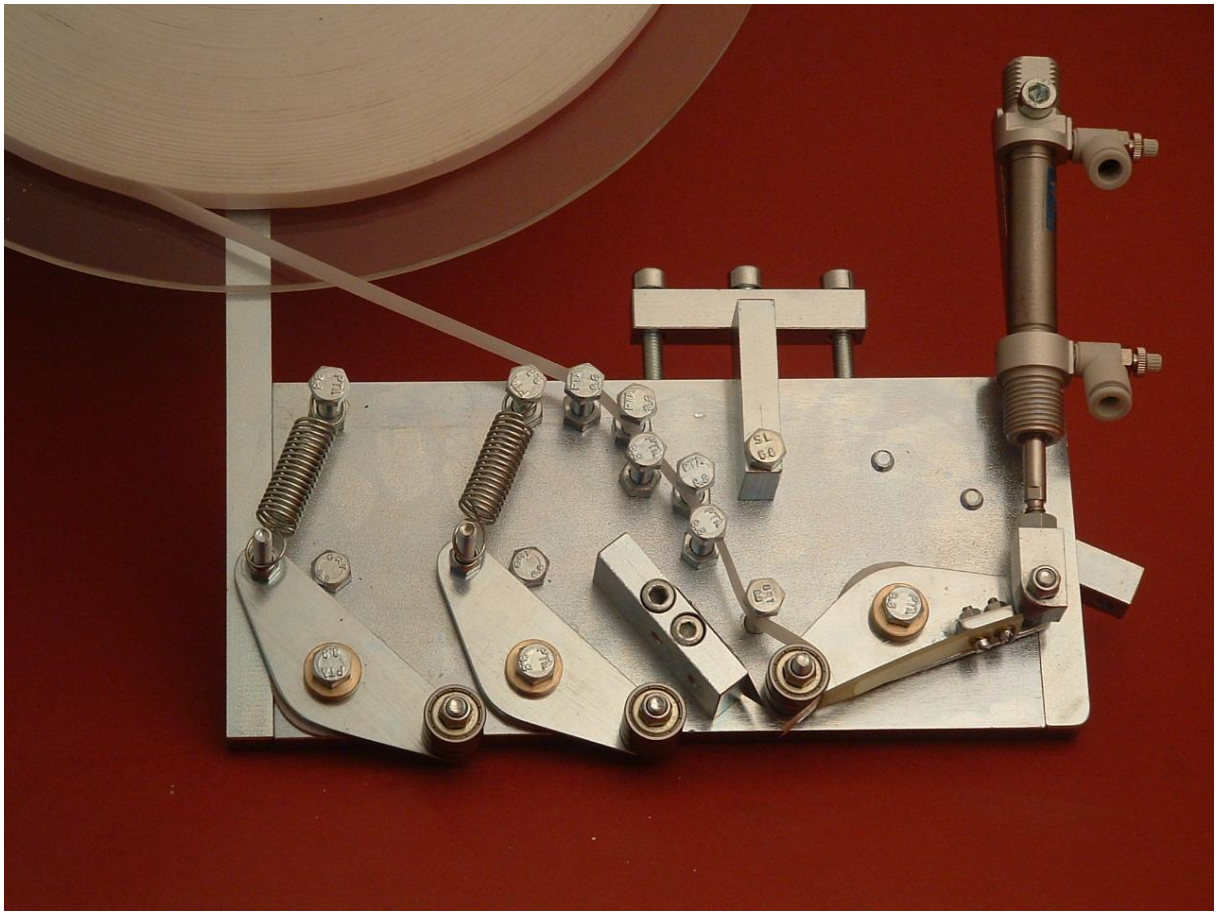
Paperfox TD-1 tape dispenser Instructions manual

V1.4

11.12.2014.



Manufacturer: Paperfox Hungary

www.paperfox.eu

Application of the TD-1 tape dispenser

The Paperfox TD-1 tape dispenser is designed for sticking 12mm wide “finger lift” double side self adhesive tapes on cardboard, stronger paper or other similar sheet materials.

The Paperfox TD-1 tape dispenser can be controlled pneumatically.

The Paperfox TD-1 tape dispenser originally was designed for the Paperfox HH-1 return receipt making machine, but it can be used in any similar machine.

Warning Paperfox TD-1 tape dispenser

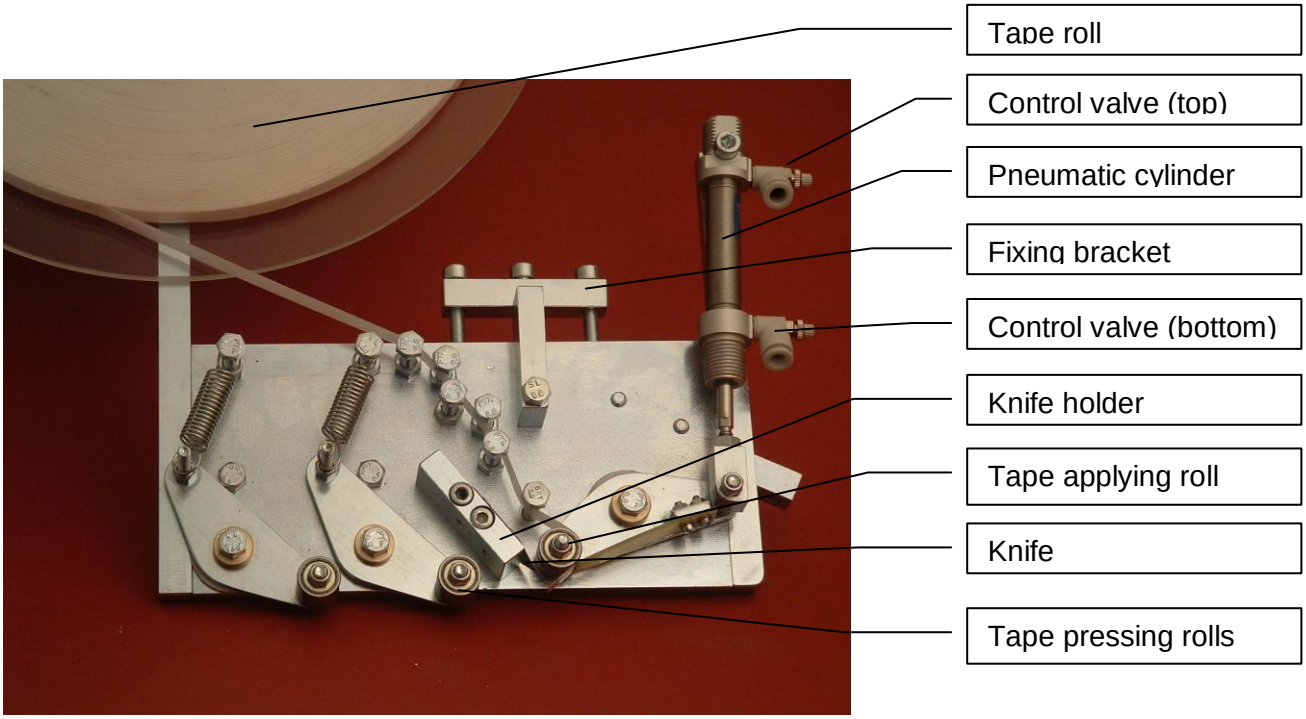
- The Paperfox TD-1 tape dispenser is designed for sticking 12mm wide “finger lift” double side self adhesive tapes on cardboard, stronger paper or other similar sheet materials. You can use other tapes and other materials, but the device isn’t tested for such applications. Maybe that you have to make some modification for processing other materials.
- Prior to the Paperfox TD-1 tape dispenser utilization, definitely read all instructions.
- To reduce the risk of injury, an inspection shall be essential, if the Paperfox TD-1 tape dispenser utilized in the vicinity of children.
- There is a very sharp knife in the Paperfox TD-1 tape dispenser. Be careful when you change the knife or when you insert the adhesive tape in the device.

Parameters

Dimensions: (L x H x W)	500 x 450 x 50 mm
Weight:	3.8 kg
Tape width:	12/6mm (12mm wide, 6mm sticking width)
Tape roll outer diameter:	320mm
Tape roll core inner diameter:	75mm...3”
Tape roll length:	500m
Suggested tape roll type:	Steratape – DST/F 6/12mm x 500m
Min. paper weight:	120 g/m^2
Pneumatic cylinder type:	Festo - DSNU-12-25-P-A
One way control valves (2pcs):	Festo - GRLA-M5-QS-6-D
Electric valve: (optional)	Festo - CPE10-M1BH-5L-M7
Control voltage:	24V DC
Operating pressure:	~ 8 bar
Knife type:	Olfa MCB-1

Standard parts of the Paperfox TD-1 Tape dispenser

The Paperfox TD-1 Tape dispenser usually consists of the following parts:



The TD-1 tape dispenser normally have only the accessories in the picture above. You can control the device with switching compressed air to the pneumatic cylinder. The device can be fixed with the fixing bracket to two 15x15mm rectangular steel bars.

Optional parts of the Paperfox TD-1 Tape dispenser

Coupling plug to compressor (Festo KS4-CK-4)

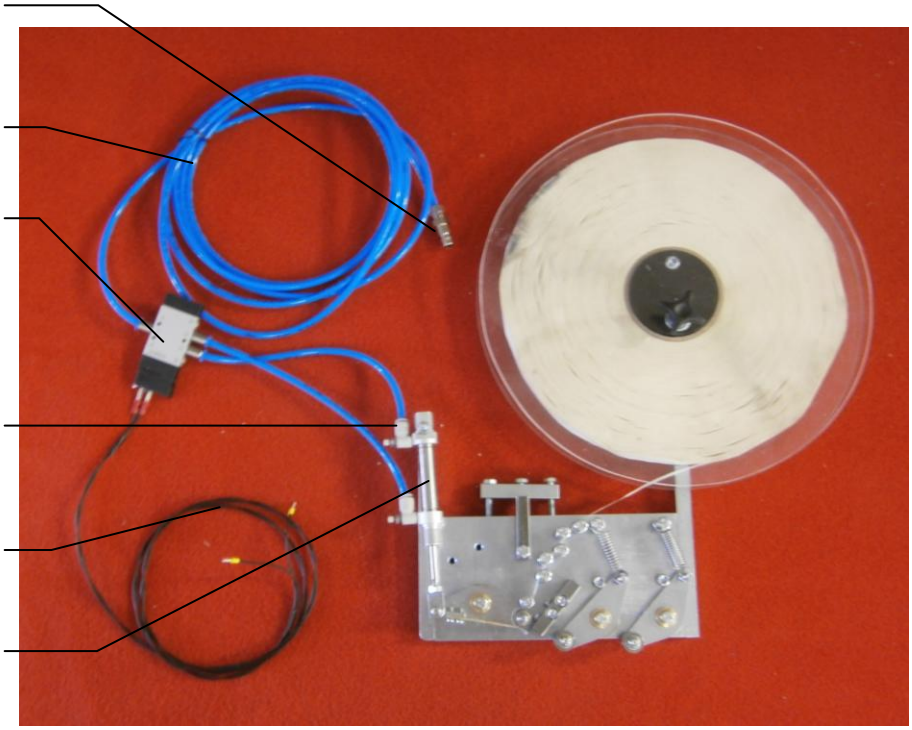
Pneumatic tube (6mm)

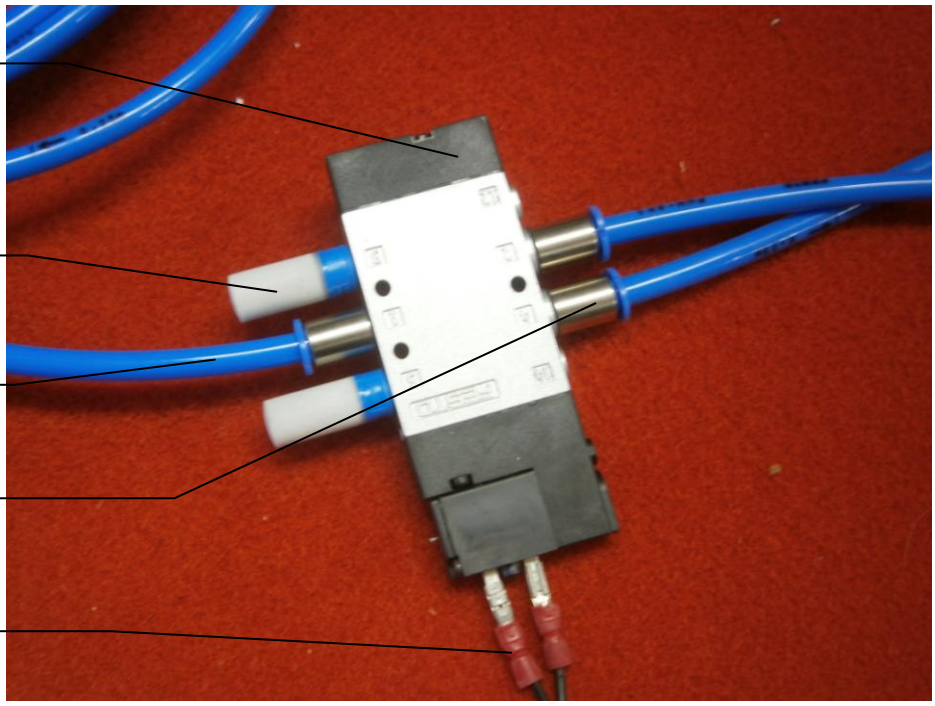
5/2 Way Solenoid Valve (Festo CPE10-M1BH-5L-M7)

One-way Flow control valve (Festo GRLA-M5-QS-6-D)

Electric cable (24V DC)

Standard cylinder (Festo DSNU-12-25-P-A)





5/2 Way Solenoid Valve (Festo CPE10-M1BH-5L-M7)

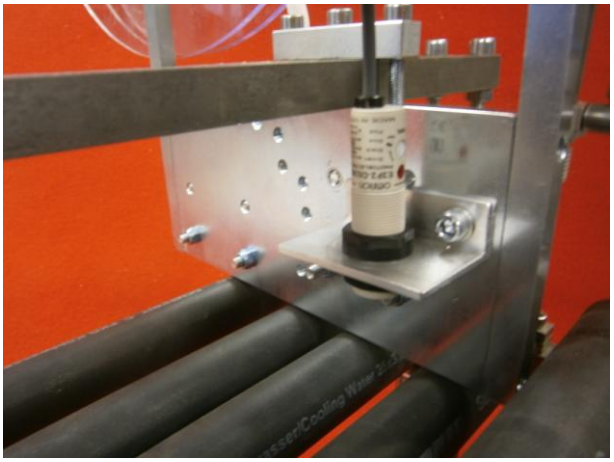
Silencer (Festo UC-M7)

Plastic tubing (6mm)

Push-in fitting (Festo QSM-M7-6-I

Control input (24V DC)

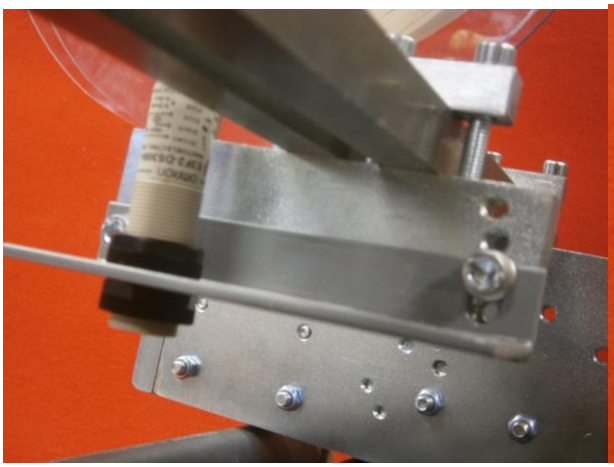
You can control the TD-1 tape dispenser with the help of **optosensors**. We offer optionally OMRON E3F2 or E3F1 series optosensors. This optosensors can be inserted in 18,5mm holes. We offer mounting brackets for this sensors. You can use any similar optosensors to control the unit.



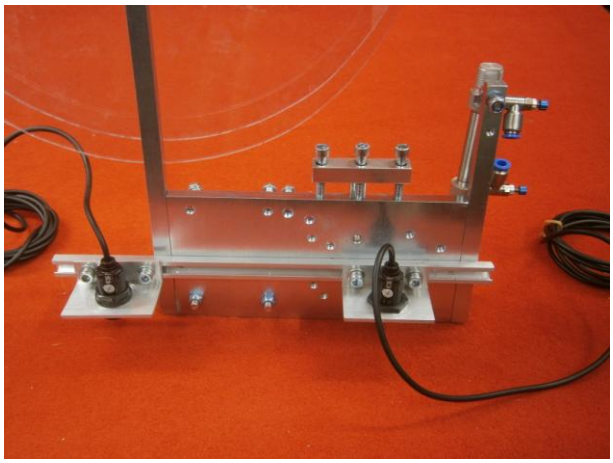
Simple bracket for optosensor

You can mount an optosensor with a simple bracket to the TD-1 tape dispenser. If you want to lay the tape band from the side to the oposit side of the sheet, then it is enough to use one optosensor to control the unit.

Mounting bracket for an optosensor to 15x15mm rectangular steel bars.

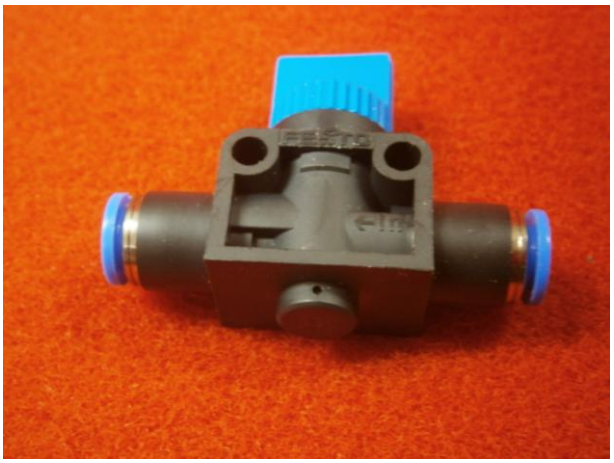


We use this mounting bracket in our HH-1 return receipt making machine. If you want to lay the tape band from the side to the oposit side of the sheet, then it is enough to use one optosensor to control the unit. The optosensor opens the pneumatic valve at the first side of the paper and closes at the end. fine adjustmens can be done by the adjustable flow control valves.



Sliding rail with sliding brackets for optosensor

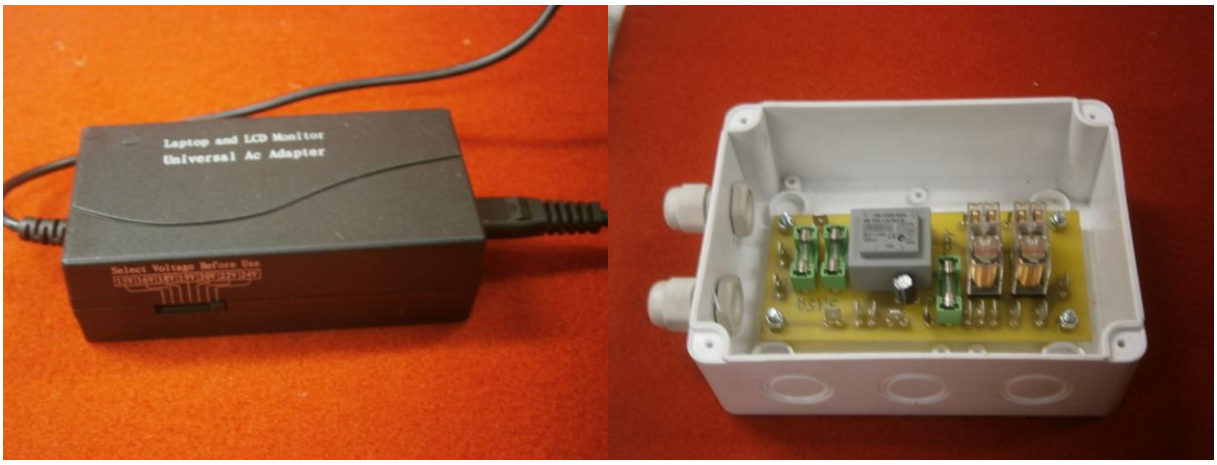
We can offer a rail with sliding backets for fixing two optosensors. You can connect the optosensors so that the device shoud start to lay the adhesive tape when the edge of the paper reaches the first optosensor and stop laying when it reaches the second. So you can set the position of the tape by moving the optosensors to the proper position. Small adjustments can be done with the adjustable flow control valves.



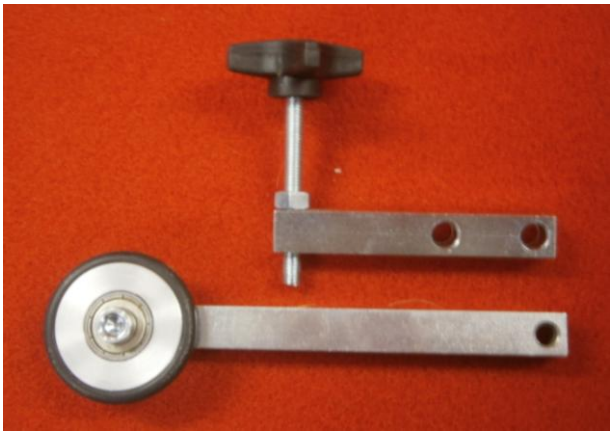
Shut off valve

You can easily switch off the compressed air from the device with this valve. It is quite a useful function if you want to insert the adhesive band into the device or if you want to celan or djust it.

Power supply



The solenoid valve and the optosensors are working on 24V DC voltge. We can offer a simple 24V notebook charger for this purpose or we can manufacture individually sutch device.



Paper guide rubber roller

You can mount an additional rubber roller to the TD-1 with this device. In some application this arm holdes a perforating knife to perforate the paper prior applicating the tape band.

Operation of the Paperfox TD-1 Tape dispenser

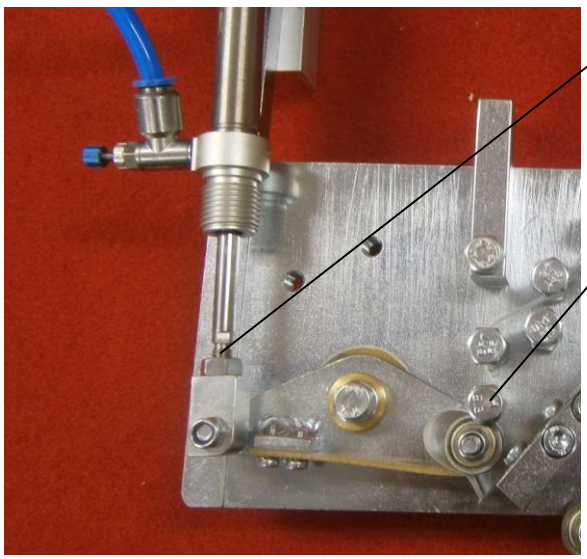
You can control the movement of the tape applying roll with driving compressed air to the upper or lower input (with control valve) of the pneumatic cylinder.

You can adjust the speed of the up and down movement of the tape applying roll with the control valves. You can adjust the starting delay of the tape application (and the start position of the tape on the paper) with the upper control valve. You can adjust the finishing delay of the tape application (and the end position of the tape on the paper) with the bottom control valve. In this way you can use a simple optosensor to control the device and set the accurate position of the tape with this pneumatic control valves. This method is very simple, but not so accurate, because you control the delay time and not directly the position of the tape. The position of the tape is depends on the speed of the machine.

More accurate way of controlling the start and en position of the tape if you use two optosensors. You can make small adjustments with the adjustable flow valves, but do not use big delays because it would make the positioning inaccurate especially if the speed of the paper is changing or not stabile.

If you use the optional electric valve then connect the Paperfox TD-1 Tape dispenser with the pneumatic connector to a compressor with 8 bar pressure and you can control the movement of the tape applying roll with 24V DC current at the input connectors of the electric valve. You can control the valve with a simple optosensor, with a PLC or any signal which you can get from the machine on which you mount the TD-1.

We suggest to set the end position of the moving roller close to the M6 screw, but so that do not touch it. Usually this setting is proper but in some cases you can try other settings.

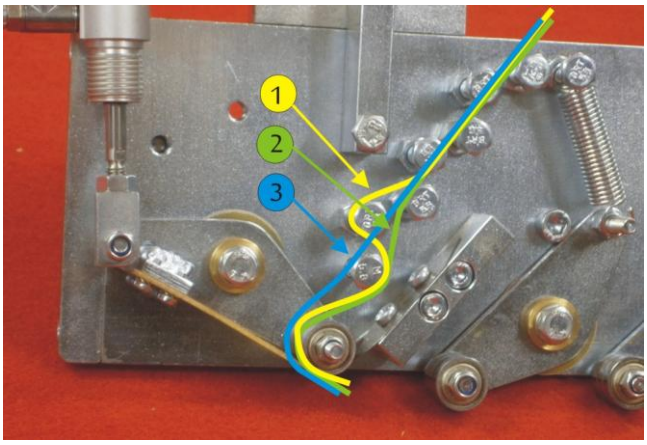


You can set the end position of the moving roller with turning around the axle of the pneumatic cylinder after loosing this nut.

Set the end position of the moving roller close to this screw, but so that not to touch it. If the roller presses the adhesive tape to the screw then it sticks to the screw.

If the tape is so strong that the knife can't cut it well, you can increase the cutting force by setting the end position of the moving roller so that it should touch the M6 screw.

The tape can be inserted in many ways.



The green line (2) is the usual way. This solution can be used with the most tapes and sheets.

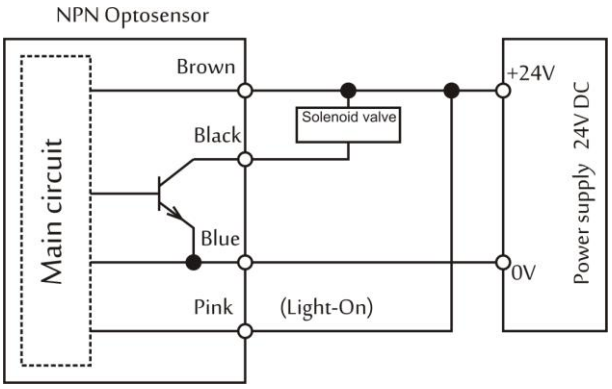
You can increase the cutting force and make the guiding of the tape more stabile if you insert the tape as the yellow line (1) in the picture. This solution increases the tension of the tape so do not use it if the sheets on which you want to stick the tape are thin. The risk of this solution is that the guiding elements may collect the glue from the tape and the glue strip on the tape can be hurt. It especially often happens with old, too long stored tapes.

If the tape is easy to cut you can reduce the tension of the tape by guiding the tape according the blue (3) line on the picture. The risk of this solution is that the reduced tension of the tape is not enough to provide the force to cut the tape.

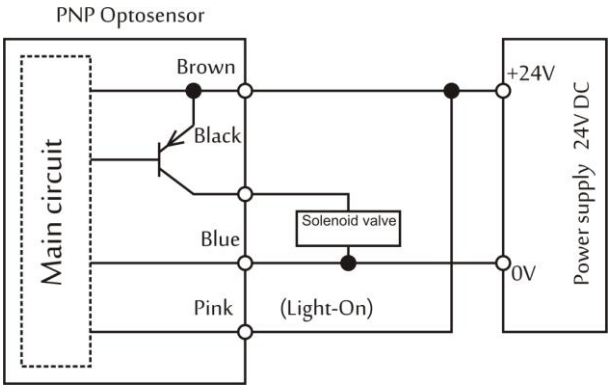
IMPORTANT NOTICE: You can save a lot of work if you use a good quality tape. The glue on the tape is subject to wear. Some reseller keeps them on stock for several years. The manufacturer suggests using the tape before 1 year after manufacturing. Some user stores the adhesive tape on a refrigerator. I don't know if it is a good solution, but I suggest to use new rolls and remove them from its packaging only immediately before usage.

If you see a gap between the rounds of tape in the roll then the quality of the roll is poor. The air gets to the glue, it dries and don't sticks to the paper well, in addition the glue layer break easily so that the guiding elements on the tape applicator can collect the glue particles.

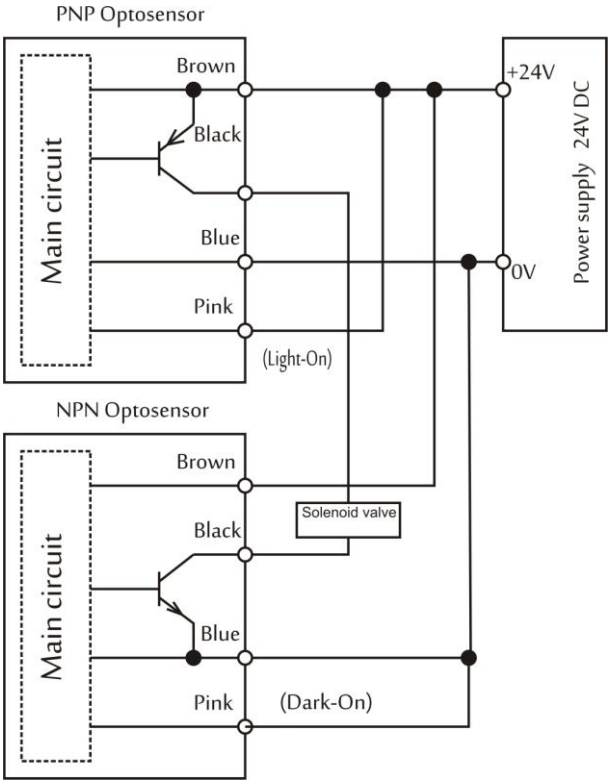
Electric connection



Connecting OMRON E3F1-TN series optosensor.



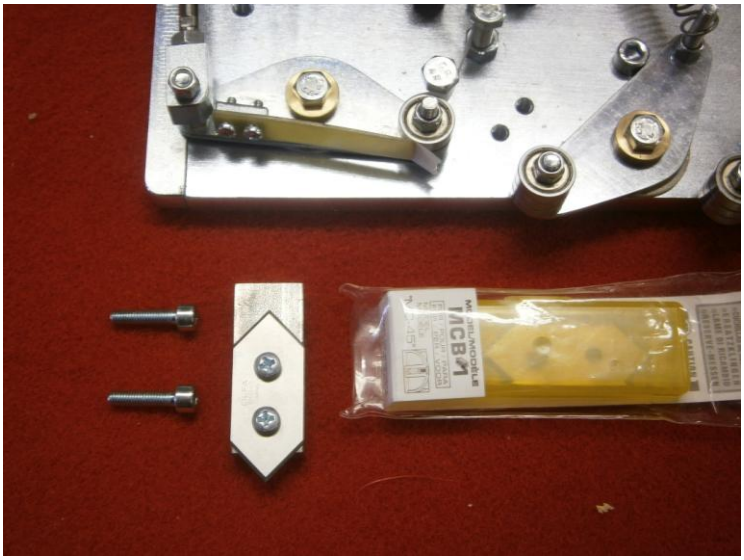
Connecting OMRON E3F1-TP series optosensor.



You can use two optosensors to controll your TD-1. When the paper reaches the PNP optosensor it switches on. The NPN optosensor is connected to be dark-on so it is also on. The pneumatic valve opens. As the paper reaches the NPN optosensor it switches off so the pneumatic valve switches off.

Replacing the knife

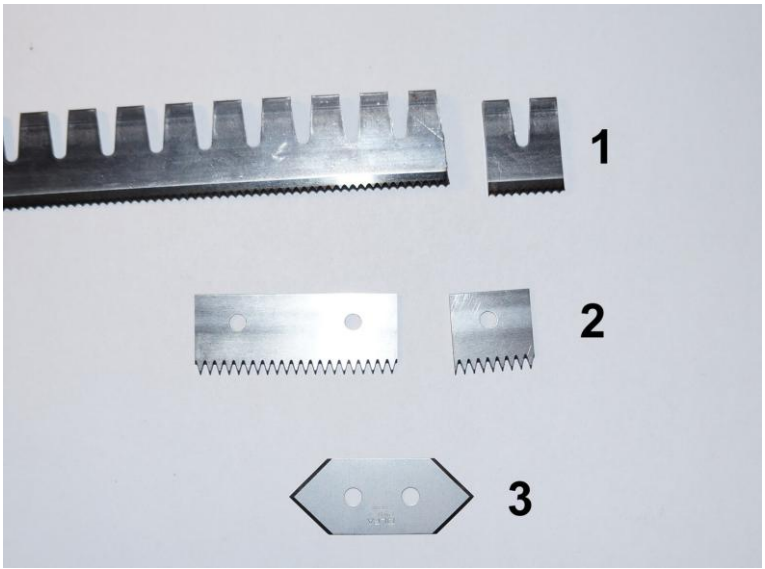
The knife in the Paperfox TD-1 tape dispenser is very sharp. Be very careful when you replace it or if you inserting the adhesive tape.



Remove the knife holder from the Paperfox TD-1 tape dispenser and you can remove the knife. Booth cutting edge of the knife can be used.

Using different knifes

You can use other kind of knives in your TD-1 as well.
There is no "best solution", the optimal knife profile depends on the tape and the material on which you want to stick the tape. We collected some possible solution in the following picture:



1. Rotary cutting rules

There are several manufacturer which offers rotary cutting rules. We used Böhler rules. Rotary cutting rules show a serrated cutting edge for easy penetration into the board.

Advantages:

- This knife produces a semi-straight, toothed cutting line
- There are different tooth profil available

Disadvantages:

- Sometimes it is not easy to buy Rotary cutting rules
- With some type of adhasive bands the knife collects the glue and dirt between teeth
- You have to cut the blade to insert it into the machine.

2. Martor Nr. 763 blades.

Avantages:

- Quiete a sharp knife
- This knife produces a semi-straight, toothed cutting line

Disadvantages:

- The manufcturer is going to finish the manufacturing of this knife.
- You have to cut the blade in two to insert it into the machine.

3. OLFA MCB-1 knife.

Advantages:

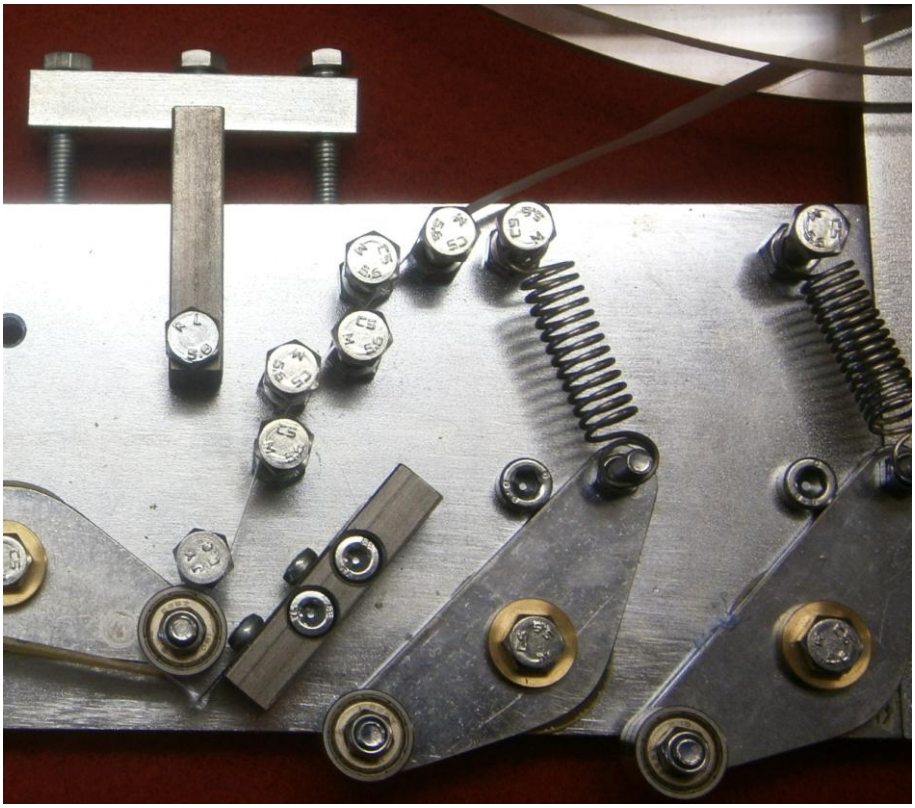
- This knife is available worldwide in paper od decoration shops in 5 pcs. packets. So you can get is easily.
- You can mount it without any modification into the Paperfox Tape dispensers.
- Very sharp knife, so it cuts even the strong tapes.
- Because of the simly shape of the knife it don't collects the glue and dirt between teeth.

Disadvantages:

- The cutted ends of the tape are not sraight they are "V" shaped.
- If the tape is not symmetric (assimmetric finger lift tapes) it can push the tape aside.
- This knife is drangerous, it can couse injuries.

Inserting a double sided tape into the Paperfox TD-1 tape dispenser

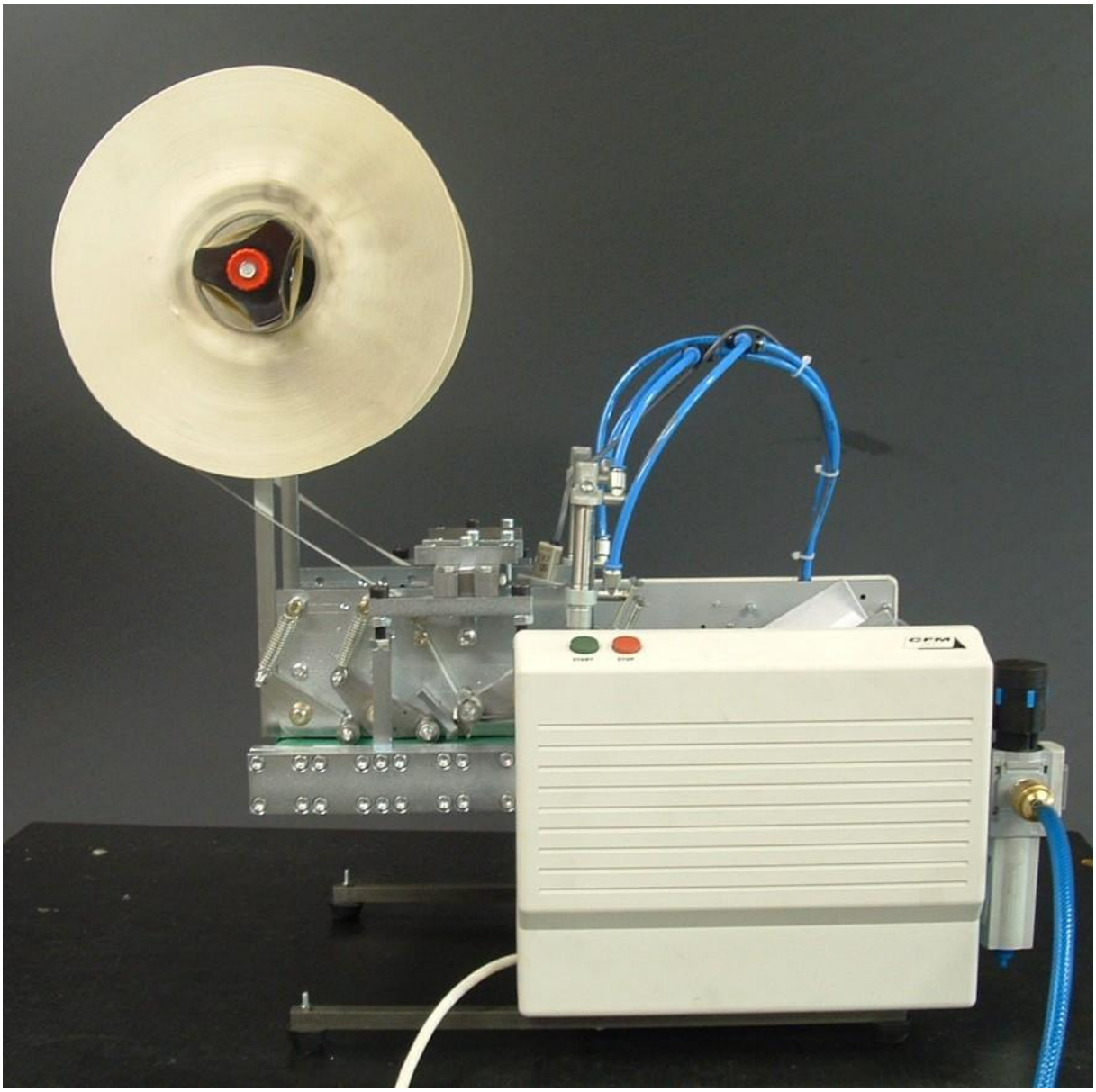
- Remove the transparent plexy cover of the tape holder,
- Place a roll of tape on the shaft
- Place back the cover and fix it with a screw.
- Feed the adhesive tape into the Paperfox TD-1 tape dispenser as you can see on the picture below



In the newest models we have inserted an additional screw to the TD-1 to ensure the proper guiding of the tape even if the paper don’t runs properly under the TD-1.

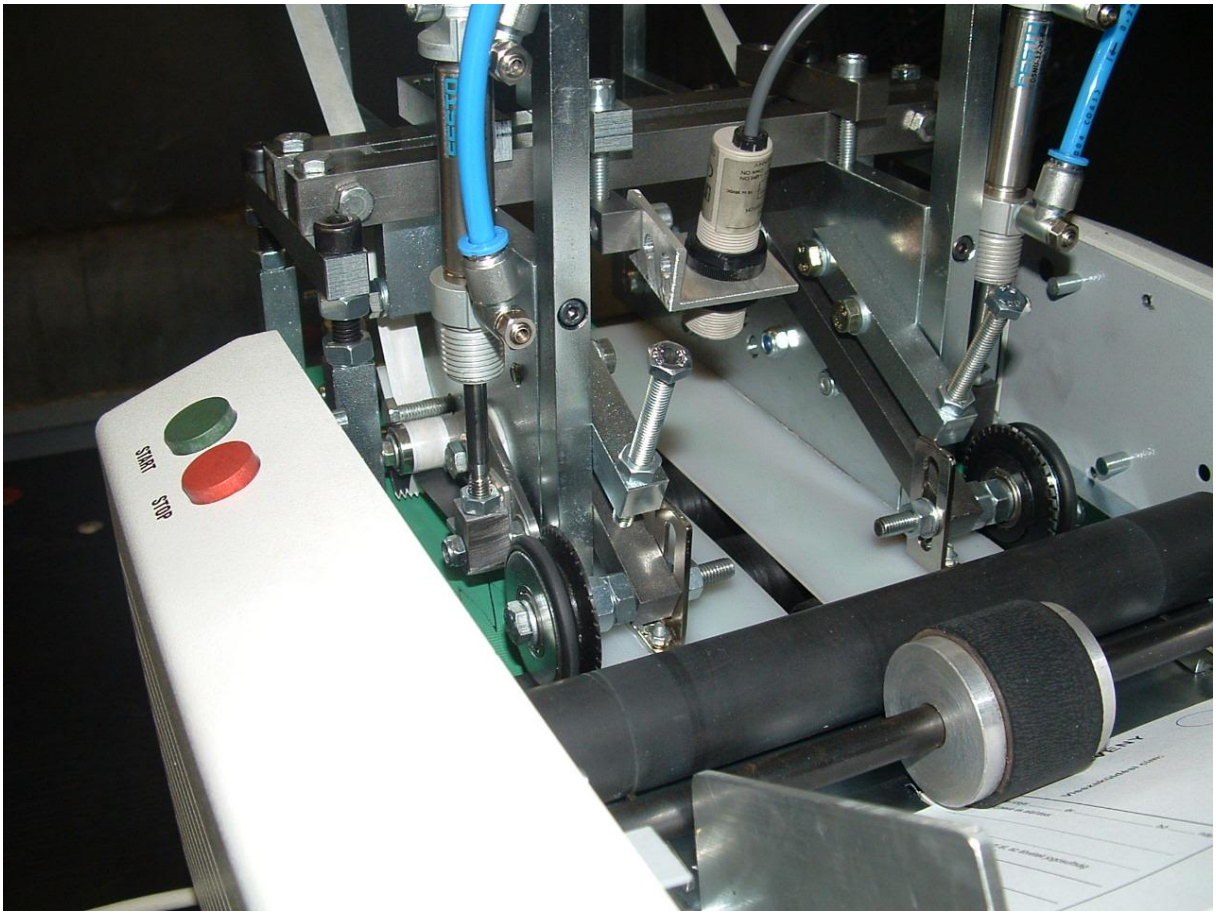
A sample application - Paperfox HH-1 return receipt making machine

Originally the Paperfox TD-1 tape dispenser was designed for usage in the Paperfox HH-1 return receipt making machine. This machine uses two Paperfox TD-1 tape dispensers and it is controlled with a simple optosensor.



The Paperfox TD-1 tape dispensers were fixed with the fixing brackets onto two parallel 15x15mm steel bar. A conveyor belt runs under the Paperfox TD-1 tape dispensers and it is supported with rollers under the rollers of the Paperfox TD-1 tape dispenser.

We used in this machine an air filer to save the machine from the dust in the air and a pressure regulator to secure the accuracy.



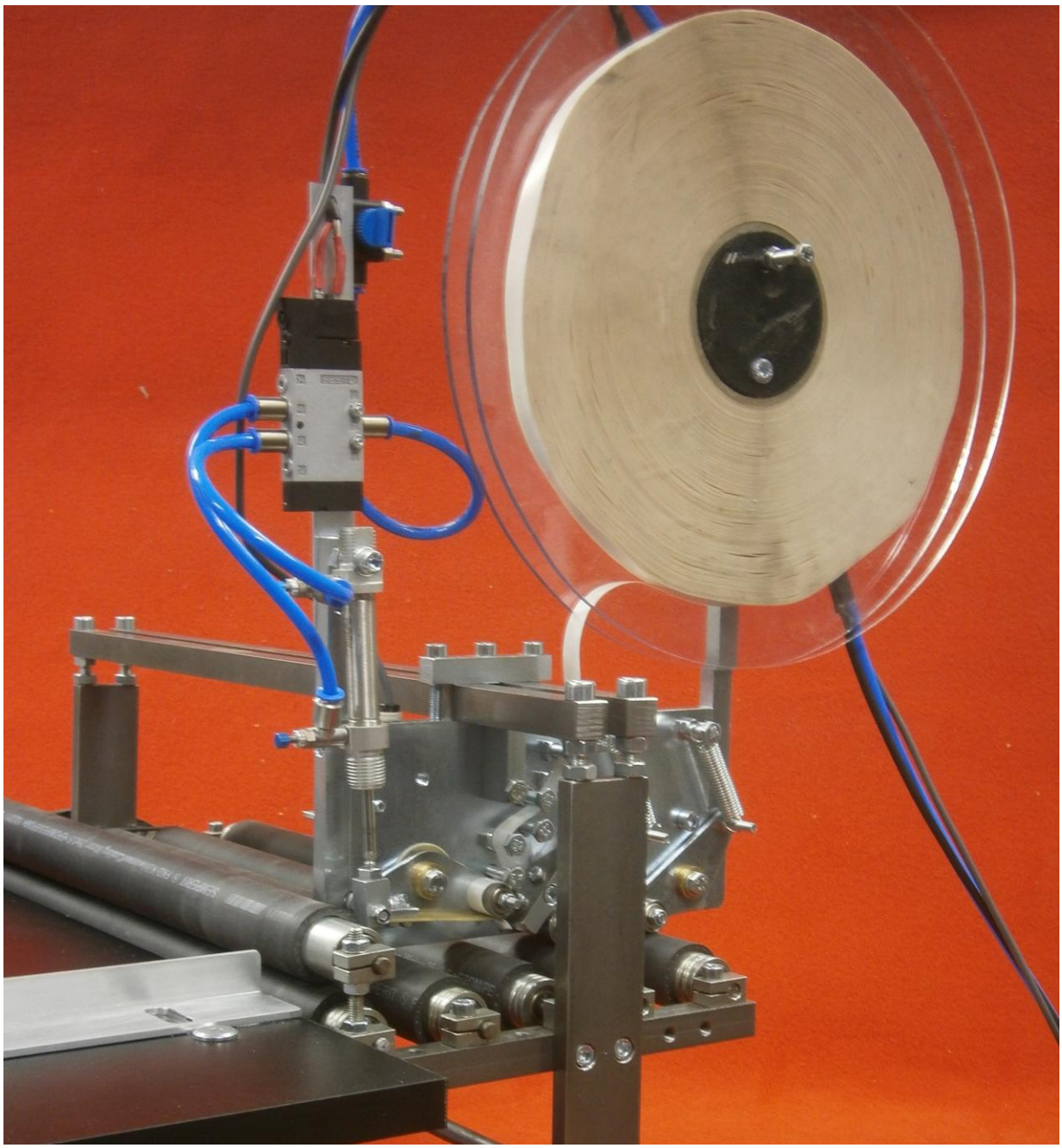
We used an optosensor to control the Paperfox TD-1 tape dispensers. When a sheet of paper arrives under the Paperfox TD-1 tape dispenser, the optosensor switches on the electric valve, and if the paper leaves the Paperfox TD-1 tape dispenser the switches off the valve. Then the Paperfox TD-1 tape dispenser cuts the tape.

This machine lays a tape from the beginning of the sheet to the end. With the pneumatic control valves the begin and end position of the tape can be regulated.

If you want to lay tape only on a part of the sheet, then you can use the control valves to set the position, or if this solution is not accurate enough then you can use two optosensors in two positions and activate the valve only when booth optosensor senses the paper.

With programmable logic controllers you can use more sophisticated solutions.

Sample Application – Tape dispensing with manual feed



The Paperfox HH-1 return receipt making machine is a very compact machine, so you can not see much on the photos. So we made a sample application on which you can see more details.

Notice that the TD-1 is fixed to two 15x15mm rectangular steel bars. The height of the device can controlled with M8 setting screws. In this application we have mounted the solenoid valve and the shut-off valve to the vertical bar above the pneumatic cylinder.

Weblinks about the usage of the Paperfox TD-1 tape dispenser

http://paperfox.eu/paperfox_td-1_tape_applying_head.html

http://paperfox.eu/paperfox_hh-1_return_receipt_making_machine.html