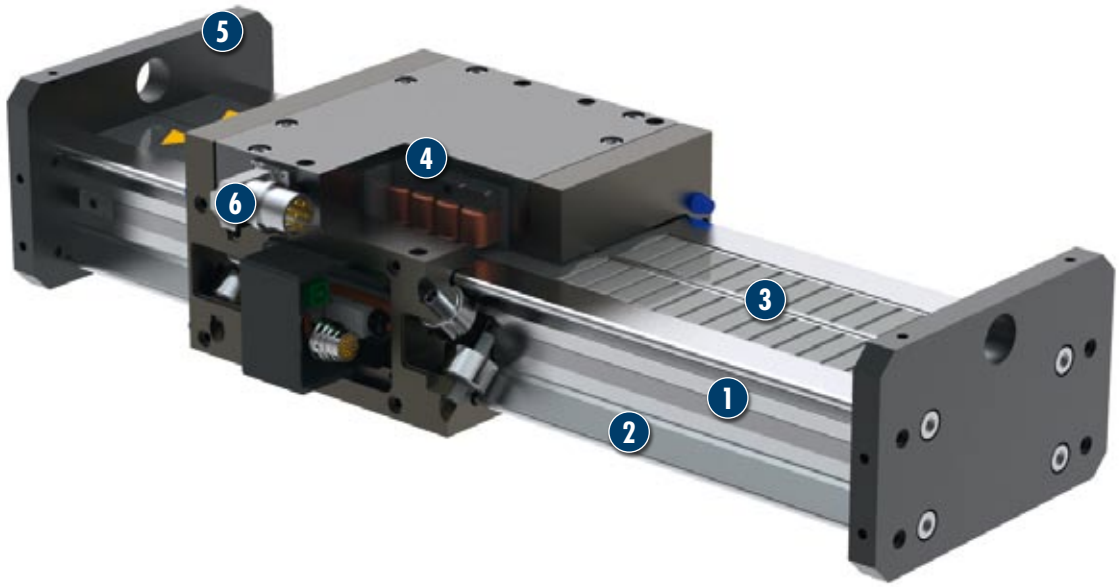


Moment load
Max. 760 Nm



Repeat accuracy
0.01 mm

Module design



1 **Elongated X-shaped aluminum press-drawn section**
with high planar moments of inertia for maximum moment and shearing force load

2 **High precision, hardened and ground steel guide rails**
for optimum guidance properties and speeds

3 **Integrated secondary parts**
with high power magnets

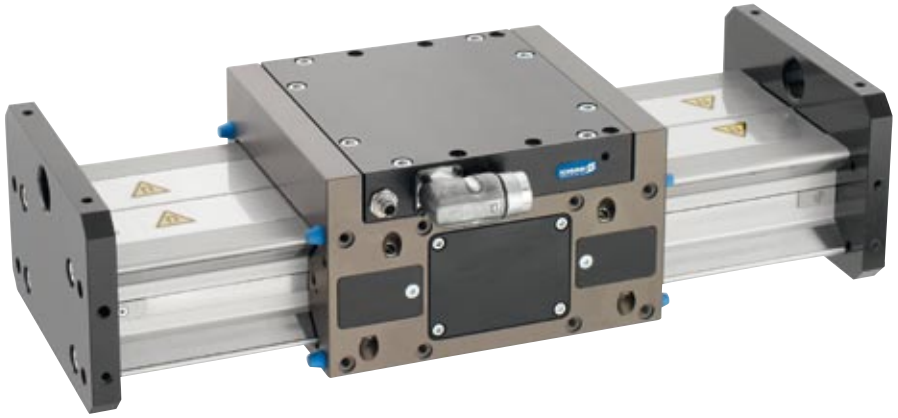
4 **Compact primary part slide**
with mounting surfaces, rollers adjusted without play and integrated measuring system

5 **End plates**
for mounting sensors and shock absorbers

6 **Motor plug**

Linear axis with direct drive

and roller guide



Area of application

The axis module is suitable for medium loads with high dynamic requirements.

General information about the series

Drive

3-phase, electronically commutated AC synchronous linear motor.
Primary part 3-phase copper coil body, secondary part iron mount with permanent magnets and dirt cover.

Stroke measuring system

Non-contact magnetic measuring system with integrated analog signal output, 1 Vss (insensitive to contamination)

Profile guide

X-shaped aluminum press-drawn section with ground tracks with a secondary part made up of high power magnets

Guided slide

Roller-guided slide, adjustable with no play using cam, primary part and measuring system reading head directly integrated. Attachments can be mounted and secured using thread and centering sleeves on all four side surfaces.

Operating temperature

From 10 °C to 40 °C

Options

- **Pneumatic brake for relieving the load on the linear motor, e.g. under influence of axial forces in target position**
- Other independent motor slides on a common profile guide and with a linear measuring system
- Collision protection in case of programming errors is provided by corresponding limit switches
- Second passive guided slide for long attachments (free moving)
- Wipers for removing deposits on the guideways.
- Absolute stroke measuring system and optical stroke measuring systems for applications with very high accuracy

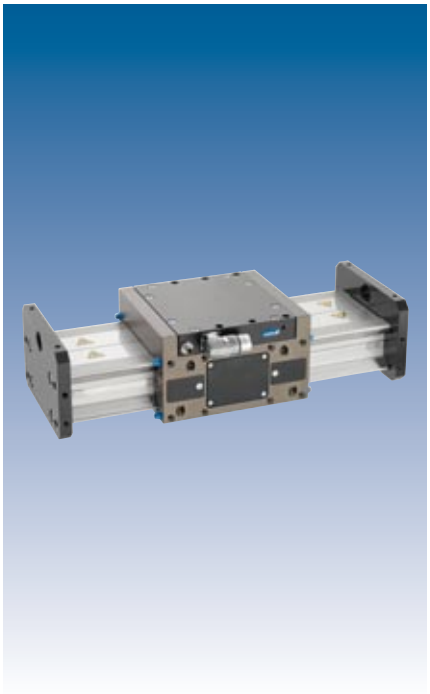
Accessories

- Control units from Bosch Rexroth or Siemens (other manufacturers on request)
- Limit switching using either mechanical or inductive sensors; referencing using inductive sensors
- Hydraulic shock absorbers on profile end plates to prevent inelastic collisions (size and number of shock absorbers depend on application)
- Cable track, pre-assembled and mounted on drive
- Adapter plates on request
- Pre-assembled cable sets in different lengths

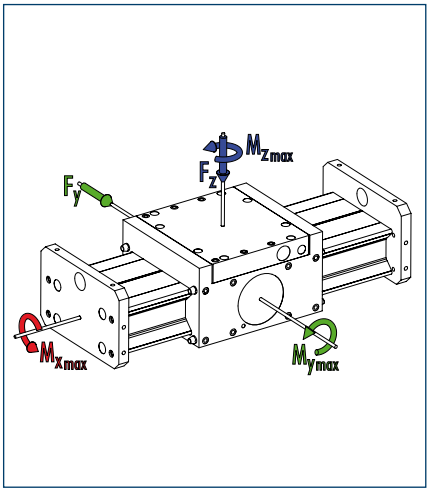
Warranty

24 months
ⓘ Refer to ambient conditions on our introductory pages

For production reasons, the colors may vary from those shown in the catalog.



Load data



	MLD M	MLD ML
M_x max. [Nm]	380	380
M_y max. [Nm]	410	700
M_z max. [Nm]	570	760

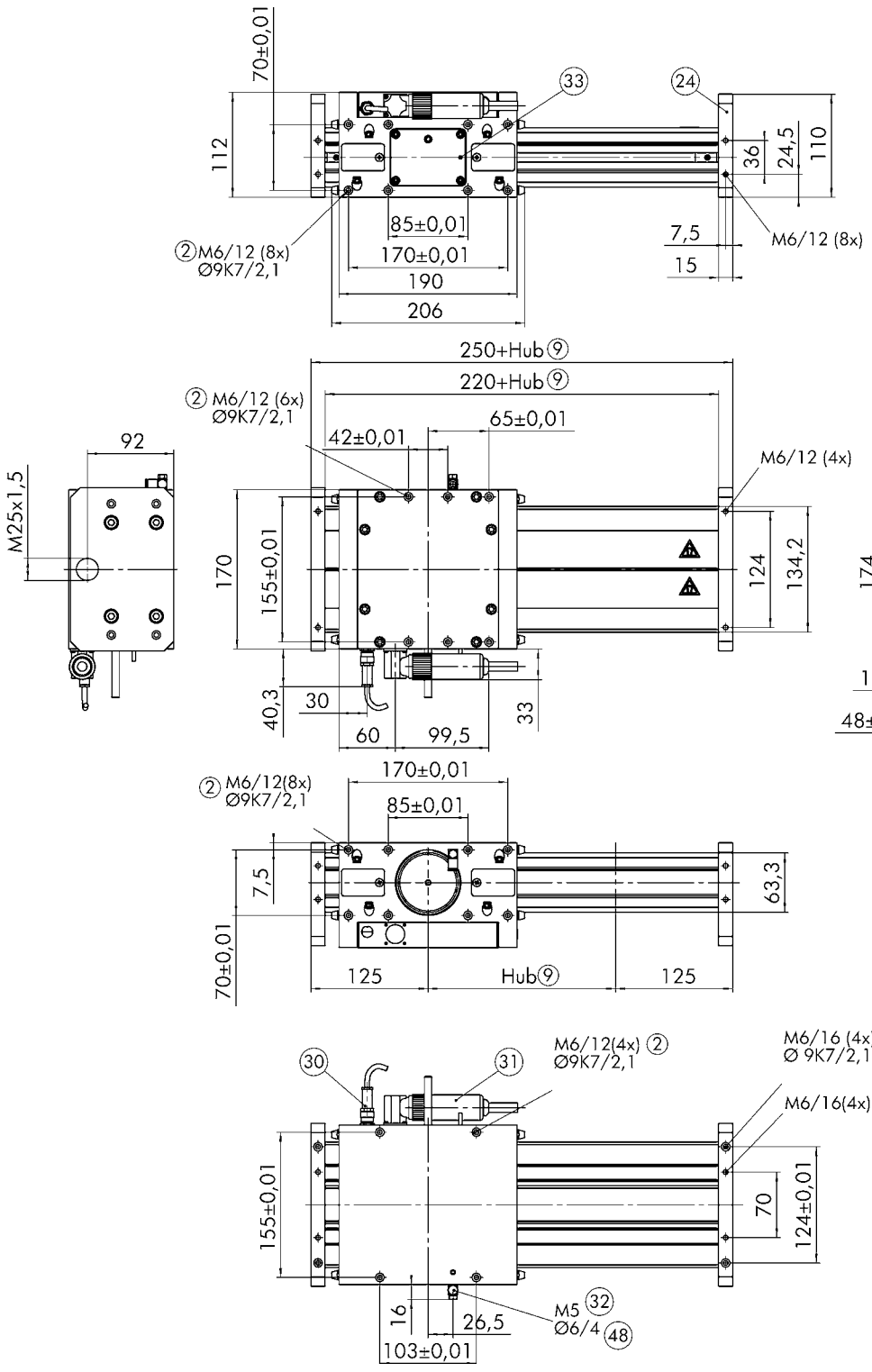
Technical data

Designation		MLD 100M	MLD 200M	MLD 200ML	MLD 400ML
Max. driving force (*)	[N]	250	500	500	1000
Rated force (**)	[N]	88	186	156	332
Max. speed	[m/s]	4	4	4	4
Max. acceleration	[m/s²]	40	40	40	40
Max. useful load (horizontal)	[kg]	20	20	40	40
Max. stroke	[mm]	2800	2800	2700	2700
Repeat accuracy (***)	[mm]	0.01	0.01	0.01	0.01
Measuring system resolution (controller-dependent)	[µm]	0.5	0.5	0.5	0.5
Max. current	(A_{eff})	8.1	16.2	16.2	32.4
Max. continuous current at standstill	(A_{eff})	2.2	3.8	3.9	6.9
Max. ambient temperature	[°C]	40	40	40	40
Max. surface temperature	[°C]	70	70	70	70
Weight of guided slide inc. motor	[kg]	5.5	6.0	8.3	9.5
Weight of end plates	[kg]	1.45	1.45	1.45	1.45
Profile / 100mm stroke	[kg]	0.97	1.14	0.97	1.14

(*) Depending on controller type used
(**) Depending on installation situation (heat dissipation)
(***) The specified repeat accuracies are only applicable at constant ambient temperatures.

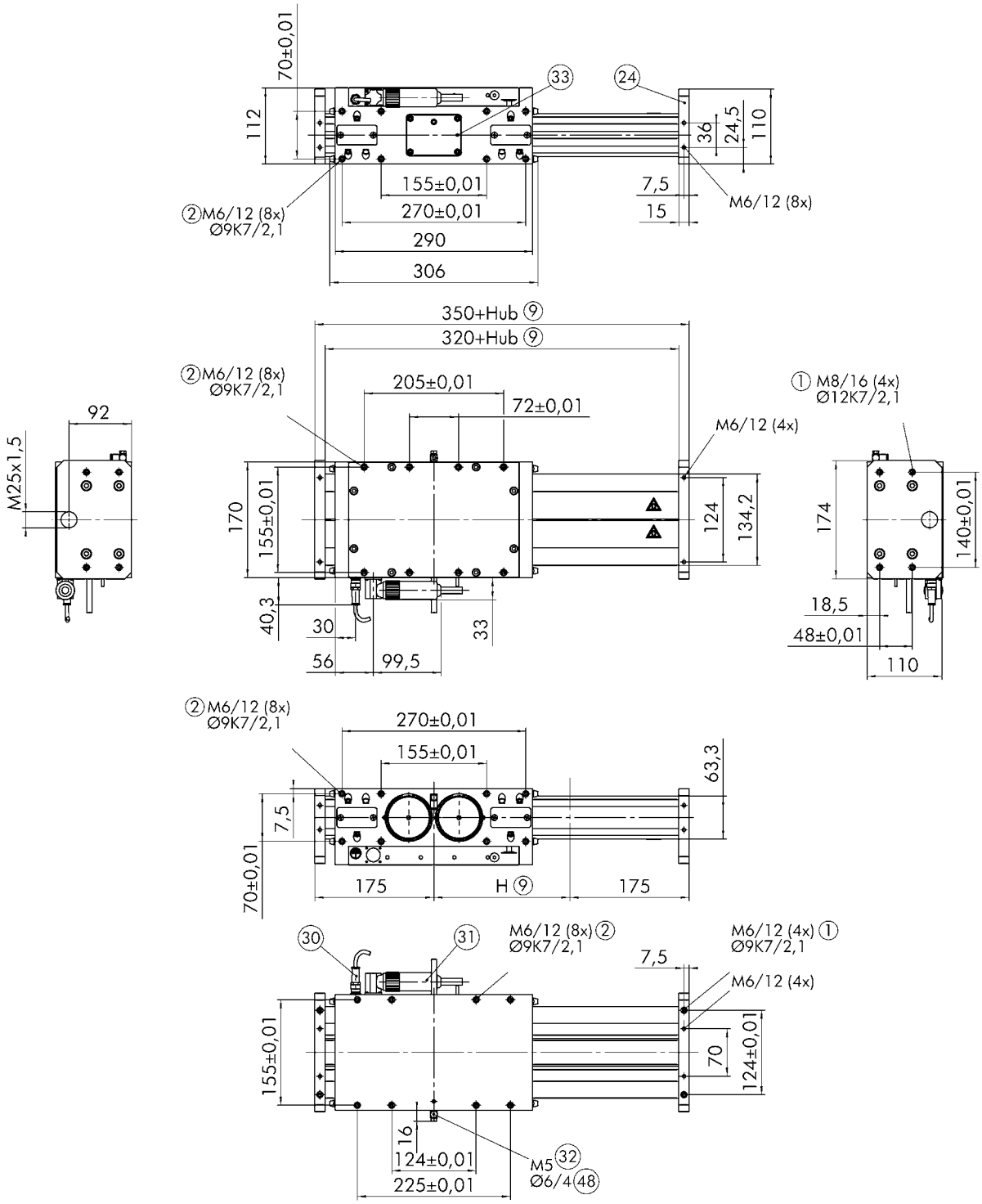
ⓘ The specified repeat accuracy applies at constant ambient temperatures.
Some of the specified forces can vary considerably when using different control units and with increasing travel speeds

Main views MLD M



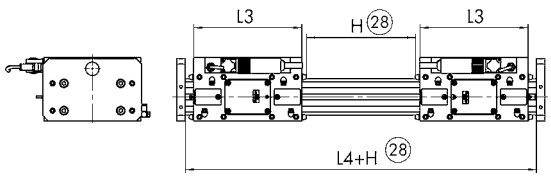
① Linear unit connection
② Assembly connection
⑨ Useful stroke
㉔ Flange
㉚ Hall sensor connecting plug
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter

Main views MLD ML



① Linear unit connection
② Assembly connection
⑨ Useful stroke
㉔ Flange
㉚ Hall sensor connecting plug
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter

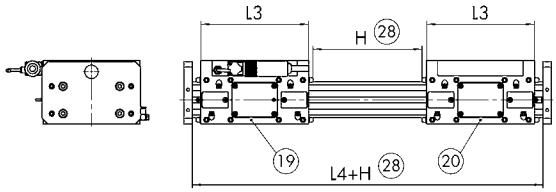
Second slide (third slide only on request)



Type	L3	L4
MLD 100M	190	480
MLD 200ML	290	680

28 Total stroke = 2 x stroke per slide

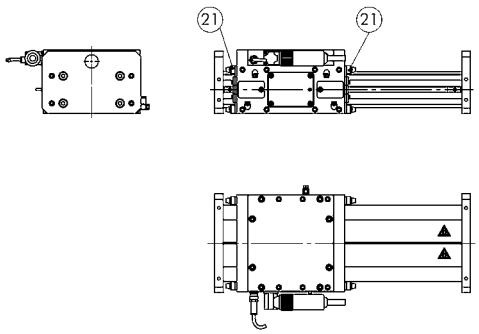
Second passive slide



Type	L3	L4
MLD 100M	190	480
MLD 200ML	290	680

19 Powered slide
20 Passive slide
28 Total stroke = 2 x stroke per slide

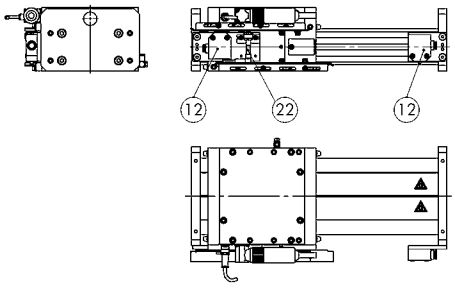
Wipers



21 Wipers

ⓘ Using wipers shortens the useful stroke by 22 mm.

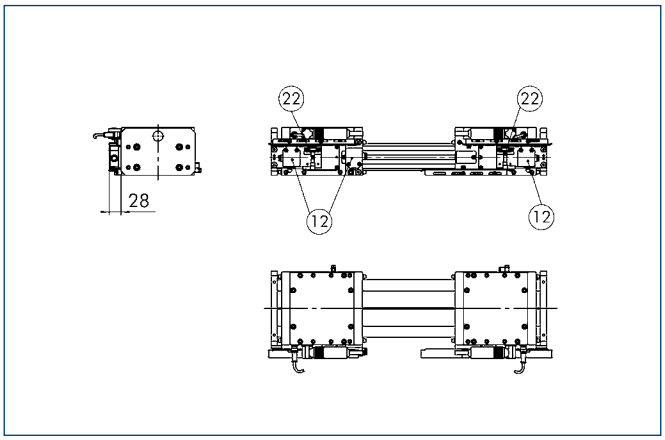
Limit and reference switch with one slide



12 Mechanical limit switches
22 Inductive reference switch

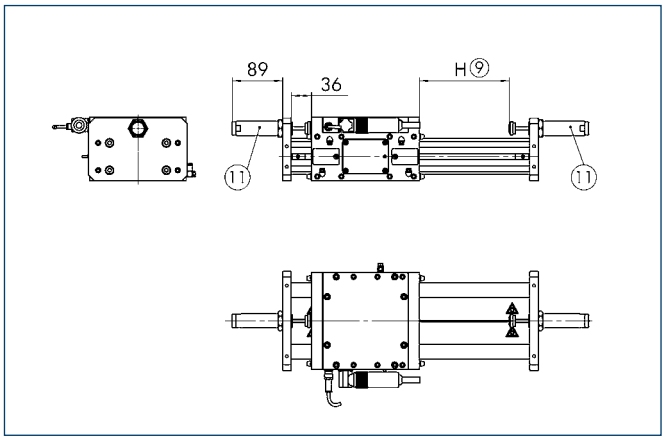
Figure : Left reference switch

Limit and reference switch with two slides



⑫ Mechanical limit switches
㉒ Inductive reference switch

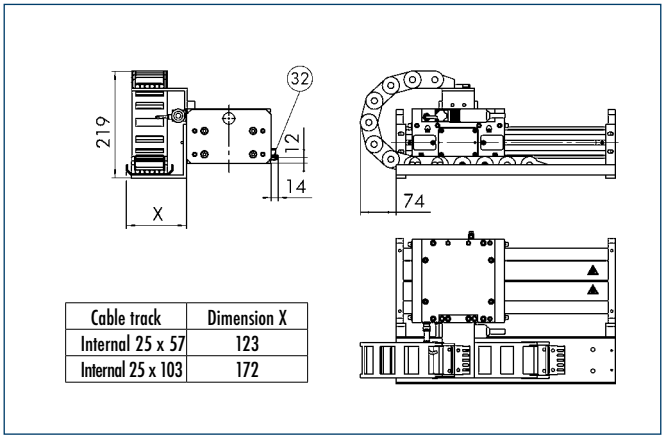
Shock absorber



⑨ Useful stroke
⑪ Shock absorber

ⓘ Shock absorbers shorten the useful stroke by 42 mm, as the shock absorbers may not be actuated during axis operation.

Cable track for one motor slide

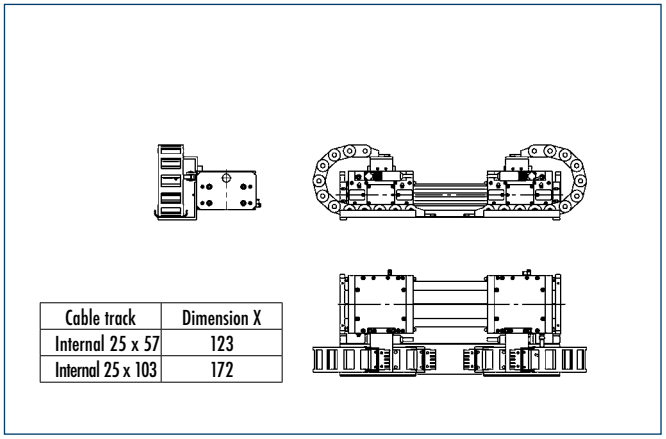


Cable track	Dimension X
Internal 25 x 57	123
Internal 25 x 103	172

Figure : Cable track to left

XYZ for cable track width 50 mm
XYZ for cable track width 100 mm

Cable tracks for two motor slides



Cable track	Dimension X
Internal 25 x 57	123
Internal 25 x 103	172

XYZ for cable track width 50 mm
XYZ for cable track width 100 mm

MLD M (ML) component option codes and ordering

Each axis is supplemented with the required options. Each option is made up of 4 digits. The first two digits indicate the axis type. These are identical for all options for an axis.* The last two digits indicate the selectable options or accessories.

Option digits for axis types:

MLD 100M	= 51xx	MLD 200 ML	= 53xx
MLD 200M	= 52xx	MLD 400 ML	= 54xx

Version	Description	Option
Active slide	1 slide	xx01
Motor for active slide with plug outlet	Left (completely assembled for INDRADRIVE)	xx03
	Right (completely assembled for INDRADRIVE)	xx04
	Left (completely assembled for SINAMICS)	xx58
	Right (completely assembled for SINAMICS)	xx59
Passive slide	1 slide	xx02 (n)**
Holding brake	Mounted in 1 active slide	xx05
Brake valve inc. 10m cable	for 1 slide	xx06
Wipers	mounted on slide	xx07
Reference switch	Inductive reference switches, left	xx08
	Inductive reference switches, right	xx09
	Inductive reference switches for 2 active slides	xx10
Limit switches	Inductive limit switches (right/left)	xx11
	Inductive limit switches for 2 active slides	xx12
	Mechanical limit switches (left/right)	xx13
	Mechanical limit switches for 2 active slides	xx14
Cable track	Narrow, attachment on left	xx15
	Narrow, attachment on right	xx16
	Narrow, for 2 slides left/right	xx17
	Wide, attachment on left	xx18
	Wide, attachment on right	xx19
	Wide, for 2 slides left/right	xx20
Shock absorber	2 units in set	xx21
	3 units in set (2 slides)	xx22
Centering sleeves	D = 9K7 in enclosed pack	xx24 (n)**
Standard cable sets	INDR. / Basic cable set, 5m straight	xx32
	INDR. / Basic cable set, 10 m straight	xx33
	INDR. / Basic cable set, 15 m straight	xx34
	INDR. / Basic cable set, 20 m straight	xx35
	INDR. / Adv. cable set, 5m straight	xx36
	INDR. / Adv. cable set, 10 m straight	xx37
	INDR. / Adv. cable set, 15 m straight	xx38
	INDR. / Adv. cable set, 20 m straight	xx39
	Sinamics cable set, 5 m	xx40
	Sinamics cable set, 10 m	xx41
	Sinamics cable set, 15 m	xx42
	Sinamics cable set, 20 m	xx43
Measuring system mounting kit	Four-digit code: (e.g. 0132) generated from following code:	Digit 1: 0 Digit 2: Stroke measuring system type: 1 = Magnetic incremental linear unit 2 = Internal 3 = Absolute MSA 4 = Optical LIA Digit 3: Stroke measuring system cable length: (Corresponding to cable set length as standard) 1= 5m 2= 10m 3= 15m 4= 20m Digit 4: Drive controller cable version: (Corresponding to cable set version as standard) 1 = Internal 2 = BoschRexroth Indradrive BASIC 3 = BoschRexroth Indradrive ADVANCED 4 = SIEMENS Sinamics

Digit 1	Digit 2	Digit 3	Digit 4
0	1	3	2

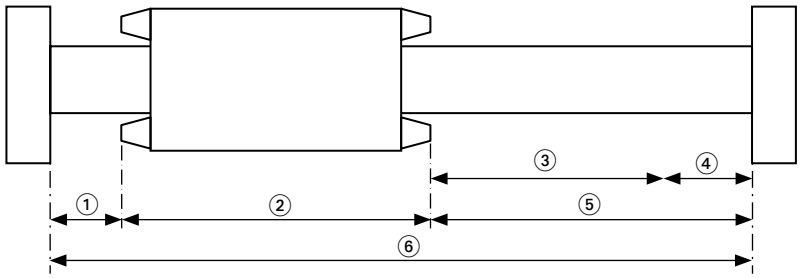
Sample order

MLD 100M	-	1	-	150	-	nnn	-	5104 - 5111 - 5116 -5124(6) - 5133 - 0132
Type of axis		Number of active slides		Useful stroke		Total length*** (added by Schunk)		List of required options

* The exception is the stroke measuring system option, which always appears last.

** Options with () contain the quantity of the options specified in brackets. For all options where the number automatically corresponds to the number of active slides, no quantity is specified.

*** Total length = Profile length + 2x end plate The only lengths available as the profile length for this axis type - due to the magnet - are xx05, xx20 and xx80mm. The profile length is made up of the useful stroke, the total of the slide lengths and the safety reserve typical for the axis (14 mm) and is extended to the next technically feasible length by Schunk project engineers (wipers and shock absorbers are also taken into account). The Schunk useful stroke specification may slightly exceed the required useful stroke due to the permissible profile length. The total length is supplemented.

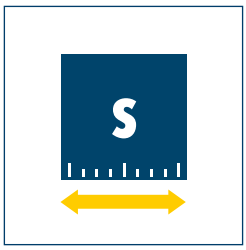


1. Safety reserve
2. Slide length
3. Stroke
4. Supplement to permissible profile length
5. Useful stroke
6. Profile length

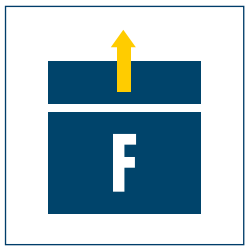
Scope of delivery includes

3-phase, electronically commutated AC synchronous linear motor with primary and secondary part, measuring system, profile guide with guide rollers, slide, profile end plates and with or without Hall sensor depending on the drive concept. Please specify other options when ordering.

MLD MU/MUL

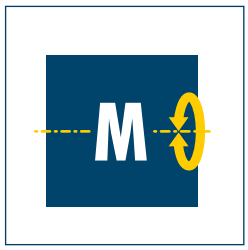


Useful stroke
up to 2,800 mm

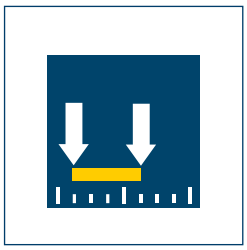


Driving force
up to 1,000 N

Maximum speed
Up to 4 m/s

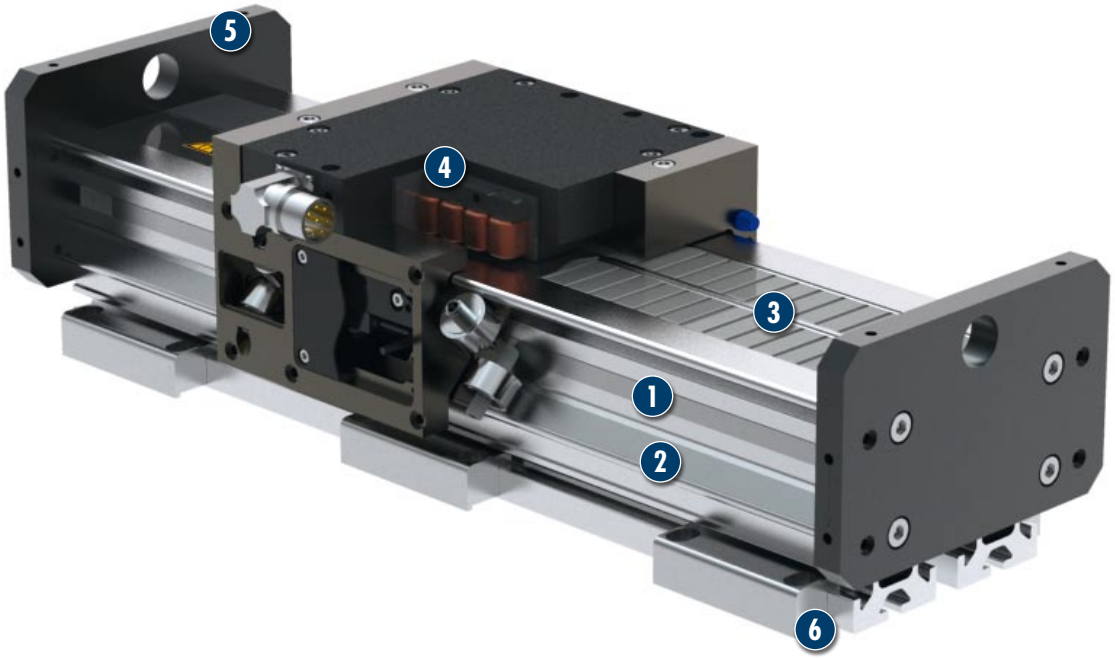


Moment load
Max. 760 Nm



Repeat accuracy
0.01 mm

Module design



1 **Elongated X-shaped aluminum press-drawn section**
with high planar moments of inertia for maximum moment and shearing force load

2 **High precision, hardened and ground steel guide rails**
for optimum guidance properties and speeds

3 **Integrated secondary parts**
with high power magnets

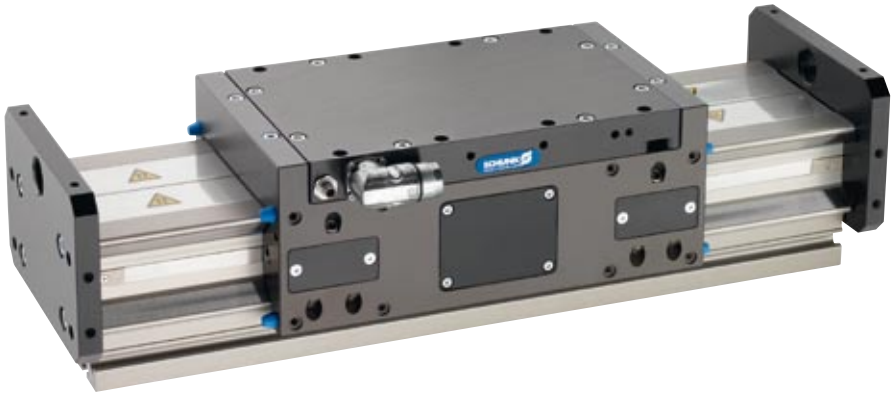
4 **Compact primary part slide**
with mounting surfaces, rollers adjusted without play and integrated measuring system

5 **End plates**
for mounting sensors and shock absorbers

6 **Supported profile**
for higher useful loads

Linear axis with direct drive

and roller guide



Area of application

The axis module is suitable for medium loads with high dynamic requirements.

General information about the series

Drive

3-phase, electronically commutated AC synchronous linear motor.
Primary part 3-phase copper coil body, secondary part iron mount with permanent magnets and dirt cover.

Stroke measuring system

Non-contact magnetic measuring system with integrated analog signal output, 1 Vss (insensitive to contamination)

Profile guide

X-shaped aluminum press-drawn section with ground tracks with a secondary part made up of high power magnets

Guided slide

Roller-guided slide adjustable with no play using cam, primary part and measuring system reading head directly integrated. Attachments can be mounted and secured using thread and centering sleeves on all four side surfaces.

Operating temperature

From 10 °C to 40 °C

Options

- **Pneumatic brake for relieving the load on the linear motor, e.g. under influence of axial forces in target position**
- Other independent motor slides on a common profile guide and with a linear measuring system
- Collision protection in case of programming errors is provided by corresponding limit switches
- Second passive guided slide for long attachments (free moving)
- Wipers for removing deposits on the guideways.
- Absolute stroke measuring system and optical stroke measuring systems for applications with very high accuracy

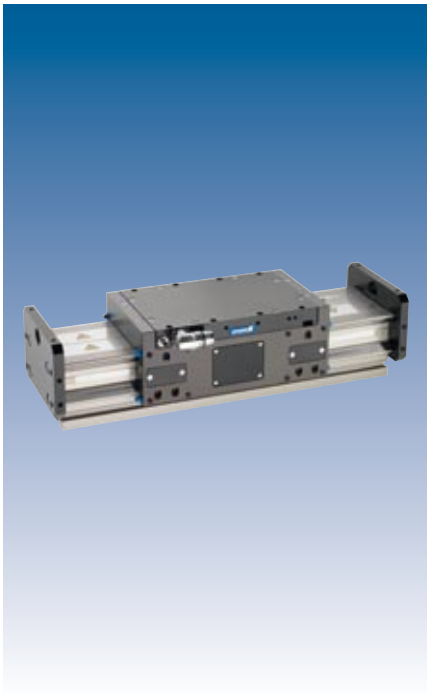
Accessories

- Control units from Bosch Rexroth or Siemens (other manufacturers on request)
- Limit switching using either mechanical or inductive sensors; referencing using inductive sensors
- Hydraulic shock absorbers on profile end plates to prevent inelastic collisions (size and number of shock absorbers depend on application)
- Cable track, pre-assembled and mounted on drive
- Adapter plates on request
- Pre-assembled cable sets in different lengths

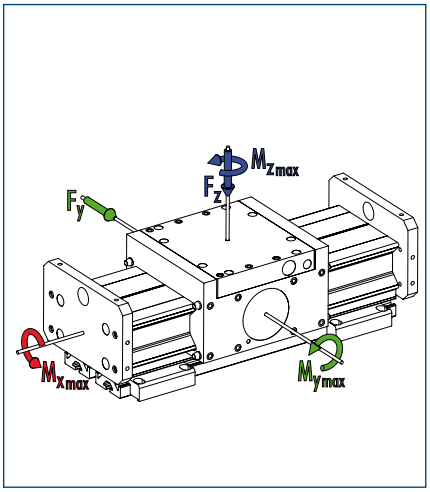
Warranty

24 months
ⓘ Refer to ambient conditions on our introductory pages

For production reasons, the colors may vary from those shown in the catalog.



Load data



	MLD MU	MLD MUL
M_x max. [Nm]	380	380
M_y max. [Nm]	410	700
M_z max. [Nm]	570	760

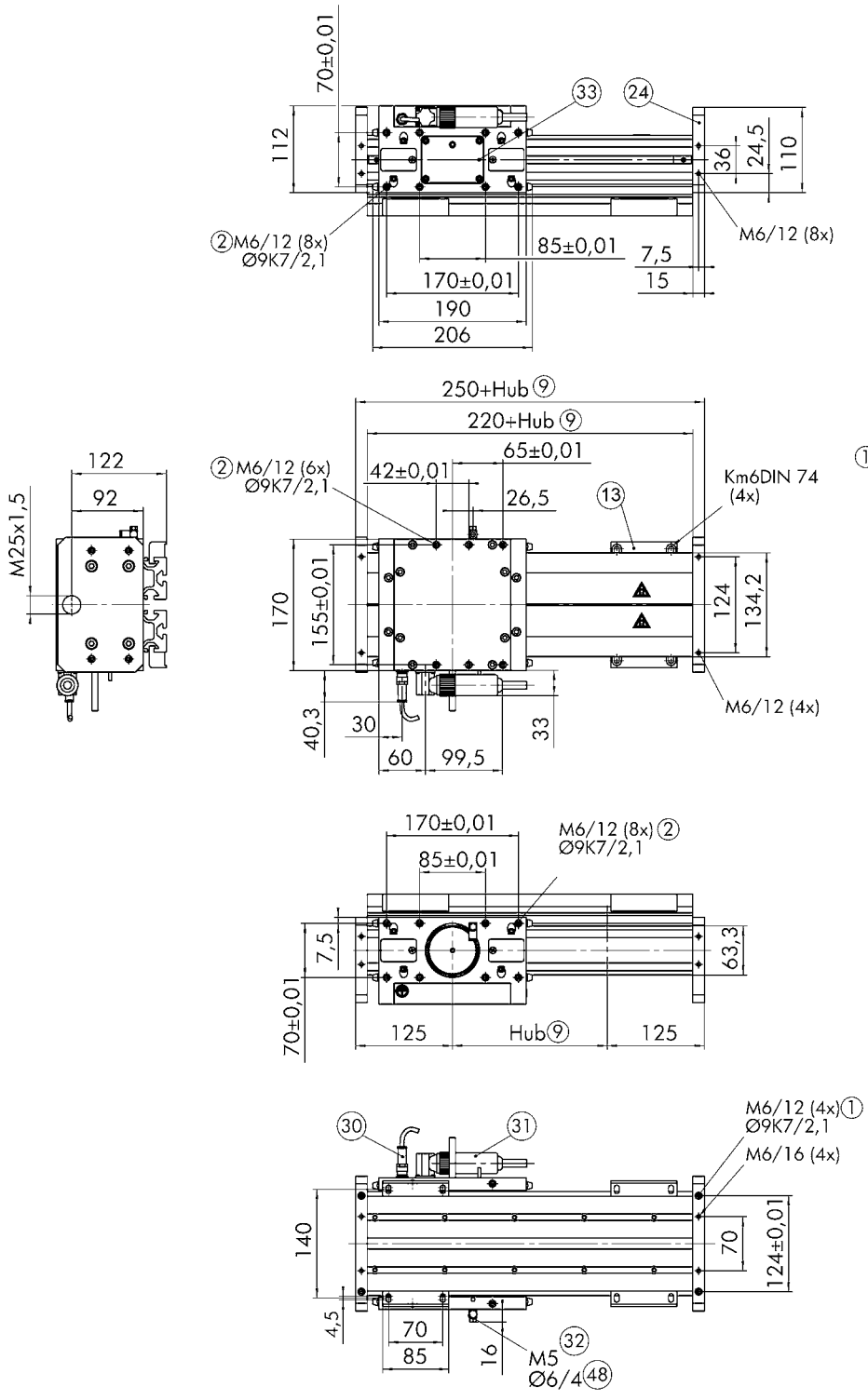
Technical data

Designation		MLD 200MU	MLD 400MUL
Max. driving force (*)	[N]	500	1000
Rated force (**)	[N]	176	322
Max. speed	[m/s]	4	4
Max. acceleration	[m/s²]	40	40
Max. useful load (horizontal)	[kg]	20	40
Max. stroke	[mm]	2800	2700
Repeat accuracy (***)	[mm]	0.01	0.01
Measuring system resolution (controller-dependent)	[µm]	0.5	0.5
Max. current	(A_{eff})	16.2	32.4
Max. continuous current at standstill	(A_{eff})	3.8	6.7
Max. ambient temperature	[°C]	40	40
Max. surface temperature	[°C]	70	70
Weight of guided slide inc. motor	[kg]	5.1	8.3
Weight of end plates	[kg]	1.45	1.45
Profile / 100mm stroke	[kg]	1.99	1.99

(*) Depending on controller type used
(**) Depending on installation situation (heat dissipation)
(***) The specified repeat accuracies are only applicable at constant ambient temperatures.

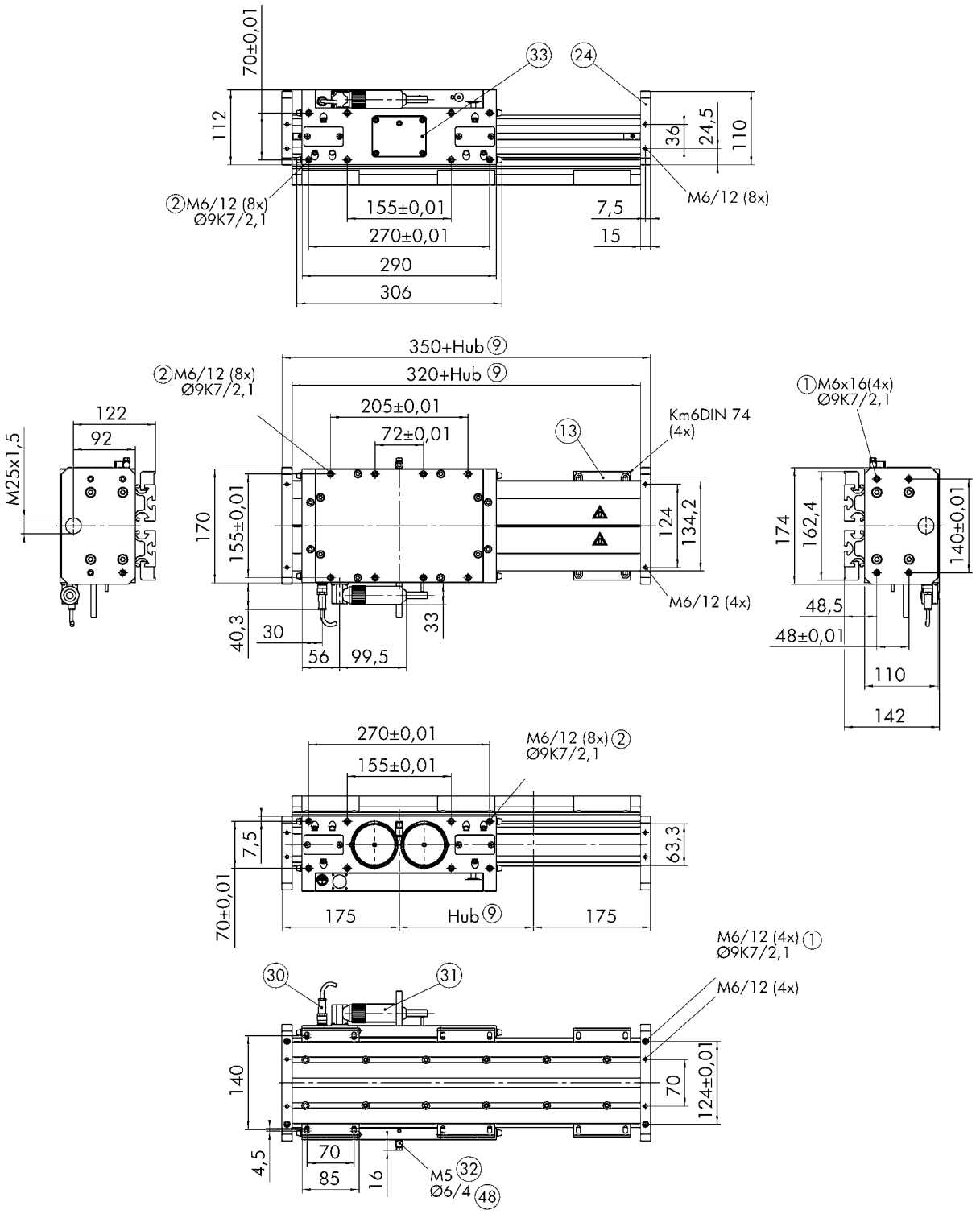
ⓘ The specified repeat accuracy applies at constant ambient temperatures.
Some of the specified forces can vary considerably when using different control units and with increasing travel speeds

Main views MLD MU



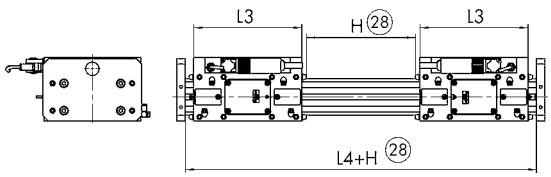
① Linear unit connection
② Assembly connection
⑨ Useful stroke
⑬ Mounting block
㉔ Flange
㉚ Hall sensor connecting plug
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter

Main views MLD MUL



① Linear unit connection
② Assembly connection
⑨ Useful stroke
⑬ Mounting block
㉔ Flange
㉚ Hall sensor connecting plug
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter

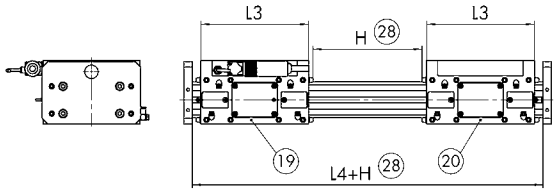
Second slide (third slide only on request)



Type	L3	L4
MLD 100MU	190	480
MLD 200MUL	290	680

28 Total stroke = 2 x stroke per slide

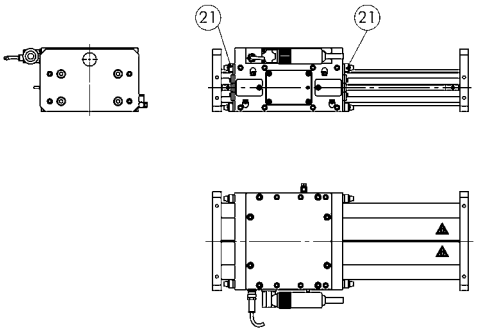
Second passive slide



Type	L3	L4
MLD 100MU	190	480
MLD 200MUL	290	680

19 Powered slide
20 Passive slide
28 Total stroke = 2 x stroke per slide

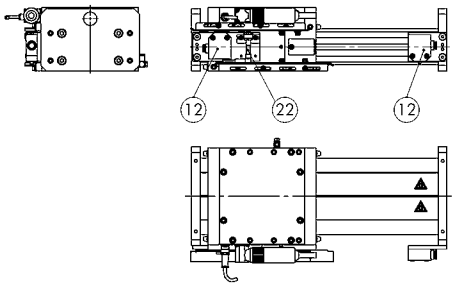
Wipers



21 Wipers

ⓘ Using wipers shortens the useful stroke by 22 mm.

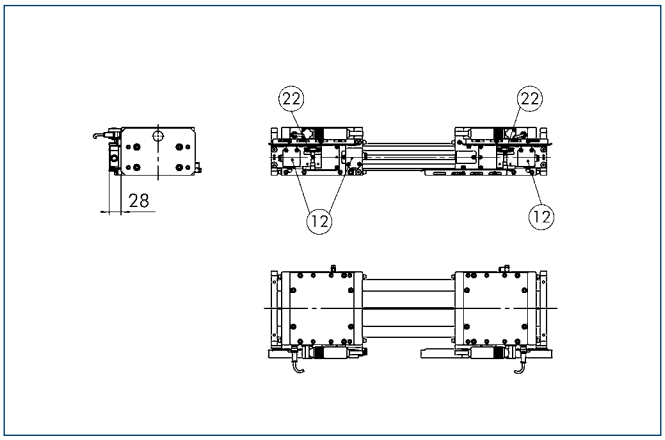
Limit and reference switch with one slide



12 Mechanical limit switches
22 Inductive reference switch

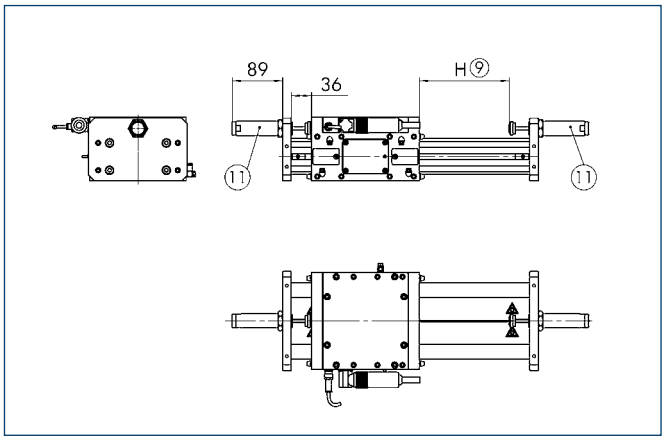
Figure : Left reference switch

Limit and reference switch with two slides



⑫ Mechanical limit switches
㉒ Inductive reference switch

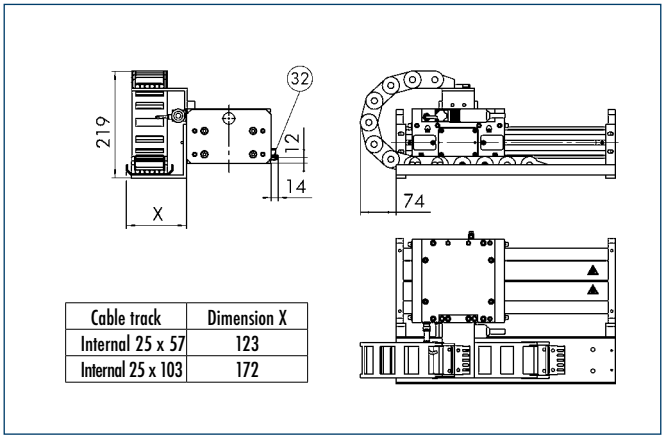
Shock absorber



⑨ Useful stroke
⑪ Shock absorber

ⓘ Shock absorbers shorten the useful stroke by 42 mm, as the shock absorbers may not be actuated during axis operation.

Cable track for one motor slide

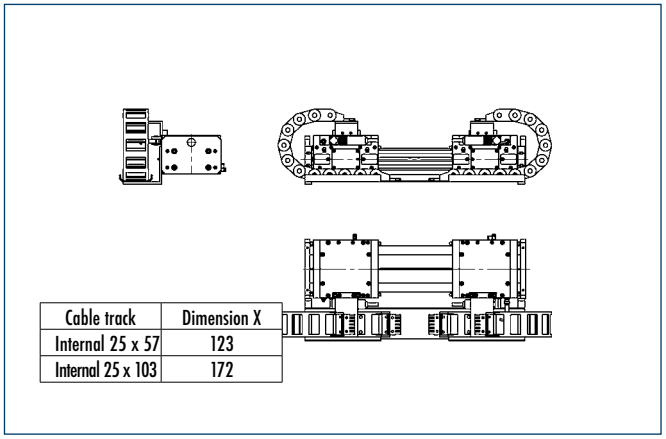


Cable track	Dimension X
Internal 25 x 57	123
Internal 25 x 103	172

Figure : Cable track to left

XYZ for cable track width 50 mm
XYZ for cable track width 100 mm

Cable tracks for two motor slides



Cable track	Dimension X
Internal 25 x 57	123
Internal 25 x 103	172

XYZ for cable track width 50 mm
XYZ for cable track width 100 mm

MLD MU (MUL) component option codes and ordering

Each axis is supplemented with the required options. Each option is made up of 4 digits. The first two digits indicate the axis type. These are identical for all options for an axis.* The last two digits indicate the selectable options or accessories.

Option digits for axis types:
MLD 200MU = 55xx
MLD 400MUL = 56xx

Version	Description	Option
Active slide	1 slide	xx01
Motor for active slide with plug outlet	Left (completely assembled for INDRADRIVE)	xx03
	Right (completely assembled for INDRADRIVE)	xx04
	Left (completely assembled for SINAMICS)	xx58
	Right (completely assembled for SINAMICS)	xx59
Passive slide	1 slide	xx02 (n)**
Holding brake	Mounted in 1 active slide	xx05
Brake valve inc. 10m cable	for 1 slide	xx06
Wipers	mounted on slide	xx07
Reference switch	Inductive reference switches, left	xx08
	Inductive reference switches, right	xx09
	Inductive reference switches for 2 active slides	xx10
Limit switches	Inductive limit switches (right/left)	xx11
	Inductive limit switches for 2 active slides	xx12
	Mechanical limit switches (left/right)	xx13
	Mechanical limit switches for 2 active slides	xx14
Cable track	Narrow, attachment on left	xx15
	Narrow, attachment on right	xx16
	Narrow, for 2 slides left/right	xx17
	Wide, attachment on left	xx18
	Wide, attachment on right	xx19
	Wide, for 2 slides left/right	xx20
Shock absorber	2 units in set	xx21
	3 units in set (2 slides)	xx22
Clamping profiles	Mounting strips for axis profile	xx23 (n)**
Centering sleeves	D = 9K7 in enclosed pack	xx24 (n)**
Standard cable sets	INDR. / Basic cable set, 5m straight	xx32
	INDR. / Basic cable set, 10 m straight	xx33
	INDR. / Basic cable set, 15 m straight	xx34
	INDR. / Basic cable set, 20 m straight	xx35
	INDR. / Adv. cable set, 5m straight	xx36
	INDR. / Adv. cable set, 10 m straight	xx37
	INDR. / Adv. cable set, 15 m straight	xx38
	INDR. / Adv. cable set, 20 m straight	xx39
	Sinamics cable set, 5 m	xx40
	Sinamics cable set, 10 m	xx41
	Sinamics cable set, 15 m	xx42
	Sinamics cable set, 20 m	xx43
Measuring system mounting kit	Four-digit code: (e.g. 0132) generated from following code:	Digit 1: 0 / Digit 2: 1 / Digit 3: 3 / Digit 4: 2
	Digit 1:	0
	Digit 2: Stroke measuring system type:	1 = Magnetic incremental linear unit 2 = Internal 3 = Absolute MSA 4 = Optical LIA
	Digit 3: Stroke measuring system cable length: (Corresponding to cable set length as standard)	1= 5m 2= 10m 3= 15m 4= 20m
	Digit 4: Drive controller cable version: (Corresponding to cable set version as standard)	1 = Internal 2 = BoschRexroth Indradrive BASIC 3 = BoschRexroth Indradrive ADVANCED 4 = SIEMENS Sinamics

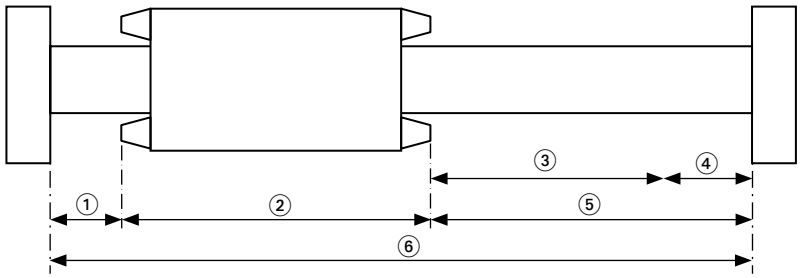
Sample order

MLD 200MU	-	1	-	150	-	nnn	-	5504 - 5511 - 5516 -5524(6) - 5533 - 0132
Type of axis		Number of active slides		Useful stroke		Total length*** (added by Schunk)		List of required options

* The exception is the stroke measuring system option, which always appears last.

** Options with () contain the quantity of the options specified in brackets. For all options where the number automatically corresponds to the number of active slides, no quantity is specified.

*** Total length = Profile length + 2x end plate The only lengths available as the profile length for this axis type - due to the magnet - are xx05, xx20 and xx80mm. The profile length is made up of the useful stroke, the total of the slide lengths and the safety reserve typical for the axis (14 mm) and is extended to the next technically feasible length by Schunk project engineers (wipers and shock absorbers are also taken into account). The Schunk useful stroke specification may slightly exceed the required useful stroke due to the permissible profile length. The total length is supplemented.

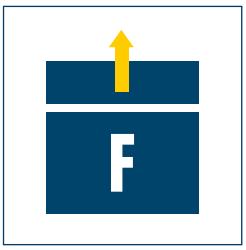


1. Safety reserve
2. Slide length
3. Stroke
4. Supplement to permissible profile length
5. Useful stroke
6. Profile length

Scope of delivery includes

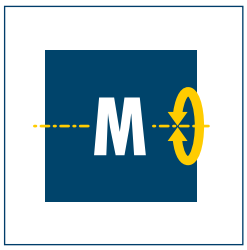
3-phase, electronically commutated AC synchronous linear motor with primary and secondary part, measuring system, profile guide with guide rollers, slide, profile end plates and with or without Hall sensor depending on the drive concept. Please specify other options when ordering.

Useful stroke
up to 2,800 mm

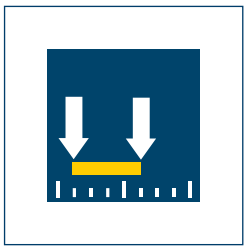


Driving force
up to 1,500 N

Deflection
0.1 mm .. 1 mm

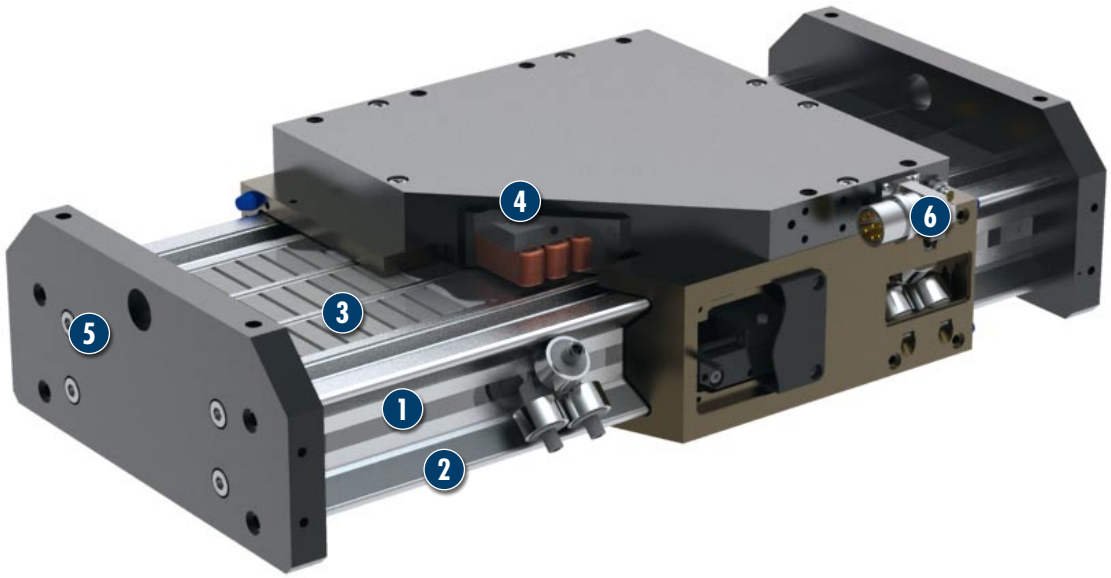


Moment load
Max. 810 Nm



Repeat accuracy
0.01 mm

Module design



1 **Elongated X-shaped aluminum press-drawn section**
with high planar moments of inertia for maximum moment and shearing force load

2 **High precision, hardened and ground steel guide rails**
for optimum guidance properties and speeds

3 **Integrated secondary parts**
with high power magnets

4 **Compact primary part slide**
with mounting surfaces, rollers adjusted without play and integrated measuring system

5 **End plates**
for mounting sensors and shock absorbers

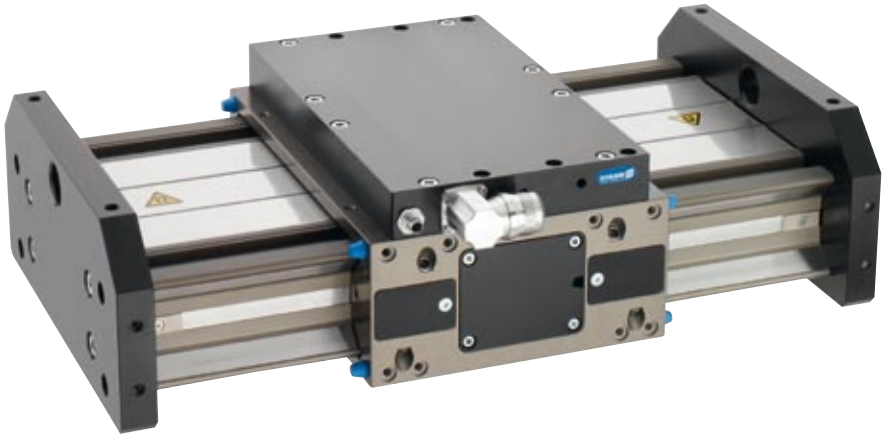
6 **Motor plug**

Linear axis with direct drive

and roller guide

Area of application

Self-supporting heavy load profile
for applications with high payloads



General information about the series

Drive

3-phase, electronically commutated AC synchronous linear motor.
Primary part 3-phase copper coil body, secondary part iron mount with permanent magnets and dirt cover.

Stroke measuring system

Non-contact magnetic measuring system with integrated analog signal output, 1 Vss (insensitive to contamination)

Profile guide

X-shaped aluminum press-drawn section with ground tracks with a secondary part made up of high power magnets

Guided slide

Roller-guided slide adjustable with no play using cam, primary part and measuring system reading head directly integrated. Attachments can be mounted and secured using thread and centering sleeves on all four side surfaces.

Operating temperature

From 10 °C to 40 °C

Options

- **Pneumatic brake for relieving the load on the linear motor, e.g. under influence of axial forces in target position**
- Other independent motor slides on a common profile guide and with a linear measuring system
- Collision protection in case of programming errors is provided by corresponding limit switches
- Second passive guided slide for long attachments (free moving)
- Wipers for removing deposits on the guideways.
- Absolute stroke measuring system and optical stroke measuring systems for applications with very high accuracy

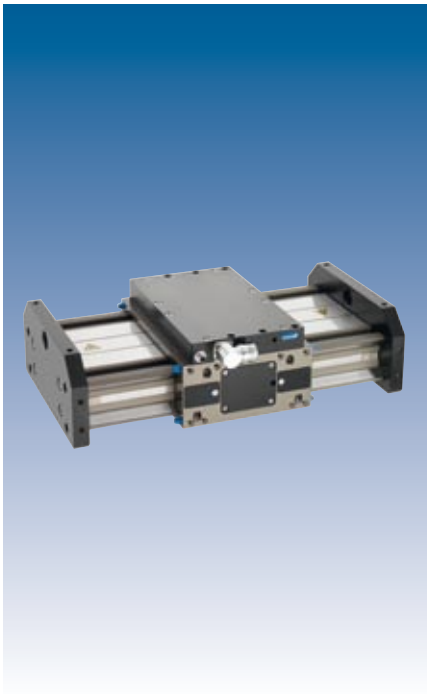
Accessories

- Control units from Bosch Rexroth or Siemens (other manufacturers on request)
- Limit switching using either mechanical or inductive sensors; referencing using inductive sensors
- Hydraulic shock absorbers on profile end plates to prevent inelastic collisions (size and number of shock absorbers depend on application)
- Cable track, pre-assembled and mounted on drive
- Adapter plates on request
- Pre-assembled cable sets in different lengths

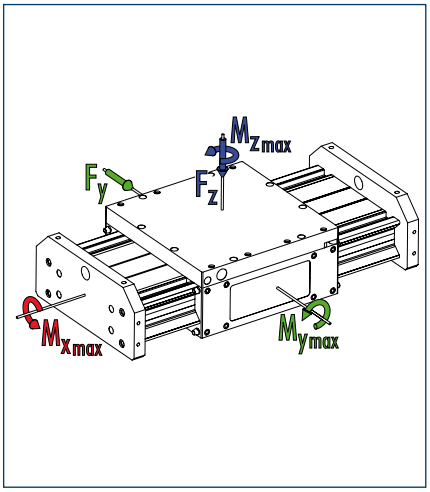
Warranty

24 months
ⓘ Refer to ambient conditions on our introductory pages

For production reasons, the colors may vary from those shown in the catalog.



Load data



	MLD T	MLD TL
M_x max. [Nm]	600	600
M_y max. [Nm]	410	700
M_z max. [Nm]	680	810

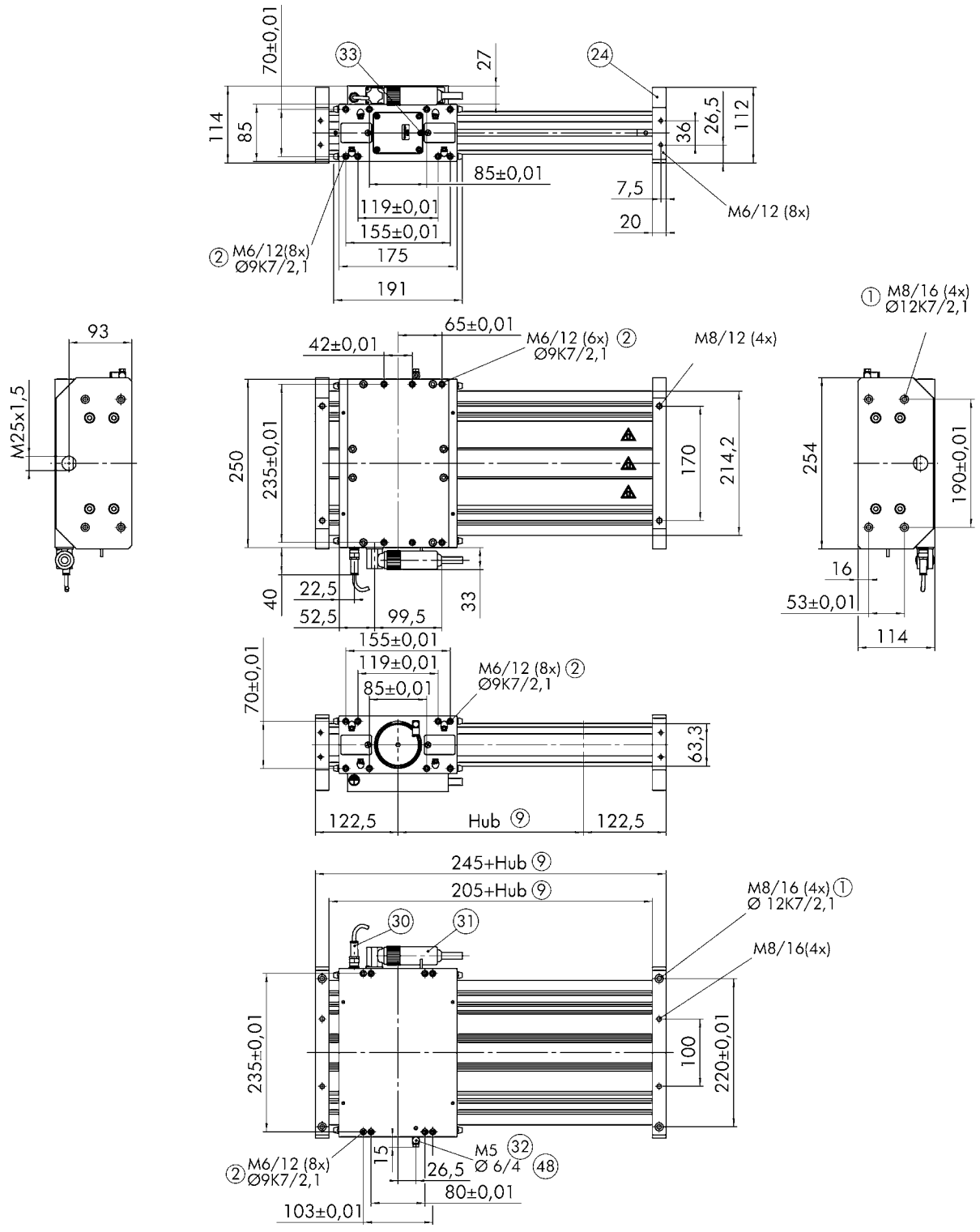
Technical data

Designation		MLD 200T	MLD 300T	MLD 200TL	MLD 400TL	MLD 600TL
Max. driving force (*)	[N]	500	750	500	1000	1500
Rated force (**)	[N]	170	225	208	288	393
Max. speed	[m/s]	4	4	4	4	4
Max. acceleration	[m/s²]	40	40	40	40	40
Max. useful load (horizontal)	[kg]	25	25	50	50	50
Max. stroke	[mm]	2800	2800	2700	2700	2700
Repeat accuracy (***)	[mm]	0.01	0.01	0.01	0.01	0.01
Measuring system resolution (controller-dependent)	[µm]	0.5	0.5	0.5	0.5	0.5
Max. current	(A_{eff})	16.2	24.3	16.2	32.4	48.6
Max. continuous current at standstill	(A_{eff})	4.2	5.6	5.2	7.2	9.8
Max. ambient temperature	[°C]	40	40	40	40	40
Max. surface temperature	[°C]	70	70	70	70	70
Weight of guided slide inc. motor	[kg]	6.6	7.0	9.4	11.1	12.0
Weight of end plates	[kg]	2.8	2.8	2.8	2.8	2.8
Profile / 100mm stroke	[kg]	1.75	1.96	1.53	1.75	1.96

(*) Depending on controller type used
(**) Depending on installation situation (heat dissipation)
(***) The specified repeat accuracies are only applicable at constant ambient temperatures.

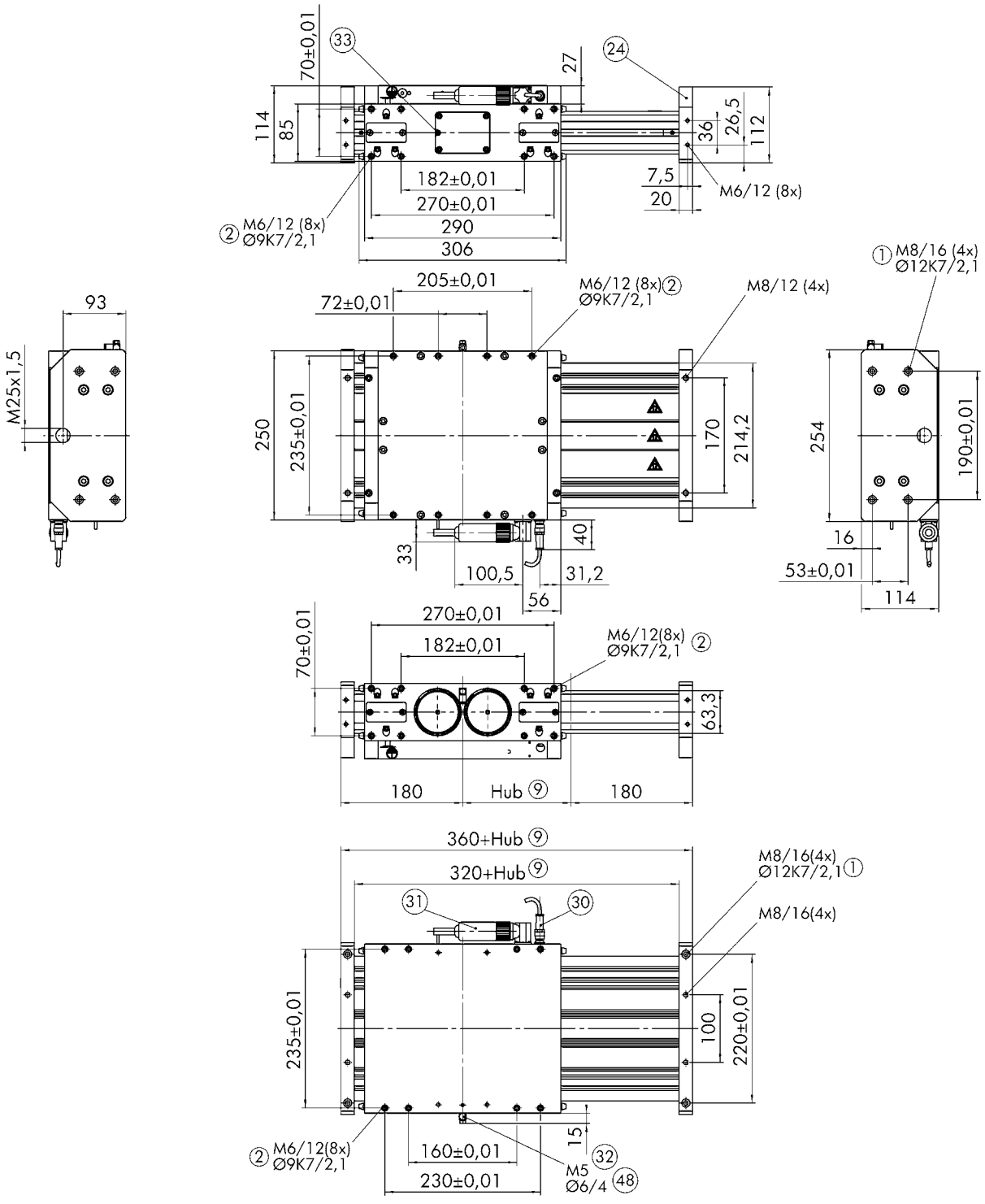
ⓘ The specified repeat accuracy applies at constant ambient temperatures.
Some of the specified forces can vary considerably when using different control units and with increasing travel speeds

Main views MLD T



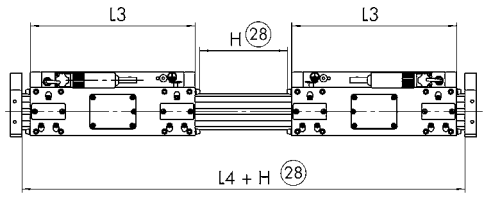
① Linear unit connection
② Assembly connection
⑨ Useful stroke
㉔ Flange
㉚ Hall sensor connecting plug
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter
㉝ Depth of centering sleeve hold in adapter plate

Main views MLD TL



① Linear unit connection
② Assembly connection
⑨ Useful stroke
⑳ Passive slide
㉔ Flange
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter
㉝ Depth of centering sleeve hold in adapter plate

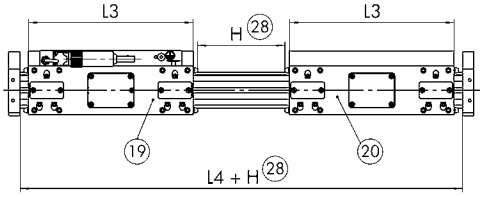
Second slide (third slide only on request)



Type	L3	L4
MLD 100T	175	405
MLD 200TL	290	680

28 Total stroke = 2 x stroke per slide

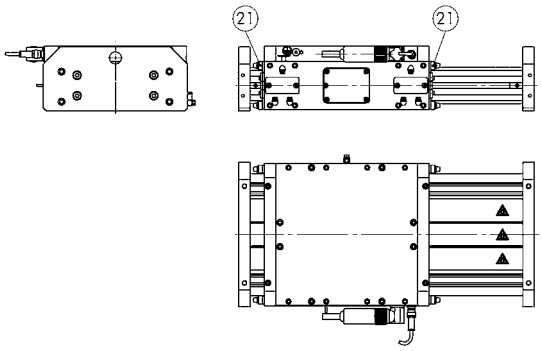
Second passive slide



Type	L3	L4
MLD 100T	175	405
MLD 200TL	290	680

19 Powered slide
20 Passive slide
28 Total stroke = 2 x stroke per slide

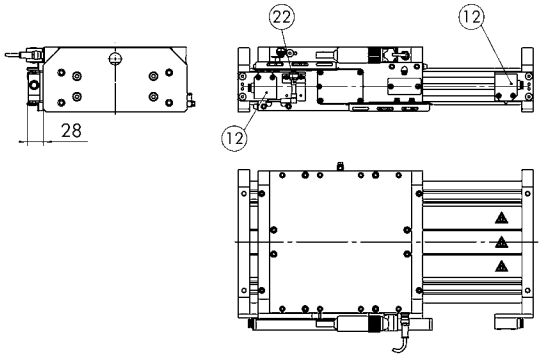
Wipers



21 Wipers

ⓘ Using wipers shortens the useful stroke by 22 mm.

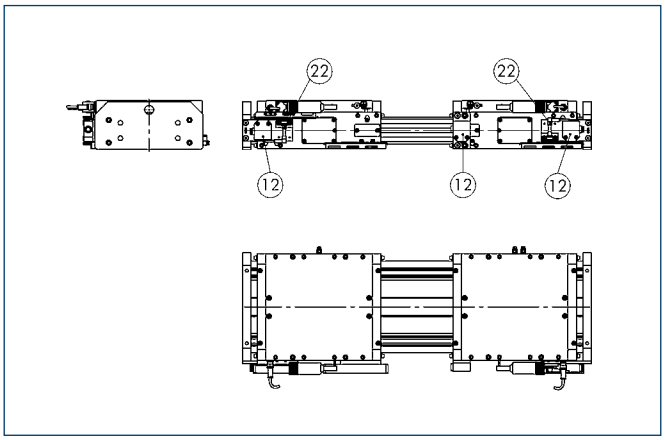
Limit and reference switch with one slide



12 Mechanical limit switches
22 Inductive reference switch

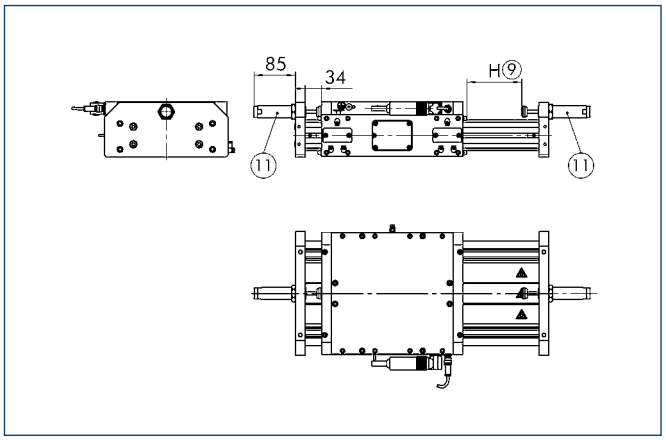
Figure : Left reference switch

Limit and reference switch with two slides



(12) Mechanical limit switches
(22) Inductive reference switch

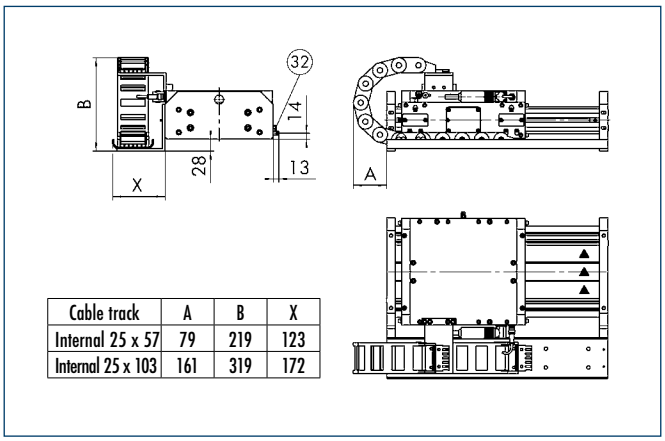
Shock absorber



(9) Useful stroke
(11) Shock absorber

ⓘ Shock absorbers shorten the useful stroke by 42 mm, as the shock absorbers may not be actuated during axis operation.

Cable track for one motor slide

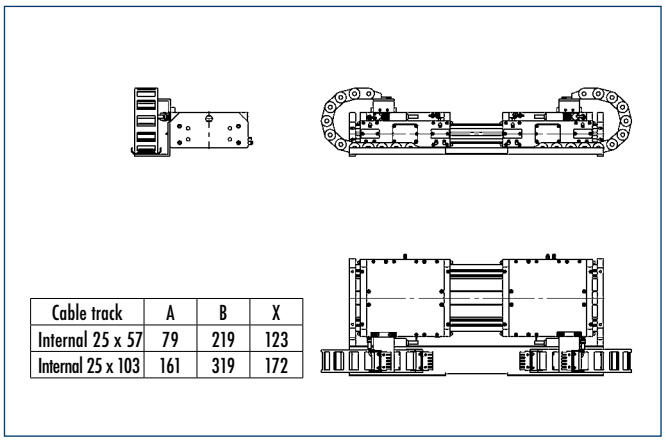


Cable track	A	B	X
Internal 25 x 57	79	219	123
Internal 25 x 103	161	319	172

Figure : Cable track to left

XYZ for cable track width 50mm
XYZ for cable track width 100mm

Cable tracks for two motor slides



Cable track	A	B	X
Internal 25 x 57	79	219	123
Internal 25 x 103	161	319	172

XYZ for cable track width 50mm
XYZ for cable track width 100mm

MLD T (TL) component option codes and ordering

Each axis is supplemented with the required options. Each option is made up of 4 digits. The first two digits indicate the axis type. These are identical for all options for an axis.* The last two digits indicate the selectable options or accessories.

Option digits for axis types:
MLD 200T = 62xx
MLD 300T = 63xx

MLD 200 TL = 64xx
MLD 400 TL = 65xx
MLD 600 TL = 66xx

Version	Description	Option
Active slide	1 slide	xx01
Motor for active slide with plug outlet	Left (completely assembled for INDRADRIVE)	xx03
	Right (completely assembled for INDRADRIVE)	xx04
	Left (completely assembled for SINAMICS)	xx58
	Right (completely assembled for SINAMICS)	xx59
Passive slide	1 slide	xx02 (n)**
Holding brake	Mounted in 1 active slide	xx05
Brake valve inc. 10m cable	for 1 slide	xx06
Wipers	mounted on slide	xx07
Reference switch	Inductive reference switches, left	xx08
	Inductive reference switches, right	xx09
	Inductive reference switches for 2 active slides	xx10
Limit switches	Inductive limit switches (right/left)	xx11
	Inductive limit switches for 2 active slides	xx12
	Mechanical limit switches (left/right)	xx13
	Mechanical limit switches for 2 active slides	xx14
Cable track	Narrow, attachment on left	xx15
	Narrow, attachment on right	xx16
	Narrow, for 2 slides left/right	xx17
	Wide, attachment on left	xx18
	Wide, attachment on right	xx19
	Wide, for 2 slides left/right	xx20
Shock absorber	2 units in set	xx21
	3 units in set (2 slides)	xx22
Centering sleeves	D = 9K7 in enclosed pack	xx24 (n)**
	D = 12K7 in enclosed pack	xx25 (n)**
Standard cable sets	INDR. / Basic cable set, 5m straight	xx32
	INDR. / Basic cable set, 10 m straight	xx33
	INDR. / Basic cable set, 15 m straight	xx34
	INDR. / Basic cable set, 20 m straight	xx35
	INDR. / Adv. cable set, 5m straight	xx36
	INDR. / Adv. cable set, 10 m straight	xx37
	INDR. / Adv. cable set, 15 m straight	xx38
	INDR. / Adv. cable set, 20 m straight	xx39
	Sinamics cable set, 5 m	xx40
	Sinamics cable set, 10 m	xx41
	Sinamics cable set, 15 m	xx42
	Sinamics cable set, 20 m	xx43

Measuring system mounting kit

Four-digit code: (e.g. 0132) generated from following code:

	Digit 1	Digit 2	Digit 3	Digit 4
	0	1	3	2

Digit 1:
0

Digit 2: Stroke measuring system type:
1 = Magnetic incremental linear unit
2 = Internal
3 = Absolute MSA
4 = Optical LIA

Digit 3: Stroke measuring system cable length:
(Corresponding to cable set length as standard)
1= 5m
2= 10m
3= 15m
4= 20m

Digit 4: Drive controller cable version:
(Corresponding to cable set version as standard)
1 = Internal
2 = BoschRexroth Indradrive BASIC
3 = BoschRexroth Indradrive ADVANCED
4 = SIEMENS Sinamics

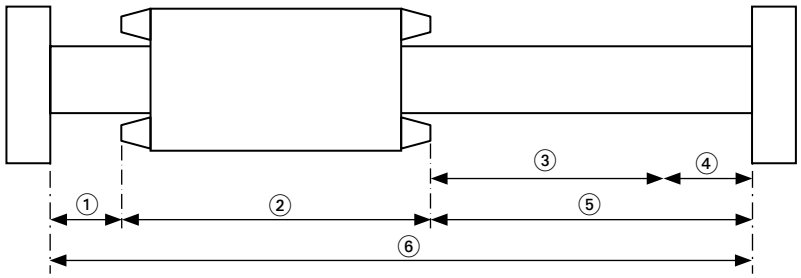
Sample order

MLD 200T	-	1	-	150	-	nnn	-	6204 - 6211 - 6216 -6224(6) - 6233 - 0132
Type of axis		Number of active slides		Useful stroke		Total length*** (added by Schunk)		List of required options

* The exception is the stroke measuring system option, which always appears last.

** Options with () contain the quantity of the options specified in brackets. For all options where the number automatically corresponds to the number of active slides, no quantity is specified.

*** Total length = Profile length + 2x end plate The only lengths available as the profile length for this axis type - due to the magnet - are xx05, xx20 or xx80mm. The profile length is made up of the useful stroke, the total of the slide lengths and the safety reserve typical for the axis (14 mm) and is extended to the next technically feasible length by Schunk project engineers (wipers and shock absorbers are also taken into account). The Schunk useful stroke specification may slightly exceed the required useful stroke due to the permissible profile length. The total length is supplemented.

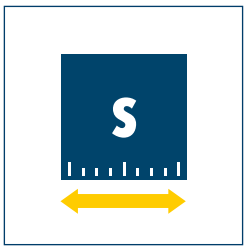


1. Safety reserve
2. Slide length
3. Stroke
4. Supplement to permissible profile length
5. Useful stroke
6. Profile length

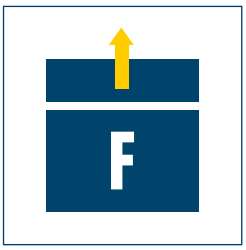
Scope of delivery includes

3-phase, electronically commutated AC synchronous linear motor with primary and secondary part, measuring system, profile guide with guide rollers, slide, profile end plates and with or without Hall sensor depending on the drive concept. Please specify other options when ordering.

MLD TU/TUL



Useful stroke
up to 2,800 mm



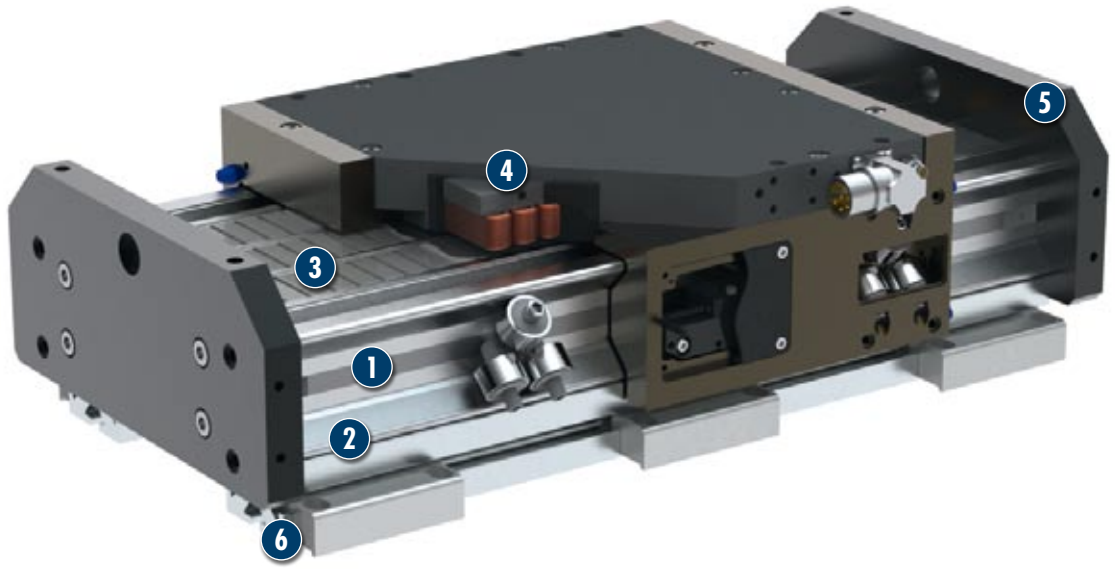
Driving force
up to 1,500 N

Deflection
0.1 mm .. 1 mm

Moment load
up to 810 Nm

Repeat accuracy
0.01 mm

Module design



1 **Elongated X-shaped aluminum press-drawn section**
with high planar moments of inertia for maximum moment and shearing force load

2 **High precision, hardened and ground steel guide rails**
for optimum guidance properties and speeds

3 **Integrated secondary parts**
with high power magnets

4 **Compact primary part slide**
with mounting surfaces, rollers adjusted without play and integrated measuring system

5 **End plates**
for mounting sensors and shock absorbers

6 **Supported profile**
for higher useful loads

Linear axis with direct drive

and roller guide

Area of application

Self-supporting heavy load profile
for applications with high payloads

General information about the series

Drive

3-phase, electronically commutated AC synchronous linear motor.
Primary part 3-phase copper coil body, secondary part iron mount with permanent magnets and dirt cover.

Stroke measuring system

Non-contact magnetic measuring system with integrated analog signal output, 1 Vss (insensitive to contamination)

Profile guide

X-shaped aluminum press-drawn section with ground tracks with a secondary part made up of high power magnets

Guided slide

Roller-guided slide adjustable with no play using cam, primary part and measuring system reading head directly integrated. Attachments can be mounted and secured using thread and centering sleeves on all four side surfaces.

Operating temperature

From 10 °C to 40 °C

Options

- **Pneumatic brake for relieving the load on the linear motor, e.g. under influence of axial forces in target position**
- Other independent motor slides on a common profile guide and with a linear measuring system
- Collision protection in case of programming errors is provided by corresponding limit switches
- Second passive guided slide for long attachments (free moving)
- Wipers for removing deposits on the guideways.
- Absolute stroke measuring system and optical stroke measuring systems for applications with very high accuracy

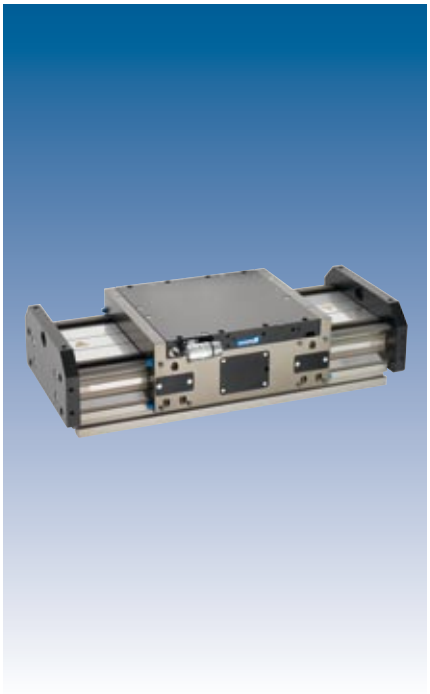
Accessories

- Control units from Bosch Rexroth or Siemens (other manufacturers on request)
- Limit switching using either mechanical or inductive sensors; referencing using inductive sensors
- Hydraulic shock absorbers on profile end plates to prevent inelastic collisions (size and number of shock absorbers depend on application)
- Cable track, pre-assembled and mounted on drive
- Adapter plates on request
- Pre-assembled cable sets in different lengths

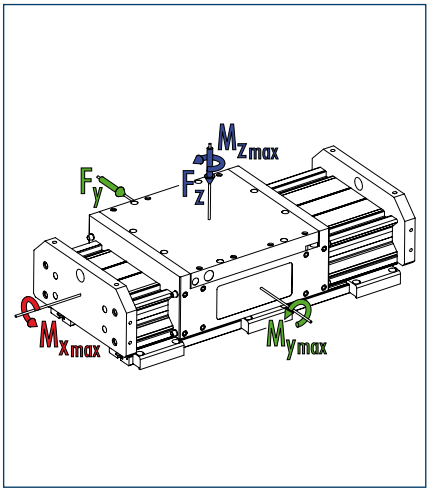
Warranty

24 months
ⓘ Refer to ambient conditions on our introductory pages

For production reasons, the colors may vary from those shown in the catalog.



Loa data TUL



	MLD TU	MLD TUL
M_x max. [Nm]	600	600
M_y max. [Nm]	410	700
M_z max. [Nm]	680	810

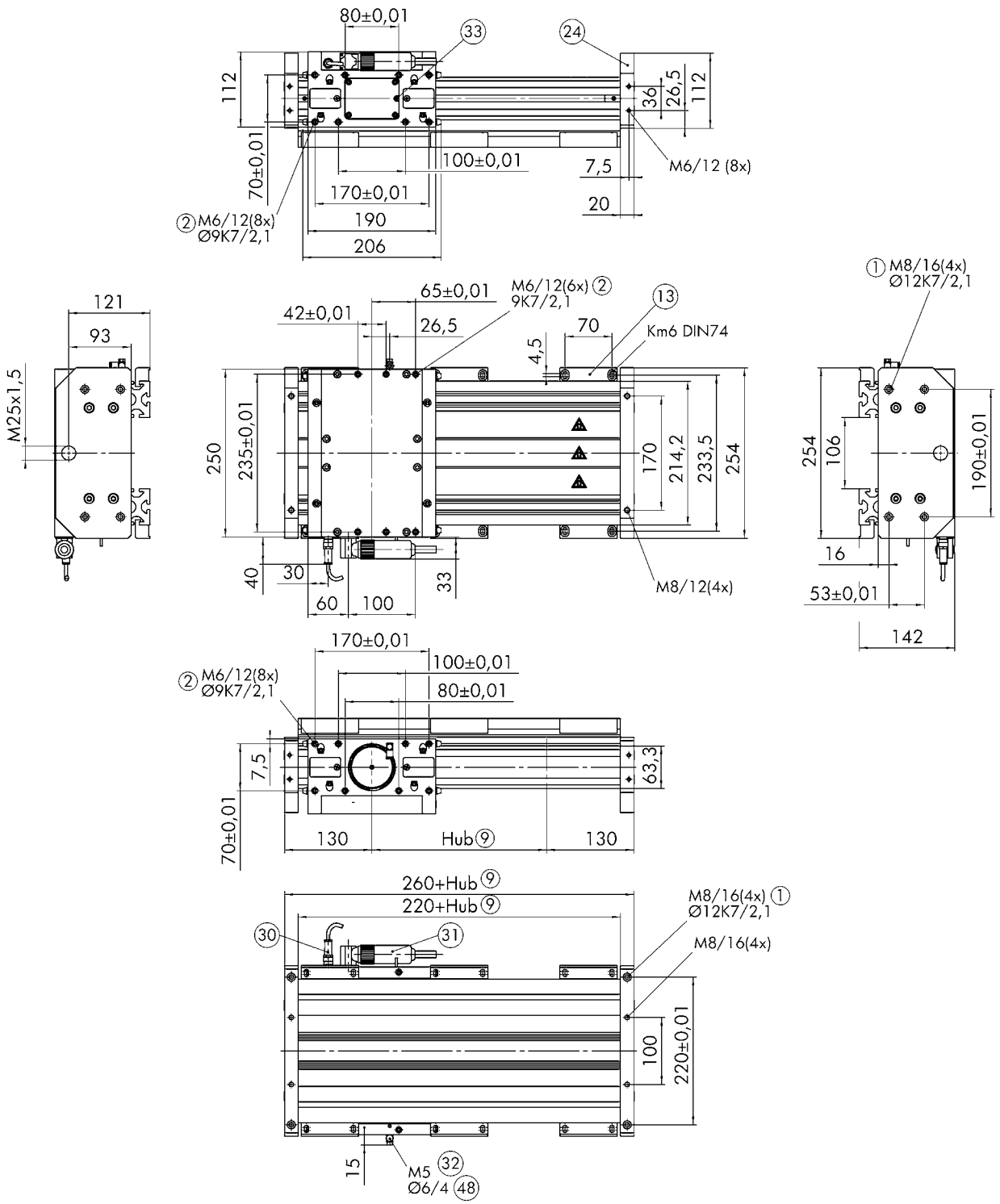
Technical data

Designation		MLD 200TU	MLD 300TU	MLD 200TUL	MLD 400TUL	MLD 600TUL
Max. driving force (*)	[N]	500	750	500	1000	1500
Rated force (**)	[N]	143	189	182	247	344
Max. speed	[m/s]	4	4	4	4	4
Max. acceleration	[m/s²]	40	40	40	40	40
Max. useful load (horizontal)	[kg]	25	25	50	50	50
Max. stroke	[mm]	2800	2800	2700	2700	2700
Repeat accuracy (***)	[mm]	0.01	0.01	0.01	0.01	0.01
Measuring system resolution (controller-dependent)	[µm]	0.5	0.5	0.5	0.5	0.5
Max. current	(A_{eff})	16.2	24.3	16.2	32.4	48.6
Max. continuous current at standstill	(A_{eff})	4.2	5.6	5.2	7.2	9.8
Max. ambient temperature	[°C]	40	40	40	40	40
Max. surface temperature	[°C]	70	70	70	70	70
Weight of guided slide inc. motor	[kg]	6.6	7.0	8.5	10.2	11.1
Weight of end plates	[kg]	2.8	2.8	2.8	2.8	2.8
Profile / 100mm stroke	[kg]	2.6	2.81	2.38	2.6	2.81

(*) Depending on controller type used
(**) Depending on installation situation (heat dissipation)
(***) The specified repeat accuracies are only applicable at constant ambient temperatures.

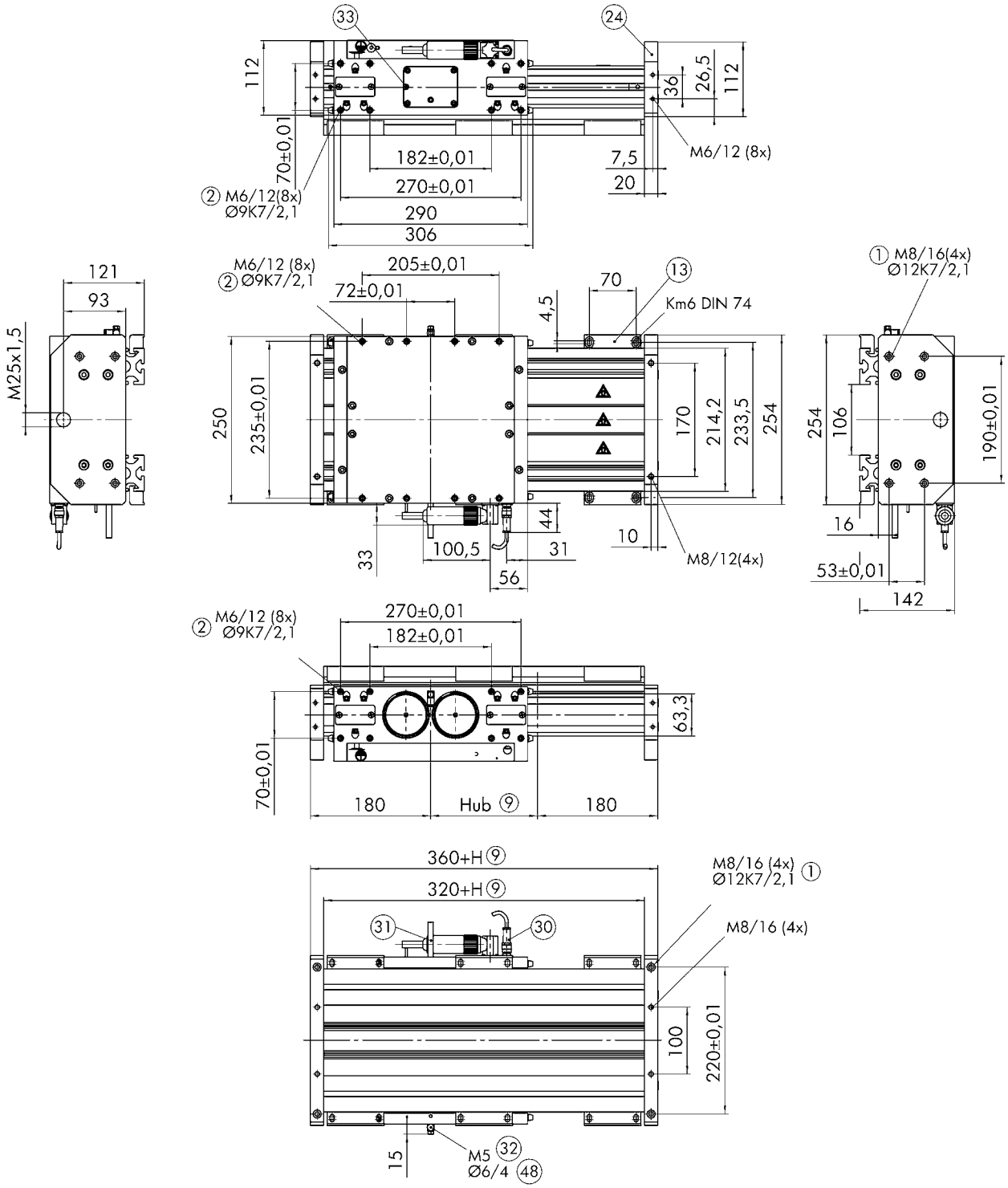
ⓘ The specified repeat accuracy applies at constant ambient temperatures.
Some of the specified forces can vary considerably when using different control units and with increasing travel speeds

Main views MLD TU



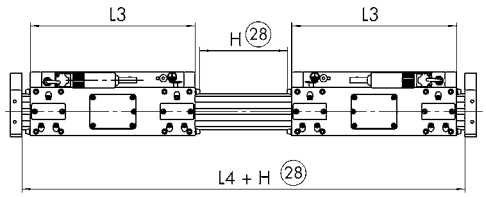
① Linear unit connection
② Assembly connection
⑨ Useful stroke
⑬ Mounting block
㉔ Flange
㉚ Hall sensor connecting plug
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose diameter

Main views MLD TUL



① Linear unit connection
② Assembly connection
⑨ Useful stroke
⑬ Mounting block
㉔ Flange
㉚ Hall sensor connecting plug
㉛ Motor plug
㉜ Pneumatic connection for holding brake
㉝ Cable for stroke measuring system
㊽ Hose

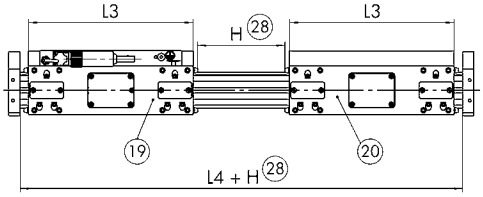
Second slide (third slide only on request)



Type	L3	L4
MLD 100TU	190	480
MLD 200TUL	290	680

28 Total stroke = 2 x stroke per slide

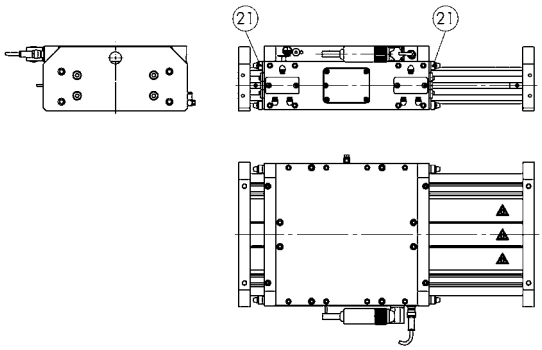
Second passive slide



Type	L3	L4
MLD 100TU	190	480
MLD 200TUL	290	680

19 Powered slide
20 Passive slide
28 Total stroke = 2 x stroke per slide

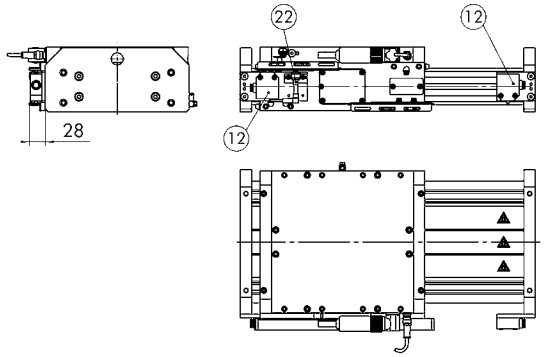
Wipers



21 Wipers

ⓘ Using wipers shortens the useful stroke by 22 mm.

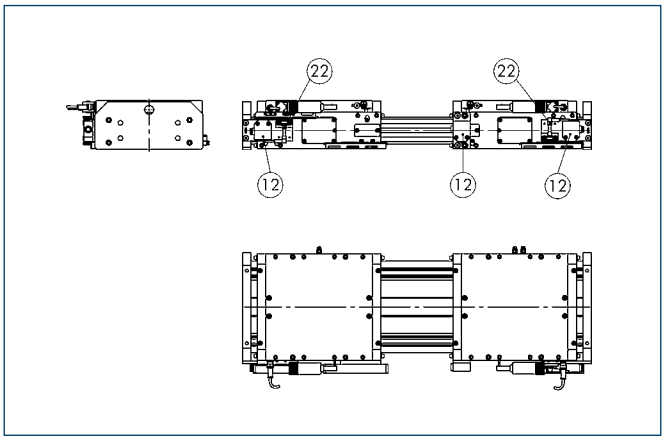
Limit and reference switch with one slide



12 Mechanical limit switches
22 Inductive reference switch

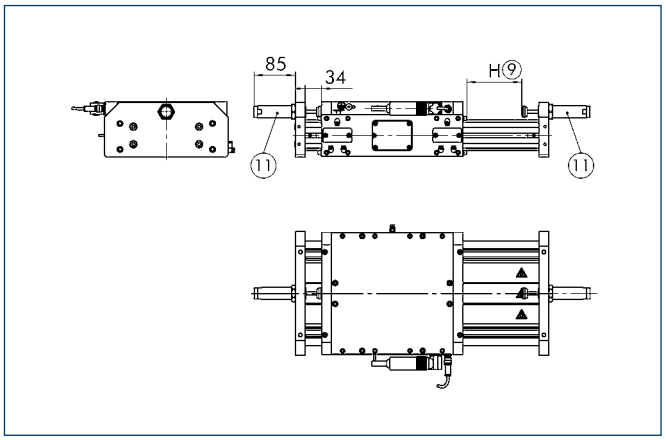
Figure : Left reference switch

Limit and reference switch with two slides



⑫ Mechanical limit switches
㉒ Inductive reference switch

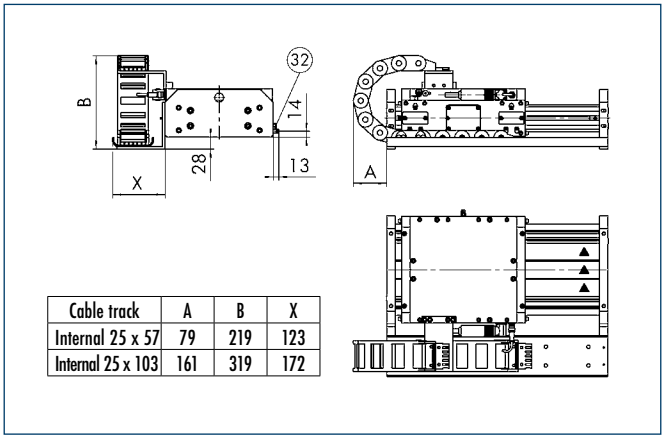
Shock absorber



⑨ Useful stroke
⑪ Shock absorber

ⓘ Shock absorbers shorten the useful stroke by 42 mm, as the shock absorbers may not be actuated during axis operation.

Cable track for one motor slide

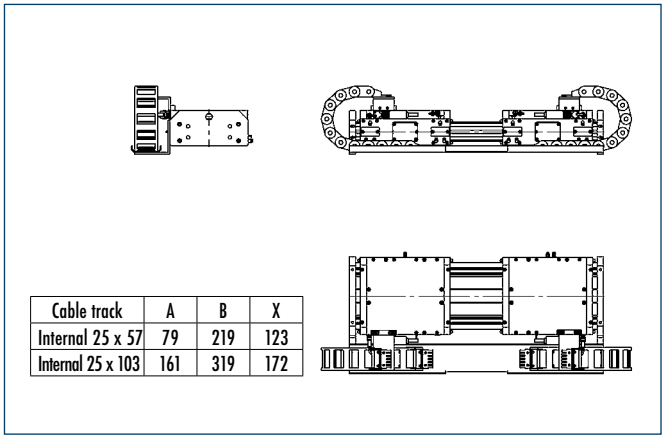


Cable track	A	B	X
Internal 25 x 57	79	219	123
Internal 25 x 103	161	319	172

Figure : Cable track to left

XYZ for cable track width 50mm
XYZ for cable track width 100mm

Cable tracks for two motor slides



Cable track	A	B	X
Internal 25 x 57	79	219	123
Internal 25 x 103	161	319	172

XYZ for cable track width 50mm
XYZ for cable track width 100mm

MLD TU (TUL) component option codes and ordering

Each axis is supplemented with the required options. Each option is made up of 4 digits. The first two digits indicate the axis type. These are identical for all options for an axis.* The last two digits indicate the selectable options or accessories.

Option digits for axis types:
MLD 200TU = 68xx
MLD 300TU = 69xx
MLD 200 TUL = 70xx
MLD 400 TUL = 71xx
MLD 600 TUL = 72xx

Version	Description	Option
Active slide	1 slide	xx01
Motor for active slide with plug outlet	Left (completely assembled for INDRADRIVE)	xx03
	Right (completely assembled for INDRADRIVE)	xx04
	Left (completely assembled for SINAMICS)	xx58
	Right (completely assembled for SINAMICS)	xx59
Passive slide	1 slide	xx02 (n)**
Holding brake	Mounted in 1 active slide	xx05
Brake valve inc. 10m cable	for 1 slide	xx06
Wipers	mounted on slide	xx07
Reference switch	Inductive reference switches, left	xx08
	Inductive reference switches, right	xx09
	Inductive reference switches for 2 active slides	xx10
Limit switches	Inductive limit switches (right/left)	xx11
	Inductive limit switches for 2 active slides	xx12
	Mechanical limit switches (left/right)	xx13
	Mechanical limit switches for 2 active slides	xx14
Cable track	Narrow, attachment on left	xx15
	Narrow, attachment on right	xx16
	Narrow, for 2 slides left/right	xx17
	Wide, attachment on left	xx18
	Wide, attachment on right	xx19
	Wide, for 2 slides left/right	xx20
Shock absorber	2 units in set	xx21
	3 units in set (2 slides)	xx22
Clamping profiles	Mounting strips for axis profile	xx23 (n)**
Centering sleeves	D = 9K7 in enclosed pack	xx24 (n)**
	D = 12K7 in enclosed pack	xx25 (n)**
Standard cable sets	INDR. / Basic cable set, 5m straight	xx32
	INDR. / Basic cable set, 10 m straight	xx33
	INDR. / Basic cable set, 15 m straight	xx34
	INDR. / Basic cable set, 20 m straight	xx35
	INDR. / Adv. cable set, 5m straight	xx36
	INDR. / Adv. cable set, 10 m straight	xx37
	INDR. / Adv. cable set, 15 m straight	xx38
	INDR. / Adv. cable set, 20 m straight	xx39
	Sinamics cable set, 5 m	xx40
	Sinamics cable set, 10 m	xx41
	Sinamics cable set, 15 m	xx42
	Sinamics cable set, 20 m	xx43
Measuring system mounting kit	Four-digit code: (e.g. 0132) generated from following code:	Digit 1: 0 Digit 2: Stroke measuring system type: 1 = Magnetic incremental linear unit 2 = Internal 3 = Absolute MSA 4 = Optical LIA Digit 3: Stroke measuring system cable length: (Corresponding to cable set length as standard) 1= 5m 2= 10m 3= 15m 4= 20m Digit 4: Drive controller cable version: (Corresponding to cable set version as standard) 1 = Internal 2 = BoschRexroth Indradrive BASIC 3 = BoschRexroth Indradrive ADVANCED 4 = SIEMENS Sinamics

Digit 1	Digit 2	Digit 3	Digit 4
0	1	3	2

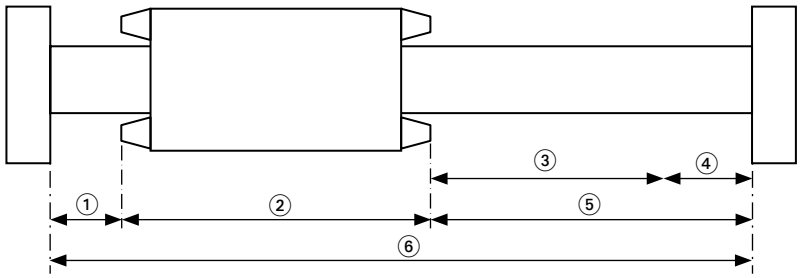
Sample order

MLD 200TUL	-	1	-	150	-	nnn	-	7004 - 7011 - 7016 -7024(6) - 7033 - 0132
Type of axis		Number of active slides		Useful stroke		Total length*** (added by Schunk)		List of required options

* The exception is the stroke measuring system option, which always appears last.

** Options with () contain the quantity of the options specified in brackets. For all options where the number automatically corresponds to the number of active slides, no quantity is specified.

*** Total length = Profile length + 2x end plate The only lengths available as the profile length for this axis type - due to the magnet - are xx05, xx20 or xx80mm. The profile length is made up of the useful stroke, the total of the slide lengths and the safety reserve typical for the axis (14 mm) and is extended to the next technically feasible length by Schunk project engineers (wipers and shock absorbers are also taken into account). The Schunk useful stroke specification may slightly exceed the required useful stroke due to the permissible profile length. The total length is supplemented.



1. Safety reserve
2. Slide length
3. Stroke
4. Supplement to permissible profile length
5. Useful stroke
6. Profile length

Scope of delivery includes

3-phase, electronically commutated AC synchronous linear motor with primary and secondary part, measuring system, profile guide with guide rollers, slide, profile end plates and with or without Hall sensor depending on the drive concept. Please specify other options when ordering.