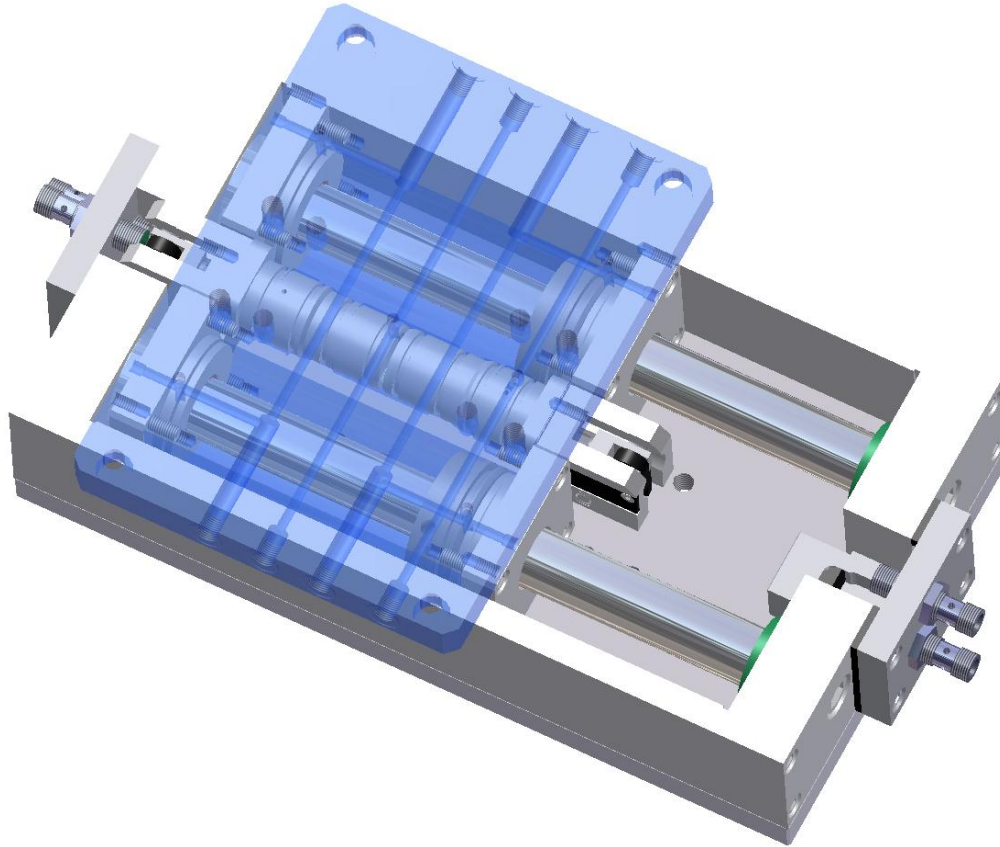


# TÜNKERS<sup>®</sup> Linear Unit



LE 60-100/200

## Operating Instructions

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**Please state the information given on type identification plates in case of any queries and when ordering spare parts!**

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## 1.0 Product Characteristics

- Robust housing of screw-mounted aluminium plates.
- Slide guide supported by 2 precision rods in 4 bronze bushings for maximum strokes of 200 mm.
- 2 pneumatic cylinders Ø 55 mm integrated into the slide table providing for sliding forces of up to 1750 N at 5 bar.
- End position sensing at both ends and end position locking.
- End position dampening as a standard with plastic buffer (optional: shock absorber).
- End position locking on both sides via toggle mechanism.
- Air supply connections G1/8 on both sides.
- Optionally equipped with guard plates on both sides (type "SB") for protection of the mechanics.

## 2.0 Safety Precautions

### Safety precautions to be observed by the user

These instructions contain the information required for the use of the products described herein as intended. They are directed towards technically qualified personnel.

“Qualified personnel” refers to persons over 18 years of age who, based on their qualification, experience, training and their knowledge of relevant standards, regulations, accident prevention regulations and operating conditions, have been authorised by the person responsible for the safety of the installation to carry out the respectively required work and are in a position to recognise and prevent possible hazards (Definition of skilled employees pursuant to IEC 364).

#### **Hazard Warnings:**

The following warnings serve the purpose of the personal safety of the operating personnel and the safety of the products described and connected devices.



**DANGER:** This means that there is an immediate danger to the life and health of the operator, if the corresponding safety measures are not taken.



**CAUTION:** Indicates a warning against possible damages to the machine or other material assets, if the corresponding safety measures are not taken.

- The linear unit is not designed as a ready-to-use tool assembly and is therefore not equipped with an independent safety device. Only through appropriate integration into a manufacturing system and the installation of a corresponding safety control will the technical safety requirements be met.
- Please read and observe these operating instructions closely prior to assembly and start-up of the linear unit.
- Do not reach into the working area of the linear unit!
- The linear unit is to be shut down immediately in case of any faults putting persons at risk.
- Do not operate the linear unit in any sort of way which would impair its safety!
- It is imperative that the pressure supply of the linear unit (pneumatic line) is disconnected prior to any work in the tool area!
- Maintenance work can only be carried out by relevantly trained personnel while the machine is resting.
- It is imperative that the safety equipment is refitted properly after completion of maintenance works.
- For reasons of safety, use ORIGINAL assembly groups and spare parts provided by the manufacturer only. Our defects liability guaranty shall cease, if non-TÜNKERS parts are used.

### 3.0 Assembly

- Installation of the linear unit by means of 4 flat fillister-head screws mounted to the slide or the lower plate.

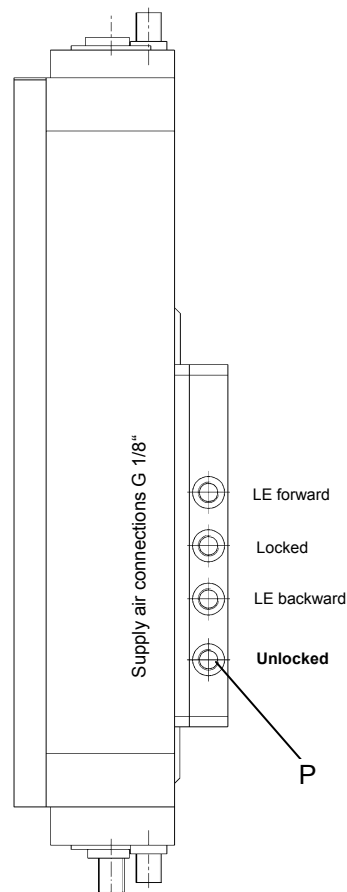


**CAUTION:** The linear unit is not factory-adjusted. This is to be considered in the construction and manufacture of the brackets/supports, respectively.

- Establish the connection to compressed-air supply between pneumatic control and linear unit (connections "P").



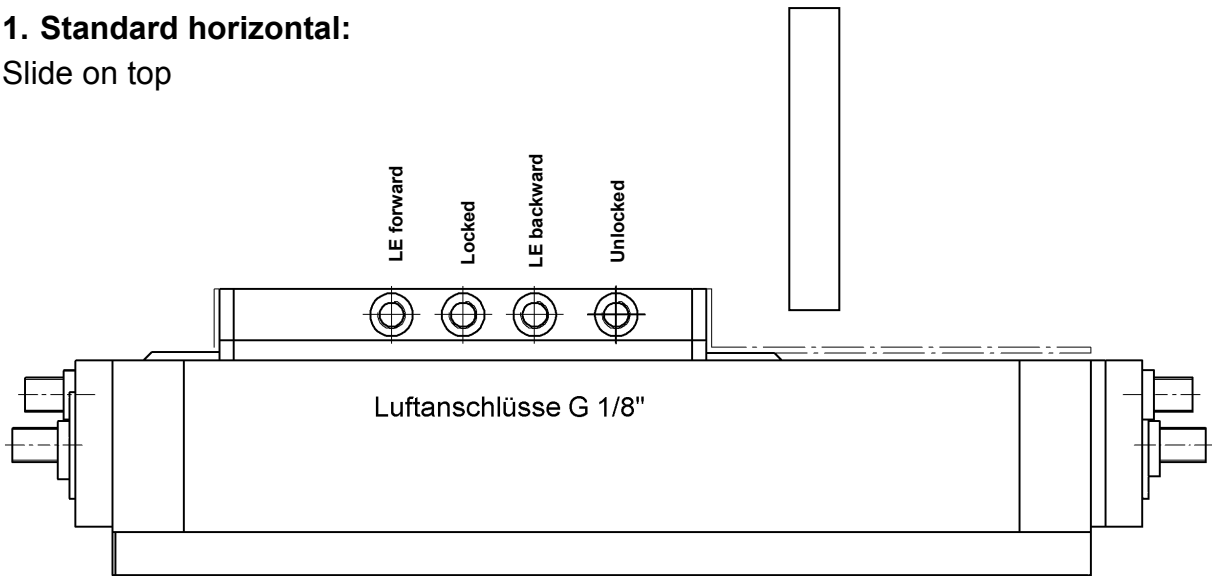
**CAUTION:** The use of external flow control valves is recommended for the fine-adjustment of the positioning process speed.



## 4.0 Installation Options

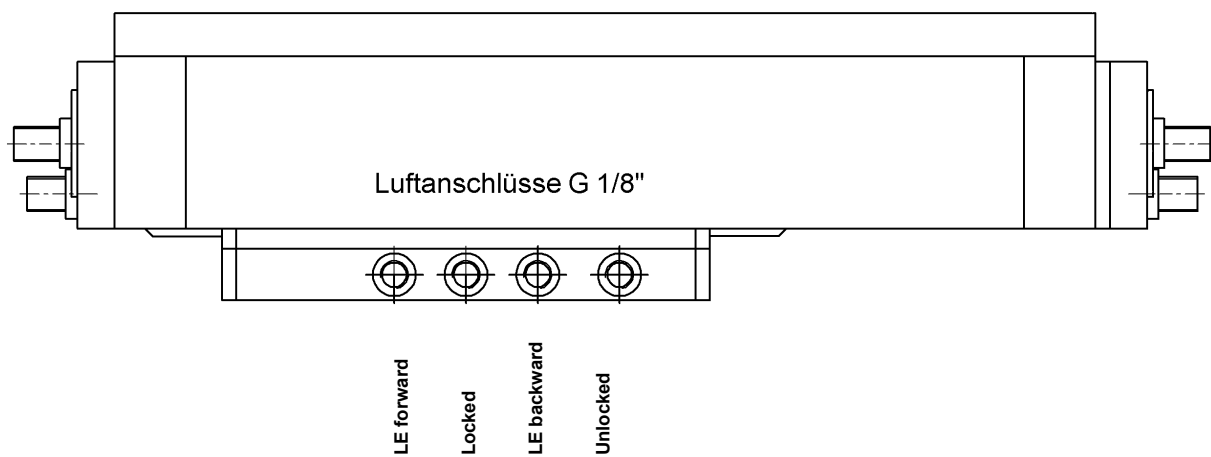
### 1. Standard horizontal:

Slide on top

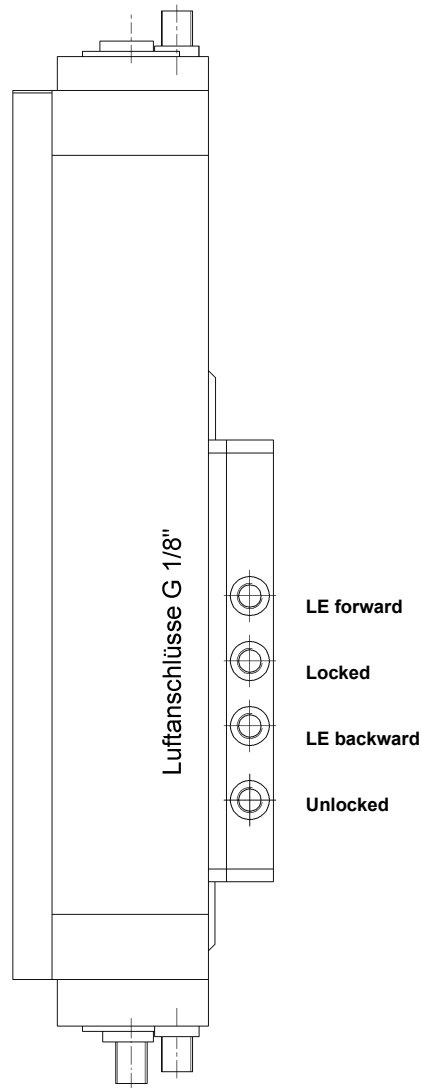


### 2. Overhead horizontal:

Slide at the bottom, mechanics are protected at the same time



**3. Vertical:**  
e.g. as lifting unit



## 5.0 Inductive Sensing System T02

Position and fasten electric coupling to connecting plug M12x1 in accordance with the electric design of the linear unit.



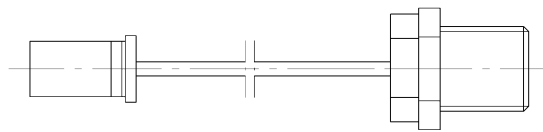
**CAUTION:** The operation with incorrect or excessive voltage can cause short circuiting and damage to persons.

Functional checks of the integrated LED as follows:

green..... Operating voltage  
 yellow.....End position left and clamp locked at left  
 yellow.....End position right and clamp locked at right

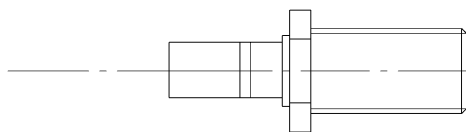
### Replacement of the sensing system

- Dismantle sensing system by removing the fixing nuts.
- Install new sensing system (sensing distance 1 mm) and verify the functioning of the switches (see circuit diagram "MZ.. T02").



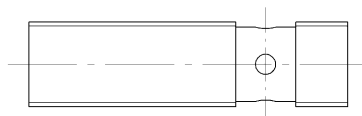
**Art.-No. 276668**

for shorter strokes  $\leq 80$  and/or  $\leq 180$



**Art.-No. 240221**

Standard until 2009



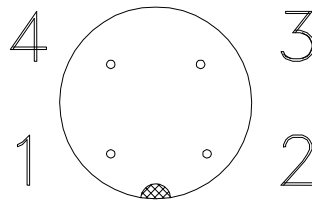
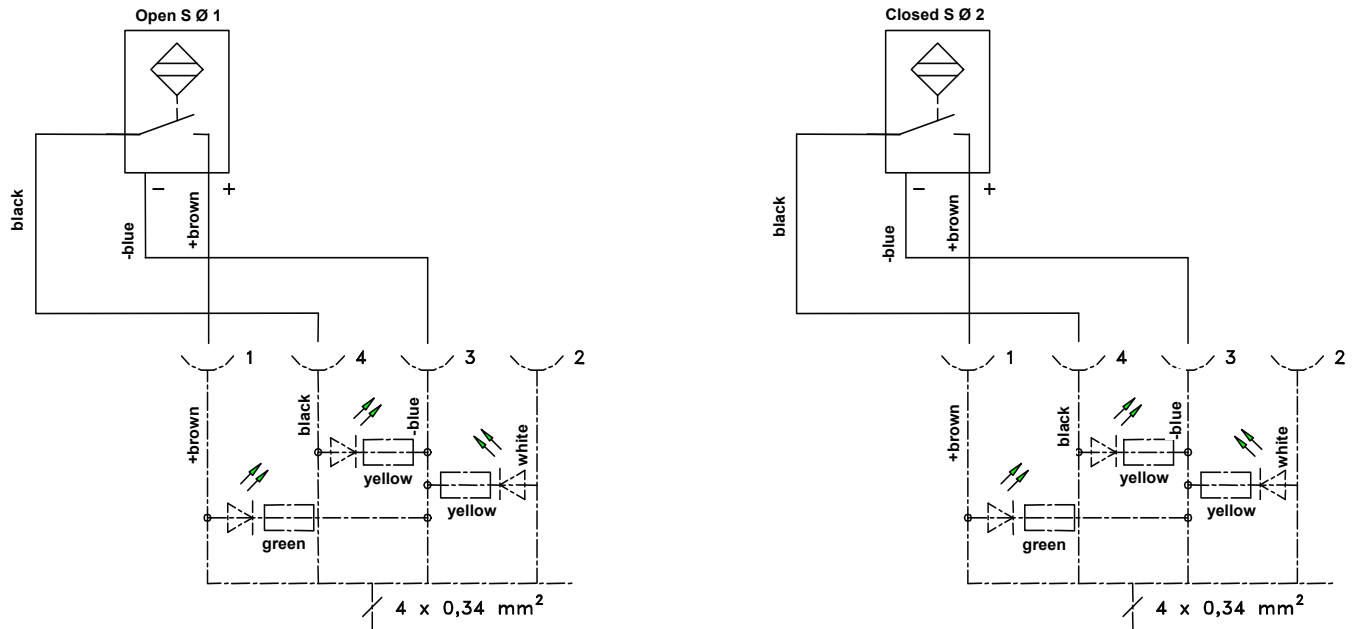
**Art.-No. 276035**

Standard as of 2009

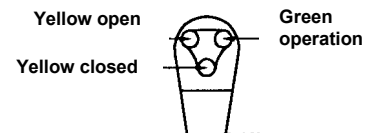


## 6.0 Circuit Schemes

### Circuit scheme MZ... T02:



#### LED layout



Electric specifications for voltages of up to 30 V:

Resistive load	3 A
Lamp load	1.5 A
Inductive load	3 A

Protection class IP 67

**Right-angled coupling with 3 LEDs WK 4 - 05**

## Pneumatic Circuit Schemes:

### for strokes $\geq 40$ mm:

Before the start of the linear unit in direction FORWARD respectively BACKWARD unlock the Toggle-Lock Clamp (air connection **UNLOCKED**).

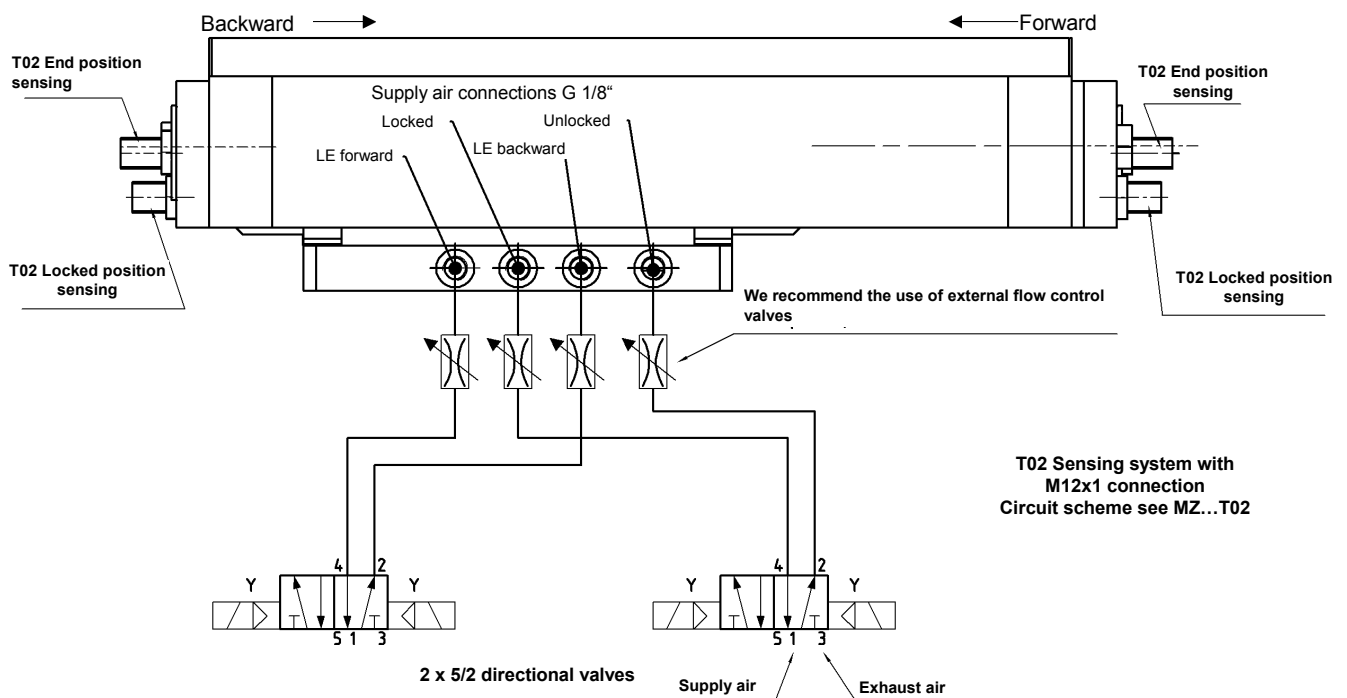
**Attention:** To open the lock, the lifting cylinder must press into the respective end position! The lock locks when the lifting cylinder is working against the lock.

Drive the linear unit up to the end stop (air connection **LE – FORWARD** respectively **LE – BACKWARD**).

Lock the Toggle-Lock Clamp (air connection **LOCKED**).

Both Toggle-Lock Clamps type VRL lock and unlock at the same time.

Sensing T02 of the Toggle-Lock Clamp is switched in the locked position.



**for strokes < 40 mm:**

Before the start of the linear unit in direction FORWARD respectively BACKWARD both Toggle-Lock Clamps must be unlocked (air connections **Clamp 1 + 2 UNLOCKED**).

**Attention:** To open the lock, the lifting cylinder must press into the respective end position! The lock locks when the lifting cylinder is working against the lock.

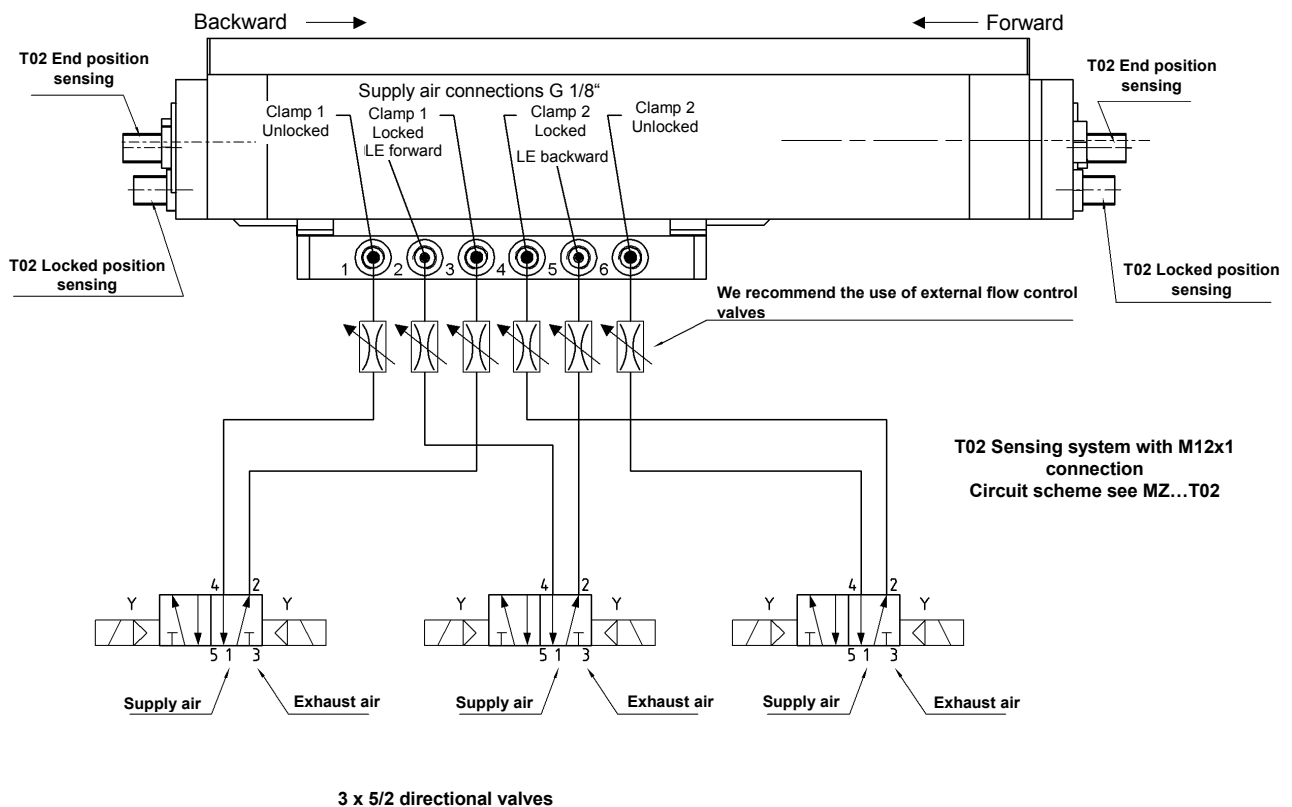
Drive the linear unit up to the end stop (air connection **LE – FORWARD** respectively **LE – BACKWARD**).

Clamp 1 is locking and Clamp 2 is unlocked (direction FORWARD).

Clamp 2 is locking and Clamp 1 is unlocked (direction BACKWARD).

Both Toggle-Lock Clamps are controlled separately. There is one Clamp locked and one Clamp unlocked in the respective end position.

Sensing T02 of the Toggle-Lock Clamps is switched in the locked position.



## 6.0 Maintenance

The linear unit is equipped with low-maintenance bearings and guidings.

The carriage housing is totally enclosed. Special maintenance is not necessary.

We recommend to clean the visible guide rods every 6 months and grease them slightly with BP-LS-EP00. The inner parts and the toggle-lock clamp should only be lubricated with BP-LS-EP00 after disassembly e.g. when replacing sealings.



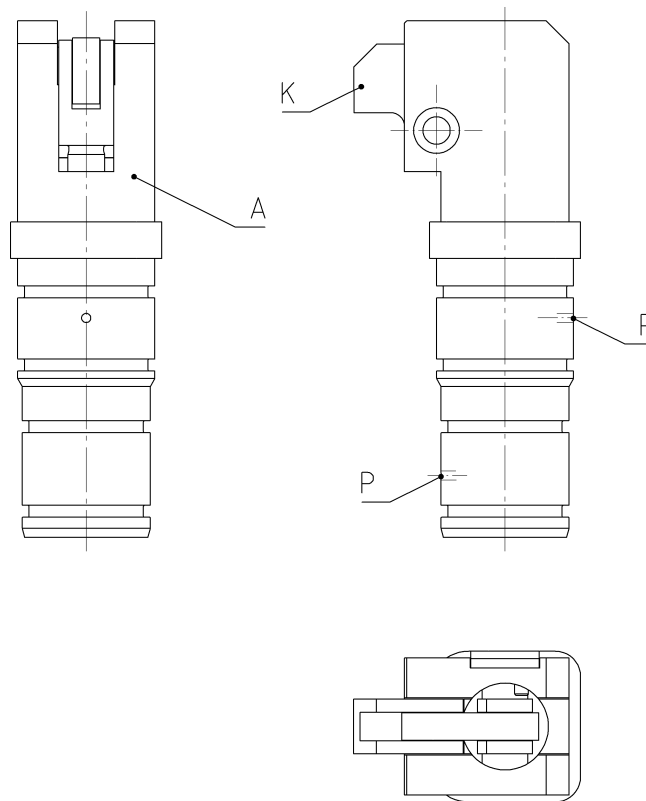
Cleaning with a steam-jet or solid carbon dioxide causes damage to the linear unit.

## 7.0 Toggle-Lock Clamp for Linear Unit LE 60



## 7.1 Product Characteristics

- Compact clamp in cartridge design with toggle mechanism.
- Toggle-locked (holding torque 54 Nm).
- Housing in monoblock design “A” of high-strength aluminium material.
- Integrated pneumatic cylinder Ø 20 mm.
- Air connections “P”, compressed-air supply via pneumatic control.
- Clamp in short design “K”.
- For max. operating pressure of 6 bar.



## 7.2 Safety

The toggle-lock clamp is not designed as a ready-to-use tool assembly and is therefore not equipped with an independent safety device. Only through appropriate integration into a manufacturing system and the installation of a corresponding safety control will the technical safety requirements be met.

The toggle-lock clamp is to be shut down immediately in case of any faults putting persons at risk.

Maintenance work can only be carried out by relevantly trained personnel while the machine is resting.

## 7.3 Assembly

- Anti-rotating installation of the clamp to the boreholes of the linear unit; mount 2 covers right and left with flat fillister-head screws to the linear unit.
- Establish connection to pressurised-air supply between pneumatic control and linear unit (connections "P", see 7.1).



The use of external flow control valves is recommended for the fine-adjustment of the positioning process speed.

## 7.4 Toggle-Lock Clamp Set-Up

- Close the clamp. The toggle-joint must audibly move into over-center position. The clamp is positioned at an angle of 90° to the housing.



**CAUTION! Danger of Crushing!**

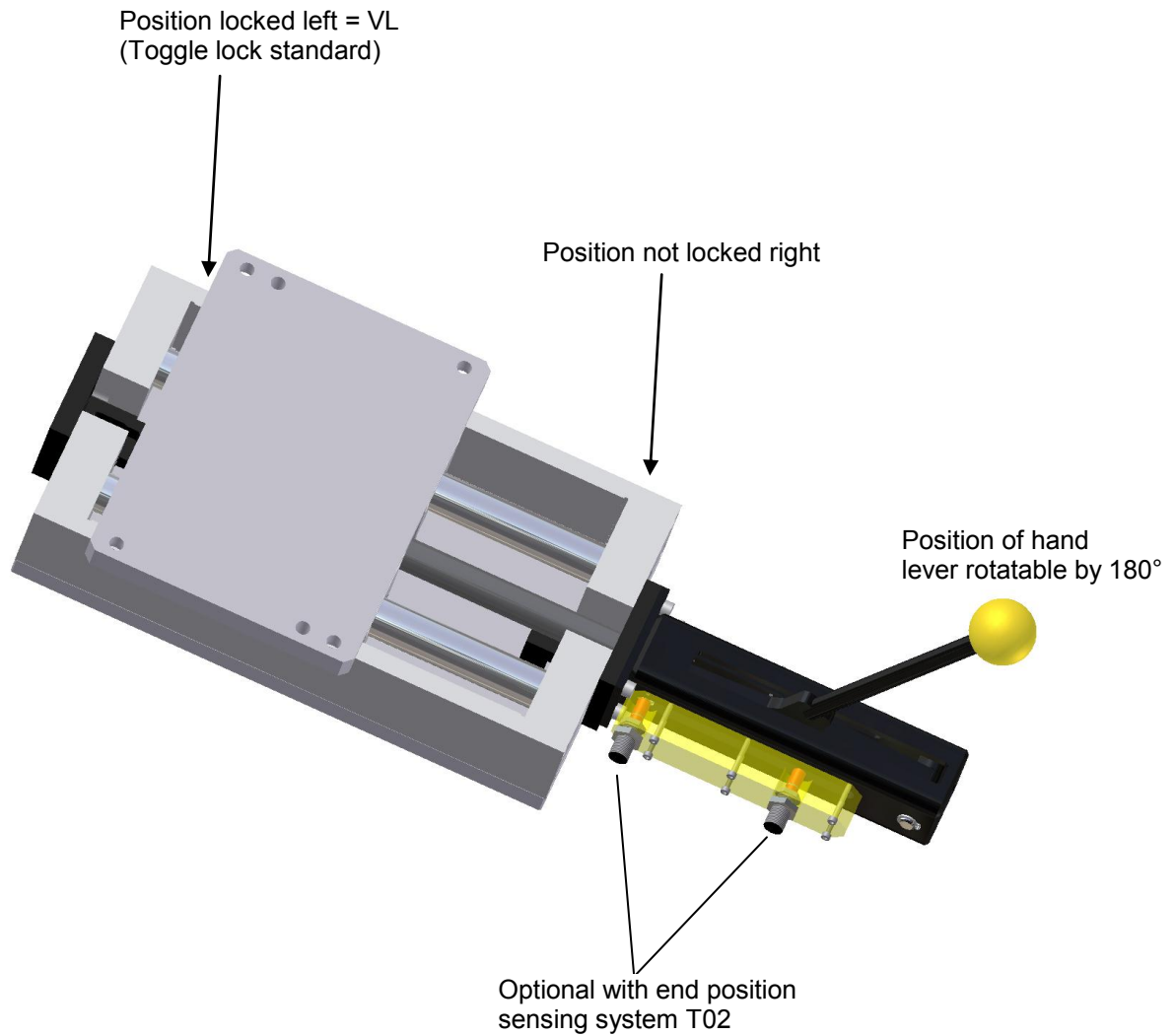
Fingers can be severed or crushed when setting up the clamp “K” (see 7.1). Do not reach into the swivel area of the clamp arm.



**CAUTION!** This clamp type is equipped with a toggle-lock, i.e. indefinite clamping forces can be generated in the end position. Wrong set-up with excessive preloading can therefore lead to premature wear of the toggle mechanism. Indication for excessive preloading: The clamp does not open any more and/or opens with delay after pressure build-up in the cylinder.



## 7.5 Manually Operated Linear Unit Type MLE 60-Stroke-(SB)-T02



Dimensions and load see data sheet "LE 60".  
Design and dimensions as to custom strokes upon request.