

Applicator A 1000

Service Manual for the following products

Family
A 1000

Edition: 6/2008 - Part No. 9008703

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1.1 Instructions

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



Danger!

Draws your attention to an exceptionally grave, impending danger to your health or life.



Warning!

Indicates a hazardous situation that could lead to injuries or material damage.



Attention!

Draws attention to possible dangers, material damage or loss of quality.



Notice!

Gives you tips. They make a working sequence easier or draw attention to important working processes.



Environment!

Gives you tips on protecting the environment.



Handling instruction



Reference to section, position, illustration number or document.



Option (accessories, peripheral equipment, special fittings).

1.2 Safety Instructions

- Connect the applicator to other devices only which carry safety extra-low voltage.
- Switch off in case of connecting or disconnecting some devices (computer, printer and accessories)
- The applicator is only to use in a dry environment. No wetness seems like splash water, fog and other.



Warning!

Attend that the printer power supply is disconnected and the compressed air supply is closed before starts the mounting works.



Warning!

In the applicator operation are moving parts open. Particularly in the pad area between the ground and labeling position.

Don't reach into this area in case of operation. Save hairs, loosely wear and emblazonments.
Close the compressed air supply in case of necessary works.



Warning!

Don't make manipulation at the device which doesn't described in the printer and applicator manuals.

1.3 Environment



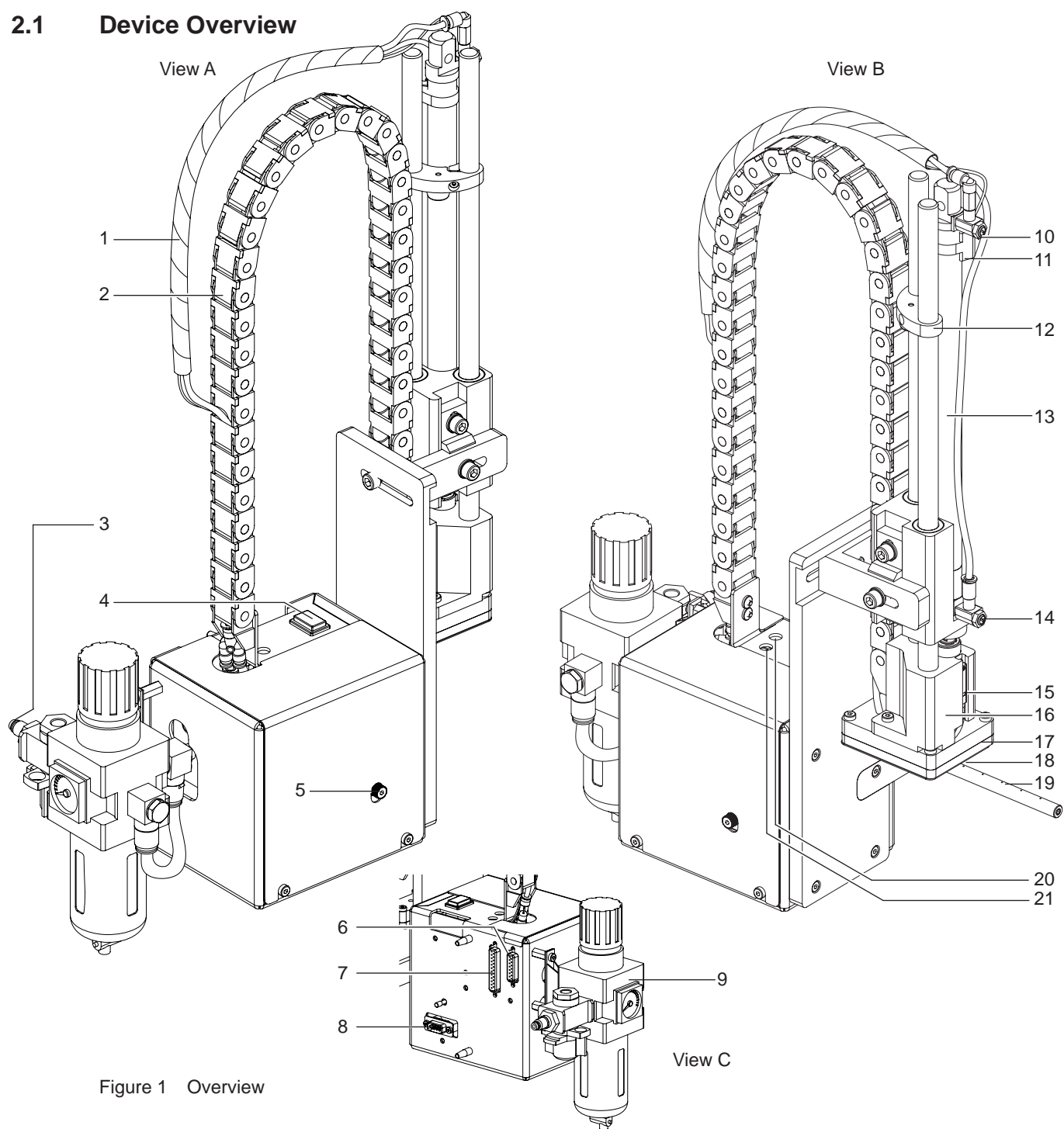
Obsolete devices contain valuable recyclable materials that should be sent for recycling.

- Send to suitable collection points, separately from residual waste.

The modular construction of the printer enables it to be easily disassembled into its component parts.

- Send the parts for recycling.

2.1 Device Overview



- | | | | |
|----|------------------------------------|----|---------------------------------------|
| 1 | Tube | 12 | Stopper |
| 2 | Energy Track | 13 | Lift Cylinder |
| 3 | Connector Compressed Air | 14 | Throttle Valve Lift Cylinder (bottom) |
| 4 | Pre-dispense Key | 15 | Labelling Sensor |
| 5 | Knurled Screw | 16 | Pad Retainer |
| 6 | PLC-Interface (15-Pin) | 17 | Top Plate (* customized) |
| 7 | PLC-Interface(25-Pin) | 18 | Pad (* customized) |
| 8 | Connector Applicator Printer | 19 | Blasrohr (* kundenspezifisch) |
| 9 | Pneumatic Maintenance Unit | 20 | Throttle Valve Vacuum |
| 10 | Throttle Valve lift Cylinder (top) | 21 | Throttle Valve Support Air |
| 11 | Sensor obere Endlage | | |

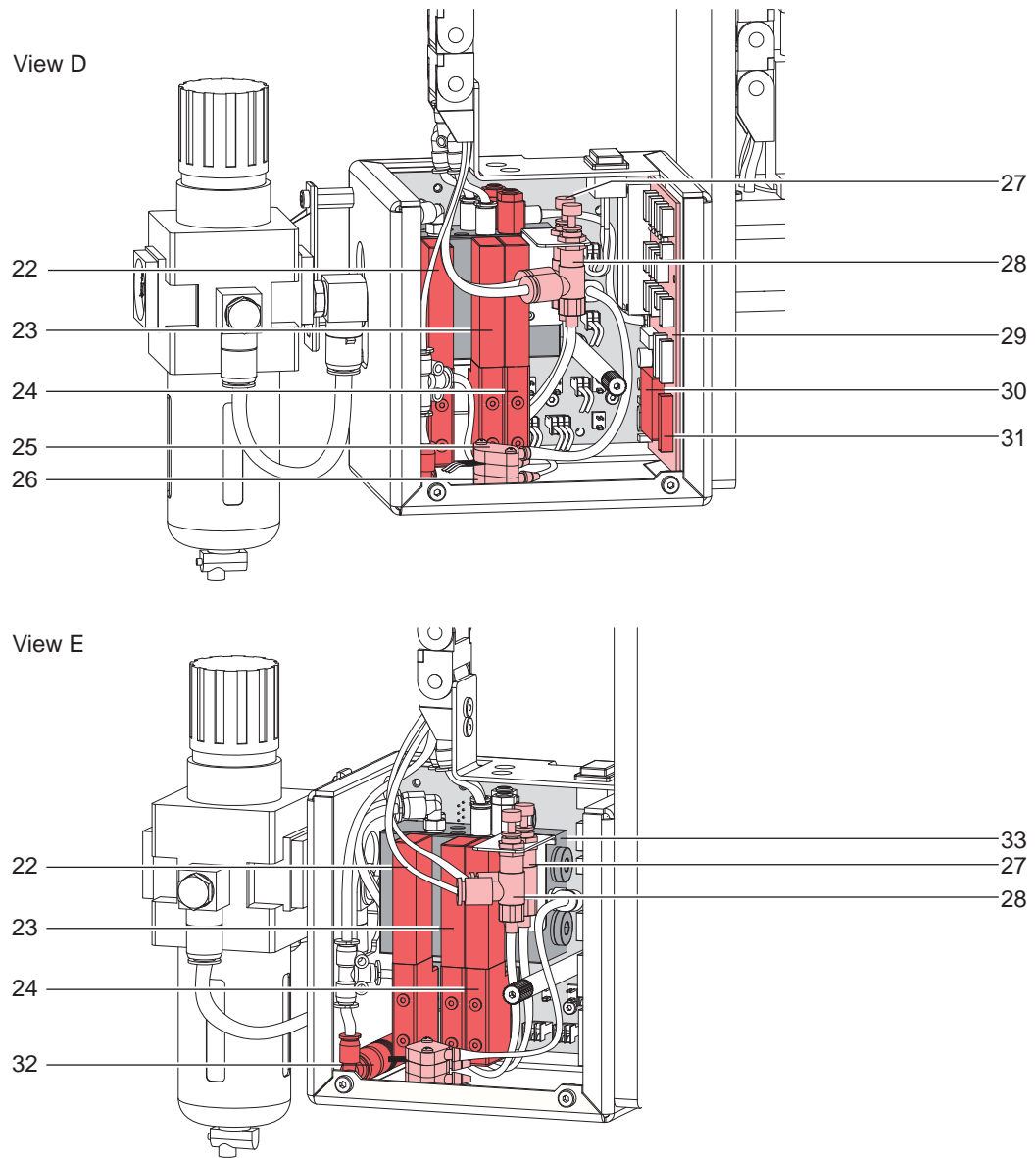


Figure 2 Overview

22	Valve Lift Cylinder	29	PCB Labeling Control
23	Valve Blow Air	30	Controller 1
24	Valve Vacuum / Support Air	31	Controller 2
25	Pressure Sensor	32	Vacuum Generator
26	Vakuumsensor	33	Valve Block
27	Miniatur Pressure Regulator Lift Cylinder out		
28	Miniatur Pressure Regulator Lift Cylinder in		

2.2 Function

2.2.1 Sensor

Sensor labeling 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 of the return movement.

Pressure Sensor

The pressure sensor controls the pressure air.

2.2.2 Pneumatic

Cylinder

A cylinder with stroke of 100-400 mm is used for the transport of labels between the dispense edge of the printer and the labelling position. It will be controlled by the "cylinder" valve. The speed of movement can be changed by two throttle valves mounted at cylinder.

Pad

The label will be transported by a pad. The pad must be appropriate to the size of label. The pad assembly and cylinder are conjoint and it will range by the cylinder.

In case of a label transportation it's a vacuum applied on the pad.

When the applicator will be used in 'blow' mode, the label will be applied by a high pressure.

Vacuum Generator

The vacuum at the pad will be produced by a vacuum generator. The vacuum generator is controlled by the vacuum valve "Vakuum". It's possible to adjust the low pressure by a throttle valve.

Blow Tube

Air is blown from below (supporting air) through a blow tube onto the label in order to support the transfer of the label from the printer to the pad. It's possible to adjust the direction of the blast. The supporting air is switched on by the supporting air valve "Stützluft".

Pneumatic Maintenance Unit

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.

Valve Block

The distribution of the compressed air to the various pneumatic units is made in the valve block.

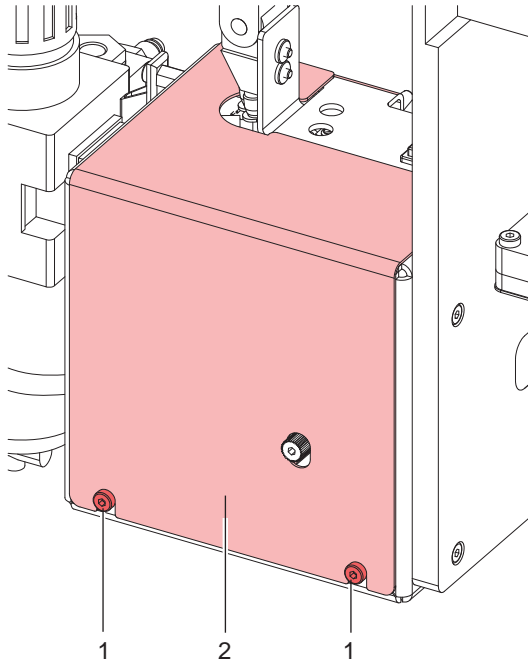


Figure 3 Dismount cover

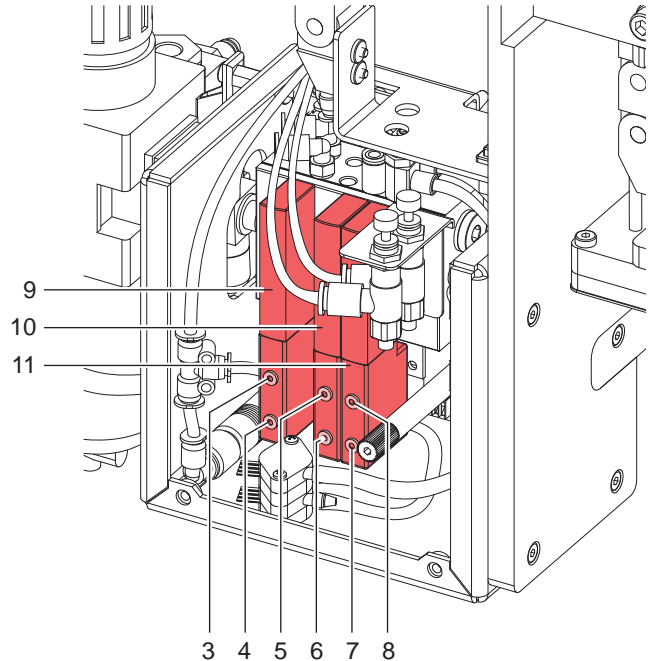


Figure 4 Pneumatic control valves

Valves

For control and adjust works its possible tostrat a valve direct by hand via an integrated key. You can see the valves only with dismanted cover.

- Loosen screws (1) and remove cover (2) .
- Via integrated Keys (3-8) you can switch the pneumatic valves by hand.

Three way valve (9) to control the lift cylinder

Is the printer switched on the valve will be elecronical conrolled and the pad will move to the start position and hold on this place. In case of switching the valve the pad will move to the labelling position. In normal labelling operation the valve switched again afte the signal of the labelling sensor.



Notice!

The manually control of the valves is only possible when the printer is switched off.

When switching the valve via the key 3 the pad will moved down to the most bottom position. It doesn't use the stop signal from the labelling sensor.

Switch key 4 and the pad will move up.

Double two way valve (10) to control the blow air

In the operation mode "blow" the label will blow on the product trough switch on the blow air on the pad. in the operation modes "stamp" and "roll on" will start the blow air for a short time in the movement back to the start position to clean all holes in the pad.

For all described function the both integrated valves will switched parallel.

When switching the valves (blow air) manually by key 5 and 6 there used only one of the two integrated valves.

Double two way valve (11) to control the vacuum / support air

The both internal valves attend to switch on the vacuum generator , to create a depression on the pad and independent of there to control the support air on the blow tube.

Key 7 switched the support air and key 8 the vacuum.

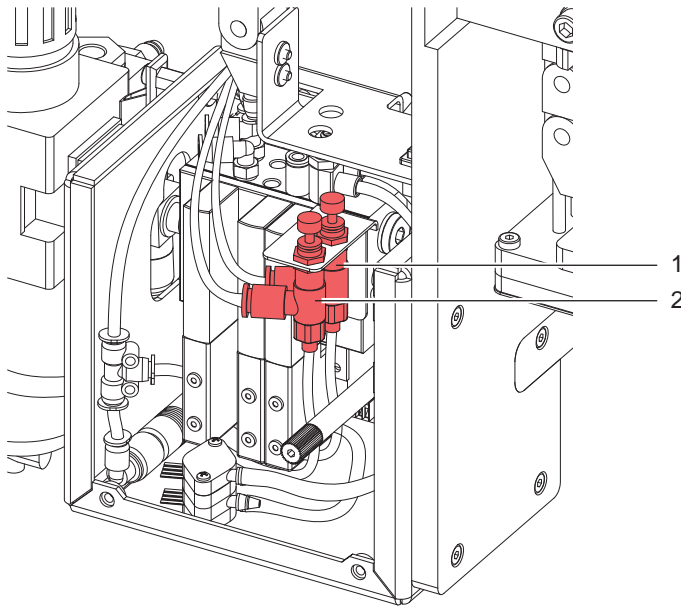


Figure 5 Miniature pressure regulator

Miniature pressure regulator

After removing the cover it's possible to see two miniature pressure regulator (1, 2). With adjusting of these regulators it's possible to reduce the pressure in the chambers of the lift cylinder.

Valve 1 limited the pressure for the upper chamber of the lift cylinder.

Valve 2 limited the pressure for the lower chamber of the lift cylinder.



Attention!

the both valves are adjusted to a pressure of 0,25 MPa (2,5 bar) and sealed.
This reduce the maximum speed of the pad movement and minimize the risk of injury.

Otherwise gives this setting a guarantee for the corect operation, with havy pads as well.

► Don't change adjustments!

2.2.3 Electronics / PCB Labelling Control

The electronics are supplied with both operating voltages 5 V and 24 V via the printers peripheral interface.

Function of the most important components

PCB Applicator Control

LED 1	Label on pad yellow - in active condition: LED on
LED 2	Operating voltage 5 V yellow - in active condition: LED ON
LED 3 - LED 6	Status of external Signals via PLC-Interface ▷ Operator's Manual "Applicator A 1000", PLC-Interface
LED 7	no function
IC 1	Controller to operate the internal procedures, to realize PLC interface and contains the applicator firmware.
IC 2	Controller to implement the SPI interface (logical connection to the printer).

Table 1 Components on PCB

3.1 Tools

All tools you need for repair the applicator.

Tools	Size	for Assemblies
combination wrench	5,5 mm	cylinder plunger
	9,0 mm	throttle valve
	10,0 mm	guide rod
	14,0 mm	L-connector (valve block > pneumatic maintenance unit)
	20,0 mm	lift cylinder
hexagon wrench	2,0 mm	valve block, energy track ...
	2,5 mm	PCB ...
	5,0 mm	adjustment guiding block
screwdriver for slotted screws	2,5 mm	throttle valves
crosstip screwdriver	PH0	valves on the valve block
	PH2	Sensoren (Aufschlagsensor, obere Endlage)
PLCC-Extractor cab-Part.-No.: 8920001		changing controller 1
wrist grounding		for works at PCB and controller
manometer	to 5 bar	pressure measurement
soft brush, cloth, multi purpose cleaner (without solvent))		

Table 2 Tools and their purpose



Attention!

Pull tubes (1) at pneumatic connectors only if the releasing ring (2) pressed. (Figure 6 right).

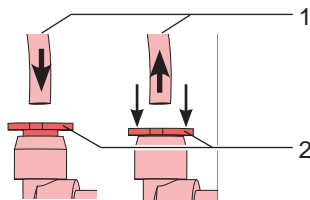


Figure 6 Push (left) and pull (right) of tubes

3.2 Cleaning



Attention!

Never use solvent and abrasive.

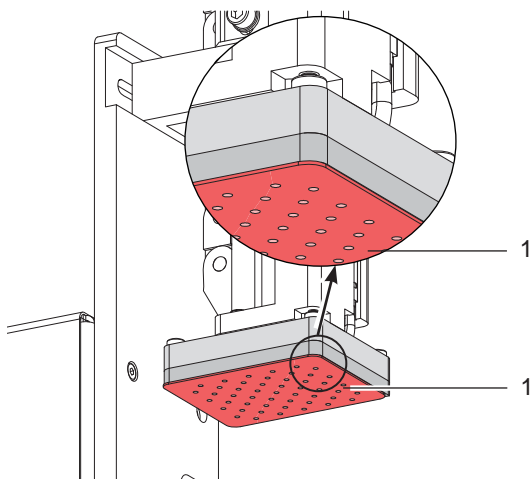


Figure 7 Pad with slide foil

- ▶ Clean the outside surfaces with multi purpose cleaner.
- ▶ In regularly function it's possible that accrue dust particles and label splits. Remove that by a soft brush or/and a vacuum cleaner.
- ▶ Especially at slide foil (1) it's possible that fouling deposit.
To receive an ideal takeover and handling of the label it's necessary to clean the surface of slide foil at regular intervals.

To divide on the mother plate to arrive it's necessary to dismount the cover.
Before the regular work will start it's absolutely necessary to mount the cover again.



Warning!

Attend that the printer power supply is disconnected and the compressed air supply is closed before starts the mounting works.

Dismount Cover

1. Loosen screws (1).
2. Remove cover in direction of arrow.

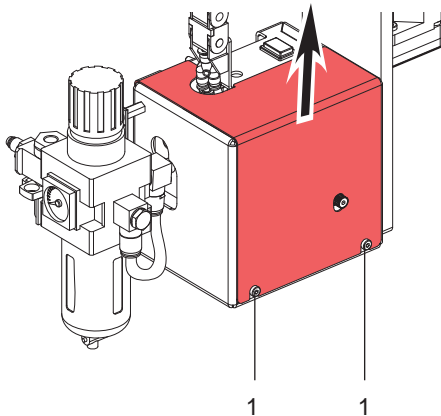


Figure 8 Cover mount and dismount



Attention!

Mount the cover again before you start the normal operation!

4.1 Instructions for sticking Slide Foil onto the Pad

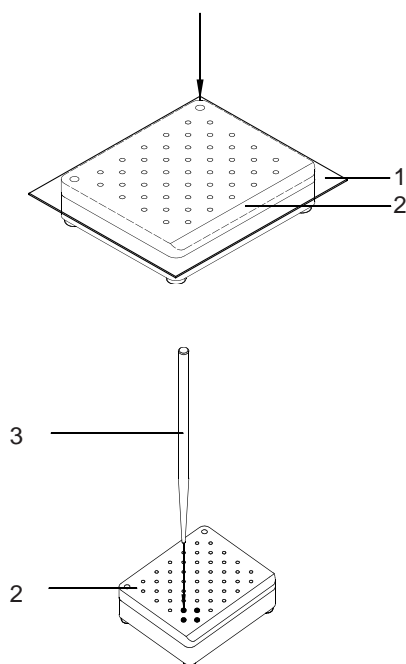


Figure 9 Sticking the slide foil /Punching the holes

1. Dismount the pad unit.
2. Make a note of the hole pattern on the slide foil.
3. Remove the slide foil completely.
4. Clear the surface from remains of glue.
5. Remove covering foil from the slide foil.
6. Put the slide foil (1) with its adhesive side onto the pad (2).
7. Press the slide foil firmly on the pad.
8. Cut off those parts of the slide foil (1) (along the broken line) that jut out over the edge of the pad (2).
9. Punch the slide foil on the pad (2) using the punch pin (3) appropriate to the hole pattern on the wearing slide foil.
10. Punch the hole completely by turning the pin.
11. Mount the pad unit.

4.2 Replace Valves

**Warning!**

Attend that the printer power supply is disconnected and the compressed air supply is closed before starts the mounting works.

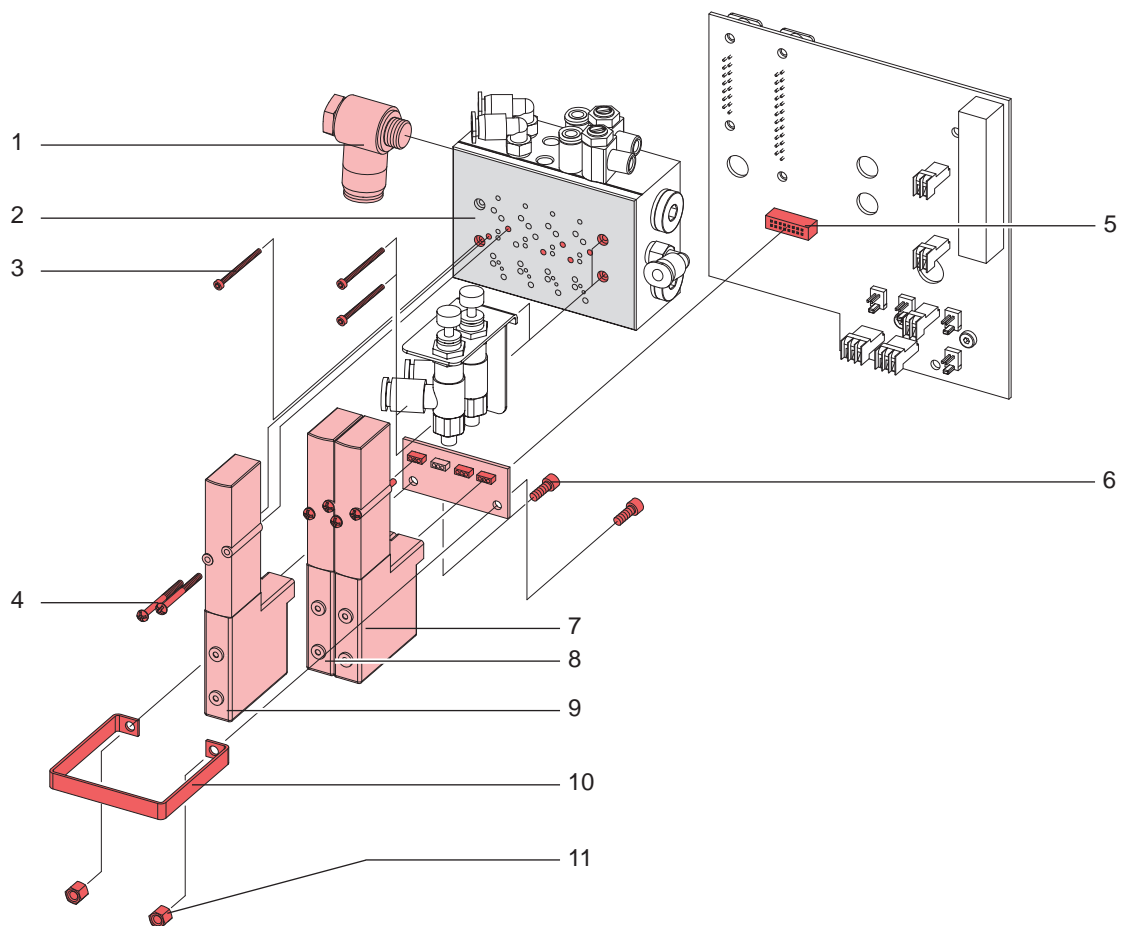


Figure 10 Replace valves

1. Pull off tubes from valve block (2).
2. Dismount push-in L-connector (1).
3. Dismount vacuum- and pressure sensor from the base plate.
4. Loosen screws (3) to dismount the valve block. Pull the Valveblock from the connector (5) on the PCB.
5. Loosen screws (6) on the bracket (10) and the PCB valve block and remove the bracket (10).
6. Screws (4) loosen the valve (7, 8 or 9) which can be changed.
7. Attach the bracket (10) and the PCB valve block with screws (6) and screw nuts (11). Tighten it.
8. Attach the valve block (2) so that the plug in connector tucks into the socket (5) on the PCB applicator interfaces.
9. Tighten screws (3) to fix the valve block.
10. Mount push-in L-connector (1) and attach all tubes again.
11. Mount the vacuum- and pressure sensor.

4.3 Replace PCB Applicator Control



Attention!

Protection against electrostatic discharge before work → grounding

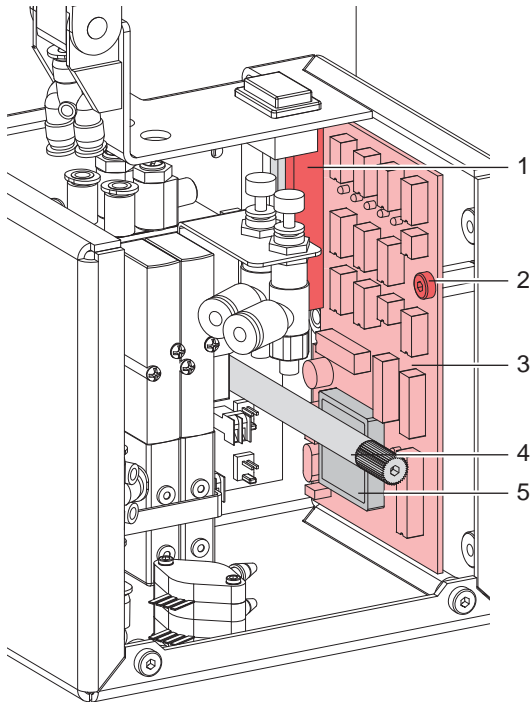


Figure 11 Replace the PCB applicator control

1. Pull the knurled screw (4) and turn it counterclockwise until the screw found the winding and turn it out.
2. loosen screw (2).
3. Detach PCB applicator control (3) from connector (1).
4. Change PCB (3) or controller (5).
5. Attach.PCB (3) again via the connector (1).
6. Tighten screw (2) .
7. Turn in the knurled screw (4) until it turned free.

4.4 Replace Controller



Attention!

Protection against electrostatic discharge before work → grounding



Attention!

Remove controller only with a special tool

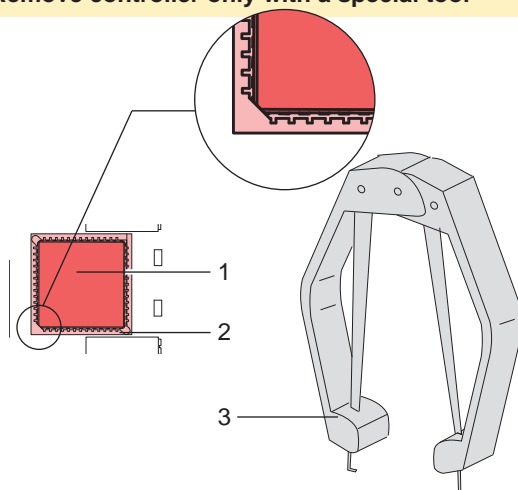


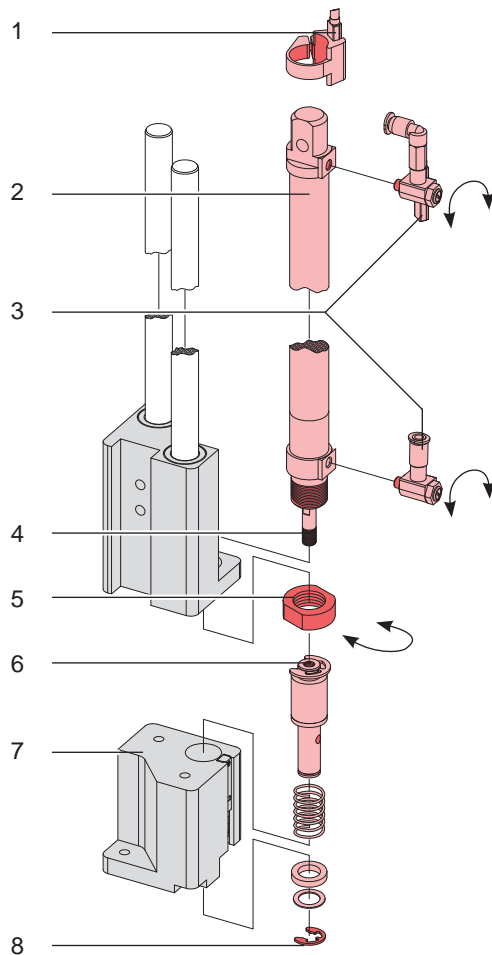
Figure 12 Change controller

1. Dismount the PCB, like described in chapter 4.3.
2. Pull off the controller (1) with a PLCC-extractor (3) from the socket (2).
3. Put in the controller (1). See at the marker on socket and controller.
bevel edge controller → bevel edge socket
4. Mount PCB again, like described in chapter 4.3

4.5 Replace Cylinder

**Warning!**

Attend that the printer power supply is disconnected and the compressed air supply is closed before starts the mounting works.



1. Dismount sensor start position with mounting clip (1) and pull off tubes from cylinder (2).
2. Unscrew throttle valves (3) from cylinder.
3. Remove locking washer (8) and takeout the other both flat washers.
4. Pull the guiding with mounted pad downwards from the adapter bolt (6) and take out the spring.
5. Afterwards unscrew the plunger (4) from adapter bolt (6) with combination wrench 5,5 mm. Use the drilling into the adapter bolt (6) to lock it.
6. After loosening the screw nut (5) takeout the cylinder (2).
7. Put in new cylinder (2) and fix it with screw nut (5).
8. Screw the adapter bolt (6) to the plunger (4).
9. Attach the spring into the guiding and the adapter bolt (6) also from the other side and push up the pad assembly. Attach the washers and fix these by the locking washer (8).
10. Mount throttle valve (43) again.
11. Mount sensor (1) and tubes again.

Figure 13 Replace the lift cylinder

4.6 Replace Cylinder-Sensor

**Warning!**

Attend that the printer power supply is disconnected and the compressed air supply is closed before starts the mounting works.

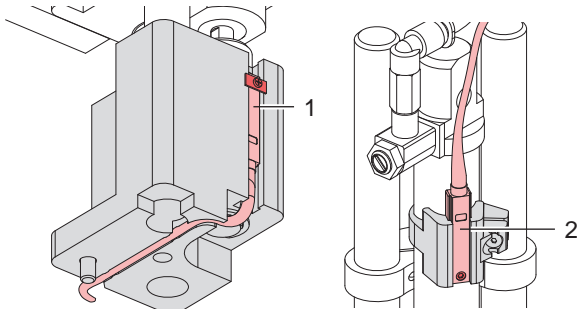


Figure 14 Sensor labeling position / Sensor start position

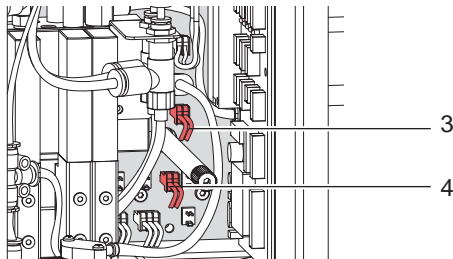


Figure 15 Slots of sensors

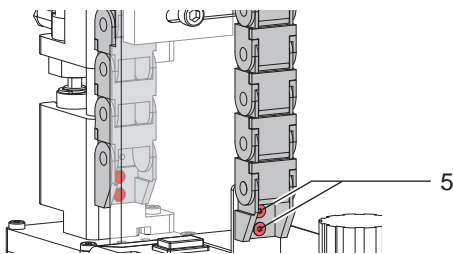


Figure 16 Dismount energy track - Sensor labeling position

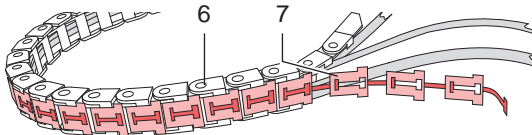


Figure 17 Open the energy track

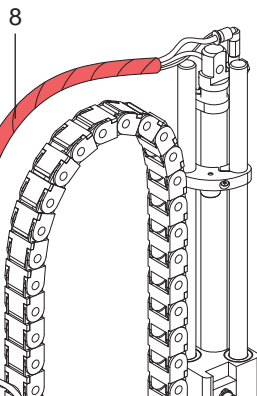


Figure 18 Spiral cable conduit - Sensor start position

1. Dismount the cover.
2. Detach the connector from sensor which can be changed.
slot CON 8 (3) → sensor start position (2)
slot CON 6 (4) → sensor labeling position (1)

Sensor labeling position (1)

- ▶ Loosen screws (5) to dismount the energy track on one side only.
- ▶ Detach the into one another looked divide in T-form (7) from the divide in U-form (6) of the energy track. (Figure 16)
- ▶ Pull out the dismounted sensor.
- ▶ Replace the sensor.
- ▶ Close the energy track again. Press in the T-form (7) pieces into the U-form (6) pieces.
- ▶ Mount the energy track and tighten the screws (5).

Sensor start position (2)

- ▶ Unwrap cable and tubes from the spiral cable conduit (8) .
 - ▶ Dismount the sensor 'start position' and replace it .
 - ▶ Wrap cable and tubes from the spiral cable conduit (8) again.
5. Mounting the sensors on board side in reverse order, like described in the first paragraphs.

After replacing a sensor it's necessary to adjust the sensor position new.

Described in chapter 5.1.

5.1 Sensor Labeling Position / Sensor Start Position

Sensor labeling position and sensor start position shown their initiation by integrated LED's. In case of activation the LED's will glow.

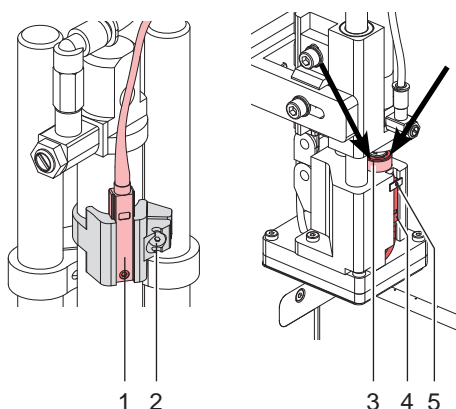


Figure 19 Sensor adjustments

Adjustment Sensor Start Position (1)

1. Ease the locking ring by loosen the screw (2).
2. Compressed air supply open.
3. Printer switch on → cylinder will be retracted (start position)
4. Move the locking ring so that the LED glow.
5. Fix the position of the sensor via tighten the ring (2)

Adjustment Sensor Labeling Position(4)

1. Ease screw (5) and printer switch on.
2. move so the sensor that the LED will glow if the Adapterbolt (3) is pressed approx. 5 mm into the pad assembly.

5.2 Function of the LED's in the Applicator Electronics

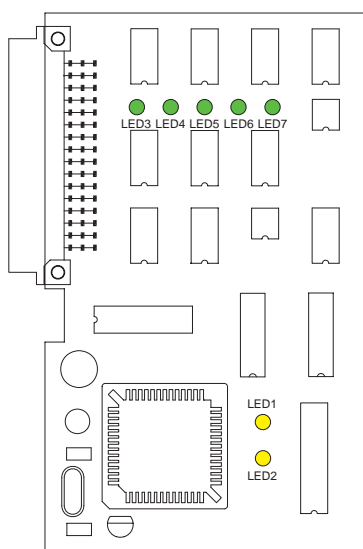


Figure 20 LED on the PCB applicator control

LED-No.	Color	Description	Active Condition
1	yellow	Label on pad	ON
2	yellow	operation voltage 5 V	ON
3	green	PLC-Signal XSTRT	ON
4	green	PLC-Signal XSTP	ON
5	green	PLC-Signal XDREE	ON
6	green	PLC-Signal XRS	ON
7	green	no function	

Table 3 LED on the PCB applicator control

5.3 Pressure Measurement

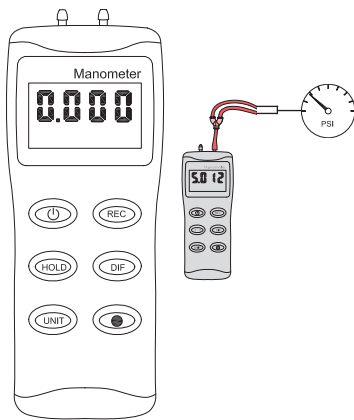


Figure 21 Pressure Measurement

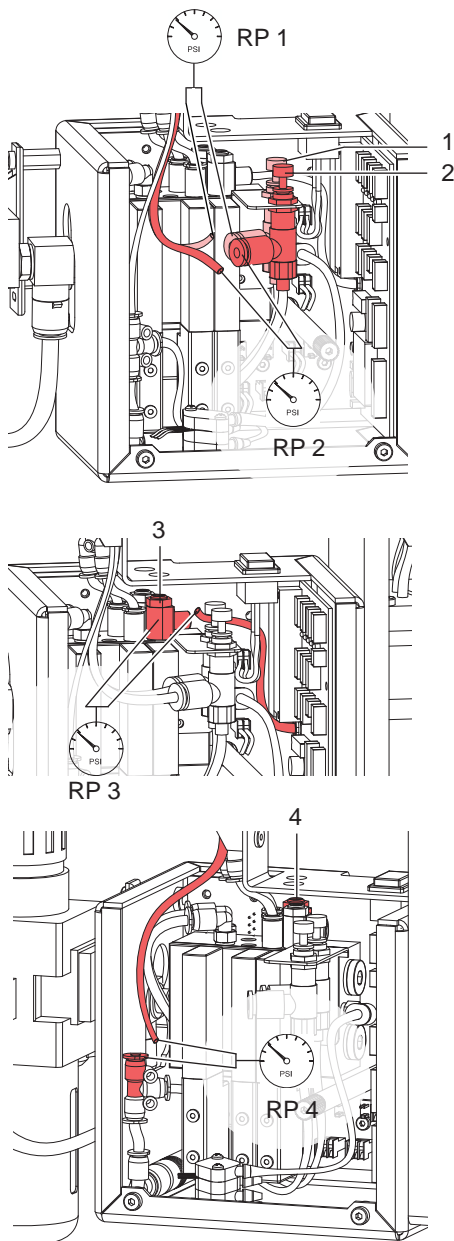


Figure 22 Reading points to measure the pressure

Use a manometer with a measurement area to 5 bar for measurement the pressure

Reading points (RP) of pressure values.

RP 1/2 : Working Pressure Lift Cylinder (reference value 2.5 bar)

1. Remove cover and close compressed air supply.
2. Consecutively connect the manometer on RP 1 (detect presure and adjust like item 3-5) then connect to RP 2. (like item 3-5).
 - RP 1: Lift cylinder movement out
 - RP 2: Lift cylinder movement in
3. Compressed air supply open and measure the pressure.
4. As and when required adjust it on miniature pressure regulator .
5. To detach the manometer close the air supply and de-aerate the cylinder again.
6. Mount cover again.

RP 3 : Support Air (reference value 2,0 bar)

1. Dismount cover.
2. Attach manometer between measurement points RP 3.
3. Open the air supply and activate the valve manually to measure the pressure.
4. As and when required adjust it on support air throttle valve.
5. Mount cover again.

RP 4 : Vacuum (reference value -0,6 bar)

1. Close suction plate hermetic.
2. Attach manometer between measurement points RP 4.
3. Open the air supply and activate the valve manually to measure the pressure.
4. As and when required adjust it on vacuum throttle valve.



Attention!

After pressure measurements, connect all component exactly and check it.

5.4 Error Indication

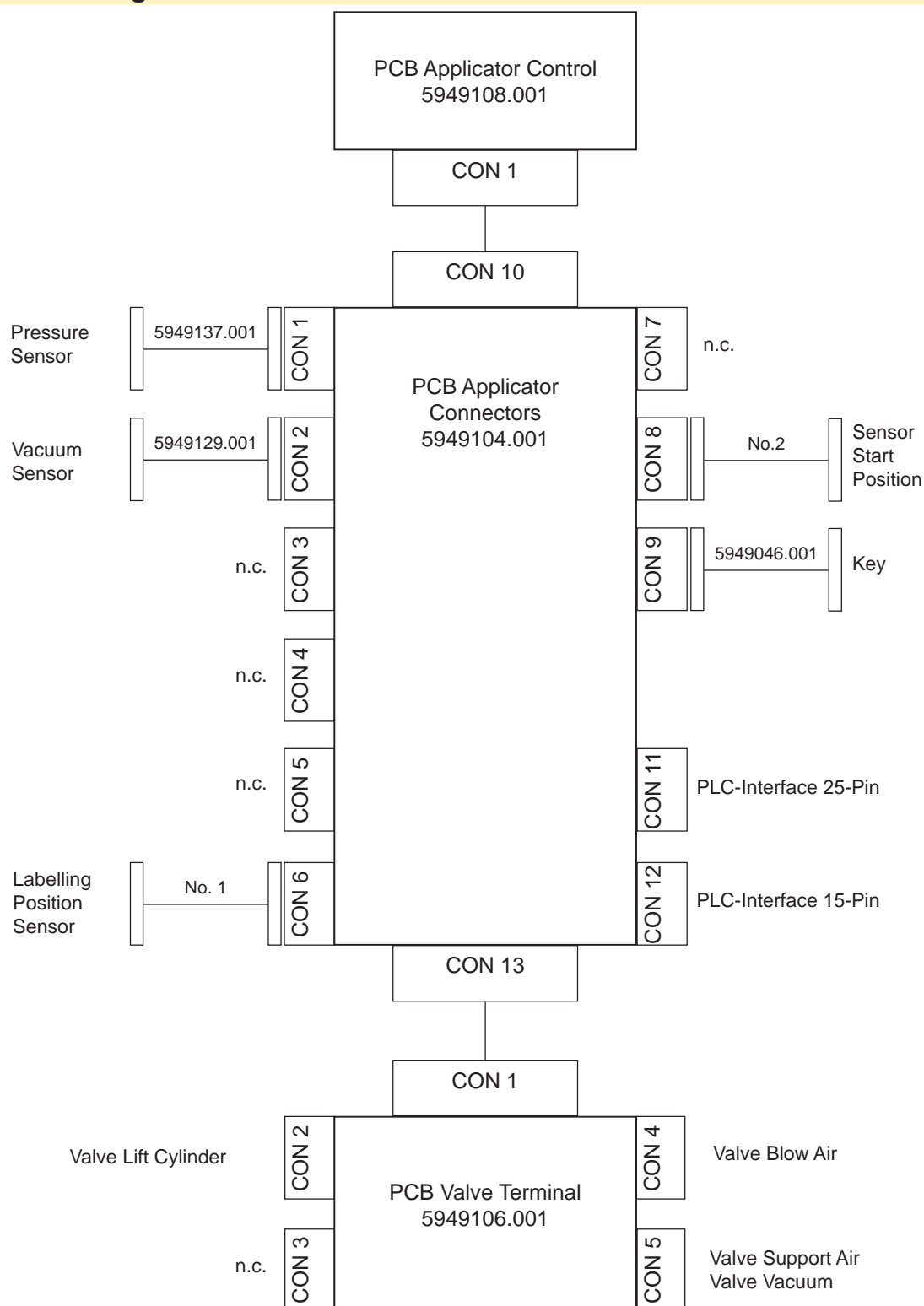
The following table comprised possible sources of faults and possible proposals for fault clearance. Outer causes like lack of pressure air and malfunction of printer will be verified further.

Symptom	Cause and solution
Insufficient vacuum on pad	<ol style="list-style-type: none"> In cyclical operation, the vacuum valve won't controlled. PCB defect ► change PCB There is no pressure at the outlet of the vacuum throttle valve or the pressure can't be controlled. ► Replace vacuum throttle valve. It doesn't establish a vacuum on exit of the vacuum generator ► Replace the sound absorber if it soiled. Leakage in the chain of vacuum ► Measurement like described in ▷5.4 ► Check the vacuum transmission elements and in case of failure replace it. It doesn't establish a vacuum on exit of the vacuum generator ► Replace the vacuum generator in case of failure. Not enough negative pressure at the suction plate. Suction channels at the suction plate, foil or absorbability plate clogged. ► Clean the suction channels and/or replace foil and absorbability plate respectively.
Fault in cylinder movement	<p>The state of valve control will shown via LED's at the plug connectors.</p> <ol style="list-style-type: none"> Cylinder will be not controlled. LED's glow in case of switching but valve doesn't work ► Replace valve LED's doesn't glow ► Check connections, replace as necessary PCB There is no pressure at the outlet of each on cylinder mounted throttle valve or the pressure can't be controlled. ► Replace the fault throttle valve. There is no pressure at the outlet of the miniature pressure regulator or the pressure can't be controlled. ► Replace the miniature pressure regulator.
Loss of blow air	<ol style="list-style-type: none"> The valve doesn't activated, LED at valve doesn't glow. PCB damaged ► Replace PCB On pad doesn't exist enough pressure in case of activated valve. Pneumatic tubes fault ► Replace pneumatic tubes

Table 4 Troubleshooting and fault clearance

Symptom	Cause and solution
Loss of support air	<ol style="list-style-type: none"> 1. Valve will not controlled, LED doesn't glow. (▷ Operator's Manual) - PCB damaged ▶ Replace PCB 2. There is no pressure at the outlet of the support air throttle valve or the pressure can't be controlled. ▶ Replace support air throttle valve. 3. Not enough pressure air at blow tube in case of controlled valve. Pneumatic tubes fault ▶ Replace pneumatic tubes
Permanent error in transfer of labels to the pad (error message: pad empty)	<ol style="list-style-type: none"> 1. Incorrect pad position in the start position compared to the printer's dispense edge. Backmost edge of pad approx. 1 mm over the printer's dispense edge. (▷ Operator's manual) 2. Temporary falling pressure in compressed air supply for the lift cylinder. (e.g. trough manipulate hand slide valves) ▶ Quit the error message 3. Vacuum to low and want of Vacuum at pad ▶ Adjust vacuum throttle valve. 4. Support air doesn't blow exactly the label to the pad. ▶ Adjust the blow tube for support air. ▶ Adjust pressure of support air via throttle valve 'support air'. ▶ Adjust switch on delay at via potentiometer R21 ▷Operator's manual
Loss of applicator function	<ol style="list-style-type: none"> 1. Interface applicator-printer connector SUB-D15 doesn't connect accurate. ▶ Reestablish connection. 2. Breakdown pressure air. ▶ Check circuit points. 3. Applicator PCB damaged. ▶ Replace PCB.

Table 4 Troubleshooting and fault clearance (continuance)



Type	No. 1 Labelling Position Sensor	No. 2 Sensor Start Position
A 1000-150	5949203.001	5949198.001
A 1000-220	5949177.001	5949172.001
A 1000-300	5949230.001	5949123.001
A 1000-400	5949243.001	5949238.001

Figure 23 Block Diagram A 1000

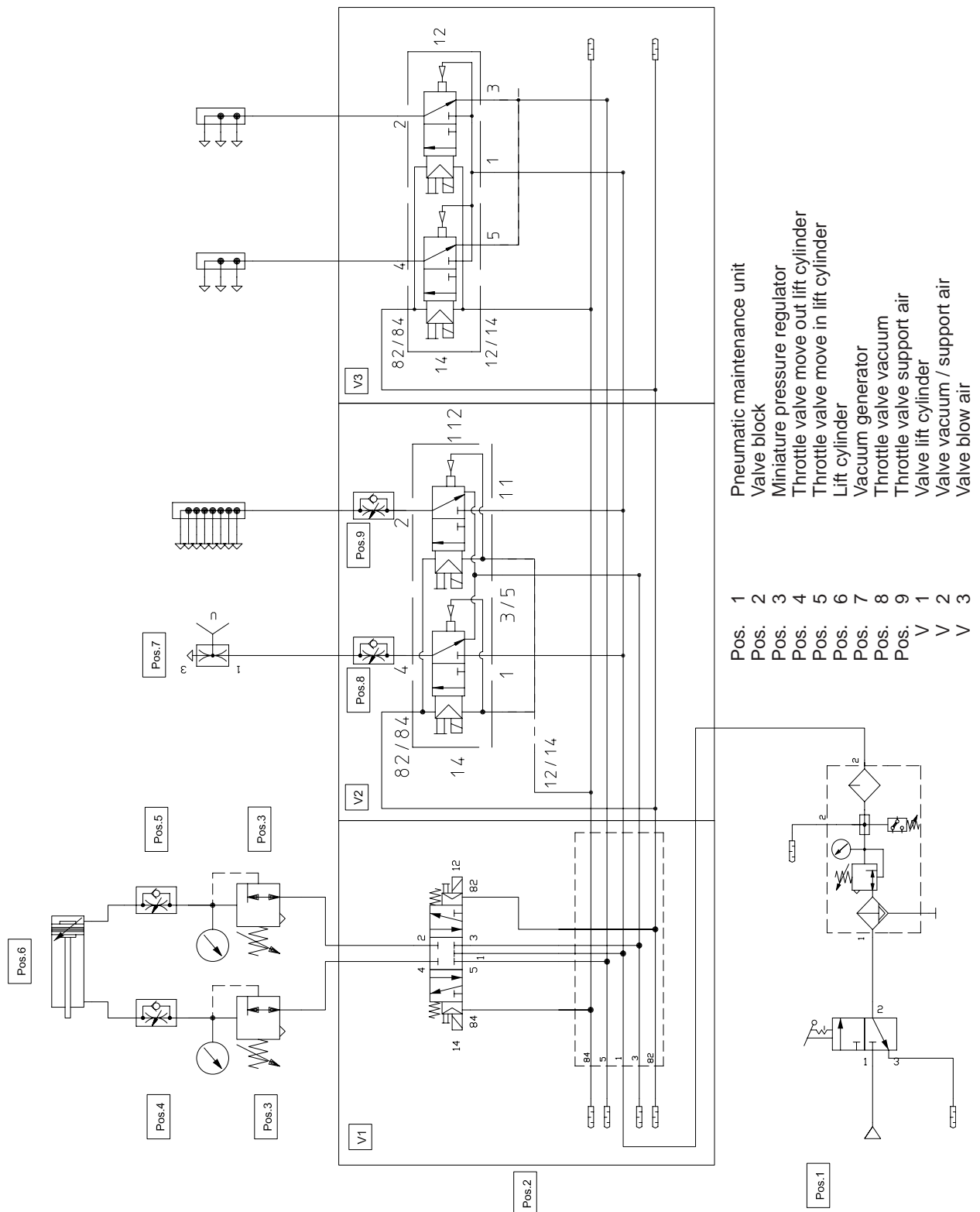


Figure 24 Pneumatic drawing applicator A 1000

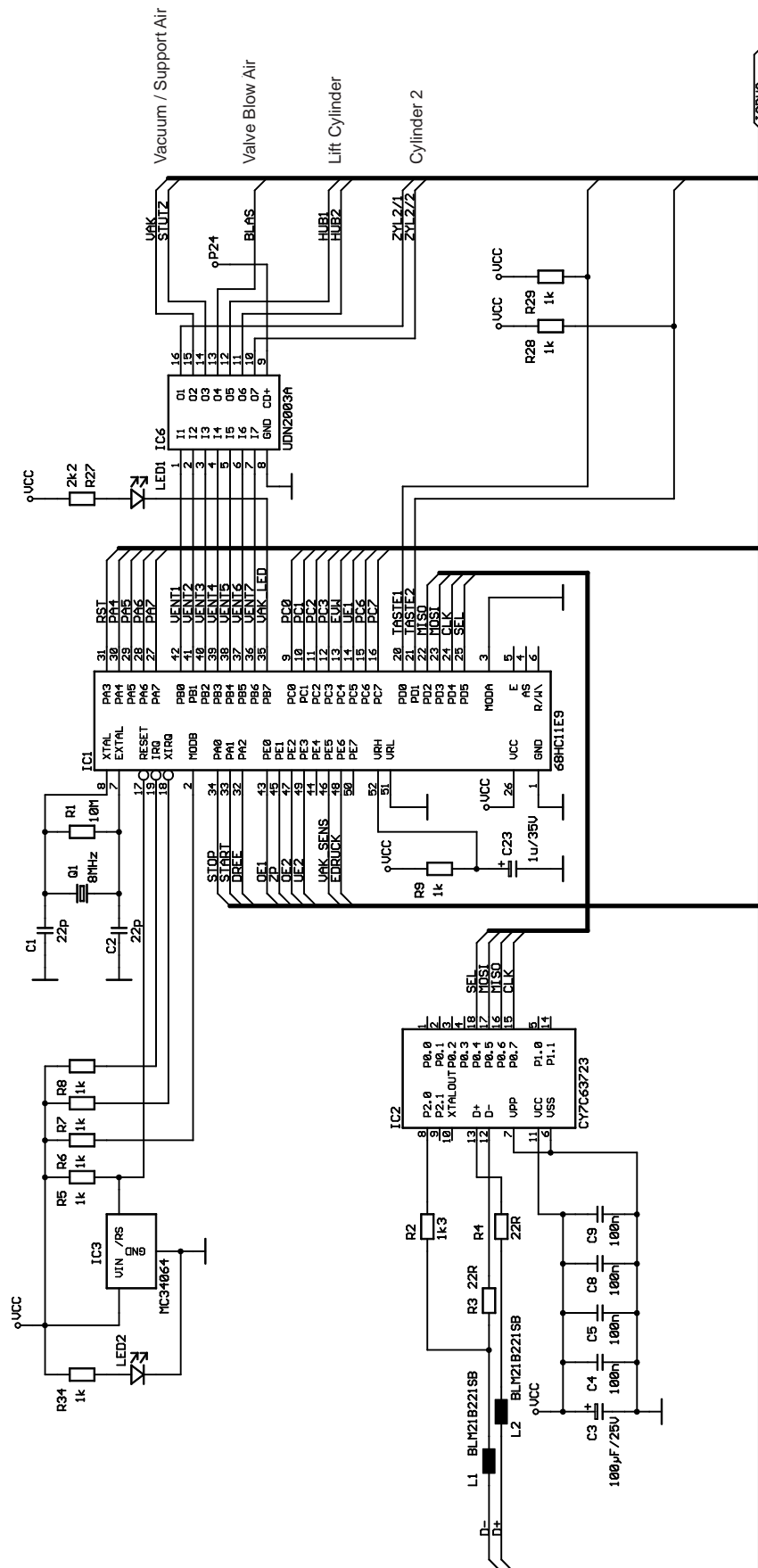


Figure 25 Circuit Diagram PCB Applicator Control A 1000 (5949108.001)

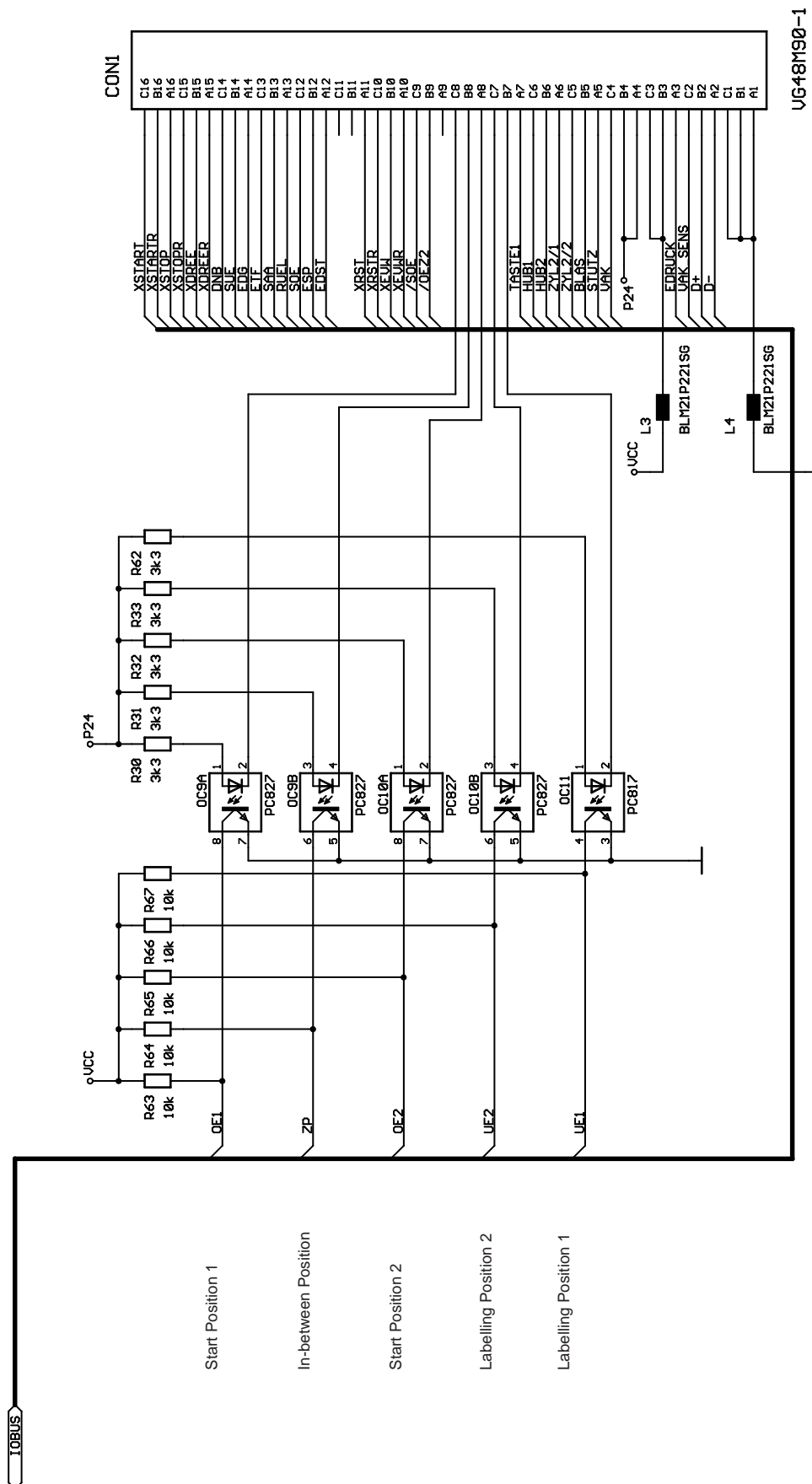


Figure 26 Circuit Diagram PCB Applicator Control A 1000 (5949108.001)

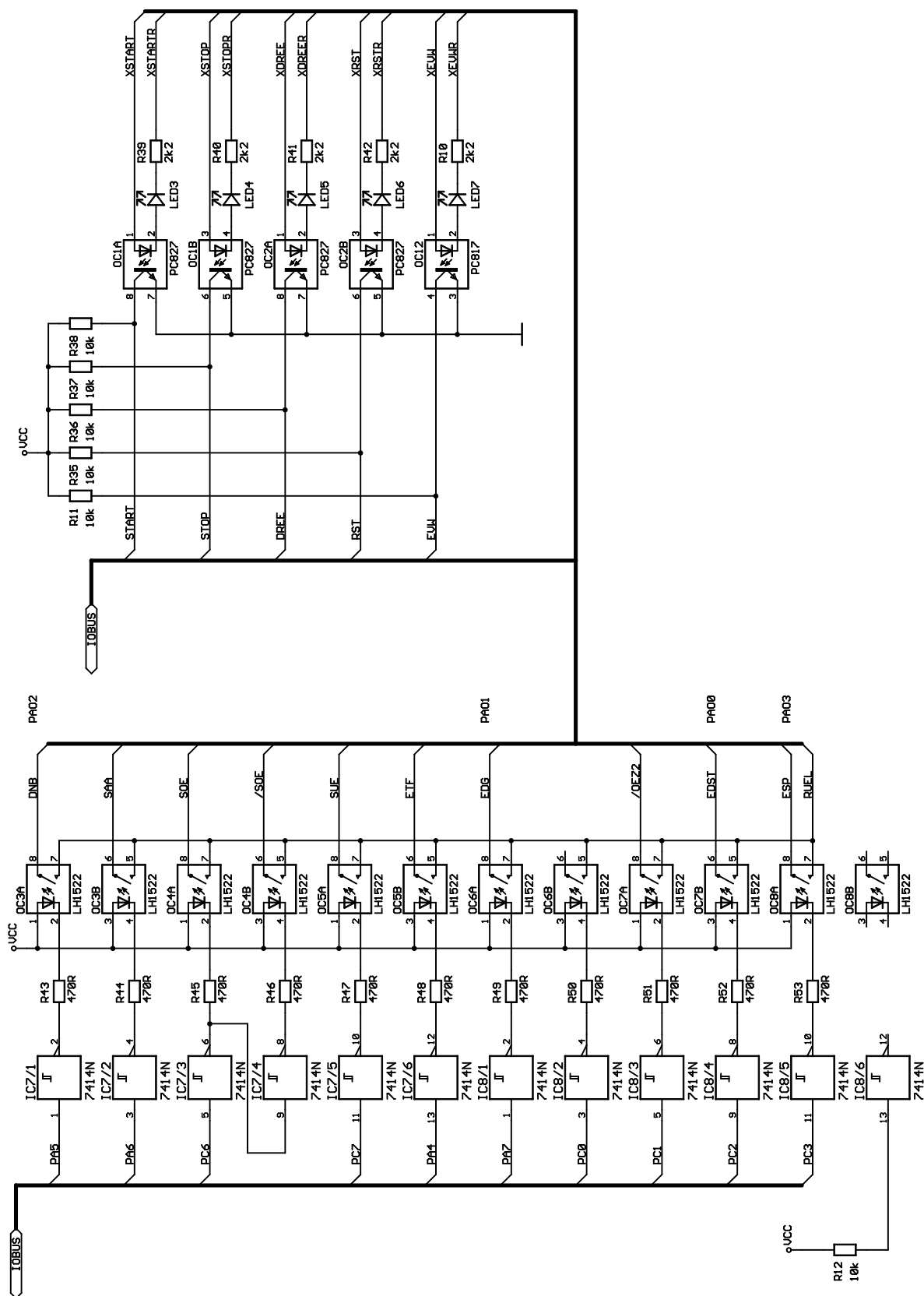


Figure 27 Circuit Diagram PCB Applicator Control A 1000 (5949108.001)

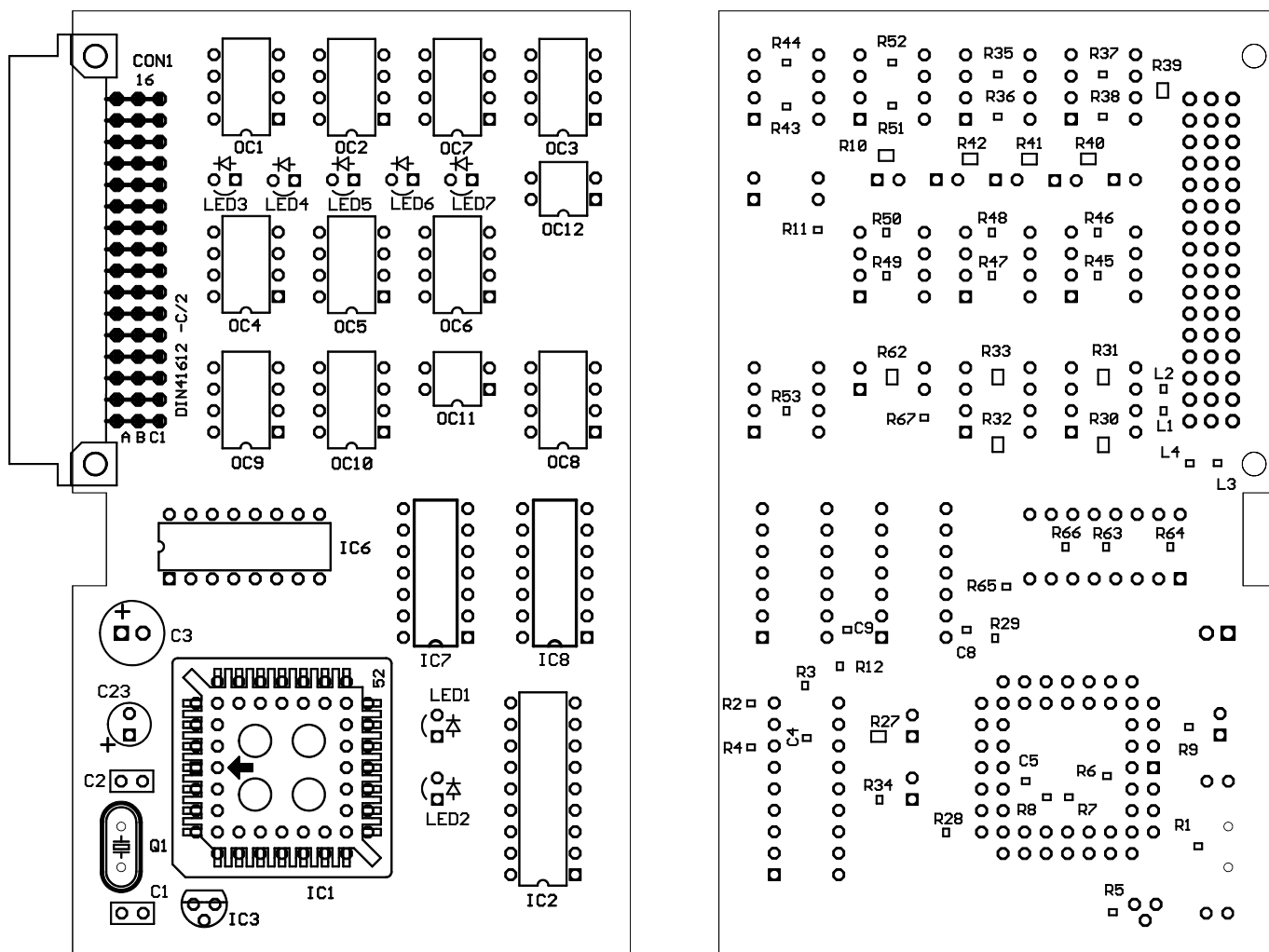
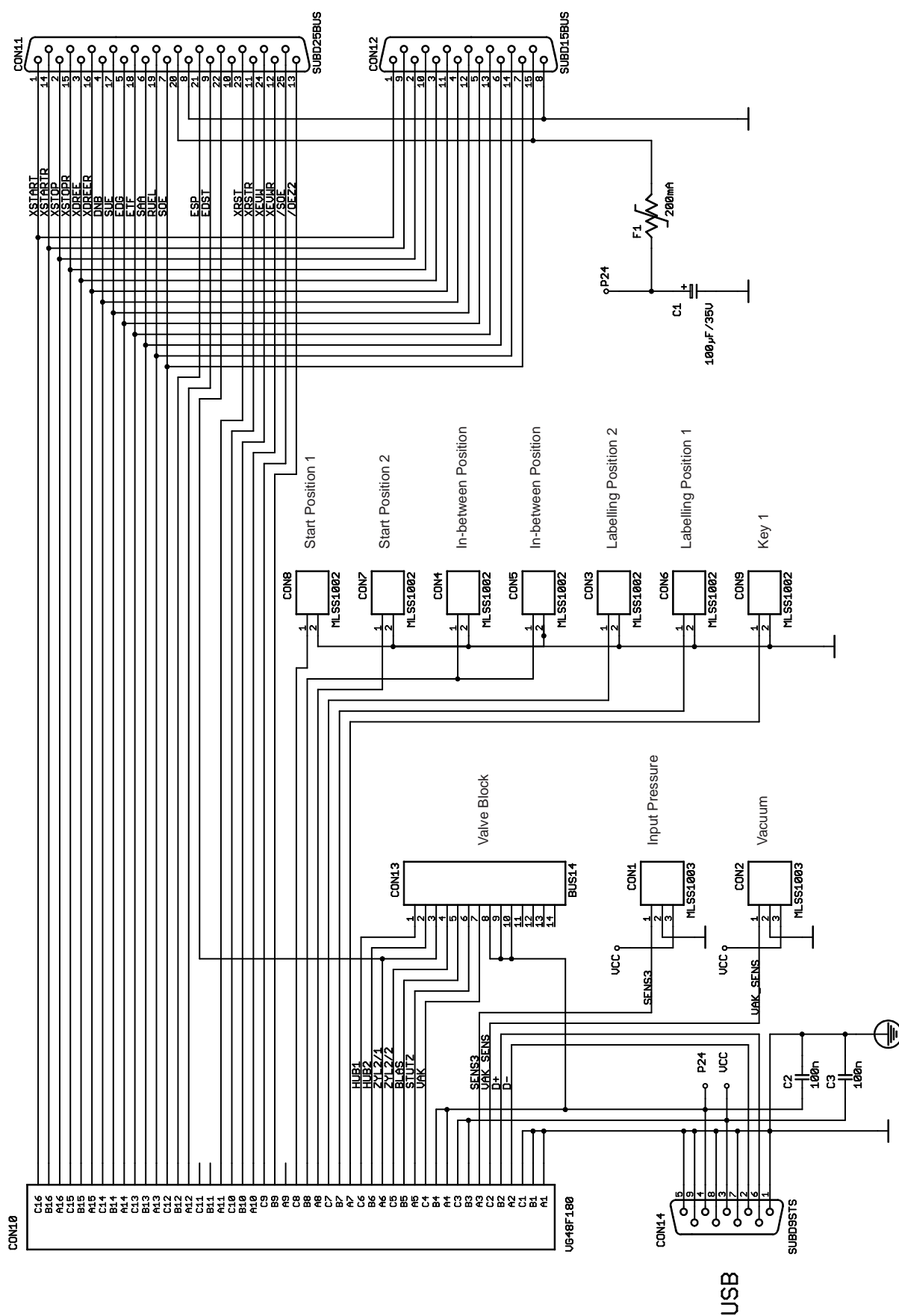


Figure 28 Terminal Diagram PCB Applicator Control A 1000 (5949108.001)



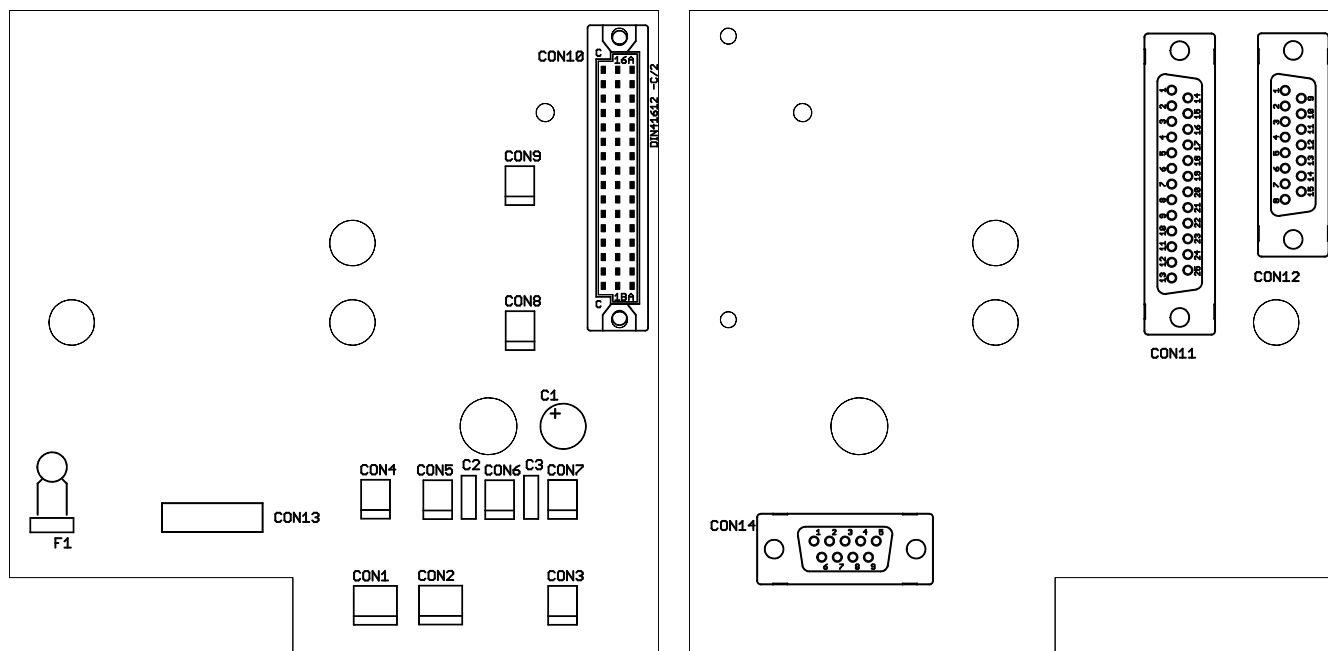


Figure 30 Terminal Diagram PCB Applicator Interfaces A 1000 (5949104.001)

12 Circuit Diagram Valve Block

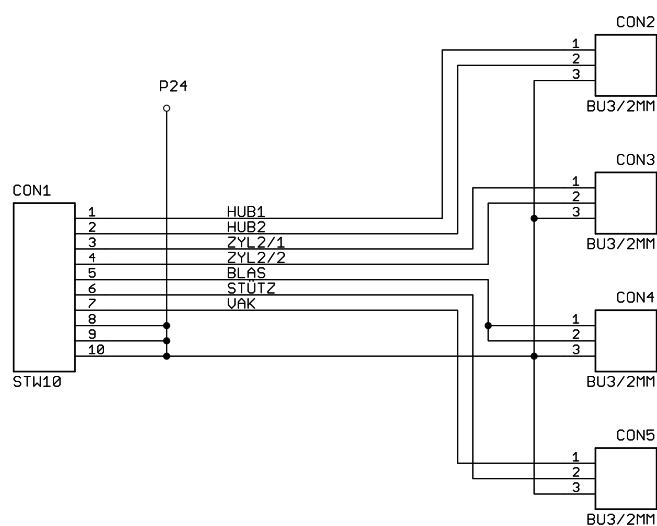


Figure 31 Circuit Diagram PCB Valve Block A 1000 (5949106.001)

A

Applicator function 21

B

Block Diagram 22

Blow air

 Valve 9

Blow air 20

Blow Tube 8

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Controller 15

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Support air

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Support air 21

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Tools 12

Transfer of labels 21

V

Vacuum

 Valve 9

Vacuum Generator 8

vacuum on pad 20

Valve 14

Valve Block 8

Valves 9