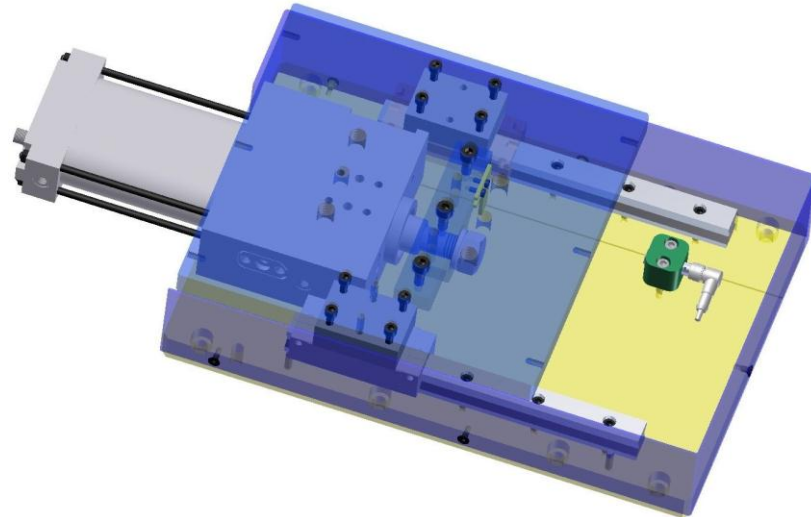
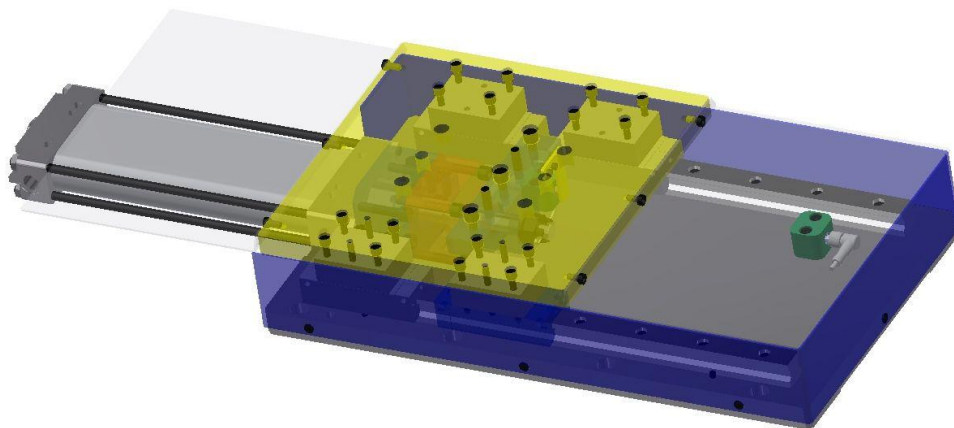


TÜNKERS[®] Linear Unit



LE 100/200



LE 100/200 VRL

Operating Instructions

Contents

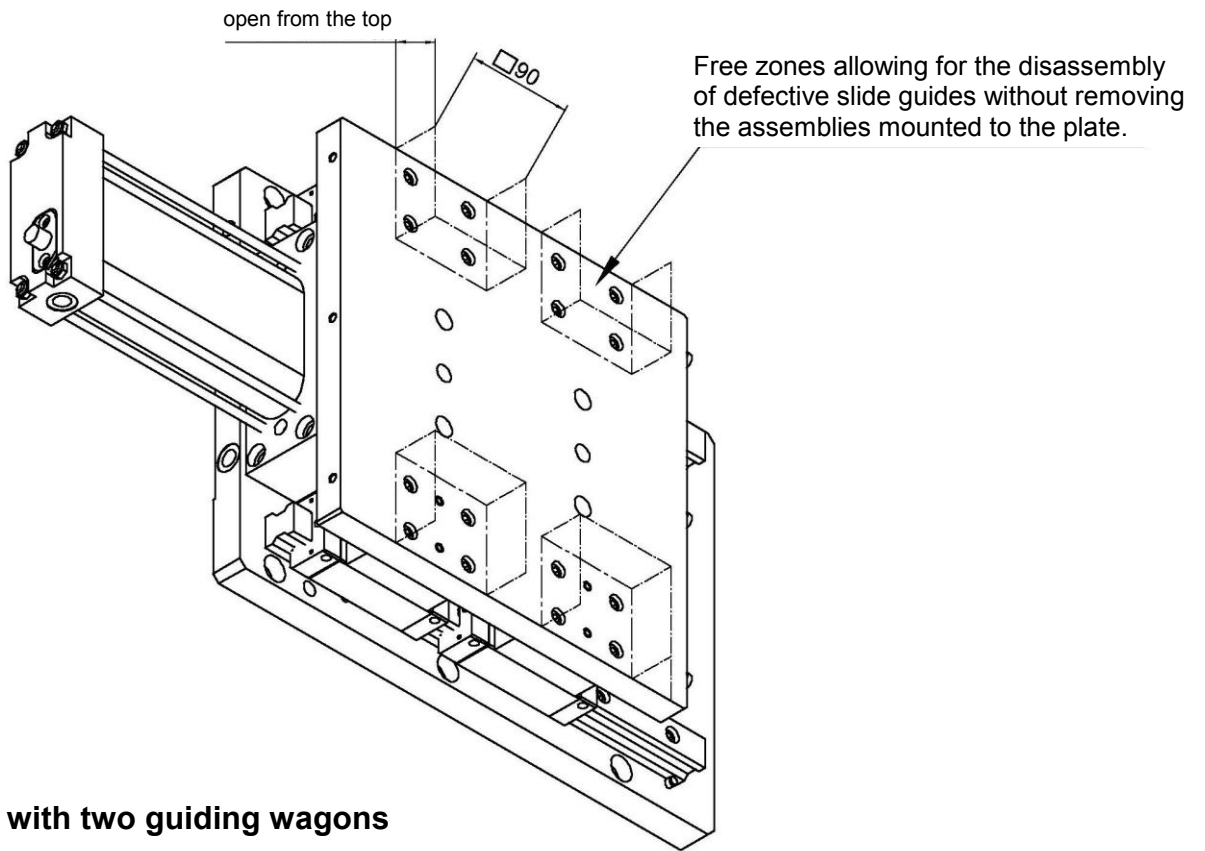
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Please quote the data given on the type plate in case of any queries and when ordering spare parts!

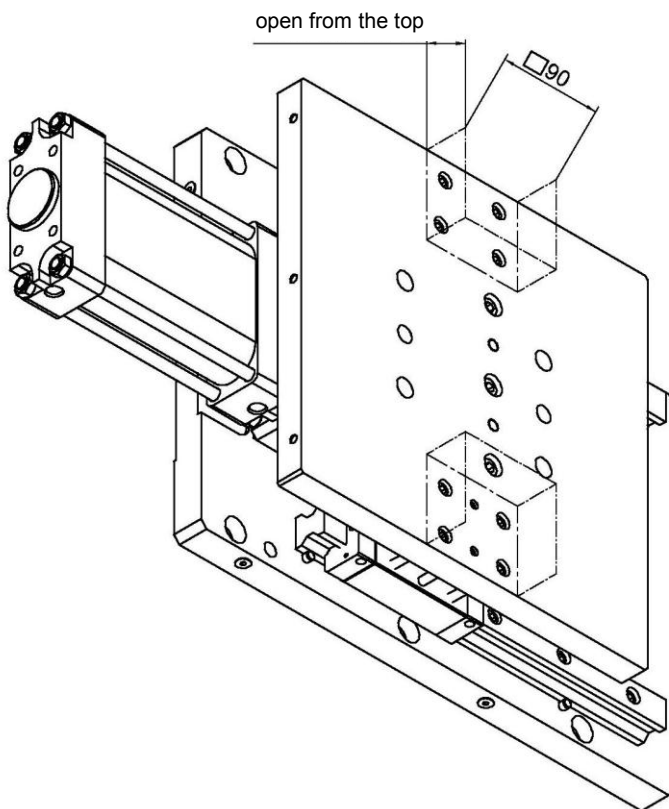
1.0 Product features

- Robust and screw-mounted aluminium plates.
- Slide guidance including precision carriage for maximum stroke lengths of 500 mm.
- Drive via Multipower Cylinder with locking function (LE 100/200) in extended position, respectively Flat Cylinder ZF (LE 100/200 VRL) in retracted and extended position.
- Limit switch for both end positions.
- Air connections on both sides.
- Optionally equipped with protective plates on both sides (Model SB) to protect the mechanical system.

LE model with four guiding wagons



LE model with two guiding wagons



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 Installation

- Fix the linear unit via cylinder screws "S" to the bottom plate.

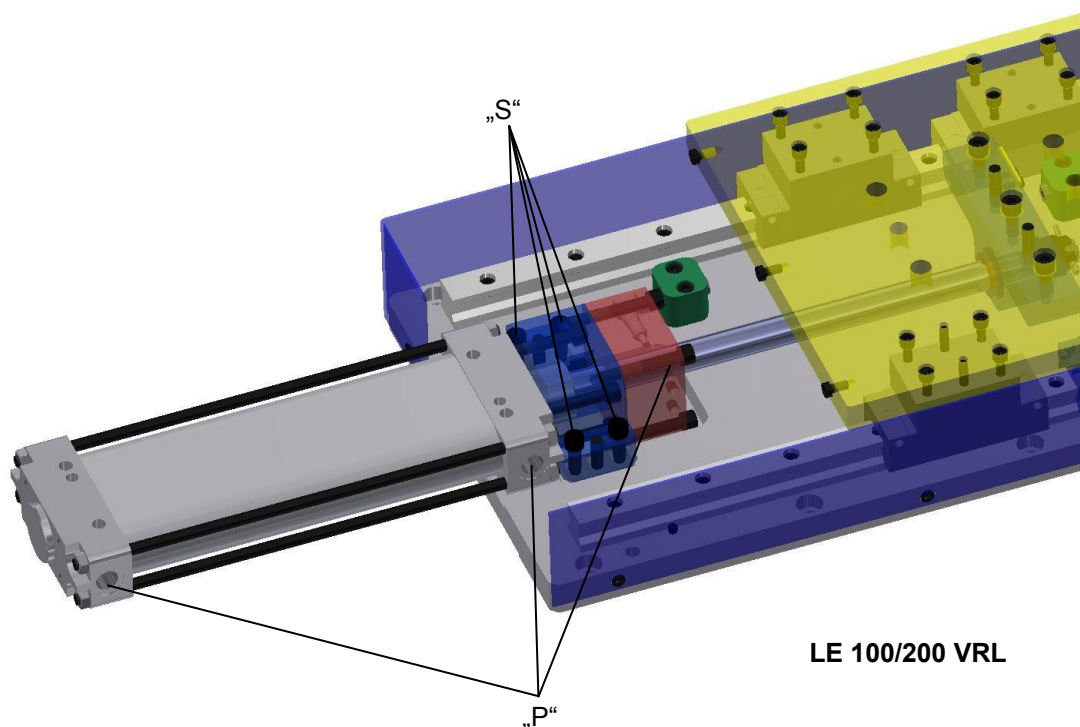
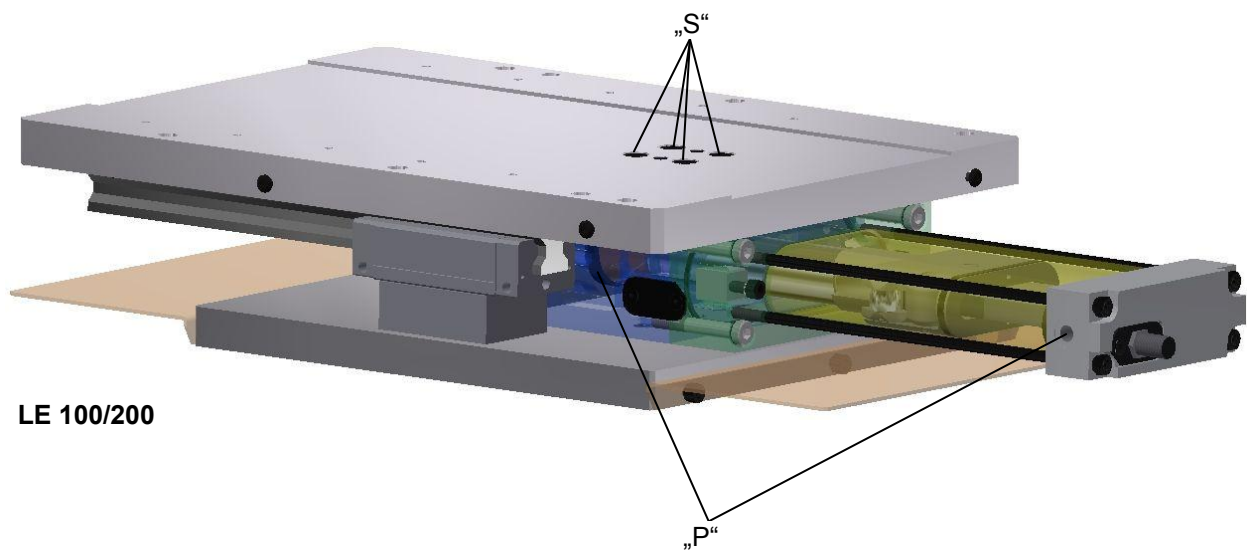


WARNING: Adjustment of the linear unit is not provided for on the product side. This must be considered accordingly in the design or manufacture of the brackets/mountings.

- Establish the supply with compressed air between pneumatic control and linear unit (connectors "P").



Warning: The use of external throttle valves is recommended for the fine adjustment of the speed and positioning operation.



4.0 BH Blocking System

Attention: It is essential that the installation and operating instructions of the manufacturer HEMA are read prior to putting the blocking unit into operation (see annex A).

The blocking system is a blocking unit driven by spring force which is activated in case of system pressure loss.

Pre-stressed spring plates affect the inner diameter of collets with kerf cuts, which lock the piston rod. The locking effect is loosened by pressurising air chambers located between the spring plates, which causes the spring plates to bulge, thus they shorten in length and the inner diameter of the collet widens.

All of the blocking units installed are designed for an operating pressure of 4 bar $\pm 5\%$. In the case of intentional or unintentional application of an operating pressure, which exceeds or falls short by more than 5%, the product warranty shall cease. Increasing the operating pressure does not result in an enhancement of the performance of the blocking unit but it can cause damage, malfunctioning or premature wear and tear. Therefore, the operating pressure applied to the blocking unit must be set and protected against changing with the aid of suitable means guaranteeing repeatability.

On principle, the blocking unit is designed for cyclic operation for the static holding and securing of the drive unit, preferable in the end positions. A maximum number of clamping cycles of 1,000,000 clampings is guaranteed. If the emergency stop function is activated during the moving process, we recommend inspecting the jamming system after about every 2000 emergency stops or once a year, respectively.

To do so the unit is aerated and the drive cylinder of the linear unit is loaded with a pressure of 4 bar. This ought not to result in a slip through / linear motion of $> 5^\circ$. The procedure must be completed in locked and opened position of the linear unit.

After having activated the emergency stop function, the linear unit is to be moved back into home position, i.e. opposite to the last driving direction.

The follow-up time after an emergency stop is approx. 0.3 s with an assumed driving time of the overall distance of 4 s, which results in a corresponding follow-up movement.

In this respect, it needs to be considered that the follow-up time next to the driving speed and mass is also influenced by the control properties of the signal and control elements used.

With regard to the control, please also consider that the blocking is released ca. 0.2/0.3 s prior to activation of the linear motion.

However, it is mandatory that quick-vent valves are provided for, as a gradually decreasing pressure has a direct effect on the follow-up time, see enclosed pneumatics circuit scheme for soft-start LE 100/200 VRL (page 12).

Adjustment of the limit switches

As a standard, only the vented switching state of the blocking unit is read when applied in connection with linear units. If monitoring of the pressurized switching state should be required, the second sensor connection can be used additionally as per manufacturer's instructions.

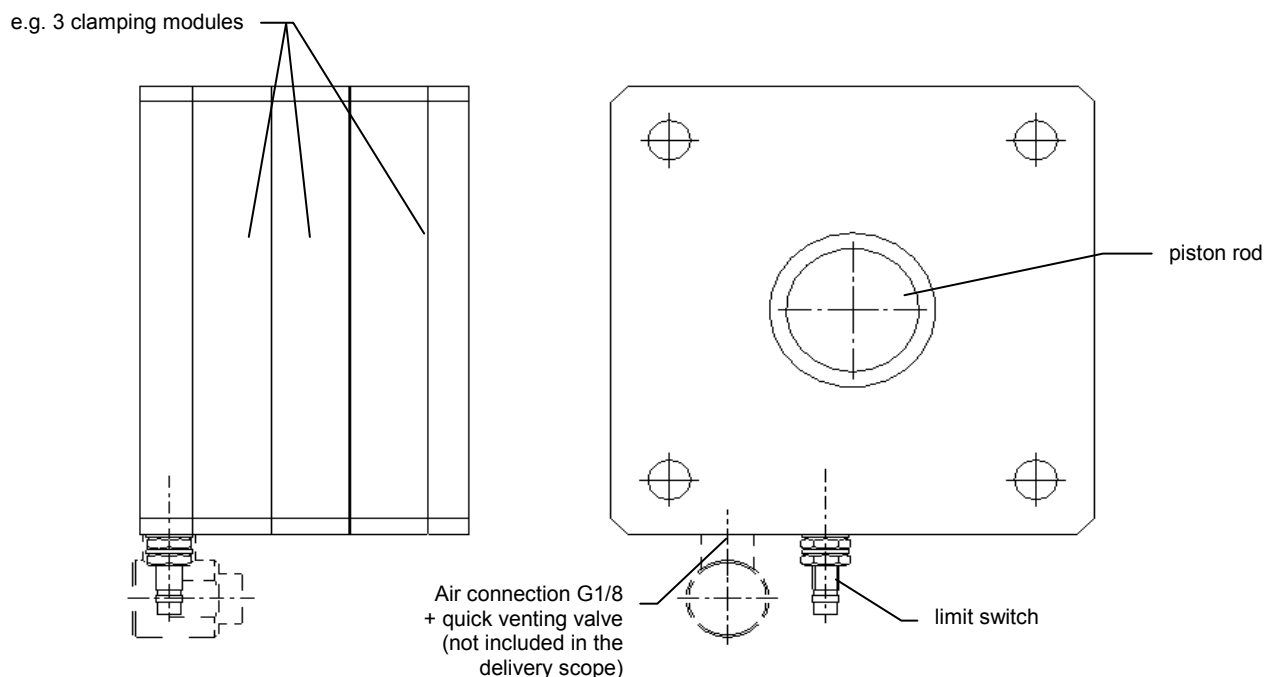
The end switch is carefully turned in until the specified depth is reached and fixed with the provided flange. Following this, its functioning is to be tested electrically.

Caution: The switch lug may suffer permanent bending, if the sensor is turned in too far, which can cause the loss of the switch signal.

Caution: The sensors only allow for the monitoring of the switching status. They do not serve the purpose of functional control.

Caution:

The blocking unit must not be opened or disassembled. Energy is stored in the compressed springs. Any changes will inevitably lead to a reduction in operational safety and the loss of product warranty



5.0 Inductive sensor T02

Place the electric coupling as per electric specifications of the linear unit onto the connector M12x1 and fasten it.



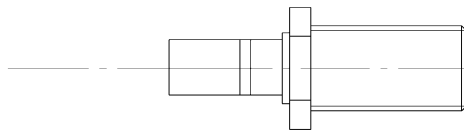
Warning: Applying the wrong or excessive voltage for operation may cause short circuits and damage to persons.

Functional control of the integrated LED:

green.....Operating voltage
 yellow.....End position left and clamps locks on the left
 yellow.....End position right and clamp locks on the right

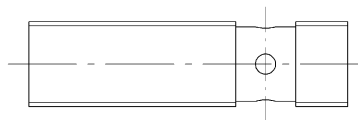
Replacing the sensor

- Remove the sensor by loosening the fastening nuts.
- Install new sensor (1 mm switching distance) and check the functioning of the switches (see also Circuit diagram “MZ.. T02”).



only LE 100/200

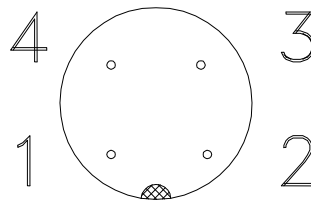
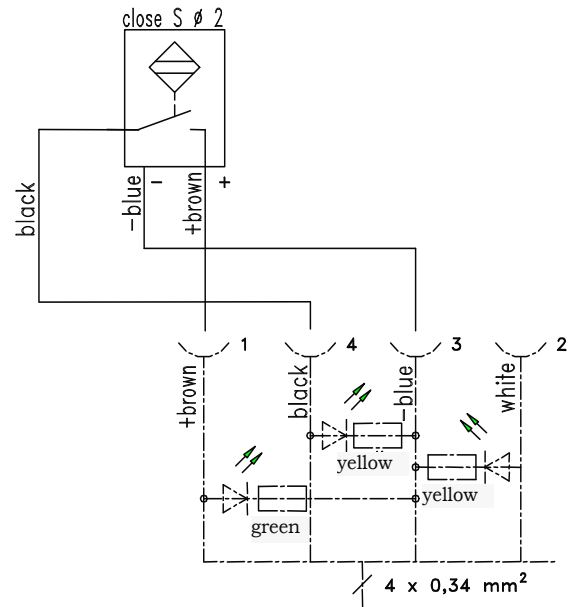
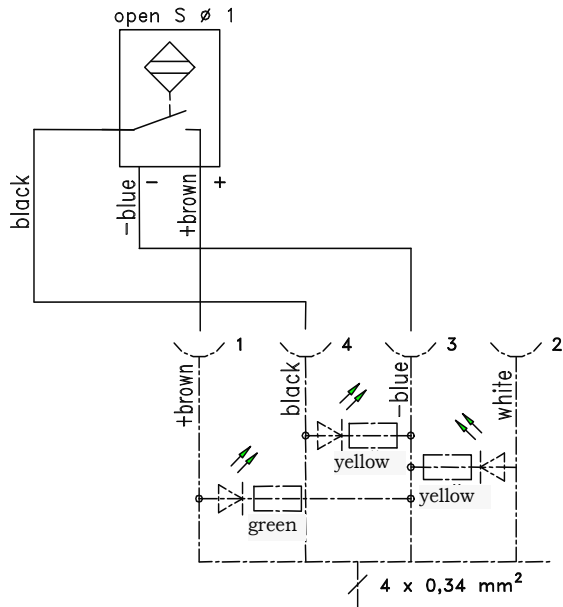
Art. No. 240221
 for end position “backward”



LE 100/200 and
 LE 100/200 VRL

Art. No. 276035
 for end position “forward + locked”

6.0 Circuit diagrams

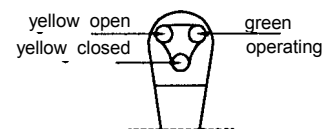


Electrical data at voltage up to 30 V =

Resistance demand 3 A
Lamp demand 1,5 A
Inductive demand 3 A

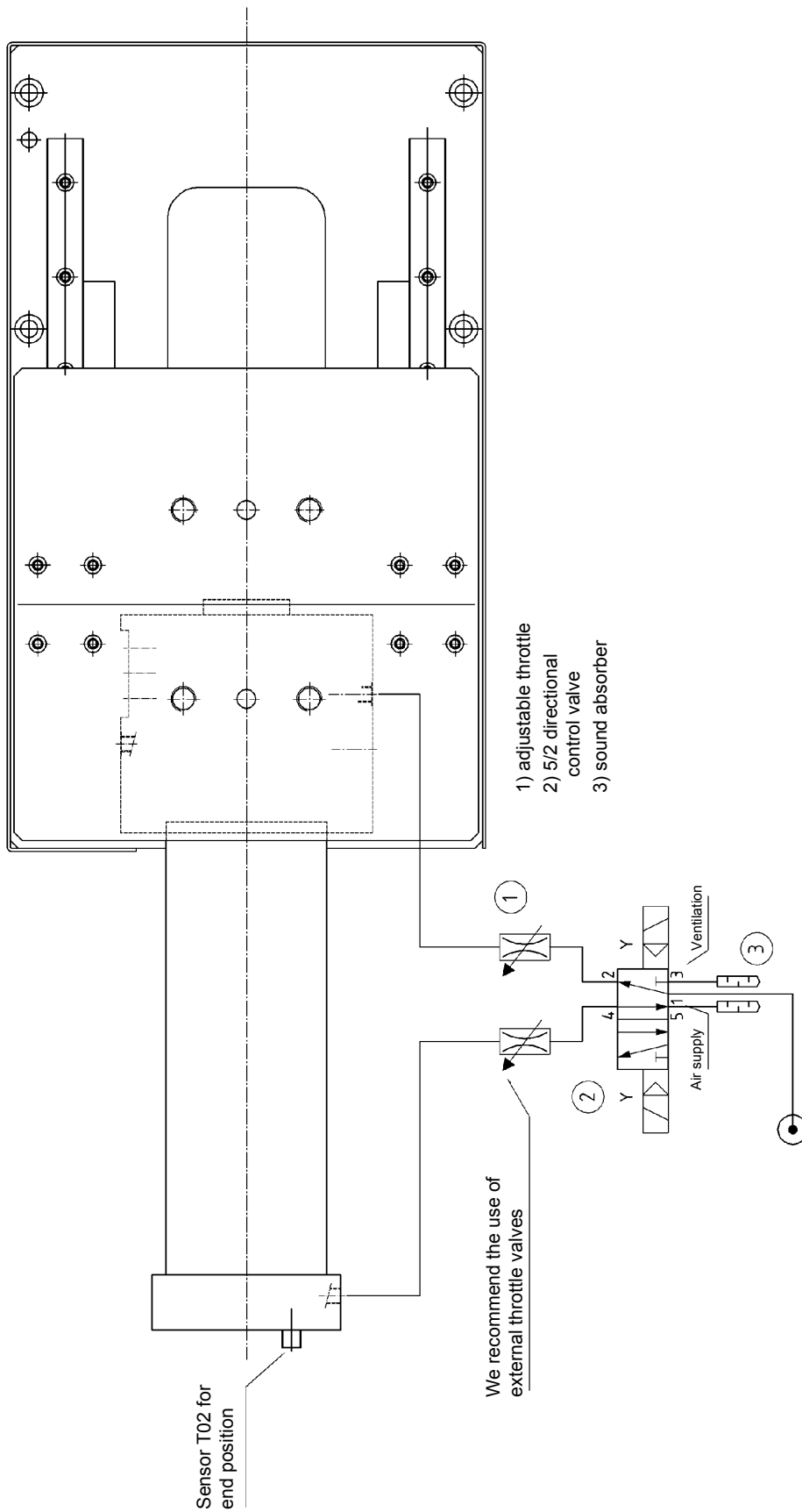
Protection class IP 67

Arrangement of the LED

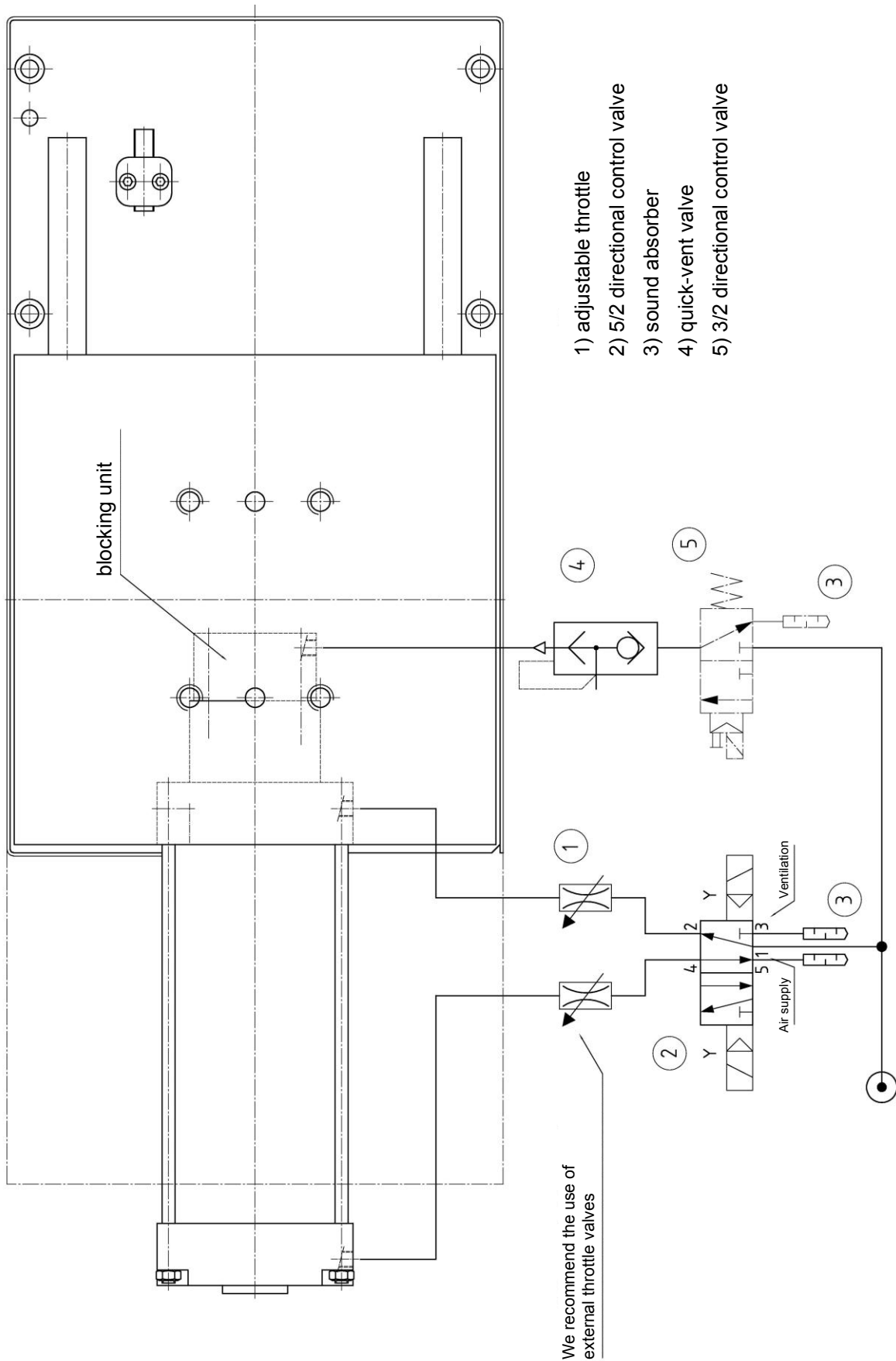


Angle coupler with 3 LED
WK 4 - 05

Pneumatics circuit diagram LE 100/200:



Pneumatics circuit diagram LE 100/200 VRL:



7.0 Maintenance

The linear unit is equipped with low-maintenance guides, considering its application in line production. Maintenance of the carriages is required at half-year intervals, due to the closed construction.

The carriages must be greased every six months with Multis EP2, company Total, or comparable grease. The amount of grease per connection on the guiding wagon is 1.4 cm³.



Cleaning with a steam cleaner or dry ice damages the linear unit.

8.0 Operating Instructions MZ...

1. Description

The Multi Power Cylinder is a high-power tool designed as an engine for tasks in forming, clamping and positioning in the processing of sheet metal. It consists of a pneumatic cylinder and a toggle lever mechanism inside the front housing. The housing has got mountings at the front and sides.

Optionally, the Multi Power Cylinder is equipped with an inductive monitoring for both end positions.

The working stroke of the Multi Power Cylinder divides into pre-stroke and power stroke. During pre-stroke, the system works similar to a pneumatic cylinder, so the pre-power of the pre-stroke matches the one of a pneumatic cylinder with the same cylinder diameter:

	clamping power of the power stroke at 6 bar	clamping power at 6 bar
MZ 40	0,7 kN	4 kN
MZ 63	1,75 kN	10 kN
MZ 80	2,8 kN	28 kN
MZ 100	4,3 kN	45 kN
MZ 140	7 kN (5 bar)	60 kN (5 bar)

Size MZ 40 – 80 with anti-rotating function, tolerance $\pm 0,2^\circ$.

In the end position the integrated toggle lever mechanism operates a force intensification of appr. 1:8, so that the above clamping powers are reached with a power stroke of appr. 6 – 8 mm. In version „V“ the end position is mechanically locked.

2. Safety

The Multi Power Cylinder was not conceived to be a complete tool, ready for independent applications and has therefore not been fitted with safety equipment. Only when it is correctly installed in a production system and a corresponding safety control system is added, will all safety requirements be met.

Should any faults occur that place personnel at risk, the Multi Power Cylinder is to be switched off immediately. Maintenance measures are only to be undertaken when the machine is at a complete standstill and by suitably qualified specialists.

After maintenance work has been carried out, the protection devices are to be refitted in the correct way.

3. Assembly of the Multi Power Cylinder

- Assembly of the Multi Power Clamp with 4 screws at the cylinder head or the housing sides.
- Mounting of the adapter or tools at the receiver of the piston rod.
- Connect to supply air between pneumatic control valve and clamp (connections „N“).

Caution: The working pressure for control lines is max. 6 bar. Exceeding this pressure can destroy the toggle lever mechanism.

Caution: For fine adjustment of speed of clamping process, the use of external directional flow control valves is recommended.

A. Inductive position sensing (T02)

- Position the electrical coupling on connector "C" in accordance with the electrical design of the Multi Power Cylinder and screw it tight.

Important: Operation with incorrect or too high voltage can lead to short circuiting and danger to personnel.

Function control with integrated LED as follows:

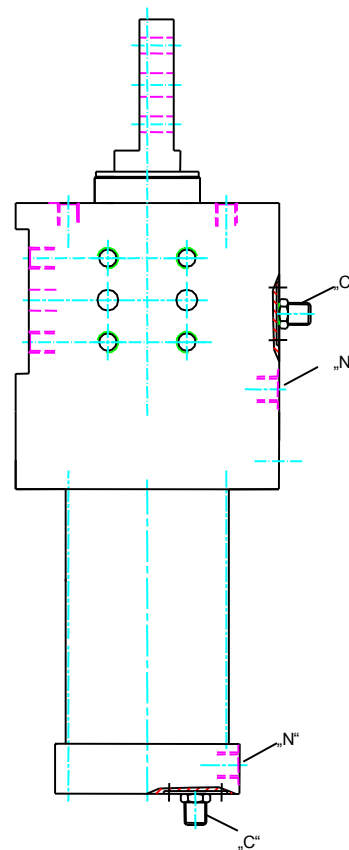
greenoperation voltage
yellowcylinder up
yellowcylinder down

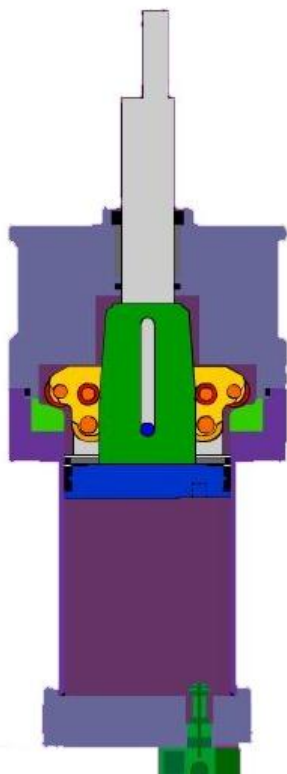
4. Replacement of limit switch cartridge

- Remove limit switch cartridge by releasing the fixing screw.
- Set new limit switch cartridge and assemble. Check the function of the switches.

5. Maintenance

The Multi Power Cylinder is fitted with a view to application in series production with low-maintenance bearings and guides. Because of the closed structure of the retractable pin cylinder no special maintenance is necessary. Cleaning with high-pressure steam or dry ice may damage the Multi Power Cylinder.



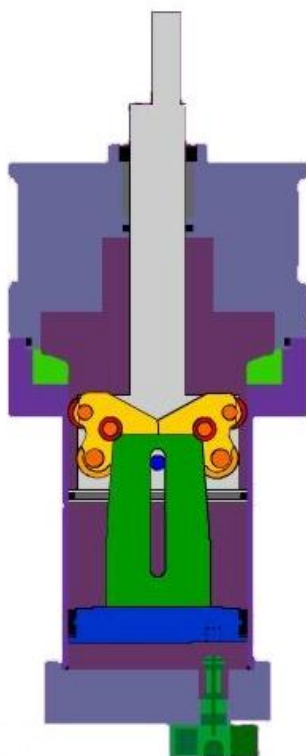


Pre-stroke

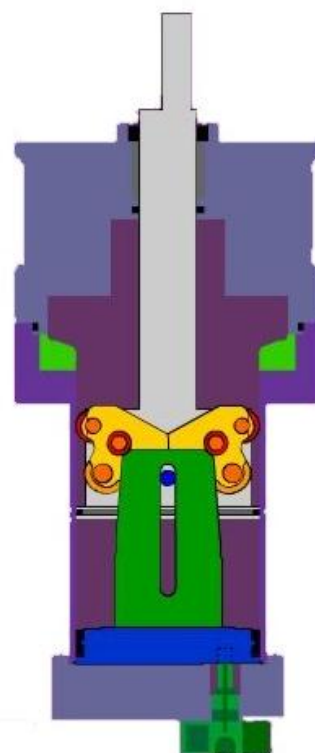
The power is comparable to the one of a pneumatic cylinder

Power stroke

Mechanical power gear ratio by toggle lever mechanism, which operates a force intensification of appr. 1: 8 in the end position



Starting position



9.0 Operating Instructions ZF...

1. Description

The flat cylinder is a high-power tool designed for use in locating points in the processing of sheet metal. It consists of a pneumatic cylinder in flat design with mountings at the front and the cylinder head and a non-twist receiver for the centring pin "A".

The flat cylinder is fitted with a magnetic piston, which allows positioning to be controlled optionally with external magnetic switches "C".

2. Safety

The flat cylinder was not conceived as a full tool supplied ready for independent use and has therefore not been fitted with its own safety equipment. Only when it is correctly installed in a production system and a corresponding safety control system is added, will all safety requirements be met.

Should any faults occur that place personnel at risk, the flat cylinder is to be switched off immediately. Maintenance measures are only to be undertaken when the machine is at a complete standstill and by suitably qualified specialists.

After maintenance work has been carried out, the protection devices are to be refitted in the correct way.

3. Assembly of the flat cylinder

- The flat cylinder is installed by means of four head cap screws on the front side of the cylinder area or on the cylinder head.
- The centering pin manufactured by the customer is secured in the piston rod receiver with a threaded pin M6X10.
Caution: The flat cylinder was not provided with means of fine adjustment. This must be taken into account when designing / manufacturing the consoles / braces.
- Create supply of compressed air between pneumatic control and flat cylinder (connections "N").
Caution: For fine adjustment of speed of positioning operation use the built-in regulating valves.
- If external magnet switches are used, they are to be assembled and connected.

4. Maintenance

The flat cylinder is fitted with a view to application in series production with low-maintenance bearings and guides. Because of the closed structure of the flat cylinder no special maintenance is necessary.

Caution: Damage can be caused to the flat cylinder by cleaning with steam-jet or dry ice.

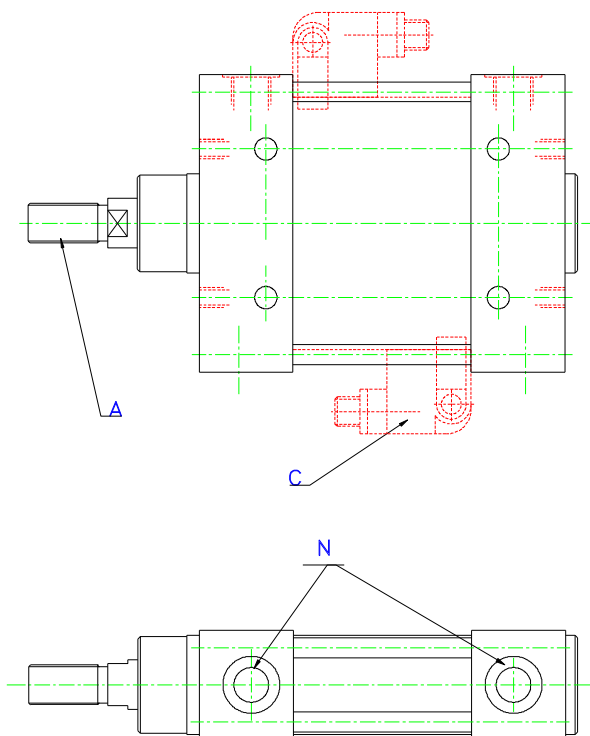


Fig. 1: Flat Cylinder