TÜNKERS® Stamping Unit

PFS 400-60 PU

Operation Instruction
260262

Subject to technical modifications. 05.10.2017

TÜNKERS® Maschinenbau GmbH Am Rosenkothen 8 • D-40880 Ratingen Tel. 02102 4517-0 • Fax 02102 445808 Internet www.tuenkers.de

Contents

Please give us the details written on the type plate, when you order spare parts or when you need further information!

1.0 Description

The toggle press is a flexible tool system especially designed for the requirements of large-scale manufacturing. Being a machine component, the toggle press can only be made into a functioning system by combining it with a hydraulic or a pneumatic control system. The clamp consists of the following modules:

- Double-acting pneumatic or hydraulic cylinder in a single or tandem construction.
- Tool housing with integrated toggle lever system and adapter for the attachment of tools.
- Swivel arm for holding the inserted tools (punch, die/piercing die bush).
- Pressure jaw for holding the opposing tool (punch, die/piercing die bush).
- Optional swivel support, either spring centred or with pneumatic equalizer.

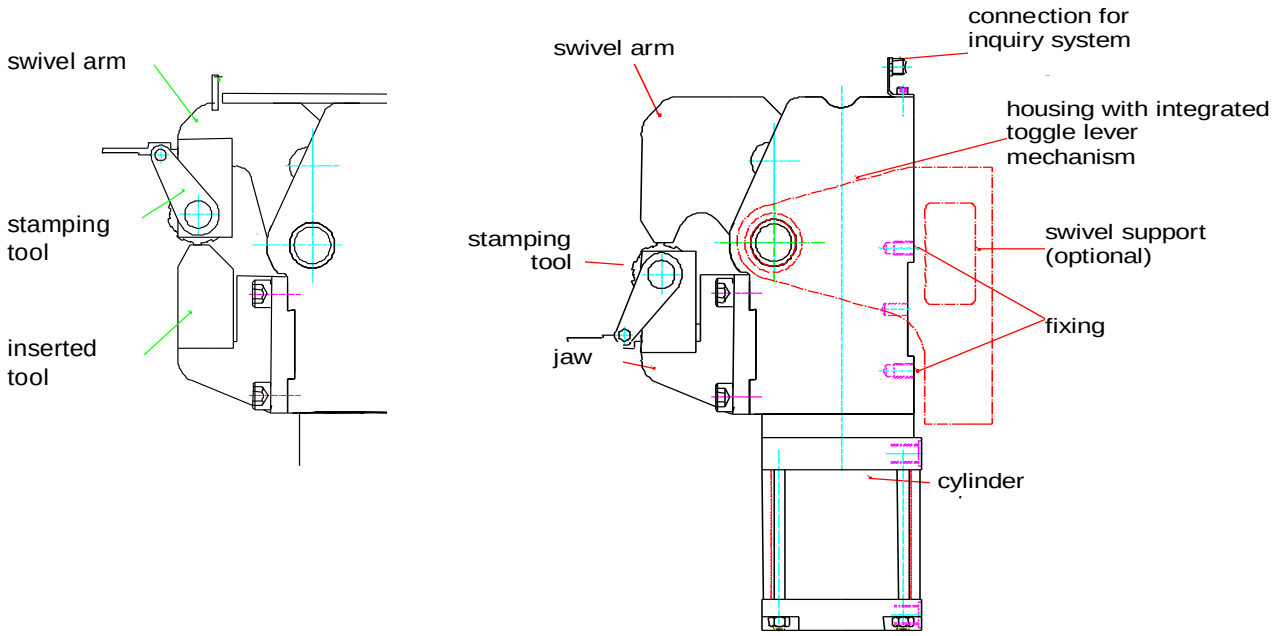


Fig. 1: Basic construction of the toggle press

How it works:

When the pneumatic cylinder is pressurised, a toggle lever mechanism integrated into the tool housing is operated which drives the swivel arm. At the end position of the mechanism a force multiplication of 1:10 is reached resulting in the high forces required for the forming application. The integrated stop makes sure that the arm is always moved to a reproducible end position.

By pressurising the piston ring side of the cylinder the return stroke is initiated. Integrated sensors monitor the position.

2.0 Safety precautions

Safety precautions to be observed by the user

This description contains the information required to use the products for the purpose for which they were designed. This information is intended for the use of suitably qualified persons.

The term “qualified” refers to persons, over 18 years of age, whose education, experience and training – along with their knowledge of the applicable norms, rules, accident-prevention regulations and working practices – qualify them to take responsibility for the safe operation of the machine and carry out the corresponding tasks to ensure that possible hazards can be identified and avoided (definition of qualified staff as per IEC 364).

Danger warnings:

The following warnings are designed to ensure the personal safety of operating staff and also the safe operation both of the products described and of items of equipment connected to them.

DANGER: This means that there is an immediate danger to the life or health of the user, if the corresponding preventative precautions are not observed.

CAUTION: Indicates a possible danger of damage to the machine or other items of equipment, if the corresponding preventative precautions are not observed.

- The unit is not designed as a ready-to-use freestanding tool, and is therefore not equipped with its own safety devices. The safety precautions shall not be regarded as fulfilled until the device has been correctly incorporated into a system of production and a corresponding safety control system has been installed.
- Before mounting and starting the Stamping unit, please read and follow these operation instructions.

CAUTION! Danger of crushing! Punch and die can crush or sever fingers!

- DO NOT reach into the working area of the stamping tool while it is in operation.
- Shut down the Stamping unit immediately in the event of any malfunction that is likely to affect personal safety.
- Before carrying out work in the tool area, disconnect the pressure supply to the power unit (compressed-air conduit).
- All maintenance work must be carried out by qualified service personnel and with the machine shut down.
- Ensure that all safety devices are refitted correctly after maintenance work has been carried out.
- The manufacturer is not liable for damage resulting from using other than original spare parts.

3.0 Installation

The toggle press must not be manipulated before it is connected to the pneumatic system.

- The unit is attached to the intended fastening areas on the housing or the swivel support by means of cylinder-head screws and pins.
- Connect the pressure supply between the supply lines and the cylinder. Please note that the maximum pressure quoted in the technical data must not be exceeded.
- Connect electro-coupling corresponding to the electrical design (see circuit diagram fig. 3) onto the connection plug "M12" (fig. 2) and tighten the screws.

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

Function of the integrated LEDs is as follows:

green .....operating voltage
red .....unit is closed
yellow.....unit is open

The manufacturer has adjusted the toggle press to the required application (thickness and type of the sheet). A specialist employed by TÜNKERS® or correspondingly trained personnel may only adjust it.

4.0 Adjustment of the embossing depth

By means of compensation shims (enclosed in the delivery) beneath the Stamping unit, the embossing depth can be adjusted and matched to the thickness of the sheet being used. For doing this, the Stamping unit must be dismantled (see 5. Exchange of dies). Please note that the maximum embossing force is only reached when the toggle lever mechanism reaches its limiting position (visual check: the support roller touches the stop on the housing).

CAUTION: The embossing action must only occur while a metal sheet is inserted. Without the metal sheet the inserted tool could become damaged.

CAUTION: During maintenance work the safety rules according to section 2 must be observed and followed.

5.0 Exchange of Stamping unit

The Stamping unit is built into the tool jaw or swivel arm. Before the tools are exchanged, the swivel arm has to be moved into the open position.

- Loosen the M10 cylinder head screw which you will find beneath either the tool jaw or the swivel arm.
- Remove the Stamping unit or the die holder.
- Exchange the tools.
- Install the new tools in reverse order.

After exchanging the tools, the Stamping unit has to be driven slowly into closed position in order to check whether the tools are standing in correct position to each other.

6.0 Exchange of limit switches

- Loosen the fastening screws (Pos. 190 + 220).
- Pull the switch sheet metal (Pos. 180) with the limit switches upwards out of the housing and replace the limit switches.
- Push the switch sheet metal (Pos. 180) carefully into the housing.
  CAUTION: The switch sheet metal must be positioned between the lower spring dowel sleeve and the housing, otherwise there is a risk of collision!
- Tighten the fastening screws (Pos. 190 + 220).

CAUTION: A switch can only be replaced as the complete unit, i.e. both switches have to be replaced. When installing the electric switches, care must be taken that the new switches are installed in a position appropriate to the opening angle. The plug assignment will be found in the technical data (fig.3).

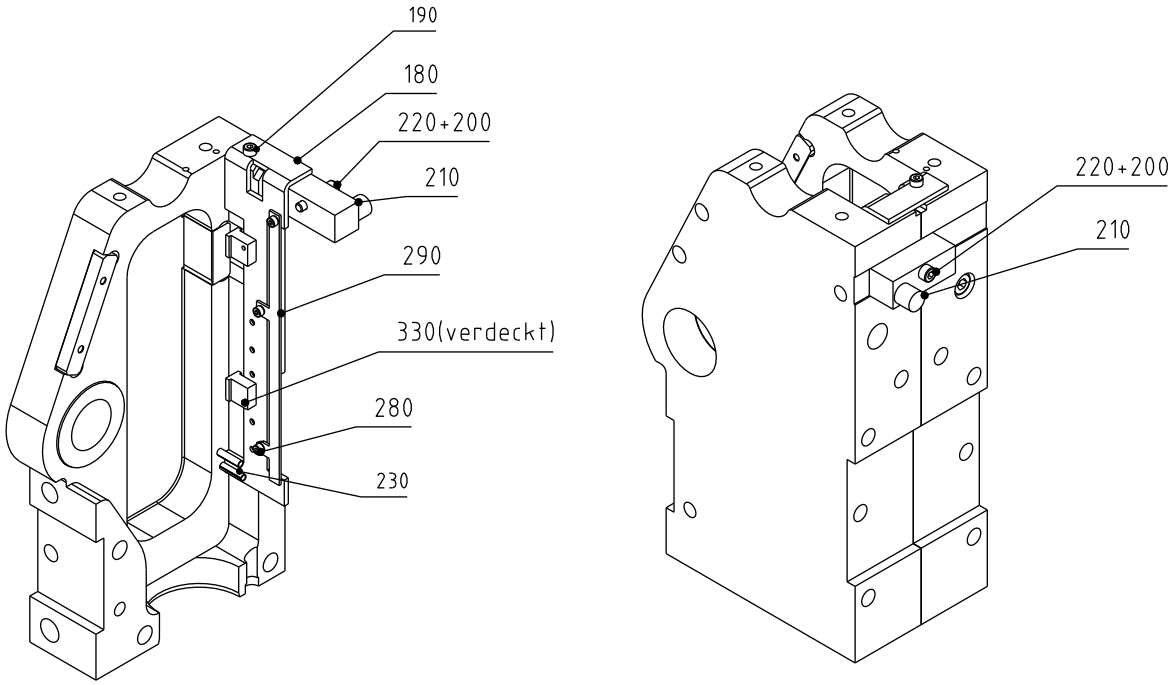


Fig. 2: Exchange of limit switches

7.0 Maintenance

Carrying out all required maintenance and monitoring work is a precondition for the problem-free functioning of the toggle press. Appropriately trained specialists may only carry out maintenance and monitoring work during standstill. After maintenance work has been carried out, the protection devices are to be correctly refitted.

The inserted tools have to be cleaned at regular intervals using compressed air or something equivalent, in order to guarantee the problem-free functioning of the toggle press. All the other components of the toggle press are largely protected from contamination and do not need to be specially cleaned.

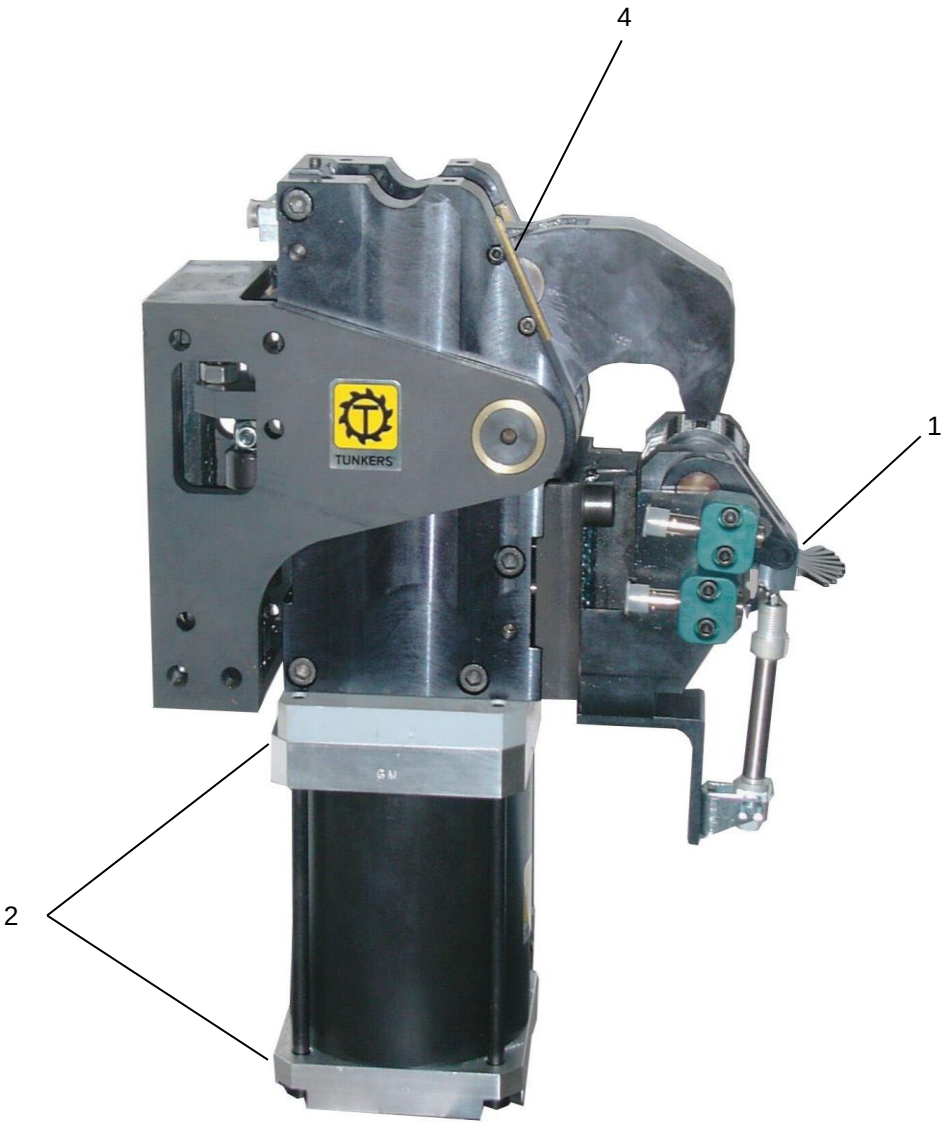
NOTE: One of the most important servicing jobs is keeping all the hose connections clean. The couplings must be fitted with covers. Before installing the coupling for the hydraulic or pneumatic hoses, care must be taken that the coupling and threads are kept clean.

Part	Daily	Weekly	Monthly
1 Tools	B		
2 Pneumatic connections		A	
3 Stamping unit complete		B	
4 Guide beads			C

A = check for leakage

B = check, general visual inspection

C = grease lightly as necessary



8.0 Wiring diagram

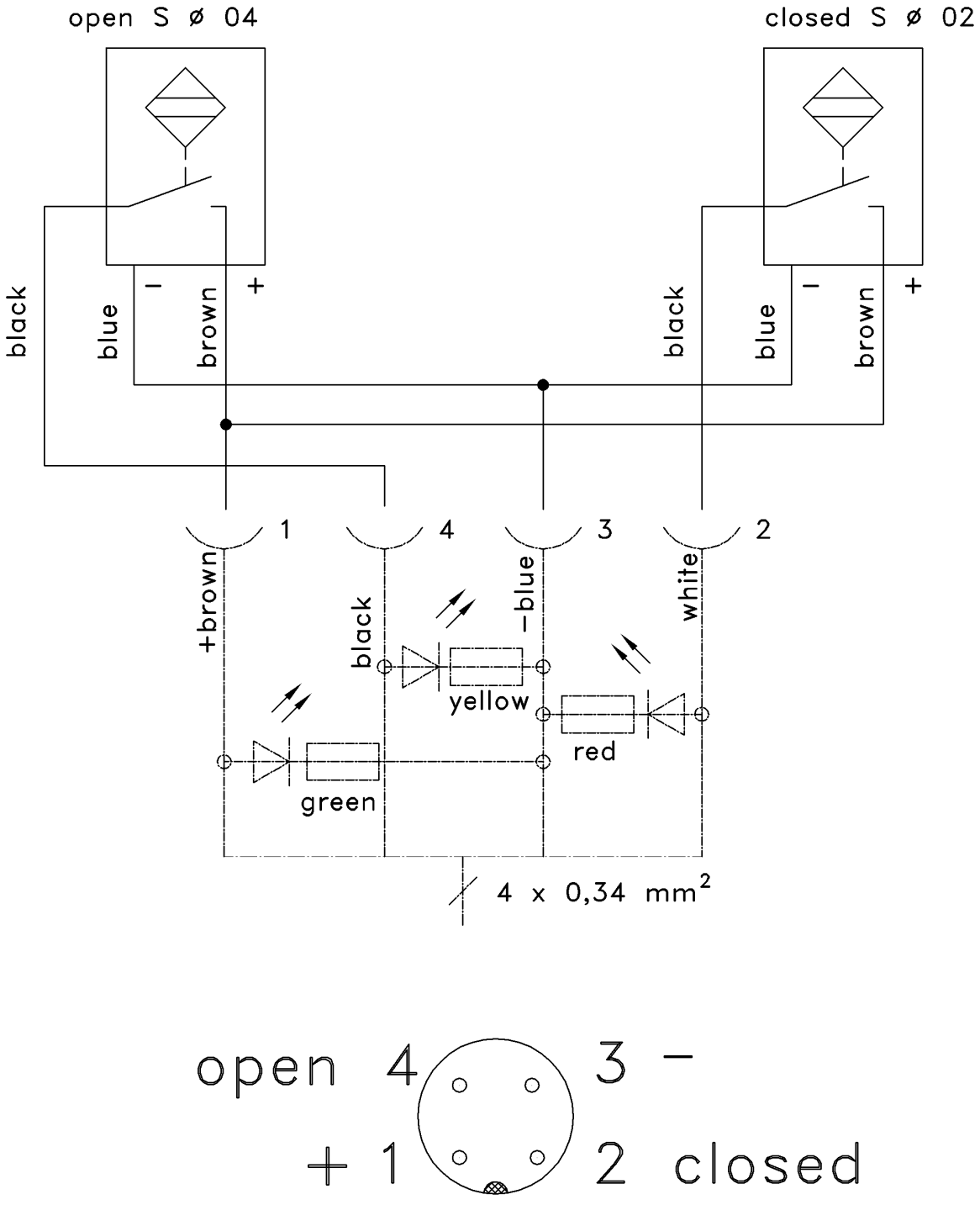
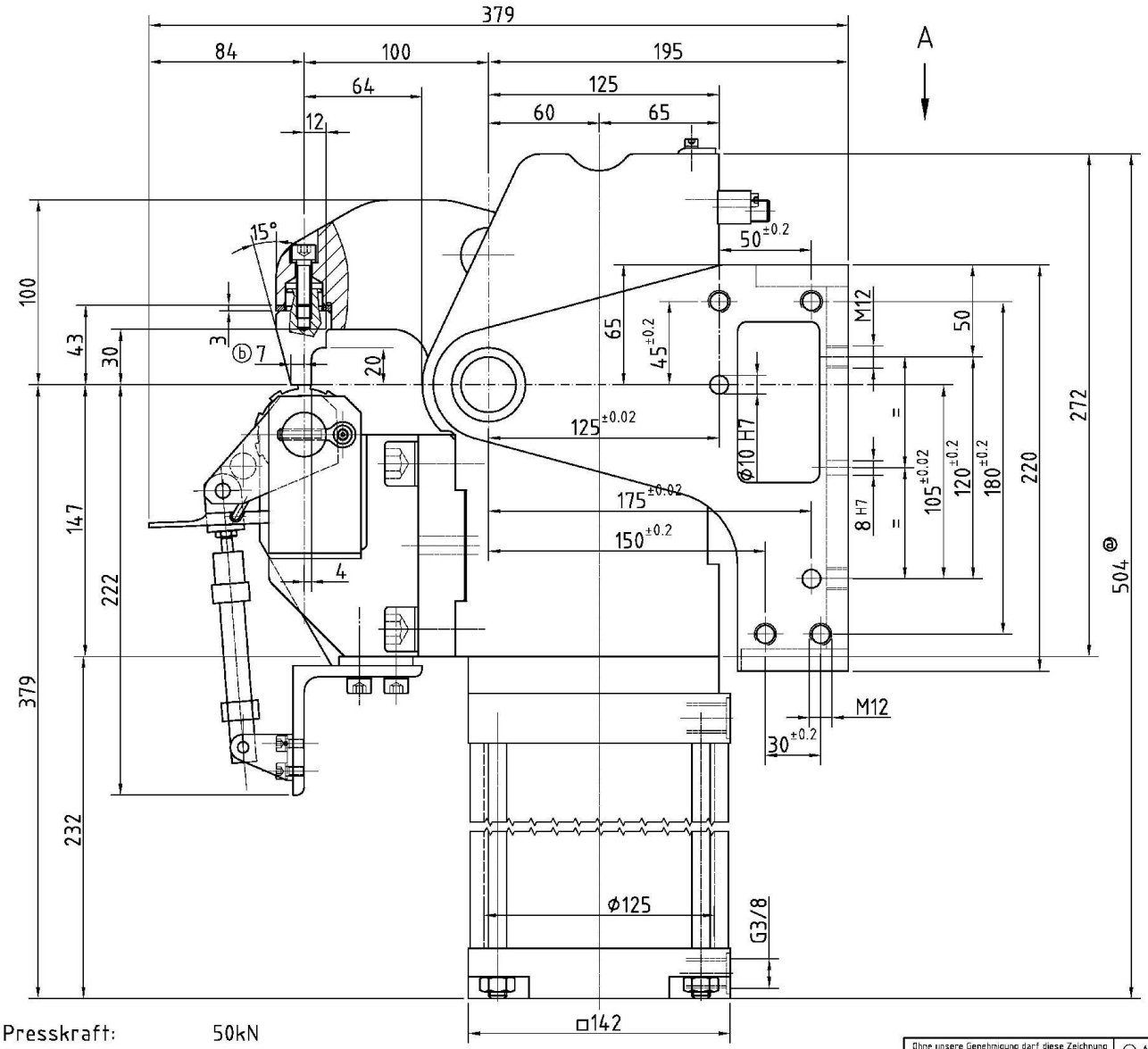
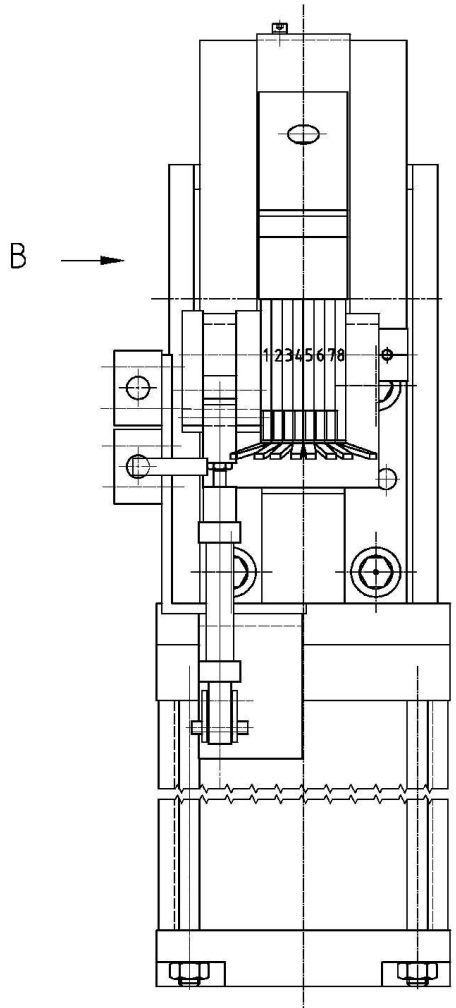


Fig. 3: Wiring diagram limit switch set T12

9.0 Appendix

- Drawing Stamping Unit PFS 400-60 PU 7297603100 (260262)
- Drawing stamping tool 218238
- Spare parts drawing PFS 400 T12
- Spare parts lists housing, swivel support, cylinder
- Spare parts drawing and list tools





Presskraft:	50kN
Betriebsdruck:	6 bar
Medium:	Druckluft
Werkzeug:	Prägewerk 8 stellig, max. 6mm Schrifthöhe, die letzten 3 Stellen automatisch hochzählend
Öffnungswinkel:	75°
Abfrage:	T12 induktiv

Ansicht A und B auf Bl2

○ Alle Maße sind Prüfmaße
○ Alle Maße mit Toleranzangaben sind Prüfmaße
○ ☐ Prüfmaße

Maße ohne Toleranzangabe DIN 7168 – m

Zust.	Änderung	Datum	Name
h			
g			
f			
e			
d			
c			
b	Änderung Amboß	11.12.06	Pet.
a	Maßänderung	04.05.01	Sr.

	Datum	Name
Bearb.	21.09.2000	Schneider
Gepr.		

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Maschinenbau GmbH
40880Ratingen

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Maßstab 1:2.5 | Position | Menge

Oberflächenbesch.

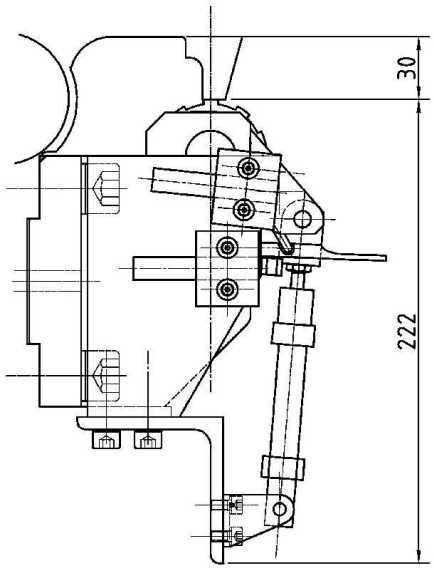
Pneum. Prägeeinheit
PFS 400-60 Pu PW 6-8/A3

7297603100

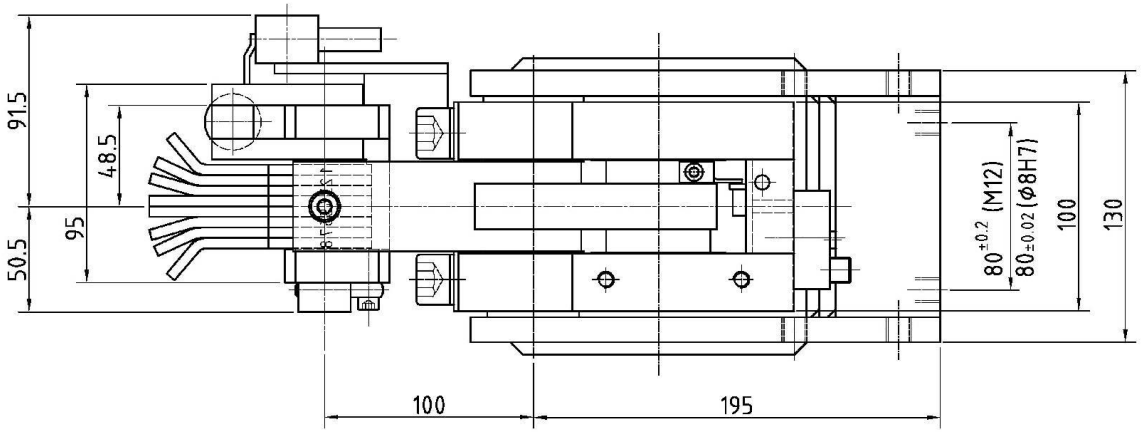
Blatt 1 Bl

11.12.2006

Ansicht B



Ansicht A



○ Alle Maße sind Prüfmaße
⊠ Alle Maße mit Toleranzangaben sind Prüfmaße
○ ☐ Prüfmaße

Maße ohne Toleranzangabe DIN 7168 – m

Maßstab 1:2.5 | Position | Menge

	Zust.	Änderung	Datum	Name
h				
g				
f				
e				
d				
c				
b		Klemmarm geänd	11.12.06	Pet.
a				

	Datum	Name
Bearb.	21.09.2000	Schneider
Gepr.		

Oberflächenbesch.

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Pneum. Prägeeinheit
PFS 400-60 Pu PW 6-8/A3

7297603100

Blatt 2 / 2 Bl

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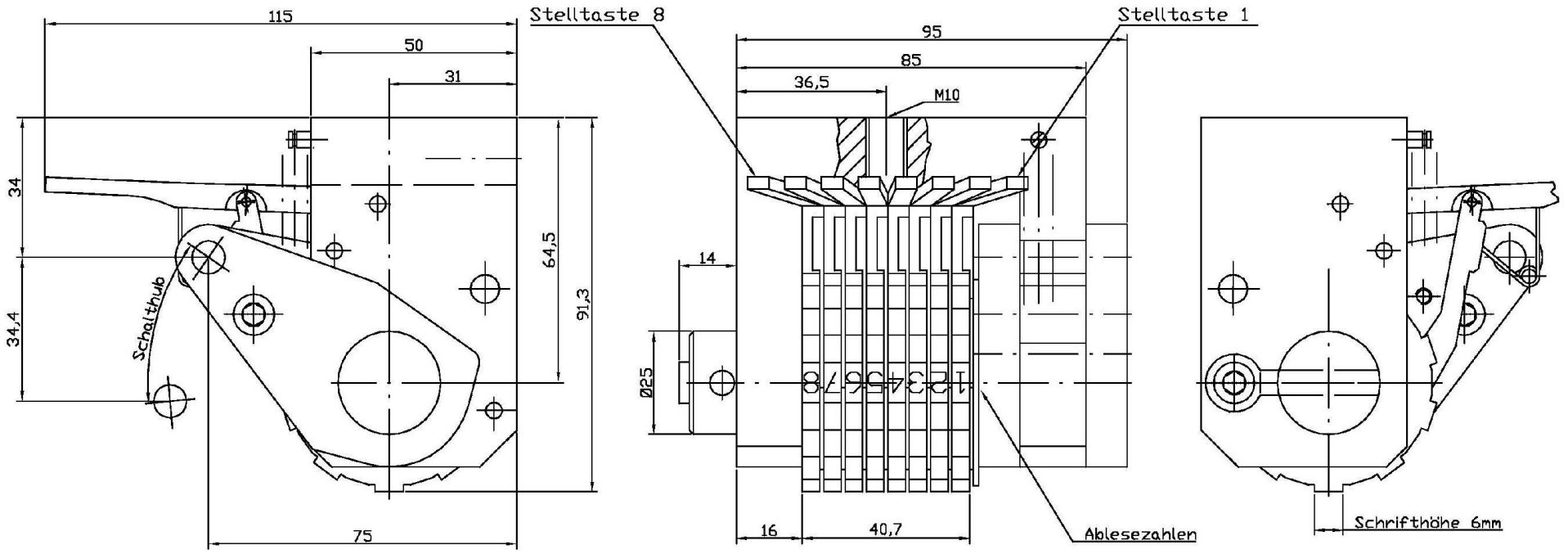
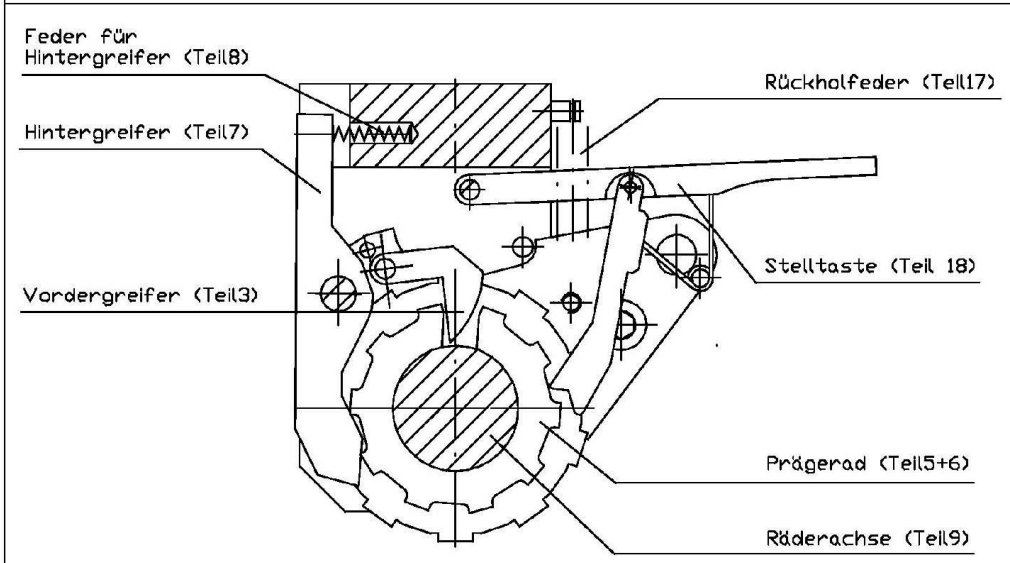
11.12.2006



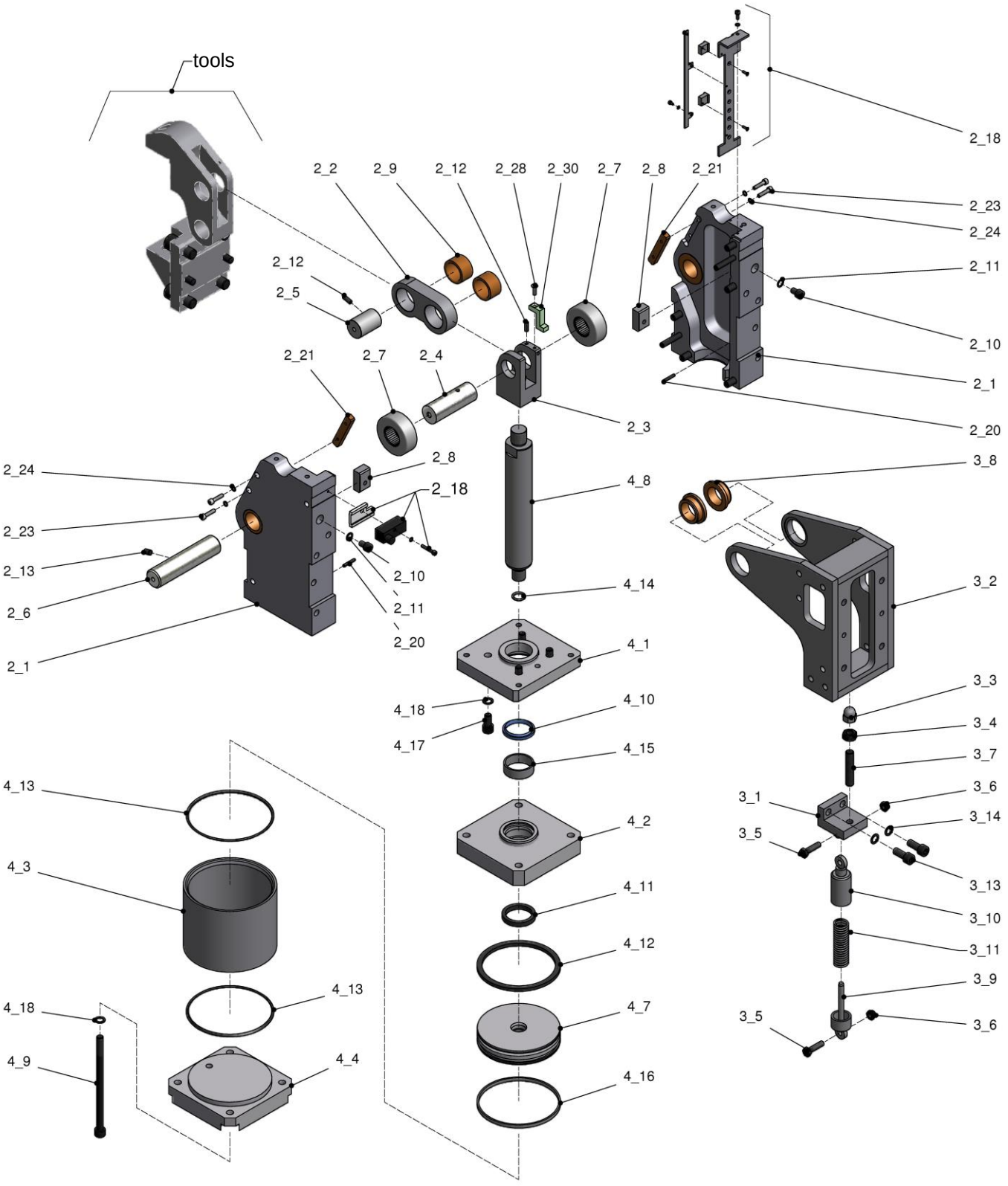
12345678 Abdruck

die letzten 3 Stellen
automatisch hochzählend



(Verwendungsbereich)				(Zul. Abw.)		(Oberfl.)	Maßstab 1:1	(Gewicht)
							(Werkstoff, Halbzeug) (Rohteil-Nr) (Modell- oder Gesenk-Nr)	
					Datum	Name	Prägewerkzeug 8 stellig, 6mm Schrifthöhe	
				Bearb.				
				Gepr.				
				Norm				
							Art.Nr. 218238	Blatt Blätter
Zust.	Änderung	Datum	Name	Ursprung			Ersatz für:	Ersatz durch:

Spare Parts Drawing PFS 400 T12



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Spare Parts List housing PFS 400

Spare Parts

Pos.	Part-No.	Quantity	Description	Type	Flag[1]
2_1	224502	1	housing	PFS 400/900	
2_2	210188	1	strap	PFS 400/900	
2_3	224480	1	fork shaped piece	PFS 400/900	
2_4	209899	1	bolt	PFS 400/900	R
2_5	209901	1	bolt	PFS 400/900	R
2_6	202668	1	bolt	PFS 400/900	R
2_7	210310	2	supporting roller complete	PFS 400/900	R
2_8	210305	2	supporting plate	PFS 400/900	R
2_9	209917	2	bush	PFS 400/900	R
2_10	200216	2	hex. socket head cap screw	M 8 x 12 DIN 912	
2_11	200977	2	securing spring washer	S 8	
2_12	225951	2	set screw	M 6 x 16 DIN 913	
2_13	200549	1	set screw	M 8 x 12 DIN 913	
2_20	201189	2	dowel pin	4 x 24 DIN 1481	
2_21	210002	2	guide bead	PFS 400/900	R
2_23	221394	4	hex. socket head cap screw	M 5 x 22 DIN 912	
2_24	200975	5	securing spring washer	S 5	
2_28	258489	1	hexagon socket countersunk head screw	M 5 x 15 DIN 7991	
2_30	393367	1	trip cam	PFS 400/900	

spare parts sets / accessories

Pos.	Part-No.	Quantity	Description	Type	
	230239	1	repair kit Stamping unit Ø125	PFS 400 (with swivel support)	
2_18	243204	1	limit swtch set completeT12 75°	PFS 400/900	

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[1] **R = included with repair kit**

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Spare Parts List
swivel support with spring compensation

PFS 400

Spare parts

Pos.	Part-No.	Quantity	Description	Type	
3_1	210333	1	angle lever complete	PFS 400/900	
3_2	210236	1	swivel support complete	PFS 400/900	
3_3	221439	1	domed cap nut	M 12 DIN 1587	
3_4	200708	1	hexagon nut	M 12 DIN 934	
3_5	200005	2	hexagon bolt	M 8 x 30 DIN 931	
3_6	200728	2	hexagon nut	M 8 DIN 985	
3_7	229347	1	set screw	M 12 x 60 DIN 913	
3_8	224623	2	flanged bush	PFS 400/900	
3_9	209965	1	spring compensation complete (top)	PFS 400/900	
3_10	209966	1	spring compensation complete (bottom)	PFS 400/900	
3_11	211545	1	pressure spring	PFS 400	
3_13	200257	2	hex. socket head cap screw	M 10 x 25 DIN 912	
3_14	200978	2	securing spring washer	S 10	

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Spare Parts List cylinder PFS 400

Spare parts

Pos.	Part-No.	Quantity	Description	Type	
4_1	210366	1	cylinder receiver	PFS 400/900	
4_2	210402	1	cylinder head	PFS 400	
4_3	210422	1	cylinder tube Ø 125	PFS 400/900	
4_4	210377	1	cylinder bottom	PFS 400/900	
4_5	226913	1	piston	PFS 400/900	
4_6	210154	1	piston rod	PFS 400	
4_7	228899	4	hex. socket head cap screw	M 10 x 217 DIN 912	
4_8	212559	1	scraper	Ø40/48 x 7 x 4	RD
4_9	212579	1	rod seal	Ø 40/50 x 8	RD
4_10	227529	1	piston seal	Ø 125	RD
4_11	201946	2	o-ring	125 x 3	RD
4_12	201695	1	o-ring	18 x 3	RD
4_13	228901	1	driving band	15 x 2.5 x 149	RD
4_14	228902	1	driving band	5.6 x 2.5 x 390	RD
4_15	200256	4	hex. socket head cap screw	M 10 x 20 DIN 912	
4_16	200978	8	securing spring washer	S 10	

spare parts sets / accessories

Pos.	Part-No.	Quantity	Description	Type	
	230172	1.00	seal kit	PFS 400 (with Airzet sealing 125/110x5)	

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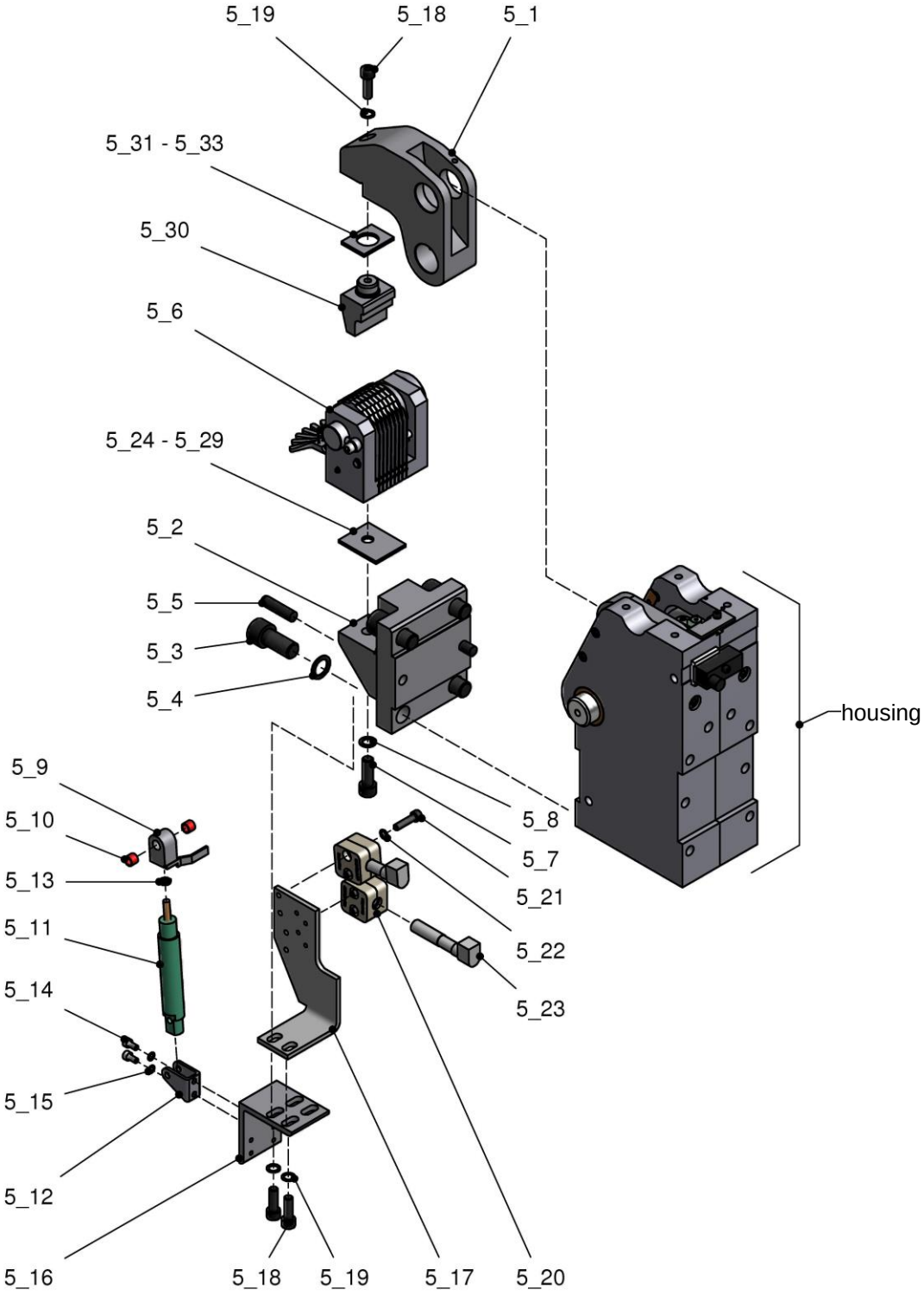

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Spare Parts List tools PFS 400 PU

Spare parts

Pos.	Part-No.	Quantity	Description	Type	
5_1	261152	1	clamp arm	PFS 400-60 PU	
5_2	224580	1	jaw complete	PFS 400-60 PU/PO	
5_3	200314	4	hexagon socket head cap screw	M 16 x 35 DIN 912	
5_4	200980	4	securing spring washer	S 16.0	
5_5	216363	2	parallel pin	10.0m6 x 40 DIN 7979	
5_6	218238	1	stamping tool	PFS 400-60 PU/PO	
5_7	200258	1	hexagon socket head cap screw	M 10 x 30 DIN 912	
5_8	200978	1	securing spring washer	S 10.0	
5_9	223878	1	cylinder eye complete	PFS 400	
5_10	201578	2	bush	8.0/10 x 8.0 DIN 17662	
5_11	216397	1	pneumatic cylinder	DSN 12-40 P	
5_12	216400	1	bench	LBN-12/16	
5_13	200683	1	hexagon thin nut	M 6 DIN 439	
5_14	220336	2	hexagon socket head cap screw	M 5 x 10 DIN 912	
5_15	200975	2	securing spring washer	S 5.0	
5_16	217164	1	angle bracket	PFS 400	
5_17	210331	1	bracket	PFS 400-60 PU	
5_18	200221	2	hexagon socket head cap screw	M 8 x 25 DIN 912	
5_19	200977	2	securing spring washer	S 8.0	
5_20	224255	2	pipe clip		
5_21	200173	4	hexagon socket head cap screw	M 6 x 25 DIN 912	
5_22	200976	4	securing spring washer	S 6.0	
5_23	216408	2	inductive sensor	Ø 12	
5_24	216310	2	adjustment sheet	0.5	
5_25	226984	1	adjustment sheet	1.0	
5_26	226985	1	adjustment sheet	2.0	
5_27	225679	2	adjustment sheet	0.1	
5_28	225681	2	adjustment sheet	0.3	
5_29	228044	2	adjustment sheet	0.2	
5_30	261153	1	anvil	PFS 400-60 PU	
5_31	228067	1	shims	2.0 mm	
5_32	228065	1	shims	1.0 mm	
5_33	210275	2	shims	0.5 mm	

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