

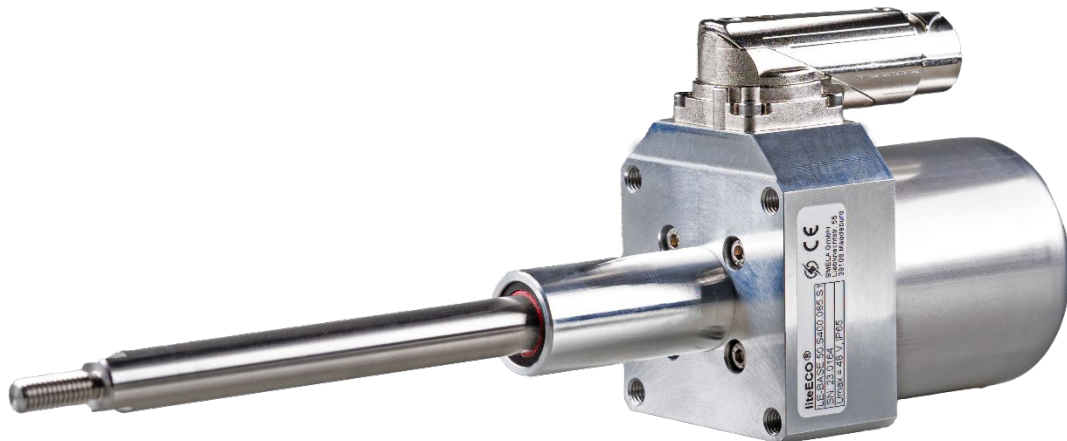


Installation declaration

(incl. assembly instructions according to EC Machinery Directive 2006/42/EC,
Annex VI for partly completed machinery)

liteECO® BASE Linearactuators

Linear Telescopic Electromechanical Concept



Note: The German assembly instruction is the original version. All documents in other languages are translations of the original version. SMELA GmbH reserves the right to make changes in the sense of technical improvements.

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1 Important basic information

1.1 General information on the Declaration of installation incl. assembly instructions

This document contains important information for safe and proper use of the SMELA linear actuators (hereinafter referred to as "product"). The instructions are thus an integral part of the product and must be kept accessible to personnel at all times. Before starting any work, the personnel must have read and understood these instructions. A prerequisite for safe working is the observance of all safety instructions in this manual.

The original of these instructions was written in the official language German. All other language versions are translations of the German instruction.

1.2 Content and structure

The content structure is oriented to the life phases of the product. SMELA reserves the right to make changes to the technical data. They may deviate in detail from the particular version of the device. The current status of the technical data can be requested from the manufacturer at any time. Any claims cannot be asserted on this basis.

1.3 Directives

The basic safety and health requirements of the applicable laws, directives were applied during execution. Safety is confirmed by the declaration of incorporation. All safety information in these mounting instructions refers to the laws and regulations currently applicable in Germany. In addition to the safety information in these mounting instructions, the regulations for accident prevention, environmental protection and occupational health and safety applicable at the place of use must be observed and complied with.

Procedure for carrying out the risk assessment for machines:

- Language of risk assessment: German
- Risk assessment: EN ISO 12100 Safety of machinery - General principles for design - Risk assessment and risk reduction, three-step iterative process for risk reduction in conjunction with Machinery Directive 2006/42/EC, Annex I, first general principle.

2 Security

2.1 Convention for safety instructions and symbols

The following signal words indicate dangers and prohibitions in the instructions depending on the severity of the possible consequences:

⚠ DANGER	
	<p>Danger to persons</p> <p>Failure to do so will certainly result in irreversible injury and even death.</p>

⚠ WARNING	
	<p>Danger to persons</p> <p>Non-observance can lead to irreversible injuries and even death.</p>

⚠ CAUTION	
	<p>Danger to persons</p> <p>Failure to do so may result in minor injury.</p>

⚠ NOTE	
	<p>Property damage</p> <p>Non-compliance can cause property damage.</p>

The following safety symbols indicate the type of hazard:



Property damage possible



Magnetic field



General danger



Risk of crushing



Electrical Voltage

2.2 Intended use of the machine

The product is intended for use in industrial and industry-related machines, plants and automatic machines for linear movements. Other possible applications must be discussed with the manufacturer in advance. The applicable guidelines for integration in systems and machines must be observed and complied with.

If a direct or indirect risk to persons cannot be ruled out, additional measures (e.g. cover, barrier, etc.) must be taken to minimize the risk potential accordingly. The device must not be used in areas where there is a risk of personal injury or in potentially explosive atmospheres.

The product is to be used within the scope of its technical data, which can be found in the latest product data sheet (Datasheet DS-LE-BASE).

The operator alone is liable for any damage resulting from non-intended use of the device. The manufacturer accepts no liability for personal injury or damage to property resulting from misuse or from procedural errors, non-intended operation and commissioning.

The device may only be operated by trained and authorized personnel in compliance with all safety instructions.

Safe and fault-free use and operational safety of the device are only guaranteed if the device is used as intended in accordance with the information in these installation instructions. Intended use includes observing and complying with all safety instructions in these mounting instructions as well as all applicable regulations of the employers' liability insurance association and the valid laws on environmental protection. Intended use also includes compliance with the operating instructions specified in these mounting instructions.

2.3 Non-intended use of the machine

A non-intended use is present when the product:

- is operated without safety devices,
- comes into contact with water and other liquids (IP protection tests not yet completed, as of 01.06.2023)
- is used in potentially explosive atmospheres.

Any use beyond the intended use or any other use is considered misuse.

2.4 Structural modifications

Carrying out structural modifications by means of conversions, alterations and reworking can impair the function or safety or cause damage to the product and are therefore not permitted.

2.5 Application area

Incorrect ambient and operating conditions may result in hazards from the product that can lead to serious injuries and considerable damage to property. Only use the product within its defined application parameters (see chapter 3). This includes especially the use in splash-proof indoor areas with sufficient ventilation to allow thermal convection for cooling.

2.6 General operator obligations

- The operator is obliged to use the device only in perfect and operationally safe condition. He must ensure that, in addition to the safety instructions in the installation manual, the generally applicable safety and accident prevention regulations, the specifications of DIN VDE 0100 and the environmental protection regulations of the respective country of use are observed and complied with.
- The operator is responsible for ensuring that all work with the device is carried out only by trained, safety instructed and authorized staff.
- The operator of the device or the staff authorized by him is in the end responsible for accident-free operation.
- The operator is responsible for compliance with the technical specifications, in particular for compliance with the static loads. Failure to comply with the static loads may result in loss of the support or holding function.

2.7 Requirements for the staff

- Every person who is assigned to work with the device must have read and understood the complete assembly instructions before carrying out the corresponding work. This also applies if the person concerned has already worked with such a device or has been trained for it.
- Any work on the device may only be carried out by trained, safety instructed and authorized personnel. Before starting any work, the staff must be familiarized with the dangers involved in handling the device.
- All persons may only perform work in accordance with their qualifications. The areas of responsibility of the respective staff must be clearly defined.
- Any staff assigned to work with the device must not have any physical limitations that temporarily or permanently impair attention and judgment (e.g., due to overtiredness).
- The handling of the device as well as all assembly, disassembly and cleaning work by minors or persons who are under the influence of alcohol, drugs or medication is not permitted.
- The staff must wear suitable personal protective equipment according to the work involved and the present working environments.

2.8 Warranty and liability

Warranty and liability claims are excluded in case of:

- Failure to observe the instructions for transport and storage
- Non-intended use
- Self-performed repair and maintenance work
- Improper installation and operation
- Operation of the product without or with defective protective devices
- Modifications or structural changes to the product

2.9 General safety instructions

⚠ WARNING



Permanently excited magnets in the actuator can cause hazards for persons with active and passive implants

→ Persons with pacemakers or implants must not be in the proximity of the magnetic field / actuator.

⚠ WARNING



Various surfaces can heat up strongly during operation and cause burns to the skin when touched.

→ Wear protective gloves when working near hot surfaces.
→ Make sure that all surfaces have cooled down to ambient temperature before starting work.

⚠ WARNING



As long as the power supply is switched on or residual energy is present in the system, components may move unexpectedly and cause injuries.

→ Before starting any assembly work on the actuator, the power supply must be switched off and secured against being switched on again.
→ Furthermore, it must be ensured that there is no residual energy in the system.

⚠ WARNING



Risk of injury due to loss of self-locking effect

→ Use an external brake to secure the plunger, the application and coupled loads in case of assembly or maintenance work.

⚠ NOTE



Loss of self-locking of the mechanical actuator components can also result in damage to the application including other devices and customer products.

→ Use a brake on the application.

3 Technical Data

3.1 Product variants and technical modifications

The device can be ordered in various configurations. The exact configuration of your device can be found on the delivery bill. This Declaration of Incorporation documents the data of all linear actuators of the liteECO® LE48 series offered up to the date of issue of this document. SMELA GmbH reserves the right to make changes in the sense of technical improvements, further developments and scaling of the product portfolio. The latest data can be found in the product data sheet (Datasheet DS-LE-BASE).

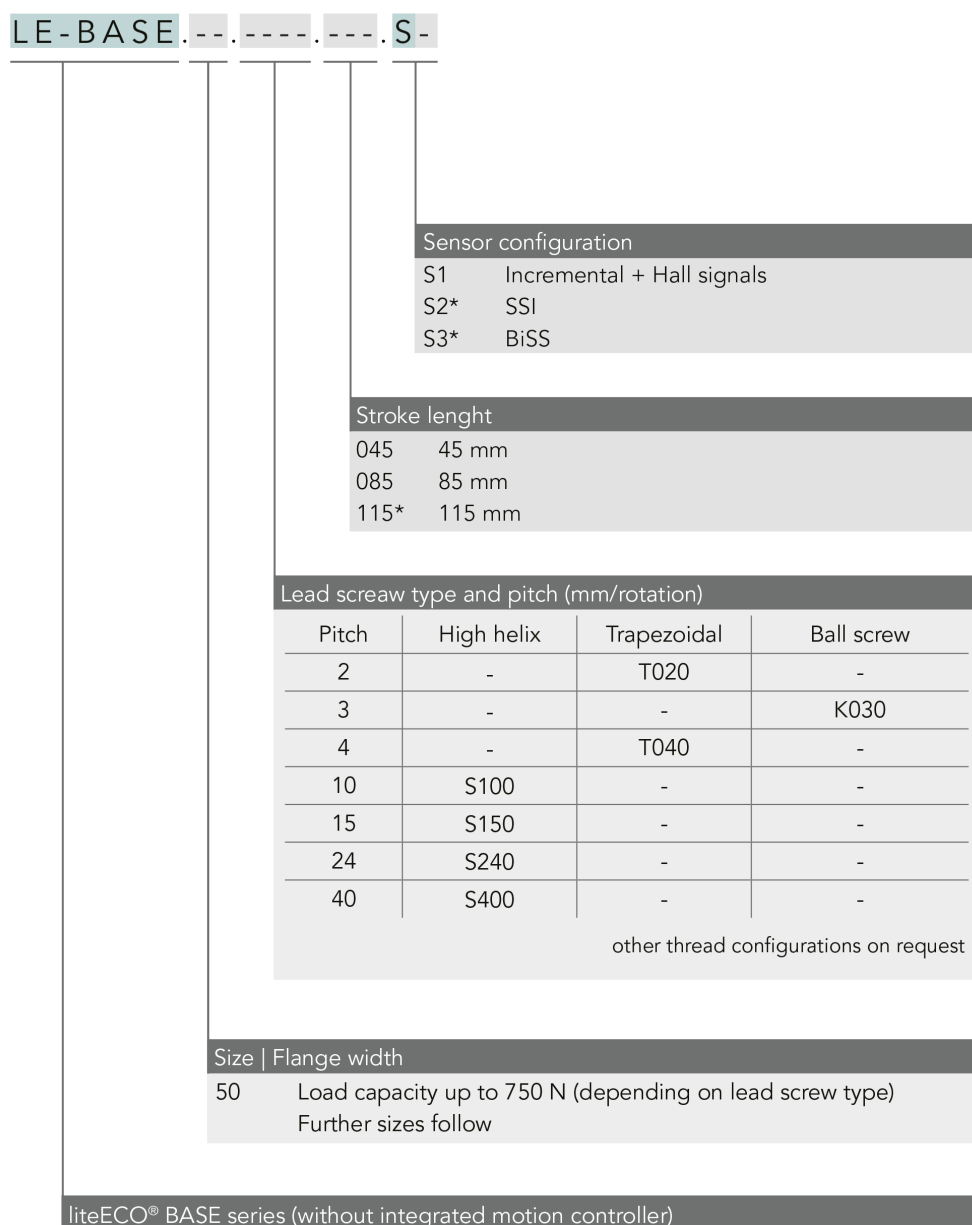


Figure 1: Possible Product-configuration, State: 06/2023, *planned configurations

3.2 General description and structure of the product

The product is an electromechanical linear drive or linear actuator which, due to its telescopic arrangement of motor and mechanics, forms a compact drive unit for generating linear movements. Integrated in the housing are a three-phase synchronous motor with a power transmission element (spindle/nut), position sensors and a hybrid connection which leads power and signal wires to the outside. Control and regulation must be performed via an external drive controller (not included in the product or scope of delivery).

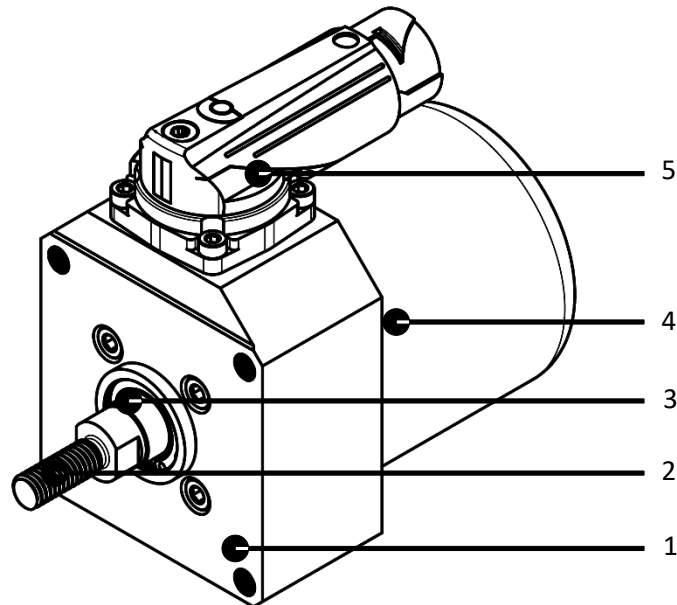


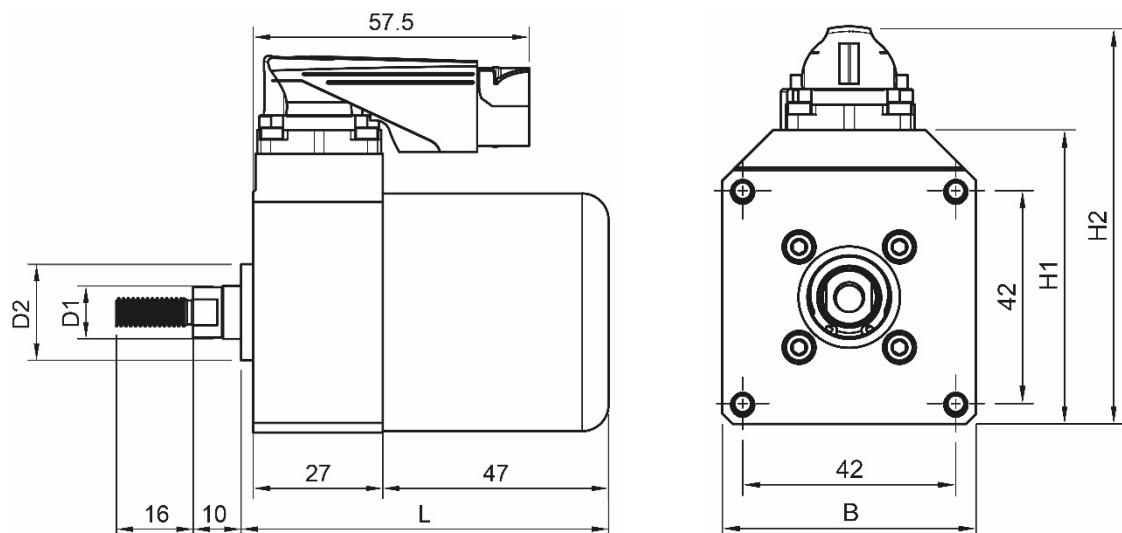
Figure 2: Components of the SMELA liteECO® BASE series

1. Flange for mounting in/on the customer application
2. Mounting option on the plunger
3. Moveable plunger
4. Actuator housing
5. Hybrid-connection for electrical supply and sensors

3.3 Technical Data, Dimensions

Table 1: Dimensions, coupling

Characteristics (depending on stroke length)	Stroke 045	Stroke 085	Stroke 115
Stroke S [mm]	45	85	115
Length L [mm]	77	117	147
Width B [mm]	50		
Height H1 [mm]	58		
Height H2 [mm]	78		
Centering collar D2 [mm]	Ø 20 x 2,5		
Diameter plunger D1 [mm]	Ø 11		
Thread on plunger	M6x16 (external thread)		
Width across flats for fixing the plunger [mm]	9		
Weight [g]	540	590	640
My, Mz (Transverse forces on the plunger) [Nm]	< 1		
Coupling / bolting on the flange Hole distance [mm]	42 x 42		
Mounting options (1) from the front into the flange (2) from behind through flange (3) Accessories (in the back of the flange)	4 x M5 Internal thread x Depth 13 mm 4 x M3 (as through hole) 4 x M4 Internal thread x Depth 12 mm		
Tightening torque (strength class 8.8) M3 [Nm] M4 [Nm] M5 [Nm]	1,3 3,0 6,0		
Hybrid connection (Power & Signal)	M15 Intercontec Itec 915, 15-polig, male angled (rotatable)		
Degree of protection	IP65 (in test phase)		
Materials (of the external components) Plunger Flange Cover Wiper ring (optional)	Stainless steel (1.4305) Aluminium Aluminium HPU (Hydrolysis resistant polyurethane)		



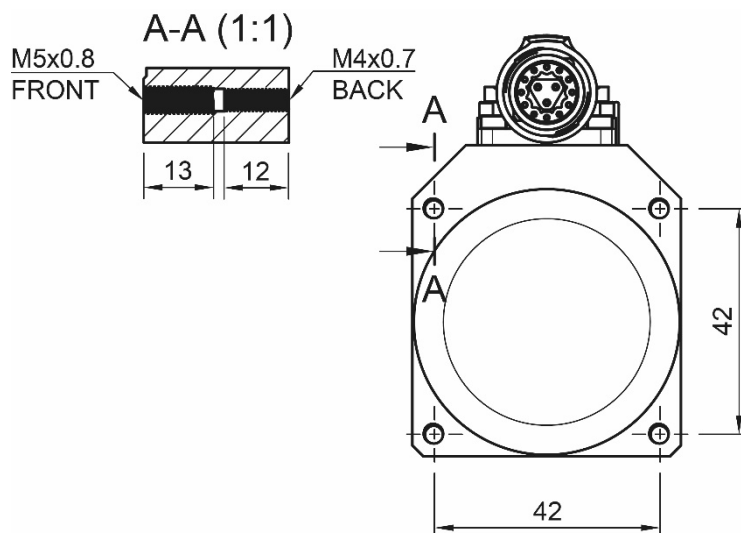


Figure 3: product dimensions

3.4 Mechanical performance data

The following maximum achievable performance data are based on the permissible load capacity for the thread pairs used and the motor. Limiting parameters are, among others, the static load capacity of the nut configuration, the permissible sliding speed and the permissible peak and nominal currents of the integrated servomotor (see following page). In practice, due to the reciprocal effects of influences, it may not always be possible to reach the limit values and never at the same time. Any increase in the load leads to a reduction in the permissible sliding speeds and vice versa. Please do not hesitate to ask us about the technical feasibility of your motion profiles.

Table 2: Mechanical performance data

Lead screw configuration	Limit load capacity ¹⁾	Backlash ²⁾	Peak force ³⁾ / Peak current ³⁾	Nom. force ⁴⁾ / Nom. current ⁴⁾	Max. speed ⁵⁾	Max. acceleration ⁶⁾	Positioning time ⁷⁾
	N	mm	N / A	N / A	mm/s	m/s ²	ms
High helix							
S100	300	approx. ±0,1	300 / 12	125 / 5	500	25	120
S150	300		200 / 12	83 / 5	750	37,5	85
S240	260		125 / 12	52 / 5	1.200	60	65
S400	140		75 / 12	31 / 5	2.000	TBD	TBD
Trapezoidal thread							
T020	500	approx. ±0,1	500 / TBD	500 / TBD	50	TBD	TBD
T040	500		500 / TBD	313 / TBD	100	TBD	TBD
Ball screw							
K030	750	approx. ±0,05	417 / TBD	417 / TBD	135	TBD	TBD

3.5 Electrical performance data

Table 3: Electrical performance data

	Symbol	Unit	
General			
Nominal voltage ⁸⁾	U_N	V	24 to 48
Operating temperature ⁹⁾	T_{amb}	°C	+5 to +40
Internal temperature limit ⁹⁾	$T_{int,max}$	°C	+90
Motor feedback Measurement system Interface Resolution (increments quadcounts)			Optical (rotative, singleturn) Incremental, Hall, SSI*, BiSS* 1.024 4.096 higher resolutions*
Motor parameters			
Max. permissible speed (equal to no-load speed at 24 V) ⁸⁾	$n_{max} = n_0$	min ⁻¹	3.025
Max. acceleration ⁶⁾	α_{max}	rad/s ²	16.610
Max. motor phase current ³⁾	I_{max}	A	12
Thermal time constant (winding) ¹⁰⁾	$T_{th,w}$	s	20
Nom. current ⁴⁾ poor thermal connection ¹¹⁾ good thermal connection ¹²⁾	$I_{N,wc}$ $I_{N,nc}$	A A	3 5
Max. torque (at I_{max})	M_{max}	mNm	750
Torque constant	k_M	mNm/A	62,5
Speed constant ¹³⁾	k_n	min ⁻¹ /V	126
Terminal resistance ¹⁴⁾	R_S	mΩ	585
Terminal inductance ¹⁴⁾	L_S	μH	300
Electrical time constant ¹⁴⁾	T_{el}	ms	0,512
Number of pole pairs	Z_P	-	7
Rotor inertia ¹⁵⁾	J	g · cm ²	455

Footnotes:

* Planned, on request

1) Limit load capacity: max. static force and axial load capacity of the internal mechanics; exceeding loads are not permissible and must be absorbed by external mechanics or brakes

2) The backlash is wear-dependent, the wear is dependent on load and dynamics

3) Maximum permissible force and the corresponding proportional phase power must not be exceeded in order to protect the internal mechanics. The max. phase power of the rotary motor I_{max} may furthermore be applied for max. 20 seconds in order not to exceed the internal limit temperature starting from an initial temperature of the actuator of 20°C

4) Permissible permanent nom. force / permissible nom. phase current not to exceed the internal limit temperature at an ambient temperature of 20 °C. Determined by a slow and permanent movement under load (quasi-static method) for the normal case, i.e. the connection of the actuator to a metal body with a thermal contact resistance to air of 1,7 K/W. In case of a worse thermal coupling, limit to the nom. current of the worst case.

5) The max. speed depends on voltage. The applied voltage (conductor-conductor) may be up to 48 V. The characteristics shown refer to a nom. voltage of 24 V (at the actuator);

6) During braking (negative acceleration), energy is generated and fed back into the DC link; if the DC link is not capable or regenerative braking, care must be taken to ensure that the intermediate capacitance is adequately dimensioned and that an additional braking resistor is used

7) Over the stroke of 45 mm (shortest configuration) with a rated voltage of min. 24 V (at the actuator), without load

8) The applied voltage (conductor-conductor) can be up to 48 V. The characteristic data refer to a nominal voltage of 24 V (at the actuator); The actual voltage at the actuator can deviate from the DC link voltage and depends, among other things, on the frequency converter used (voltage utilization) and the length of the connection cable

9) Max. permissible ambient temperature; The internal limit temperature must not be exceeded

10) The max. phase current I_{max} is to be applied for a duration of max. $T_{th,w}$ in order not to exceed the internal limit temperature of $T_{int,max}$ starting from an initial temperature of the actuator $T_{int} = T_{amb} = 20^\circ\text{C}$

11) With thermal insulation (actuator horizontal in static air at 20°C, 80% humidity, thermal contact resistance to air = 5 K/W)

12) When connected to a metal body with a thermal transfer resistance to air of 1.7 K/W

13) Related to measured peak voltage, no RMS value, phase to phase

14) Phase to phase; without taking into account connecting cables between actuator and drive controller; measured at 1 kHz, 1V rms

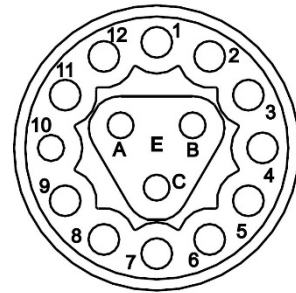
15) Calculated value without linear unit

3.6 Electrical connection

The electrical connection to a motion controller or a control unit is made via the hybrid connector Intercontec Itec 915, which leads power and signal lines bundled from the actuator. The pin assignment is listed in Table 4.

Table 4: Pin-assignment sensor configuration S1 Intercontec Itec 915, Stifte (male) – actuator side

Pin assignment at actuator for sensor configuration S1	
Pin	Function
1	5 V (Sensor)
2	GND (Sensor)
3	Enc A
4	Enc <u>A</u>
5	Enc B
6	Enc <u>B</u>
7	Enc Z
8	Enc <u>Z</u>
9	Hall Sensor 1
10	Hall Sensor 2
11	Hall Sensor 3
12	GND (Sensor)
A	Motor Phase 1
B	Motor Phase 2
C	Motor Phase 3



4 Transportation & Storage



4.1 Packaging

Dispose of the packaging materials at the designated disposal point.

4.2 Transportation

Ensure proper transport securing to avoid damage to the product.

Transport the products at a minimum of -20°C and a maximum of $+50^{\circ}\text{C}$. In case of strong climatic changes, make sure that the products warm up slowly and avoid condensation.

 WARNING	
	<p>Suspended loads or unsecured stacked objects can cause injuries when falling down</p> <ul style="list-style-type: none">→ Avoid standing under suspended loads.→ The product and other objects must be properly secured before transport, e.g. with straps.

4.3 Storage

The product must be stored in the original packaging at a temperature range of $+5^{\circ}\text{C}$ to $+40^{\circ}\text{C}$.

The environment must be dry, dust-free and low in vibration.

5 Mounting and installation, initial commissioning

Before starting any work, read and observe all the following safety instructions as well as all the safety instructions in Chapter 2.


5.1 Mounting and installation

Fasten the product exclusively to the drill holes provided for this purpose on the flange plate (see figure 2) using screws of strength class A2-70 and the tightening torques recommended for this purpose.


The coupling to the components to be moved is made via the M6 external thread of the tappet. The coupling may differ depending on the configuration. Please refer to your delivery note for the exact type.

The use of screw locking adhesive is recommended to secure the screws.


⚠ WARNING

	<p>Voltage-carrying parts lead to electric shocks when touched, with the possible consequence of serious injuries or even death.</p> <ul style="list-style-type: none"> → Only allow electrical work to be carried out by authorized specialists. → Before starting electrical installation work, check according to the safety rules of electrical engineering: <ul style="list-style-type: none"> ○ Unlock ○ Secure against restarting ○ Check that no voltage is present ○ Ground and short-circuit ○ Cover neighbouring and voltage-carrying parts → Carry out electrical work only in dry environments and not in damp conditions
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⚠ WARNING




	<p>Improperly routed cables can be damaged and cause electric shock.</p> <ul style="list-style-type: none"> → The maximum cable length between motor and control electronics must not exceed 5 meters. → Consider the bending radius (static 40 mm, dynamic 80 mm) of the supplied SMELA cable. → The SMELA cable must not be twisted by more than 30 °/m. → The SMELA cable must not be subjected to more than 30 N tensile load. → All electrical cables must not be subjected to crushing.
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⚠ WARNING

	<p>Risk of injury due to incorrectly dimensioned mountings. Breakage or separation of mechanical connections may result in crushing or hitting of persons or individual parts of the body.</p> <ul style="list-style-type: none"> → Use holding fixtures dimensioned for the expected forces and suitable fastening material. → The application-side mounts must also be dimensioned for the expected forces.
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⚠ NOTE

	<p>Improper assembly may damage the product</p> <ul style="list-style-type: none"> → The product should be securely bolted to flat surfaces or substructures that bear the load from the product (actuator) and the customer's application. → The linear actuator must be aligned exact axially to the application to avoid transverse forces on the plunger and wear of the internal mechanical components. → Torsional/bending moments (see product description), impacts and shocks on the plunger must also be avoided.
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⚠ NOTE	
	<p>Damage to the device due to improper electrical connection.</p> <ul style="list-style-type: none"> → Pay attention to the phases and control voltages specified in these instructions and in the operating instructions of servocontrollers. → Reversing the polarity or using different voltage levels can damage the components.
⚠ NOTE	
	<p>Torsional forces on the plunger can damage the internal mechanics and the optionally integrated anti-rotation device.</p> <ul style="list-style-type: none"> → When coupling the application to the external thread of the tappet tip, use suitable tools for screwing. → Make absolutely sure that the (optional) integrated anti-rotation device is relieved by fixing the plunger (countering) with a suitable tool.
⚠ NOTE	
	<p>Screws screwed too deeply into the actuator flange can cause damage to the housing with possible consequential damage to the internal actuator components.</p> <ul style="list-style-type: none"> → The fastening screws should only be screwed in up to the maximum screw-in depth described in the data sheet/product. → Similarly, the minimum screw-in depth should not be fallen short of in order to guarantee sufficient fastening. → Take into account the thickness of the carrier material to which the actuator is fastened.

5.2 Commissioning / Operation

Operate the product only in compliance with all safety instructions in this manual and within the limits of the technical data (see latest data sheet DS-LE-BASE).

We will be pleased to assist you with the selection and appropriate parameterization of the servo controllers.

The following section provides an overview of the requirements for the servo controller and the necessary basic settings.

5.2.1 Requirements for the servo controller

Use a positioning controller with the following requirements/functions:

- Suitable for low inductance drives
- Commutation systems:
 - Commutation takes place via the Hall sensors
 - Alternatively, commutation can be done via the incremental encoder (adjustable offset of the index track and referencing may be required)
- Position control with subordinate speed and current control
- Possibility to reference the linear absolute position for feedback position control by adjustable power threshold (driving on block, homing)
- Optional: connection of external end position switches / sensors

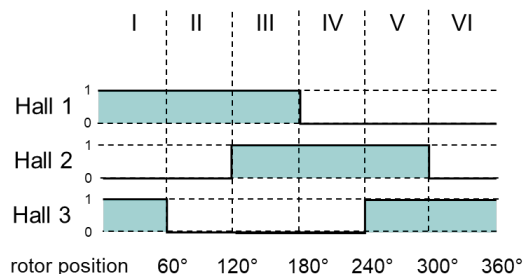
5.2.2 Motor parameters for servocontroller

The characteristic data required for parameterization of the motion controller can be found in these instructions or in the latest product data sheet (DS-LE-BASE). Ask us for the latest version.

5.2.3 Block commutation in conjunction with hall sensors

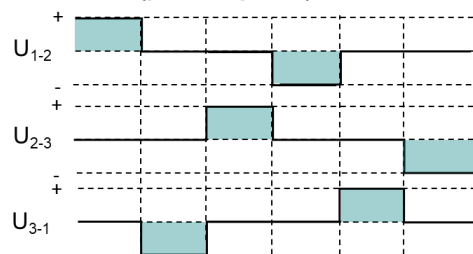
The built-in Hall sensors provide the information for commutation of the motor windings of a brushless servomotor. The correct wiring of both the Hall sensors and the motor windings is essential for the correct function of the actuator / motor.

Commutation phases



Due to the manufacturer-specific definition of the Hall sensor polarity, the Hall sensor signals may have to be inverted. The same applies to the control and incremental encoders used for this purpose. The inversion can be achieved by a corresponding configuration of the positioning control used.


Voltage at the Motor (phase – phase)





For liteECO® actuators, a clockwise rotation (top view flange) is generated as standard for the positive current setpoints and the plunger is moved out to the front.


Figure 4: Diagram of the block commutation

⚠ ATTENTION:	The plug may only be inserted when the device is voltage-free and de-energized.
⚠ ATTENTION:	Please check the pin assignment and cable colors against the data sheet.
⚠ ATTENTION:	The cables, pin assignments (as well as technical data and firmware) may be subject to change by the manufacturers. SMELA assumes no liability due to defects caused by incorrect wiring.



⚠ NOTE	
	<p>If the actuator is strongly decelerated, the kinetic energy is released again. In 4 quadrant operation, the released kinetic energy is fed back into the intermediate circuit of the supply as electrical energy. If no other consumer draw this energy, the voltage in the intermediate circuit can increase and cause damage to electrical circuits.</p> <p>→ For protection use appropriate brake shopper or overvoltage protection modules.</p>

⚠ NOTE	
	<p>Moving the actuator or the plunger during the switch-on or initialization process can lead to faulty control and malfunctions.</p> <p>→ After the switch-on process, the actuator must not be moved to avoid errors in the indexing of the encoder system.</p> <p>→ As soon as the regulation is active and the encoder system supplies valid position values, the motor can have moved again.</p>

⚠ NOTE	
	<p>The SMELA liteECO® actuators can be operated with different servocontrollers. If the parameterization is incorrectly matched, the actuator and the servocontroller may be damaged.</p> <p>→ Make sure that the parameters of the drive components match each other.</p> <p>→ If necessary, make software adjustments and limitations to protect the system.</p> <p>→ If you have any questions about parameterization please contact our service department.</p>

⚠ NOTE	
	<p>Abrupt overrunning of the minimum and maximum position of the actuator with coupled loads can lead to damage to the integrated mechanics or the entire actuator.</p> <p>→ The stroke of the actuator including coupled load must be limited by stops or buffers in the end positions.</p> <p>→ Sufficient dimensioning of the end stops must be ensured in order to absorb the kinetic energy of the moving loads and high speeds.</p>

6 Malfunctions, troubleshooting and elimination

 HINWEIS	
	<p>A change in operating behavior may be an indication of malfunctions or damage to the actuator or the entire drive system.</p> <p>→ The actuator should only be put back into operation after the cause of the fault has been eliminated.</p>

Fault / error message	possible cause(s)	Remedy
Actuator does not move or moves only sporadically	Incorrect connection/pin assignment	Check the pin assignment using Table 4
	Cable break or pin pressed in at the connector	Testing the individual wires for signal plausibility at the end of the assembled cable
	Sensor signals are not read out correctly	Check the signal flows and parameterization on and in the servocontroller, especially the max. linear travel in the controller.
	Servocontroller incorrectly parameterized or defective	
	Internal mechanical breakage of mechanical transmission links	In case of suspicion, please contact SMELA customer service
High operating temperature	Too high power demand via servocontroller	Limit the output power/current to the given performance data
	Defect of the mechanical transmission parts	In case of suspicion, please contact SMELA customer service
	Too high ambient temperature	Ensure sufficient cooling/ventilation
Strong operating noise	Defect or excessive wear of the mechanical transmission parts	In case of suspicion, please contact SMELA customer service
	Bearing damage	

7 Maintenance, refurbishment and disposal

7.1 Cleaning

Only clean the actuator with clean cloths and non-aggressive cleaning products. If your actuator has a wiper, the plunger will grease itself. Otherwise, a light greasing with an oil as corrosion protection is recommended.

7.2 Visual inspection

Check the actuator and the cables regularly for visible damage and proper operating behavior in order to avoid possible consequential damage.

7.3 Wear and Refurbishment

SMELA actuators operate with a threaded spindle and nut, made of different material pairings. Regardless of the service life, wear of the mechanics can occur due to high forces and dynamics (load-dependent). The wear leads to gearlessness, which may be undesirable for the application and cannot always be compensated by the position control without preload.

SMELA offers a refurbishment service in which the mechanics are renewed. Please contact our customer service: service@smela.com.

7.4 Disposal

Dispose the product at the designated disposal points and consider the different valid national regulations.