TÜNKERS® Marking Unit

PFS 900-90 PU 75° T12/3 125mm

Operation Instruction

286262

Subject to technical modifications. **19.12.2014**

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 marking unit is a flexible tool system especially designed for the requirements of large-scale manufacturing. Being a machine component, the marking unit 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.

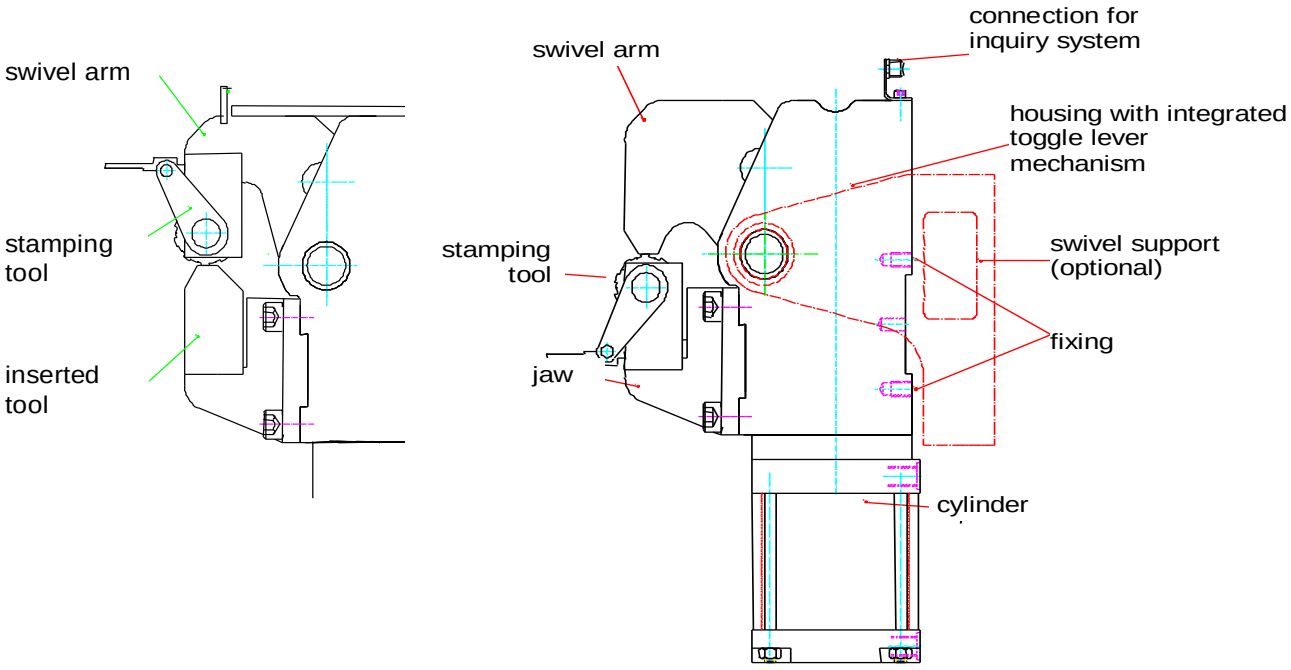


Fig. 1: Basic construction of the marking unit

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. The position is monitored by integrated sensors.

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 marking 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 marking unit while it is in operation.
- Shut down the marking 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 marking unit 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 marking unit has been adjusted to the required application (thickness and type of the sheet) by the manufacturer. It may only be adjusted by a specialist employed by TÜNKERS® or correspondingly trained personnel.

4.0 Adjustment of the embossing depth

By means of compensation shims (enclosed in the delivery) beneath the marking unit, the embossing depth can be adjusted and matched to the thickness of the sheet being used. For doing this the marking unit must be dismantled (see 5. Exchange of tools). 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 tools

The stamping tool are 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 tool.
- Exchange the tools.
- Install in reverse order.

After exchanging the tools the marking 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).

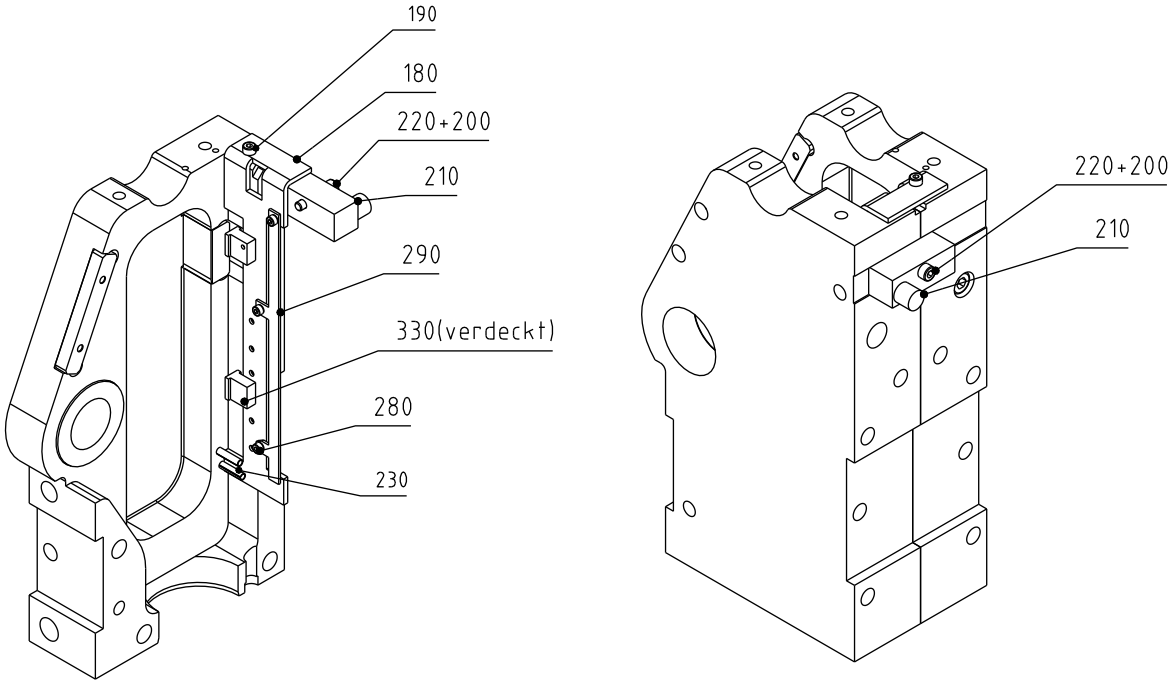


Fig. 2: Exchange of limit switches

7.0 Maintenance

Carrying out all required maintenance and monitoring work is a precondition for the problem-free functioning of the marking unit. Maintenance and monitoring work may only be carried out during standstill by appropriately trained specialists. 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 marking unit. All the other components of the marking unit are largely protected from contamination and do not need to be specially cleaned.

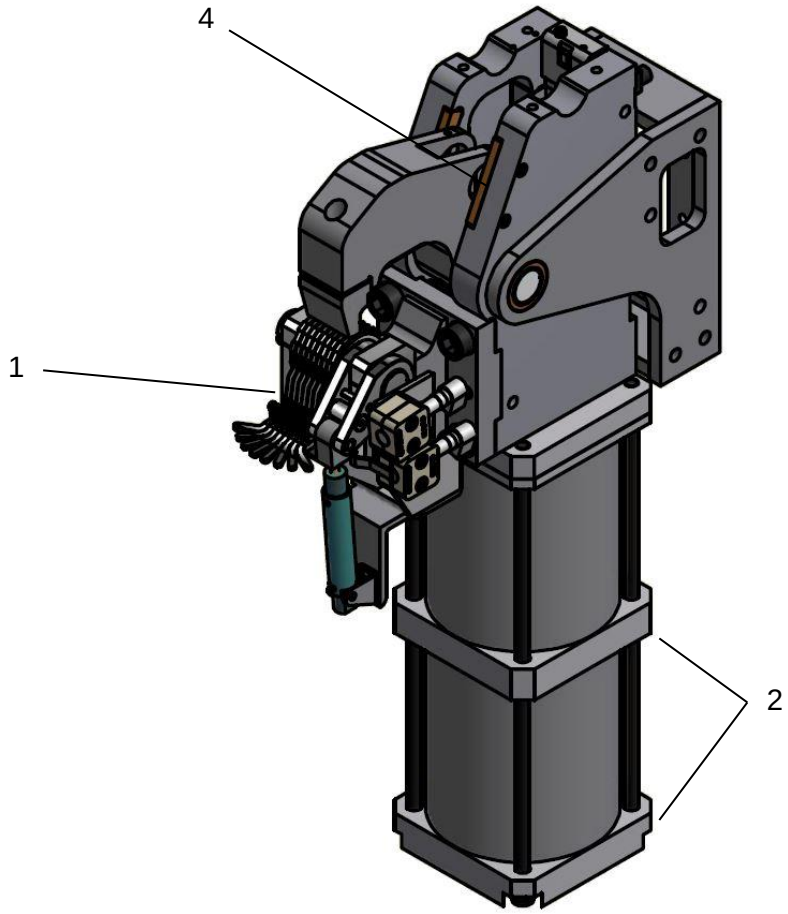
NOTE: One of the most important servicing jobs is keeping all the hose connections clean. The couplings must be fitted with covers. Before installing the coupling for the hydraulic or pneumatic hoses, care must be taken that the coupling and threads are kept clean.

Part	Daily	Weekly	Monthly
1 Tools	B		
2 Pneumatic connections		A	
3 Marking 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

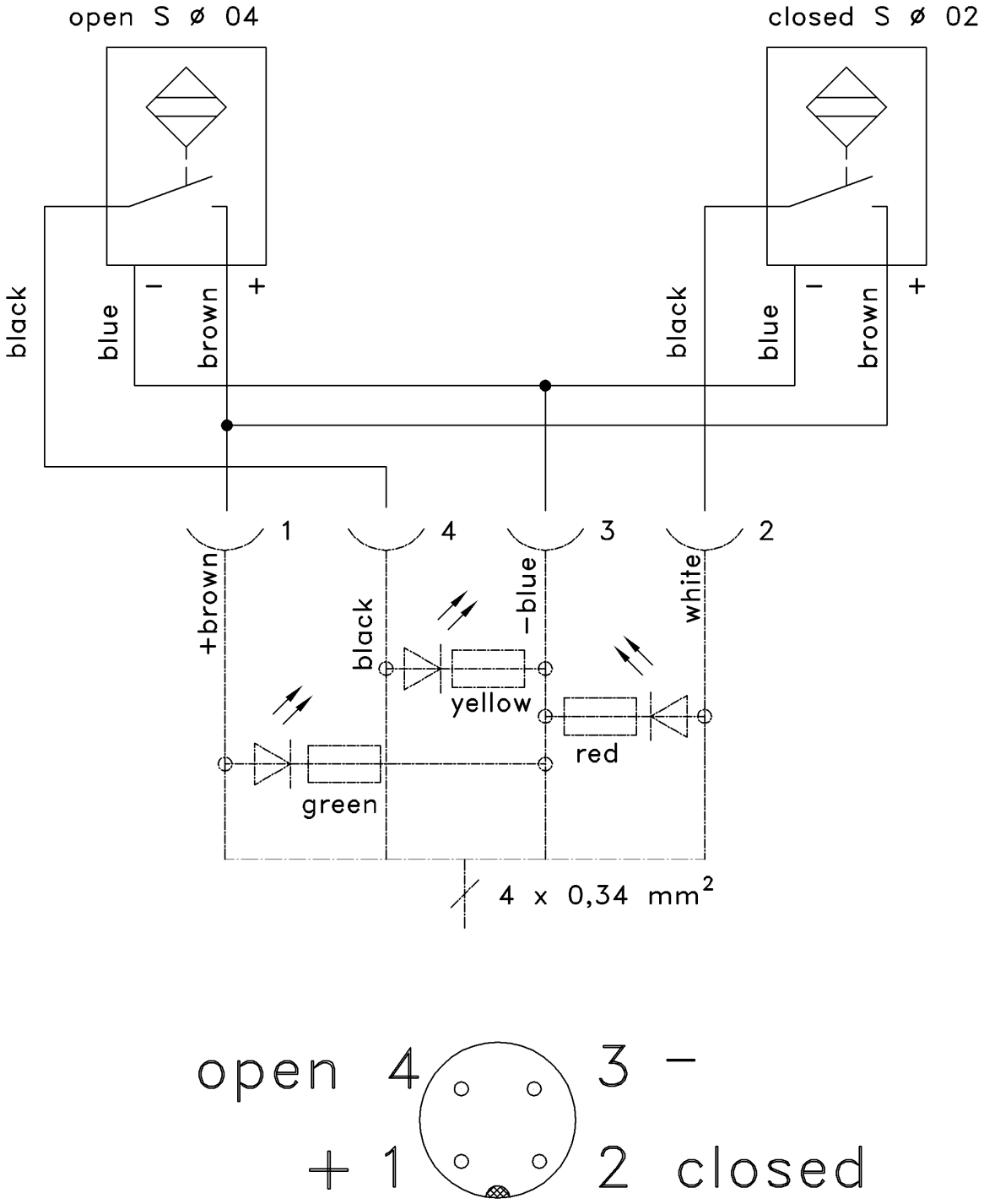
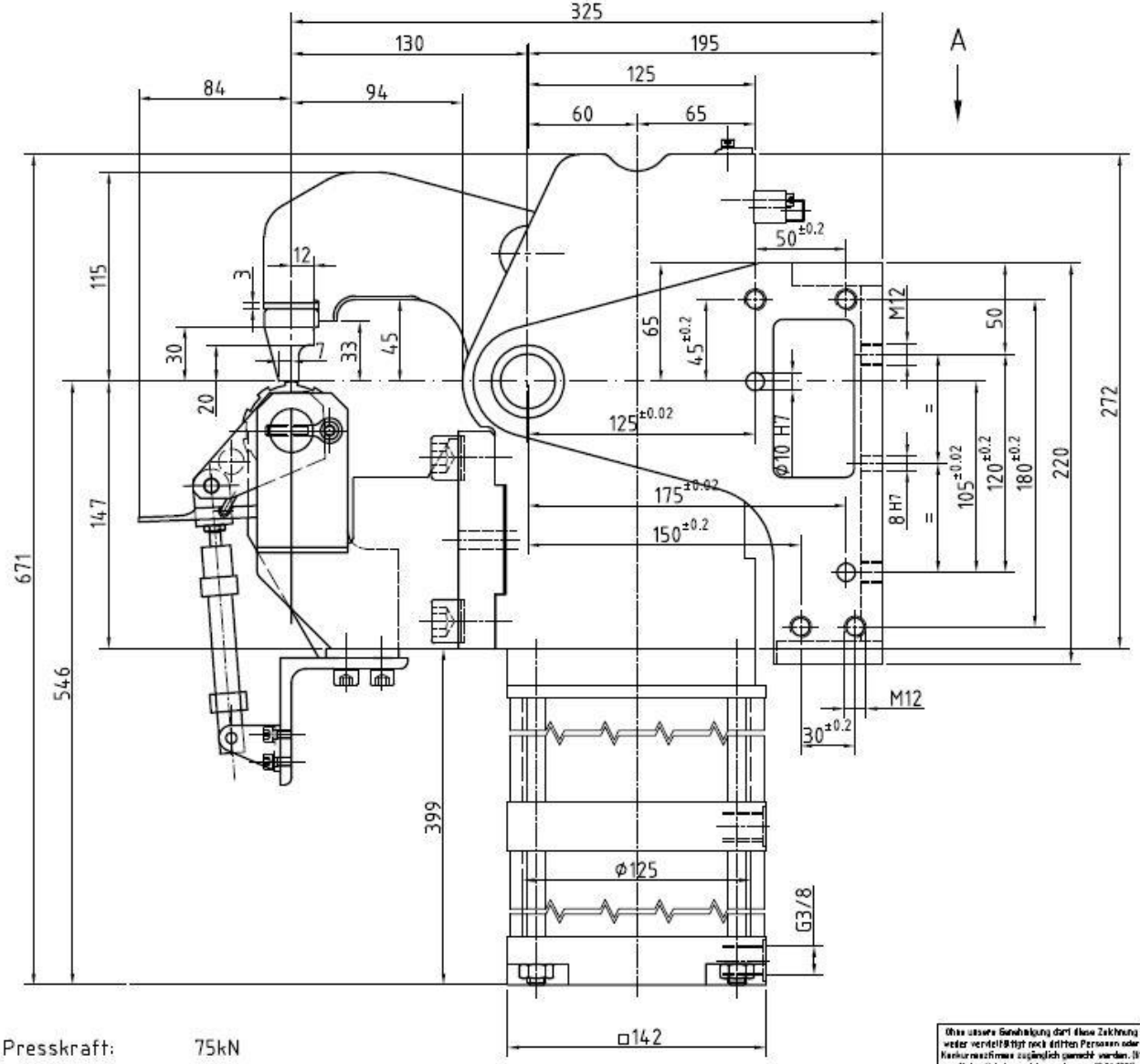
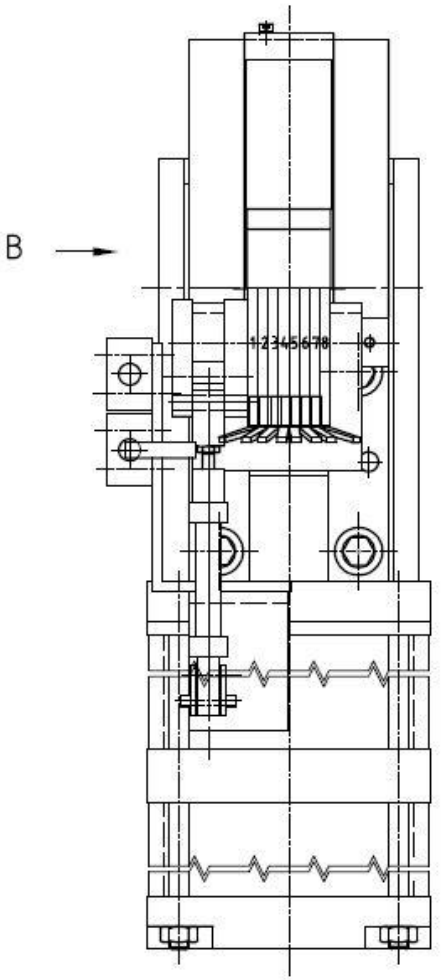


Fig. 3: Wiring diagram limit switch set T12

9.0 Appendix

- Drawing no. 286262
- Spare parts drawing PFS 900
- Spare parts lists basic body cpl., swivel bracket cpl., pneumatic cylinder, tool fixture cpl.





Presskraft:	75kN
Betriebsdruck:	5 bar
Medium:	Druckluft
Werkzeug:	Prägewerk 8 stellig, max. 6mm Schrifthöhe, die letzten 3 Stellen automatisch hochzählend
Öffnungswinkel:	75°
Abfrage:	T12/3 induktiv

Ansicht A und B auf Bl2

○ Alle Maße sind Prüfmaße
○ Alle Maße mit Toleranzangaben sind Prüfmaße
○ ▭ Prüfmaße

Maße ohne Toleranzangabe DIN 7168 – m

Maßstab 1:2.5 | Position | Menge

Oberflächenbesch.

	Datum	Name
Bearb.	06.01.2010	Peters
Gepr.		

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Pneum. Prägeeinheit
PFS 900-90 Pu, ÖW 75°,rechts, PW 6-8/A3

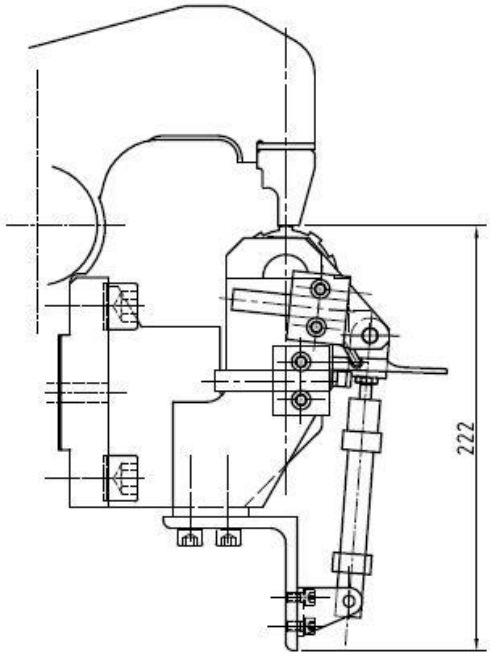
7539023100_286262

Blatt 1 / 2 Bl

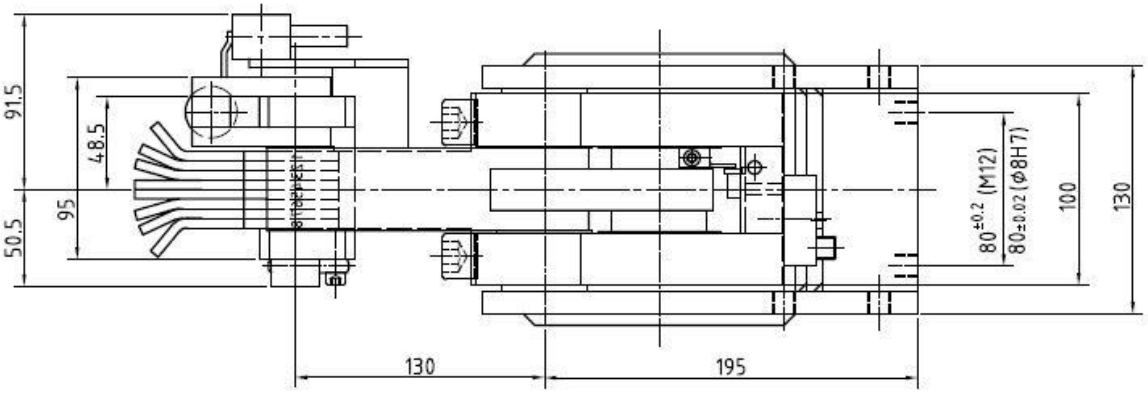
Zust.	Änderung	Datum	Name
h			
g			
f			
e			
d			
c			
b			
a			

06.01.2010

Ansicht B

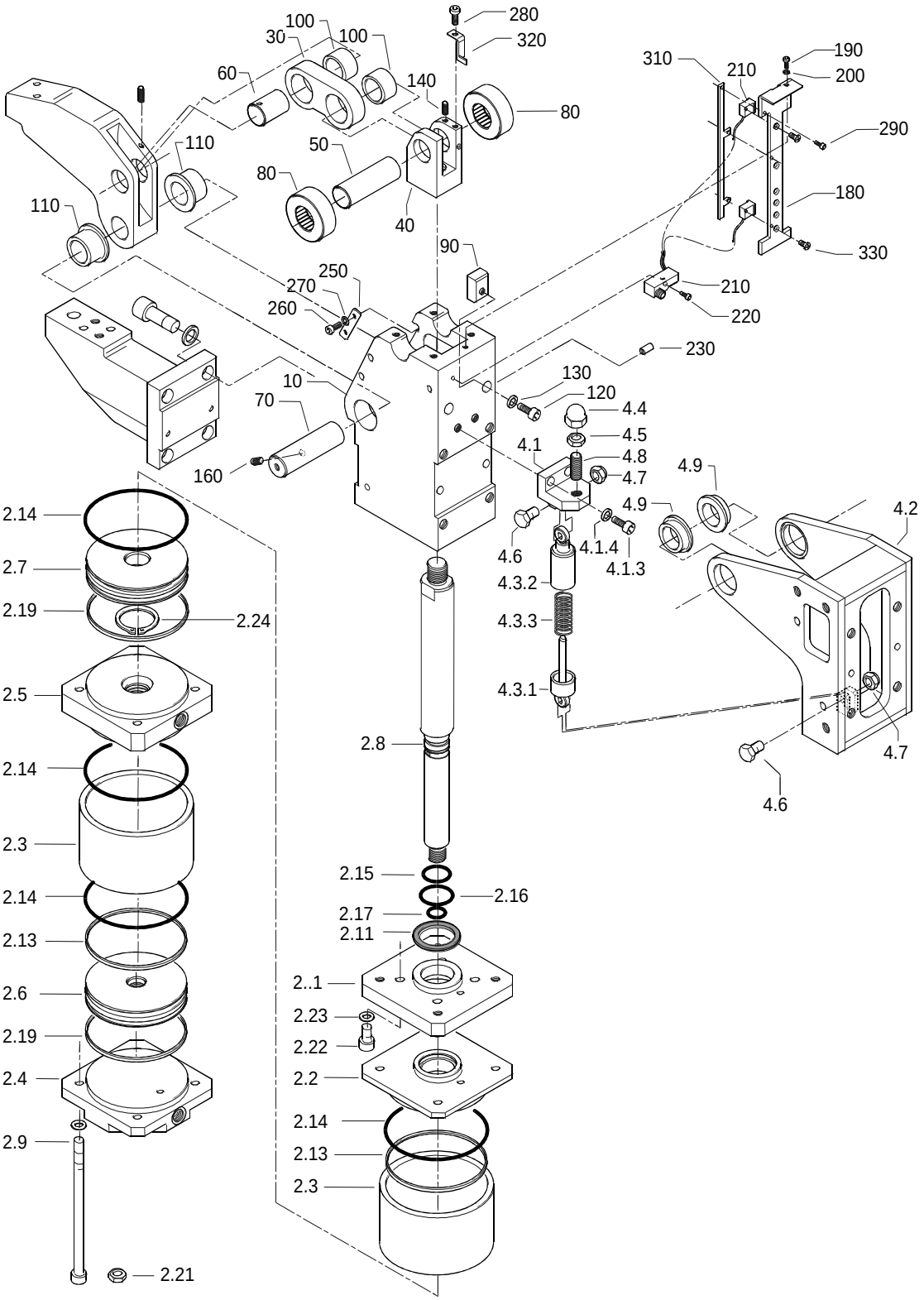


Ansicht A



Ohne unsere Genehmigung darf diese Zeichnung weder vervielfältigt noch dritten Personen oder Konkurrenzfirmen zugänglich gemacht werden. (§§ u. 11 des Urheberrechtsgesetzes v. 19.06.1901) Die Zeichnung und Beilagen sind bei Nichtbestellung sofort zurückzugeben.	○ Alle Maße sind Prüfmaße ○ Alle Maße mit Toleranzangaben sind Prüfmaße ○ ▭ Prüfmaße	Maße ohne Toleranzangabe DIN 7168 – m	Maßstab 1:2.5	Position	Menge			
				Datum	Name	Oberflächenbesch.		
			Bearb.	06.01.2010	Peters			
			Gepr.					
						Pneum. Prägeeinheit PFS 900-90 Pu, ÖW 75°, rechts, PW 6-8/A3		
			TÜNKERS ® Maschinenbau GmbH 40880Ratingen			7539023100__286262	Blatt 2 2 Bl	
Zust.	Änderung	Datum	Name				06.01.2010	

Spare Parts Drawing PFS 900



TÜNKERS® Ingenuity in series.

Spare Parts List base cpl. – part-no. 227188 PFS 900

Spare Parts

12/2014

Pos.	Part-No.	Quantity	Description	Type	Flag[1]
10	224502	1.00	housing	PFS 400/900	
30	210188	1.00	strap	PFS 400/900	
40	224480	1.00	fork shaped piece complete	PFS 400/900	
50	209899	1.00	bolt	PFS 400/900	R
60	209901	1.00	bolt	PFS 400/900	R
70	202668	1.00	bolt	PFS 400/900	R
80	210310	2.00	supporting roller complete	PFS 400/900	R
90	210305	2.00	supporting plate	PFS 400/900	R
100	209917	2.00	bush	PFS 400/900	R
110	224622	2.00	flanged bush	PFS 400/900	R
120	200216	2.00	hex. socket head cap screw	M 8 x 12 DIN 912	R
130	200977	2.00	securing spring washer	S 8	
140	225951	2.00	set screw	M 6 x 16 DIN 913	
160	200549	1.00	set screw	M 8 x 12 DIN 913	
180	219893	1.00	switch sheet metal	PFS 400/900	
190	200134	1.00	hex. socket head cap screw	M 4x10 DIN 912	
200	200974	2.00	securing spring washer	S 4	
220	200141	1.00	hex. socket head cap screw	M 4 x 25 DIN 912	
230	201189	2.00	spring dowel sleeve	4 x 24 DIN 1482	
250	210002	2.00	guide bead	PFS 400/900	R
	700689	1.00	connecting piece	PFS 400/900	
260	221394	4.00	hex. socket head cap screw	M 5 x 22 DIN 912	
270	200975	4.00	securing spring washer	S 5	
290	227191	3.00	hex. socket head cap screw	M 3 x 5 DIN 912	
310	219891	1.00	cover for cable	PFS 400/900 15 – 90°	
	200973	3.00	securing spring washer	S 3	
280	272500	1.00	countersunk screw	M 5 x 16 DIN 7991	
320	393367	1.00	switch flag	PFS 400/900	
330	200467	2.00	slot. counters. flat head screw	M 3 x 10 DIN 963	

spare parts sets / accessories

Pos.	Part-No.	Quantity	Description	Type	
	230244	1.00	repair kit	PFS 900	
210	226637	1.00	limit switch set T12 75°		

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[1] R = included with repair kit

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19.12.14

Spare Parts List swivel bracket cpl. – part-no. 229353 PFS 900

Spare Parts

12/2014

Pos.	Part-No.	Quantity	Description	Type	Flag.[1]
4.1	210333	1.00	angle lever complete	PFS 400/900	
4.2	210236	1.00	swing bracket complete	PFS 400/900	
4.4	221439	1.00	hexagon domed cap nut	M 12 - 6 DIN 1587	
4.5	200708	1.00	hexagon nut	M 12 DIN 934	
4.6	200005	2.00	hexagon screw	M8x30 DIN 931	
4.7	200728	2.00	hexagon nut	M 8 DIN 985	
4.8	229347	1.00	set screw	M 12 x 60 DIN 913	
4.9	224623	2.00	bush	PFS 900	
4.3.2	209965	1.00	lower half complete	PFS 400/900	
4.3.1	209966	1.00	upper half complete	PFS 400/900	
4.3.3	211545	2.00	pressure spring	PFS 400	
4.3.3	225505	1.00	pressure spring	PFS 900	
4.1.3	200257	2.00	hex. socket head cap screw	M10x25 DIN 912	
4.1.4	200978	2.00	securing spring washer	S 10	

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[1] **R = included with repair kit, D = included with sealing kit**

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19.12.14

Spare Parts List tool fixture cpl.–part-no. 287306 PFS 900 PU

Spare parts

12/2014

Pos.	Part-No.	Quantity	Description	Type	Flag[1]
2.1	210366	1.00	cylinder receiver	PFS 400/900	
2.2	223966	1.00	cylinder head	PFS 900	
2.3	210422	2.00	cylinder tube	PFS 400	
2.4	210377	1.00	cylinder bottom	PFS 900	
2.5	215927	1.00	adaptor	PFS 900	
2.6	226913	1.00	piston	PFS 400/900	
2.7	226914	1.00	piston	PFS 900	
2.8	210155	1.00	piston rod	PFS 900	
2.9	210045	4.00	threaded rod	PFS 900	
2.11	212559	1.00	scraper ring	Ø 40/48 x 7 x 4	RD
2.13	227529	2.00	piston seal	Ø 125	RD
2.14	201946	4.00	o-ring	125 x 3	RD
2.15	201695	1.00	o-ring	18 x 3	RD
2.16	201736	1.00	o-ring	30 x 3	RD
2.17	201716	1.00	o-ring	24 x 3	RD
2.19	228902	2.00	driving band	5,6 x 2,5 x 390	RD
2.21	200729	4.00	hexagon nut, self-locking	M 10 DIN 985	
2.22	200256	4.00	hex. socket head cap screw	M 10 x 20 DIN 912	
2.23	200978	4.00	securing spring washer	S 10	
2.24	201348	1.00	retaining ring for shaft	A 30,0 x 2,00 DIN 471	
2.25	211483	1.00	coupling ring for hole	ZJ 10,0	
2.26	229454	1.00	sieve	Ø 10 x Ø 0,3 wire	

spare parts sets/accessories

Pos.	Part-No.	Quantity	Description	Type	
	230180	1.00	seal kit	PFS 900	

[1] **R = included with repair kit, D = included with seal kit**

Subject to technical modification.

19.12.14

Spare Parts List tool fixture cpl.–part-no. 287306 PFS 900 PU

Spare parts

12/2014

Pos.	Part-No.	Quantity	Description	Type	Flag.
10	277402	1	clamp arm	PFS 400/900-90 Pu	
20	230783	1	jaw complete	PFS 900-90 P	
30	200314	4	hex. socket head cap srew	M 16 x 35 DIN 912	
40	200980	4	securing spring washer	S 16,0	
50	216363	2	parallel pin	10,0m6 x 40 DIN 7979	
60	218238	1	punching tool	PFS 400/900	
70	200258	1	hex. socket head cap srew	M 10 x 30 DIN 912	
80	200978	1	securing spring washer	S 10,0	
90	223878	1	cylinder eye cpl.	PFS 400	
100	201578	2	bush	8,0/10 x 8,0 DIN 17662	
110	216397	1	pneumatic cylinder	DSN 12-40 P	
120	216400	1	bench	LBN-12/16	
125	200683	1	hexagon thin nut	M 6-8 DIN 439	
130	220336	2	hex. socket head cap srew	M 5 x 10 DIN 912	
140	200975	2	securing spring washer	S 5,0	
150	217164	1	steel angle	PFS 400-60 Pu	
160	210331	1	angle	125x83x70	
170	200221	2	hex. socket head cap srew	M 8 x 25 DIN 912	
180	200977	2	securing spring washer	S 8,0	
185	224255	2	pipe bracket	112 a PP	
190	200173	4	hex. socket head cap srew	M 6 x 25 DIN 912	
200	200976	4	securing spring washer	S 6,0	
210	216408	2	inductive sensor	Ø 12	
220	216310	2	shims	0,5	
230	226984	1	shims	1,0	
240	226985	1	shims	2,0	
250	225679	2	shims	0,1	
260	225681	2	shims	0,3	
270	228044	2	shims	0,2	
280	261153	1	anvil	PFS 400-60 Pu	
290	228067	1	shims	2,0	
300	228065	1	shims	1,0	
310	210275	2	shims	0,5	
320	200221	1	hex. socket head cap srew	M 8 x 25 DIN 912	
330	200977	1	securing spring washer	S 8	

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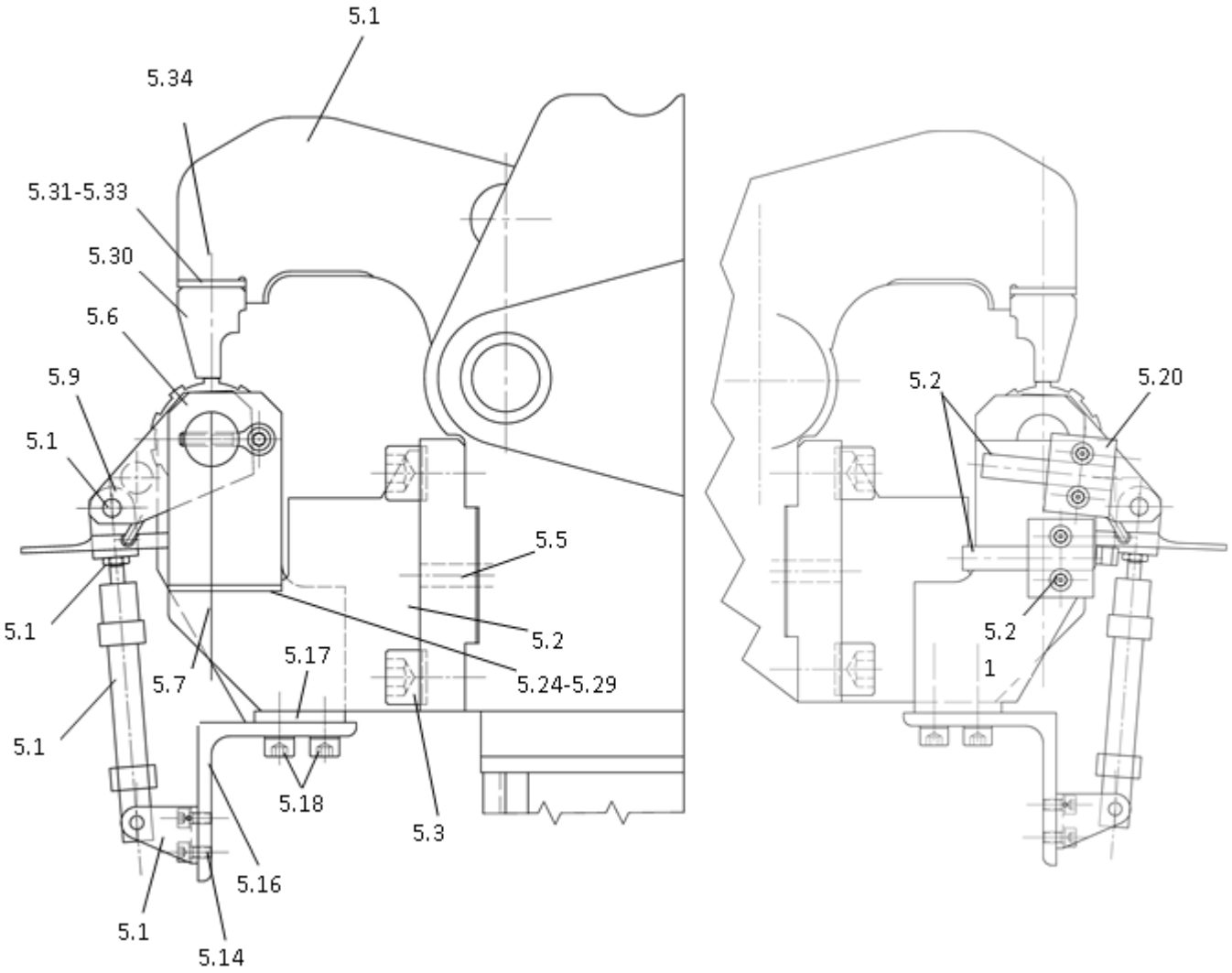
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5.24-5.29
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