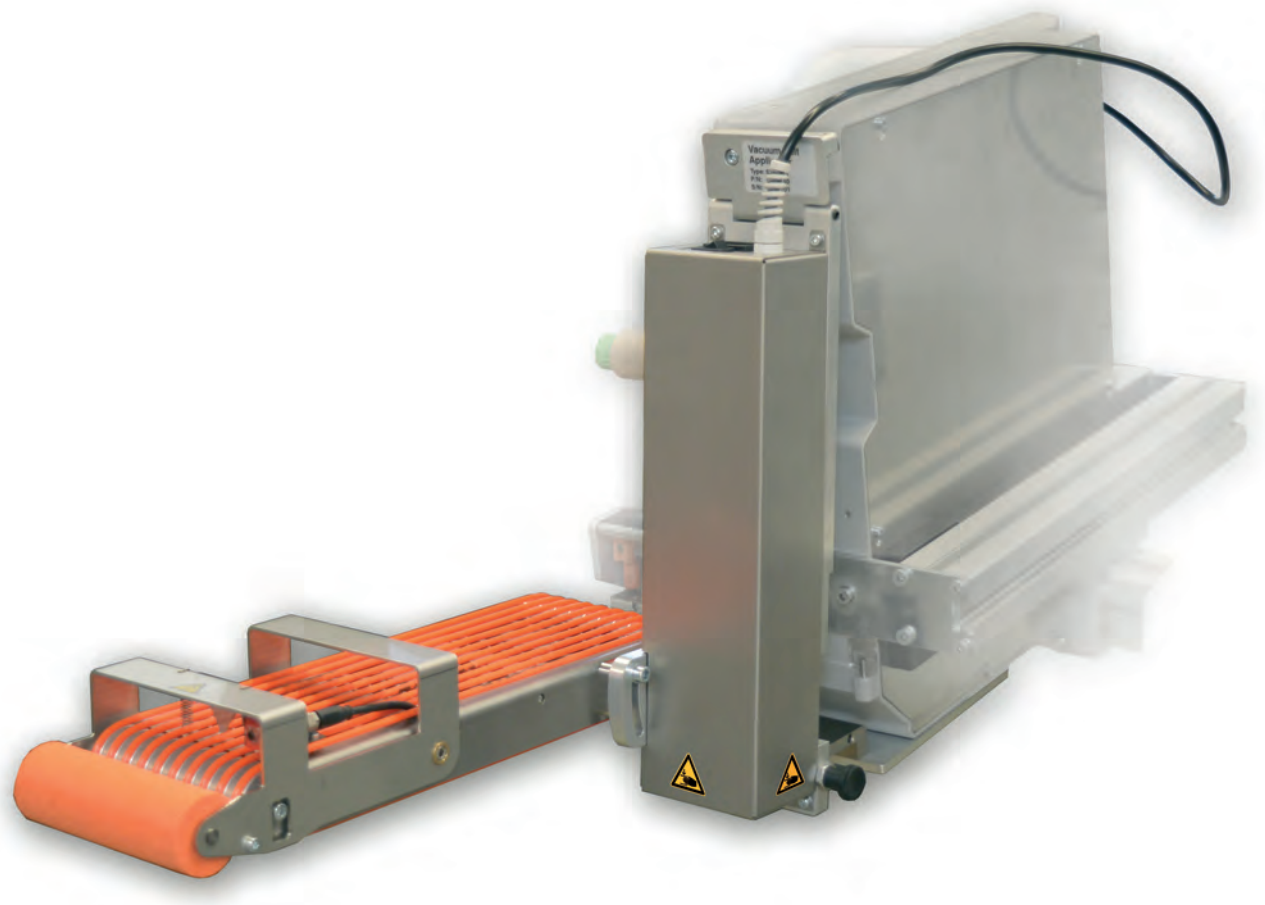
Service Manual



Vacuum-Belt Applicator

5314 / 5316

Made in Germany

Service Manual
for the following products

Family	Type
Vacuum-Belt Applicator	5314 L-3
	5314 R-3
	5316 L-3
	5316 R-3

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1 Introduction

1.1 Instructions

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

Danger!
Draws attention to an exceptionally great, imminent danger to your health or life due to hazardous voltages.

Danger!
Draws attention to a danger with high risk which, if not avoided, may result in death or serious injury.

Warning!
Draws attention to a danger with medium risk which, if not avoided, may result in death or serious injury.

Caution!
Draws attention to a danger with low risk which, if not avoided, may result in minor or moderate injury.

Attention!
Draws attention to potential risks of property damage or loss of quality.

Note!
Advice to make the work routine easier or on important steps to be carried out.

Environment!
Gives you tips on protecting the environment.

▶ Handling instruction

▷ Reference to section, position, illustration number or document.

∗ Option (accessories, peripheral equipment, special fittings).

Time Information in the display.

1.2 Safety Instruction

Attention!
Initiation, adjustments and changing of parts are to be performed by qualified service personnel only.

Warning!
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

- Before mounting the delivered components disconnect the printer from the power supply and close the shutoff valve at the applicator.
- 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.
- In operation, moving parts are easily accessible.
  This applies especially for the zone of belts and fans. During operation do not reach into that zone and keep long hair, loose clothes, and jewelry distant.
- During operation do not reach into that zone and keep long hair, loose clothes, and jewelry distant.
- The device may only be used in a dry environment, do not expose it to moisture (sprays of water, mists, etc.).
- Do not use the device in an explosive atmosphere.
- Do not use the device close to high-voltage power lines.
- Perform only those actions described in this operating manual.
  Work going beyond this may only be performed by trained personnel or service technicians.
- Unauthorized interference with electronic modules or their software can cause malfunctions.
- Other unauthorized work on or modifications to the device can also endanger operational safety.

- Always have service work done in a qualified workshop, where the personnel have the technical knowledge and tools required to do the necessary work.
- There are various warning stickers on the device. They draw your attention to dangers. Warning stickers must therefore not be removed, as then you and other people cannot be aware of dangers and may be injured.

1.3 Safety Markings

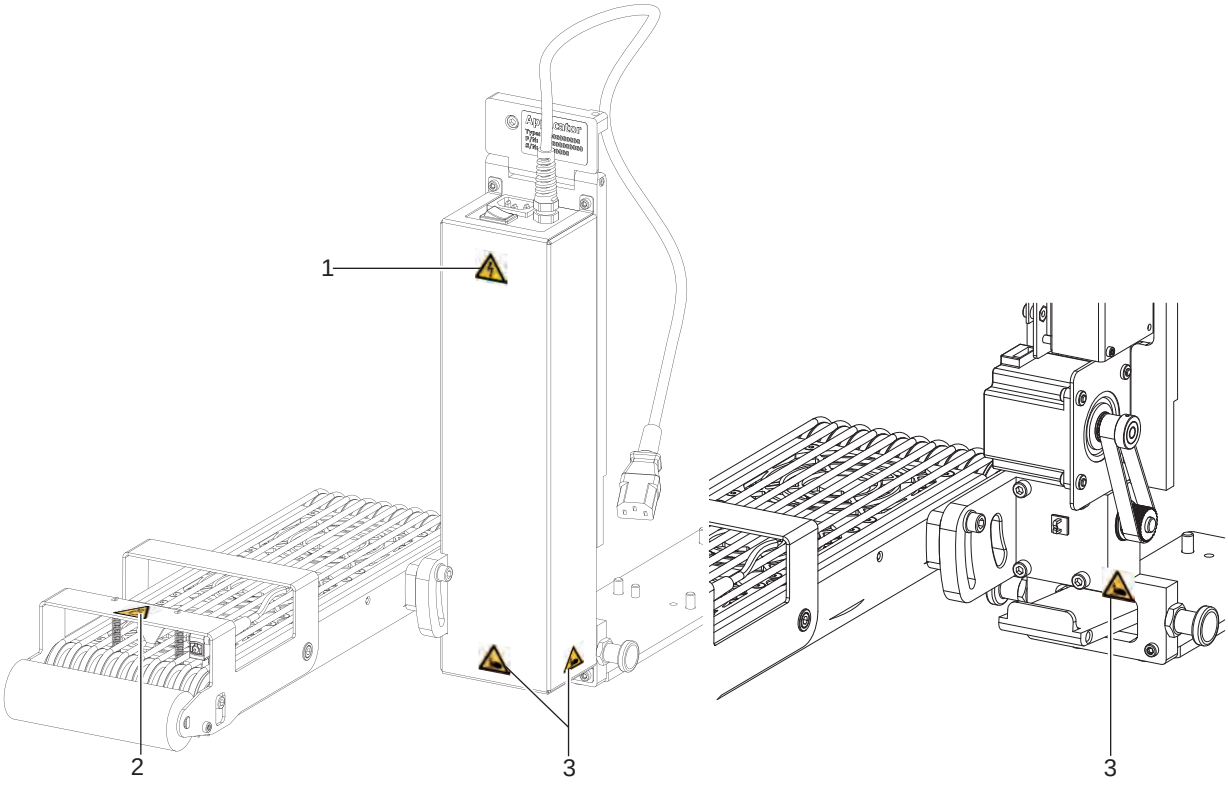


Fig. 1 Safety Markings

1: **Warning danger of electrocution.**

2: **Beware of rotating parts. Potential bodily harm particularly to hands and fingers.**

3: **Warning of contusions and/or crushing of hands and fingers when mounting or dismounting the applicator!**

1.4 Environment

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

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

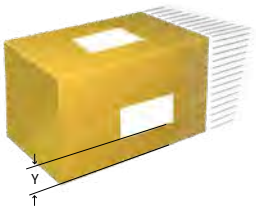
The modular construction of the print module enables it to be easily disassembled into its component parts.

▶ Send the parts for recycling.

2.1 Important Features

- For operation in a system the I/O interface of the printer can be used.

2.2 Technical Data



Vacuum belt applicator		5314-3	5316-3
Label applications		on plane surfaces	
Directions to which dispense labels		left and right	
Label widths operating a HERMES Q4/Q4.3	mm	20 - 114	-
HERMES Q6.3	mm	-	46 - 174
Label heights	mm	60 - 356	60 - 356
State of a package at the moment a label is applied in motion		■	
Label applications	from the top	■	
	from below	■	
	from the side	■	
Package heights	uniform	■	
Package speeds	up to m/s	0.5	
Gap between packages	at least m	0.5	
Vacuum belt speed[1)]	mm/s	100 - 500	
Cycle rate[2)]	labels/min up to	30	
Distance of a label to the conveyor belt, when applying from the side	mm	Y = 20	

[1)] The speed of a package must be at least as high as the speed of the vacuum belt.
[2)] calculated using labels 100 mm high and a print speed of 250 mm/s

Table 1 Technical Data

2.3 Device Overview

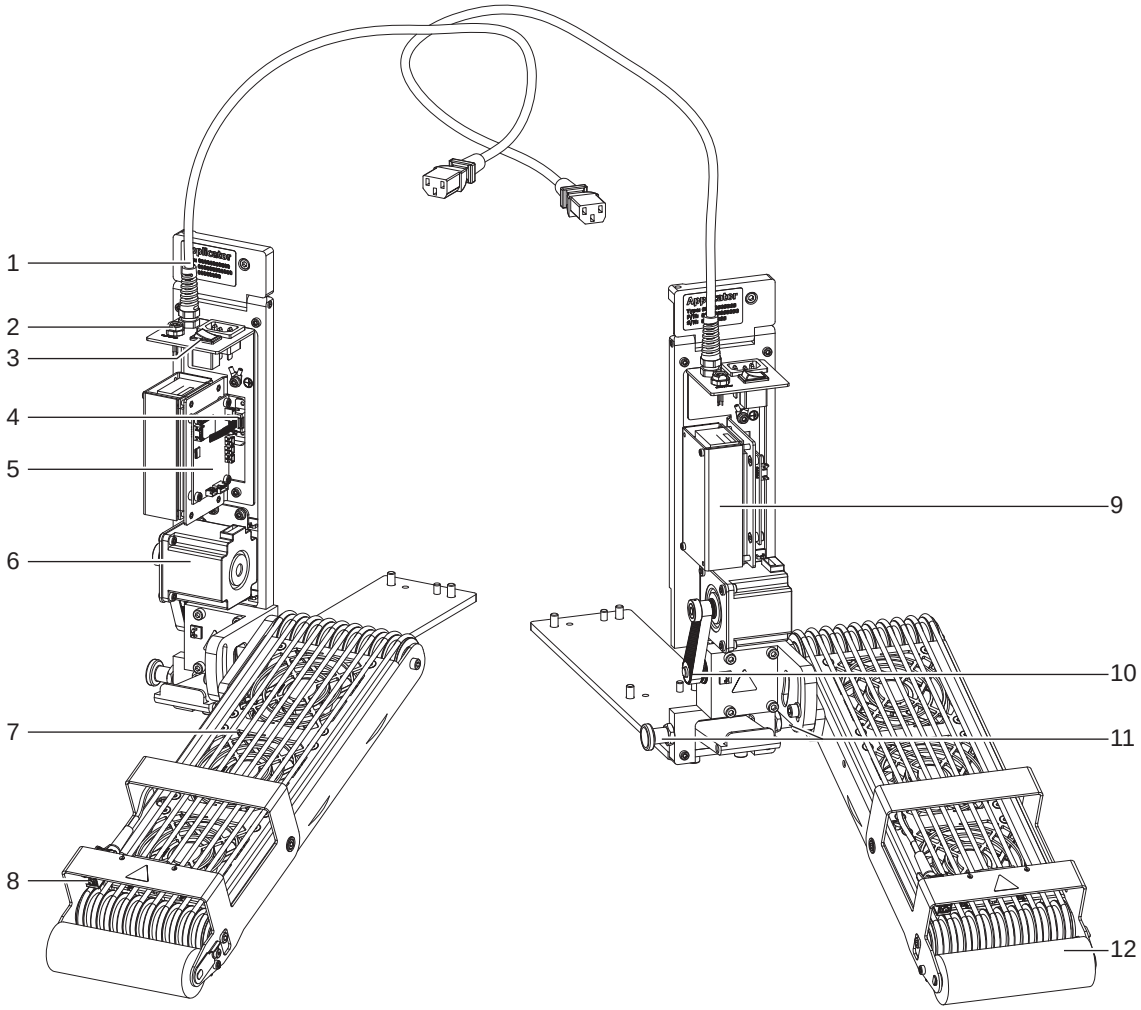


Fig. 2 Overview

1 Power supply cable of the printer
2 3-pole connector for sensor start
3 Power switch applicator
4 SUB-D 9 connector to the printer
5 Circuit board applicator control
6 Belt driven motor
7 Vacuum belt unit and ventilators
8 Sensor
9 Power supply with cover
10 Belt with motor shaft belt
11 Locking bold
12 Pinch roller

2.4 Contents of Delivery

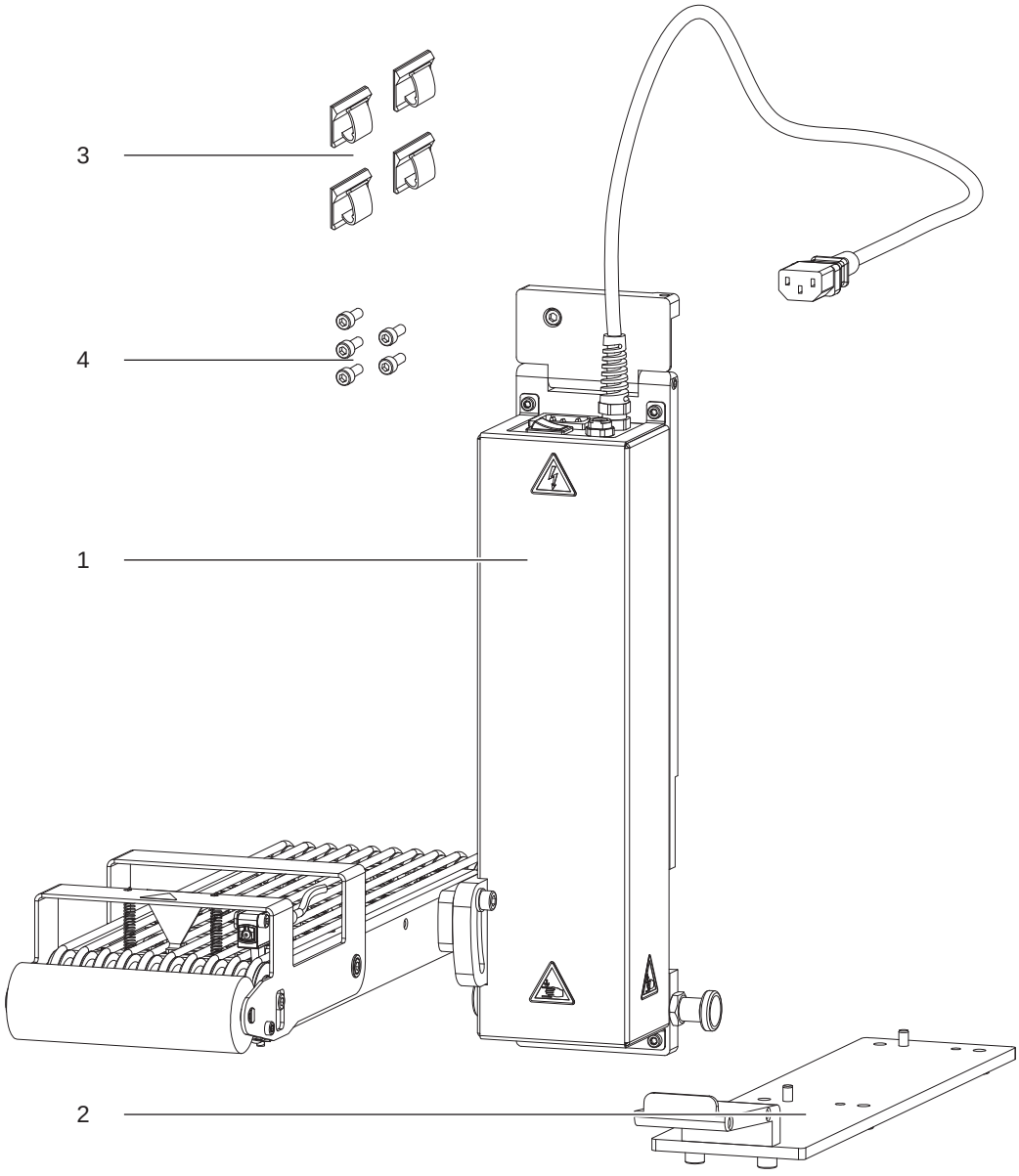


Fig. 3 Contents of delivery

1 Mounted applicator
2 Base plate for mounting the applicator to the printer
3 Self adhesive cable clamps x 4
4 Screws for mounting the applicator to the printer
5 Documentation

Note!
Please keep the original packaging in case the applicator needs to be returned.

Attention!
The device and printing materials will be damaged by moisture and wetness.
► Only set up the label printer with applicator in dry locations protected from moisture and/or water.

3.1 Standard Operation

- ▶ Check all external connections.
- ▶ Load the material. ▷ "Operator's Manual"
- ▶ Switch on the printer.
- ▶ Press the respectively **feed** at the printer.
  A synchronization feed is initiated. The processed labels need to be removed manually. After a few seconds the printer carries out a short backfeed to position the front edge of the next label at the printing line.

Note!

This synchronization also has to be carried out when the print job is interrupted with respectively **the cancel key.**

Synchronizing is not necessary if the print head was not lifted between print jobs. This also applies if the printer was powered off in between print jobs.

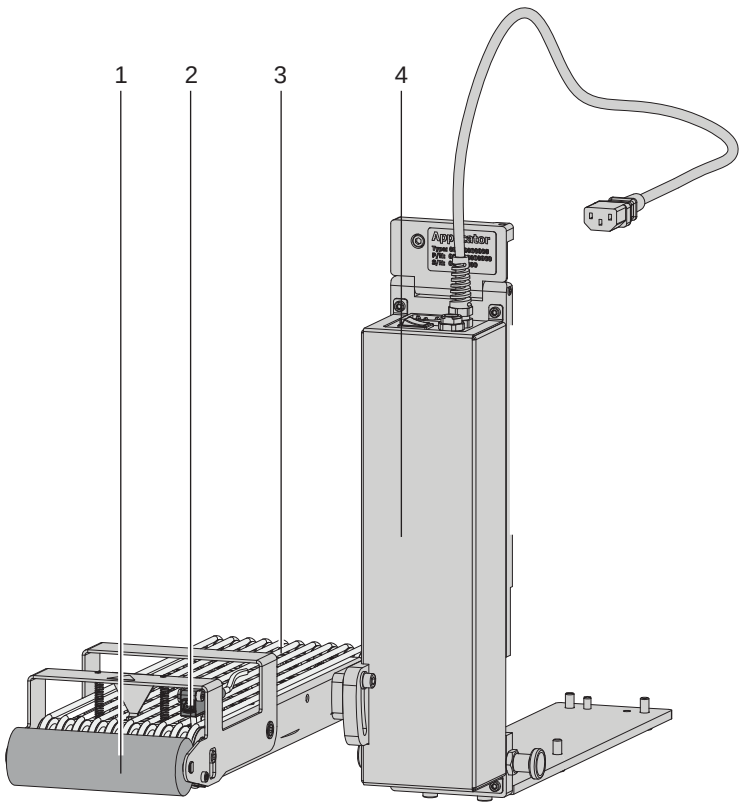
- ▶ Start a print job.
- ▶ Start the labelling process via PLC interface.

Error messages that occur during the labelling process are shown in the display of the printer.

▷ „3.6 Error messages of the Applicator“

3.2 Cleaning

Attention!
Never use solvent and abrasive.



- ▶ Clean the pinch roller (1) and transport belts with a multi purpose cleaner.
- ▶ Clean the fan area (2) with a soft brush or a vacuum cleaner.
- ▶ Use glass cleaner to clean the reflex sensor (3).
- ▶ For cleaning the outer surfaces (4) a multi-purpose cleaner is sufficient.

Fig. 4 Cleaning

3.3 Power Supply of the Devices

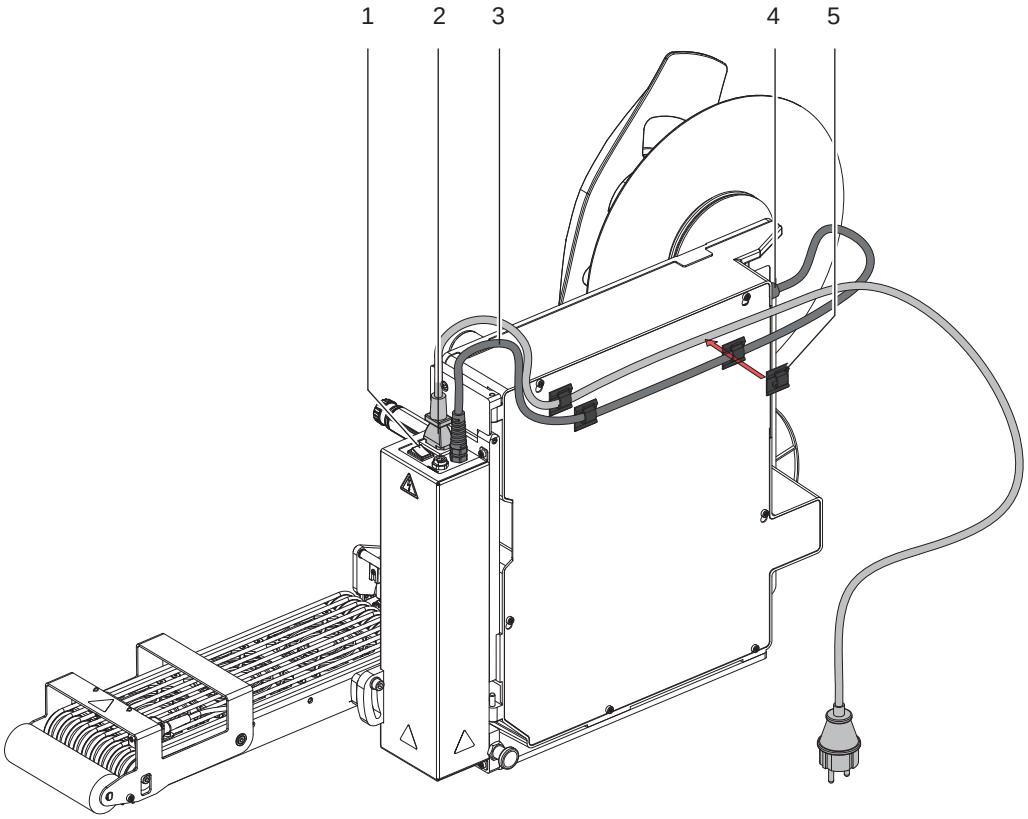


Fig. 5 Power supply of the printer and the applicator

Attention!
When the power cable is connected the entire current flows through the power supply of the printer. The power switch of the applicator only affects the powers supply of the applicator.

1. Plug the power cable (2), as part of the contents of delivery, into the plug point of the applicator.
2. Disconnect the plug (4) of cable (3) of the applicator and plug it into the plug point of the printer.
3. Switch on the applicator via the switch (1).
4. Power up the printer.

Note!
If only the printer is powered and not the applicator, the error message: *Compressed air error* **will be displayed.**

5. To better organize the cables use the self adhering cable clamps (5). These clamps may be freely placed to best suit the needed support for the cables.

3.4 Pivoting the Applicator

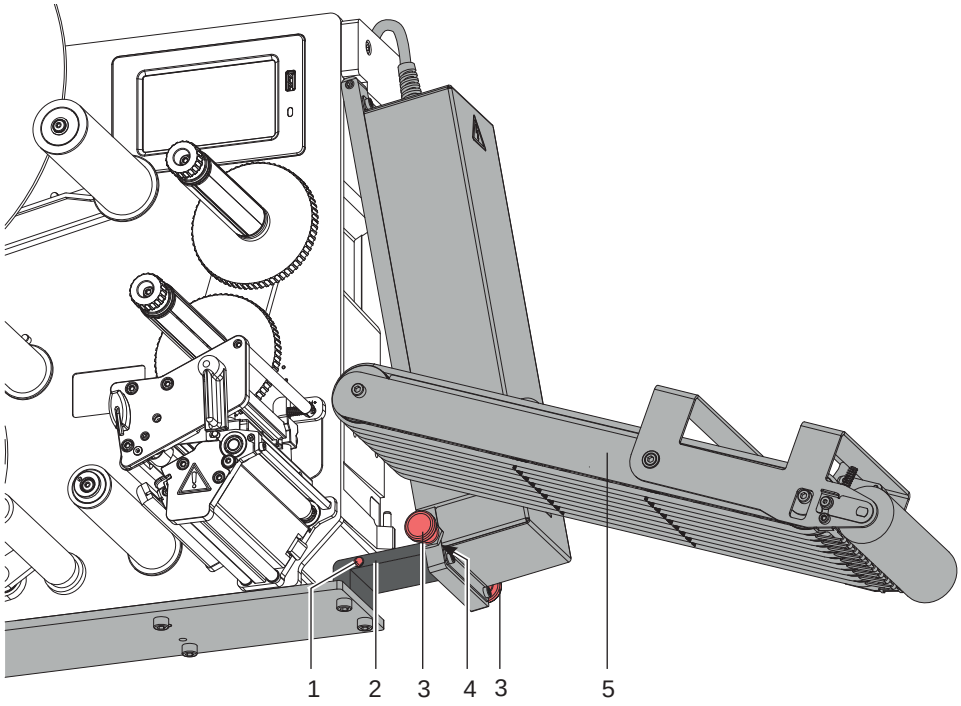


Fig. 6 Pivoting the applicator

Attention!
Danger of injury to hands and fingers by the applicator!
When releasing the snap lock keeping the applicator in place, it will drop due to its own weight.

1. To pivot the applicator (5), for cleaning or inserting material, pull the locking bolts (3) outward.

2. With pulled out locking bots (3) lift the applicator until the bolts can snap into the provided holes (4) of the mounting plate (2).
3. To remount the applicator pull the locking bolts (3) outward again and push the applicator toward the printer until the bolts (3) can securely lock into the provided holes (1) on the mounting plate (2).

3.5 Error Messages of the Printer

For detailed information about printer errors (e.g. 'Paper out', 'Ribbon out', etc.) ▷ Operator's manual of the printer

Error treatment:

- ▶ Clear the error results.
- ▶ Press the **feed** key to synchronize the label feed and remove the peeled labels manually.
- ▶ Press the **pause** key to quit the error state.

After error correction, the label causing the error will be reprinted.

3.6 Error messages of the Applicator

The following table contains an overview of error messages and their possible causes. It also suggests methods to resolve the problem:

Error Message	Possible Cause
Vac. plate empty	Label is removed from the waiting position on the pressure roll before the signal START is coming in.
Upper position not reached *Upper position* (Hermes+)	Label has not reached the area of the reflex sensor after 5 sec or was not detected.

Table 2 Error messages of the applicator

Error treatment:

- ▶ Clear the error results
- ▶ Press the **pause** key to quit the error state.

Note!

In fault check adjustments and settings with help of the Service Manual.

After error correction, the print of the label causing the error cannot be repeated without re-start the print job. Except at the error " *Vac. plate empty*" . In this case, the last label will be printed again after the error state has been quit with the **pause** key and by then pressing the Enter button ↵ .

- ▶ In the application mode "Apply/Print" send the signal "Print first label" or press the button ↵ to send a printed label to the reflex sensor position on the applicator.

4.1 Default Settings and Values

Note!
The applicators are set to default configurations by factory standards. These values guarantee a seamless operation within the parameters.

Note!
If the customer requires a custom setup the parameters will be pre installed. These values may deviate from the factory default parameters. The values are listed in the setup protocol and delivered with the printer applicator system.

The default factory values are:

- Connected to a cab Hermes+ printer, vertical
- Default material used for the setup: cab part No.: 5556472 54x35.5

4.2 Tools

• Crosstip screwdriver (Phillips)	2		to adjust the sensor
• Hexagon key L-wrench	2.5		for matched norm parts (in delivery state of the applicator)
	3 5		to set the angle of the applicator to adjust the pressure roller
• Flat-round noise	straight angled		

Table 3 Tools

4.3 Mounting and Dismounting the Applicator

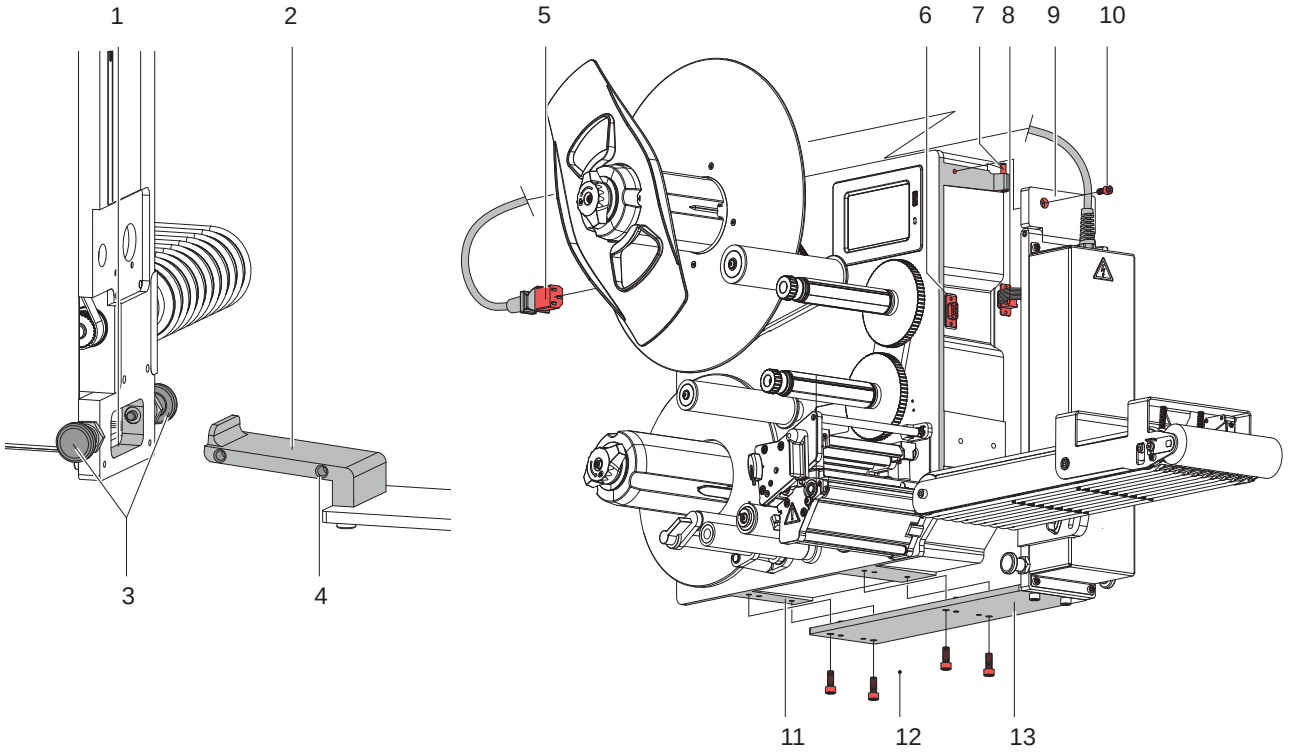


Fig. 7 Mounting and dismounting the applicator

1 Pull out the locking pin (3) and insert the mounting plate (2) into the opening (1) on the applicator.
2 Snap the locking bolts (3) into the holes (4).
3 Place the printer onto its back - with the material guide upward.
4 Hang the applicator into hinge (1).
5 Connect the sub-D 9 connector (3) of the printer to the sub-D 9 connecter (4) of the applicator.
6 Place the applicator onto the printer in such a way that the holes of the mounting plate (6) are in alignment with the holes of the printer's base plate (5).
7 Insert the screws (7) and fasten them.
8 Insert the screws (2) and fasten them.
9 Put the printer back into a stable upright position.

Attention!
Initiation, adjustments and changing of parts is to be performed by qualified service personnel only.
▷ Service Manual Applicator.

Attention!
▶ Disconnect the printer from the power supply before mounting the applicator!
▶ Ensure the printer is stading securely in a stable position!

4.4 External Start-Sensor

The start signal to apply the label can originate from an external sensor connected to the 3 pole connector (1) connected directly to the applicator.

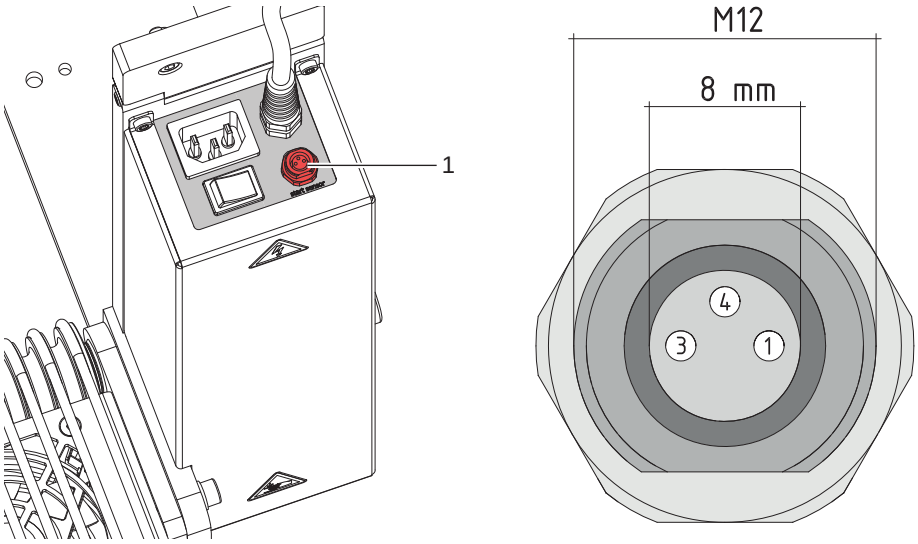


Fig. 8 Start signal connector on the applicator

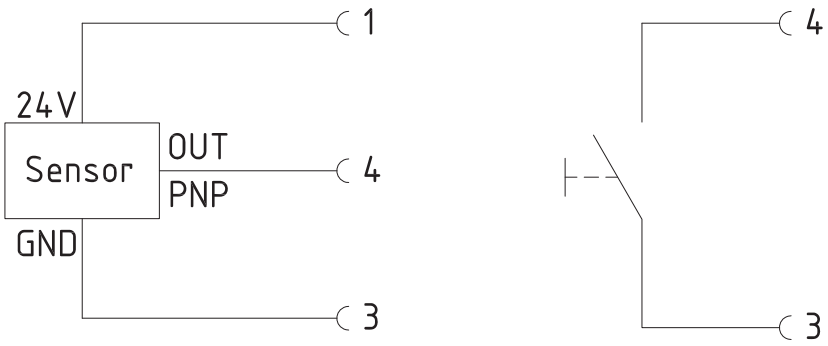


Fig. 9 Examples of connections of start sensors

The start of the printing job - print first label is still initiated over the I/O interface of the printer. Circuitry and programming of the connections is to be set as illustrated.

Note!

The position of the applicator to the printer is predetermined by the factory and should not be altered to guarantee a reliable label take-over. Only change the angle of the applicator and the pressure of the pinch roller.

5.1 Adjust the Angle to the Printer

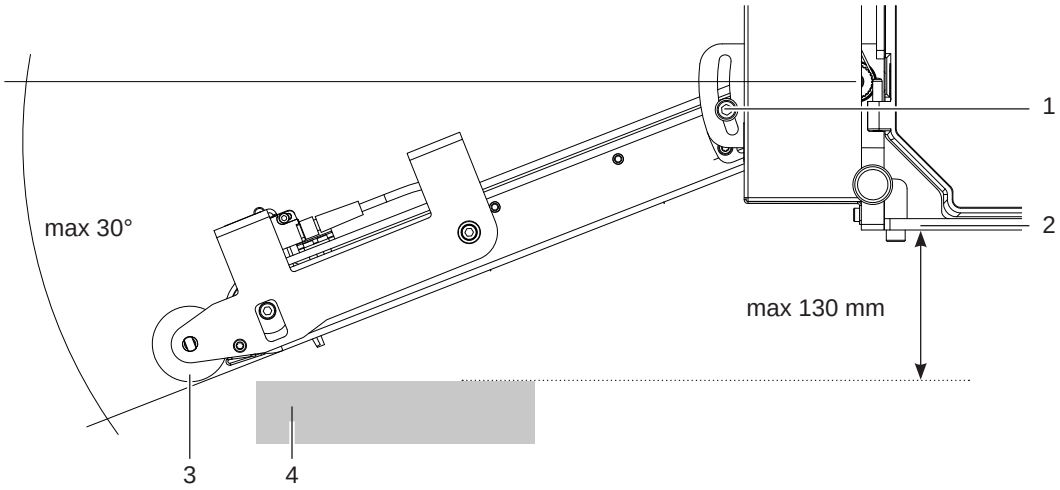


Fig. 10 Angle of the applicator to the printer

Warning!

If you loosen screw (1) the device will drop onto its own weight! Potential risk of injury!

- ▶ Loosen screw (1) to set the angle, or depth, of the applicator to the printer.
- ▶ Set the angle to the product (4) and fasten the screw (1).

Note!

The bottom of the printer edge (2) and the product (4) should be about 2 mm less than the measured distance of the bottom edge of the pinch roller (3) and bottom edge of the printer (2) to ensure enough pressure for the pinch roller for successful applications.

5.2 Adjustments in the Printer Setup

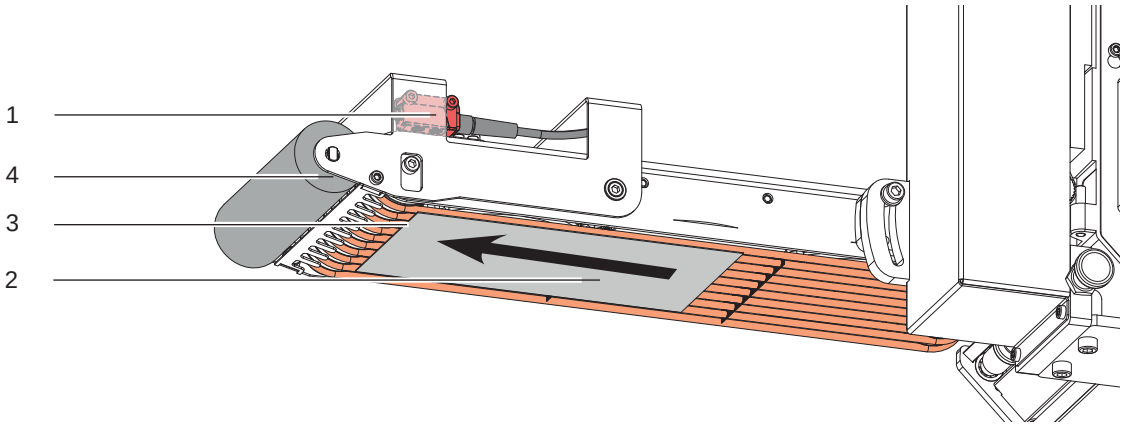


Fig. 11 Label transport/reflex sensor

Waiting position of the label

The operation mode *"Blow"* must be selected in the setup: *Setup* > *Labelling* > *Transfer mode* .
Only once this is selected is it possible to change the parameter *"Blow time"* .

After detection of the label (3) by the reflex sensor (1) it will be transported further for a set time to reach the pinch roller (4).
To change this value use the parameter:

> Blow time

A higher value causes a longer transport distance.
200 ms equates to 10 mm. ▷ Setup parameters of the applicator

Overrun of the label

If the label (3) has left the sensor area (2) it will be transported further for a defined time to apply the label via the roller. To change this overrun time use the parameter:

> Support delay on

5.3 Signals

- The signal **DREE** causes the printing of the label wich is then transported to the waiting position.
- The signal **START** will transport and apply the label to the product.

  In the application mode **"Apply - Print"** the printing of the next label starts directly after application of the previous label.
  In the application mode **"Print - Apply"** the signal DREE must be sent for the print of each label.

Pin	Signal	Name	Description		Activation/Active Status
			without applicator	with applicator	
1	←	DREE	-	print first label in mode "Apply-Print"	Switch on +24V between Pin 1 and Pin 25
13	←	START	Print start signal Precondition: The superior control has confirmed with the ETE signal that the previous label has been taken from the peel-off position.	Start of printing and labeling	+24V between Pin 13 and Pin 25
▷ Interface description Hermes+					

Table 4 A section of the interface description of the label printer

6.1 Configuration Parameters of the Applicator

The configuration parameters of the applicator can be found in the menu *Setup > Machine param.*

Note!
The speed of the belt and the label transport is set by the parameter *Support del. off***.**
The value is displayed in ms and not the actual value used mm/s.

Note!
It is necessary to set the values of the table precisely. Deviation from the listed values will cause the default value of 100 to be used.

Parameter	Meaning	Default
> *Support del. off*	Parameter to set the speed of the belts. Four steps are available. 100 ms: 100 mm/s speed of the transport belt 150 ms: 150 mm/s speed of the transport belt 220 ms: 220 mm/s speed of the transport belt 300 ms: 300 mm/s speed of the transport belt 500 ms: 500 mm/s speed of the transport belt	*100 ms*

Table 5 Applicator parameters

6.2 Setting the Peel Position

To optimize the transfer of the labels from the printer to the applicator there are two different parameters available for adjusting the peel position.

Attention!
- **First adjust the parameter "Peel Position" in the printer configuration.**
- **Then adjust the additional peel-off offset in the software.**

It is very important to follow this procedure for a seamless start after loading material and dealing with the treatment of error.

Parameter "Peel Position" in the printer configuration

- Check the basic settings in the printer setup. Perform labelling cycles by alternately pressing the button and Enter button ▷ „7.1 Test Mode without a Print Job“
- In the submenu *Labelling* > *Peel-off position* adjust the "Peel-off position" in such a way, that the blank labels are peeled-off completely from the liner.

Peel-off offset in the software

- Check the setting in the software. Perform labelling cycles by repeatedly pressing .
  ▷ „7.2 Test Mode with a Print Job“
- Adjust the peel-off offset in such a way, that the printed labels are peeled-off completely from the liner
  ▷ Programming manual or software documentation.

6.3 Activation of Peel-off Mode

Note!
- **For labelling operation activate the peel-off mode in the software.**

For direct programming use the P command ▷ Programming manual.

7.1 Test Mode without a Print Job

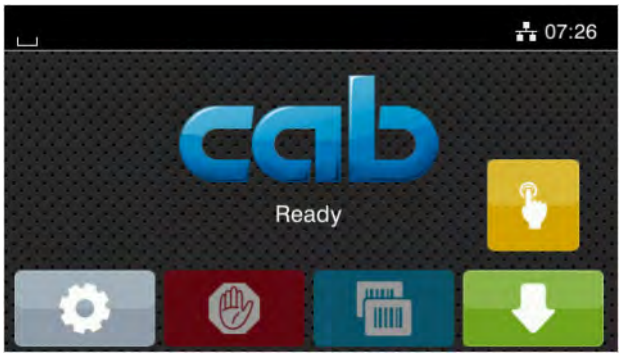


Fig. 12 Display

By alternating between buttons and on the display it is possible to simulate the labeling process without an active printing job.

- ▶ Push button .
  This causes the feed of an empty label. Simultaneously the vacuum of the pad as well as the supporting air are activated. As soon as the label has securely arrived at the pad the supporting air is switched off.
- ▶ Push button .
  When pushing this button the cylinder Z is extended into the labeling position. Reaching the labeling position is signalized by the triggering of the impact sensor. With that signal the vacuum is stopped and the label is applied to the product. With the application of the label the cylinder is contracted back into the starting position.

Note!

- ▶ **Use the printer configuration to find the best peel-off offset for the initiation.**

7.2 Test Mode with a Print Job

This method allows testing of the labeling process with actual printing data by using the button.

- ▶ Send a print job.

The test mode is executed in two half cycles:

- ▶ Push the button.
  Half cycle 1
  A label is printed. The vacuum of the pad as well as the supporting air (blow tube) are switched on. When the label has been picked up by the pad, the supporting air is switched off.
- ▶ Push the button.
  Half cycle 2
  The pad is moved to the labelling position. The triggered impact sensor signals when the labelling position is reached. The vacuum is switched off as soon as the label is placed onto the product. Then, the pad is moved back into the starting position.

If the label is removed by hand after **half cycle 1** has been completed and the button is pressed, **half cycle 1** will be repeated with the next label in the printing line.

Note!

- ▶ **Use the software to find the best peel-off offset for the initiation.**

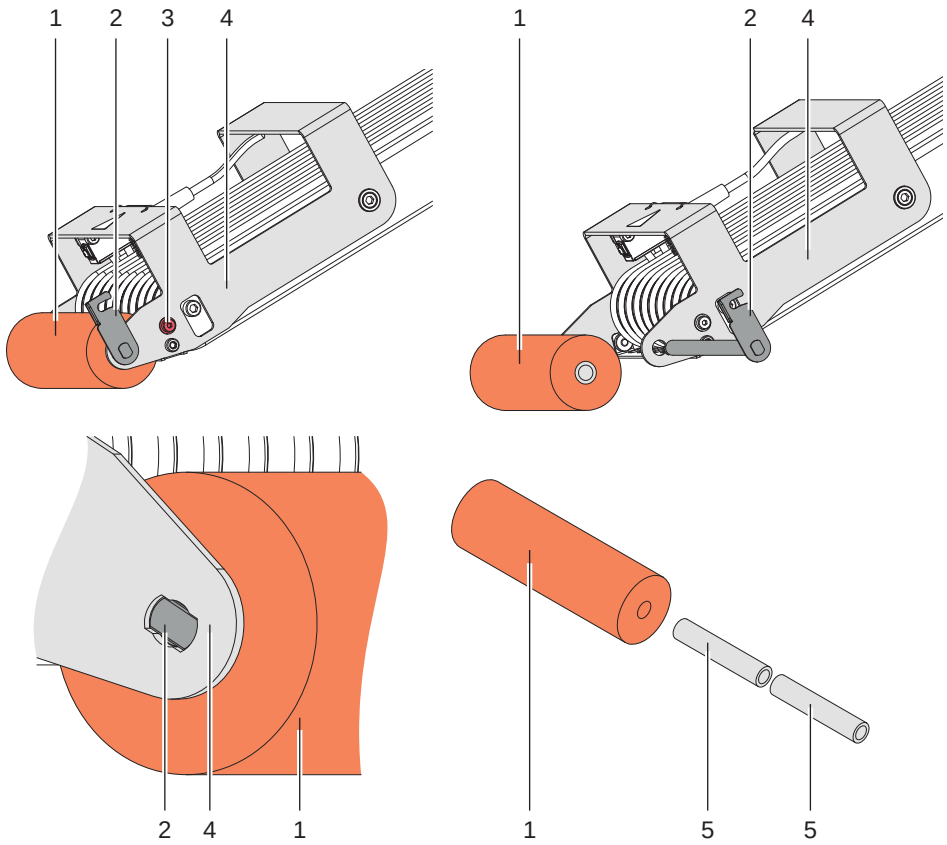


Fig. 13 Exchanging the pinch roller

1. Loosen screw (3).
2. Turn the lever (2) 90°. On the opposite side of lever (4) the lock of the axis (2) must be placed into the indentation of lever (4).
3. Pull out axis (2) and take off the pinch roller (1).
4. Remove the bushings (5) from the pinch roller (1) and place them into the new roller.
5. Remount the pinch roller in the reverse order as removing it.

Comparison of menu items / parameter

HERMES Q			Hermes+	
	Label feed		**feed**	Label feed
	with print job:alternately print and apply of a label			Enter
	without print job: Start of the applicator movement			
	Start display - Selection menü			Setup
	Setup			Machine param.
	Labelling			Applicator
	Transfer mode			Mode of oper.
	Cycle sequence			Mode of apply
	Waiting position			Waiting position
	Blow time			Blow time
	Roll-on time			Roll-on time
	Support delay on			Support delay on
	Support delay off			Support delay off
	Start delay			Delay time
	Lock time			Lock time
	Vacuum delay			Delay vacuum
	Vacuum control			Vacuum control
	Label hand-over			Hand-over up
	Cleaning blow			Cleaning blow
	Peel-off position			Peel position

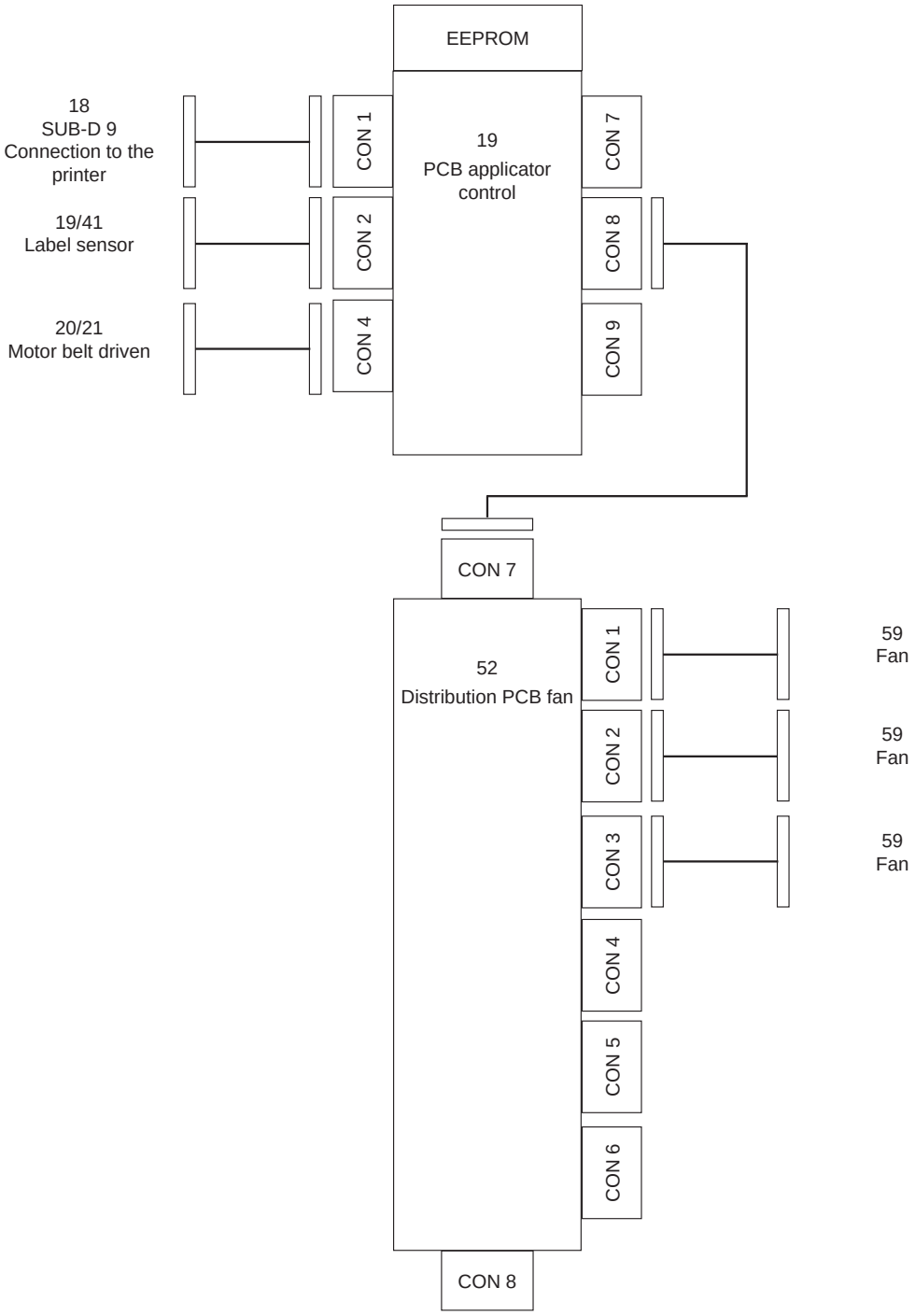


Fig. 14 Block diagram

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