



## Studding Machine AS-ZN, EP-ZN, EPK-ZN

### Operating Instructions

(Id.-No. 00035100)

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# 1 Preface and general information

## 1.1 How to use these Operating Instructions

These Operating Instructions are intended for safety-relevant operations on and with the spikes studding machines (following called „machine“) AS-ZN, EP-ZN and EPK-ZN. They contain safety instructions which must be observed.

All personnel working at and with the machine must have the Operating Instructions available and observe the information and notes essential for them.

The Operating Instructions must always be complete and perfectly readable.

## 1.2 Scope of supply

The machine consists of a base frame, spikes studding gun (following called „gun“) and stud feeder. Individual divergences are possible. The exactly scope of supply can be obtained from the pertinent papers.

After receipt of the supply, check immediately whether it corresponds with the accompanying papers. OKU Tools GmbH does not grant any warranty for subsequent claims. Claim for

- visible transport damages immediately to the forwarder.
- visible deficiencies / incompleteness immediately to OKU Tools GmbH.

## 1.3 Application as directed

The machine is intended to be used only for the insertion of spikes into tyres of cars and trucks.

**Any other use shall be deemed inappropriate!**

## 1.4 Liability

The information, data and notes in the Operating Instructions met on the state of the art at the time of printing. Claims referring to machines which have already been supplied cannot derive from the information, illustrations and descriptions.

We do not accept any liability for damage and operating interference caused by:

- inappropriate use
- unauthorized modifications to the machine
- improper working on and with the machine
- operating mistakes
- disregarding the Operating Instructions

## 1.5 Warranty

Conditions of warranty: see terms of sale and delivery of OKU Tools GmbH.

Warranty claims must be made to OKU Tools GmbH immediately after detecting the deficiency or fault.

The warranty is void where liability claims cannot also be made.

## 2 Safety information

### 2.1 Personnel responsible for safety

#### 2.1.1 Operator

An operator is any natural or legal person who uses the machine or on behalf of whom the machine is used.

The operator or his safety officer must ensure,

- that all relevant regulations, instructions and legislation are observed.
- that only qualified personnel work with and on the machine.
- that the personnel have the Operating Instructions available for all corresponding operations.
- that non-qualified personnel are prohibited from working with an on the machine.

#### 2.1.2 Skilled personnel

Skilled personnel are persons who – because of their education, experience, instructions and knowledge about corresponding standards and regulations, rules for the prevention of accidents and operating conditions – are authorized by the person responsible for the safety of the plant to perform the required actions an who are able to recognize potential hazards (see IEC 364, definition for skilled personnel).

## 2.2 General safety information

This safety information is not claimed to be complete. In case of questions please contact OKU Tools.

At the time of delivery the machine meets the state of the art and ensures safe operation.

The machine is a source of danger for persons, for the machine itself and for other material assets of the operator, if

- unqualified personnel work with or on the machine
- the machine is used inappropriately




Operate the machine only when it is in a proper state.

Any additions, modifications or redesigns of the machine are basically prohibited. OKU Tools must be contacted in all cases.


## 2.3 Layout of the safety information

All safety information in these Operating Instructions has a uniform layout.


### Warning of personnel injury

Icons used	Meaning	Signal words	Notes
	Warning of hazardous electrical voltage	<b>Danger!</b>	Warns of <b>impending danger</b> . Consequences if disregarded: Death or very severe injuries
	Warning of a general danger	<b>Warning!</b>	Warns of a <b>potential, very hazardous situation</b> . Consequences if disregarded: Death or very severe injuries
	Warning of a general danger	<b>Caution!</b>	Warns of a <b>potential hazardous situation</b> . Consequences if disregarded: Light or minor injuries

**Warning of material damage**

Icons used	Meaning	Signal words	Notes
	Warning of material damage	<b>Stop!</b>	Warns of <b>potential material damage</b> . Consequences if disregarded: Damage of the machine or its environment

**Other information**

Icons used	Meaning	Signal words	Notes
	General note	<b>Note!</b>	Designates a general, useful note. If you observe it, handling of the machine/device is made easier.



## 3 Technical Data

### 3.1 Type plate

The type plate includes most important technical data and is attached on the rear of the machine.

### 3.2 Dimensions and weight

The following values are valid for the base frame without any accessories and can differ according to the respective extra equipment.

Breadth	ca. 870 mm
Depth	ca. 730 mm
Height	ca. 1270 mm
Weight	ca. 45 kg

### 3.3 Noise emission

The sound pressure level at the work station of the operator can reach up to 83 dB(A). Provide suitable ear protection for the operator.

### 3.4 Ambient conditions

Install the machine only in closed and dry rooms.

The operating ambient temperature shall be from 10 °C to 40 °C.

## 4 Installation



### Caution!

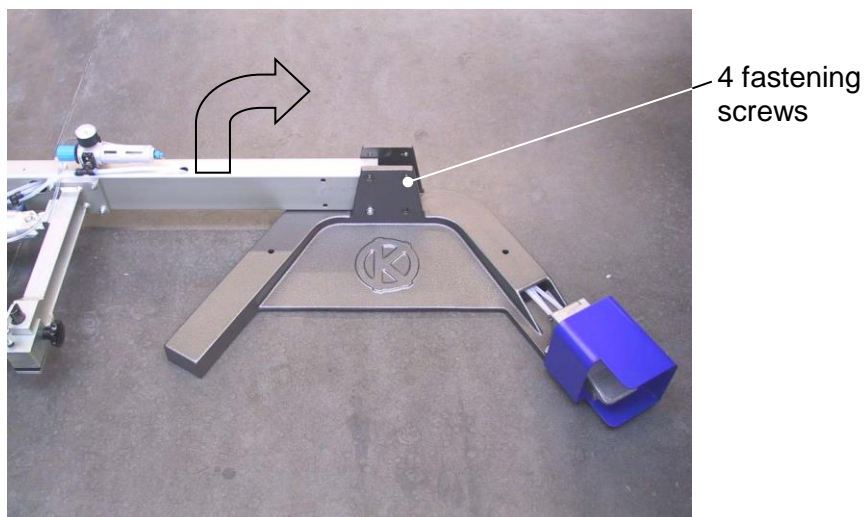
**Only transport the machine with transport equipment or hoists which are suitable for this load. Ensure a safe fixing. Avoid shocks!**

Take precautions before installation of machine:

- Check machine for proper condition.
- Never install a damaged machine.
- Never set up a damaged machine.

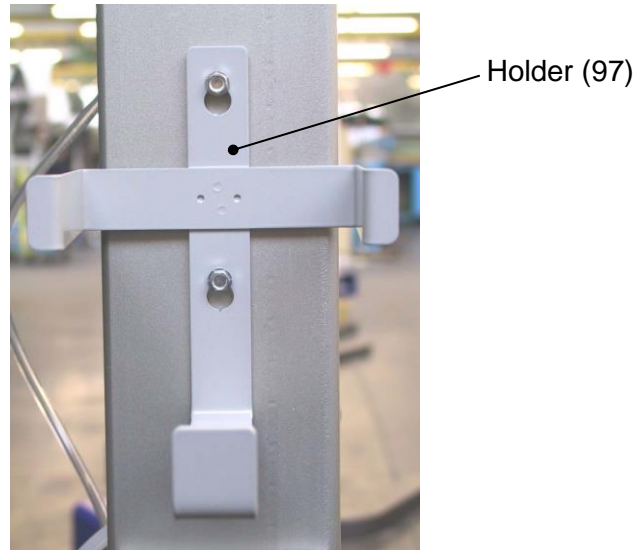
### 4.1 Installation

The machine is turned down for transport reasons.



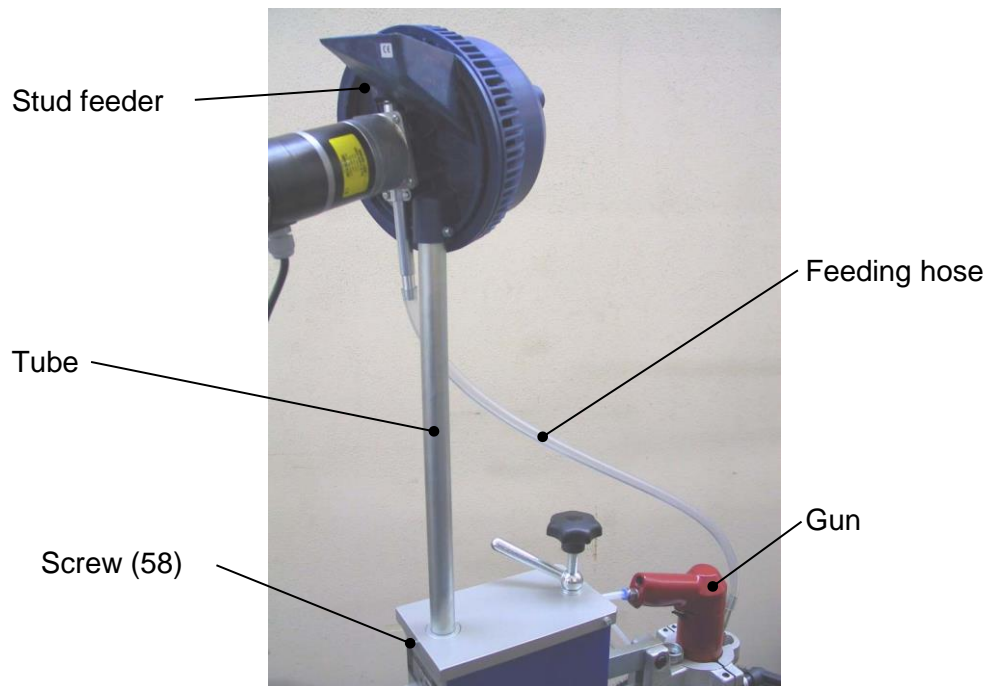
Set machine upright and fasten to base by means of the provided screws.

Fasten holder (97) for water tank (98) on the pillar (4) at the back of the machine by means of the two provided screws.



Place the tank into the holder and insert the water hose into the screw coupling (100) in the cover of the tank.

Insert the tube for the stud feeder (screw up) into the provided bore on the machine and tighten screw (58).



Place feeder onto tube and secure by means of screw.

Connect the stud gun and the feeder by means of the provided feeding hose. Cut the hose so that it's always in an inclined position.

Fasten machine to the ground by means of two screws. Now, the machine can't move while operated.

## 4.2 Pneumatic connection



### Warning!

The pneumatic connection is to be made by qualified personnel with extensive knowledge in handling of pneumatic systems.

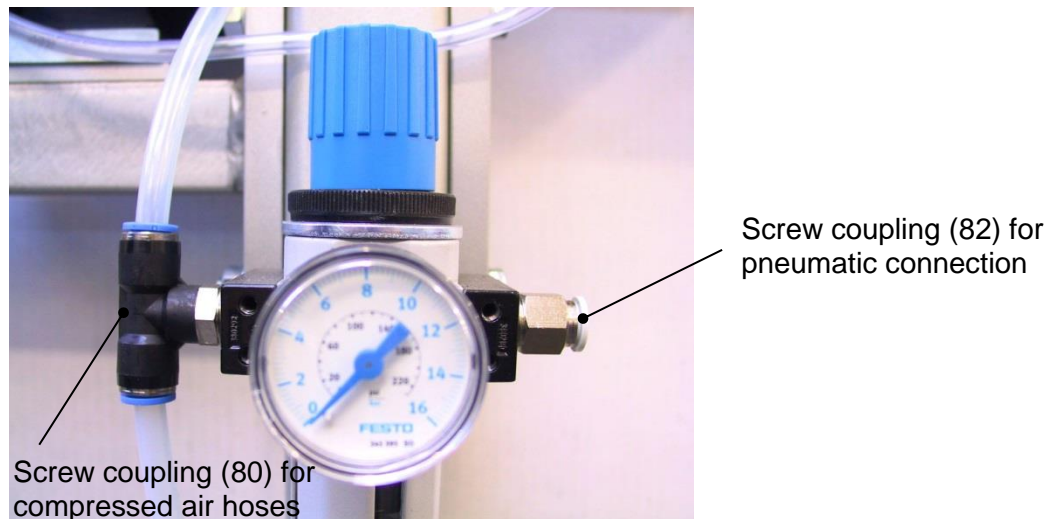
Fasten pre-assembled filter regulator (77) make FESTO to the pillar by means of the knurled nut at the fastening bracket (76). See hereto also chapter 10.3 of general drawing.



Filter regulator (77)

Fastening bracket (76)

Insert both compressed-air hoses into the rotary screw coupling (80) as pictured below. Then insert compressed-air supply hose into screw coupling (82).



### 4.3 Electrical connection



**Danger!**

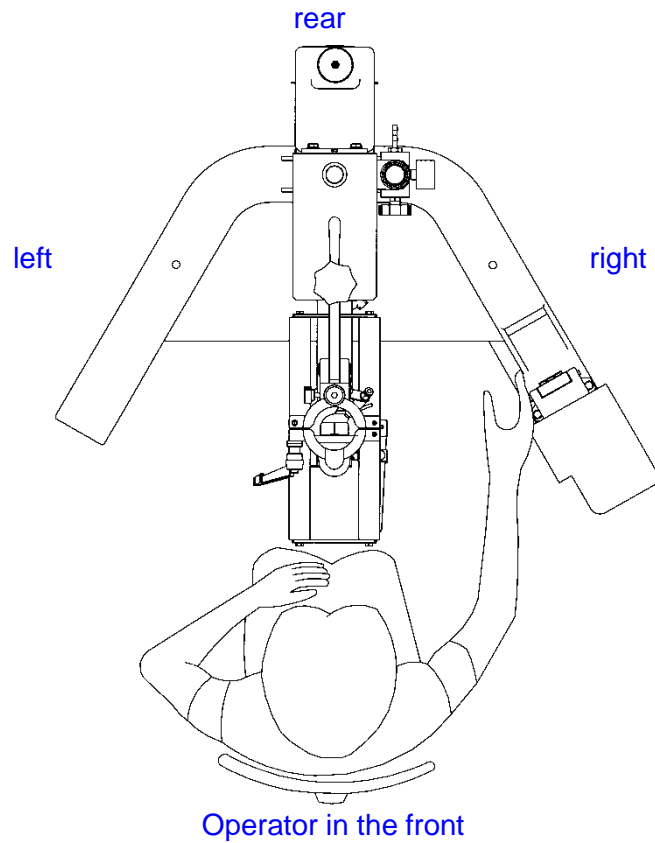
**Electrical connections must only be made by skilled personnel!**

The electrical connection is for the stud feeder only.

Connect the power plug of the feeder with the power supply system (230 V, 50/60 Hz).

## 5 Setting into operation

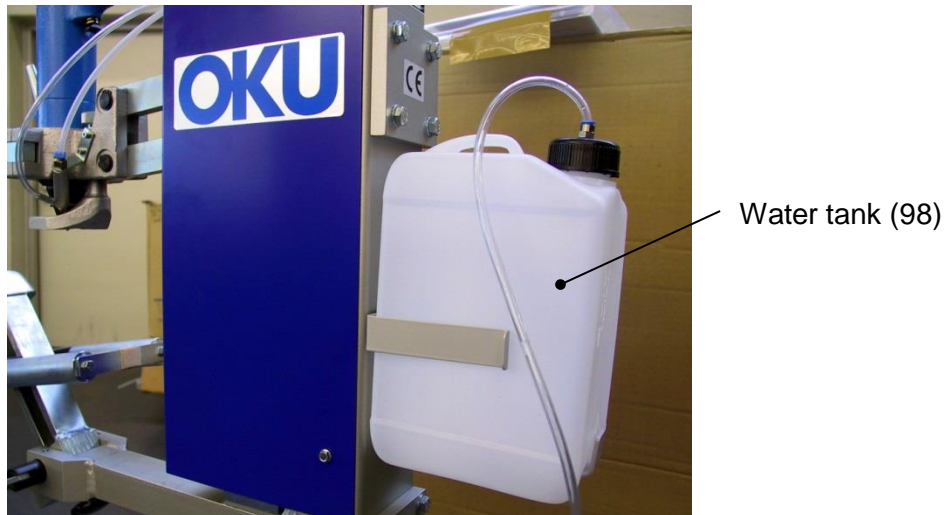
### 5.1 Workplace



The workplace of the operator is in front of the machine. No other person is allowed to be at the machine during operation.

## 5.2 Preparations

Fill the water tank (98) with stress-relieved water. To get this, fill the tank with tap water and mix it with some drops of usual washing-up liquid.

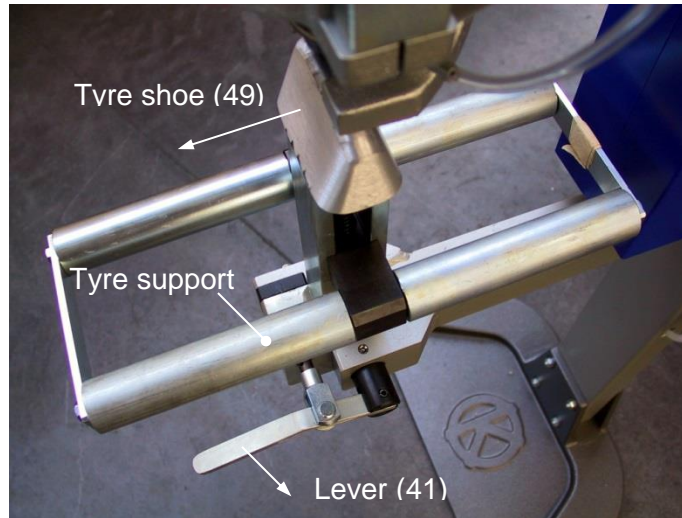


### Tip!

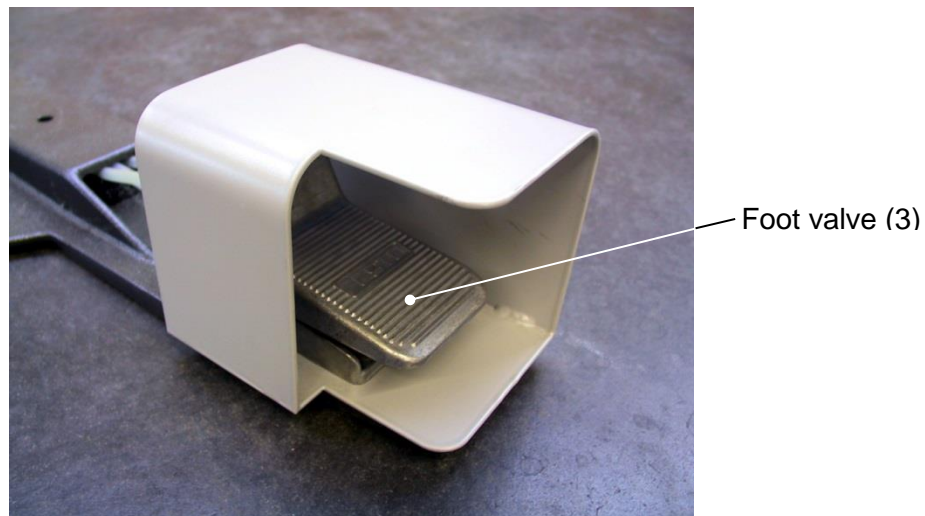
**Use little washing-up liquid only in order to avoid pulling out the studs of the tyre.**

Set operating pressure of the filter regulator (77) to approx. 7-8 bar. The operating pressure must not be higher than 10 bar!

Push the lever (41) to the right to release the interlock of the tyre support. Pull the tyre shoe (49) together with the tyre support to the fore.



Perform a few idle strokes by pressing the foot valve (3) until enough spray liquid is sucked in.



### Stop!

**The foot valve (3) must not be operated if the tyre shoe (49) is in a vertical position and no tire is seated in order to prevent damage to the tyre shoe and the gun by the downward movement of the pressing springs!**



## 6 Operation of the machine

### 6.1 Adjusting the gun

Slip the tyre over the tyre shoe of the tyre support and push it back. The tyre support is engaged in vertical position.

Adjust the star grip (46) so that an air gap remains between the tyre shoe and the tyre. This assures that the tyre can be easily turned on the rollers.



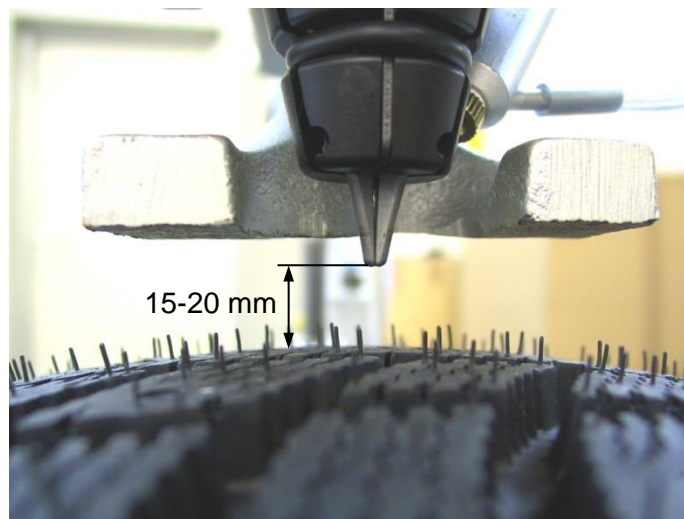
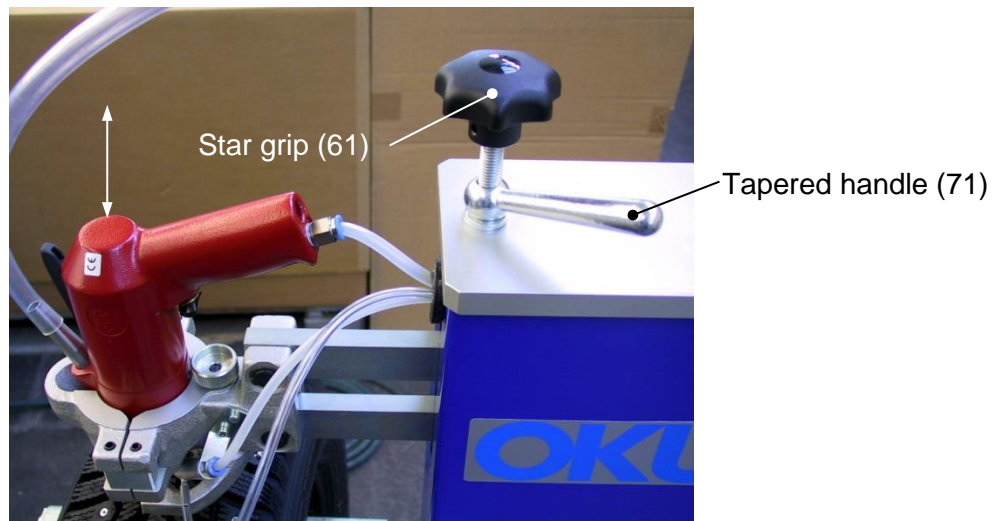
Star grip (46)



#### Tip!

If the air gap is too small the tyre lies on the tyre shoe and can't be moved easily. Turn the star handle until the tyre can be moved easy.

Release tapered handle (71) and adjust the distance between the spreader finger and the tyre tread to 15 – 20 mm by turning the star grip. Secure settings by pulling tapered handle (71).



## 6.2 Inserting spikes

Fill the feeder with approx. 500 spikes and allow the feeding hose of the gun to be filled with spikes.

Tilt the tyre until one vulcanized stud hole is directly under the spreader finger.



### Warning!

**Never put your hands between the gun and the tyre. High risk of injury!**

Upon operation of the foot valve (3) the machine is inserting the stud. The spreader fingers permeate into the tyre until the stop is seated on the tyre. The stud is automatically sprayed with stress-relieved water while inserted.



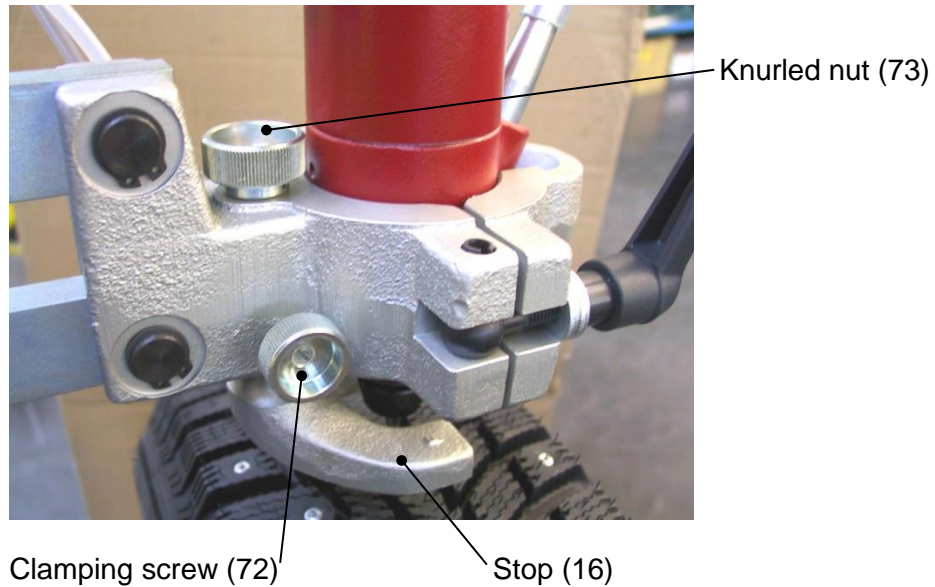
### Tip!

**The foot valve must be operated until the stud is inserted. If it is released too early, the stud won't be inserted correctly and through this it won't be possible to achieve a uniform depth of stud insertion.**

## 6.3 Faults during insertion

### 6.3.1 Insufficient stud projection over the tyre tread

Stop (16) must be turned down; unscrew clamping screw (72) and adjust stop by turning the knurled nut (73). Secure adjustment by tightening clamping screw.



### 6.3.2 Excessive stud projection over the tyre tread

Stop (16) must be turned up; loosen clamping screw (72) and adjust stop by turning the knurled nut (73). Secure adjustment by tightening clamping screw.



#### Tip!

**If the stop is in the highest position and the insertion depth still not sufficient, increase the working pressure at the filter regulator (77). If the depth is still not sufficient check the stud length and the depth of the holes in the tyre tread.**

### 6.4 Manual usage of gun

The gun can be removed from the base frame and operated manually (see illustration in the following). Release clamping lever (25) with eye screw (23) until it can be turned to the left. Now pull holder (15) to the fore and remove gun. A proper automatic spraying function can't be guaranteed anymore.



#### Stop!

**The gun must be converted before it can be used manually. See hereto operating instructions of stud gun.**

## 6.5 Exchange of gun

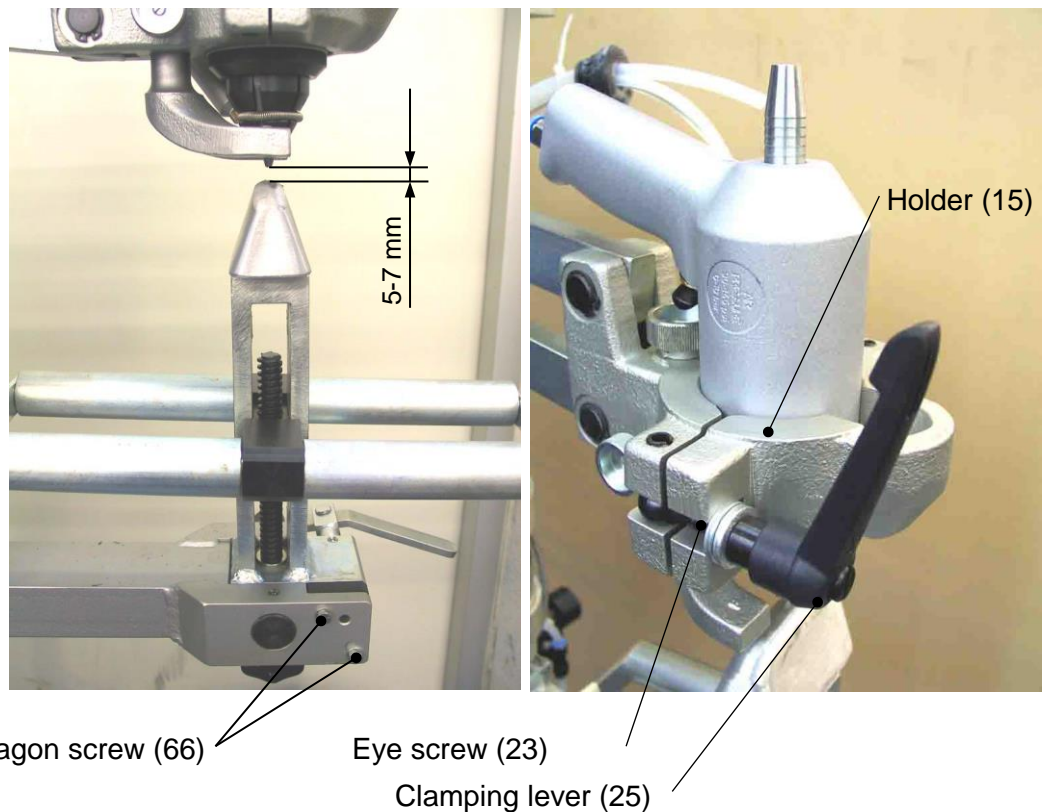
The exchange of a gun might become necessary if another stud format is used or if the gun is defective.



### Warning!

**Disconnect the machine from the compressed air supply before changing the gun. High risk of injury!**

Release the clamping lever (25) with eye screw (23) until it can be turned to the left. Pull holder (15) to the fore and remove gun. Disconnect the gun from the feeding hose and insert the new gun. Adjust distance between the spreader fingers and the support shoe to approx. 5-7mm before you secure the tapered handle. Connect gun with feeding hose.



## 6.6 Basic setting

The machine is preset by the manufacturer before supply. A recovery of this setting might become necessary should these settings have been modified.

Disconnect the machine from the compressed air supply. Remove the protection covers (74 or 75) and check the projecting end of the piston rod in the fork head. It should be 3-4mm, if not adjust the projecting end to 3-4mm.

Adjust the distance between spreader fingers and tyre shoe (49) to approx. 5-7mm (see chapter 6.5)

Check for alignment of the centrelines of the gun and the support shoe. If not adjust the support shoe by loosen screw (66) –see chapter 6.5. Then tighten screw again.

Mount protection covering and connect machine to compressed air supply.

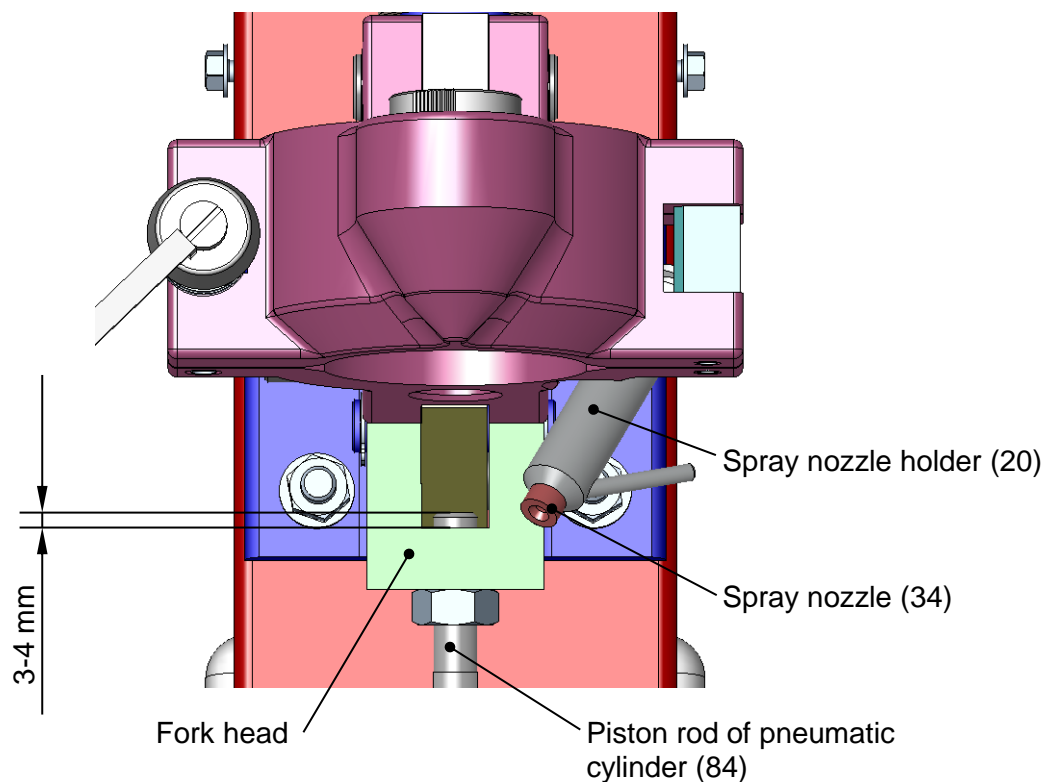


Illustration without stop (16) and covers (74, 75)

## 7 Faults and troubleshooting

### 7.1 Base frame

Fault	Cause and elimination
None or insufficient spray function	<p>Fill up the water tank (98) with stress-relieved water.</p> <p>Spray nozzle (34) blocked, clean</p> <p>Adjust water stream by means of the throttle relief valve (93) and secure settings (see 7.4)</p>
Pneumatic is not working, no inserting function	<p>Check compressed air supply</p> <p>Check pneumatic components and hose, replace defective parts</p>
Pneumatic cylinder is working irregular resp. jamming	<p>Pneumatic cylinder (84) defective replace!</p> <p>Condensed water in the lines</p> <p>Drain water from the condensate glass bowl!</p>
Sound absorber in the pneumatic system blocked	<p>Clean sound absorber (86) with suitable cleansing fluid, rinse thoroughly and dry with pressed air.</p> <p><b>Caution! Do not clean with Tri (Trichlorethen)!</b></p> <p><b>Caution! Flammability of cleansing benzene!</b></p>

### 7.2 Gun

See operating instructions for stud gun.

### 7.3 Stud feeder

See operating instructions for stud feeder.



## 7.4 Adjustment of sprayer

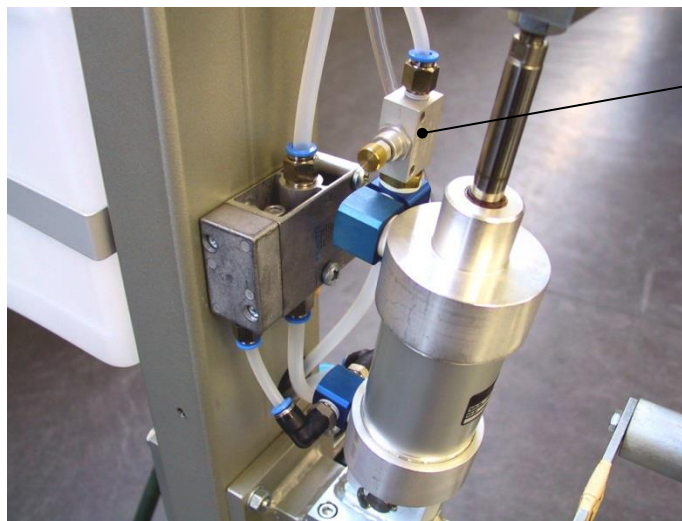
The water stream for moistening the stud at insertion is optimally adjusted. Should it be necessary to readjust it, please proceed as follows:



### Warning!

**The adjustment of the sprayer requires the operation of the machine without protection covers. The adjustment should therefore be made only by trained personnel with extensive knowledge in handling pneumatic machinery!**

Remove protection covers (74 and 75). Throttle relief valve (95) for adjustment of stream flow is now accessible.



Throttle relief valve (95)

Loosen counter nut at adjusting screw of throttle valve.

Operate the foot valve (3) and keep it down. The machine executes the inserting movement and remains in the inserting position. Stress-relieved water is then sprayed as long as the foot valve is actuated.

The water stream can be adjusted by turning the adjusting screw of the throttle valve. Adjust the nozzle so that the water stream is sprayed to the inserting position of the stud.

Secure settings by tightening counter nut of adjusting screw.

Mount the protection covers onto the machine.

## 8 Lubrication and maintenance

### 8.1 Lubrication



**Stop!**

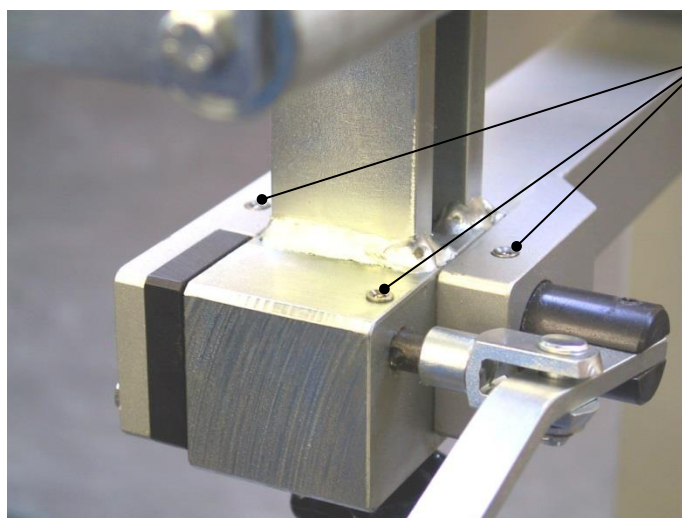
**Observe the effective directions for the use and safety of the applied lubricants!**

#### 8.1.1 Lubricating oil

Distinguishing mark acc. to DIN 51502	Designation	ISO-Viscosity index DIN 51519	Manufacturer
AN 22	Normal lubricating oil	ISO VG 22	AVIA (AVILUB RS 22) BP (BP Energol CS 22) ESSO (Coray 22) SHELL (SHELL Carnea Oel 22)

#### 8.1.2 Locations of lubrication

No.	Designation	Services	Consumables Measured values	Frequency
1	lubricator (3x) at tyre support	Lubricate	Lubricating oil DIN 51501-L-AN 22	Monthly



Lubricator (102)

## 8.2 Maintenance

### 8.2.1 Compressed air serve unit



Nr.	Designation	Services	Operative materials	Frequency	Notes
1	Filter container	Check		Weekly	Switch filter regulator to depressurized, drain condensate  The level for condensate may not pass the baffle-plate (max. mark)
2	Filter container	Clean	Water	If required	Switch filter regulator to depressurized  Unscrew container clockwise  Clean with water
3	Filter cartridge is contaminated	Replace		If required	Switch filter regulator to depressurized  Unscrew container clockwise  Unscrew baffle plate and take out filter cartridge  Change sinter filter at high contamination,  Pore width 0,005 mm

## **8.2.2 Machine**

Lubricate machine at the points described under chapter 8.1.2. at regular intervals. Otherwise the machine is maintenance-free.

## **8.2.3 Gun**

Notes for lubrication and maintenance for the gun you will find in the Operation Instructions of the gun.

## **8.2.4 Stud feeder**

Notes for lubrication and maintenance for the stud feeder you will find in the Operation Instructions of the stud feeder.

## 9 Shutdown and dismantling

OKU Tools takes back your studding machine. We recommend you have OKU Tools professionally dismantle the studding machine and dispose of it.



### Tip!

**Be part of the environmental protection by recycling valuable materials.**

What?		Where?
Transport material	Pallets	Return to the manufacturer or forwarder
	Packing material	Cardboard boxes to waste paper plastic to plastic recycling or waste material reuse wood-wool or waste material
Lubricants	Oil, grease	Dispose according to the valid regulations
Components	Used materials: aluminium aluminium cast grey cast iron steel brass plastic	Separate valuable substances and dispose

## 10 Spare and wear parts

### 10.1 Requirements



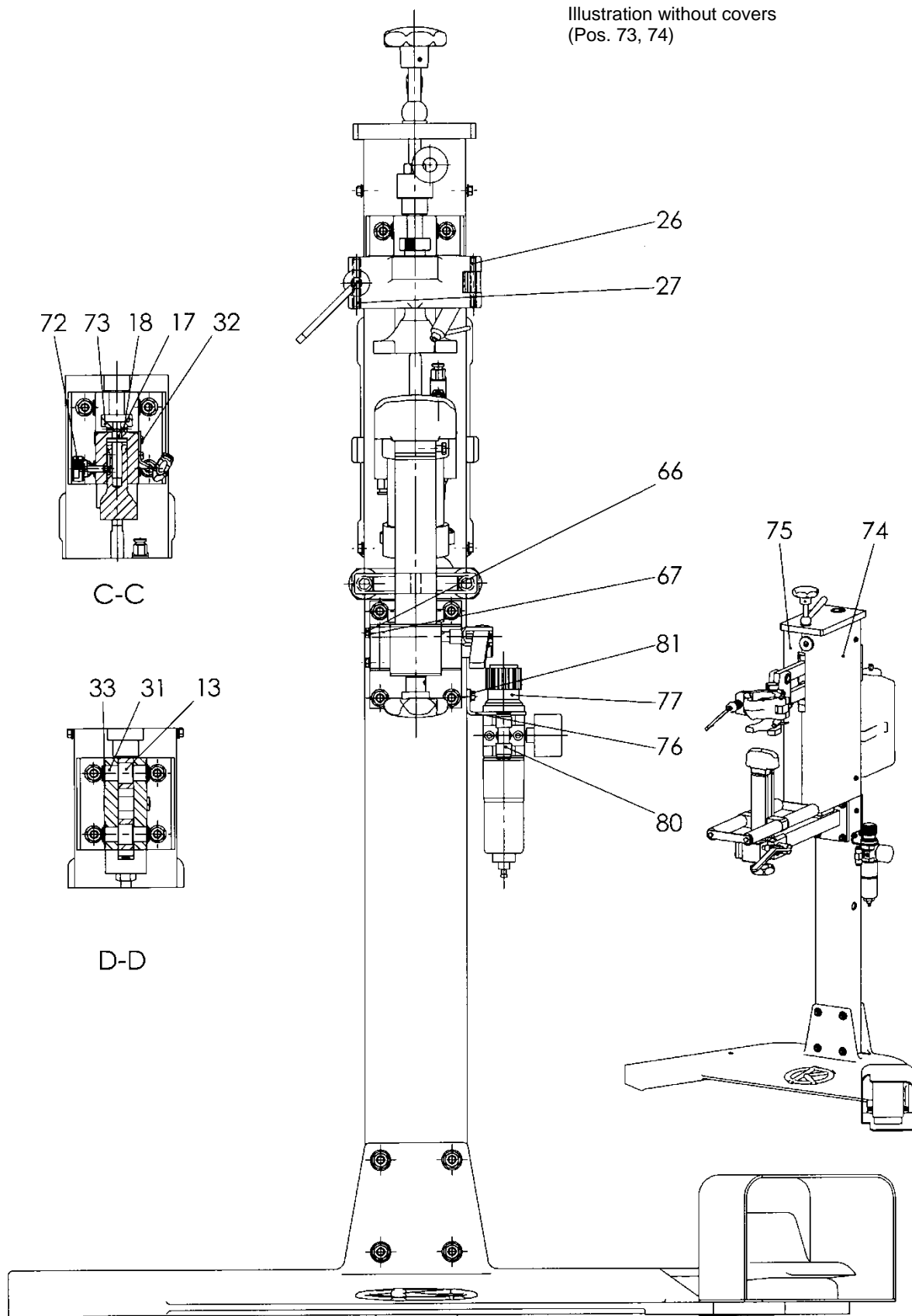
**Stop!**

**Spare and wear parts must be in accordance with the technical requirements stipulated by the manufacturer.**

### 10.2 Handling of order

To ensure punctual handling of orders, please give the **OKU-Id.-No.** of the spare part you need when ordering. You can remove the **OKU-Id.-No.** by the drawing of the machine and the spare parts list.







## 10.4 Explanation to the spare parts list

The numbering of the spare parts in the machine drawing corresponds to the item numbers of the spare parts list.

## 10.5 Spare parts list

Item.	OKU-Id.-No.	Quantity	Designation
1	00570058	1	Foot
2	35035558	1	Protection cover
3	00025600	1	Foot valve
4	35104975	1	Pillar
5	00305008	1	Supporting arm
6	00350741	1	Plate
7	00350778	2	Angle
8	00350742	1	Plate
9	00350802	2	Bolt
10	00350752	2	Sleeve
11	00470191	1	Guide
12	00470192	1	Guide
13	00003792	4	Cylinder bearing
14	00003774	1	Cylinder bearing
15	00571665	1	Holder
16	00470186	1	Stop
17	00350761	1	Bolt
18	00000588	1	Spring-type straight pins
19	00350805	1	Angle
20	00250132	1	Spray nozzle holder
21	00031536	3	Foot valve
22	00350745	1	Strip
23	00350743	1	Eye screw
24	00004125	2	Washer
25	00034668	1	Clamping lever
26	00000608	2	Spring-type straight pins
27	00004084	1	Spring-type straight pins
28	00000200	12	Hexagon screw
29	00000678	28	Washer
30	00000630	14	Hexagon nut

Item.	OKU-Id.-No.	Quantity	Designation
31	00350765	2	Bolt
32	00000056	2	Cap screw
33	00000810	8	Retaining ring
34	00351873	1	Spray nozzle
35	00000151	2	Hexagon screw
36	00350799	1	Bolt
37	00265086	1	Support
38	00350755	1	Plate
39	00350777	1	Ratchet pin
40	00350746	1	Compression spring
41	00350739	1	Lever
42	00003752	1	Fork joint
43	00004085	1	Spring-type straight pins
44	00350798	1	Bolt
45	00470195	1	Spindle
46	00353343	1	Star grip
47	00003721	3	Disc spring
48	00000590	2	Spring-type straight pins
49	00350793	1	Tyre shoe
50	00000119	1	Hexagon screw
51	00350808	2	Holding piece
52	00350756	4	Roller
53	00004522	8	Bush
54	00350768	2	Axle
55	00350749	2	Bar
56	00000663	4	Safety Washer
57	00000114	4	Hexagon screw
58	00000125	1	Hexagon screw
59	00350775	1	Spindle
60	00000688	1	Washer

Item.	OKU-Id.-No.	Quantity	Designation
61	00358479	1	Star grip
62	00000640	1	Hexagon nut
63	00350760	1	Stop
64	00003769	1	Buffer
65	00000680	1	Washer
66	00004097	2	Hexagon screw
67	00000676	2	Washer
68	00350762	1	Bolt
69	00000808	2	Retaining ring
70	35104066	1	Sleeve
71	00003692	1	Tapered handle
72	00003190	1	Clamping screw
73	00004090	1	Knurled nut
74	00470183	1	Cover
75	00470184	1	Cover
76	00032628	1	Fastening bracket
77	00034678	1	Filter regulator
78	00000126	2	Hexagon screw
79	00000677	2	Washer
80	00031555	1	Screw coupling
81	00004101	9	Hexagon screw
82	00031539	7	Screw coupling
83	00003983	1	Valve

Item.	OKU-Id.-No.	Quantity	Designation
84	00353729	1	Pneumatic cylinder
85	00000216	4	Cap screw
86	00003947	1	Sound absorber
87	00003905	2	Screw coupling
88	00003943	1	Screw coupling
89	00004103	2	Screw
90	00003936	2	Sealing ring
91	00031546	1	Screw coupling
92	00031547	1	Screw coupling
93	00004001	6	Sealing ring
94	00003964	1	Screw coupling
95	00003976	1	Throttle relief valve
96	00005966	1	Grommet
97	35035559	1	Holder
98	00034677	1	Water tank
99	00021718	1	Screw coupling
100	00031535	2	Screw coupling
101	00004113	1	Valve
102	00004054	3	Lubricator
103	00419768	1	Type plate
104	00009123	1	CE-sign
105	00468313	1	Water hose

## 11 Appendix

### 11.1 CE-Declaration of Conformity

(CE Machine Directive 2006/42/EC, Appendix II A)

The manufacturer: OKU Tools GmbH  
Rosenstraße 15  
73650 WINTERBACH, GERMANY

herewith declares that the machine

designation: **Studding Machine AS-ZN, EP-ZN, EPK-ZN**

as delivered complies all the relevant regulations of the CE Machine Directive 2006/42/EC.  
Moreover, the machine complies with all the regulations of the EMC Directive (2004/108/EC).

Harmonized standards applied:

EN 349	Safety of machinery – Minimum gaps to avoid crushing of parts of the human body
EN 60204-1	Safety of machinery – Electrical equipment of machines – Part 1: General requirements
EN ISO 12100	Safety of machinery – General principles for design – Risk assessment and risk reduction

Leonberg, 15.11.2017

OKU Tools GmbH



Karin Klingel  
CEO



Elmar Peters  
CEO

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