

# **PNEUMATIC APPLICATOR FOR COMPA III / COMPA V C220 / C300 / C400**

Service Instructions



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The pneumatic applicator complies with the following safety guidelines:

**CE** Electromagnetic Compatibility Directive (2014/30/EU)  
EG Machinery Directive (2006/42/EG)



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# 1 Introduction

## 1.1 General Instructions

Important information and instructions in this document are designated as follows:



**DANGER** identifies an extraordinarily great and immediate danger which could lead to serious injury or even death.



**WARNING** identifies a possible danger could lead to serious bodily injury or even death if sufficient precautions are not taken.



**WARNING** of cutting injuries.  
Pay attention that cutting injuries caused by blades, cutting devices or sharp-edged parts are avoided.



**WARNING** of hand injuries.  
Pay attention that hand injuries caused by closing mechanical parts of a machine/equipment are avoided.



**WARNING** of hot surfaces.  
Pay attention so as not to come into contact with hot surfaces.



**CAUTION** indicates a potentially dangerous situation which could lead to moderate or light bodily injury or damage to property.



**NOTICE** gives you tips. They make a working sequence easier or draw attention to important working processes.



Gives you tips on protecting the environment.



Handling instruction



Optional accessories, special fittings

Date

Information in the display

## 1.2 General Safety Instructions



### WARNING!

Danger of injury by inadvertent move out of the cylinder.

- ⇒ Disconnect the printer from the power supply before mounting the applicator.
- ⇒ Connect the compressed air only after mounting the applicator to the printer.
- Only connect the device to other devices which have a protective low voltage.
- Switch off all affected devices (computer, printer, accessories) before connecting or disconnecting.
- The device may only be used in a dry environment, do not expose it to moisture (sprays of water, mists, etc.).



### WARNING!

In operation, moving parts are easily accessible. This applies especially for the zone, where the pad is moved between the starting and the labelling position.

- ⇒ During operation do not reach into that zone.
- ⇒ Keep long hair, loose clothes, and jewellery distant.
- ⇒ Before any manipulations in those areas, close the shutoff valve.



### WARNING!

Other unauthorized work on or modifications to the device can also endanger operational safety.

Unauthorized interference with electronic modules or their software can cause malfunctions.

- ⇒ Perform only those actions described in this operating manual.
- ⇒ Work going beyond this may only be performed by trained personnel or service technicians.

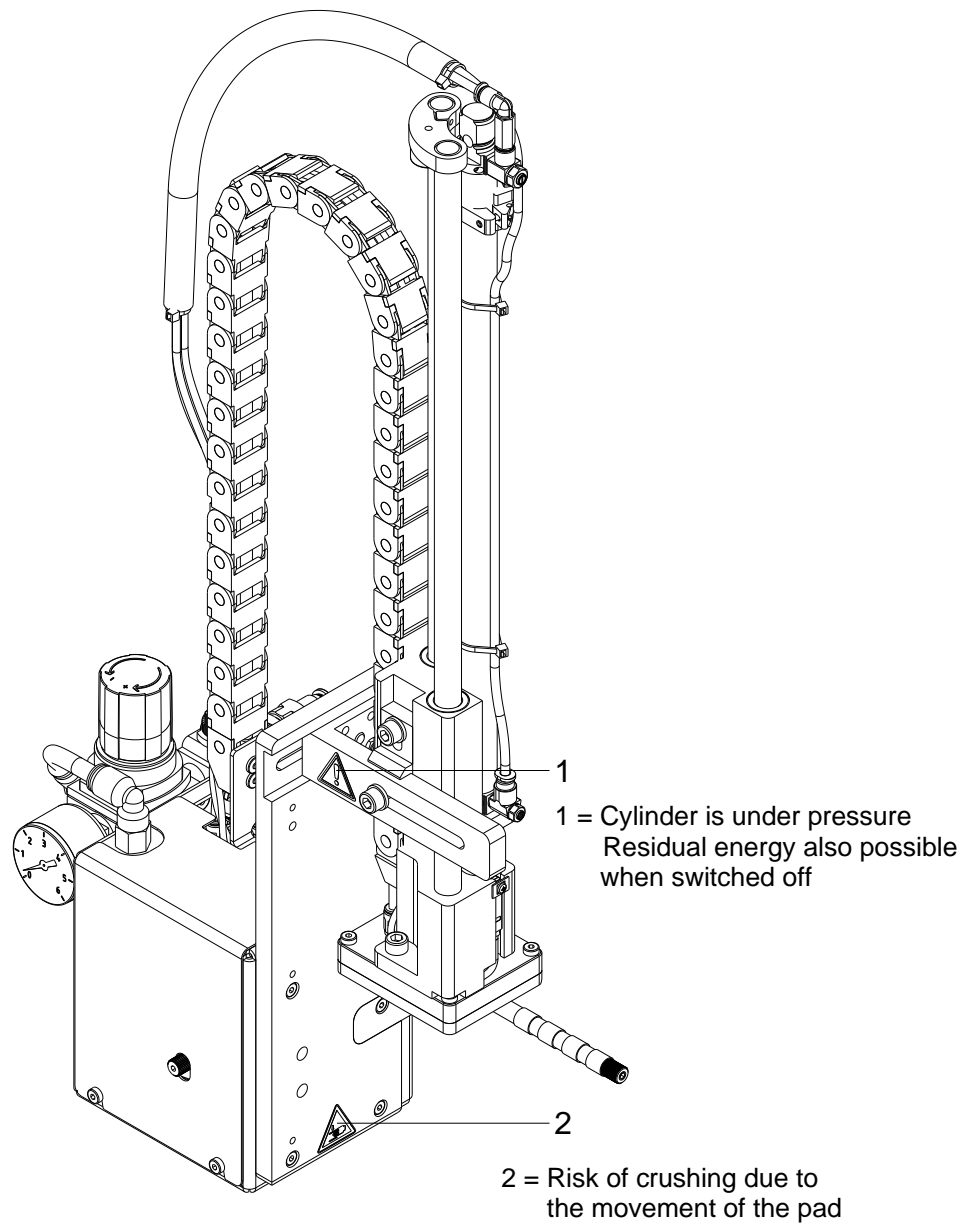


### WARNING!

The drawing in of items of clothing by moving parts can lead to injuries

- ⇒ If possible, do not wear clothing which could be caught by moving device parts.
- ⇒ Button or roll up shirt or jacket sleeves.
- ⇒ Tie or pin up long hair.
- ⇒ Tuck the ends of scarves, ties and shawls into your clothing or secure them with non-conductive clips.

### 1.3 Safety Labels



**Figure 1**



#### CAUTION!

There is a risk of injury due to the movement of the pad downwards and back up again.

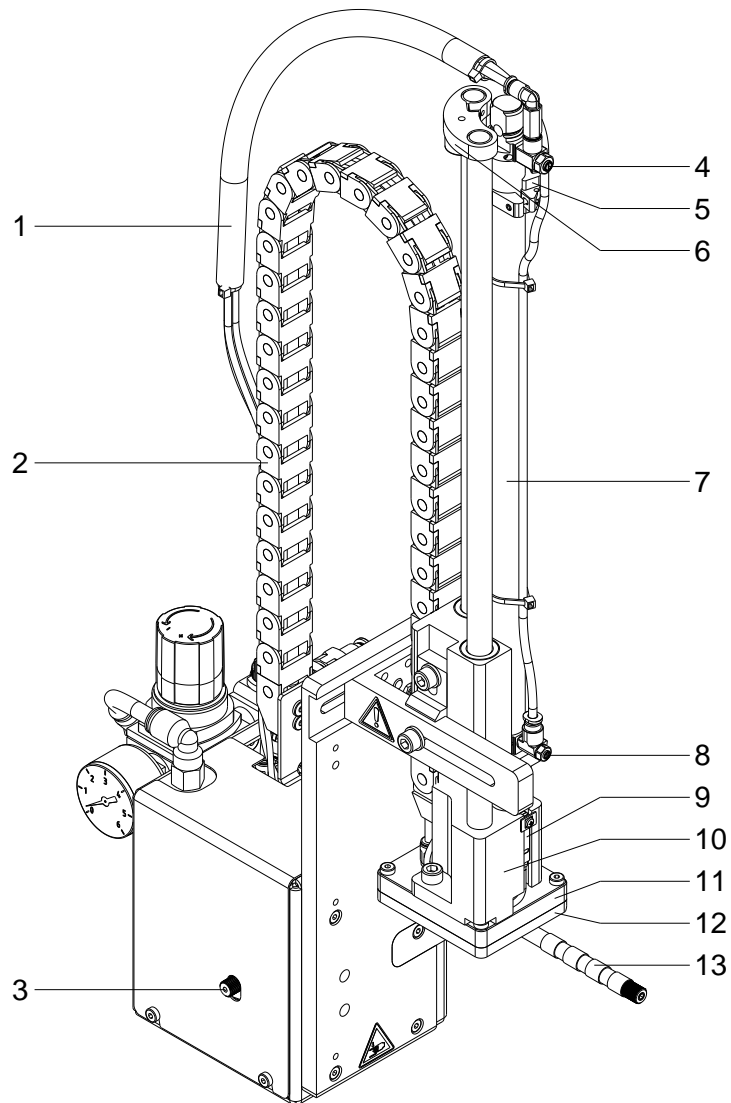
- ⇒ Do not reach into the working area of the pad.
- ⇒ Keep hair, loose clothing, and items of jewellery out of this area.
- ⇒ When incorporating the unit into the overall system, safety precautions must be taken so that no-one is able to reach into the working area.





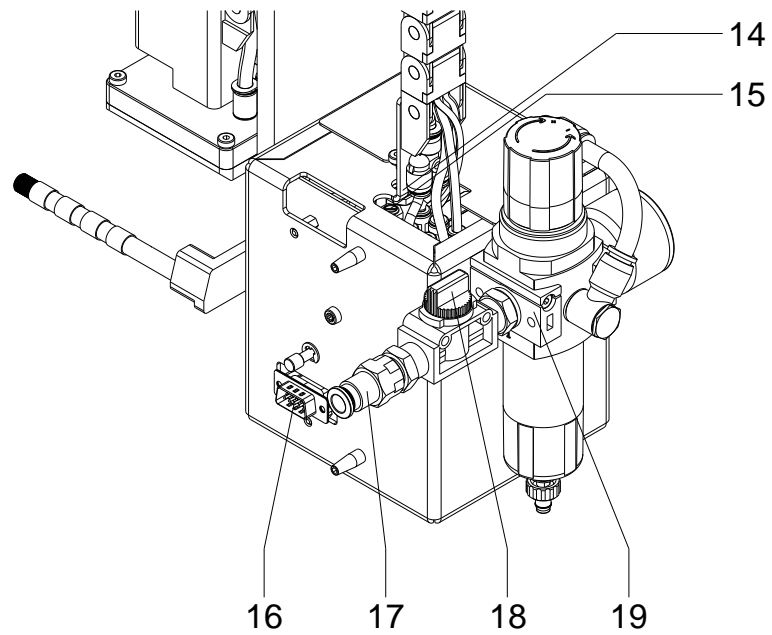
## 2 Product Description

### 2.1 Applicator Overview

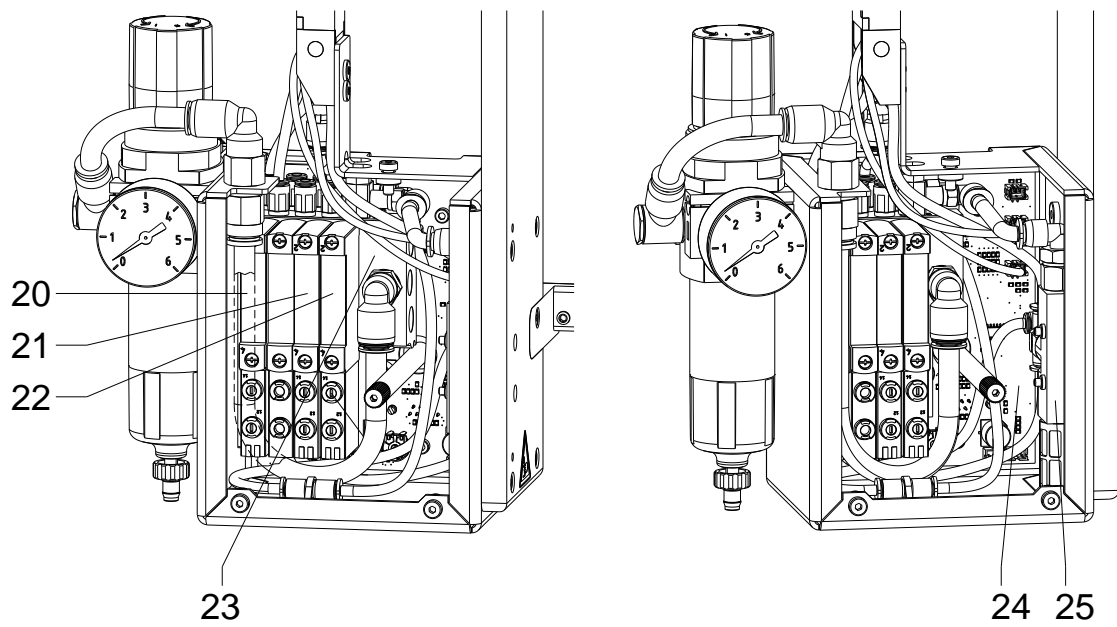


**Figure 2**

- |     |   |      |  |
|-----|---|------|--|
| 1 = | Tube  | 8 =  | Lower cylinder throttle valve                |
| 2 = | Energy chain  | 9 =  | Labelling sensor (lower end position sensor) |
| 3 = | Knurled screw for attaching the applicator to the printer | 10 = | Pad retainer                                 |
| 4 = | Upper cylinder throttle valve                             | 11 = | Top plate (customized)                       |
| 5 = | Sensor start position (upper and position sensor)         | 12 = | Suction plate (customized)                   |
| 6 = | Stopper for operating mode <i>Blow on</i>                 | 13 = | Blow tube                                    |
| 7 = | Lift cylinder   |      |  |

**Figure 3**

- 14 = Throttle valve vacuum
- 15 = Throttle valve support air
- 16 = Connector applicator – printer
- 17 = Connector compressed air
- 18 = Shut-off valve compressed air
- 19 = Pneumatic maintenance unit

**Figure 4**

- 20 = Valve lift cylinder
- 21 = Valve blow air
- 22 = Valve vacuum / support air
- 23 = Valve block
- 24 = PCB applicator control
- 25 = Vacuum generator

## 2.2 Sensors

**Sensor labelling position**

The contact of the pad onto the product or the reaching of the release position is detected by a Hall-sensor. For which purpose the displacement of the adapter bolt in relation to the sensor is used.

**Sensor start position**

The start position is the upper end position of cylinder and the position of the pad which takeover the label from printer. This position will be detected via a Hall-sensor in interaction with a magnet mounted inside cylinder.

**Sensor vacuum**

The correct transfer of a label will be checked by the vacuum sensor. It also checks that there is no longer a label on the pad in case the return movement. This sensor is integrated to the applicator PCB.

**Sensor pressure**

The pressure sensor controls the pressure air. This sensor is integrated to the applicator PCB.

## 2.3 Pneumatic

<b>Cylinder</b>	<p>A cylinder with stroke of 220-400 mm is used for the transport of labels between the peel-off edge of the printer and the labelling position.</p> <p>The movement of cylinder is controlled by a control valve on the valve block.</p> <p>The speed of movement can be changed by two throttle valves mounted at cylinder.</p>
<b>Pad</b>	<p>The label will be transported by a pad. The pad must be appropriate to the size of label.</p> <p>During the label transport a vacuum is applied on the pad.</p> <p>In operating mode 'blow on' in the lower final position the label is applied by a high pressure.</p>
<b>Vacuum generator</b>	<p>The vacuum at the pad is produced by a vacuum generator. The vacuum generator is controlled by control valve on the valve block.</p> <p>The low pressure can be adjusted by a throttle valve.</p>
<b>Blow tube</b>	<p>Air is blown from below (supporting air) through a blow tube onto the label to support the transfer of the label from the printer to the pad.</p> <p>The blow tube is adjustable concerning the blowing direction.</p> <p>The supporting air is connected by the magnet valve (support air). The power of the supporting air can be adjusted by a throttle valve at the valve block.</p>
<b>Pneumatic maintenance unit</b>	<p>The pneumatic maintenance unit is offered as an option for the applicator. The important components of the pneumatic maintenance unit are a pressure reducer with manometer, a water separator with micro filter and a main connector for compressed air.</p>
<b>Valve block</b>	<p>The distribution of the compressed air to the various pneumatic units is made in the valve block.</p> <p>On the valve block is mounted the control valve for support air and vacuum with their throttle valves and the control valves for the lift cylinder and blow air.</p>

## Control valves

**NOTICE!**

For adjustments of certain applicator functions, release the control valves in the pneumatic system.  
The control valves are accessible only with dismantled cover.

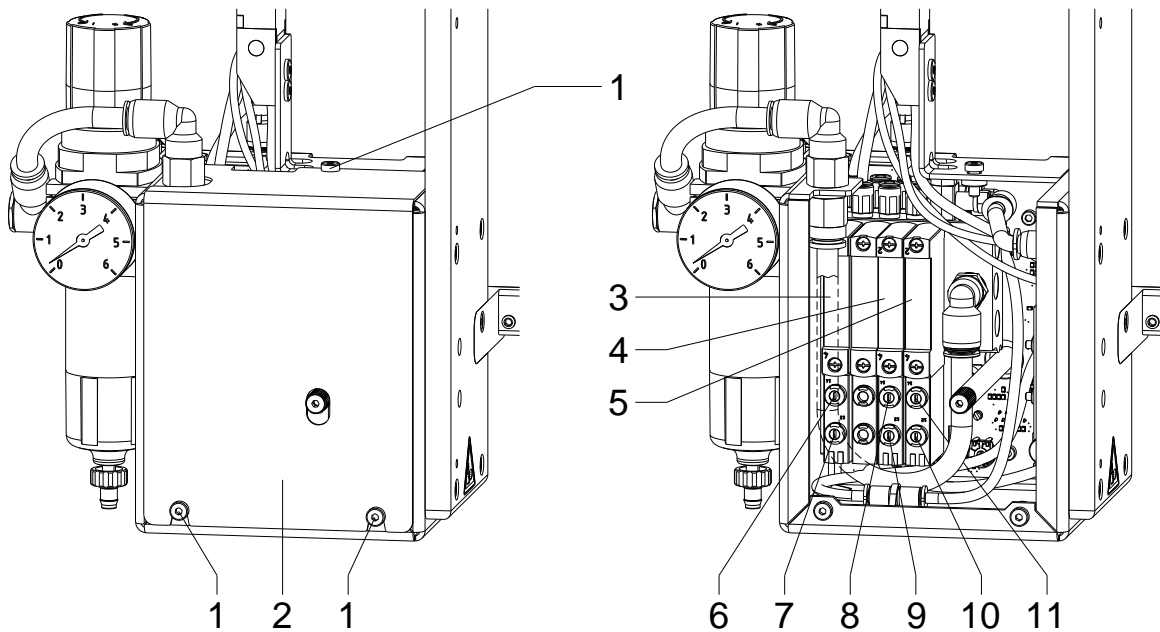


Figure 5

- ⇒ Loosen screws (1) and remove cover (2).
- ⇒ The compressed air control valves can be controlled manually with integrated switch (6 - 11).

**Three-way valve (3) to control the lift cylinder**

If the printer is switched on the valve will be controlled by electronics and the tamp will hold in the upper end position (home position). If the valve is switched the tamp will move in the lower end position (labelling position). In normal labelling operation the movement back in the upper end position will start by a signal from the labelling sensor (lower end position sensor).

**NOTICE!**

The switching by hand of this valve has only a result in case of a switched off printer.

Switching the valve by hand over switch 6 the tamp will move down up to the lowest possible position because no control is made by the sensor.

Switching the valve by hand over switch 7 the tamp will move up.

**Double two-way valve (4) for blow air**

In the operation mode 'Blow on' the label will blow up to the product.

In the operating modes 'Stamp on' and 'Roll on' the blow air is switched on for a short time after each application to avoid contaminations within the vacuum channels.

For all described functions both valves will be controlled parallel.

By pressing the keys 8 or 9 the blow air is only switched on by one of both internal valves.

**Double two-way valve (5) for vacuum / supporting air**

The two internal valves serve the vacuum nozzle for connecting an in this way for creating the negative pressure at the tamp and independent of this for connecting the support air at the blow tube for the label transfer.

By pressing switch 10 the vacuum is switched on and by pressing switch 11 the supporting air is switched on.





### 3 Maintenance and Cleaning

#### 3.1 Tools

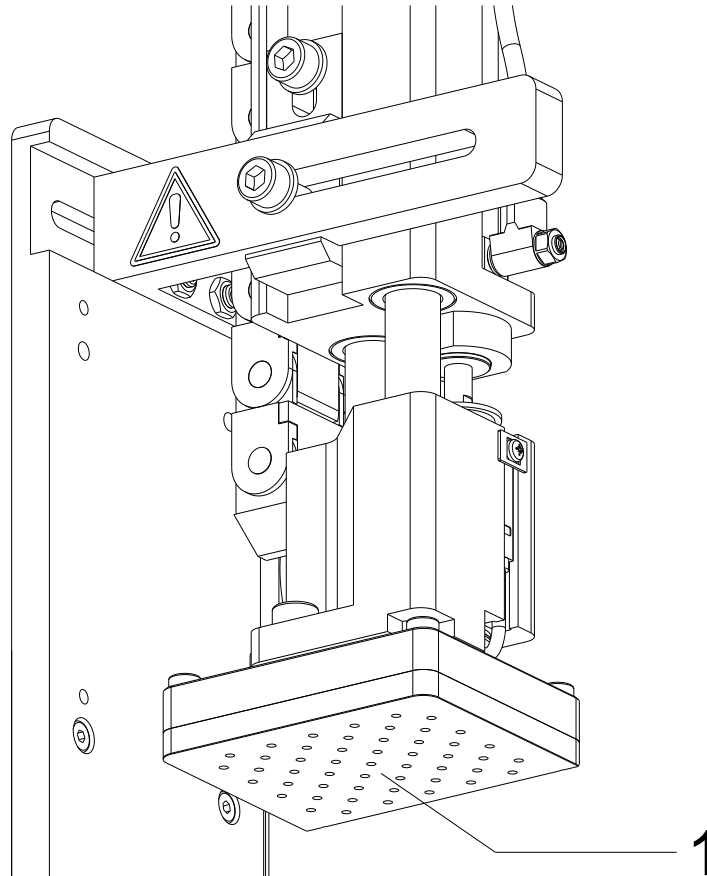
For Assemblies	Tools	Size
Cylinder plunger	Combination wrench	5.5 mm
Throttle valve		9.0 mm
Guide rod		10.0 mm
L-connector (valve block in maintenance guiding)		14.0 mm
Lift cylinder		20.0 mm
Valve block, energy track	Hexagon wrench	2.0 mm
PCB		2.5 mm
Adjustment guiding block		5.0 mm
Throttle valves	Screwdriver for slotted screws	2.5 mm
Valves on the valve block	Crosstip screwdriver	PH 0
Sensors (labelling sensor + sensor start position)		PH 2
Works at PCB	Wrist grounding	
Pressure measurement	Manometer	to approx. 5 bar
Cloth soft brush, multi-purpose cleaner (without solvent)		

### 3.2 Cleaning

**CAUTION!**

Abrasive cleaning agents can damage the applicator!

- ⇒ Do not use abrasives or solvents to clean the outer surface of the label printer.



**Figure 6**

- ⇒ Clean the outside surfaces with multipurpose cleaner.
- ⇒ Remove dust particles and label splits with a soft brush or a vacuum cleaner.
- ⇒ The ideal takeover and handling of the label can be achieved by cleaning the surface of slide foil (1) at regular intervals.

## 4 Replacing Components



### WARNING!

Risk of injury by uncontrolled functions of the applicator.

- ⇒ Disconnect the printer power supply.
- ⇒ Close the compressed air supply before the work.

### 4.1 Dismantle the Cover



### NOTICE!

Dismantle the cover to arrive the components installed on the carrier plate.

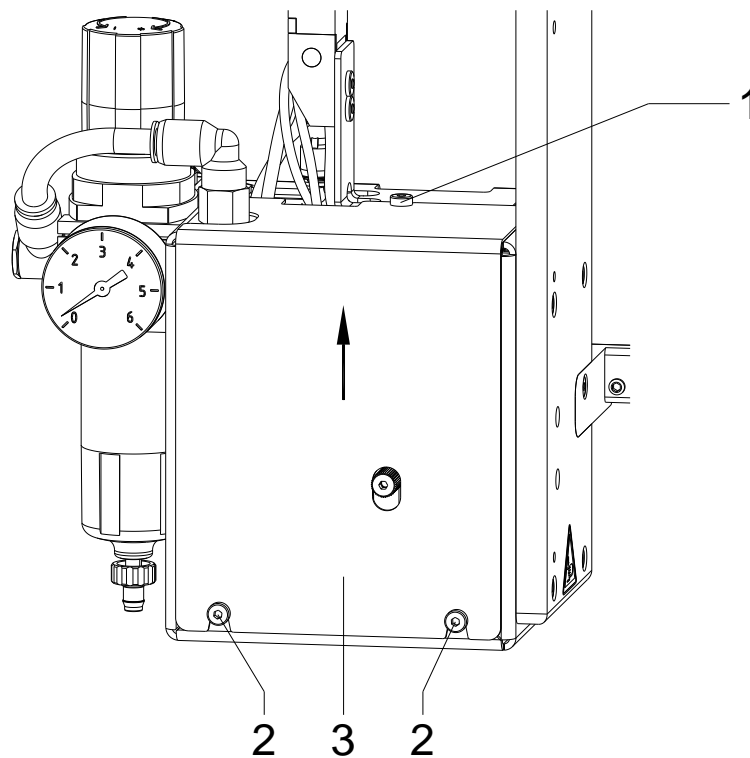


Figure 7

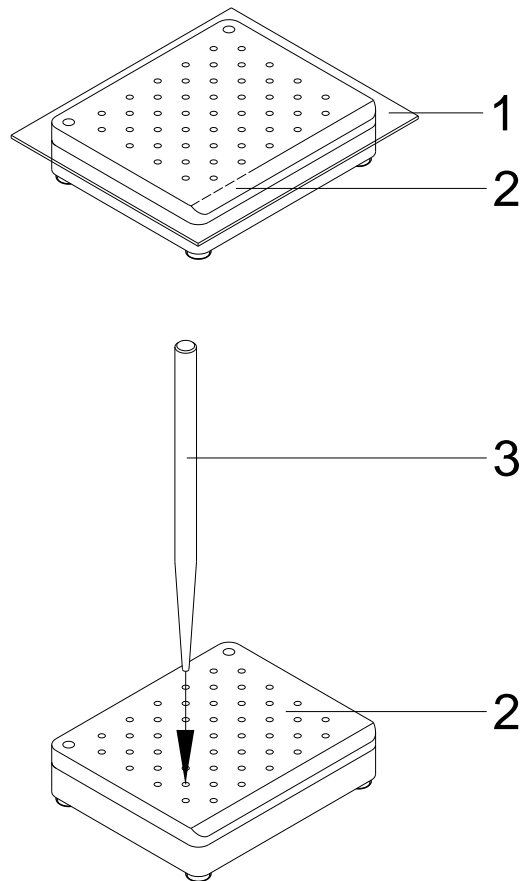
1. Loosen the screw (2).
2. Remove the screw (1).
3. Remove the panel (3) in direction of arrow.



### NOTICE!

Before starting the normal operation mount the cover again.

## 4.2 Stick the Slide Foil onto the Pad



**Figure 8**

1. Dismount the pad unit (2).
2. Remove the slide foil (1) completely.
3. Clear the surface from remains of glue.
4. Remove covering foil from the slide foil (1).
5. Put the slide foil (1) with its adhesive side onto the pad (2). Press the slide foil firmly on the pad.
6. Cut off overlapping parts of the slide foil (1) according to the broken line of the pad (2).
7. Punch the slide foil (1) on the pad (2) using the punch pin (3) appropriate to the hole pattern on the wearing slide foil.
8. Punch the hole completely by turning the pin.
9. Mount the pad unit (2).

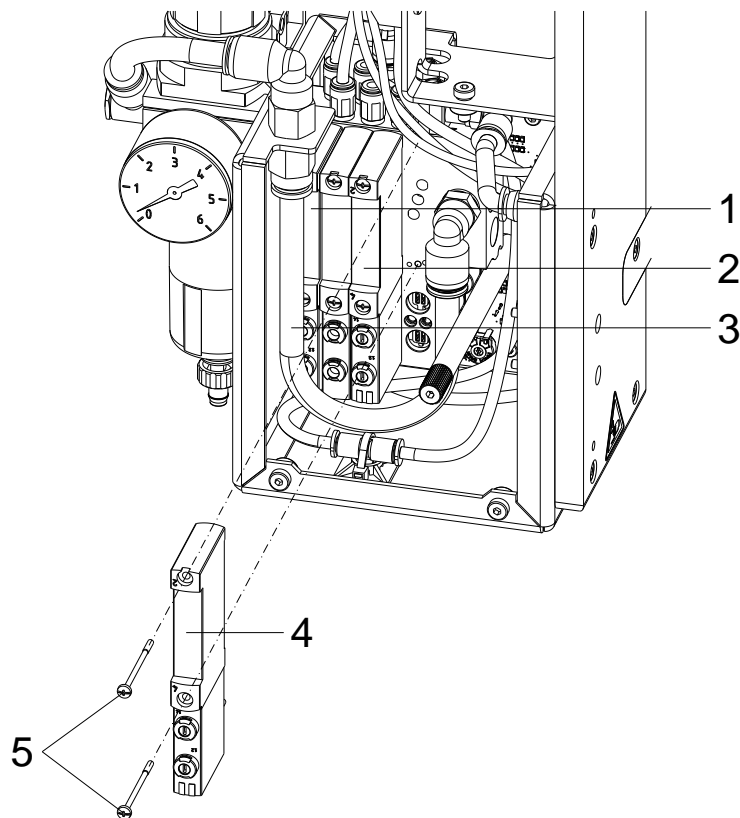
### 4.3 Replace the Valves



#### WARNING!

Risk of injury by uncontrolled functions of the applicator.

- ⇒ Disconnect the printer power supply.
- ⇒ Close the compressed air supply before the work.



**Figure 9**

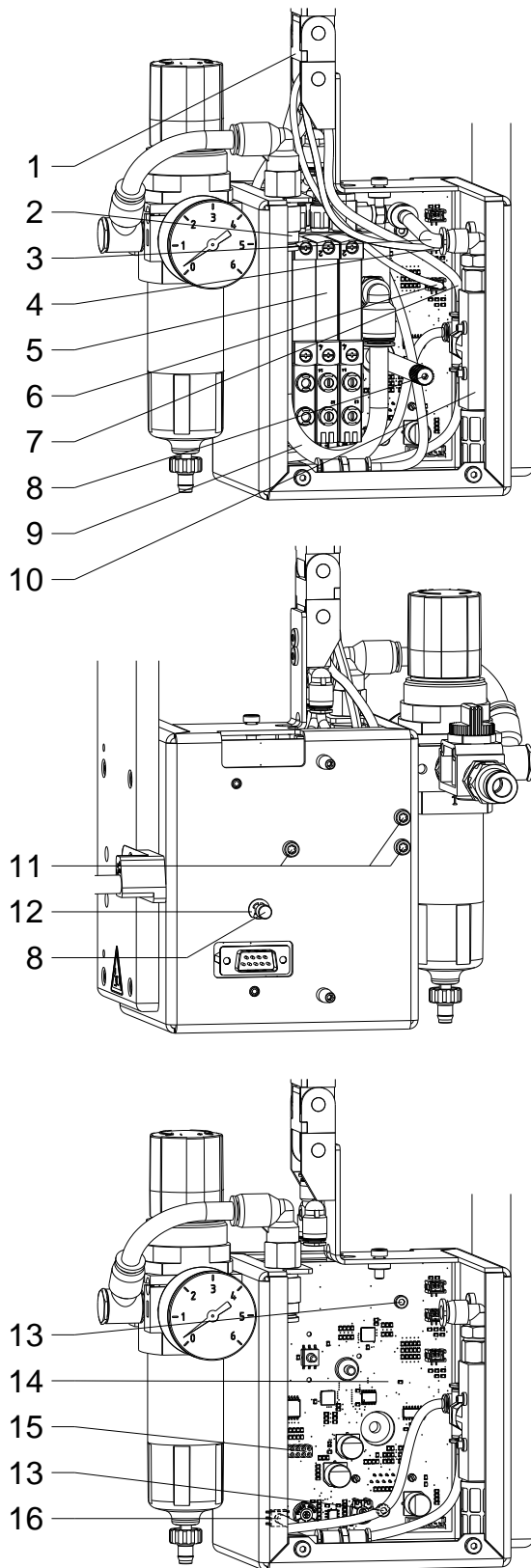
#### Removing the valves

1. Remove the panel (see chapter 4.1, page 19).
2. Loosen the screws (5) on the valve to be replaced (1, 2 or 4) and pull the valve to the front.
3. Pull off the inconvenient tube (3) if necessary.

#### Installing the valves

1. Insert the new valve, fasten it with screw (5) and make sure that the rubber seal supplied is in the correct position.
2. Replace possibly removed tubes.
3. Attach the panel.

### 4.4 Replace the PCB



#### Removing the PCB

1. Remove the panel (see chapter 4.1, page 19).
2. Dismount the applicator from the printer.
3. Remove the lock washer (12) from the knurled screw (8).
4. Pull the knurled screw (8), turn it counterclockwise until the thread engages, and then remove it.
5. Remove the connectors (4, 6) from the PCB (14).



#### NOTICE!

Do not forget the connecting position for the re-installation!

6. Disconnect tubes (3, 7) from the vacuum generator (10) and the tube (9) from the connector (2).
7. Open approx. three links of the energy chain (1) on the outside.
8. Remove three-cylinder screws (11).
9. Swing the valve block (5) out of the housing as far as possible.
10. Unscrew two screws (13) and remove PCB (14).
11. Remove the tube (16) from the vacuum sensor of the PCB (14).

#### Installing the PCB

1. Provide the vacuum sensor on the new PCB (14) with a tube (16).
2. Mount the PCB (14).
3. Swing the valve block (5) carefully and ensure the plug connection (15) between the PCB (14) and valve block (5).
4. Attach the valve block (5) with screws (11).
5. Plug-in the tubes.
6. Reconnect the connectors to the PCB.
7. Close the energy chain.
8. Screw in the knurled screw (8).
9. Attach the applicator to the printer and mount the panel.

Figure 10

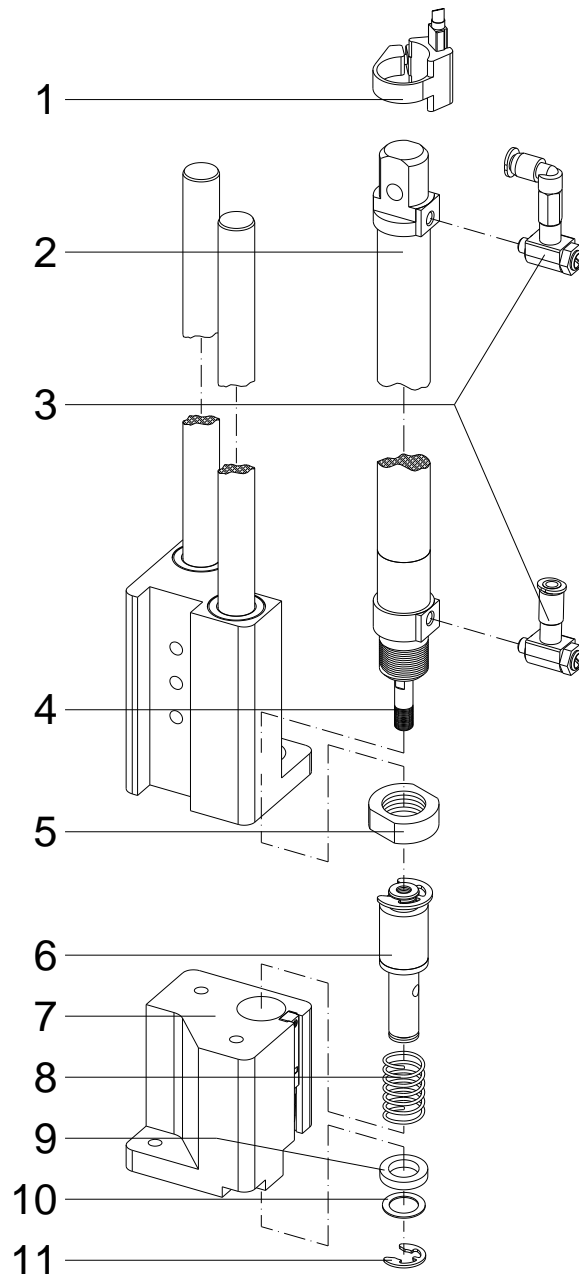
## 4.5 Replace the Cylinder



### WARNING!

Risk of injury by uncontrolled functions of the applicator.

- ⇒ Disconnect the printer power supply.
- ⇒ Close the compressed air supply before the work.



### Removing the cylinder

1. Dismount the sensor start position (1) (upper and position sensor) with mounting clip and pull off the tubes from cylinder (2).
2. Unscrew the throttle valves (3) from the cylinder (2).
3. Remove the locking washer (11) and the other both washers (9, 10). Pay attention to the order of the washers.
4. Pull the pad retainer (7) down from the adapter bolt (6) and remove the spring (8) from the pad retainer (7).
5. Hold the adapter bolt (6) at the inserted drilling and loosen the plunger (4) from the adapter bolt (6) with a combination wrench 5.5 mm.
6. Loosen the screw nut (5) and remove the cylinder (2).

### Installing the cylinder

1. Insert the new cylinder (2) and fix it with the screw nut (5).
2. Screw the adapter bolt (6) onto the cylinder piston.
3. Insert the spring (8) into the pad retainer (7) and press the pad retainer upwards.
4. Press the adapter bolt (6) against the pad retainer (7), put on the washers (9, 10) and secure with the lock washer (11).
5. Mount again the throttle valves (3).
6. Mount the sensor start position (1) (upper and position sensor) and the tubes again.

Figure 11

### 4.6 Replace the lower end position sensor on the cylinder



**WARNING!**

Risk of injury by uncontrolled functions of the applicator.

- ⇒ Disconnect the printer power supply.
- ⇒ Close the compressed air supply before the work.

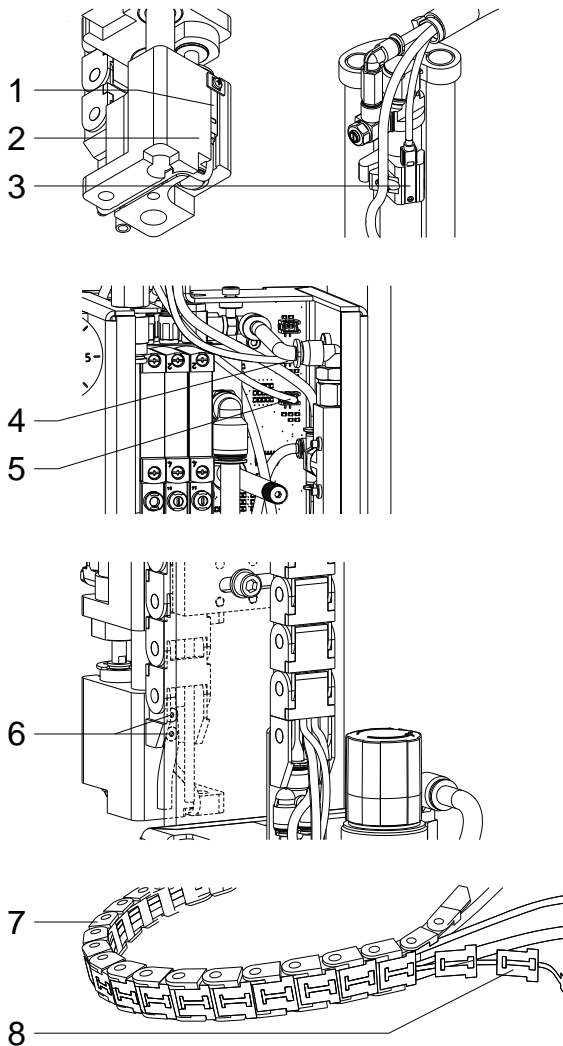


Figure 12

#### Removing the lower end position sensor (1) (labelling sensor) on the cylinder

1. Remove the tamp pad and panel (see chapter 4.1, page 19)
2. Pull the connector (5) of the sensor (1) from the PCB (slot ST205).
3. Loosen the screws (6) to dismount the energy chain (7) on one side.
4. Loosen the T-zipper (8) from the outside out of the links of the energy chain (7).
5. Remove the sensor (1) from the groove of the pad retainer (2) and pull it out of the energy chain (7).

#### Installing the lower end position sensor (1) (labelling sensor)

1. Fasten the new sensor in the pad retainer (2), lay the cable and insert it into the energy chain.
2. Press the T-zipper (8) into the links to close again the energy chain (7).
3. Fasten the energy chain with screws (6). Insert the plug connection on the PCB and mount the panel.



**NOTICE!**

After replacing a sensor, its position must be readjusted (see chapter 5.1, page 27).



## 4.7 Replace the upper end position sensor on the cylinder



### WARNING!

Risk of injury by uncontrolled functions of the applicator.

- ⇒ Disconnect the printer power supply.
- ⇒ Close the compressed air supply before the work.

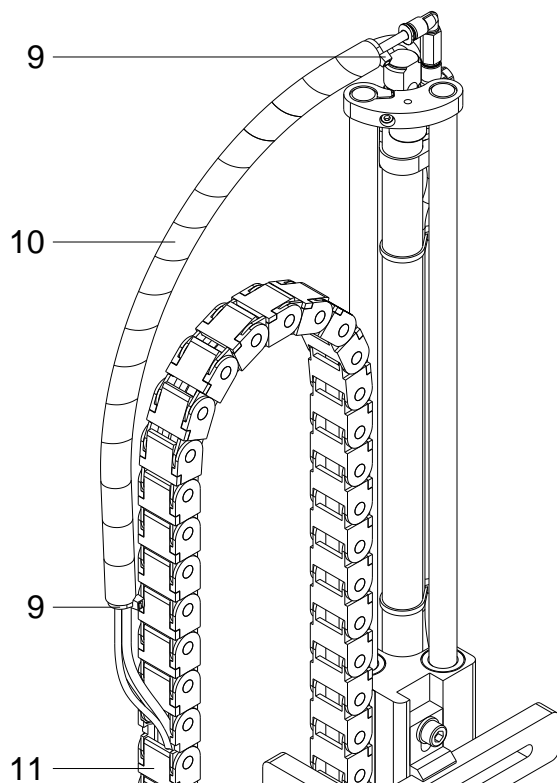


Figure 13

### Removing the upper end position sensor (2) (start position sensor) on the cylinder

1. Remove the tamp pad and panel (see chapter 4.1, page 19)
2. Pull the connector (4) of the sensor (3) from the PCB (slot ST204).
3. Open the lower part of the energy chain (11).
4. Remove the cable tie (9) and unwind the spiral hose (10) from hoses and cables.
5. Remove the sensor (2).

### Installing the upper end position sensor (2) (start position sensor)

1. Attach the new sensor (2) at the cylinder, lay the cable and insert it into the energy chain.
2. Wind again the spiral hose (10) around the cables and hoses
3. Attach new cable ties (9).
4. Press the T-zipper into the links to close again the energy chain (11).
5. Insert the plug connection on the PCB and mount the panel.



### NOTICE!

After replacing a sensor, its position must be readjusted (see chapter 5.1, page 27).



## 5 Troubleshooting

### 5.1 Sensor Labelling Position / Sensor Start Position

The sensor labelling position and the sensor start position show the activation by a LED integrated in the sensor. This LED glows in case of activation.

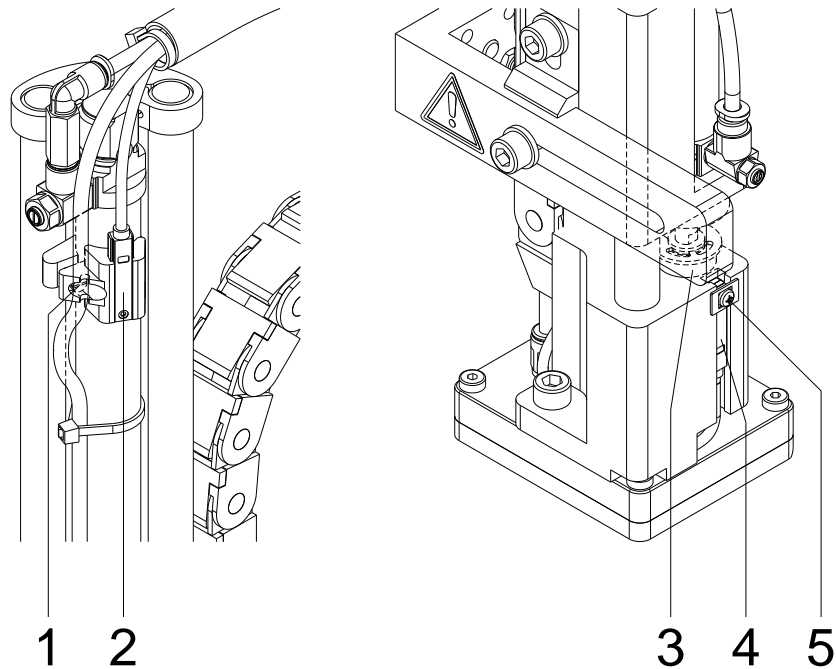


Figure 14

#### Adjust the sensor start position (2) – upper end position sensor

1. Loosen the locking ring by loosen the screw (1).
2. Open the compressed air supply.
3. Switch on the printer and the cylinder is moved to the maximum position (upper end position).
4. Move the locking ring with sensor (2) so that the LED at the sensor glows.
5. Fix the sensor position by tightening the screw (1) of locking ring.

#### Adjust the sensor labelling position (4) – lower end position sensor

1. Loosen the screw (5) at the sensor and switch on the printer.
2. Adjust the sensor (4) in a way that it is activated if the adapter pin (3) was pressed approx. 5 mm into the pad component. Up to pressing of the adapter pin into the pad component the LED glows at the sensor.  
In the activating condition the LED goes out.

### 5.2 Functions of LEDs in the Applicator Electronics

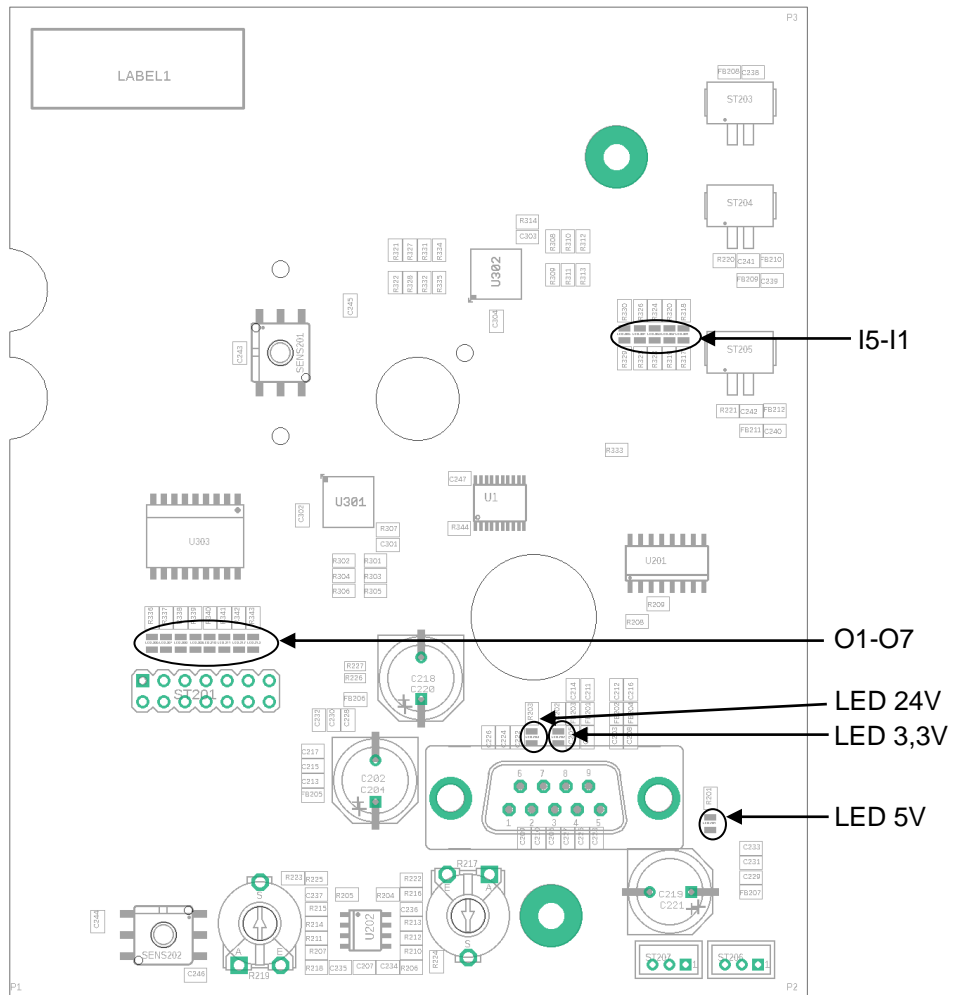


Figure 15

LED	Color	Description	LED On	LED Off
I1	red	Key start	Key pressed	Key not pressed
I2	red	Sensor start position	Pad in start position	Pad not in start position
I3	red	Sensor labelling position	Pad in labelling position	Pad not in labelling position
I4	red	Sensor compressed air	No compressed air	Compressed air available
I5	red	Sensor vacuum	No vacuum at pad	Vacuum at pad
O1	red	Lift downwards	Valve active	Valve not active
O2	red	Lift upwards	Valve active	Valve not active
O3	red	no function	-	-
O4	red	no function	-	-
O5	red	Blow air	Valve active	Valve not active
O6	red	Support air	Valve active	Valve not active
O7	red	Vacuum	Valve active	Valve not active
SV1	red	Input voltage +5V	Voltage existing	No voltage
SV2	red	Input voltage +3,3V	Voltage existing	No voltage
SV3	red	Input voltage +24V	Voltage existing	No voltage

### 5.3 Pressure Measuring



#### NOTICE!

Use a manometer with a measuring scale to 5 bar for measuring the pressure.

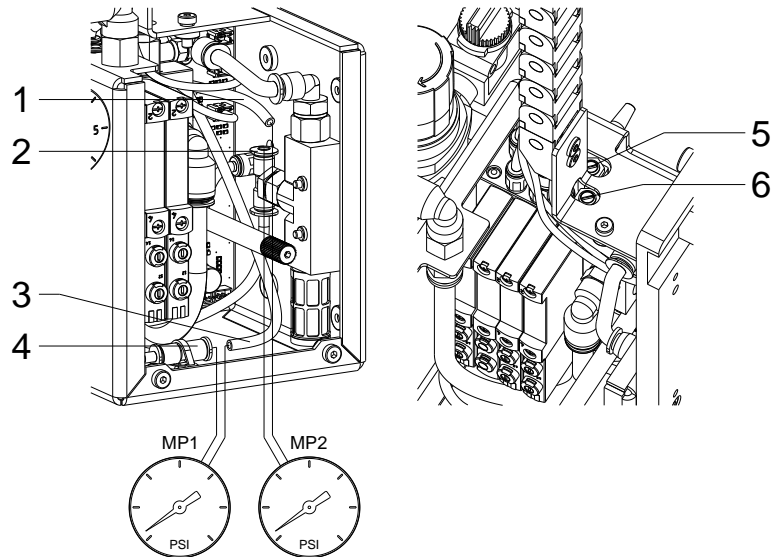


Figure 16

#### Measuring point 1: Support air (reference value 2.0 bar)

1. Dismantle the cover and interconnect the manometer to measuring point 1.  
Measuring point 1: Tube (3) - Connector (4).
2. Open the air supply and activate the valve manually to measure the pressure.
3. If required adjust the pressure at throttle valve 'support air' (1).
4. Mount the cover again.

#### Measuring point 2: Vacuum (reference value -0.6 bar)

1. Dismantle the cover.
2. Cover the suction plate at the pad hermetically.
3. Interconnect the manometer to measuring point 2.  
Measuring point 2: Tube (5) - Connector (6) at vacuum generator.
4. Open the air supply and activate the valve manually to measure the pressure.
5. If required adjust the pressure at throttle valve 'vacuum' (2).
6. Mount the cover again.



#### CAUTION!

Malfunction at label takeover from the dispensing edge to the pad.  
Not enough vacuum / air de support.

⇒ After the pressure measuring reconnect all connectors and check the interference fit of the tubes.

### 5.4 Error Indications

Error	Cause	Solution
Insufficient vacuum on the pad	In cyclical operation the control valve 'vacuum' is not controlled. Defective applicator PCB.	Change the applicator PCB.
	No pressure at the output of throttle valve 'vacuum' or the pressure cannot be adjusted.	Adjust and/or change the throttle valve.
	No vacuum at output of the vacuum generator.	Change the sound absorber if it is soiled. Change the vacuum generator if it is defect.
	Leaking vacuum chain.	Measuring as described in chapter 5.3, page 29. Check the transmission elements and replace them if necessary.
	Insufficient vacuum at the pad. Suction channels at the pad or slide foil clotted.	Clean the suction channels and/or change the slide foil.
Fault in the cylinder movement	The condition of valve control is not indicated with the LED at the valve connector.	Check the connections.
	Defective applicator PCB.	Change the applicator PCB.
	No pressure at the output of miniature pressure regulator or the pressure cannot be adjusted.	Adjust and/or change the miniature pressure regulator.
	No pressure at the output of one of the throttle valves at cylinder or the pressure cannot be adjusted.	Adjust and/or change the throttle valve.

<b>Error</b>	<b>Cause</b>	<b>Solution</b>
Loss of blow air	The valve is not activated. The LED at the valve does not glow. Defective applicator PCB.	Change the applicator PCB.
	Insufficient pressure at pad with an activated valve. Defective pneumatic tubes.	Replace the pneumatic tubes.
Loss of applicator function	Compressed air failure.	Check the connections.
	Defective applicator PCB.	Change the applicator PCB.
Loss of support air	Valve is not controlled. Defective applicator PCB.	Change the applicator PCB.
	Insufficient pressure at blow tube with an activated valve. Defective pneumatic tubes.	Change the pneumatic tubes.
	Defective or wrong adjusted throttle valve.	Adjust and/or change the throttle valve.
Permanent error at the label transfer via pad	Faulty pad position in transfer position to the peel off edge of the printer.	Correct position (backward edge of pad approx. 1 mm above the peel off edge of printer).
	Insufficient or missing vacuum.	Adjust the vacuum at throttle valve.
	Support air does not blow exactly the label to the pad.	Adjust the blow tube. Adjust the pressure of support air via throttle valve 'support air'. Adjust the switch on delay.





### 6 Block Diagram

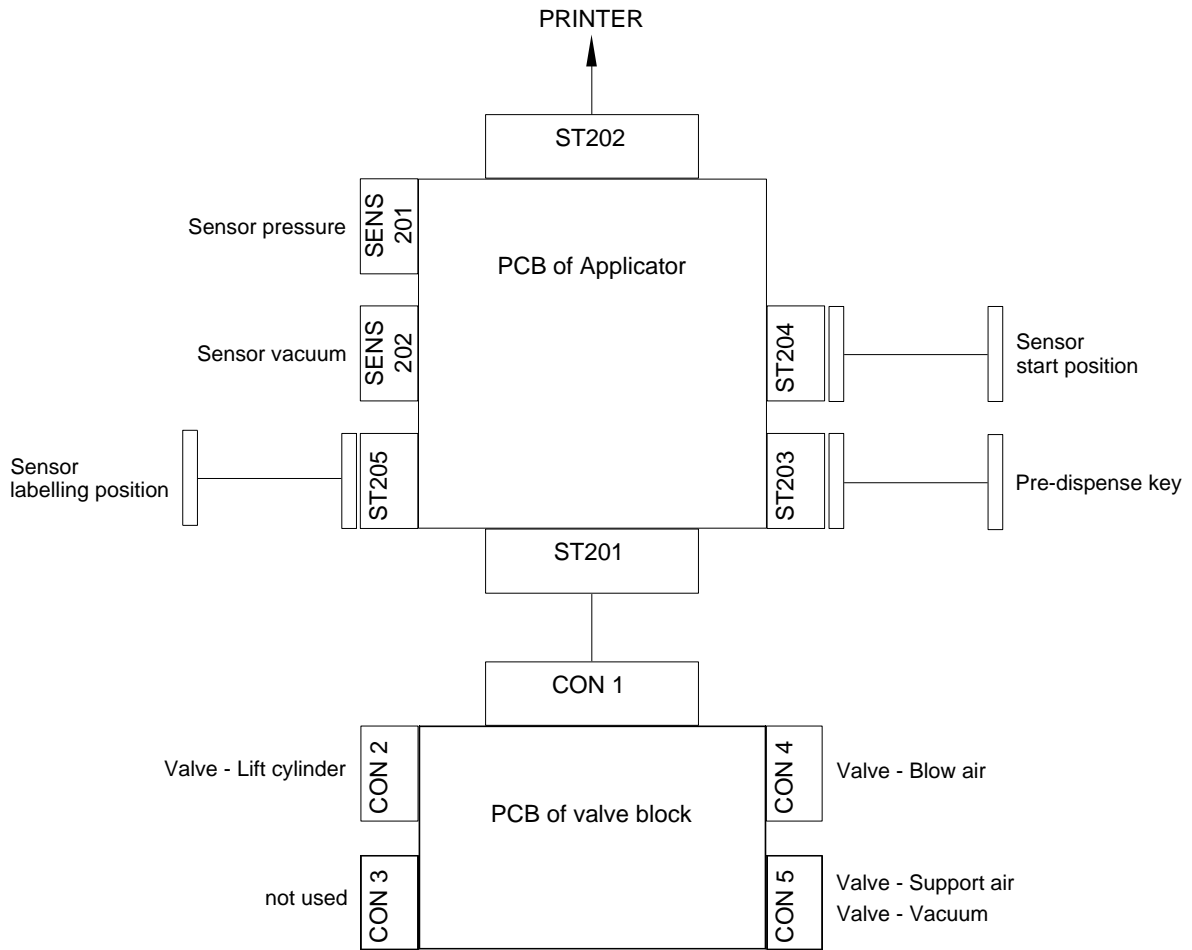


Figure 17



### 7 Pneumatic plan

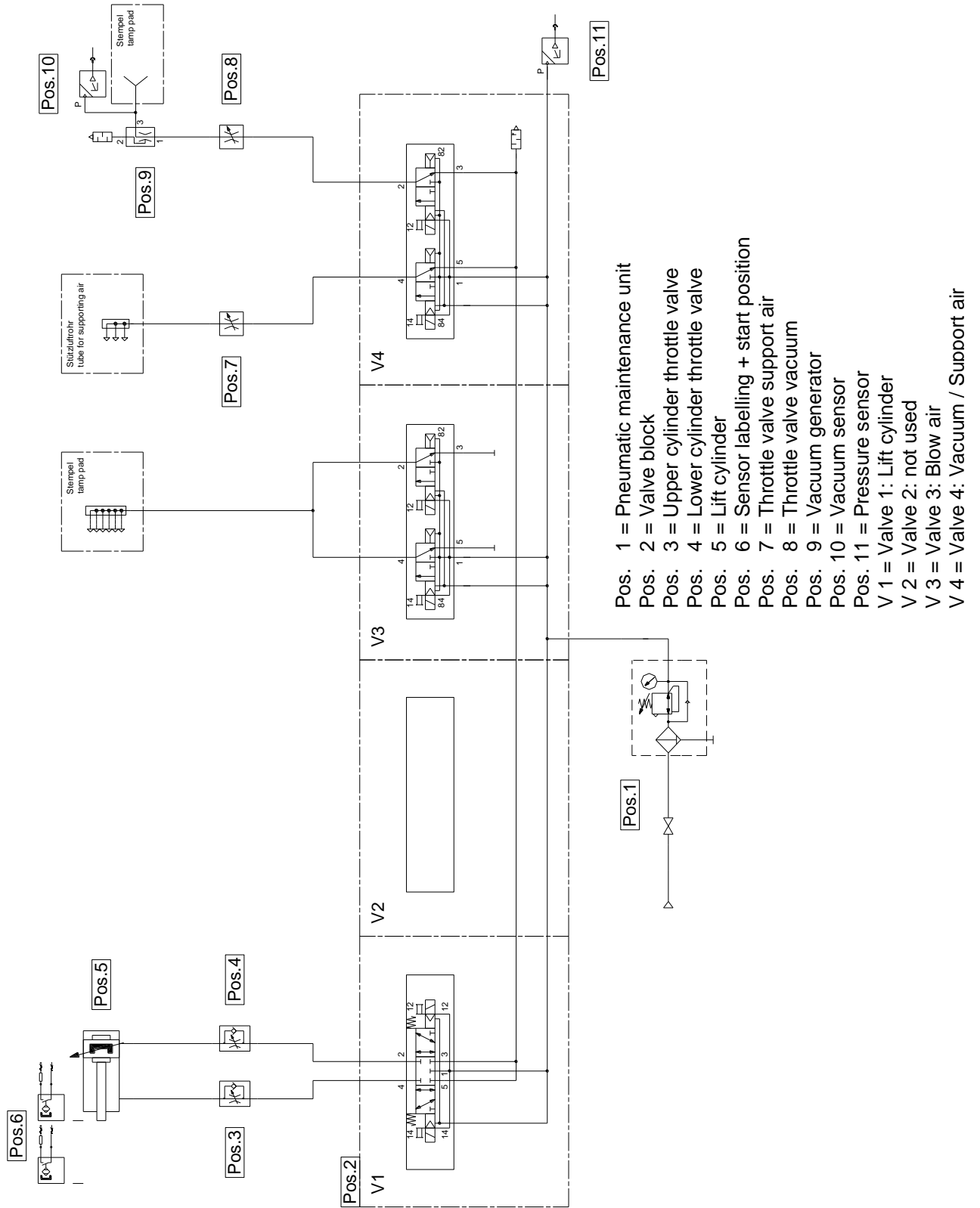


Figure 18



### 8 Terminal Diagram of PCB

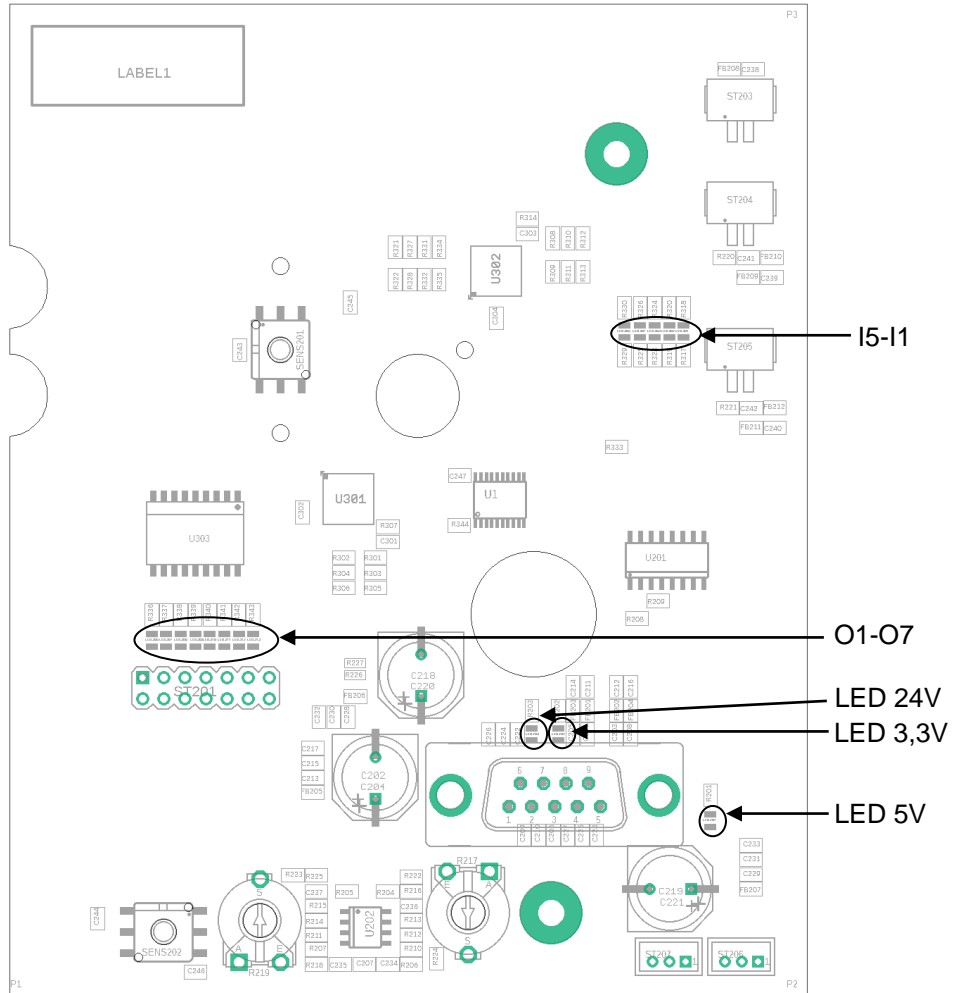


Figure 19

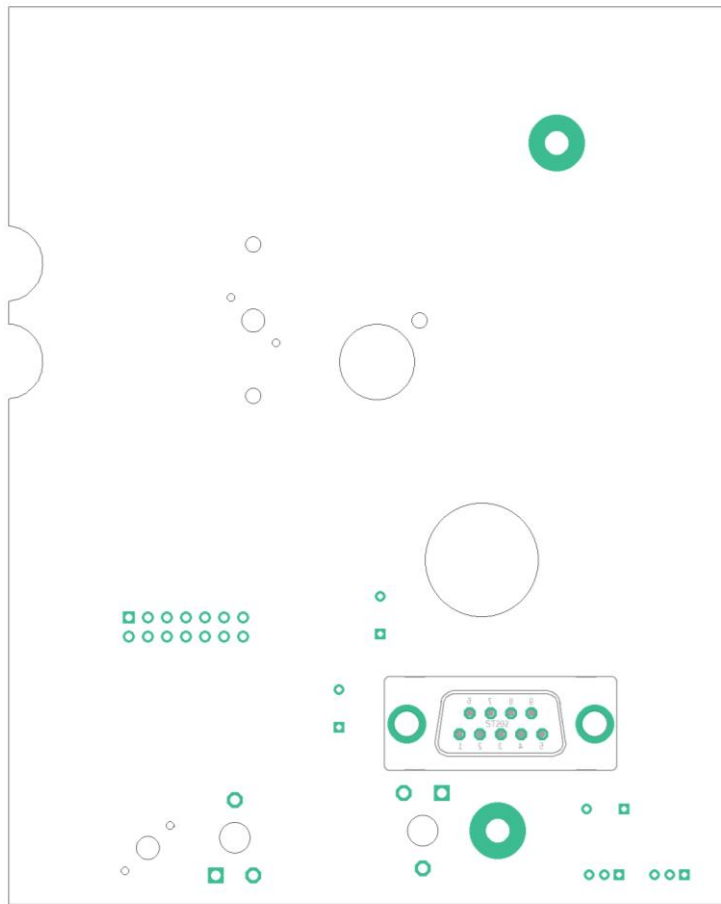
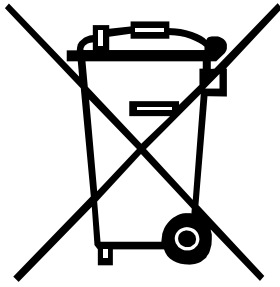


Figure 20

## 9 Environmentally Friendly Disposal



Manufacturers of B2B equipment are obliged to take-back and dispose old equipment which was manufactured after 13 August 2005. In principle, this old equipment may not be delivered to communal collecting points. They may only be organised used and disposed by the manufacturer. Valentin products accordingly labelled can therefore in future be returned to Carl Valentin GmbH.

This way, you can be sure your old equipment will be disposed of correctly.

Carl Valentin GmbH thereby fulfils all obligations regarding timely disposal of old equipment and facilitates the smooth reselling of these products. Please understand that we can only take back equipment that is sent free of carriage charges.

The electronics board of the printing system is equipped with a battery. This must only be discarded in battery collection containers or by public waste management authorities.

Further information on the WEEE directive is available on our website [www.carl-valentin.de](http://www.carl-valentin.de).





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