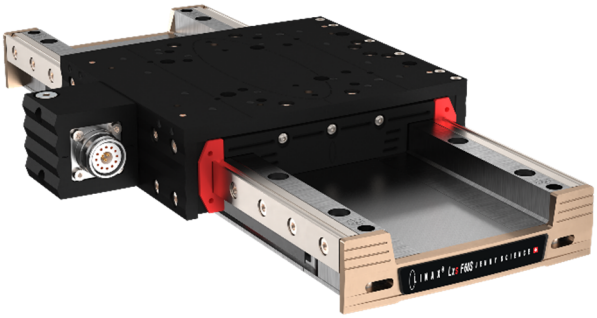
JENNY SCIENCE

moving precisely, within tight space

Version from
20. März 2026

Creator
Marcel Mehr, Development

Datasheet LINAX® F60S



Lxs F60S, s = shuttel

Lxu F60S, u = universal

Highlights

Absolute measuring system
magnetical 1 µm or optical 1 µm / 100 nm

Single cable solution
Reduces wiring effort

Compact dimensions, high precision
with Repeatability of ± 0.5 µm

Peak forces from 180N
High cycle rates with velocities up to 4m/s due to the linear motor

Forceteq® basic/pro force control
Force limitation, force monitoring with XENAX® Xvi servo controller

Functional Safety, TÜV certified
SIL 2, PL d, CAT 3 with XENAX® Xvi servo controller

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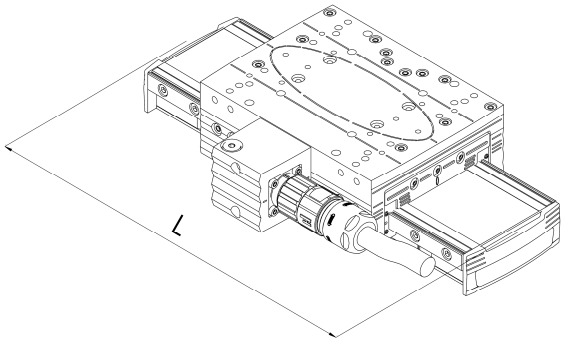
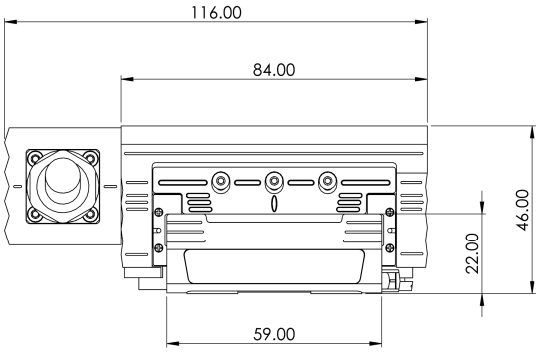
1 LINAX® Lxu F60S

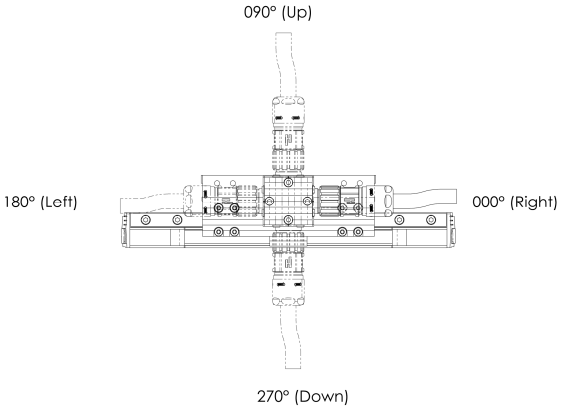
1.1 Dimensions Lxu F60S



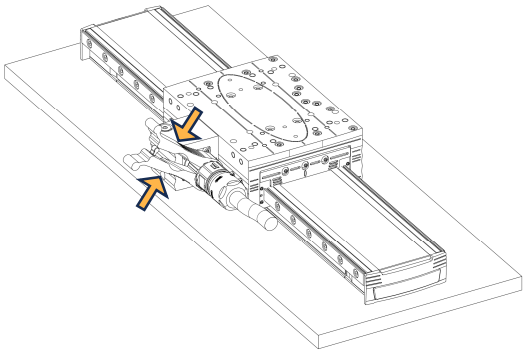
LINAX® Lxu F60S	L [mm] *(in)*
Lxu 40F60S	170 *(6.69)*
Lxu 80F60S	210 *(8.26)*
Lxu 160F60S	290 *(11.41)*
Lxu 240F60S	370 *(14.56)*
Lxu 320F60S	450 *(17.71)*

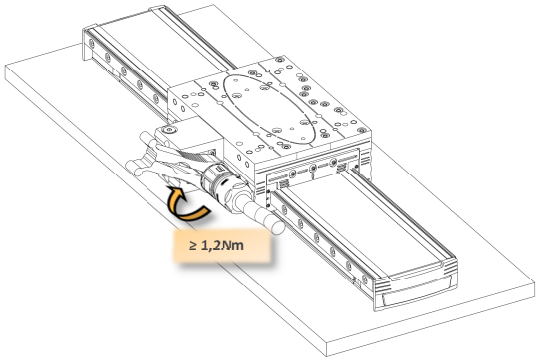


1.2 Connector housing Lxu F60S



The connector housing is rotatable in 4 directions in a 90° pattern. The motor is supplied as standard with a “right-hand cable outlet” (with a view of the connector housing).



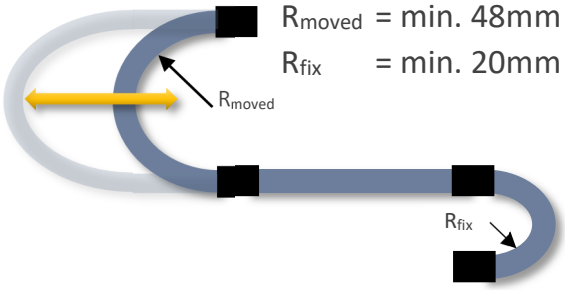


1.3 Connectors and Cable Strain Relief

The electrical connection to the carriage is made via a screw-type connector. The supplied connection cable must be properly connected to the socket at the carriage. The tightening torque of the connector must be ≥1,2 Nm to ensure a secure mechanical and electrical connection.
It must be ensured that no mechanical forces are transmitted to the connector via the cable. To this end, the connection cable must be strain-relieved or mechanically secured at the outer sheath immediately after the connector. The cable routing must be designed so that movements of the carriage do not transmit any tension, bending or torsional forces to the connector.

Due to the limited access to the connector on the slide, tightening and loosening the connector can be difficult. To assist with this, Jenny Science AG offers a suitable installation tool as an accessory. This enables controlled tightening (≥1,2 Nm) and easy loosening of the connector, even in confined installation spaces.

1.4 Cables & Bending Radius



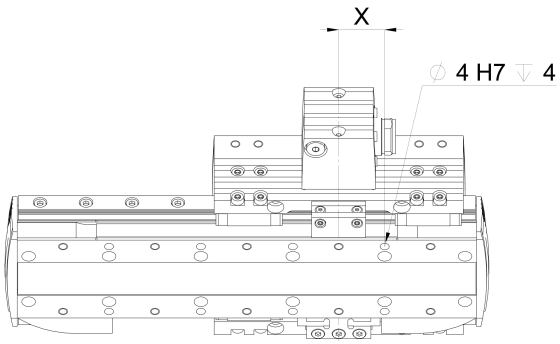
For permanently moving cables, a minimum bending radius of 48mm (R_{moved}) must be maintained. The cable must be secured at the outer sheath before and after the moving section. For permanently installed cables, a single-bend radius of 20mm (R_{fix}) is applicable. The cable is not designed for torsional stress, but can withstand more than 1 million cycles at a torsion of ±90° over a length of 1m.

1.5 Absolute measuring system & zero position Lxu F60S

1.5.1 Reference run

A reference run is not required. With the absolute measuring system, the position is available immediately after switching on.

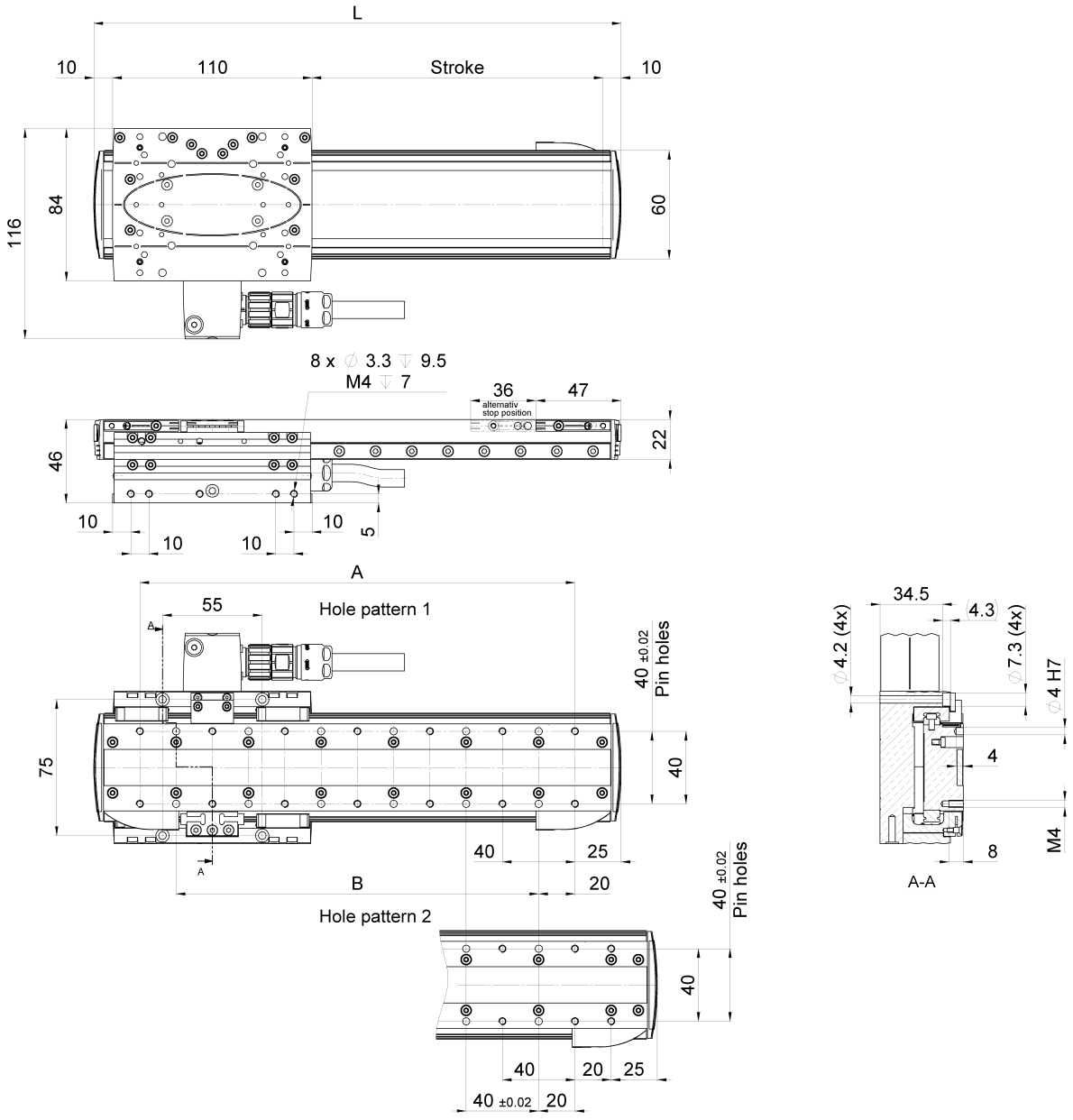
1.5.2 Position of mechanical hard stop



The mechanical stop is located approximately 1.5 mm from the zero position. The zero position is the point at which the centre of the slide is located. This is aligned with dimension X on the first pin hole.

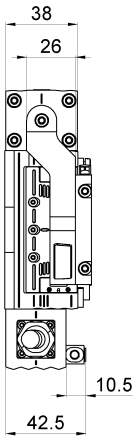
LINAX® Lxu F60S	**L [mm]** *(in)*	**X [mm]** *(in)*
Lxu 40F60S	170 *(6.69)*	0
Lxu 80F60S	210 *(8.26)*	20 *(0.29)*
Lxu 160F60S	290 *(11.41)*	20 *(0.29)*
Lxu 240F60S	370 *(14.56)*	20 *(0.29)*
Lxu 320F60S	450 *(17.71)*	20 *(0.29)*

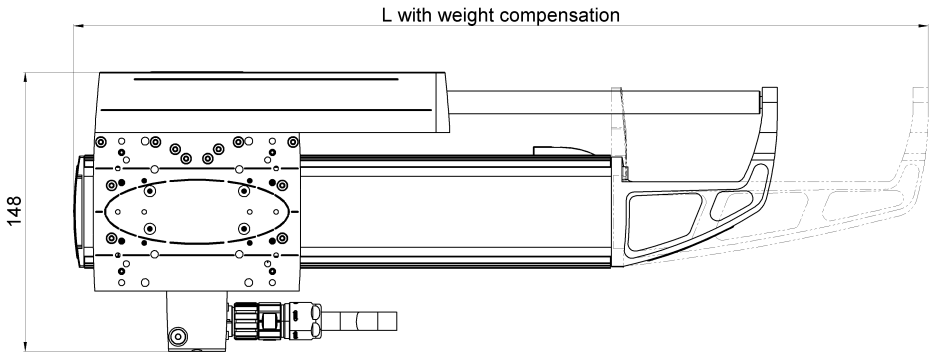
1.6 Installation dimensions Lxu 80F60S – Lxu 320F60S



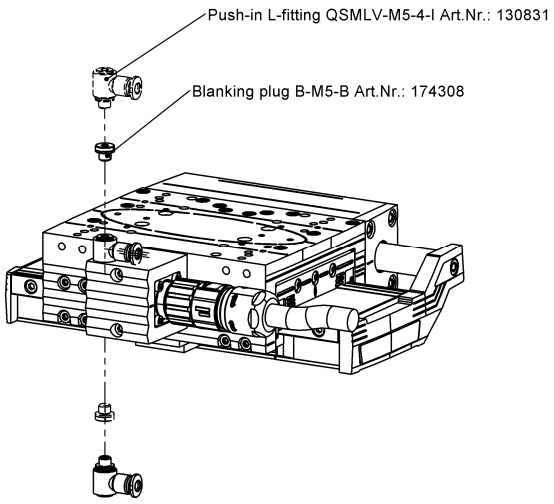
LINAX® Lxu F60S	Stroke [mm]	L [mm]	A [mm]	B [mm]	Hole pattern
Lxu 40F60S	40	170	80	40	2
Lxu 80F60S	80	210	160	120	1
Lxu 160F60S	160	290	240	200	1
Lxu 240F60S	240	370	320	280	1
Lxu 320F60S	320	450	400	360	1

1.7 Installation dimensions Lxu with weight compensation





LINAX® Lxu F60S	L with weight compensation [mm]
Lxu 40F60S	173
Lxu 80F60S	213
Lxu 160F60S	373
Lxu 240F60S	533
Lxu 320F60S	N/A

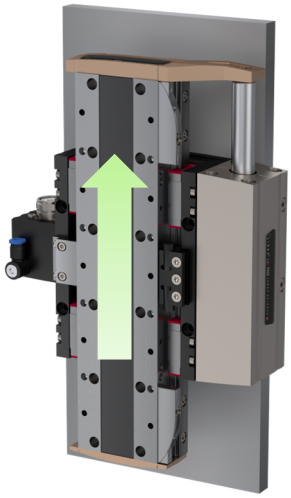


The compressed air connection for a hose with an outer diameter of 4 mm is pre-assembled on the connector housing at the factory. Depending on the installation situation, the connection can be relocated afterwards.

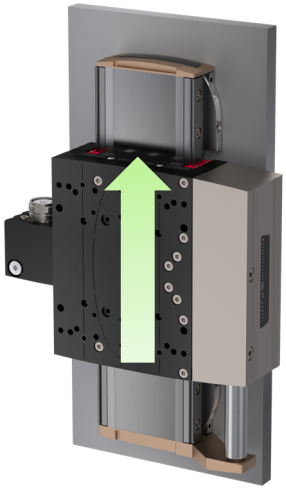
The use of a compressed air regulator (1-8 bar) and a check valve is recommended for installation on the machine side.

The pneumatic weight compensation works without air consumption. Using a standard pressure regulator, the compensation force can be adjusted so that the carriage or base plate either remains in position or moves upwards in a controlled manner in the event of a power failure.

Since both the base plate and the slide can be in motion with the LINAX® Lxu, the direction of the effect of the weight compensation must be considered when installing the axis.

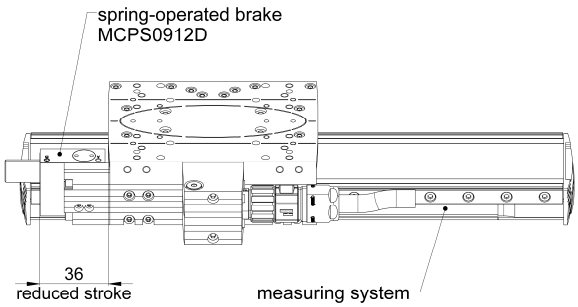


Direction of weight compensation when **base plate is in motion.**



Direction of weight compensation when **slider is in motion.**

1.8 Spring-operated Brake Lxu F60S

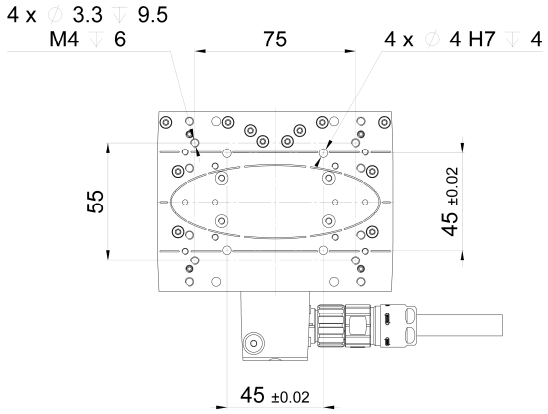


The optionally available spring-operated brake is fixed to the slide and clamps the guide as soon as the compressed air supply is interrupted. The brake is released by activating a pneumatic valve.
A solenoid valve such as the Festo CPE10-M1BH-3GL-QS-4 (item no. 196 846) can be used as the valve. This can be connected directly to the hardware output of the XENAX® Servocontroller.
The BRAKE output configured via WebMotion® automatically closes the spring-operated brake as soon as the output stage is deactivated and releases it again as soon as the axis enters the control loop.

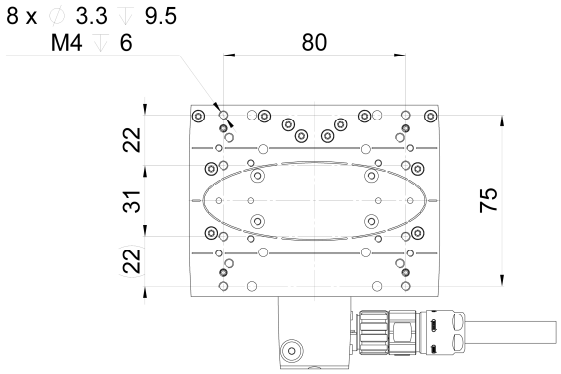
Installing the spring-operated brake reduces the usable stroke of the axis on the left-hand side (measuring system side) by 36 mm.

1.9 Hole pattern Lxu F60S

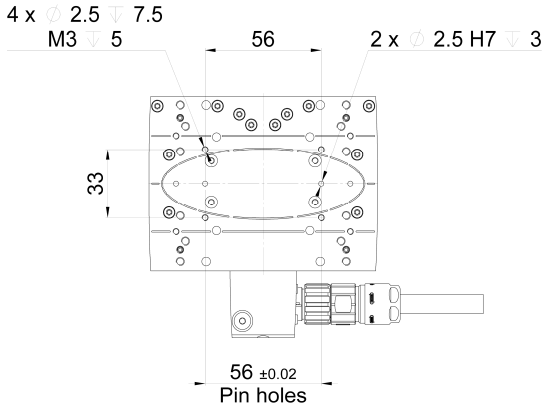
Cantilever with **Lxu F60/S** (back to back)



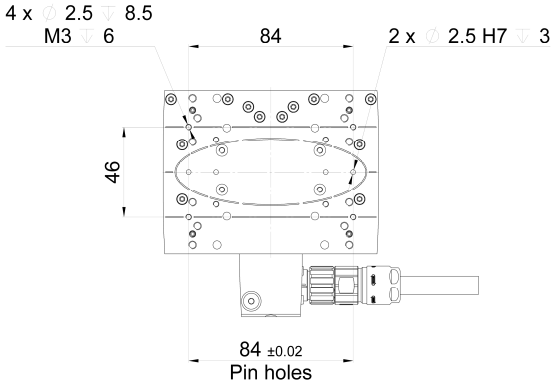
Portal with **Lxu F60/S** front flange



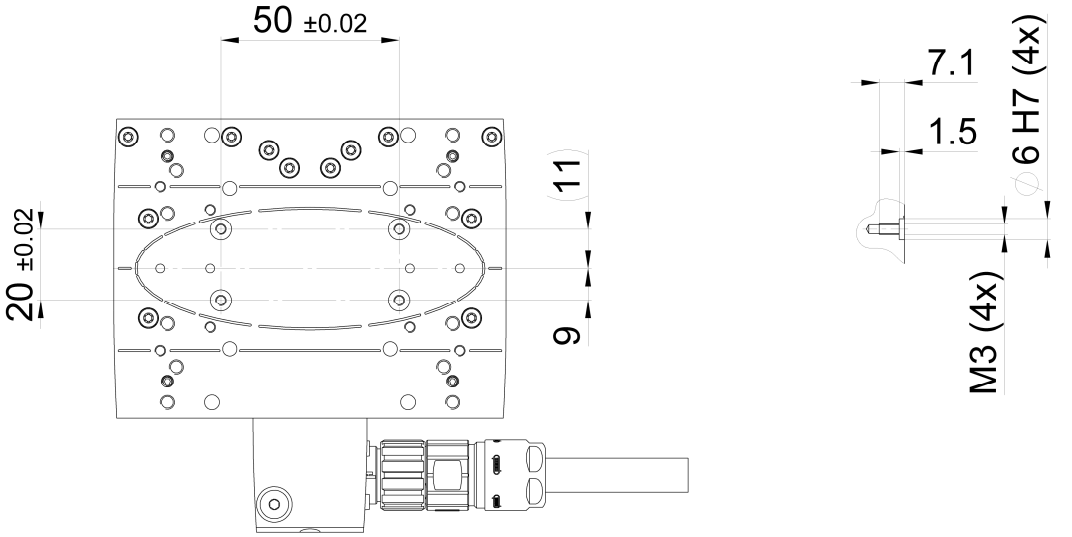
Cross table with **Lxc F08 / F10** monoblock



Cross table with **Lxc F40** monoblock



Cantilever with **Ex F20**



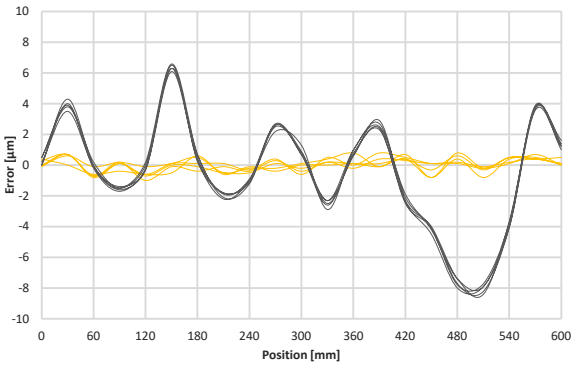
1.10 Precision Lxu F60S

1.10.1 Positioning

Measuring system	Bidirectional repeatability
1µm magnetic absolute	< ± 2.0µm
1µm optical absolute	< ± 1.5µm
100nm optical absolute	< ± 0.5µm

Measuring system	Length expansion measuring scale
1µm magnetic absolute	11.0µm/m/°C
1µm optical absolute	10.6µm/m/°C
100nm optical absolute	10.6µm/m/°C

Measurement system 1µm optical, relevant measurement point 150mm above the scale

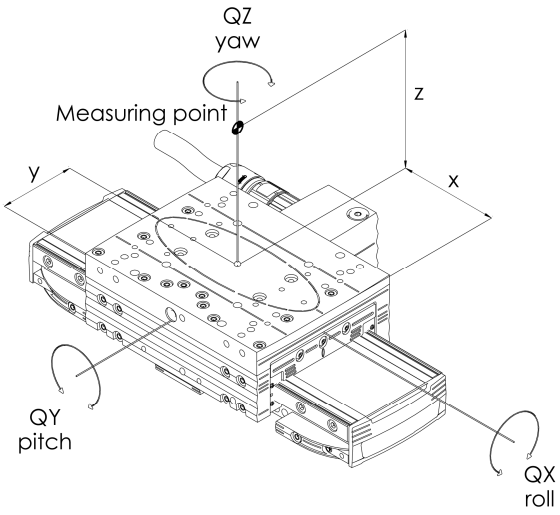


1.10.2 Position-Mapping in XENAX® Xvi 75V8S

The interferometer records the position errors across the entire stroke in tabular form. The position mapping table is then stored in the XENAX® Xvi Servocontroller. During operation, the controller corrects the positions in real time according to this table; intermediate positions are interpolated in the process.
The correction also is made when the control is via a real-time bus, thereby achieving even greater absolute accuracy.

- **Gray**, Position errors measured at the relevant point of the setup, measurement system 1µm resolution optical

- **Yellow**, Position error at the same measurement point after correction using the position mapping function.



1.10.3Guidings of slider

Ball bearing guides are used for the LINAX® Lxu linear motors. This guiding system is maintenance free for 20‘000km or 5 years as stated by the supplier.

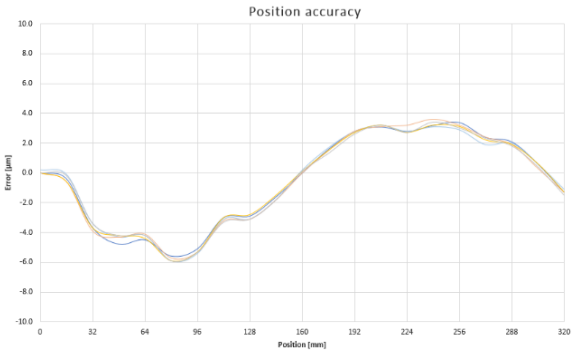
The LINAX® Lxu linear motor axes are supplied with the following tolerances as standard.

Lxu F60S	Running Accuracy horizontal EYX [µm]	Running Accuracy vertical EZX [µm]	Tilt Error QX (roll) [arcsec]	Tilt Error QY (pitch) [arcsec]	Tilt Error QZ (yaw) [arcsec]	Tolerance Constr. Height [mm]
Lxu 40F60S	± 5	± 4	± 8	± 10	± 15	± 0.1
Lxu 80F60S	± 5	± 4	± 8	± 10	± 20	± 0.1
Lxu 160F60S	± 8	± 5	± 10	± 20	± 25	± 0.1
Lxu 240F60S	± 10	± 5	± 10	± 20	± 30	± 0.1
Lxu 320F60S	± 12	± 6	± 10	± 20	± 35	± 0.1

Values for unloaded single axis, measured on a flat granite surface.

1.10.4 Typical measurement results out of series production

Position accuracy



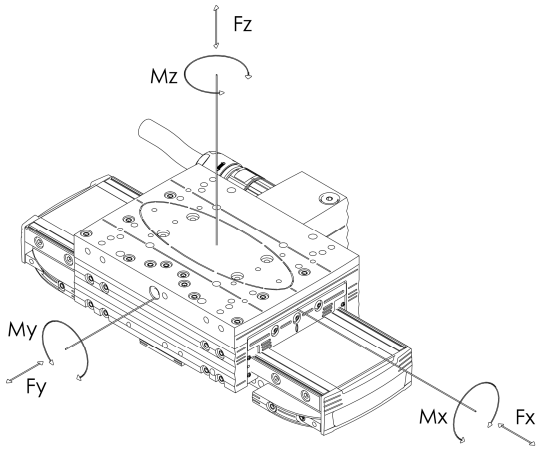
Resolution optical:	1 µm
Absolute accuracy:	± 5 µm
Repeatability forward:	0.6 µm
Repeatability backward:	0.7 µm
Repeatability bi-directional:	1.2 µm

Position accuracy 55mm over (Z) measuring system.

Tilt error

QX roll:	± 6.8 asec
QY pitch:	± 7.6 asec
QZ yaw:	± 15.2 asec

1.11 Stress values of guides Lxu F60S



LINAX® Lxu F60S	Maximum load
Mx	149 Nm
My	211 Nm
Mz	211 Nm
Fy	5400 N
Fz	5400 N

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:

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

1.12 Dynamics Lxu F60S

1.12.1 Slider in motion

Lxu F60S	Stroke [mm]	Force nom./peak [N]	Speed v.max [m/s] 24V/48V/72V	Acceleration a-max [m/s²]	Min. time/stroke @48V [ms]	Mass slider [g]	Weight compensation [g]	Mass total [g]
Lxu 40F60S	40	60 / 180	0.8/2.2/2.2	120	45	950	360	1700
Lxu 80F60S	80	60 / 180	0.8/2.4/3.0	120	60	950	360	1900
Lxu 160F60S	160	60 / 180	0.8/2.4/4.1	120	80	950	590	2200
Lxu 240F60S	240	60 / 180	0.8/2.4/4.1	120	100	950	820	2600
Lxu 320F60S	320	60 / 180	0.8/2.4/4.1	120	120	950	N/A	2900

Values only valid with XENAX® Xvi and 20% S-Curve

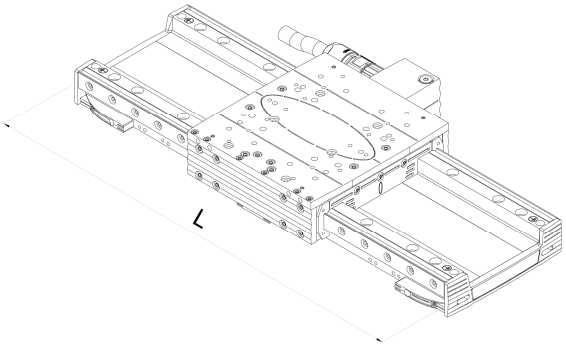
1.12.2 Base plate in motion

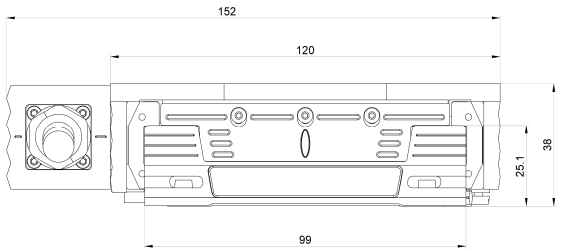
Lxu F60S	Stroke [mm]	Force nom./peak [N]	Speed v.max [m/s] 24V/48V/72V	Acceleration a-max [m/s²]	Min. time/stroke @48V [ms]	Mass Base plate [g]	Weight compensation [g]	Mass total [g]
Lxu 40F60S	40	60 / 180	0.8/2.4/2.4	140	45	750	360	1700
Lxu 80F60S	80	60 / 180	0.8/2.4/3.0	120	60	950	360	1900
Lxu 160F60S	160	60 / 180	0.8/2.4/3.8	95	100	1250	590	2200
Lxu 240F60S	240	60 / 180	0.8/2.4/4.1	80	135	1550	820	2600
Lxu 320F60S	320	60 / 180	0.8/2.4/4.1	65	175	1950	N/A	2900

Values only valid with XENAX® Xvi and 20% S-Curve

2 LINAX® Lxs F60S

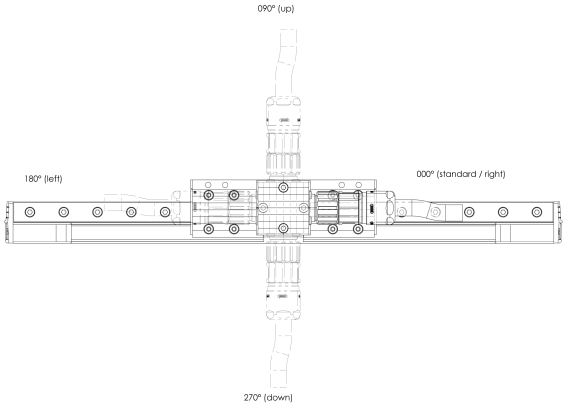
2.1 Dimension Lxs F60S





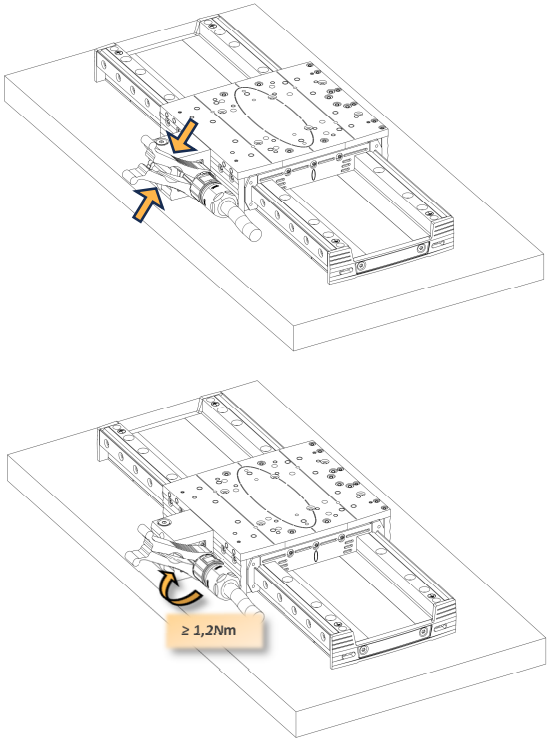
LINAX® Lxs F60S	L [mm] *(in)*
Lxs 160F60S	290 *(7.48)*
Lxs 200F60S	330 *(12.99)*
Lxs 320F60S	450 *(17.71)*
Lxs 400F60S	530 *(20.86)*
Lxs 520F60S	650 *(25.59)*
Lxs 600F60S	730 *(28.74)*
Lxs 800F60S	930 *(36.61)*
Lxs 1000F60S	1130 *(44.48)*
Lxs 1200F60S	1330 *(52.36)*
Lxs 1600F60S	1730 *(68.11)*

2.2 Connector housing Lxs F60S



The connector housing is rotatable in 4 directions in a 90° pattern. The motor is supplied as standard with a “right-hand cable outlet” (with a view of the connector housing).

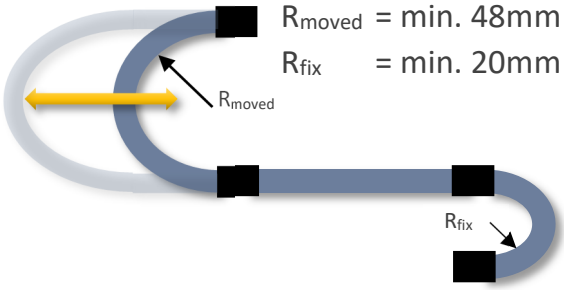
2.3 Connectors and Cable Strain Relief



The electrical connection to the carriage is made via a screw-type connector. The supplied connection cable must be properly connected to the socket at the carriage. The tightening torque of the connector must be ≥1,2 Nm to ensure a secure mechanical and electrical connection.
It must be ensured that no mechanical forces are transmitted to the connector via the cable. To this end, the connection cable must be strain-relieved or mechanically secured at the outer sheath immediately after the connector. The cable routing must be designed so that movements of the carriage do not transmit any tension, bending or torsional forces to the connector.

Due to the limited access to the connector on the slide, tightening and loosening the connector can be difficult. To assist with this, Jenny Science AG offers a suitable installation tool as an accessory. This enables controlled tightening (≥1,2 Nm) and easy loosening of the connector, even in confined installation spaces.

2.4 Cables & Bending Radius



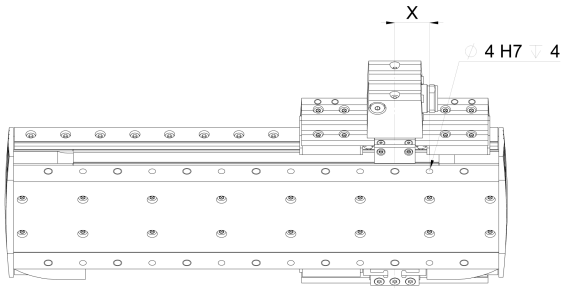
For permanently moving cables, a minimum bending radius of 48mm (R_{moved}) must be maintained. The cable must be secured at the outer sheath before and after the moving section. For permanently installed cables, a single-bend radius of 20mm (R_{fix}) is applicable. The cable is not designed for torsional stress, but can withstand more than 1 million cycles at a torsion of ±90° over a length of 1m.

2.5 Absolute measuring system & zero position Lxs F60S

2.5.1 Reference run

A reference run is not required. With the absolute measuring system, the position is available immediately after switching on.

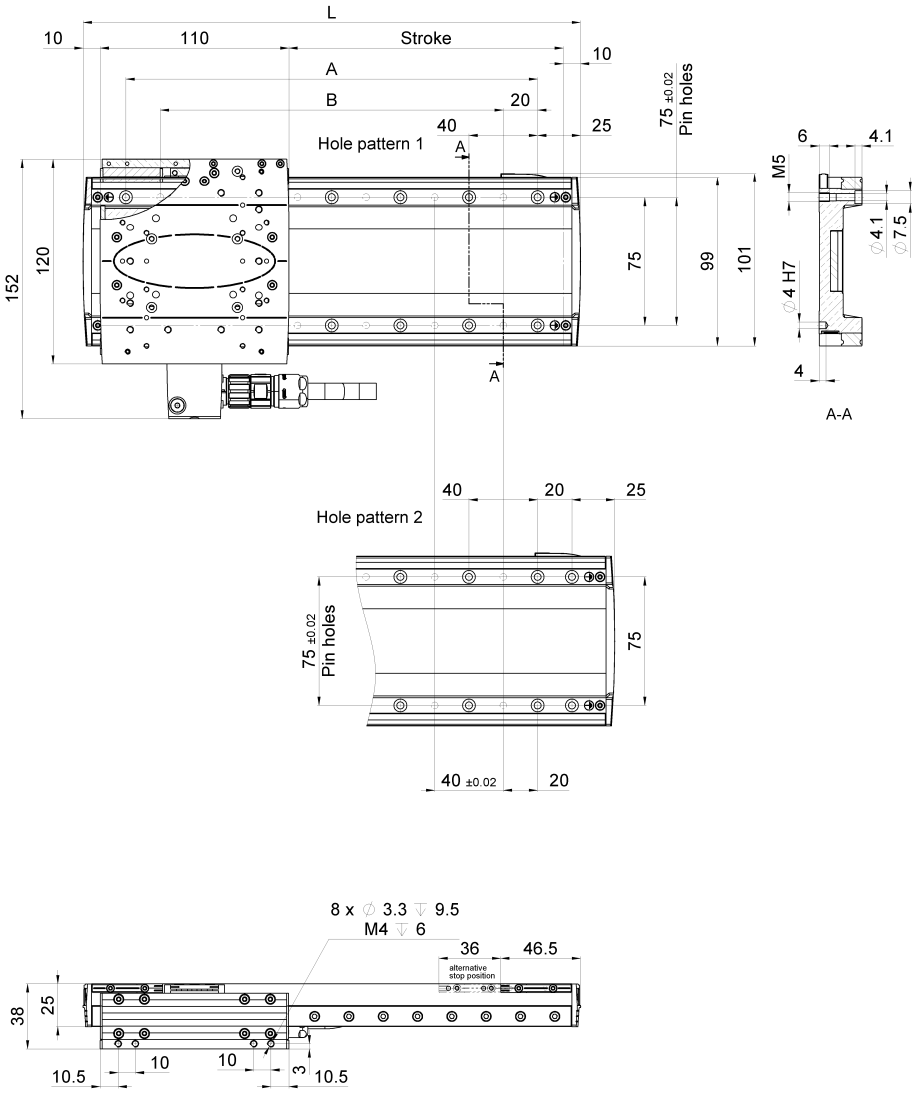
2.5.2 Position of mechanical hard stop



The mechanical stop is located approximately 1.5 mm from the zero position. The zero position is the point at which the centre of the slide is located. This is aligned with dimension X on the first pin hole.

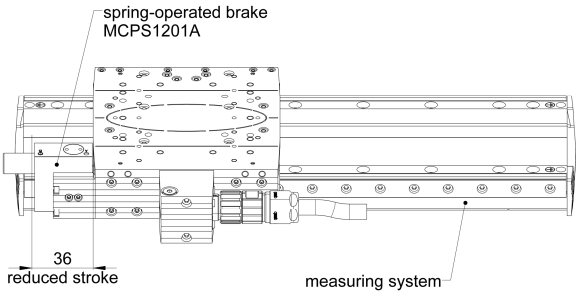
LINAX® Lxs F60S	**L [mm]** *(in)*	**X [mm]** *(in)*
Lxs 160F60S	290 *(7.48)*	20 *(0.29)*
Lxs 200F60S	330 *(12.99)*	0
Lxs 320F60S	450 *(17.71)*	20 *(0.29)*
Lxs 400F60S	530 *(20.86)*	20 *(0.29)*
Lxs 520F60S	650 *(25.59)*	0
Lxs 600F60S	730 *(28.74)*	0
Lxs 800F60S	930 *(36.61)*	20 *(0.29)*
Lxs 1000F60S	1130 *(44.48)*	0
Lxs 1200F60S	1330 *(52.36)*	20 *(0.29)*
Lxs 1600F60S	1730 *(68.11)*	20 *(0.29)*

2.6 Installation dimensions Lxs 160F60S – Lxs 1600F60S



LINAX® Lxs F60S	Stroke [mm]	L [mm]	A [mm]	B [mm]	Hole pattern
Lxs 160F60S	160	290	240	200	1
Lxs 200F60S	200	330	240	200	2
Lxs 320F60S	320	450	400	360	1
Lxs 400F60S	400	530	480	440	1
Lxs 520F60S	520	650	560	520	2
Lxs 600F60S	600	730	640	600	2
Lxs 800F60S	800	930	880	840	1
Lxs 1000F60S	1000	1130	1040	1000	2
Lxs 1200F60S	1200	1330	1280	1240	1
Lxs 1600F60S	1600	1730	1680	1640	1

2.7 Spring-operated brake Lxs F60S

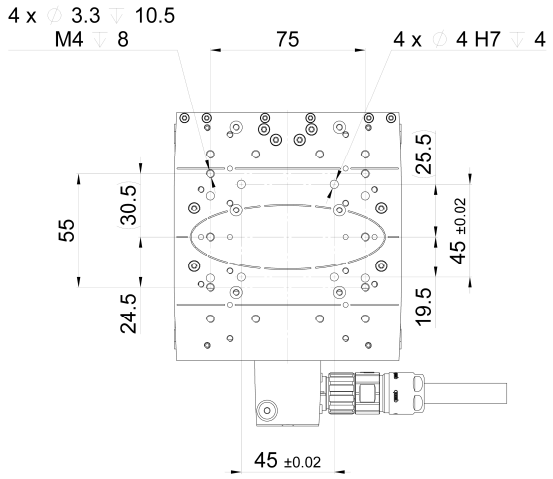


The optionally available spring-operated brake is fixed to the slide and clamps the guide as soon as the compressed air supply is interrupted. The brake is released by activating a pneumatic valve.
A solenoid valve such as the Festo CPE10-M1BH-3GL-QS-4 (item no. 196 846) can be used as the valve. This can be connected directly to the hardware output of the XENAX® servocontroller.
The BRAKE output configured via WebMotion® automatically closes the spring-operated brake as soon as the output stage is deactivated and releases it again as soon as the axis enters the control loop.

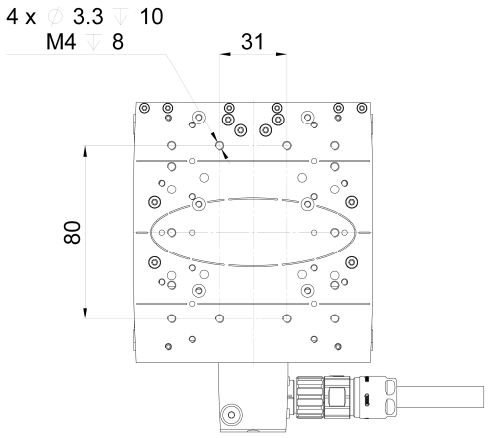
Installing the spring-operated brake reduces the usable stroke of the axis on the left-hand side (measuring system side) by 36 mm.

2.8 Hole pattern Lxs F60S

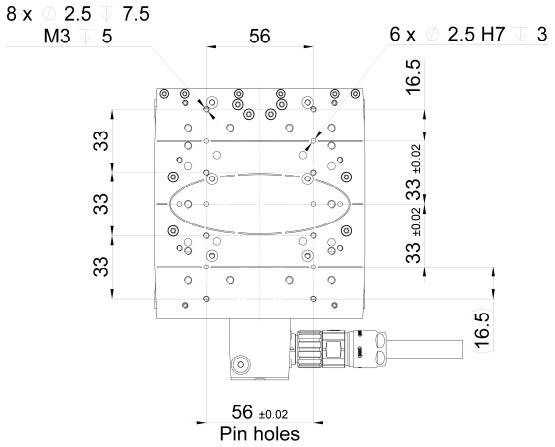
Cantilever with **Lxu F60/S** (back to back)



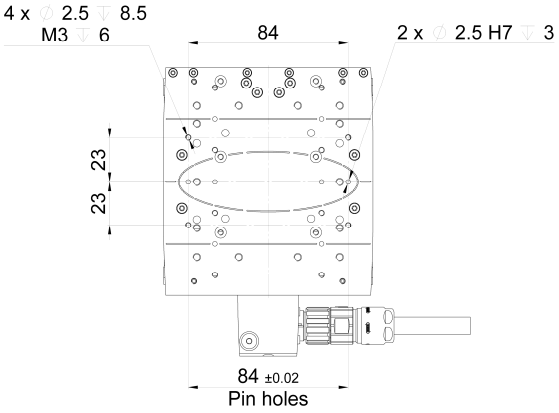
Portal with **Lxu F60/S** front flange



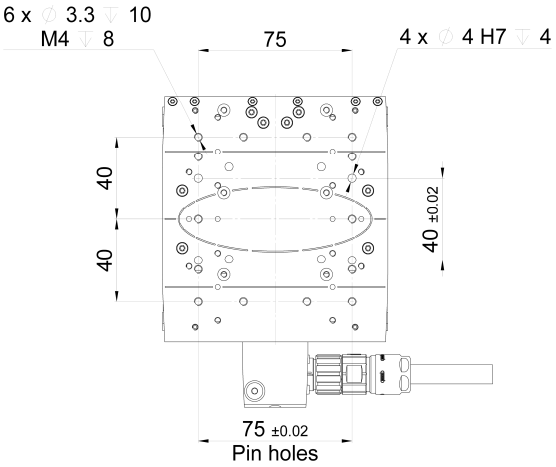
Cross table with **Lxc F08 / F10** monoblock



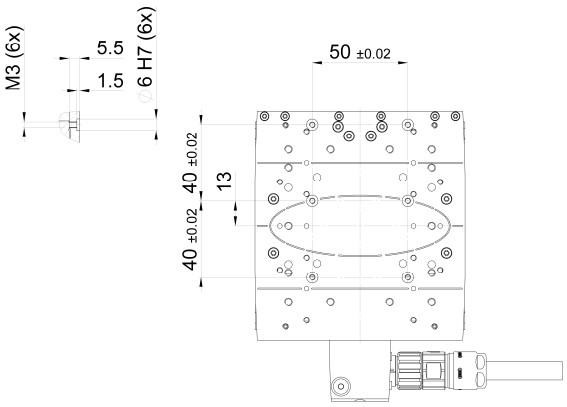
Cross table with **Lxc F40** monoblock



Cross table with **Lxs F60** ground plate



Cantilever with **Ex F20**



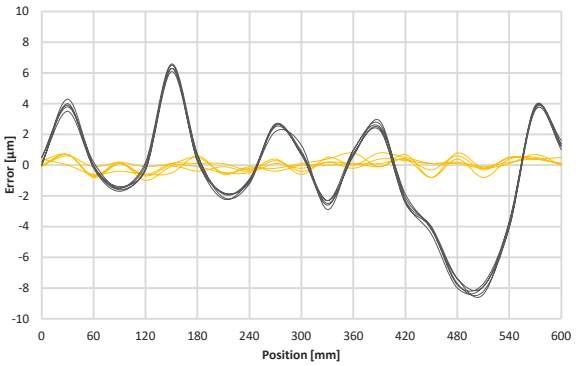
2.9 Precision Lxs F60S

2.9.1 Positioning

Measuring system	Bidirectional repeatability
1µm magnetic absolute	< ± 2.0µm
1µm optical absolute	< ± 1.5µm
100nm optical absolute	< ± 0.5µm

Measuring system	Lenght expansion measuring scale
1µm magnetic absolute	11.0µm/m/°C
1µm optical absolute	10.6µm/m/°C
100nm optical absolute	10.6µm/m/°C

Measurement system 1µm optical, relevant measurement point 150mm above the scale

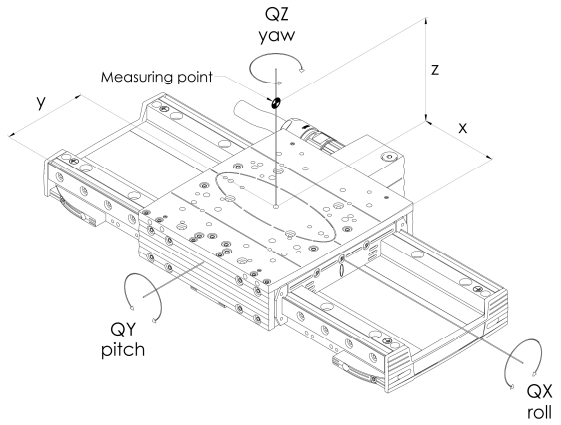


2.9.2 Position Mapping in XENAX® Xvi 75V8S

The interferometer records the position errors across the entire stroke in tabular form. The position mapping table is then stored in the XENAX® Xvi Servocontroller. During operation, the controller corrects the positions in real time according to this table; intermediate positions are interpolated in the process.
The correction also is made when the control is via a real-time bus, thereby achieving even greater absolute accuracy.

- **Gray**, Position errors measured at the relevant point of the setup, measurement system 1µm resolution optical

- **Yellow**, Position error at the same measurement point after correction using the position mapping function.



2.9.3 Guidings of slider

Ball bearing guides are used for the LINAX® Lxs linear motors. This guiding system is maintenance free for 20‘000km or five years as stated by the supplier.

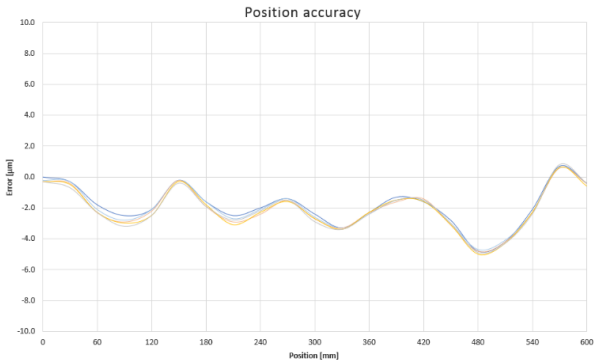
The LINAX® Lxs linear motor axes are supplied with the following tolerances as standard.

Lxs F60S	Running Accuracy horizontal EYX [µm]	Running Accuracy vertical EZX [µm]	Tilt Error QX (roll) [arcsec]	Tilt Error QY (pitch) [arcsec]	Tilt Error QZ (yaw) [arcsec]	Tolerance Constr. Height [mm]
Lxs 160F60S	± 5	± 3	± 5	± 10	± 10	± 0.1
Lxs 200F60S	± 5	± 3	± 5	± 10	± 10	± 0.1
Lxs 320F60S	± 8	± 4	± 15	± 20	± 15	± 0.1
Lxs 400F60S	± 10	± 4	± 15	± 20	± 15	± 0.1
Lxs 520F60S	± 10	± 4	± 20	± 20	± 20	± 0.1
Lxs 600F60S	± 10	± 5	± 20	± 20	± 20	± 0.1
Lxs 800F60S	± 10	± 7	± 25	± 25	± 25	± 0.1
Lxs 1000F60S	± 12	± 8	± 30	± 25	± 25	± 0.1
Lxs 1200F60S	± 13	± 9	± 30	± 25	± 25	± 0.1
Lxs 1600F60S	± 16	± 12	± 35	± 30	± 30	± 0.1

Values for unloaded single axis, measured on a flat granite surface.

2.9.4 Typical measurement results out of series production

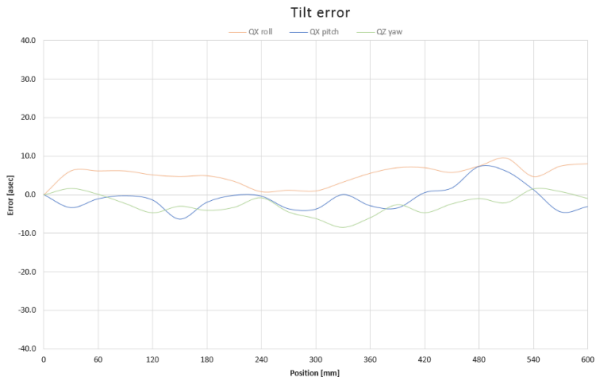
Position accuracy



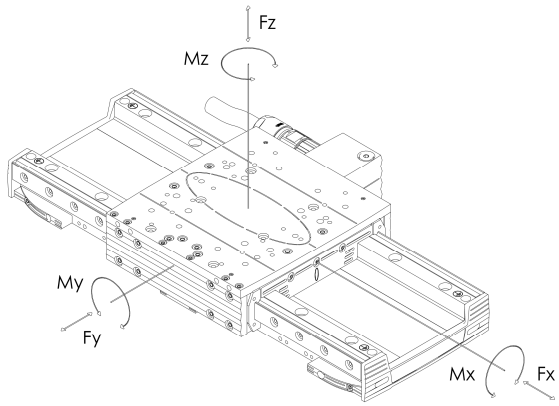
Resolution optical:	1 µm
Absolute accuracy:	± 3 µm
Repeatability forward:	0.7 µm
Repeatability backward:	0.7 µm
Repeatability bi-directional:	1.3 µm

Position accuracy 55mm over (Z) measuring system.

Tilt error



QX roll:	± 4.7 asec
QY pitch:	± 6.9 asec
QZ yaw:	± 5.1 asec



2.10 Stress values of guides Lxs F60S

LINAX® Lxs F60S	Maximum load
Mx	360 Nm
My	296 Nm
Mz	296 Nm
Fy	8000 N
Fz	8000 N

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:

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

2.11 Dynamics Lxs F60S

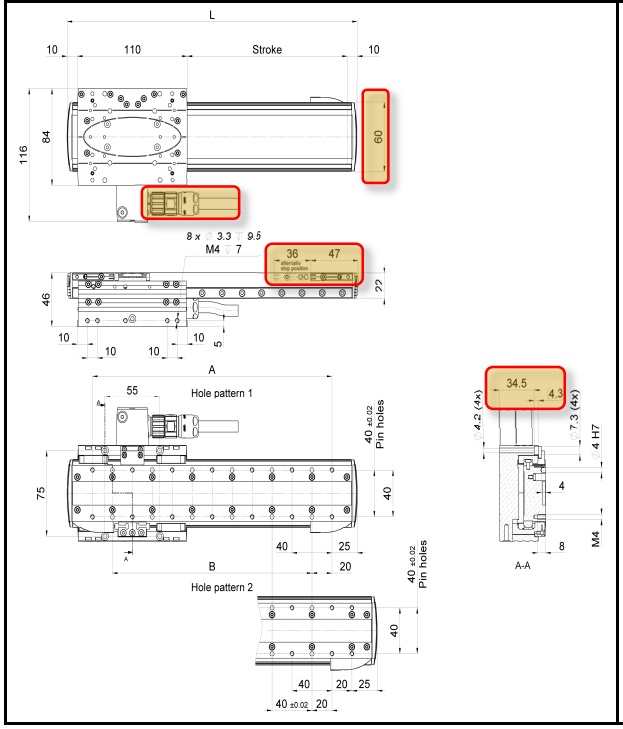
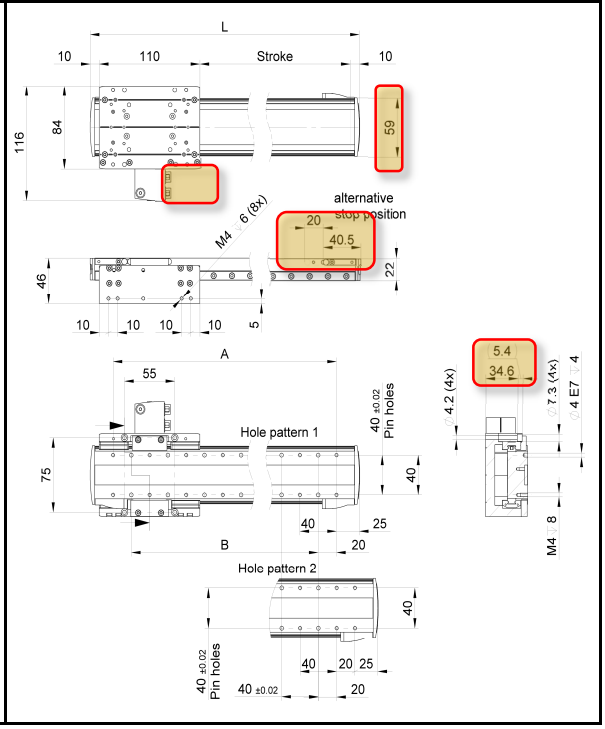
Lxs F60S	Stroke [mm]	Force nom./peak [N]	Speed v.max [m/s] 24V/48V/72V	Acceleration a-max [m/s²]	Min. time/stroke @48V [ms]	Min. time/stroke @72V [ms]	Mass slider [g]	Mass total [g]
Lxs 160F60S	160	60 / 180	0.8/2.4/4.1	120	95	80	1000	2600
Lxs 200F60S	200	60 / 180	0.8/2.4/4.1	120	110	90	1000	2800
Lxs 320F60S	320	60 / 180	0.8/2.4/4.1	120	160	120	1000	3400
Lxs 400F60S	400	60 / 180	0.8/2.4/4.1	120	195	140	1000	3900
Lxs 520F60S	520	60 / 180	0.8/2.4/4.1	120	240	165	1000	4500
Lxs 600F60S	600	60 / 180	0.8/2.4/4.1	120	280	185	1000	5000
Lxs 800F60S	800	60 / 180	0.8/2.4/4.1	120	360	235	1000	6000
Lxs 1000F60S	1000	60 / 180	0.8/2.4/4.1	120	440	285	1000	7200
Lxs 1200F60S	1200	60 / 180	0.8/2.4/4.1	120	520	335	1000	8400
Lxs 1600F60S	1600	60 / 180	0.8/2.4/4.1	120	685	435	1000	10800

Values only valid with XENAX® Xvi and 20% S-Curve

3 Installation differences to the previous version

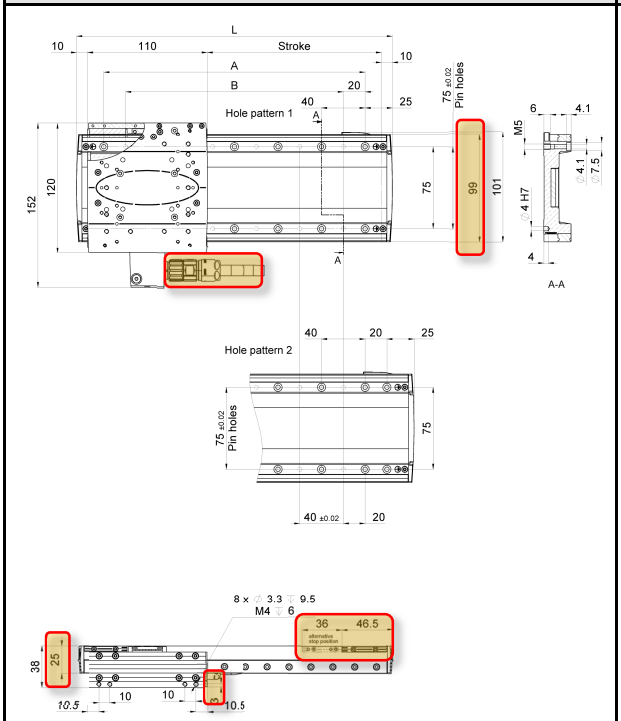
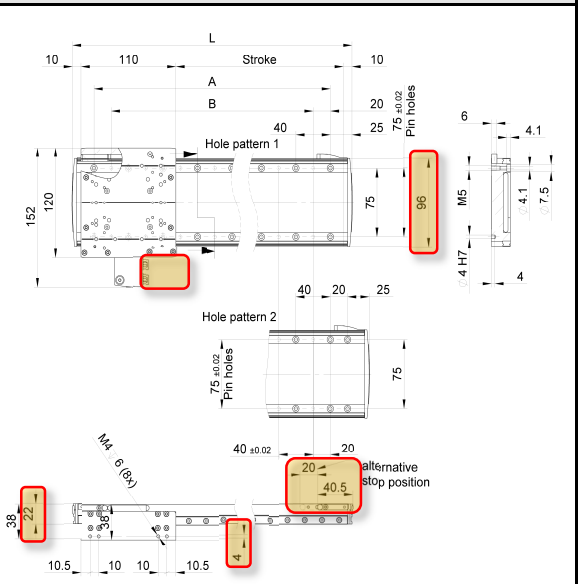
The following information shows the mechanically relevant differences for installation between the current linear axis F60S and its predecessor model F60. This overview helps you to quickly identify significant changes so that you do not have to compare every single dimension on both data sheets when changing over.

3.1 Lxu F60S vs. F60

Lxu F60S	Lxu F60
	

Mechanical stops are not compatible and cannot be incorporated into customer-specific in-house designs.

3.2 Lxs F60S vs. F60

Lxs F60S	Lxs F60
	

Mechanical stops are not compatible and cannot be incorporated into customer-specific in-house designs.

4 Installation and maintenance

4.1 Handling and installation

Electrostatic sensitive devices (ESD)

The built-in components may contain electrostatic sensitive components. Please be sure to observe the applicable ESD protection regulations.
Do not touch any ESD-sensitive components or connection points!

Specialised staff

All activities in connection with transport, connection, commissioning and maintenance may only be carried out by qualified and authorised specialist personnel.

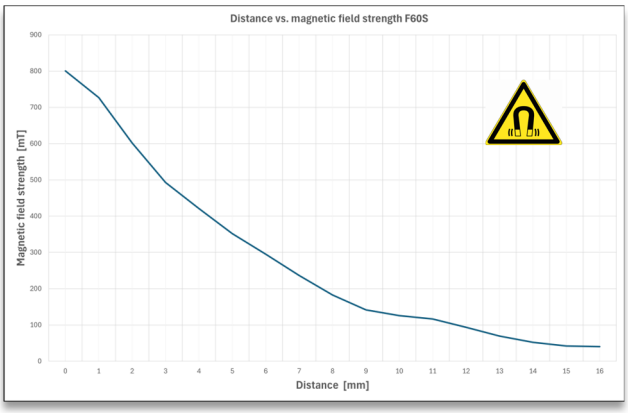
Transport

Check the system immediately upon receipt for possible transport damage. When unpacking, take particular care with sensitive components such as cables, plugs, encoders and motors. It is not permitted to commission damaged products.

Handling

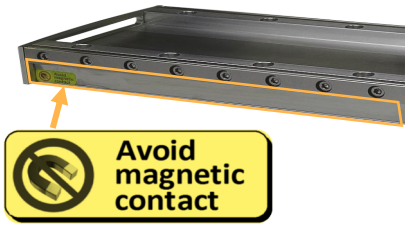
Linear motor axes must always be transported in a horizontal position, as the carriage can fall uncontrollably into the mechanical stop in a vertical position.
There is a risk of hands and fingers being squeezed!

Magnetic fields



Linear motor axes generate magnetic fields on the surface of the base plate due to their permanent magnets. However, there are no magnetic fields above the carriage or below the base plate.

Measuring system



The magnetic measuring system is sensitive to external magnetic influences and can be damaged if handled incorrectly. Avoid contact between magnetic fields - for example from other motors or magnetic torches - and the magnetic scale tape on the axis.

Incorrect handling of linear motor axes with an optical measuring system can damage or scratch the glass scale, resulting in measurement errors. Always keep the glass scale clean and avoid direct contact. Use a lint-free cloth or cotton swab and cleaning spirit for cleaning.

Mechanical assembly

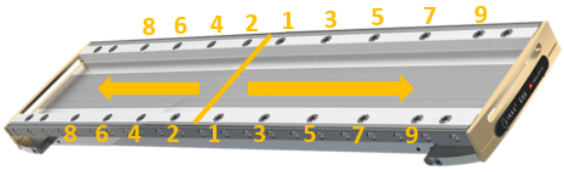
Protective gloves and suitable tools must be used for mechanical assembly.
The carriage of the linear motor axes must never be pulled off the rail. This will cause irreparable damage.
Additional applications are mounted using the threaded holes and locating holes provided for this purpose.

Tightening torques

Thread	Tightening torque [Nm]	Min. screw-in depth [mm]
M2.5	0.72	3.5
M3	1.28	3.3
M4	2.97	4.4
M5	6.03	5.5

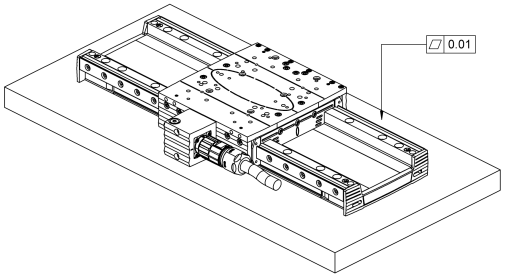
Coefficient of static friction µT = steel
Aluminium alloy dry
Strength class (screw) = 8.8

Tightening sequence during assembly



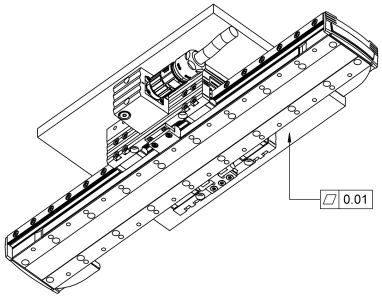
To ensure that the motor is not distorted when it is mounted on the base plate, it is important to follow the sequence when tightening the screws. The screws should be tightened starting from the inside, alternating left and right to the outside.

Flatness base plate



If the linear motor axes are mounted on a base plate, this must have a flatness of 0.01mm over a legth of 200mm. Otherwise, the linear motor axis can be distorted when screwed tight and the guides can jam. This increases wear, reduces lifetime and can damage the guides.

Flatness component assembly



The same requirements apply to the contact surface of components that are screwed onto the slide of a linear motor axis. This contact surface must have a flatness of 0.01mm over a legth of 200mm.

Flatness - practical test

Before assembly, check how smoothly the carriage can be moved by hand. Then tighten the screws and check the run again. There should be no noticeable difference. Otherwise, the contact surface must be reworked.

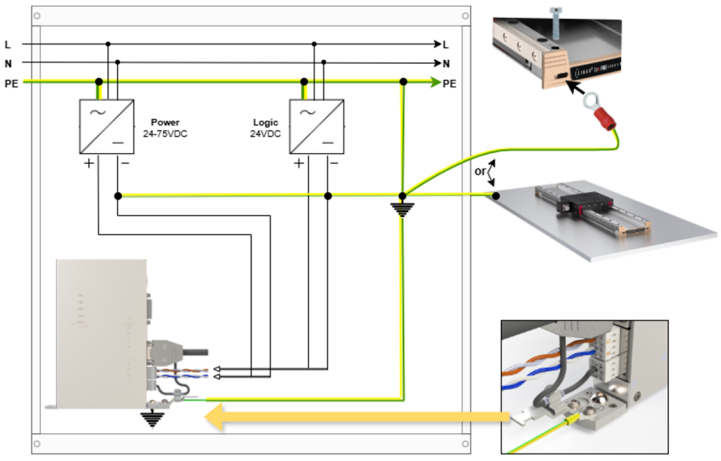
4.2 Electrical connections

Safety instructions for the power supply

A defective or incorrect power supply can cause irreparable damage to the machine.
The earthing cable must be always connected to the system.

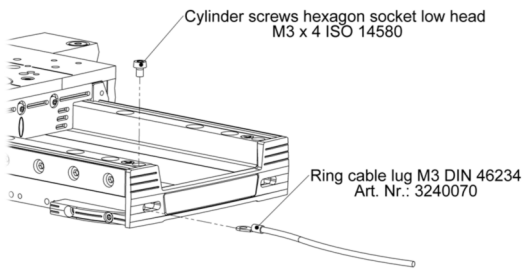
Never pull out the plug during operation! There is a danger to life and a risk of serious injury and damage to property.
Electrical connections must never be disconnected when energised. Switch off the power supply and wait at least 10 seconds before disconnecting.
The drives may only be connected to the specified power supply.
Plugs with a screw lock must be screwed on properly.
Only use original Jenny Science AG cables and do not make any modifications to them.

Earthing concept



To avoid damage to the guides due to potential equalisation currents, the following points must be observed during electrical wiring:

- The **0 volt** connection of the logic supply (pin 1) and the 0 volt connection of the power supply (pin 3) have to be connected to the ground/chassis star point of the switch cabinet.
- The **base plate** of the Lxs/Lxu motors must be connected to the GND/chassis star point of the switch cabinet.
- The **XENAX® servo controller** must be screwed onto a conductive background, which is connected to the GND/chassis star point of the switch cabinet. The motor cable must be connected to the shield clamp.



An earthing connection for an M3 ring cable terminal is located directly at the front of the axis.

4.3 Maintenance and servicing

Maintenance work must only be carried out when the axles are at a complete standstill. The axis must not be in control mode and must be disconnected from the power supply first.

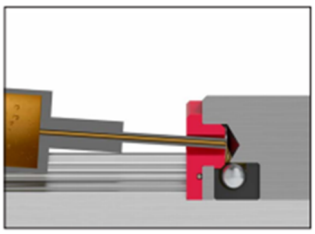
The linear motor system must not be immersed in liquids or sprayed for cleaning.

Cleaning

Coarse contamination must always be removed with a soft brush or oil-free compressed air. Depending on the environmental conditions, regular cleaning is necessary to prevent foreign particles from entering the guide system or electronics or settling on the magnetic plate.

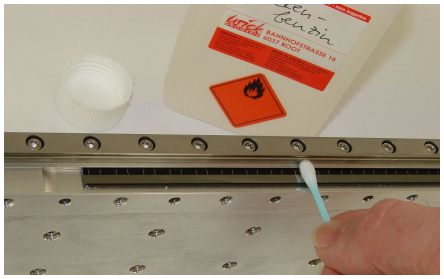
Lubrication of ball bearing guides

The axles are supplied with low-maintenance, pre-lubricated guide carriages. To ensure a long service life, relubrication with the original grease is recommended every 12 months or after every 5,000 km.



Clean the guides before lubricating. Relubrication is carried out using a dispensing-pistol and a suitable grease cartridge. Position the carriage so that you can reach the top and bottom, left and right. Now press the dispensing-pistol into the front needle hole (one for Lxu & two for Lxs) on the carriage and actuate the dispensing-pistol until grease is visible on the guide rail. Then move the carriage back and forth and remove the excess grease with a cotton bud, especially on axis with optical measuring system. If necessary, also clean the glass scale.

Cleaning the glass scale



If error “54, weak signal of read head” occurs, the glass scale is dirty and this can lead to incorrect measurements. Use a swap or lint-free cleaning cloth and a low-viscosity, degreasing cleaning agent such as cleaning petrol from a chemist or pharmacy.

4.4 Notes according to Machinery Directive 2006/42/EC

Shield	Location	Meaning
	Safety door in the area of the axis	Respect of minimum distance with pacemakers or implanted defibrillators

The linear motor axis from Jenny Science AG contains permanent magnets.
People with implants that can be magnetically influenced or with prostheses that contain ferromagnetic components are at risk due to the magnetic fields that occur (>0.5mT) and must ensure a safety distance of at least 1m.

Shield	Location	Meaning
	Safety door in the area of the axis	Warning of megnetic field

Due to the high magnetic field strengths, large attractive forces occur particularly in the immediate vicinity (distance approx. 50 mm) of the magnetic tracks. It must therefore be strictly ensured that objects made of steel or iron (e.g. watches, rings, etc.) as well as technical devices (e.g. computers, credit cards, hard discs, etc.), which could be attracted, influenced or destroyed by the magnetic field, are not brought into this area with the free hand. An appropriate safety distance must be maintained.

Shield	Location	Meaning
	Safety door in the area of the axis	Warning of surface temperature up to 80°C

The surfaces of the motors can become hot during operation of the axis. The surface temperature of the motor can reach up to 80°C.
Monitoring devices and the error messages of the control units must be checked continuously. Switch off the motor if there are any changes compared to normal operation.

Noise level up to 70 dB(A)

5 Safety und enviroment

5.1 Safety together 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	Immunity for Functional Safety
IFA:2012	Functional safety of power drive systems
EN 61326-1, EN 61800-3, EN 50370-1	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	Radiated EM Field, Interference voltage
IFA:2012	Functional safety of power drive systems

5.2 Enviroment 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
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 40

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