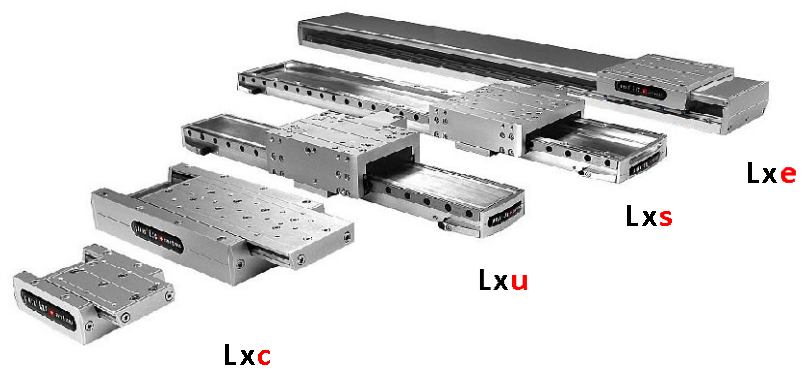


Data Sheet LINAX®

Edition October 2014

LINAX® Linear Motor Axes 4 Types



Lxc, c = compact
Lxu, u = universal
Lxs, s = shuttle
Lxe, e = exclusive

Highlights

Compact dimensions, high precision

Positioning accuracy optical $\pm 2 \mu\text{m}$,
resolution $1 \mu\text{m}$ or $\pm 500\text{nm}$,
resolution 100nm

Positioning accuracy magnetic $\pm 8 \mu\text{m}$,
resolution $1 \mu\text{m}$ (for Lxu and Lxs only)

Modular system with strokes from
44-1600mm

Peak forces from 24N – 180N

High cycle rates with velocities up to
4m/s due to the linear motor

Force Control, Force Limitation Force
Monitoring with XENAX® Servo Controller

Overview

The construction of the very compact LINAX® Lxc (compact) types is based on the patented mono-bloc design. The linear motor coils are located in the mono-bloc and the magnets and the glass scale are on the slider. The magnets are moving while the coils remain stationary. No moving cables and cable chains result which translates into longer life span.



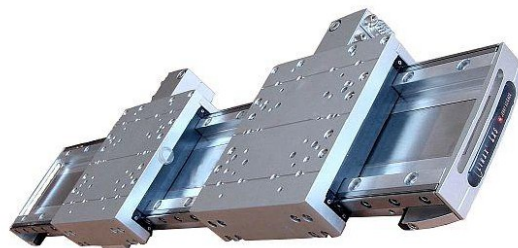
LINAX® Lxc 44F08 with Weight compensation

The Lxu (universal) types are real „all-rounders“. There are three mounting possibilities: mounting to the slider, to the ground plate or to the front face. Also interesting are the four long holes through the carriage slider. This allows for the direct back to back mounting of two Lxu sliders.



LINAX® Lxu xxF60 with four screws directly through the carriage slider

As the name implies, the Lxs (shuttle) types are the basis axes for long strokes. Of particular importance is the wide body construction with recessed linear motor, with which the height is reduced to just 38mm. the widely spaced guiding rails are able to withstand high moments of force.



LINAX® Lxs xxF60, with multiple carriage slider for highly integrated machine concepts

The LINAX® Lxe (**exclusive**) models have a special cover that is passed through the carriage slider of the linear motor. The result is a flat and elegant geometry for easy cleaning. This Lxe series is predestined for medical and clean room applications.



LINAX® Lxe xxF40, mit Schutzabdeckung

With the linear motor components from Jenny Science you can build your machines more compact, lighter and more efficient!

The result: Less space requirement, higher productivity and less energy consumption.

Alois Jenny
Jenny Science AG

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1 Code for LINAX® Types

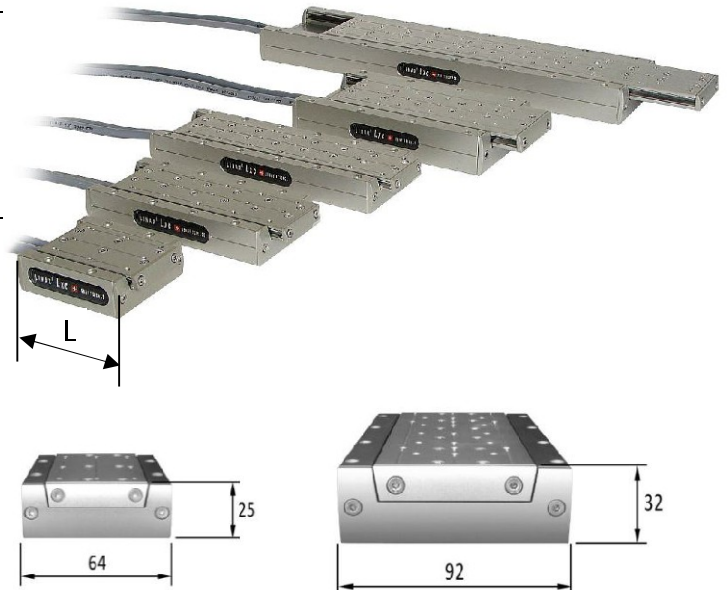
Lxc 85F10

Lx	c	85	10
Lx = LINAX®	c = compact u = universal s = shuttle e = exclusive	85 = 85mm max. net stroke	10 = 10N Nominal force 100% duty cycle

2 LINAX® Lxc F08/F10/F40

2.1 External Dimensions LINAX® Lxc

LINAX®	L [mm]
Lxc 44F08	78
Lxc 85F10	85
Lxc 135F10	135
Lxc 230F10	230
<hr/>	
Lxc 80F40	80
Lxc 176F40	176
Lxc 272F40	272



Lxc absolute zero point after REFERENCE:
Slider positioned in direction of cables

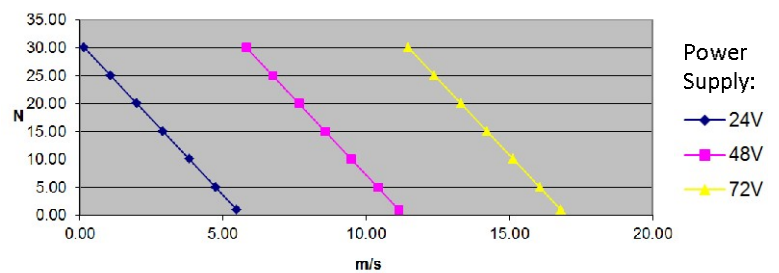


2.2 Dynamics LINAX® Lxc

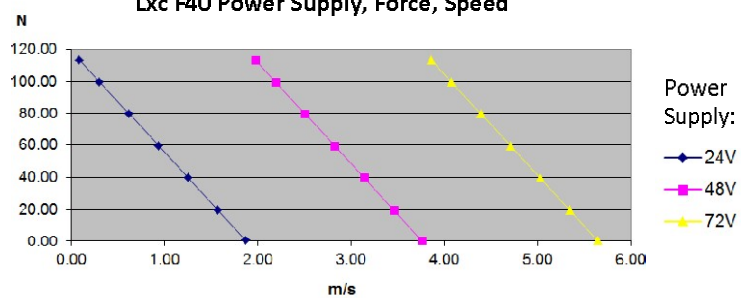
LINAX®	Stroke [mm]	Force [N] nom./peak	Speed v-max [m/s]	Acceleration a-max [m/s ²]	Min. travel time stroke [ms]	Weight Slider [g]	Weight Total [g]
Lxc 44F08	44	8/24	2.0	120	40	130	350
Lxc 85F10	85	10/30	2.5	85	70	230	650
Lxc 135F10	135	10/30	2.8	60	95	320	880
Lxc 230F10	230	10/30	3.2	45	145	450	1200
Lxc 80F40	80	40/114	2.0	100	60	520	1470
Lxc 176F40	176	40/114	2.5	90	100	750	2150
Lxc 272F40	272	40/114	2.8	75	140	1050	2800

2.2.1 Power Supply, Speed Lxc

Lxc F10 Power Supply, Force, Speed



Lxc F40 Power Supply, Force, Speed



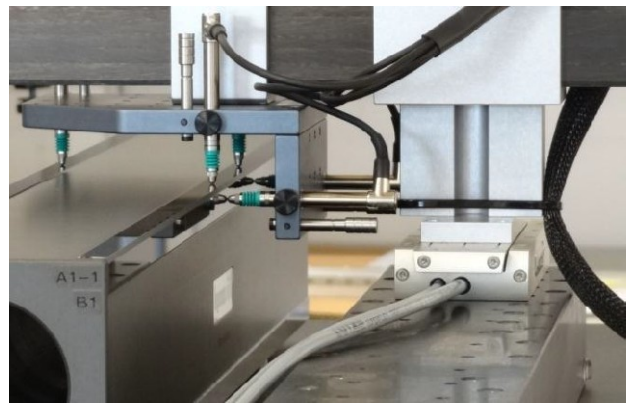
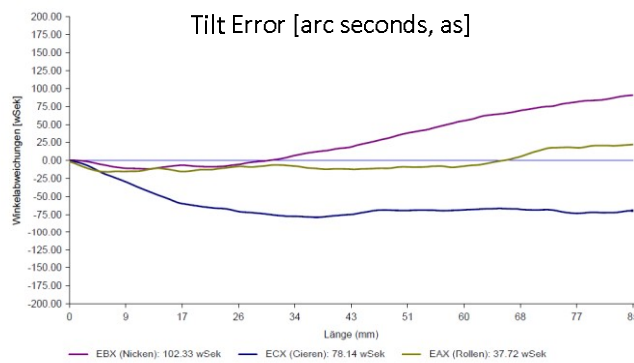
2.3 Precision LINAX® Lxc

2.3.1 Positioning Lxc

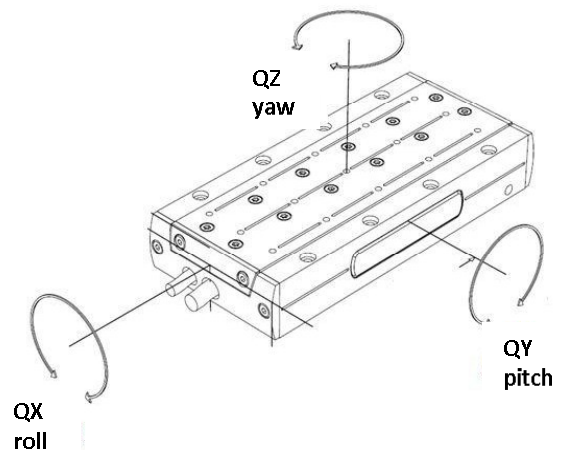
Standard resolution of optical measuring scale	1µm / counter increment
Accuracy	< +/-2µm
Optional optical measuring scale with high resolution	100nm / counter increment
Accuracy	< +/-500nm
Reference	Automatic calculation of the absolute position through the distance coded reference marks, max 10mm, direction of reference can be selected. The reference has to be completed only once after powering on the logic power (24V). The absolute position will be stored until the logic power is turned off (XENAX® Servo ctrl).
Mechanical zero point absolute	It is located 1.5mm before the mechanical limit. This is where the slider is positioned on the right end while the cable case is in the front of the user.

2.3.2 Guidings of Slider Lxc

Cross roller bearings are used for the LINAX® Lxc linear motor axes. The cross roller bearings are installed in cages and are equipped with forced centering. This construction is very robust and reliable (>50Mio cycles). The LINAX® Lxc linear motor axes have the following tolerances. These data is based on measures with linear motors free of load.

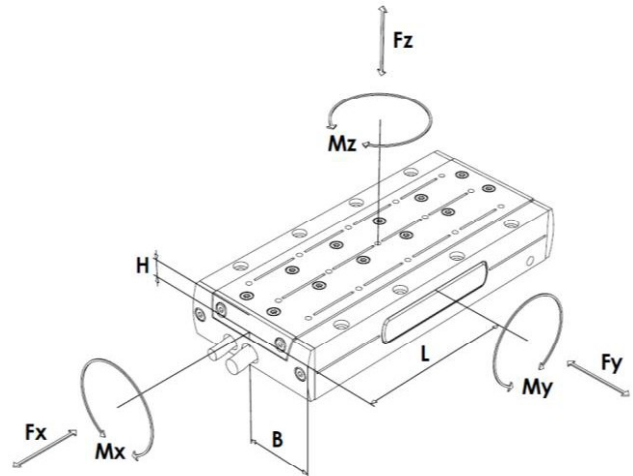


LINAX®	Running Accuracy horizontal EYX	Running Accuracy vertical EZX	Tilt Error QX (roll)	Tilt Error QY (pitch)	Tilt Error QZ (yaw)	Tolerance Constr. height
Lxc 44F08	±7µm	±7µm	±50as	±150as	±130as	±0,1mm
Lxc 85F10	±10µm	±10µm	±60as	±160as	±150as	±0,1mm
Lxc 135F10	±14µm	±14µm	±70as	±180as	±160as	±0,1mm
Lxc 230F10	±22µm	±22µm	±90as	±220as	±190as	±0,1mm
Lxc 80F40	±10µm	±10µm	±60as	±160as	±150as	±0,1mm
Lxc 176F40	±16µm	±16µm	±80as	±200as	±170as	±0,1mm
Lxc 272F40	±25µm	±25µm	±100as	±240as	±210as	±0,1mm



2.4 Stress Values of Guides Lxc

LINAX®	Mx max [Nm]	Fy max [N] Fz max [N]	My max [Nm] Mz max [Nm]
Lxc 44F08	17	787	11
Lxc 85F10	37	1722	43
Lxc 135F10	47	2181	66
Lxc 230F10	49	2296	95
Lxc 80F40	129	4080	133
Lxc 176F40	165	5236	230
Lxc 272F40	186	5916	328



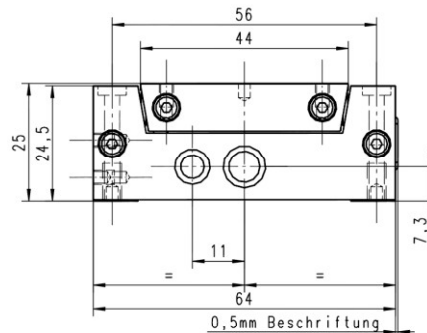
Besides adhering to the individual maximal loads, the following equation must comply if there are multiple forces and moments acting simultaneously on the linear motor:

$$\frac{|F_y|}{F_{y \max}} + \frac{|F_z|}{F_{z \max}} + \frac{|M_x|}{M_{x \max}} + \frac{|M_y|}{M_{y \max}} + \frac{|M_z|}{M_{z \max}} \leq 1$$

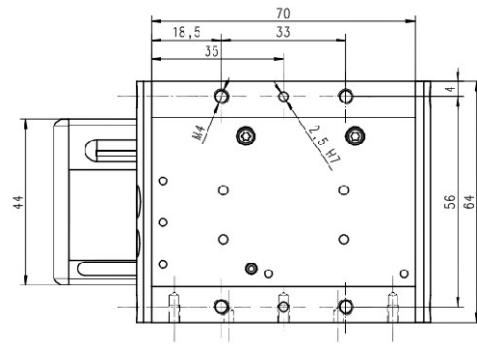
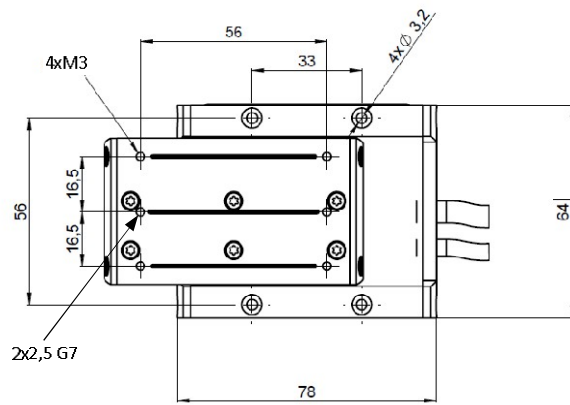
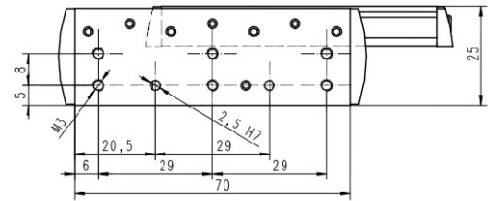
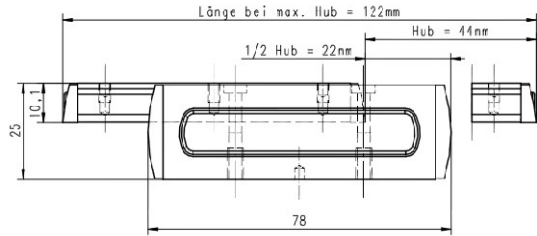
2.5 Dimensions Lxc F08/10

CAD STEP Data from www.jennyscience.ch

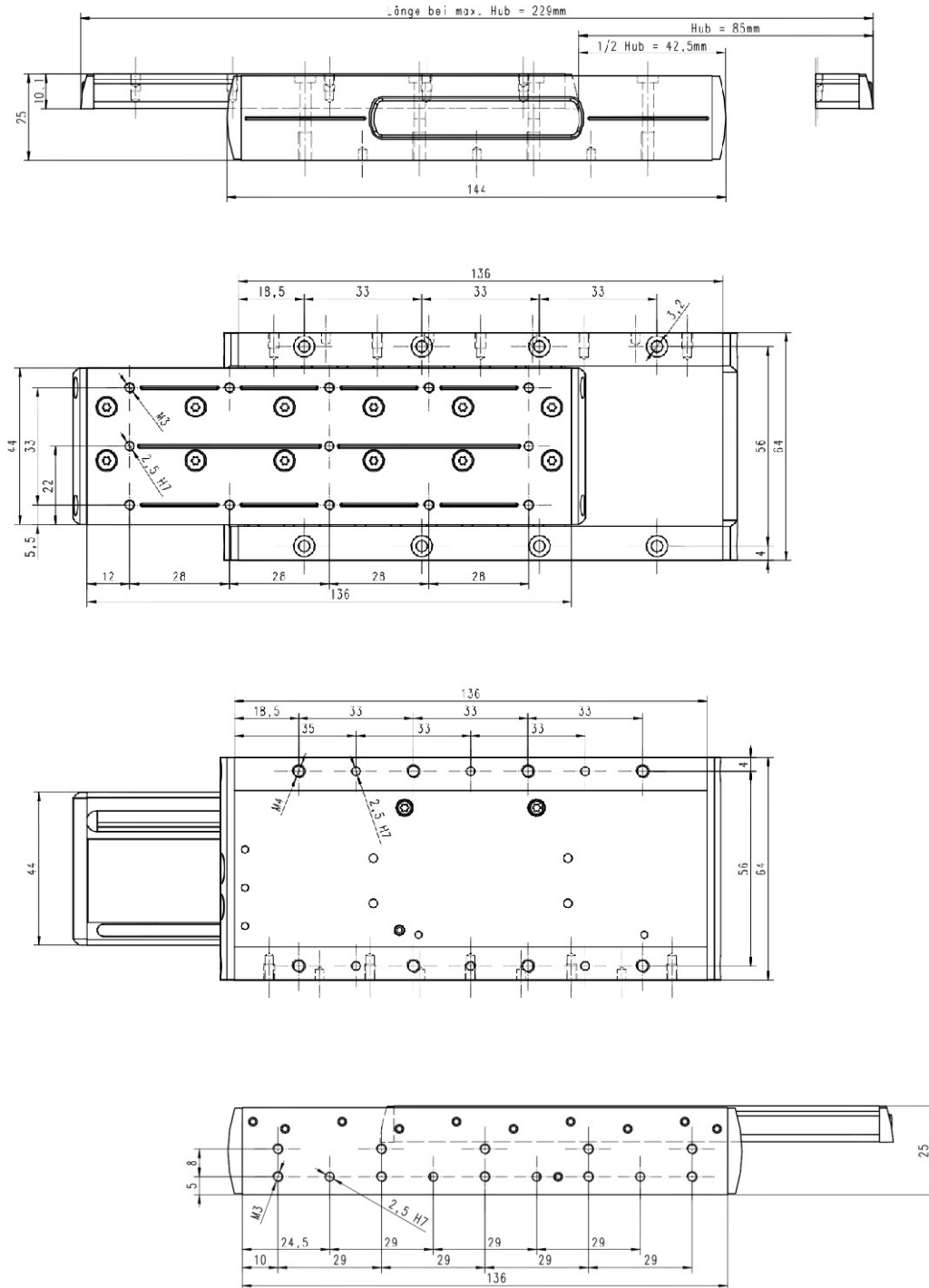
2.5.1 Cross Section Lxc F08/F10



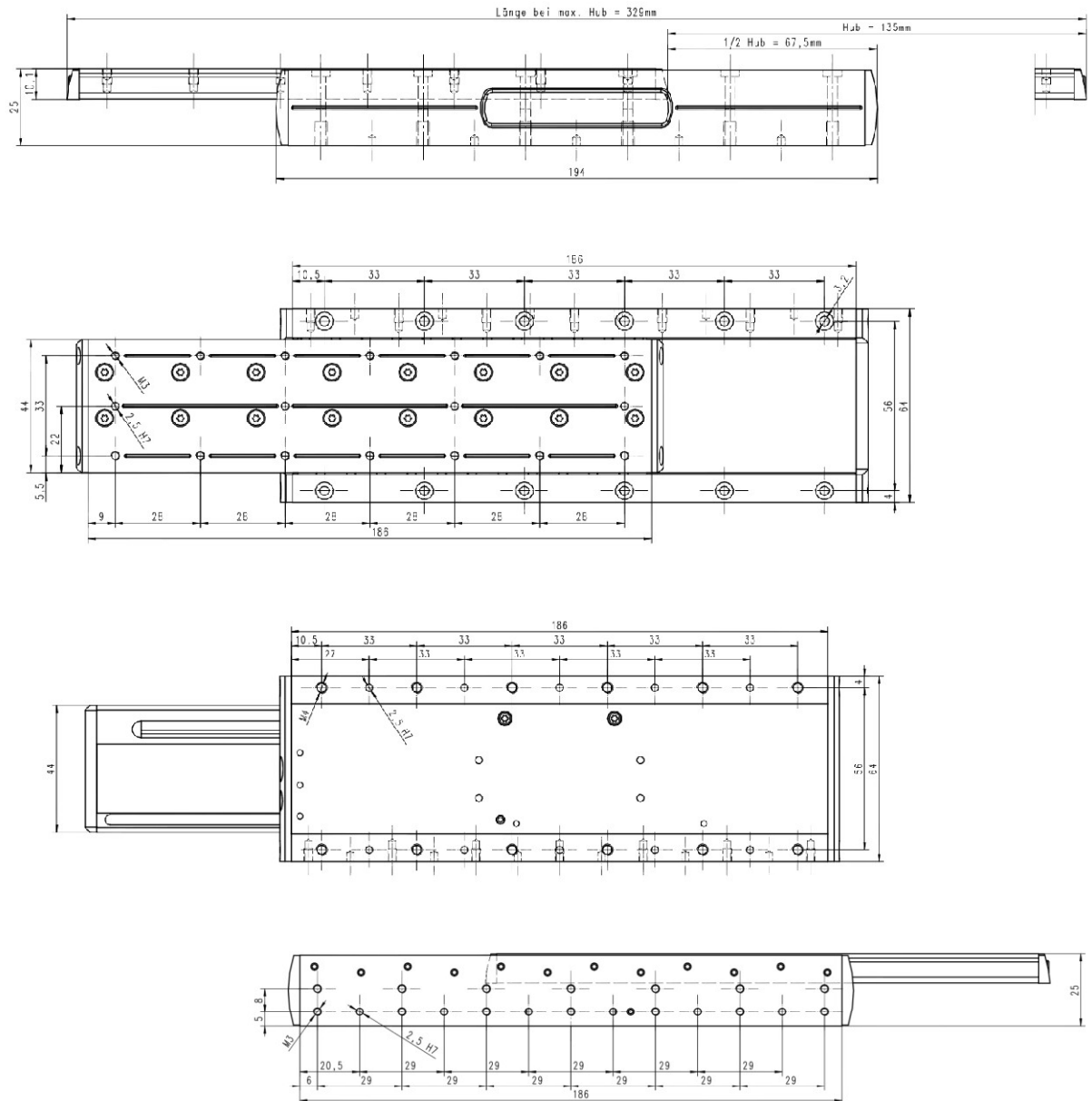
2.5.2 Installation Dimensions LINAX® Lxc 44F08



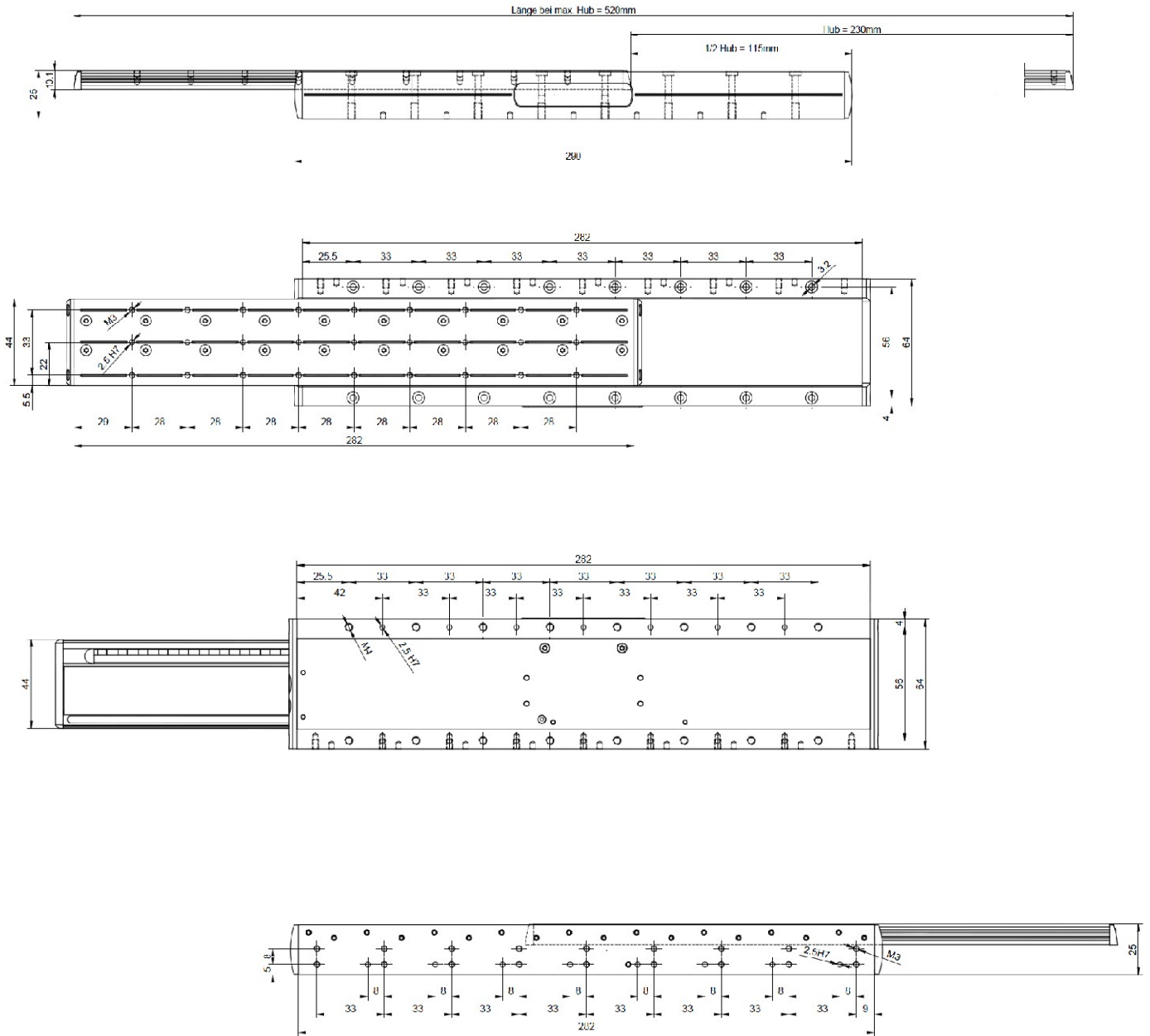
2.5.3 Installation Dimensions LINAX® Lxc 85F10



2.5.4 Installation Dimensions LINAX® Lxc 135F10

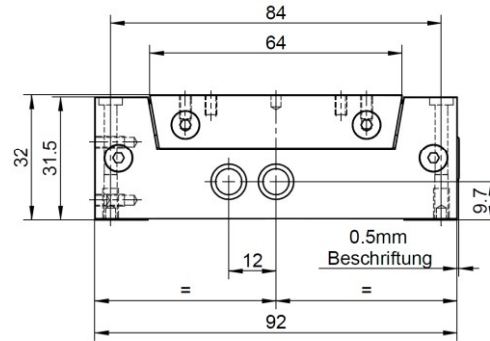


2.5.5 Installation Dimensions LINAX® Lxc 230F10

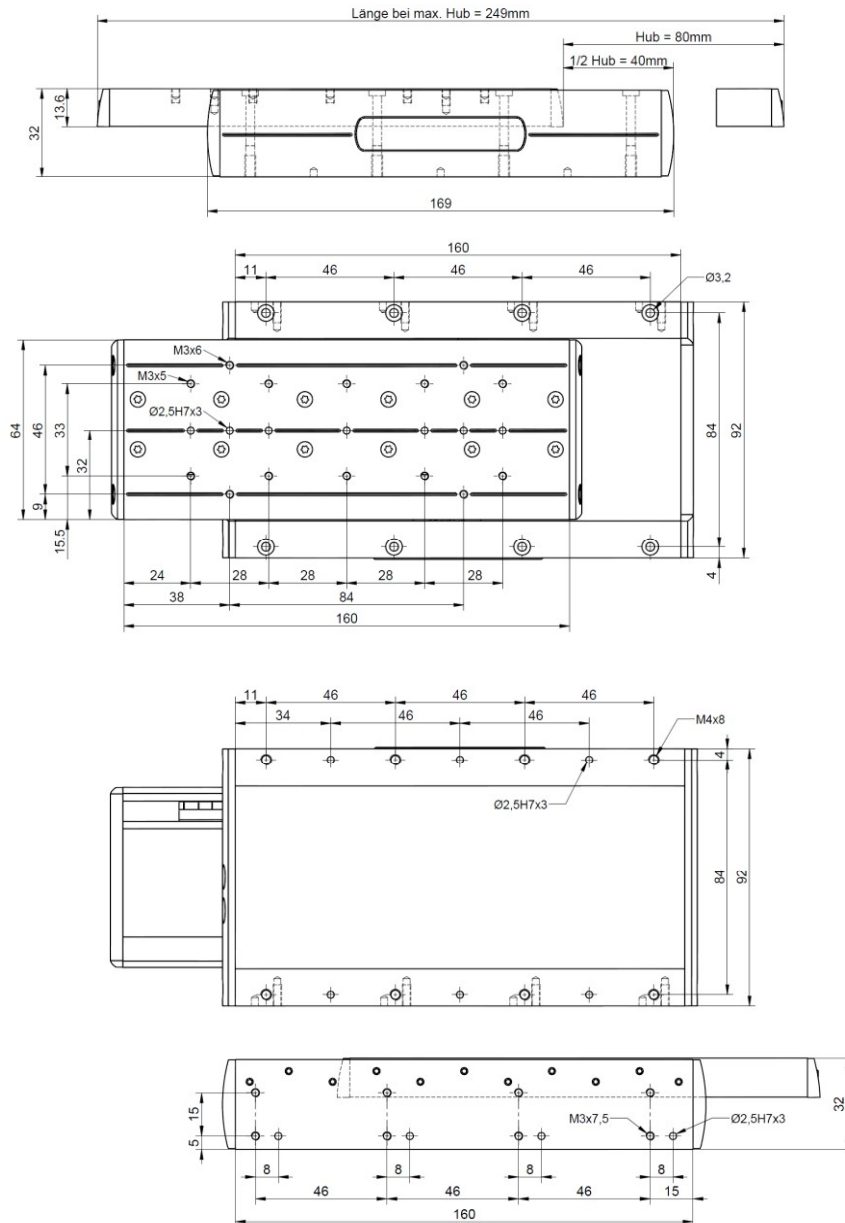


2.6 Dimensions Lxc F40

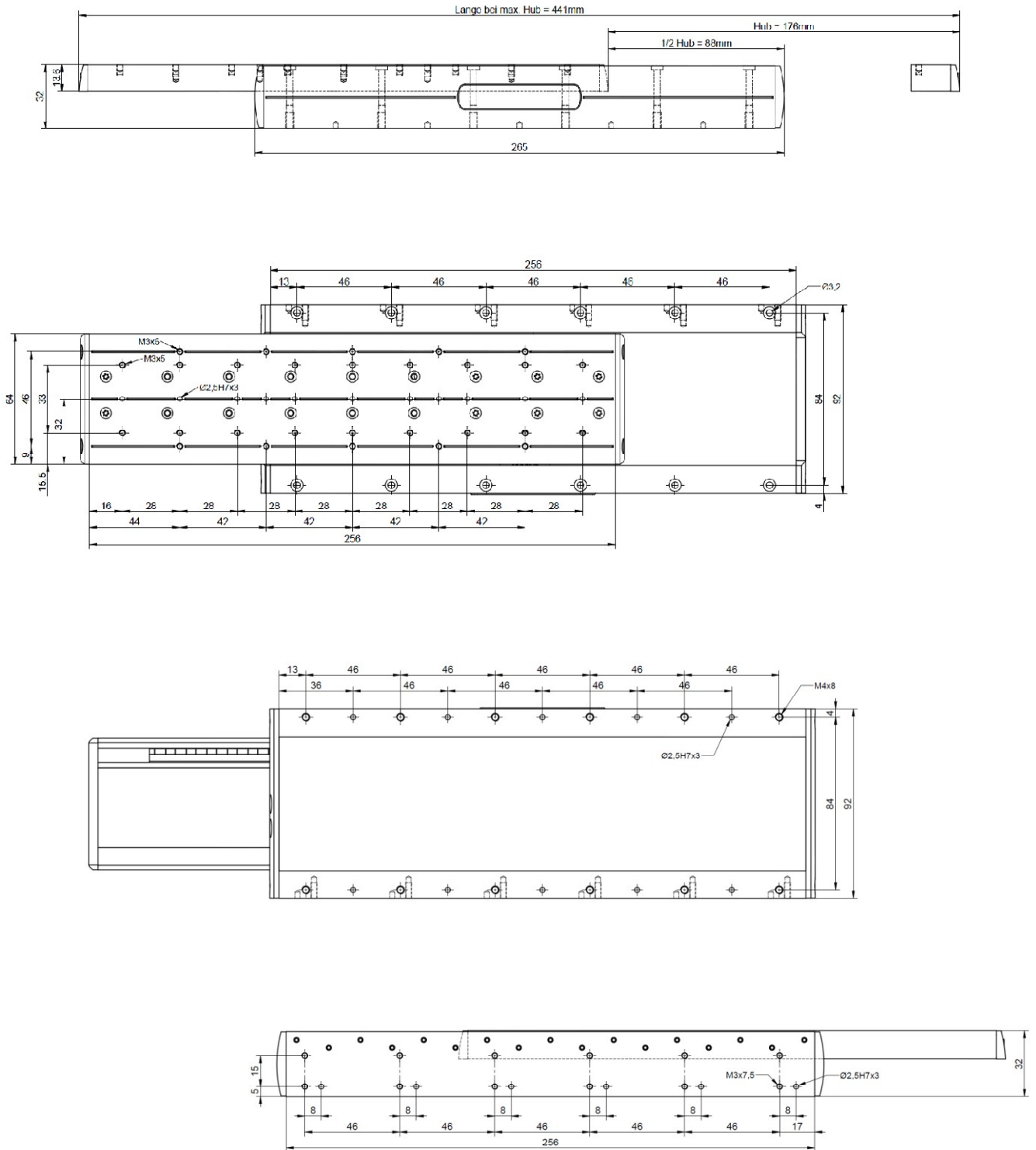
2.6.1 Cross Section Lxc F40



2.6.2 Installation Dimensions LINAX® Lxc 80F40



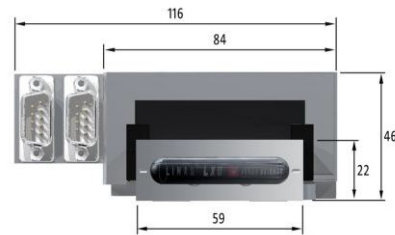
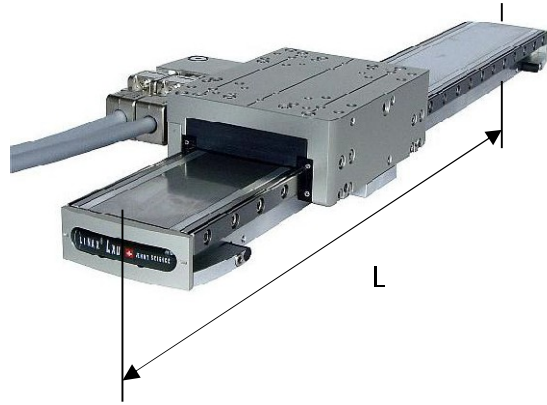
2.6.3 Installation Dimensions LINAX® Lxc 176F40



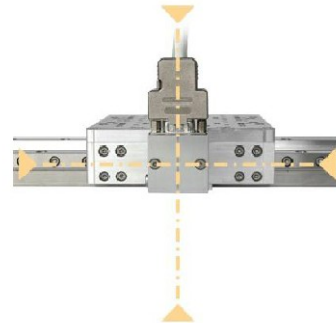
3 LINAX® Lxu F60

3.1 External Dimensions LINAX® Lxu F60

LINAX®	L [mm]	Stroke [mm]
Lxu 40F60	170	40
Lxu 80F60	210	80
Lxu 160F60	290	160
Lxu 240F60	370	240
Lxu 320F60	450	320



Lxs und Lxu
 Rotary connector case in 90° pattern. Default
 cable connector directed to the right.



Lxu absolute zero point after REFERENCE:
 Slider directed to right with sight on cable
 connector case



3.2 Dynamics LINAX® Lxu

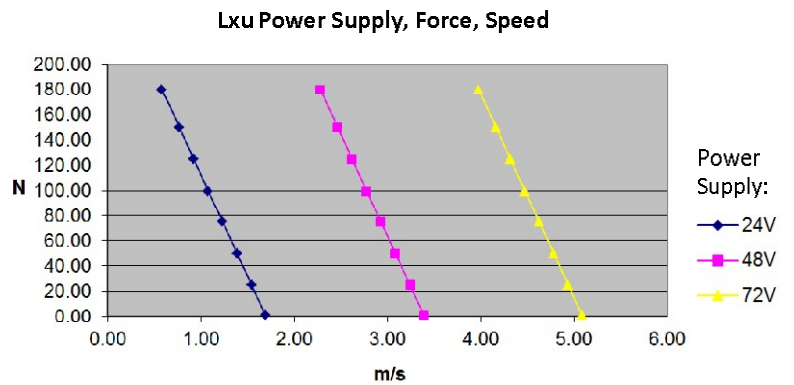
3.2.1 Slider in Motion

LINAX®	Stroke [mm]	Force [N] nom./peak	Speed v-max [m/s]	Acceleration a-max [m/s ²]	Min. travel time stroke [ms]	Weight Slider [g]	Weight Total [g]
Lxu 40F60	40	60/180	2.0	120	40	950	1700
Lxu 80F60	80	60/180	2.5	120	55	950	1900
Lxu 160F60	160	60/180	3.0	120	80	950	2200
Lxu 240F60	240	60/180	3.5	120	100	950	2600
Lxu 320F60	320	60/180	3.8	120	115	950	2900

3.2.2 Ground Plate in Motion

LINAX®	Stroke [mm]	Force [N] nom./peak	Speed v-max [m/s]	Acceleration a-max [m/s ²]	Min. travel time stroke [ms]	Weight Slider [g]	Weight Total [g]
Lxu 40F60	40	60/180	2.0	160	35	750	1700
Lxu 80F60	80	60/180	2.5	120	55	950	1900
Lxu 160F60	160	60/180	3.0	100	85	1250	2200
Lxu 240F60	240	60/180	3.5	70	120	1650	2600
Lxu 320F60	320	60/180	3.8	65	145	1850	2900

3.2.3 Power Supply, Speed Lxu



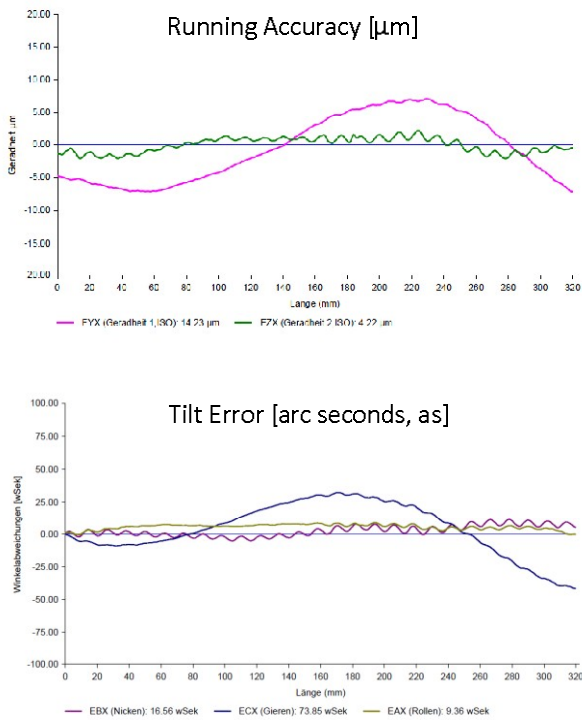
3.3 Precision LINAX® Lxu

3.3.1 Positioning Lxu

Standard magnetic measuring scale	1µm / counter increment
Accuracy magnetic	< +/-8µm
Optional optical measuring scale	1µm / counter increment
Accuracy optical	< +/-2µm
Optional optical measuring scale with high resolution	100nm / counter increment
Accuracy optical with 100nm	< +/-500nm
Reference	Automatic calculation of the absolute position through the distance coded reference marks, max 10mm, direction of reference can be selected. The reference has to be completed only once after powering on the logic power (24V). The absolute position will be stored until the logic power is turned off (XENAX® Servo ctrl).
Mechanical zero point	It is located 1.5mm before the mechanical limit. This is where the slider is positioned on the right end while the cable case is in the front of the user.

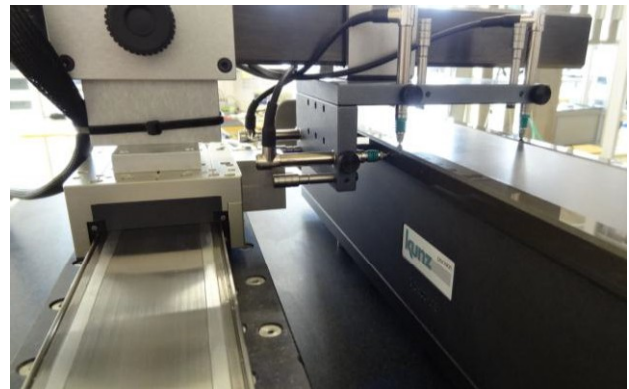
3.3.2 Guidings of Slider Lxu

Ball bearing guides are used for the LINAX® Lxu linear motors. This guiding system is maintenance free for 20'000km or five years as stated by the supplier. The LINAX® Lxu linear motor axes have following tolerances as a standard. These data is based on measures with linear motors free of load.



D:\jenny science\Lxu 320F60\Lxu 320F60 - 1 001 STR

RAIL-check



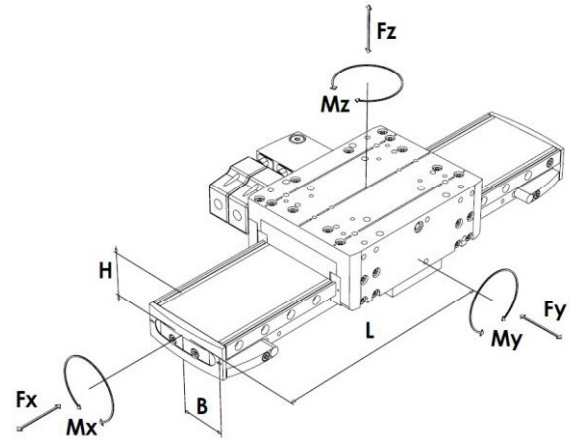
LINAX®	Running Accuracy horizontal EYX	Running Accuracy vertical EZX	Tilt Error QX (roll)	Tilt Error QY (pitch)	Tilt Error QZ (yaw)	Tolerance Constr. height
Lxu 40F60	±5µm	±4µm	±8as	±10as	±60as	±0,1mm
Lxu 80F60	±5µm	±4µm	±8as	±10as	±60as	±0,1mm
Lxu 160F60	±8µm	±5µm	±10as	±20as	±70as	±0,1mm
Lxu 240F60	±10µm	±5µm	±10as	±30as	±80as	±0,1mm
Lxu 320F60	±12µm	±6µm	±10as	±30as	±10as	±0,1mm

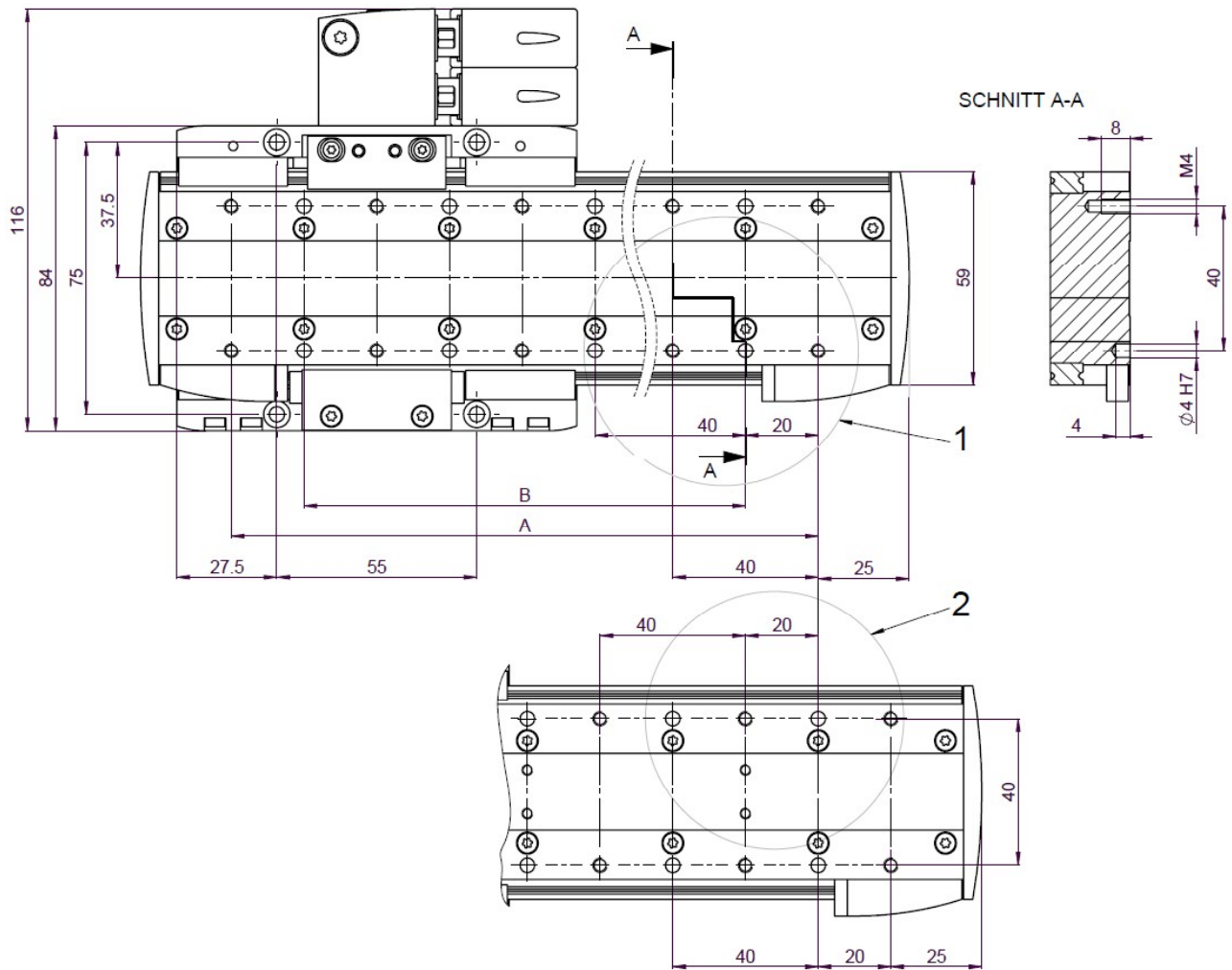
3.4 Stress Values of Guides Lxu

LINAX® Lxu	Mx max [Nm]	Fy max [N] Fz max [N]	My max [Nm] Mz max [Nm]
Lxu xxF60	149	5400	211

Besides adhering to the individual maximal loads, the following equation must comply if there are multiple forces and moments acting simultaneously on the linear motor:

$$\frac{|F_y|}{F_{y \max}} + \frac{|F_z|}{F_{z \max}} + \frac{|M_x|}{M_{x \max}} + \frac{|M_y|}{M_{y \max}} + \frac{|M_z|}{M_{z \max}} \leq 1$$



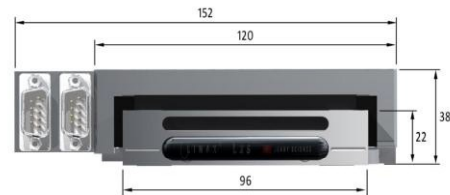
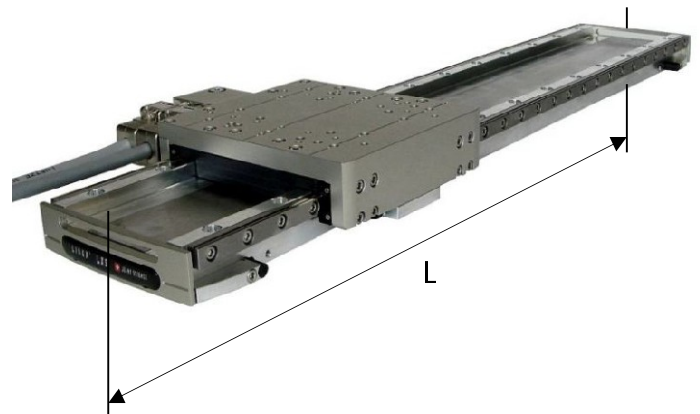


Type	Stroke[mm]	L[mm]	A[mm]	B[mm]	Hole Pattern
Lxu 40F60	40	170	80	40	2
Lxu 80F60	80	210	160	120	1
Lxu 160F60	160	290	240	200	1
Lxu 240F60	240	370	320	280	1
Lxu 320F60	320	450	400	360	1

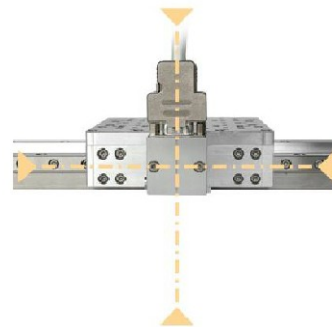
4 LINAX® Lxs F60

4.1 External Dimensions Lxs F60

LINAX®	L [mm]
Lxs 160F60	290
Lxs 200F60	330
Lxs 320F60	450
Lxs 400F60	530
Lxs 520F60	650
Lxs 600F60	730
Lxs 800F60	930
Lxs 1000F60	1130
Lxs 1200F60	1330
Lxs 1600F60	1730



Lxs und Lxu
Rotary connector case in 90° pattern. Default cable connector directed to the right.



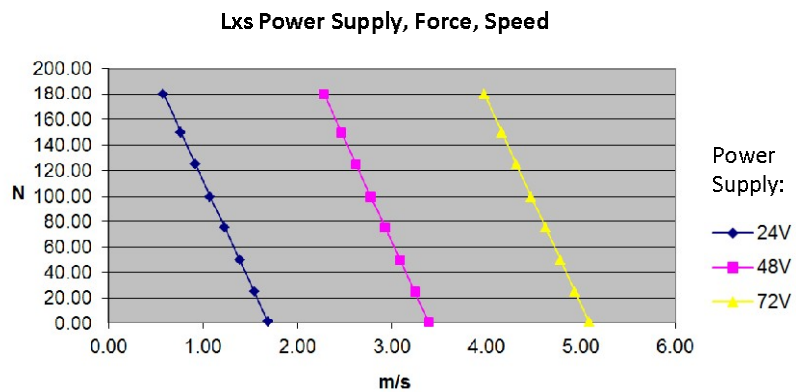
Lxs absolute zero point after REFERENCE:
Slider directed to right with sight on cable connector case



4.2 Dynamics LINAX® Lxs

LINAX®	Stroke [mm]	Force [N] nom./peak	Speed v-max [m/s]	Acceleration a-max [m/s ²]	Min. travel time stroke [ms]	Weight Slider [g]	Weight Total [g]
Lxs 160F60	160	60/180	3.0	120	80	1000	2600
Lxs 200F60	200	60/180	3.5	120	90	1000	2800
Lxs 320F60	320	60/180	3.8	120	120	1000	3450
Lxs 400F60	400	60/180	4.0	120	135	1000	3900
Lxs 520F60	520	60/180	4.0	120	165	1000	4500
Lxs 600F60	600	60/180	4.0	120	185	1000	5000
Lxs 800F60	800	60/180	4.0	120	235	1000	6100
Lxs 1000F60	1000	60/180	4.0	120	285	1000	7200
Lxs 1200F60	1200	60/180	4.0	120	335	1000	8400
Lxs 1600F60	1600	60/180	4.0	120	435	1000	10600

4.2.1 Power Supply, Speed Lxs



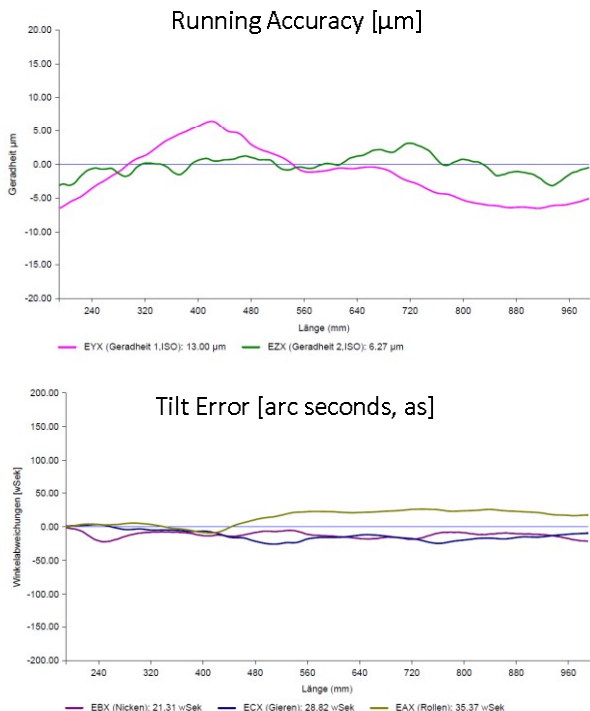
4.3 Precision LINAX® Lxs

4.3.1 Positioning Lxs

Standard magnetic measuring scale	1µm / counter increment
Accuracy magnetic	< +/-8µm
Optional optical measuring scale	1µm / counter increment, <i>not available for Lxs 1600F60</i>
Accuracy optical	< +/-2µm
Optional optical measuring scale with high resolution	100nm / counter increment, <i>not available for Lxs 1600F60</i>
Accuracy optical with 100nm	< +/-500nm
Reference	Automatic calculation of the absolute position through the distance coded reference marks, max 10mm, direction of reference can be selected. The reference has to be completed only once after powering on the logic power (24V). The absolute position will be stored until the logic power is turned off (XENAX® Servo ctrl).
Mechanical zero point	It is 1.5mm before the mechanical limit. This is where the slider is positioned on the right end while the cable case is in the front of the user.

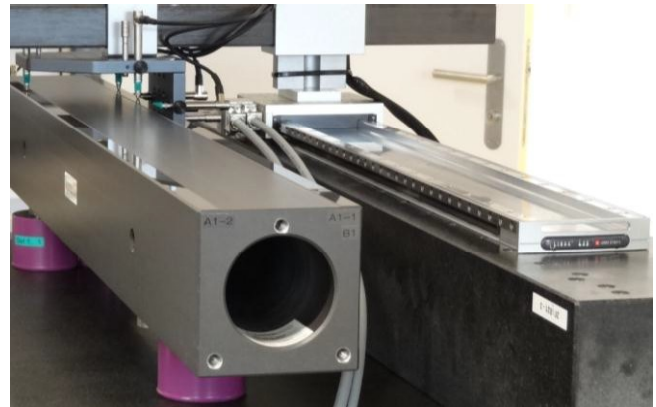
4.3.2 Guidings of Slider Lxs

For the LINAX® Lxs linear motor axis, ball bearing guides are used. This guiding system is maintenance free for 20'000km or five years as stated by the supplier. The LINAX® Lxs linear motor axes have following tolerances as a standard. These data is based on measures with linear motors free of load.



D|jenny science/Lxs 1000F60/Lxs 1000F60 - 1 003 STR

RAIL-check



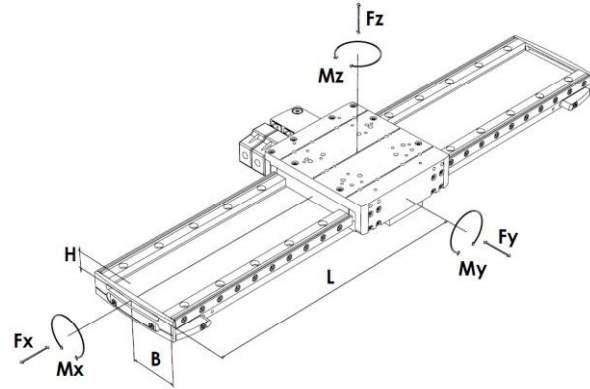
LINAX®	Running Accuracy horizontal EYX	Running Accuracy vertical EZX	Tilt Error QX (roll)	Tilt Error QY (pitch)	Tilt Error QZ (yaw)	Tolerance Constr. height
Lxs 160F60	±5µm	±3µm	±5as	±10as	±10as	±0,1mm
Lxs 200F60	±5µm	±3µm	±5as	±10as	±10as	±0,1mm
Lxs 320F60	±8µm	±4µm	±15as	±20as	±15as	±0,1mm
Lxs 400F60	±10µm	±4µm	±15as	±25as	±15as	±0,1mm
Lxs 520F60	±10µm	±4µm	±20as	±25as	±20as	±0,1mm
Lxs 600F60	±10µm	±5µm	±25as	±25as	±20as	±0,1mm
Lxs 800F60	±10µm	±7µm	±30as	±25as	±25as	±0,1mm
Lxs 1000F60	±12µm	±8µm	±30as	±20as	±25as	±0,1mm
Lxs 1200F60	±13µm	±9µm	±30as	±20as	±25as	±0,1mm
Lxs 1600F60	±16µm	±12µm	±35as	±25as	±30as	±0,1mm

4.4 Stress Values of Guides Lxs

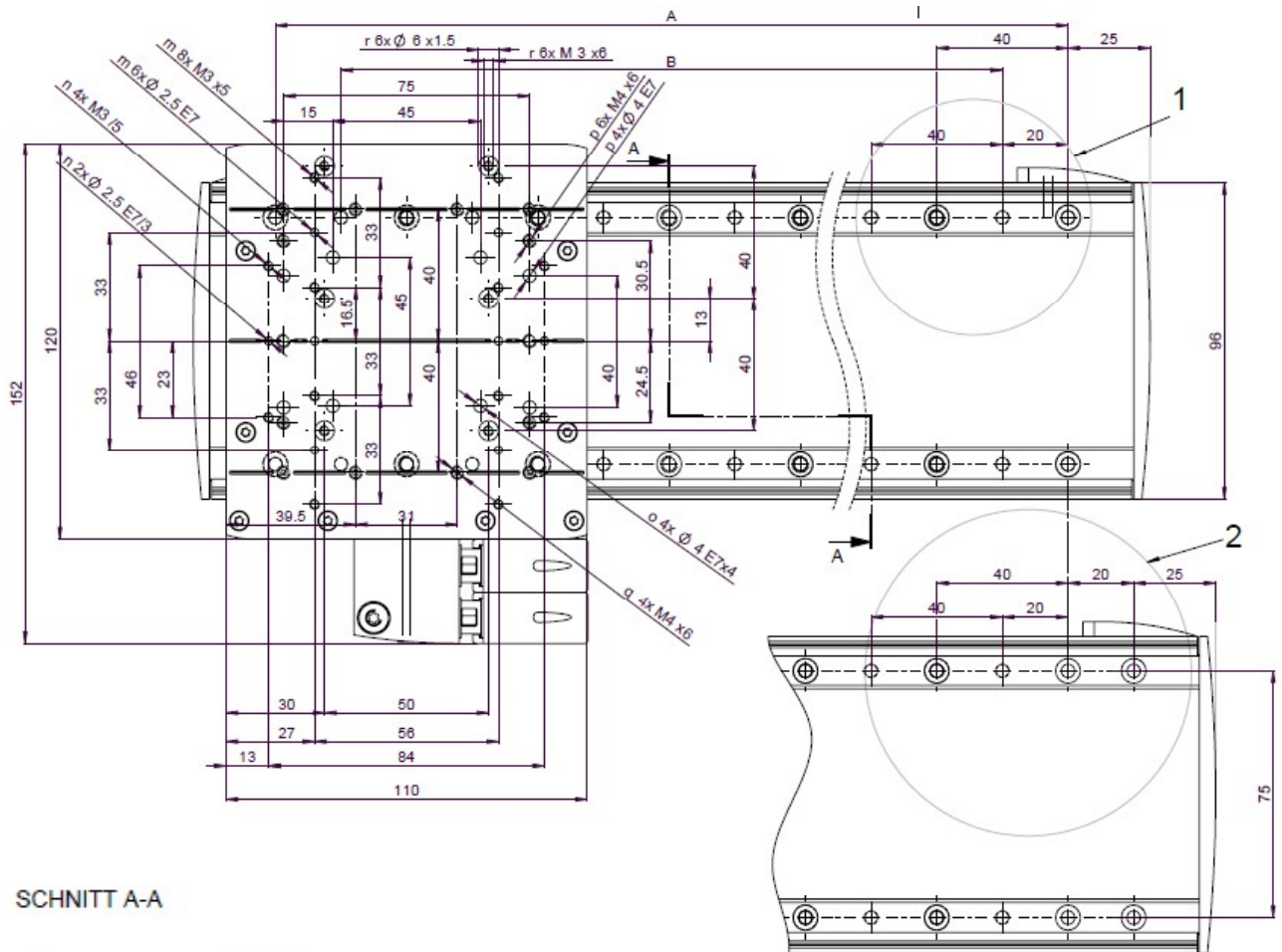
LINAX® Lxs	Mx max [Nm]	Fy max [N] Fz max [N]	My max [Nm] Mz max [Nm]
Lxs xxF60	243	5400	211

Besides adhering to the individual maximal loads, the following equation must comply if there are multiple forces and moments acting simultaneously on the linear motor:

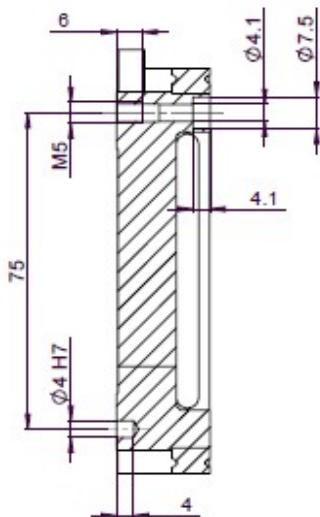
$$\frac{|F_y|}{F_{y \max}} + \frac{|F_z|}{F_{z \max}} + \frac{|M_x|}{M_{x \max}} + \frac{|M_y|}{M_{y \max}} + \frac{|M_z|}{M_{z \max}} \leq 1$$



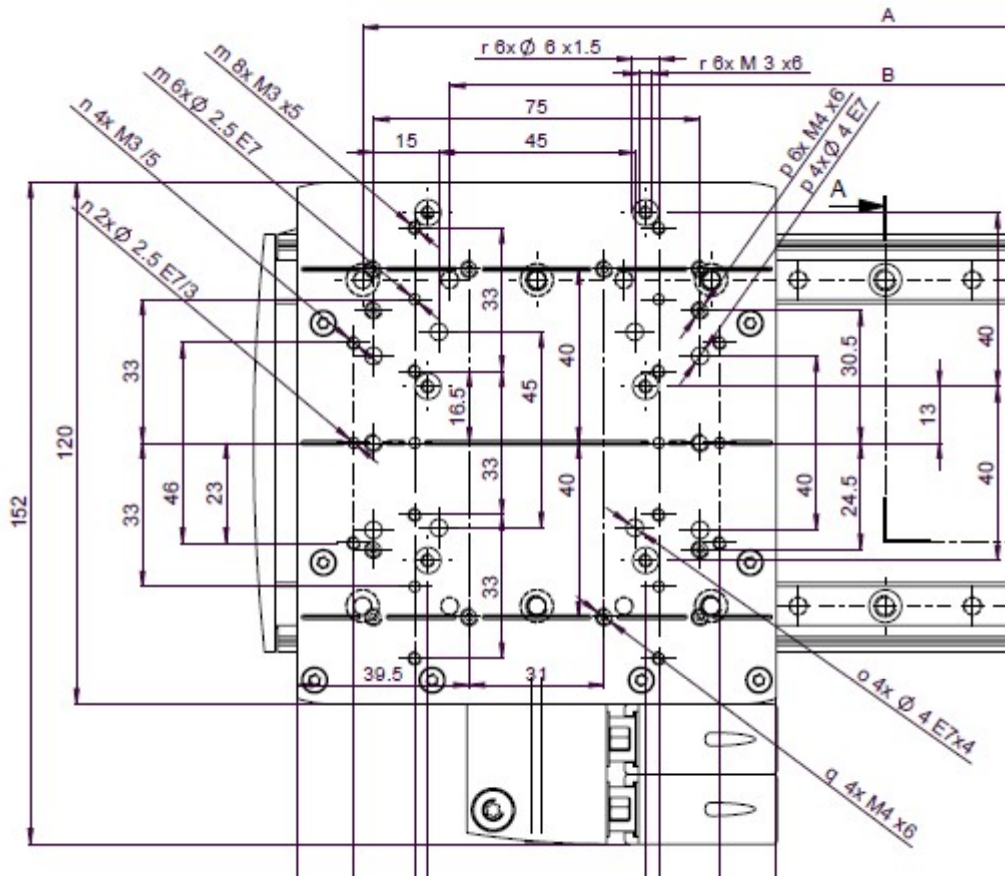
4.5 Installation Dimensions LINAX® Lxs 160 – Lxs 1600



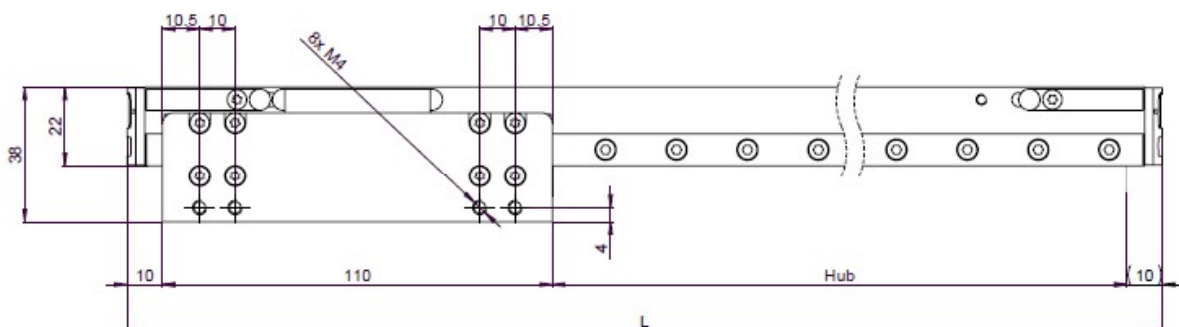
SCHNITT A-A



Type	Stroke[mm]	L[mm]	A[mm]	B[mm]	Hole Pattern
Lxs 160F60	160	290	240	200	1
Lxs 200F60	200	330	240	200	2
Lxs 320F60	320	450	400	360	1
Lxs 400F60	400	530	480	440	1
Lxs 520F60	520	650	560	520	2
Lxs 600F60	600	730	640	600	2
Lxs 800F60	800	930	880	840	1
Lxs 1000F60	1000	1130	1040	1000	2
Lxs 1200F60	1200	1330	1280	1240	1
Lxs 1600F60	1600	1730	1680	1640	1



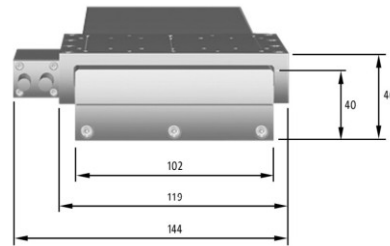
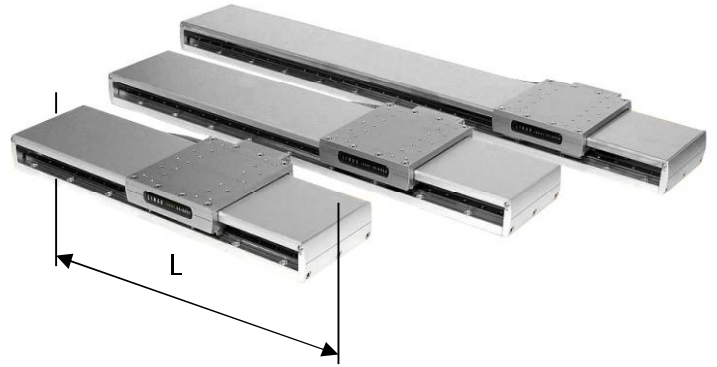
Screws	Threads & Centering Pins	Identification
For cross table with Lxc F08/F10 monobloc	M3 \varnothing 2,5E7	m
For cross table with Lxc F40 monobloc	M3 \varnothing 2,5E7	n
For cantilever with Lxu F60 slider (back to back)	M4 \varnothing 4E7	o
For cross table with Lxs F60 ground plate	M4 \varnothing 4E7	p
For application with front flange Lxu	M4	q
For cantilever with ELAX Ex F20	M3 & \varnothing 6E7	r



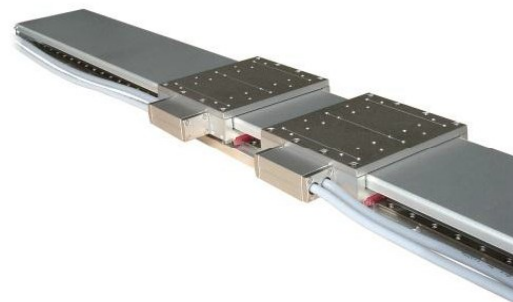
5 LINAX® Lxe F40

5.1 External Dimensions LINAX® Lxe F40

LINAX®	L [mm]
Lxe 250F40	386
Lxe 400F40	536
Lxe 550F40	686
Lxe 800F40	936
Lxe 1000F40	1136



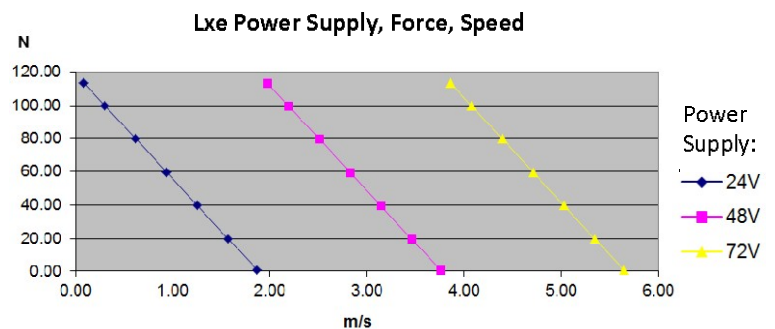
Lxe
Cable connector directed to left or to right.
Default cable connector directed to right.



5.2 Dynamics LINAX® Lxe

LINAX®	Stroke [mm]	Force [N] nom./peak	Speed v-max [m/s]	Acceleration a-max [m/s ²]	Min. travel time stroke [ms]	Weight Slider [g]	Weight Total [g]
Lxe 250F40	250	40/114	3.5	75	120	980	3080
Lxe 400F40	400	40/114	4.0	75	155	980	3850
Lxe 550F40	550	40/114	4.0	75	190	980	4620
Lxe 800F40	800	40/114	4.0	75	255	980	5900
Lxe 1000F40	1000	40/114	4.0	75	305	980	6930

5.2.1 Power Supply, Speed Lxe



5.3 Precision LINAX® Lxe

5.3.1 Positioning Lxe

Standard resolution of optical measuring scale	1µm / counter increment
Accuracy	< +/-2µm
Optional optical measuring scale with high resolution	100nm / counter increment
Accuracy	< +/-500nm
Reference	Automatic calculation of the absolute position through the distance coded reference marks, max 10mm, direction of reference can be selected. The reference has to be completed only once after powering on the logic power (24V). The absolute position will be stored until the logic power is turned off (XENAX® Servo ctrl).
Mechanical zero point absolute	1.5mm before the mechanical limit. This is where the slider is positioned on the right end while the cable case is in the front of the user.

5.3.2 Guidings of Slider Lxe

For the LINAX® Lxe linear motor axis, ball bearing guides are used. This guiding system is maintenance free for 20'000km or five years as stated by the supplier. The LINAX® Lxe linear motor axes have following tolerances as a standard. These data is based on measures with linear motors free of load.

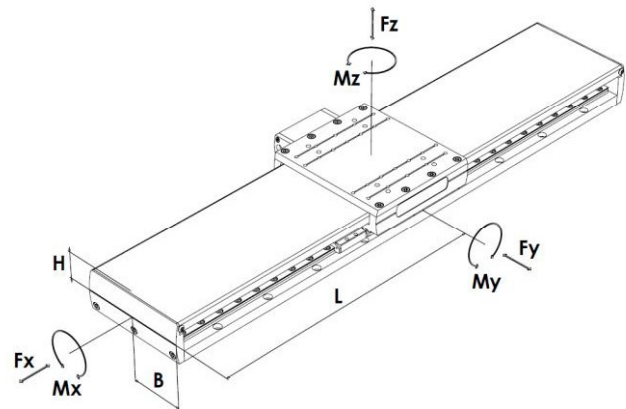
LINAX®	Running Accuracy horizontal EYX	Running Accuracy vertical EZX	Tilt Error QX (roll)	Tilt Error QY (pitch)	Tilt Error QZ (yaw)	Tolerance Constr. height
Lxe 250F40	±8µm	±5µm	±10as	±10as	±15as	±0,1mm
Lxe 400F40	±10µm	±8µm	±10as	±10as	±20as	±0,1mm
Lxe 550F40	±12µm	±8µm	±20as	±20as	±25as	±0,1mm
Lxe 800F40	±14µm	±10µm	±25as	±25as	±25as	±0,1mm
Lxe 1000F40	±16µm	±10µm	±25as	±25as	±30as	±0,1mm

5.4 Stress Values of Guides Lxe

LINAX® Lxe	Mx max [Nm]	Fy max [N] Fz max [N]	My max [Nm] Mz max [Nm]
Lxe xxF40	205	5400	194

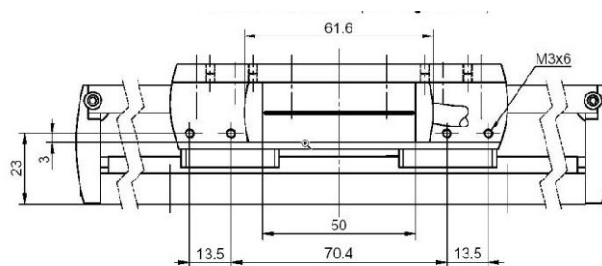
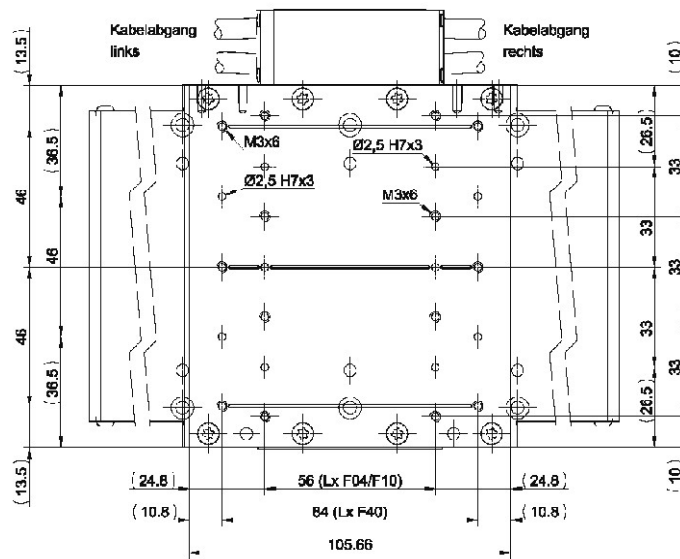
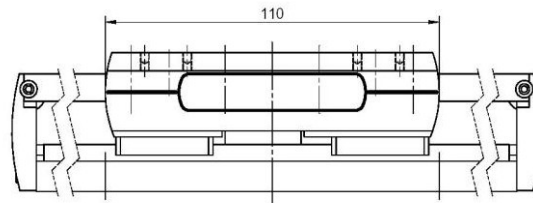
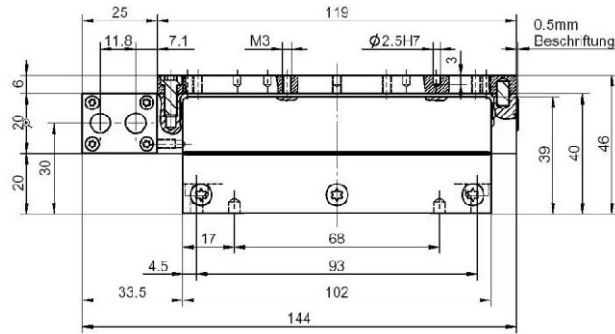
Besides adhering to the individual maximal loads, the following equation must comply if there are multiple forces and moments acting simultaneously on the linear motor:

$$\frac{|Fy|}{Fy \max} + \frac{|Fz|}{Fz \max} + \frac{|Mx|}{Mx \max} + \frac{|My|}{My \max} + \frac{|Mz|}{Mz \max} \leq 1$$

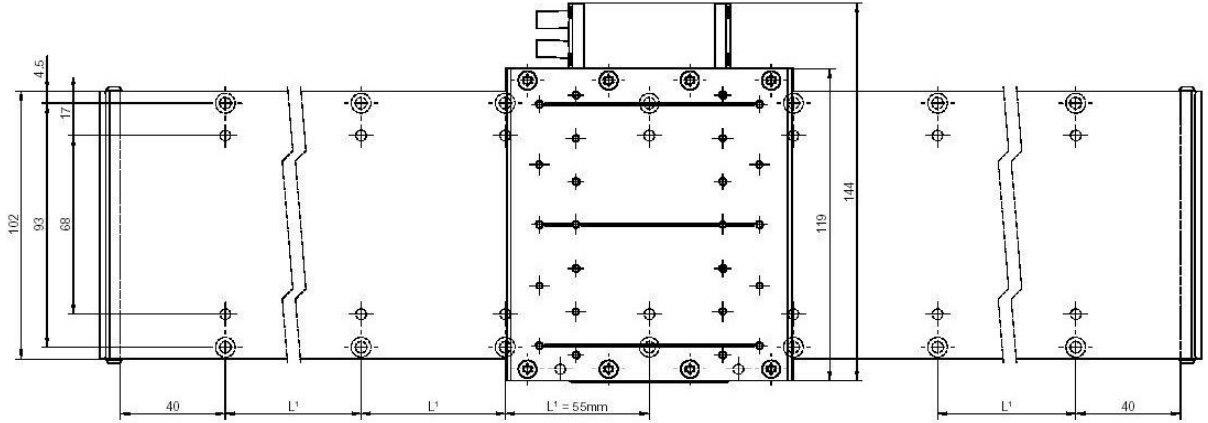


5.5 Dimensions LINAX® Lxe

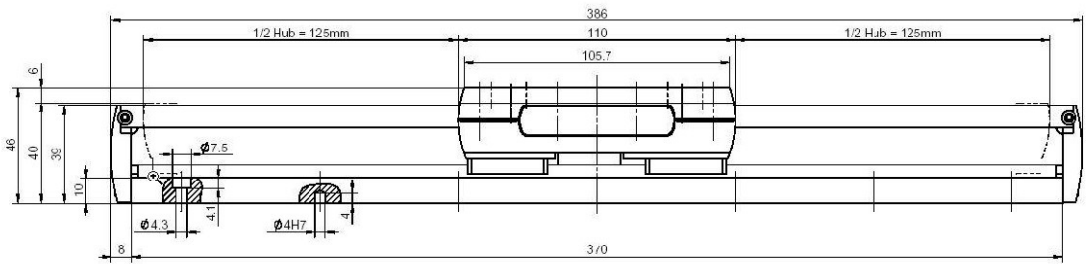
5.5.1 Slider LINAX® Lxe



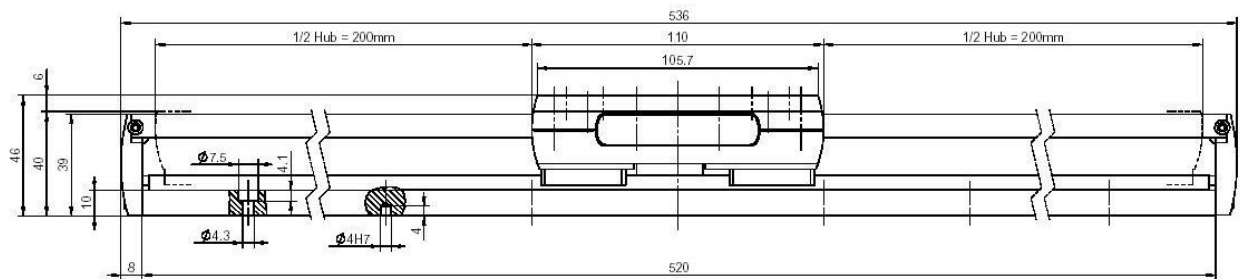
5.5.2 Ground Plates Holes LINAX® Lxe



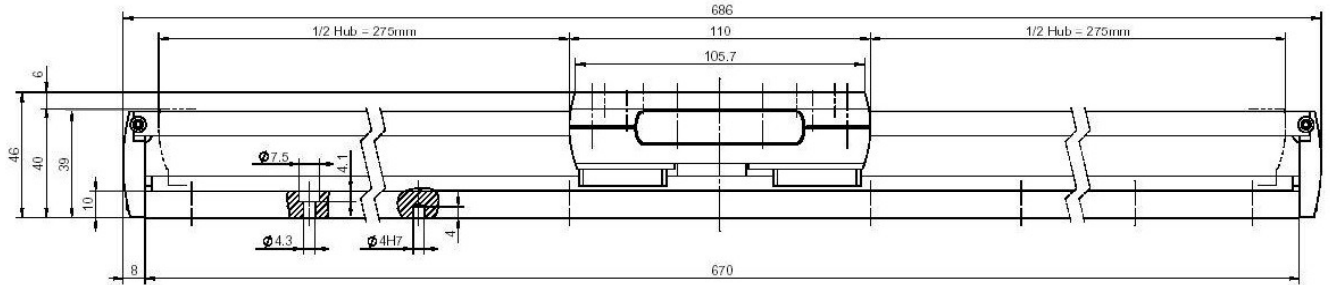
5.5.3 Installation Dimensions LINAX® Lxe 250F40



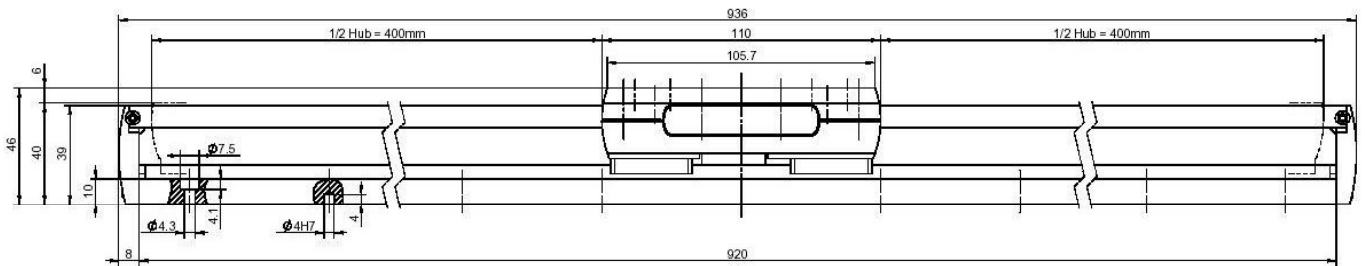
5.5.4 Installation Dimensions LINAX® Lxe 400F40



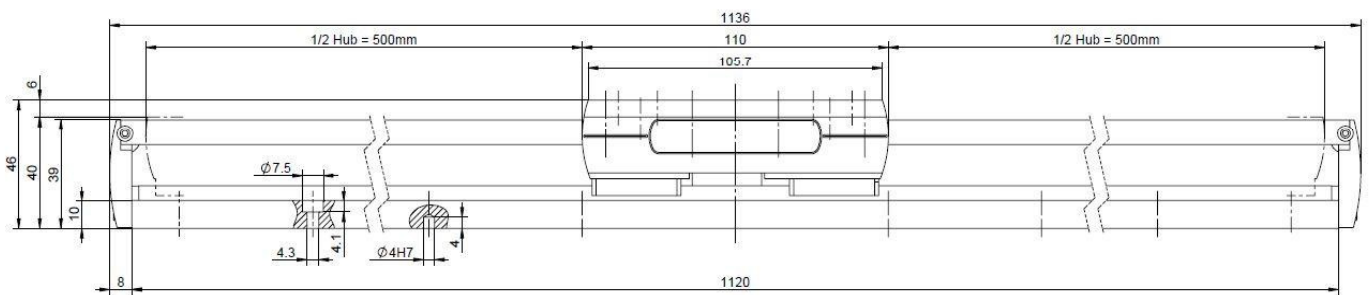
5.5.5 Installation Dimensions LINAX® Lxe 550F40



5.5.6 Installation Dimensions LINAX® Lxe 800F40



5.5.7 Installation Dimensions LINAX® Lxe 1000F40



6 Weight Compensation

In case of power interruption the motor of the LINAX® linear motors becomes powerless. If the axis is mounted vertically, the slider falls downwards. The optional available weight compensation can prevent this. If the XENAX® Xvi Servo Controller is connected and the logic power remains under power (e.g. emergency stop) the coils are shorted. The linear motor which acts as generator brakes the drive. The weight compensation will avoid that the slider is moving constantly downwards.

When compared to a simple brake, a further great advantage of the weight compensation is the relief of the vertical linear motor. With the weight compensation the motor operates weightlessly and heats much less. This savings in energy can be re-used for higher dynamics.

6.1 Weight Compensation STEP CAD Data

CAD drawings can be downloaded as .STEP files from www.iennyscience.ch.

6.2 Weight Compensation Lxc 44F08

The weight compensation for the compact Lxc 44F08 linear motor axis is based on spring force. It can be equipped with 4 different springs for external payloads of **0-200g, 200-400g, 400-600g and 600-900g**.



6.3 Weight Compensation Lxc 85F10, Lxc 80F40, Lxc 176F40

The weight compensation is mounted on the right side and is based on air pressure while there is no air consumption. With a customary air pressure regulator e.g. Festo "LRMA-QS-4 Art. No. 153 495" the compensation force can be adjusted until the weight of the slider and the payload are fully compensated. If there is power interruption the slider remains in position or moves slowly upward depending on the adjustment of the air pressure regulator. The weight compensation for the Lxc 85F10 can also be mounted on the right side.



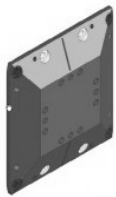
6.4 Weight Compensation

This weight compensation for the Lxu axis is also based on air pressure, while there is no air consumption. The air connection of weight compensation is located on the connector case to save room and to keep cables one-sided. With a customary air pressure regulator e.g. Festo "LRMA-QS-4 Art. No. 153 495" the compensation force can be adjusted until the slider holds position or moves upwards in case of power interruption.

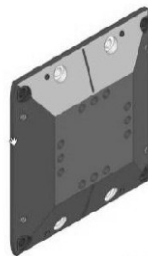


7 Front Flange Connections LINAX® Lxu

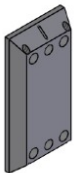
There can be mounted a further Lxu or a Lxc linear motor axis on the front of the LINAX® Lxu. If the front plate is removed, the front flange Lxu can be mounted with 4 screws and 2 centering pins. These front flanges can be rotated, mounted and centred in a 90° pattern (except from ELAX®).



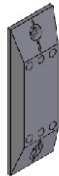
Lxu-Lxc F08/F10



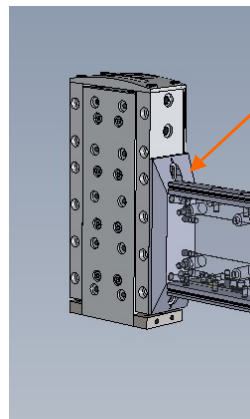
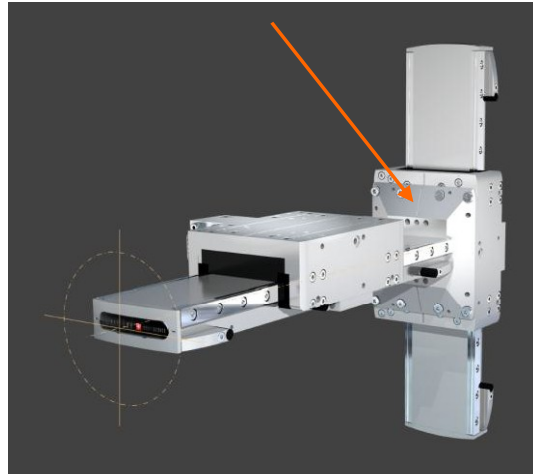
Lxu-Lxu
Lxu-Lxc F40



Lxu-Elax flat



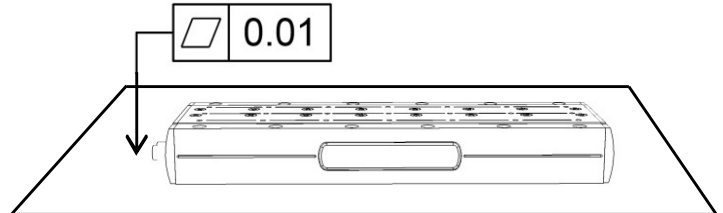
Lxu-Elax upright



8 Installation, Important Instructions

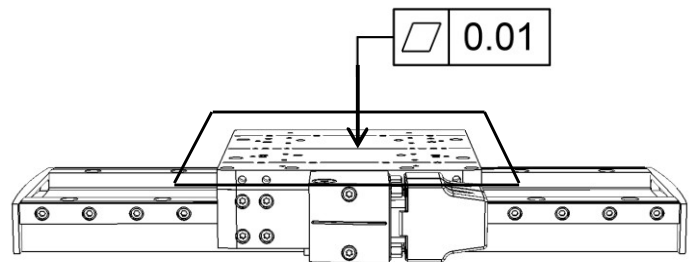
8.1 Straightness for Mounting on Ground Plate

If the LINAX® linear motor axes are mounted on a ground plate, it has to have a straightness of 0.01mm. If the straightness is out of this tolerance, the LINAX® linear motor axis can be distorted when screwed to the ground plate which might cause the guidings to seize. This increases the wear and tear, reduces the lifespan and might even destroy the guiding system.



8.2 Straightness for Mounting on Slider

These same conditions hold true for components that are mounted on the slider of the LINAX® linear motor axis. The contact surface has to have a straightness of 0.01mm.



8.3 Straightness Practical Test

Before mounting the ground plate or the slider, please test how smooth the slider can be moved by hand. After tightening the screws, move the slider again by hand. There should not be any noticeable changes in smoothness, otherwise the contact surfaces have to be revised.

9 Maintenance, Lifespan

9.1 Lubrication of LINAX® Lxc Types

The first-lubrication completed by Jenny Science before delivery lasts, depending on the strain of the linear motor, for several years. The LINAX® Lxc cross roll guiding cages are centered with racks and pinions. The lubrication intervals depend on several parameters such as strain, dynamics, operating temperature, soiling etc.

Preventively, we suggest lubricating the guiding beams every 12 months. Use an oil-soaked cotton swab with high performance lubricant OKS 671 or mineral oil (CLP or HLP in viscosities of ISO VG 15 up to 100 according to DIN 51519) and apply it to accessible spots.



9.2 Lifespan Expectations LINAX® Lxc Types

The LINAX® linear motor axes operate without wear and tear and without loss in accuracy over time. Generally speaking the mechanical guiding system is the determining factor for life span.

The LINAX® linear motor axes as well as the ELAX® linear motor slides have cross roll guides with the favourable linear support. These types of guides are precise, robust and low-maintenance. The LINAX® Lxc cross roll guiding cages are centered with racks and pinions. According to our experiences a lifespan of over 100 Mio cycles can be achieved at medium strain, good maintenance and without external dirt particles.

**SWISS
MADE**
+

Example Calculation medium payload (1.5kg)

ELAX® Ex 80F20

Effective payload in the middle $F_z C_{eff}$	1575N (12x164Nx80%)
Attraction of magnets	180N
Pre-stress	80N
Payload middle	<u>15N</u>
Equivalent load P	275N

Probable life span factor a	0.62 (95%)
-----------------------------	------------

$L = a * (C_{eff}/P)^{33} * 10^5 m = 19'662'00 m \rightarrow$ 20'000 running-km

Endurance test in "torture chamber" >100 Mio Cycles
 No maintenance, only first-lubrication, ELAX® Ex 30F20 vertical, payload 460g, Stroke 30mm, Speed 17Hz, no weight compensation, motor temperature 65°.

9.3 Lubrication of LINAX® Lxu, Lxs, Lxe Types

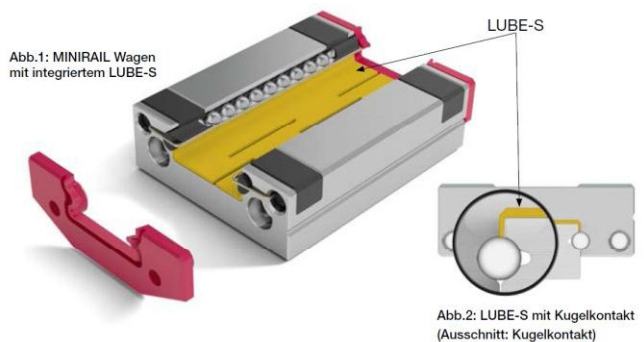
For the Lxu, Lxs and Lxe types we use ball bearing guides with integrated permanent lubrication.

For the older LINAX® models re-lubrication was completed with a lubricant filled syringe in order to refill the internal lubrication reservoir. Depending on dynamics the re-lubrication was suggested every 12 months.



The most recent used guiding carriages are maintenance free and no re-lubrication is necessary. The reservoir at the inside of the carriages lubricates all the balls automatically. Even for short-stroke applications lubrication is ensured.

New, maintenance free long term lubrication system integrated!



9.4 Lifespan Expectations Lxu, Lxs, Lxe Types

The guiding carriages have an integrated lubrication reservoir as a standard.

We recommend to re-lubricate the guiding system every 5'000km.

Important: If the guiding rails are cleaned, it has to be re-lubricated afterwards otherwise the lubricant in the reservoir might be used up and the guiding rails might run dry.

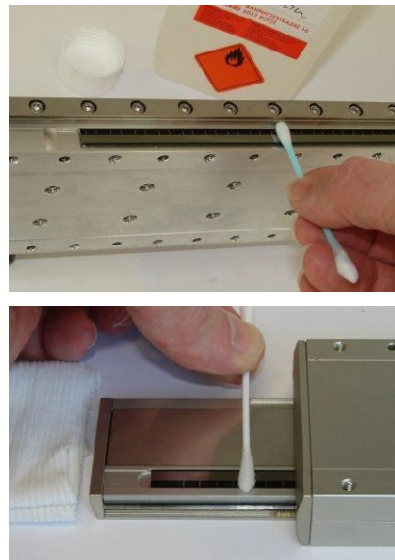
9.5 Lifespan Extending Measures

- Program trajectories with curve profile instead of trapezoidal profiles (XENAX® servo controller, default S-curve profile = 20%).
- Dynamics should only be as high as necessary.
- Movements which are not cycle time relevant can be executed slower.
- Prevent that dirt particles get into guiding rails and guiding carriages.
- Clean and lubricate guiding beams every 12 months.

9.6 Cleaning Glass Scale

After mechanical mounting or if there is visible dirt, the glass scale should be cleaned thoroughly. Please do not touch glass scale afterwards.

If there is error „54, LINAX® measuring head signal too weak“ the glass scale is contaminated and signal errors might occur. Use cotton swab or lint-free cloth with thin fluid and de-greasing detergent. E.g. cleaning alcohol from drugstore or pharmacy.



10 Safety, Environment

10.1 Safety with XENAX® Servocontroller

EN 61000-6-2:2005
Electromagnetic compatibility (EMC),
Immunity for industrial environments

EMC Immunity Testing, Industrial Class A

EN 61326-3-1
IFA:2012
EN 61326-1, EN 61800-3, EN 50370-1

Immunity for Functional Safety
Functional safety of power drive systems
Electrostatic discharges ESD, Electromagnetic Fields,
Fast electric transients Bursts, radio frequency common
mode

EN 61000-6-3:2001
Electromagnetic compatibility (EMC),
Emission standard for residential,
commercial and light-industrial
environments

EMC Emissions Testing, Residential Class B

EN 61326-1, EN61800-3, EN50370-1
IFA:2012

Radiated EM Field, Interference voltage
Functional safety of power drive systems

10.2 Environment Conditions

Storage and transport

No storage outside. Storage rooms have to be well-ventilated and dry. Storage temperature from -25°C bis +55°C

Operating temperature

5°C -50°C environment, after 40°C performance reduction

Operating humidity

10-90% non-condensing

Cooling

No external cooling needed.

Dynamics can possibly be increased by mounting the slider case on a thermoconductive ground plate.

Protection

IP 50 (except LINAX® Lxe, IP40)