Collamat® 9100

Technical handbook

5999.555-01A

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Important warnings

Before installing and operating the Collamat® 9100 read the following safety instructions.

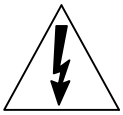
- **The Collamat® 9100 labeller is exclusively intended for labelling goods. It must exclusively be controlled and driven by a C9100 monitor.**
- **Install the Collamat® 9100 only by a trained specialist considering the national specific regulations of**
  - **prevention of accidents**
  - **mechanical stability**
  - **construction of electrical and mechanical systems**
  - **noise suppression**
- **Take notice of the technical data of the Collamat® 9100. Especially the environment conditions must be observed.**
- **Operate the Collamat® 9100 only by trained personnel.**
- **In case of non-authorized modifications the guarantee will become void.**
- **Before connecting non-standard products, ask your competent technical supporter.**

Danger notes

- **The safety symbols and danger advices on the Collamat® 9100 and in this manual must strictly be observed.**
- **Switch the monitor C9100 off before connecting or disconnecting the labeller to or from the monitor C9100.**
- **Only authorized personnel may open the monitor and the connector box.**
- **Disconnect the monitor from the mains before opening the connector box.**
- **Danger of pinching hair, jewelry, ties, clothes etc. into the traction unit !**
- **Danger of injury by cutting fingers in the paper zone !**
- **Danger of injury in the dancer roller zone of the Collamat® 9100 rewinder and unwinder !**
- **Danger of injury in the case of non-expert use of the Collamat® 9100 paper stock control !**
- **When operating the labeller, the operating personnel must keep to a safe location to prevent injury by the products being labeled.**

Symbol descriptions

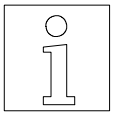
ATTENTION
Danger to damage the Collamat® 9100 or other system components, with a potential consequential danger of injuries.
DANGER
Imminent hazard for persons.



DANGER
Shock hazard due to high voltage at component.

DANGER
Hazard of contact injury due to high component temperature.

ATTENTION
ESD (ElectroStatic Discharge) warning. The p.c.boards or other components may only be touched in an electrostatically protected environment.



NOTE
Important or additional information to Collamat® 9100 or its documentation.

Introduction

General information

This Technical Manual describes design and function of the Collamat® 9100. In addition to the Operating Instructions, it contains the settings and notes necessary to get optimum use of the Collamat® 9100. The descriptions of each electrical or mechanical assembly also help for quick error analysis and trouble-shooting.

We recommend to replace p.c.boards always as complete units returning them to Collamat Stralfors AG or its representative for repair to be sure that the high quality standard of the Collamat® 9100 can also be guaranteed after any repair.

Special characteristics of the Collamat® 9100:

- resistant to wear, no clutch/brake-system
- rugged
- easy installation and operation due to modular design
- easy to operate due to up-to-date menu operated software
- quick change-over to other labelling tasks
- high performance
- high reliability and accuracy
- latest SMD-technology
- high precision 3-phase steppermotor

The Monitor

The power supply and the electronic control are built into a stable metal casing. All peripherals are connected to a connector box connected to the monitor back panel by one single D-sub-connector. A large heatsink allows to operate the monitor without additional fan. The control (monitor) can be mounted in various positions.

The monitor contains the following assemblies:

- Noise filter with voltage selector
  The noise filter keeps EMI outside to prevent any interference with the electronic control and also prevents EMI to be transmitted to the mains supply. The voltage selector allows versatile adaptation of the power supply to different mains voltages.
- Transformer
  Supplies the power for all components of the Collamat® 9100.
- Interface p.c.board
  The interface p.c.board connects the motor driver to the power supply and to the controller. The electronic part of the power supply is also installed on the interface p.c.board which shapes all input and output signals to and from the controller.

- Motor Driver
  The 3-phase motor driver is a standard assembly of a leading stepper motor. It energizes the stepper motor. The step rate is adjustable from 200 up to 1000 steps per revolution. Standard setting is 500 steps per revolution.
- Controller p.c.board
  The controller p.c.board comprises a Hitachi H8/532 microcontroller, EPROM with software, LC-display and short-stroke keyboard. The controller p.c.board controls all labelling sequences, the LC-display, the keyboard and the nonvolatile memory.
  The LC-display has four lines with 20 characters each and a background illumination.
  The controller p.c.board combines front panel and controller in one component.
-

The software

The controlling software of the Collamat® 9100 is stored in the EPROM (firmware) and has the following features:

- Modern user guidance
- 6 digits preselection and batch counter
- Adjustable label length dependent suppression of label scanner signal to detect transparent or preprinted labels
- Adjustable goods speed and length dependent scanner signal suppression after labelling
- Programmable adjustment of labelling position on the goods
- Programmable adjustment of predispensing
- Multiple labelling with electronic setting of gap between labels
- Automatic adaptation of dispensing speed by measuring the goods speed by light barrier or incremental encoder
- Storage of 20 labelling programs
- Memory protection by access password
- Two user levels
- Monitoring of label stock and out-of-label, end of paper web, open roller in traction unit, motor driver OK-signal
- Nonstop mode with two Collamat® 9100 systems
- Multilingual user display
- Automatic label scanner adjustment
- Full operability during labelling
- All peripherals program-controlled - no potentiometers and switches necessary

The Dispenser

The traction unit as well as the other peripherals are mounted on a module rail. All parts are surface treated to protect from corrosion. The special coating of the traction unit roller affords permanent torque transmission to the paper web without slip. The force of the paper web brake is adjustable. The traction roller can be easily turned by hand during Power OFF for easy threading and installing the paper web.

The Collamat® 9100 Labeller

The Collamat® 9100 must be installed by trained personnel considering the following national specific regulations:

- Prevention of accidents
- Noise suppression
- Mechanical stability
- Construction of electrical and mechanical systems

Prevention of accidents

When installing and connecting the C9100 monitor and labeller pay attention that the signal and power cables cannot become stumble obstacles. Lay the cables according to the national safety regulations. Signal cables must not be placed in close proximity to power cables.

Noise suppression

For radio interference suppression the C9100 labeller and monitor are shielded according to the CE directives. Only cables approved by Guhl & Scheibler are allowed to be used to connect the monitor to labeller and mains. Additional peripherals have to be connected only to the mains socket of the monitor. These devices must be approved by Guhl & Scheibler.

Mechanical stability

If the Collamat® 9100 is used on a movable stand, this stand must be capable to be tilted by 10° in each direction. See Figure 1:

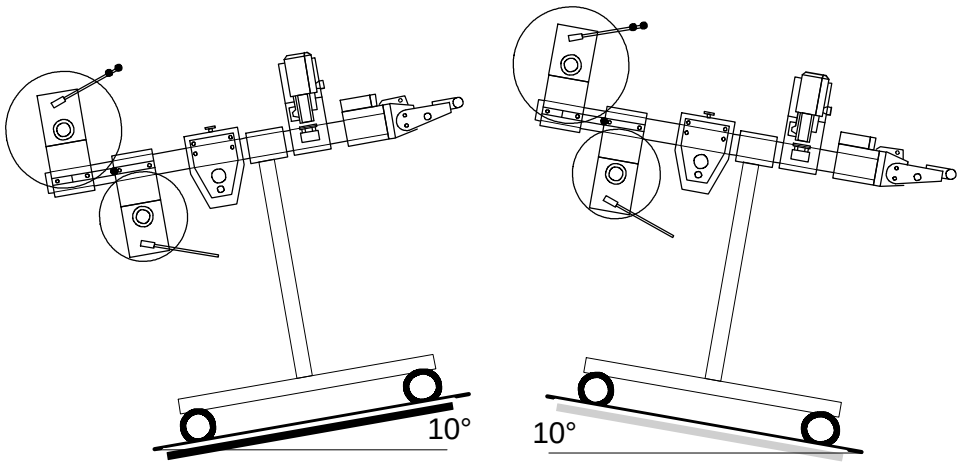


Figure 1: Mechanical stability of C9100 labeller stand

Assemblies

In the following the various assemblies, their adjustment and maintenance are described. First an overall view of the labeller.

The assemblies are mounted on a module rail. Figure 2 shows these assemblies with their designations on the module rail:

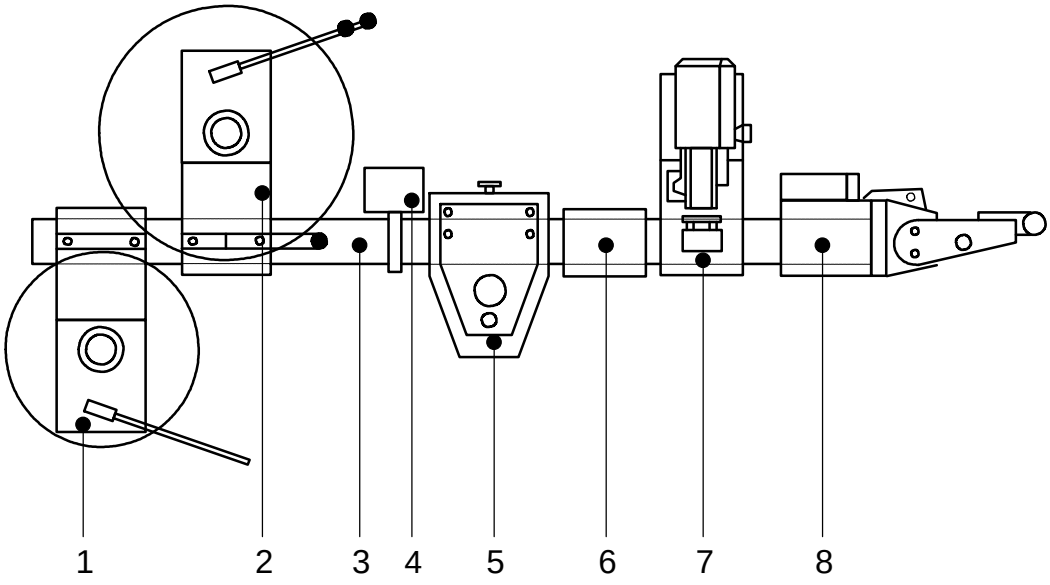


Figure 2: Assemblies

Legend for assemblies

1. Rewinder
2. Unwinder
3. Modular rail
4. Connector box
5. Traction unit
6. Support
7. Flat printing unit (optional)
8. Adapter (optional with magnet)

Installation examples

Due to the modular design of the Collamat® 9100 there is nearly no limit in variations of the installation. But for best results in labelling, the following figures show installation examples of constructions which do their work successfully:

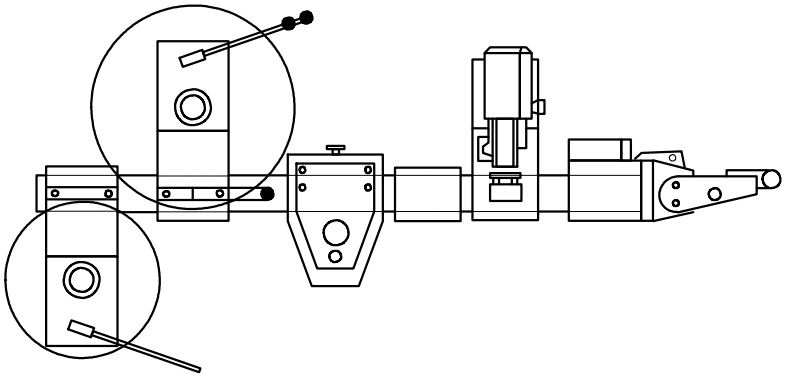


Figure 3: 1st example

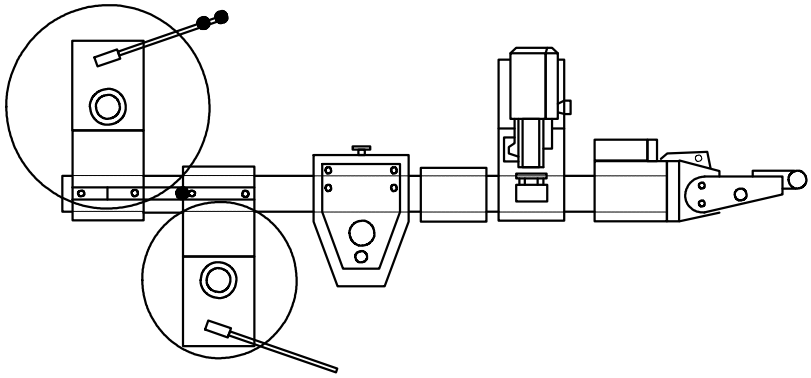


Figure 4: 2nd example

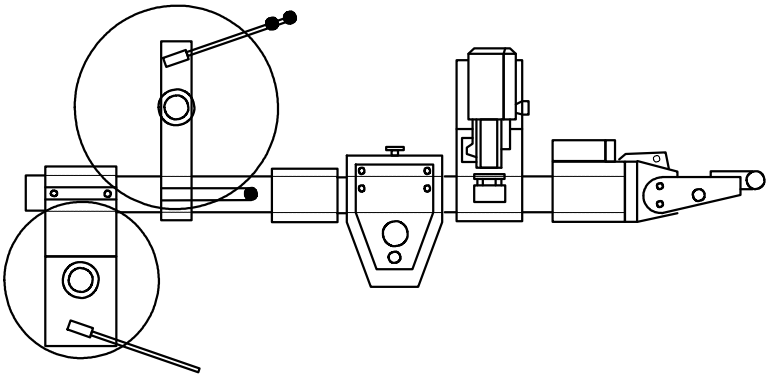


Figure 5: 3rd example

The threading of the paper web, the adjustment of the paper brake and adapter are described in the Operating Instructions of the Collamat® 9100 labeller.

Traction unit

General information

The traction unit can be used both for right- and left-hand versions of the labeller.

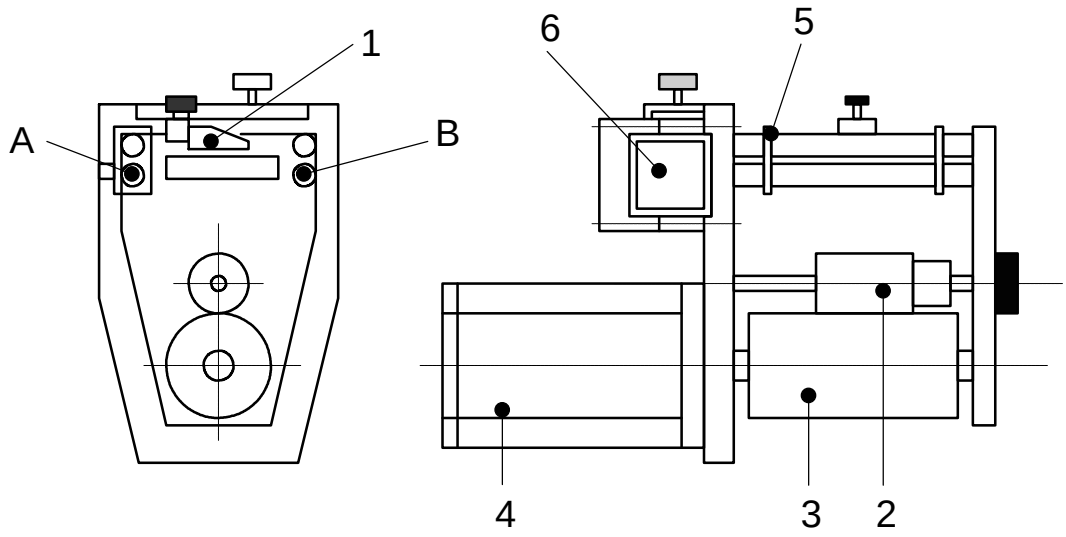


Figure 6: Traction unit

Legend for traction unit

1. Paper break
2. Pinch roller
3. Traction roller
4. Stepper motor
5. Paper web guide
6. Module rail

The direction of rotation of the traction roller is set by programming the monitor.

More information see Operating Instructions MONITOR C8600/C9100, chapter CONFIGURATION, menu DIRECTION OF ROTATION.

Install the **paper web guides** in position **A** for **right-hand** version, in position **B** for **left-hand** version.

Pinchroller

Direction of tension force

The direction of the tension force of the left- and right-hand version are opposite to each other. If the direction of the tension force is not correct, hits of the rewinder to the paper web may open the traction unit.

Procedure

Slacken locking screw **(2)**, remove, turn, reengage and screw down knurled washer (**1**). Letter 'L' or 'R' defines left- or right-hand version, respectively. Standard version is **'R'**.

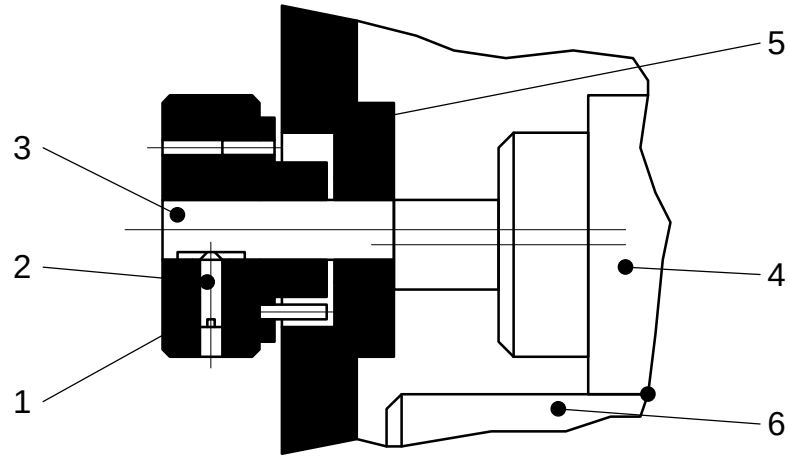


Figure 7: Direction of the tension force

Legend

1. Knurled disk
2. Locking screw
3. Eccentric pinch roller shaft
4. Pinch roller
5. Adjustment flange
6. Traction roller

Exchange of pinch roller

The pinch roller is a part subject to wear. Its wearing time is stress-dependent. It is good practice to select a paper web wider than the pinch roller to avoid wear when the pinch roller runs directly on the traction roller.

Procedure

Disassemble and remove front panel **(1)** together with eccentric pinch roller shaft (**2**). Do not slacken fixing screw **(3)**. Slacken locking screw **(4)** and pull off pinch roller **(5)**. Attach new pinch roller **(5)**, tighten locking screw **(4),** slide in and reassemble front panel **(1)**. Then check parallelism with pinch roller.

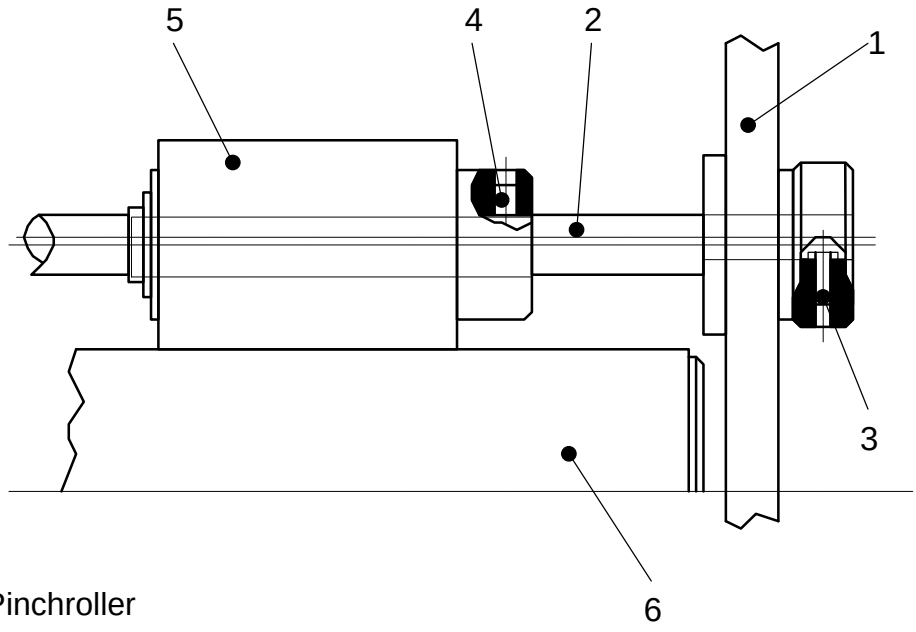


Figure 8: Pinchroller

Legend

1. Front panel
2. Eccentric pinch roller shaft
3. Fixing screw of knurled knob
4. Locking screw with hexagon socket
5. Pinch roller
6. Traction roller

The parallelism adjustment of the pinch roller is described in the following chapter.

Parallel adjustment of pinch roller

The parallelism of the pinch roller with the traction roller is decisive for the stability of the paper transport. If the rollers are not in parallel the paper web will be transported obliquely through the traction unit resulting in a lateral force on the paper web which forces the web to shift on the dispensing edge and the labels to be dispensed obliquely.

Procedure

Release and shift pinch roller **(2)** to the left, slacken screw **(7)** on right adjusting flange **(6),** turn adjustment flange **(6)** by means of 3 mm mandrel **(9)** appropriately.
Retighten screw **(7)** and shift pinch roller **(2)** to the right. Slacken clamping screw **(7)** on left adjusting flange **(5)** and adjust it with the same pressure as the right adjusting flange **(6)**. Tighten screw **(7),** reposition and lock pinch roller **(2)** in center position of traction roller (**8**).

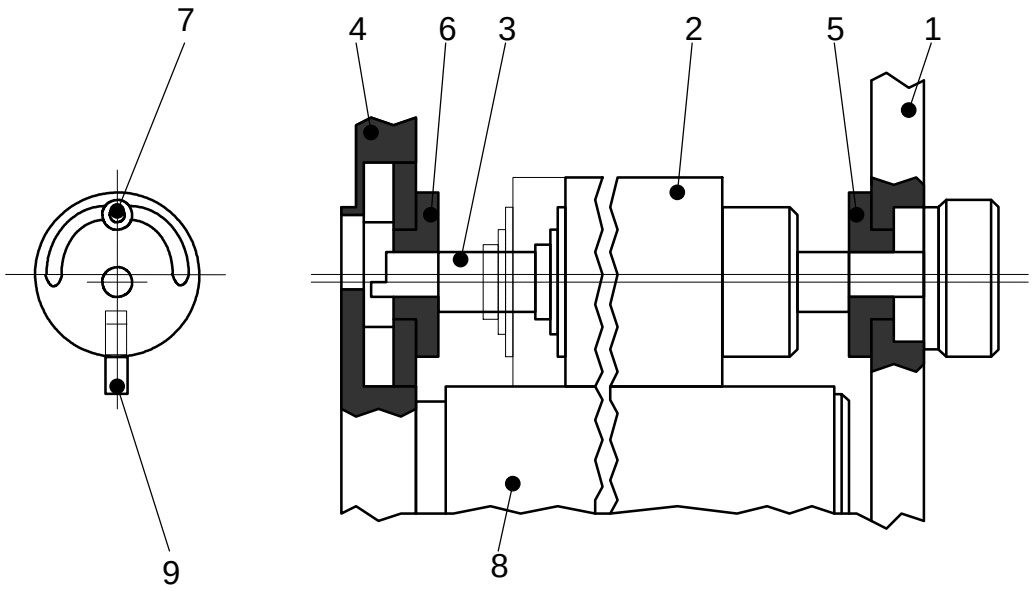


Figure 9: Parallelism of pinch roller with traction roller

Legend

1. Front panel
2. Pinch roller
3. Eccentric pinch roller shaft
4. Support plate
5. Adjusting flange, left
6. Adjusting flange, right
7. Clamping screw
8. Traction roller
9. Mandrel

In new traction units the parallelism of the pinch roller to the traction roller is already correctly adjusted by Guhl & Scheibler.

Traction roller

Replacement of traction roller and damping disk

Procedure

Remove front panel **(1)** together with pinch roller **(9)**. Unscrew stud bolt **(7)** and remove traction roller **(3)** from stepper motor-shaft **(5)**. Remove securing ring **(8)**. Remove traction roller **(3)** from roller shaft **(4)** and replace the damping disk **(6)**.
Reassemble the traction unit in reverse order. Tighten stud bolt only after assembly of front panel.

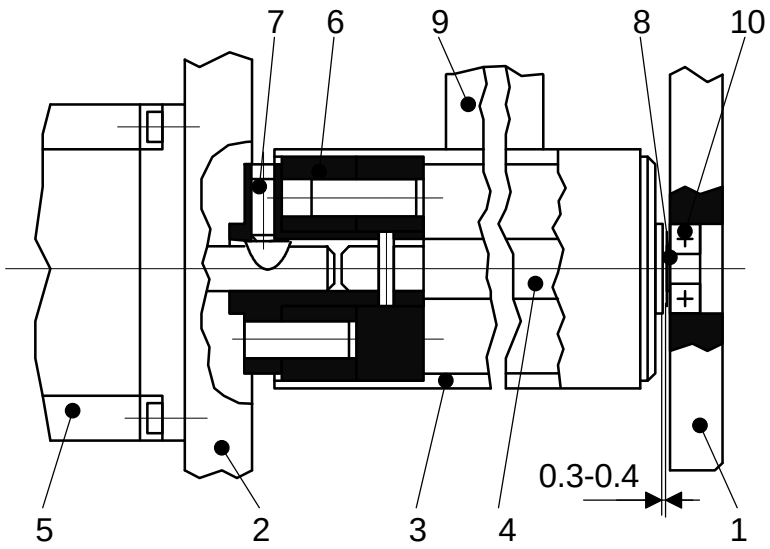


Figure 10: Replacement of traction roller

Legend

1. Front panel
2. Suport plate
3. Traction roller
4. Roller shaft
5. Stepper motor
6. Damping disk
7. Stud bolt
8. Securing ring
9. Pinch roller
10. Ball bearing

It is important that the traction roller is adjusted with an axial play of 0.3 - 0.4 mm between ball bearing (10) and collar of roller shaft (4).

Rewinder and unwinder

General information

The motor driven rewinder and unwinder (= winders) are intended to automatically rewind and unwind the backing paper web. Each winder is supplied with a DC voltage of 18.....30 Volt. Any deviation of the dancer roller starts the motor automatically. Depending on the dancer roller position the electronic system controls the motor current and thus the rewinding speed. At the end of the backing paper web or if it tears, the motor will stop automatically after a few rotations in order to avoid an uncontrollable rotation of the motor. The winding force and the dancer roller action direction can be adjusted with jumpers on the p.c.board of the winder. The direction of rotation can be changed from outside by a switch. Rewinder and unwinder distinguish themselves only by dancer roller and winding mandrel.

Construction

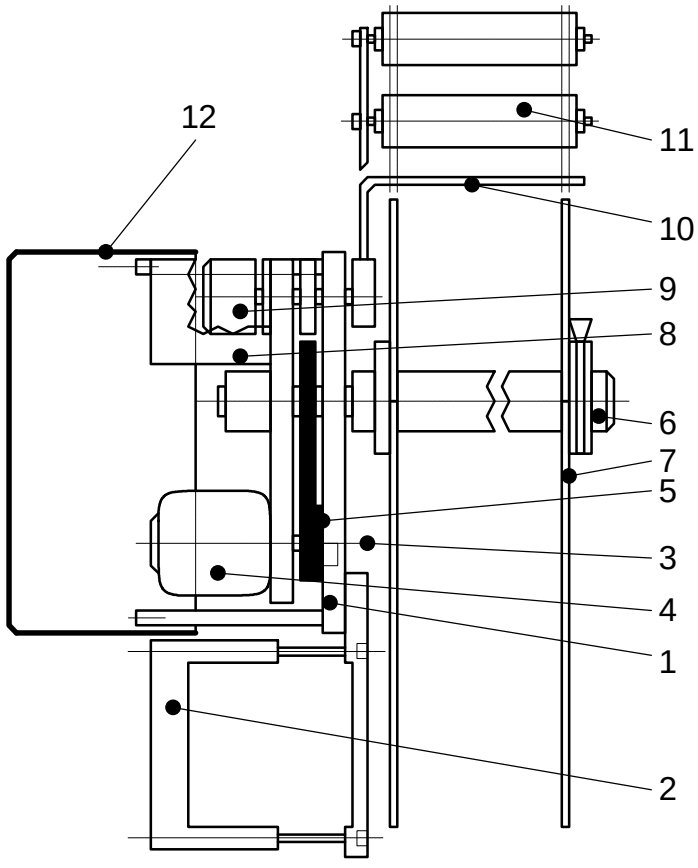


Figure 11: Winder

Legend

1. Support plate
2. Clamping piece
3. Rotation direction changeover switch
4. DC-motor
5. Brake
6. Winding mandrel
7. Lateral Disk
8. Winder p.c.board
9. Knurled knob
10. Rewinder dancer roller
11. Unwinder dancer roller
12. Cover

Support plate

The assembly is mounted on a sturdy aluminum support plate **(1)** guaranteeing a solid fixing of the winder on the module rail. A cover **(12)** with a rubber gasket protects the electronic system and mechanical parts from dirt and humidity.

Drive

The winding mandrel **(6)** is driven by a current controlled DC-motor **(4)** with belt transmission. To avoid an after-running of the winder, an electronic brake **(5)** is energized as soon as the motor stops. Therefore a definite start-stop function is guaranteed.

Dancer roller

The dancer roller has two functions: firstly, it represents a paper buffer to quickly supply or take up the paper web, secondly, to signalize its position via an electro-optical scanner to the electronic control. Due to the adjustable spring force, the paper web tension can be kept constant (adjustment of the spring force, see Collamat® 9100 Operating Instructions). The cooperation of dancer roller and electronic control guarantees constant paper tension for both the unwinder and rewinder. Two different dancer rollers are available for rewinder and unwinder.

Winding mandrel

Rewinder and unwinder distinguish themselves also by the winding mandrel. The mandrel of the rewinder is fitted with a clamping bow utilized for a secure and quick detachable connection between paper and mandrel.
The unwinder mandrel is additionally equipped with a clamping core for use on paper rolls with 3" core diameter. The clamping core serves for a reliable transmission of the torque to the paper roll. Clamping cores with other diameters are also available.

Electronic control unit of winder

This electronic control unit controls the complete unwinding/rewinding process powering the motor with current as a function of the dancer roller position. The position is optically measured and electrically decoded. The brake is automatically energized when the motor stands still.

Adjustments

In the following description of the winder adjustments pay attention to the following items:

Dancer roller:

- Spring force
- Direction of pulling force
- Direction of action

Motor:

- Direction of rotation
- Pull force (torque)

Spring tension of dancer roller

Set the spring tension so that the dancer roller can be moved back by the tension force of the backing paper web. For adjustment push and turn the knurled knob **(9)** of the dancer roller shaft with open winder housing to obtain the necessary force. Lock knob in nearest snap-in hole.
Attention there are two different types of springs namely **right-hand** and **left-hand spring** differing by the direction of rotation and force transmission direction. Choosing the wrong spring type may cause faults because the spring is not subject to tension but to pressure, so it might jump out of the snap-in hole. This can generally be noticed after a few dancer roller deviations. For further information see Collamat® 9100 Operating Instructions.

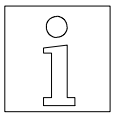
Pulling direction of dancer roller

Concerning the pull direction two different types of winders are to be distinguished. The rewinder has to be set so that the paper is always under tension whilst the unwinder must provide for a full loop. Furthermore, depending on the available space, both winders may be mounted in a different way. In principle, the dancer roller has to be adjusted so that the paper web can never be stretched. This applies both for empty and fully wound mandrels. Furthermore, the direction of action of the rewinder motor has to be opposed to the direction of the spring tension direction allowing a more exact positioning of the dancer roller with empty winder mandrel. Set the direction of unwinder motor rotation, depending on inside or outside wound label roll.

Direction of dancer roller action

The direction of dancer roller action is adjusted on the p.c.board with jumper J1. Normally, the jumper is already correctly set in factory, but there is a difference between rewinder and unwinder.

- The rewinder motor must start when the dancer roller is released
- The unwinder motor must stop when the dancer roller is free



Attention:
If the dancer roller is freely swung out , the free-wheeling limitation becomes active and stops the motor after eight revolutions. Therefore either stop the winder or do not let the dancer roller swing completely back.

Direction of motor rotation

Select the direction of motor rotation with change-over switch **(3)** (Fig.11, page 15) located on the support plate **(1)** behind the lateral disk **(7)**.

Motor torque

The motor torque depends on the kind of winder.

- The acceleration of the rewinder must not be high but its pull force acting on the paper web must be constant.
- The acceleration of the unwinder must be high and its response time low, but it has to stop immediately after unwinding.

Adjust the pull force torque on the electronic control unit with jumper J2.

Arrangement and mechanical adjustment of rewinder

The rewinder is placed behind the traction unit on the module rail.

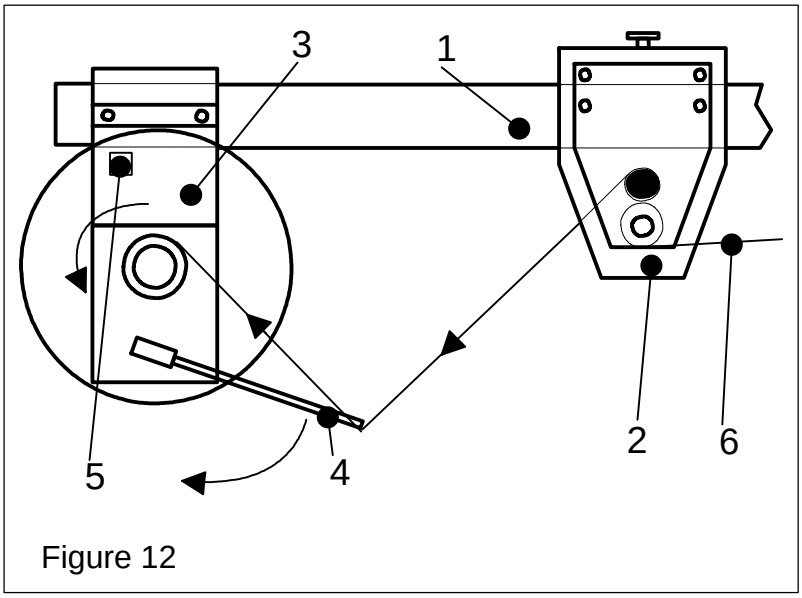


Figure 12

Legend

1. Module rail
2. Traction unit
3. Rewinder
4. Dancer roller
5. Rotation direction change-over switch
6. Paper web

The winder is mounted 'under' the module rail **(1)**. The dancer roller **(4)** pulls the paper web downwards and the motor turns anticlockwise. Adjust the dancer roller with the spring so that the force in top position does not become too high. (See Collamat® 9100 Operating Instructions.) The dancer roller must not hit the paper web when labelling with high speed. The direction of action of the dancer roller **(4)** is the same as that of the spring force, i.e. when the dancer roller moves downwards, the motor has to start. The direction of motor rotation is adjusted with the change-over switch **(5)** behind the lateral disk.

For LEFT-HAND versions the same instructions apply, however inverted !

ATTENTION:
Adjust dancer roller into top position so that the paper web is never completely stretched. Otherwise hits on the paper web may open the traction unit. Best results are obtained when the angle between winder mandrel and traction unit is an obtuse one. See also Figure 12. A straight / stretched paper web will cause problems !

Figure 13 shows a second version to mount the rewinder. The rewinder is mounted here 'above' the module rail. Use this kind of mounting only if that according to Figure 12 is not possible for lack of space reasons.

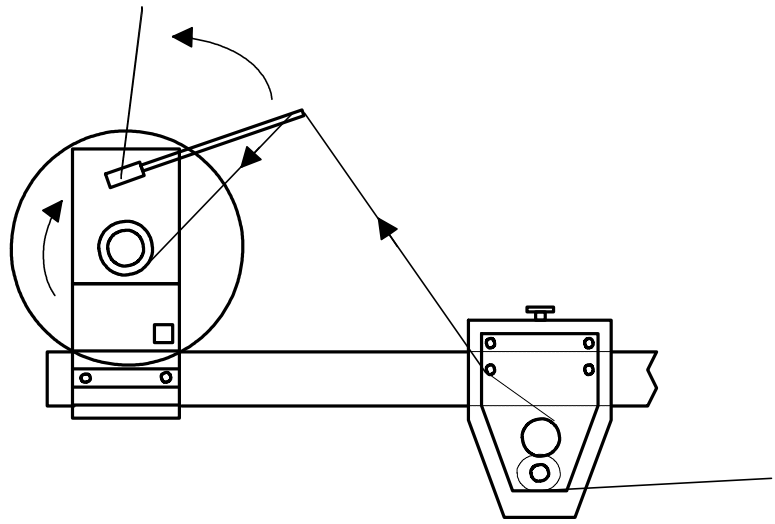


Figure 13

Adjust the spring tension of the dancer roller so that it can carry the paper web up to the upper stop. The dancer roller must move automatically completely upwards (left stop) when there is no paper. The motor turns clockwise. Be careful that the paper is never fully stretched.

For LEFT-HAND versions the same instructions apply, however inverted !
Right stop = clockwise

Installation position and mechanical adjustment of unwinder

The unwinder is installed on the module rail as shown in Figure 14:

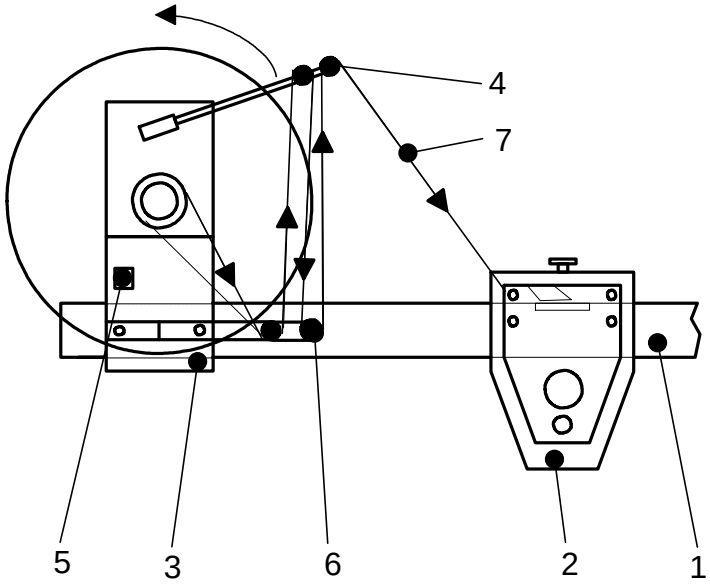


Figure 14

Legend

1. Module rail
2. Traction unit
3. Unwinder
4. Dancer
5. Rotation direction change-over switch
6. Deflection roller
7. Paper web

The unwinder is mounted 'above' the module rail **(1)**. The dancer roller **(4)** pulls the paper web upwards. The motor starts when the dancer roller moves downwards. The direction of rotation of the unwinder is adjusted by means of change-over switch **(5)**. The restoring force of the dancer roller (adjustment according to Collamat® 9100 Operating Instructions) should be adjusted as low as possible. During operation, however, the dancer roller must never touch the lower stop. Otherwise labelling will be inaccurate due to hits on the paper web.

For lateral labelling (horizontal mounting position) special paper guides are available. These guides prevent the paper web from falling down from the dancer roller.

Electrical settings

The winder p.c. board GS125 comprises two jumpers **J1** and **J2** to set the motor torque and the direction of dancer roller action. The direction of dancer roller action is set by **J1**, the motor torque by **J2.** Figure 15 shows the view of the p.c.board from the component side:

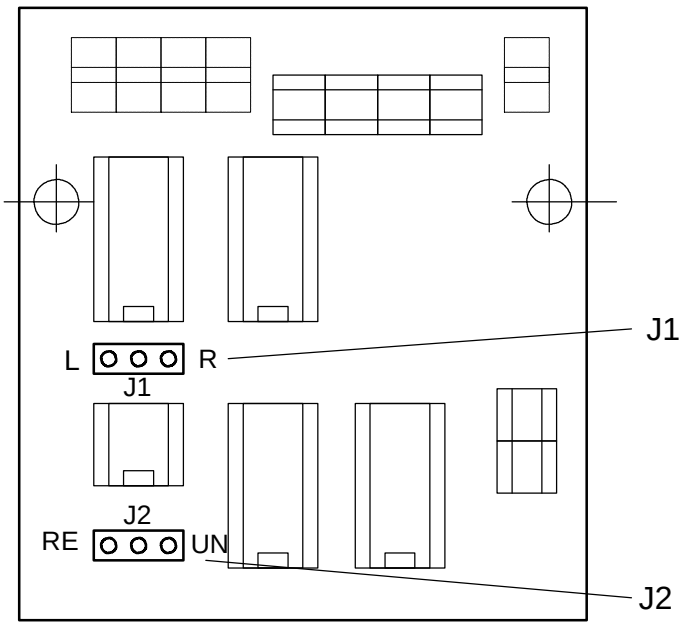


Figure 15: Winder p.c. board

Dancer roller seen from the front side:

Right stop, all sensors covered

Left stop, all sensors uncovered

Direction of dancer roller action

The position of the dancer roller is optically measured. Four light barriers (LS1... LS4) are used as sensors. They are mounted one behind the other so that in function of the dancer roller position one or more light barriers are interrupted.
The output signals of these four light barriers are added to a sum signal which controls the winder motor. Jumper **J1** allows to invert the direction of action of the dancer roller to adapt it to left-hand or right-hand type winders.

If the motor should turn at the **right stop** of the dancer roller, jumper **J1** has to be set to the **'R'** position. See also Figure 16.

For **left stop** version, set jumper **J1** to position **'L'**. See also Figure 17.

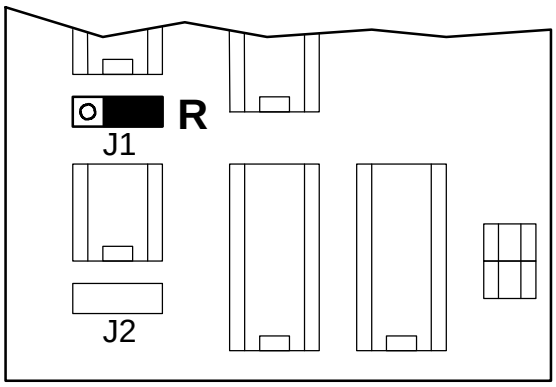


Figure 16

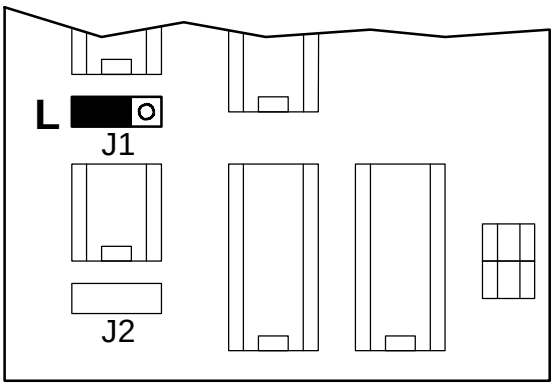


Figure 17

Motor torque

The motor torque is adjusted with jumper **J2**. The motor torque of the rewinder is lower than that of the unwinder. At the rewinder there must always act some pulling force on the paper web.
J2 is plugged as shown in Figures 18 and 19:

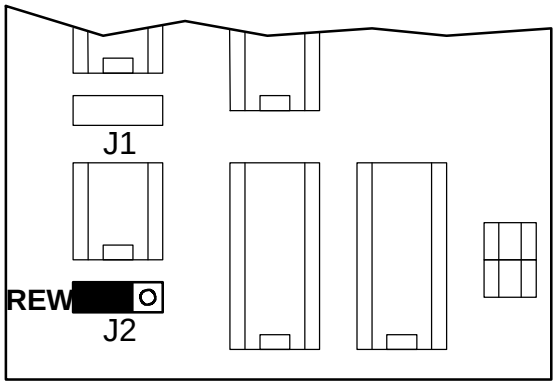


Figure 18

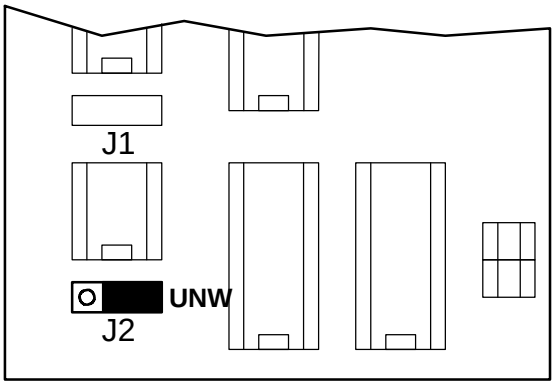


Figure 19

Midi-unwinder

General information

If the Collamat® 9100 is not pushed to its maximum capacity the non-driven midi-unwinder may be used. As a simple rule the maximum labelling speed should not exceed 2/3 of the maximum labelling speed as defined in the data sheet.

Installation position and mechanical adjustment

Install the midi-unwinder as shown in Figure 20:

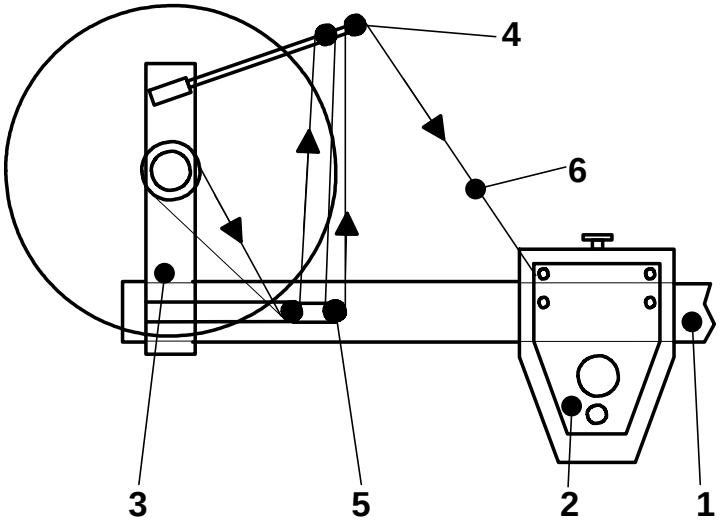


Figure 20: Midi-unwinder

Legend

1. Module rail
2. Traction unit
3. Midi-Unwinder
4. Dancer roller
5. Deflection roller
6. Paper web

The midi-winder is mounted 'above' the module rail. The dancer roller pulls the paper web 'upwards' and its force is adjusted with the spring so that it becomes not too high at the lower stop (see Collamat® 9100 Operating Instructions). When the dancer roller is moved downwards, the brake must release itself so that the traction force of the paper web can turn the mandrel together with the label roll. When the dancer roller moves upwards the label roll stops.

The lower stop must not be touched by the dancer roller in its lower position. When the dancer roller spring force is not correctly adjusted, the traction motor may block because of hits on the paper web.

Flap adapter

The flap adapter is used to dispense the labels. It peels the labels from the paperweb when the paperweb is pulled around the peeling edge. Figure 21 shows an overall view of the flap adapter:

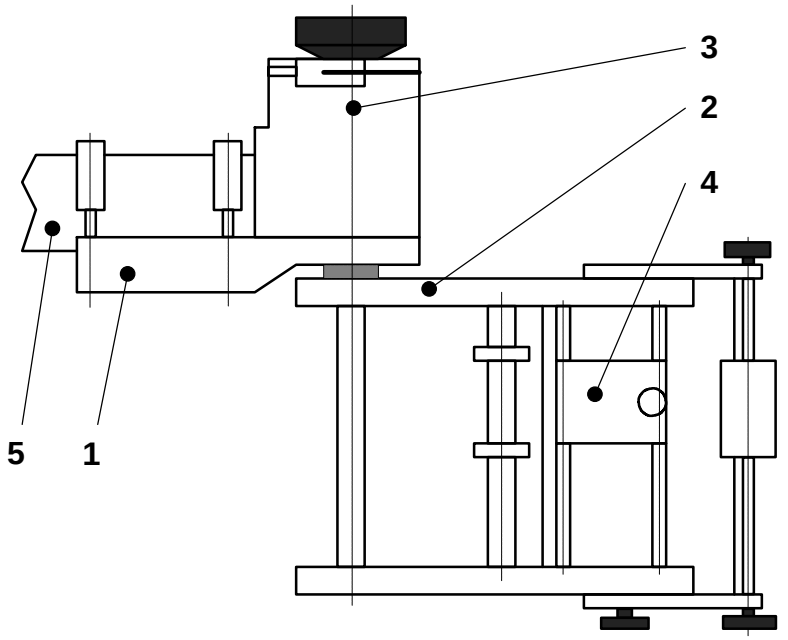


Figure 21: Flap adapter

Legend

1. Support
2. Flap
3. Rotary element
4. Label scanner
5. Module rail

The flap adapter comprises several assemblies: support **(1)** to mount the adapter to the module rail, flap **(2)** for label dispensing and rotary element **(3)** for lifting.

There are two different flap adapters:

- Springloaded flap adapter
- Fixed flap adapter

Support

The flap adapter is mounted on a sturdy aluminum plate. This plate provides for a stable fixing of the adapter on the module rail and protects the mechanical parts from dirt and humidity.

Flap

The whole flap is made of corrosion resistant material. The label scanner is placed on two guiding shafts. The optical label scanner operates with reflecting IR-light. Reliable operation of the label scanner is only guaranteed if the mirror is not scratched or dirty. The mechanical label scanner uses an exchangeable stainless strip.

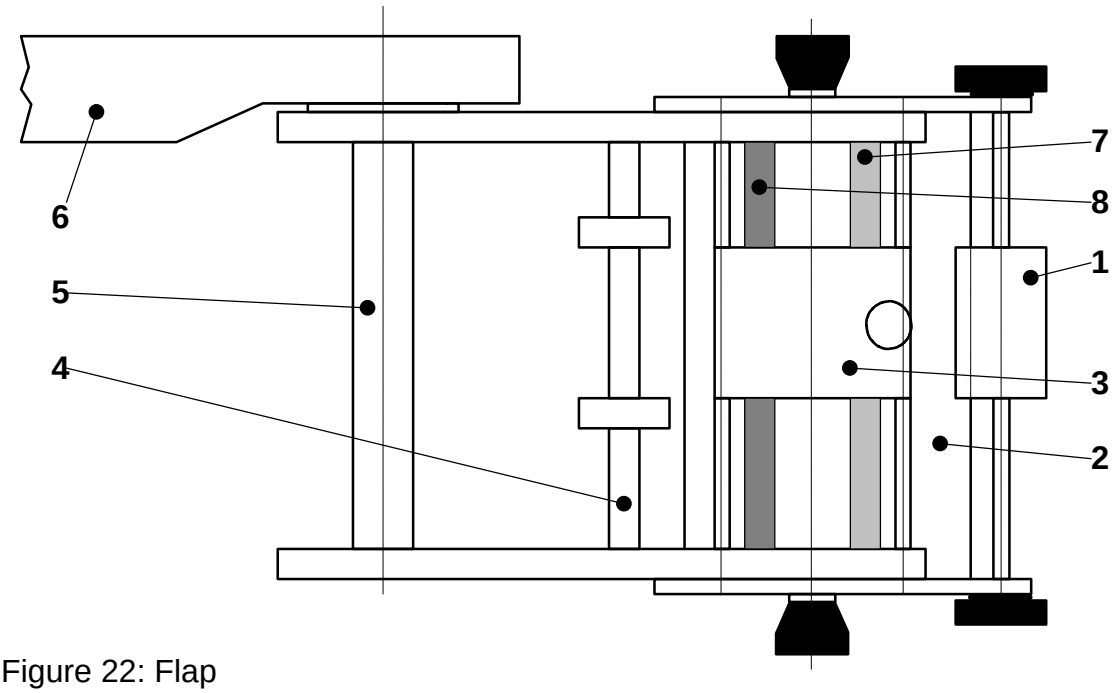


Figure 22: Flap

Legend

1. Pressing roll
2. Peeling edge
3. Label scanner (mechanical or optical)
4. Guiding shaft
5. Deflection roller
6. Support plate
7. Mechanical scanner strip
8. Mirror

Exchange of the mirror

Remove the **six cylindrical head screws (7)** under the dispensing plate. Remove and exchange mirror **(3)**. Reassemble all components in reverse order.

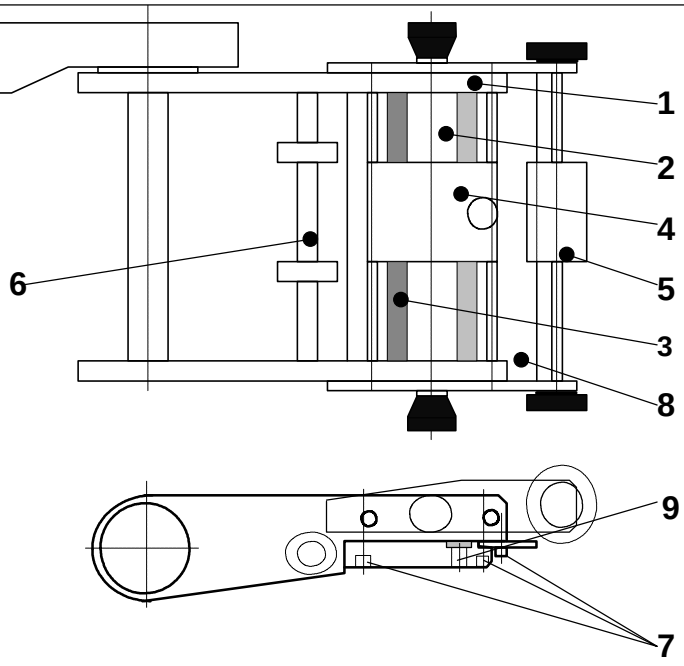


Figure 23

Legend

1. Adapter lever plate
2. Dispensing plate
3. Mirror
4. Optical label scanner
5. Pressing roll
6. Guiding shaft
7. Cylindrical head screws
8. Peeling edge
9. Stud screw

Exchange of mechanical scanner strip

Open the **stud screw (9)** under the dispensing plate and pull out the strip laterally. Shift in the new strip and fix it with the stud screw.

Exchange of peeling edge

Release the **two front cylindrical head screws (7)** under the adapter and remove the peeling edge. Reassemble the new peeling edge in reverse order.

When fixing the peeling edge (8) under the dispensing plate (2), the peeling edge must fit exactly into the stage of the dispensing plate.

Roller dispenser edge (option)

For wide paper webs and high labelling speed we recommend to mount a roller dispenser edge to reduce the torque of the traction unit motor.

To fix the roller dispenser edge, first remove the fixed dispenser edge cylindrical head screw **(5)** and replace it by the roller dispenser edge. Then assemble both roller supports **(2)** together with the peeling roller **(3)** with fixing screw **(1)** to the adapter lever. The peeling roller should turn smoothly.

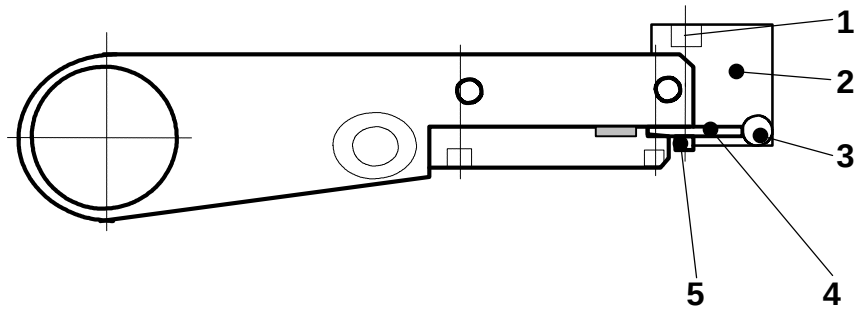


Figure 24: Roller peeling edge

Legend

1. Fixing screw
2. Roller support
3. Peeling roller
4. Dispenser edge
5. Cylindrical head screw

Optical label scanner

The optical label scanner is made of corrosion resistant material. It can be shifted or removed by releasing the knurled screw **(3)**. By screwing in or out the ball catcher **(7)** adjust the scanner catching force. Adjust the ball scatcher so that it exactly fits to the guiding also with released knurled screw.

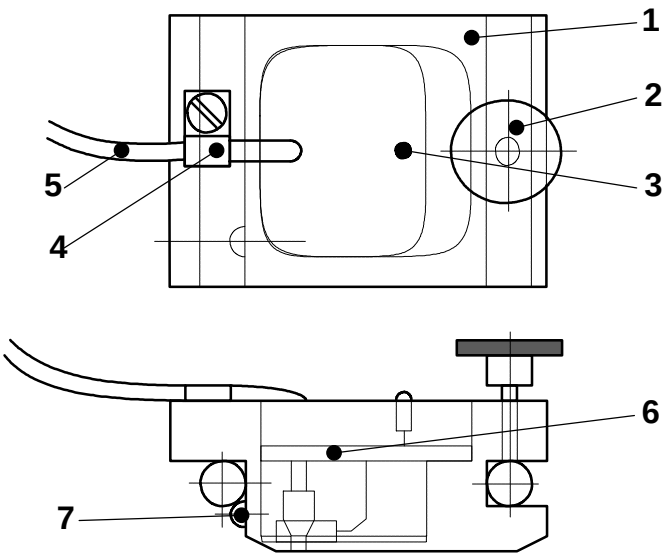


Figure 25: Optical label scanner

Legend

1. Case
2. Knurling screw
3. LED
4. Cable clip
5. Cable
6. Sensor p.c.board
7. Ball catcher

Replacement of the sensor p.c.board

Open scanner by removing the cover at cable clip **(4)**. Disassemble sensor p.c.board **(6)** by removing its fixing screws. Reassemble in reverse order. When assembling do not bend or damage the IR emitting diodes and the IR-sensor.

THE C9100 MONITOR

Before opening the monitor unplug the mains plug. Charged capacitors inside the monitor may lead to shock hazard. After unplugging wait at least 10 seconds before opening the monitor.

Construction

The electronics control of the C9100 labeller is built in a stable, elegant steel cabinet containing no adjustable controls. All settings are done via keyboard. By removing the two screws from the back panel the cover can be separated from the housing bottom.

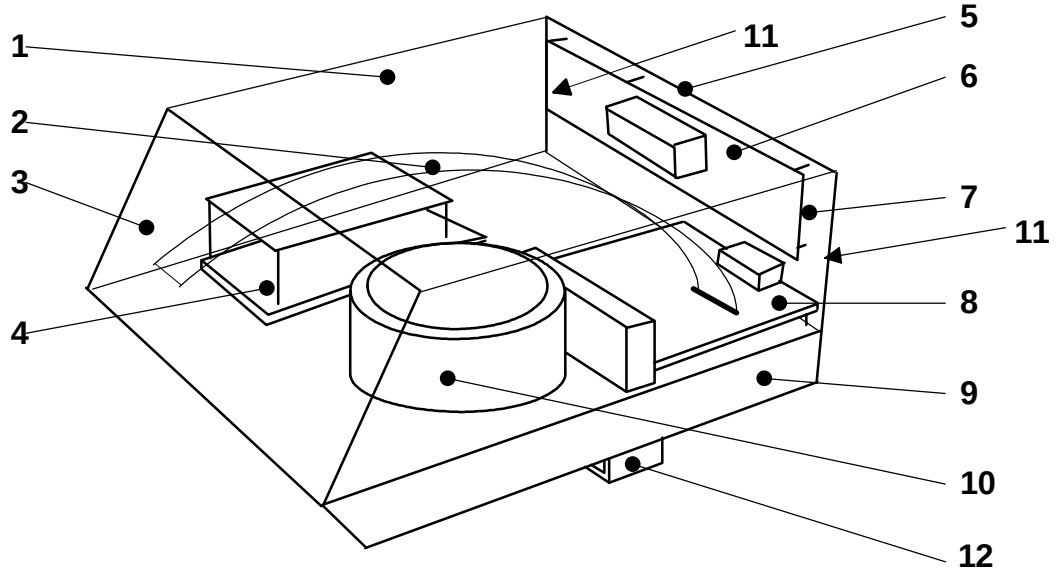


Figure 26: Monitor

Legend

1. Cover
2. Flat Cable
3. Control panel / controller p.c.board
4. Motor driver
5. Back panel
6. Mains filter p.c.board
7. Mains switch
8. Interface p.c.board
9. Heatsink
10. Transformer
11. Locking screws
12. Mounting clamp

Cover **(1)** carries control panel **(3)** and protects the assemblies inside the monitor. It can be removed from heatsink **(9)** by unscrewing the screws **(11)** and slightly shifting the cover frontwards.

ATTENTION:
Remove cover carefully. Otherwise the flat cable (2) will be torn out so that the flat cable or its connectors may be damaged.

ATTENTION:
The electronic components of the control panel must not be touched without ESD safety precautions. The controller is sensitive to electrostatic discharge.

The control panel

The control panel of the C9100 monitor is a stand-alone unit containing a microprocessor. It has the function of both a front panel and a control and management processor. All settings of the Collamat® 9100 are programmed and handled in this unit and stored in the control panel even if the power is turned off.
The monitor and control panel can be mounted in two different positions (see figure 27). Therefore the panel is fastened with six fixing bolts to the cover. It can be removed or assembled by clicking it out or in from or onto the cover. Take care to the flat cable position. It must not be twisted or squeezed.

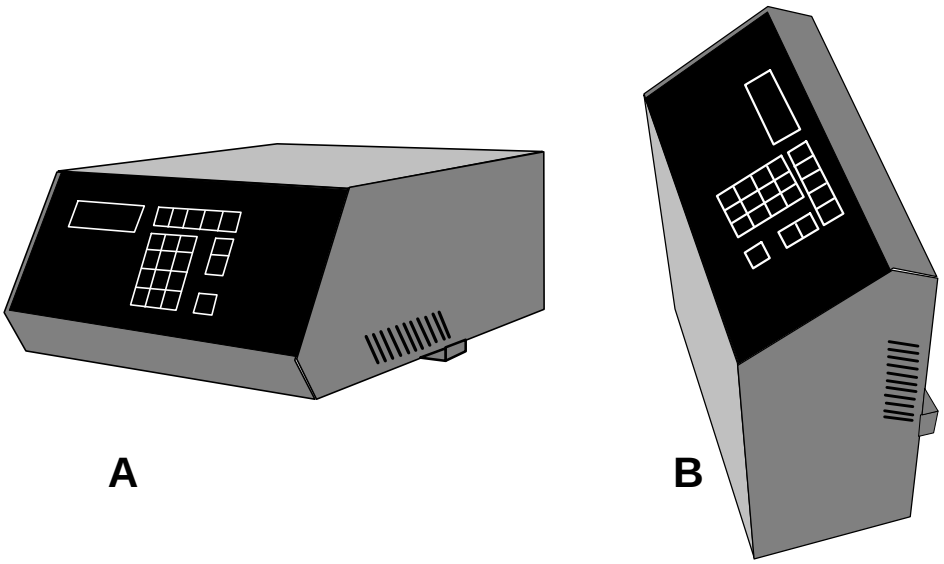


Figure 27: Installation modes

When removing the front panel from the cover, keep care that the fixing bolts are not damaged. After reassembling the front panel with the cover spread the fixing bolts a bit with a little screwdriver or a tool that fits the small slots of the bolts by hand without applying too much force. The front panel must fit tight to the cover.

ATTENTION:
When assembling or disassembling the front panel, the conductor side or the front panel may be damaged. Do not use sharp tools like knives or screwdrivers. Pay attention to the ESD safety precautions !

Construction

The control panel contains ESD sensitive components. When opening the control panel observe the ESD safety precautions.

If a control panel component is defective it must be exchanged. For any repair not made by Guhl & Scheibler the guarantee will become void.

Control panel and front panel are a constructive unit connected with a 50 conductor flat cable to the interface p.c.board. The power supply of the flat cable and the signals to the controller are supplied via this flat cable. All electronic components are soldered in SMD technology onto the p.c.board.
The front panel contains the keyboard equipped with short stroke contacts under the front foil. The keys have a clicking function helping to clearly feel their functioning. So it is easier to operate in a noisy environment.
The LCD display is, like the LEDs for the operation mode display, covered behind the front panel foil. Figure 28 is a rear view of the control panel. All SMD components, the LCD-display and the flat cable connector are placed here.

Hardware

The circuit is controlled by a H8/532 microcontroller serving the LC display, the keyboard and the control lines to the motor driver and to the labeller. All inputs and outputs of the p.c.board are protected from electromagnetic interferences (RMI) with filters assuring a safe operation and preventing the p.c.board from perturbing radiation to the outside. Figure 28 shows the component side of the control panel.

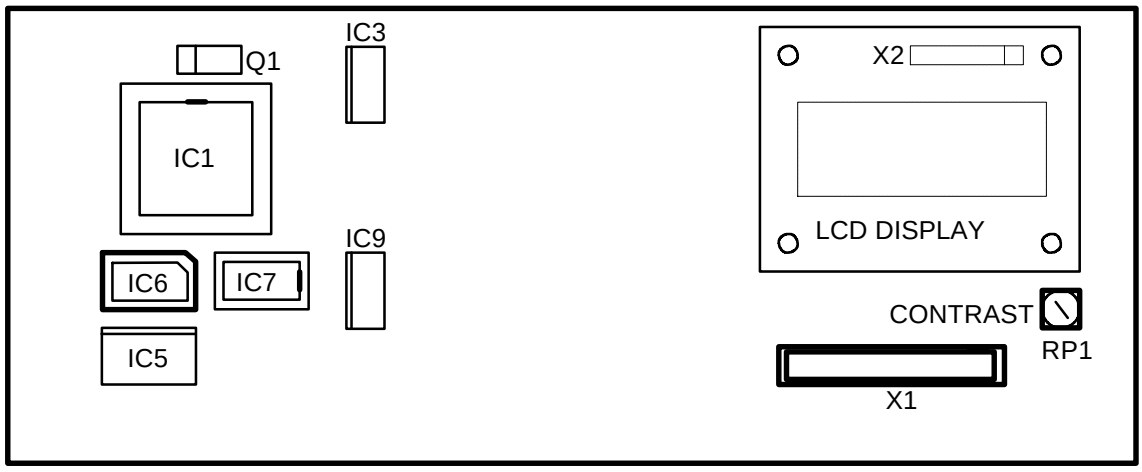


Figure 28: Rear view of control panel

IC6 program memory, EPROM 128 Kbytes

The soft ware is programmed as firmware into a 27C010 type EPROM housed in a PLCC-package. To exchange the EPROM a special **PLCC extracting tool** is necessary. The position of the EPROM is shown in Figure 28.
When inserting the EPROM, note that the beveled edge of the package fits the oblique side of the socket. Press the EPROM slightly with the finger into the socket until it snaps in.
The **IC6** program memory is programmed with the firmware of the two Collamat® types **8600 and 9100**. The firmware detects automatically the monitor by a specific code of the interface p.c.board.

ATTENTION:
If the EPROM is extracted with an incorrect tool, the socket may be destroyed.

The LCD display

The LCD display has four lines with 20 characters each and shows all the user information and the labeller states. The background illumination affords a good legibility also in dark environment. It can be turned on and off by the microcontroller.

Adjusting the contrast

Trimmer **RP1** placed on the component side allows to adjust the contrast (see also Figure 28). It has to be adjusted with a special screwdriver for SMD components. Any other kind of tool may damage the trimmer. Never apply force to the trimmer !

Exchanging a defective LCD

First remove all four fixing screws of the LCD. Then unsolder carefully all 16 soldering points of connector X2 from the LCD. Now plug in the new LCD in connector X2 and fasten it with the fastening screws. Before resoldering the pins be carefully that seat and parallelism of the LCD are exact.

Before exchanging the LCD be carefully to observe the guarantee provisions. For broken LCDs the guarantee will become void ! The same applies for unauthorized soldering on assemblies.

The back panel

The back panel comprises the mains connections and the labeller connection socket. The mains is connected to the mains filter p.c.board which contains the mains plug and the mains switch, the fuses, the mains filter and socket and an additional noise filter for the motor driver.

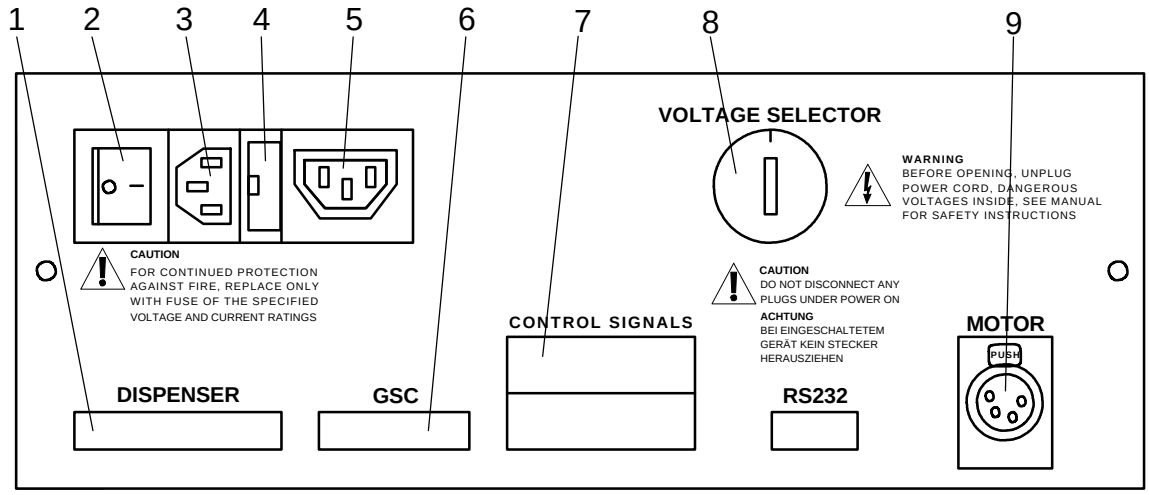


Figure 29: Backpanel Monitor C9100

Legend

1. Labeler connector
2. Mains switch
3. Mains plug
4. Fuse holder
5. Mains socket
6. Goods scanner connector
7. Signal relais connector
8. Voltage selector
9. Motor connector

Only units approved by Guhl & Scheibler are allowed to be connected to the mains sokket **(5)**. The following table shows the fuse current ratings and the maximum permissible current for the mains socket:

Mains-voltage (VAC)	Mains-fuse	Peak-current	Monitor-fuse	Max. load current
110/120 VAC	20 AT	30 Â, 10 ms	**10 AT**	2 A
220/230/240 VAC	10 AT	30 Â, 10 ms	**5 AT**	1 A

The **monitor** must be the **first** unit which is **switched on** in a heavy loaded mains. Otherwise the inrush current may blow the mains fuse.
The signal relay contacts **(7)** only may be used to signalize operation conditions of the Collamat®. These contacts must not be used to switch self-powered or dangerous units.

The connector diagrams of the labeller connection **(1)**, the goods scanners **(6)** and the signal relay **(7)** are shown in the chapter 'C9100 monitor pin assignment'.

The mains filter p.c.board

The mains filter p.c. board is used to supply a filtered mains voltage to the transformer. The p.c.board is mounted on the back panel and contains components on both sides. The mains filter p.c. board comprises a high-performance mains filter, the voltage selector, the mains plug and socket for the transformer and the mains fuses. The mains filter p.c.board also comprises the RMI-noise suppression filters for the motor driver. Figure 30 shows the mains filter p.c. board.

CAUTION: Do not disconnect any plug with power on ! Mains voltage is applied to the mains filter p.c.board ! Danger of shock hazard due to high voltage at components !

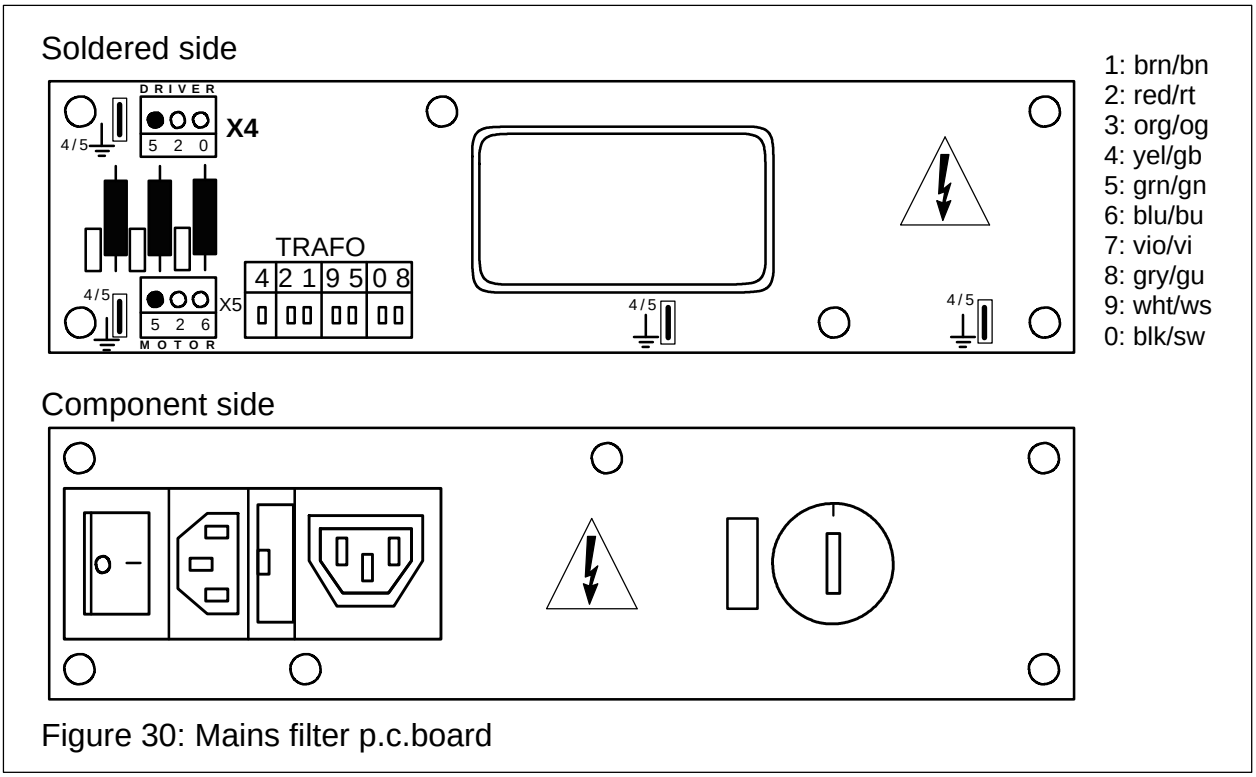


Figure 30: Mains filter p.c.board

Exchange of mains filter p.c.board

To exchange the mains filter p.c.board first disconnect all cables on the p.c.board. Then the board can be removed after unscrewing the six screws. Fasten the new p.c.board with the six screws on the spacer bolts. Reconnect first the motor cables and then all other cables. Figure 32 shows the wiring of the mains filter p.c.board.

ATTENTION:
After exchange of the mains filter p.c.board all four grounding cables must be reconnected. Otherwise shock hazard or malfunction of the monitor may result.

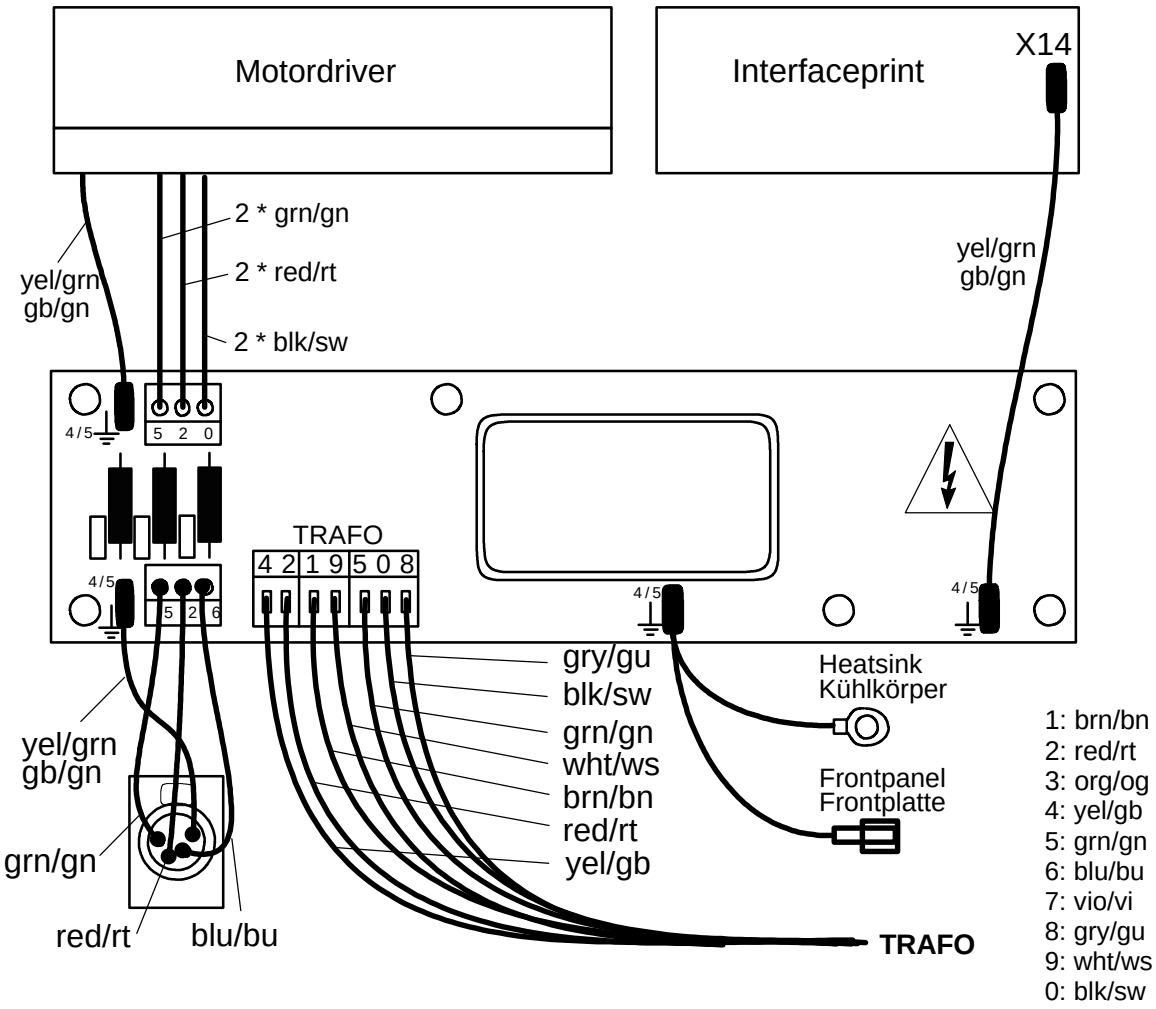


Figure 32: Wiring of the mains filter board

ATTENTION:
After exchange of the mains filter p.c.board, the voltage selector must be set to the correct mains voltage to which the Collamat® has to be connected.

The interface p.c.board

The interface p.c.board is used to connect the labeller and its peripherals to the monitor. It filters and converts the signals of labeller and installation control to the logic level of the controller. The interface p.c.board also contains the electronic parts of the power supply unit and feeds the motor control signals to the motor driver. Figure 33 shows the position of the interface p.c.board.

The power supply

The mains transformer is connected to the terminals X11 and X12. The motor driver voltage is connected to terminal X11. Fuse F1 protects this voltage from overload. LED **LD1** indicates the **120V** for the motor driver.

The supply voltage for the logic, the sensors and the winders is connected to terminal X12. Fuse F2 protects this voltage from overload. LED **LD2** indicates the presence of **24V**. The voltages 12V and 5V are generated from the 24V using switching controllers. LED **LD3** indicates the **12V**, LED **LD4** indicates the **5V**.
The 5V and 12V supplies are short-circuit proof and protected from overload.

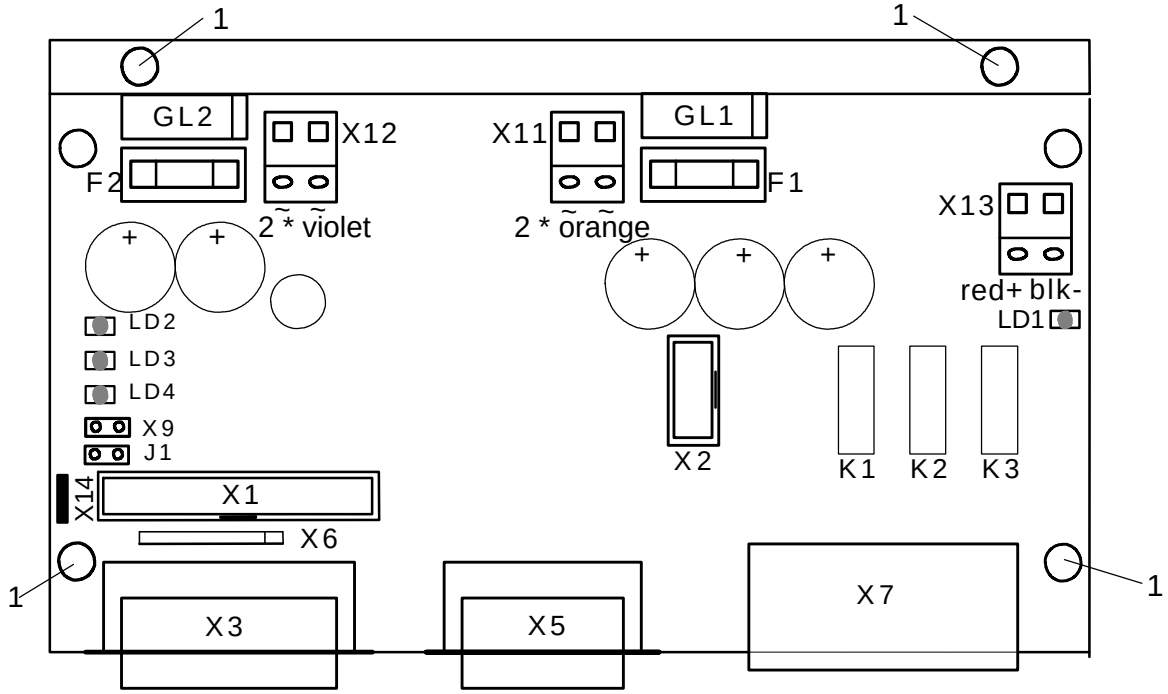


Figure 33: Interfaceboard

The following table shows the voltage and fuse values of the interface p.c.board:

Voltage	Current	Fuse	Terminal ~	Terminal =	LED
120 V	2,2 A	F1 : 4 AT	X11	X13	LD1
24 V	6 A	F2 : 10 AT	X12	-	LD2
12 V	500 mA	-	-	-	LD3
5 V	1 A	-	-	-	LD4

Fuses

If there is no voltage 120V or 24V the associated LED is not lit. If there are no 24V there are also no 12V and 5V. Each voltage has its own LED. (See also above table.) If a voltage is missed, its fuse must be checked. The fuses are placed under the heatsink on the interface p.c.board. If the fuse is blown first check the cause. The fault must be eliminated before the fuse is replaced.

Exchanging the interface p.c.board

To exchange the interface p.c.board first disconnect all cables. Then slacken the four fastening screws **(1)** and remove the p.c.board. Carefully insert the new p.c.board and fix it with the four fastening screws **(1)**. Finally reconnect all cables.

Terminals and connectors

The following table lists up the terminals and connectors of the interface p.c.board:

Terminal Connector	Description
X1	Flatcable connector to the frontpanel
X2	Motor clock and monitoring signals of the motor driver
X3	Labeller connector
X5	GSC-connector for the goods scanners
X6	Serial port for factory testing
X7	Signal relay contacts
X9	Key operated switch
X11	Voltage supply from transformer, 85 VAC
X12	Voltage supply from transformer, 19 VAC
X13	Voltage supply to motor driver p.c.board, 120 VDC
X14	Ground connector to the power filter p.c.board

Particularities

When unplugging the flat cable carefully pull it out from X1 to avoid any damage. When reinserting pay attention to plug it in over the whole width.
Connector X6 is used to test the monitor or for a serial connection of PC or modem.
Connector X7 makes floating potential relay contacts available allowing to control external units such as signal lamps or SPCs. Also an external signal input, to Start or Stop the Collamat® is provided.
Connector X9 is used to connect a additional key switch. Jumper J1 indicates the presence of the Key switch to the procesor. If the key switch is active, the userlevel of the monitor is set to programmer. This connector X9 together with Jumper J1 also is useful when the password is lost. The password can then be cleared by entering **'0000'** in the password setting menue.
The ground connection X14 is used to connect the grounding wire to the mains p.c. board. If this grounding is not plugged in, malfunctions of the labeller may occur.

The motor driver

The motor p.c.board is an assembly developed and produced by a well-known manufacturer of stepper motor controls.

The motor driver p.c. board is adjusted, tested and built into the monitor by Guhl & Scheibler. Do not change any setting ! Do not change the motor phase current !
ATTENTION: Do not change any switch or jumper position under voltage !

DANGER
Disconnect all voltage supplies before working on the motor driver !

Settings

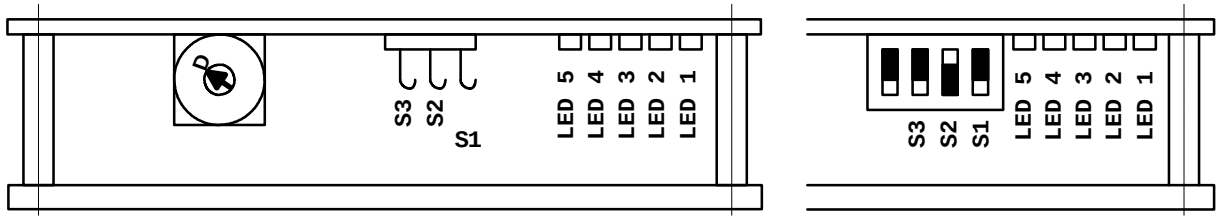


Figure 34: Motor driver settings

Set the hook switches S1, S2, S3 and the selector switch to the following positions:

S1 : open	**S2 : closed**	**S3 : open**	**Selectorswitch : D**

Status indicators

The five LEDs on the motor driver indicate operating states and faults:

LED 1	lights up when the motor driver operates properly. The supply voltage exceeds 80 VDC.
LED 2	lights up in case of a short-circuit between two motor phases.
LED 3	lights up in case of excess temperature (> 75°) of the heatsink.
LED 4	lights up in case of overvoltage (>140 V) during operation with brake.
LED 5	lights up in case of undervoltage (< 80 V).

NOTE:
If a fault occurs (LED2 to LED5), the motor is deenergized and LED1 goes out. The fault condition is displayed on the monitor and can only be cleared by switching the monitor off and on.

Exchanging the motor driver

First remove the two connector clamps. Then unplug the connector and screw off the motor driver from the heatsink. Screw down the new motor driver, connect it to its cables and secure it by the connector clamps.
When assembling pay attention that no dirt is between cooling plate and heatsink.

The connector box 9100

The signals of the C9100 monitor are fed in one cable to the connector box on the labeller. There all electrical modules of the labeller with the exception of the stepper motor are connected. The following Figure 35 shows the position of the connector terminals in the connector box. On the connector p.c.board the wire colors are marked with the numbers of the resistor color code. These colors are valid for Guhl & Scheibler peripherals. The connection cables of the modules are fed through the lateral conduit glands.

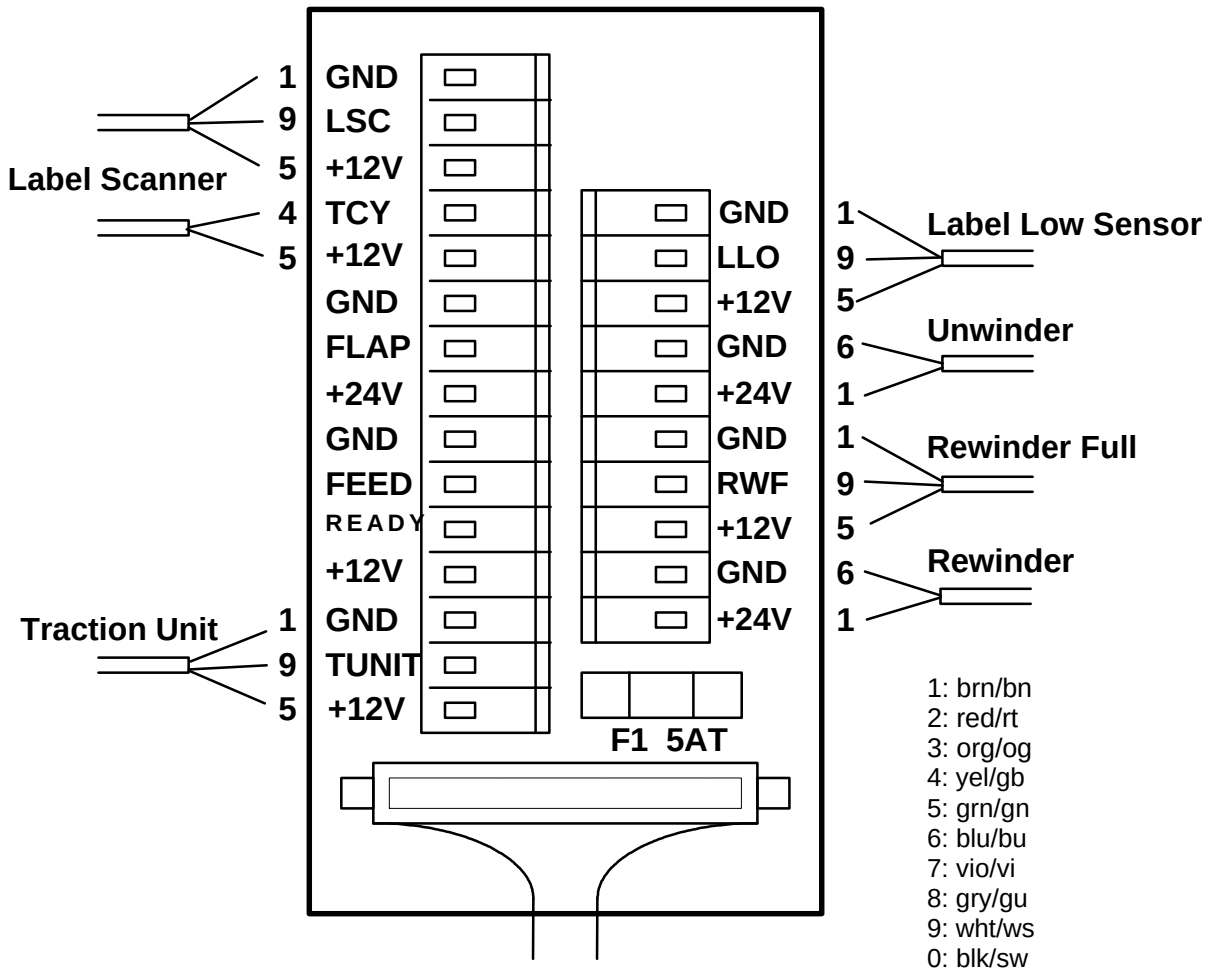


Figure 35: Connector print

Fuse F1, 5A slow blowing

Fuse F1 protects the 24V power supply of the winders from short-circuit and overload. If one or both winders are dead, first check this fuse.

Control signals for external units

The **FEED, FLAP** and **READY** signals are used to control external units.

FEED

The **FEED** signal indicates that the labeller is dispensing, i.e. that the stepper motor turns. With this signal e.g. an external flat printing unit can be controlled. See also Figure 36.

FLAP

The **FLAP** signal is used to control an external flap adapter control. The end of the signal can be delayed via the monitor. It starts together with the FEED signal. See also the following Figure 36:

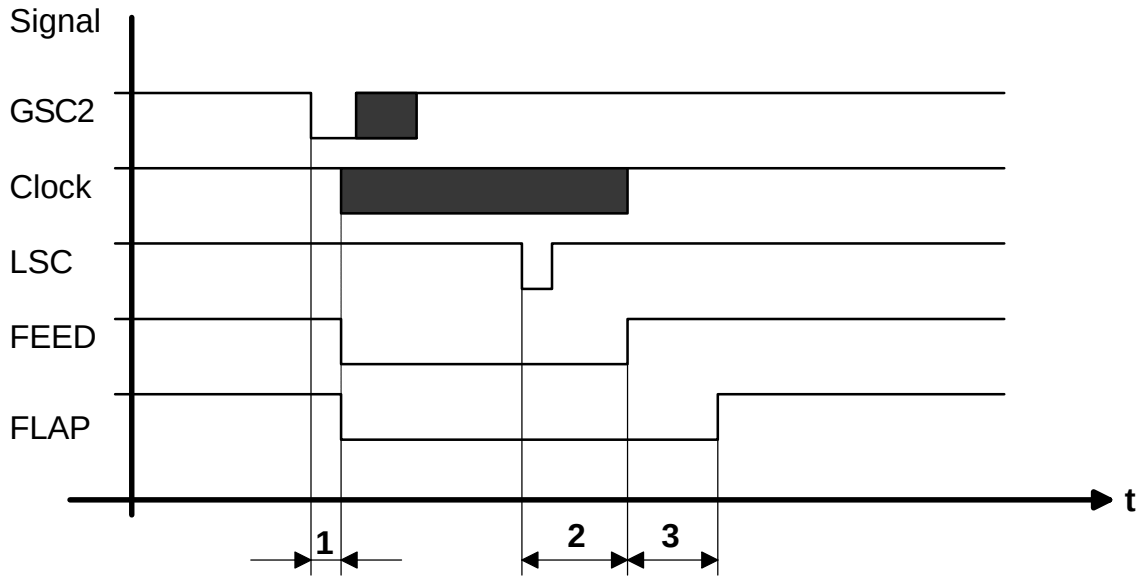


Figure 36: Signal FEED and FLAP vs. time

1. Speed dependent position delay
2. Length of predispensing
3. Time delay of FLAP signal

All signals are open collector towards ground signals and capable to drive a maximum load of 100 mA. See Figure 41.

Signals and connector pin assignments

This chapter describes the signals of the Collamat® 9100. All inputs and outputs are described functionally and electrically. Also the pin assignments of the monitor connector are described.
All inputs and outputs are equipped with filter elements to protect from electromagnetic interferences. These components also prevent interferences caused by electrostatic discharges. The interference may cause a malfunction of the Collamat® 9100. Anyway, when installing the labeller observe the rules concerning RMI and ESD to prevent such interferences. These rules are listed later in this manual.

Inputs

There are two different kind of inputs:

- **Photocoupler inputs :** isolated by photocouplers
- **Comparator inputs :** with ground referenced comparator

Photocoupler inputs

The photocoupler inputs are used to connect external equipment which may have a different grounding or another ground reference. Thus circulating ground compensation currents through the inputs and consequently faults are avoided. All photocoupler inputs are protected from wrong polarity and overvoltage. Figure 37 shows the diagram of the photocoupler inputs:

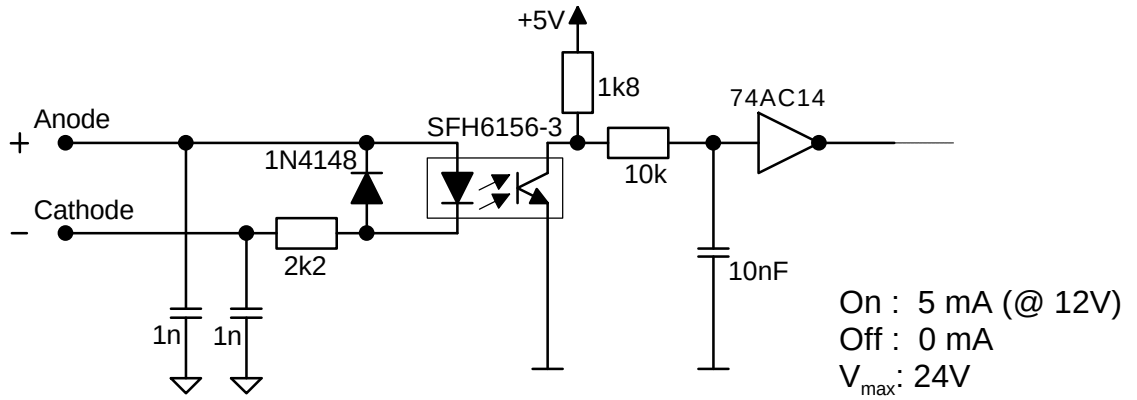


Figure 37: Photocoupler input diagram

The input is active when a current higher than 5 mA (at 12V) flows through the photocoupler LED. The maximum input voltage is 24V.

The following input signals are equipped with photocouplers:

- **GSC1** Incremental encoder or measuring goods scanner
- **GSC2** Goods scanner
- **GSC3** Goods scanner for nonstop labelling or external counter
- **NSTPI** Control signal for nonstop labelling
- **STOP** Control input for external control

Comparator inputs

The comparator inputs are used to connect the peripheral unit signals generated by the labeller. They are fed via the **DISPENSER** plug through a cable to the monitor. The peripherals are connected to the connector box.
The inputs are protected against wrong polarity and they are active when GND (0V, ground) potential is applied. (The peripheral units of Collamat Stralfors AG have NPN-outputs towards 0V.) Figure 38 shows the input diagram of the comparator inputs:

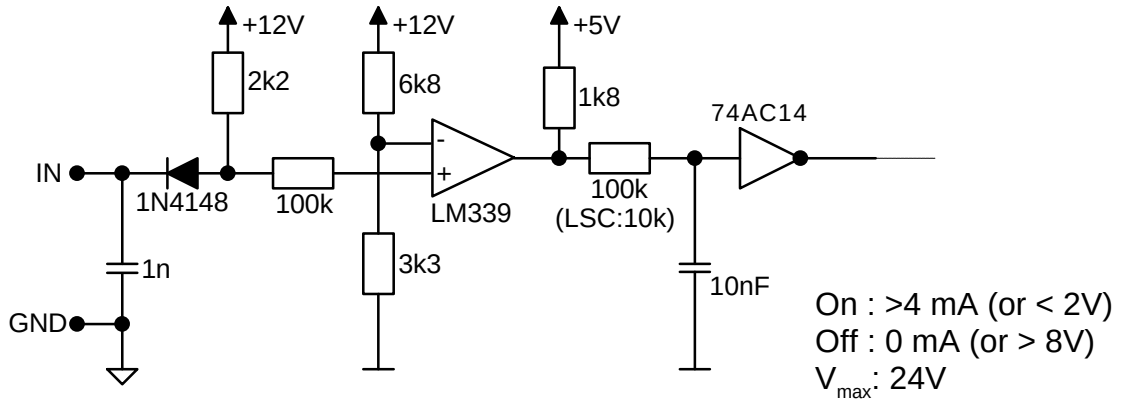


Figure 38: Comparator input diagram

The inputs are active when a current of minimum 4 mA flows towards GND.

The following input signals are equipped with comparators:
- **LSC** Label scanner
- **TUNIT** Traction unit, paper end sensor
- **READY** READY-signal from flat printer
- **LLO** Paper stock control, unwinder empty
- **RWF** Rewinder full

Functional description of inputs

Goods scanners GSC1 and GSC2 (**G**ood **SC**anner**)**

The inputs **GSC1** and **GSC2** are used to detect the goods. For all three modes (fixed speed, measuring and incremental) GSC2 is used to detect the goods. GSC1 is used for speed measurement.
- For a fixed speed GSC1 has no function
- For the detection with measuring scanner GSC1 is the first activated scanner seen in transportation direction. (GSC1 must first be interrupted.) The mechanical distance to the second scanner GSC2 can be programmed between 10 mm and 100 mm).
- For the speed measuring with an incremental encoder, GSC1 is connected to the clock output of the encoder.

Both inputs are lead to the **GSC** connector on the backpanel of the monitor. The inputs can be connected either to NPN- or PNP-sensors. Figure 39 shows how to connect the GSC inputs.

Goods scanner GSC3

The input **GSC3** is used to count the goods in the Nonstop labelling mode. The input also can be used to count goods or events. Therefore the counter must be programmed to EXTERNAL. The input GSC3 will be connected to the GSC connector. The wiring is the same like the other two GSC inputs. Figure 39 shows how to connect the GSC inputs.

Control input NSTPI (**N**on**ST**o**P I**n)

The **NSTPI** input is used for the connection of two Collamat® in the Nonstop labelling mode. The wiring of the nonstop mode is described in the chapter Nonstop labelling. This input will be connected to the GSC connector.

Control input STOP

The **STOP** input is used to stop or start the Collamat®. It has the same function like the RUN/STOP key on the control panel. If the signal is activated while the Collamat® is stopped the Collamat® will be started (RUN) and vice versa.
The relais contacts are activated according to the momentary mode. The counting of the goods will be continued anyway. Error messages will not be cleared. The connection of this signal is done the same way like the GCS signals. It must be connected to the CONTROL SIGNALS connector. Figure 39 shows how to connect the STOP input:

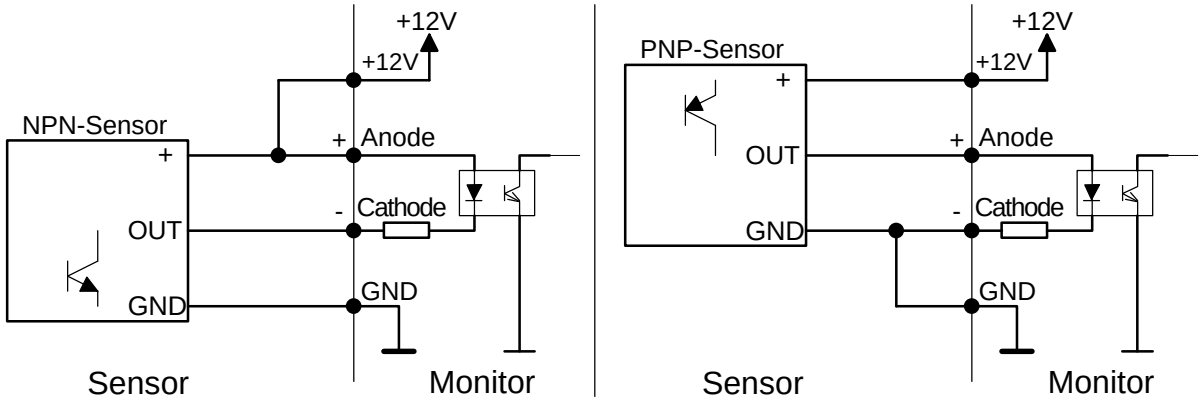


Figure 39: Connection of photocoupler

All comparator inputs are taken to the DISPENSER connector. From there the signals go to the connector box on the modular rail. The peripheral units are all connected to the connector box.

LSC (**L**abel **SC**anner)

The LSC input is connected to the label scanner. This input has a fast response time for accurate scanning of the label position while transportation. As labels scanners all NPN-sensors can be connected to the connector box.

TUNIT (**T**raction **UNIT**)

The signal **TUNIT** is used for the supervision of the traction unit. In the traction unit two signals are observed. The first sensor observes the locking sensor of the tractionroller. The second sensor observes the paperend. For the paperend sensor an alternative sensor may be used.

READY

The signal **READY** is used to signal the Collamat® that a connected peripheral device like hotstamp or flatprinter is ready. When the signal is active, it means the NPN-output of the device is pulled to GND, labelling is not possible. An error message is then displayed.

LLO (**L**abel **LO**w)
RWF (**R**e**W**inder **F**ull)

The two signals **LLO** and **RWF** are used to observe the diameter of the winders. The standard sensors of Collamat Stralfors AG are equipped with NPN-outputs and are connected to the connector box.

Outputs

Also for the outputs we have two different kind of outputs:

- **Isolated outputs**
- **Open-Collector outputs**

Isolated outputs

These outputs are completely isolated to the monitor. There are three relais outputs and one photocoupler output. The relais outputs are capable to drive signaling lamps or an external PLC. Figure 40 shows the electrical diagram of the isolated outputs.

ATTENTION:
The relais outputs must not be used to switch dangerous self-driven units.

If the relais outputs are active the contacts **A and C** are connected together. If not active **R and C** are connected together. See also figure 40.

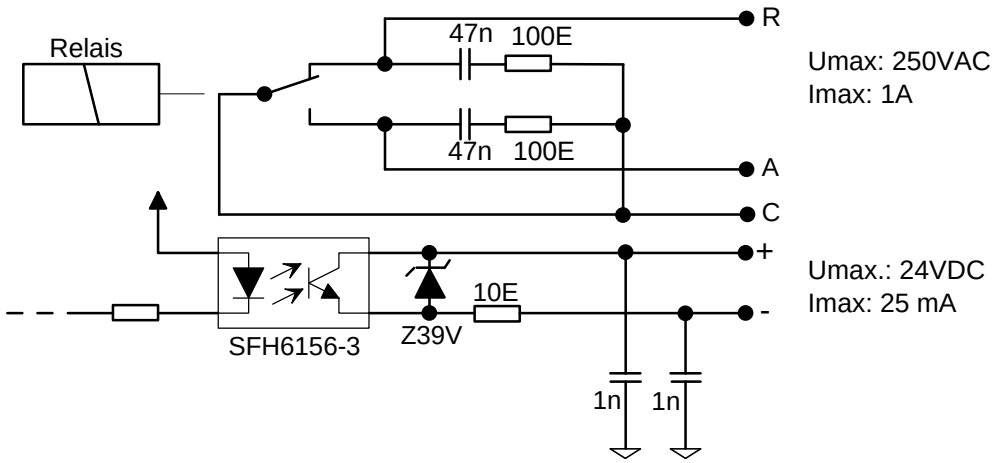


Figure 40: Floating outputs

The following outputs are floating:

- **RUN** Relais output indicates RUN mode
- **NOK** Relais output indicates a WARNING message
- **ERROR** Relais output indicates an ERROR message
- **IFEED** Photocoupler, isolated FEED-signal

Open-Collector outputs

The Open-Collector signals are used to switch and control external units. Figure 41 shows the electrical diagram of these outputs. The outputs are equipped with an internal free wheeling diode. If an inductive load is switched an additional external diode is necessary.

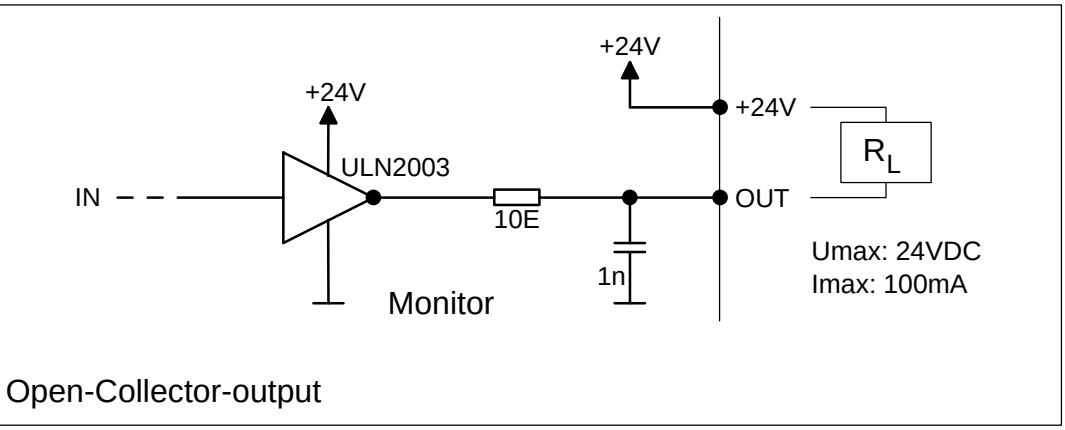


Figure 41: Open-Collector-output

The following Open-Collector-outputs are available:

- **FEED** Indicates that the traction motor is turning
- **FLAP** Signal to control an external flap adapter magnet
- **CLOCK** Steppermotor clock for synchronizing external units
- **NSTPO** Nonstop control signal

Functional description of the outputs

Mode indicator RUN

The **RUN** relais output indicates the RUN or Stop mode of the labeler. The output is activated while the Collamat® is in the labelling mode. If the Collamat® is stopped the relais output is not activated.
The output RUN can be used to activate a green lamp.

Warning signal NOK (**N**ot **OK**)

The **NOK** relais output indicates a warning condition. There are many reasons which cause a warning. The cause is displayed on the control panel. To confirm and clear the NOK signal first the cause of the warning must be eliminated. Then the ENTER key must be pressed on the control panel.
The output NOK can be used to activate a yellow lamp.

Error signal ERROR

The **ERROR** relais output indicates an error condition. There are many reasons which cause an error. The cause is displayed on the control panel. To confirm and clear the ERROR signal first the cause of the warning must be eliminated. Then the ENTER key must be pressed on the control panel.
The output ERROR can be used to activate a red lamp.

Connection of a signalisation to the monitor

To connect the signal lamps like described above it can be wired like shown in figure 42. The connection is made to the CONTROL SIGNALS connector.

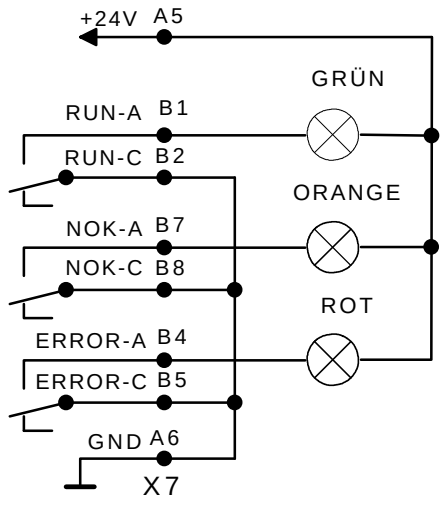


Figure 42: Connection of a signalisation lamp

Signal FEED, IFEED

The signal **FEED** is always active when the steppermotor is turning. This signal indicates an external printing unit that the paper is moving or stopped. The flatprinter analyses the rising edge of this signal for the printing action. The time diagram of the FEED signal is shown in figure 36.
The signal IFEED is a copy of the FEED signal. It is completely isolated by a photocoupler from the electronic parts. This signal can control a strange printing unit completely floating. Thanks to the photocoupler the signal can be used for NPN- or PNP-inputs. The polarity of the IFEED signal can be adjusted on the control panel. NORMAL means that the signal is with the same polarity of the FEED signal. INVERSE means that it is inverted to the FEED signal.

Flap adapter signal FLAP

The signal **FLAP** is used to control the flap adapter. The setting ADAPTERMAGNET is used to turn on or off this signal while labelling. If it is turned on the signal, FLAP is activated simultaneously with the FEED signal. The turning off of the FLAP signal can be delayed by an adjustable time. If a newer labelling process is activated while FLAP is delayed, it remains active.
The control of the flap adapter with an electromagnet or pneumatic valve is to be done by the customer. If a solution with an electromagnet is distinguished the duty cycle of the magnet must be considered for labelling. Generally the electromagnet solution is not as strong, fast and electrically easy to realize as the pneumatic actor with pneumatic valve and cylinder.

Steppermotor clock CLOCK

The signal **CLOCK** can be used to synchronize an external device (e.g.. Ink-Jet or Thermal Transfer printer) with the steppermotor.

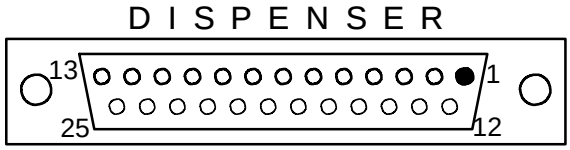
Control output NSTPO (**N**on**ST**o**P O**ut)

The signal **NSTPO** is used to link two Collamat® 9100 for the Nonstop mode. The wiring diagram is shown in the chapter Nonstop.

Monitor C9100 Connector layouts

Connector X3, DISPENSER

To this connector the control cable to the connector box is attached. The signals of this connector are used especially to control the dispenser and its units.



Type: 25 pole, D-Sub, female

Pin	Name	In/Out
1	GND	
2	LSC	I
3	GND	
4	TUNIT	I
5	GND	
6	READY	I
7	GND	
8	LLO	I
9	RWF	I

Pin	Name	In/Out
10	GND	
11	GND	
12	GND	
13	GND	
14	+12V	
15	TCY	O
16	+12V	
17	+12V	
18	FLAP	O

Pin	Name	In/Out
19	FEED	O
20	+12V	
21	+12V	
22	+24V	
23	+24V	
24	+24V	
25	+24V	

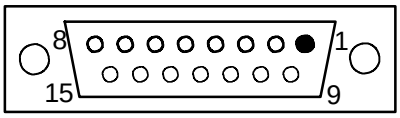
Pin assignment of the connector DISPENSER

ATTENTION:
For the connection of the dispenser signals a shielded cable must be used. Keep care that the cable is capable to lead the maximum current of the two connected winders. The cable must not be placed near power electronic devices. See also in chapter RMI protection.

Connector X5, GSC

To this connector the signals of the goods scanners and the nonstop wiring is connected. For the prevention of electromagnetic interferences (RMI) shielded cables should be used.

GSC



Type: 15 pole, D-Sub, female

Pin	Name	In/Out
1	GSC1-	I
2	GSC2-	I
3	GND	
4	GSC3-	I
5	NSTPI-	I

Pin	Name	In/Out
6	GND	
7	NSTPO	O
8	+24V	
9	GSC1+	I
10	GSC2+	I

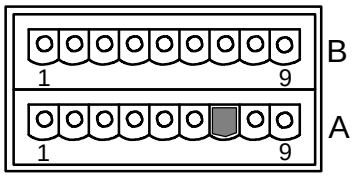
Pin	Name	In/Out
11	+12V	
12	GSC3	I
13	NSTPI+	I
14	+12V	
15	CLOCK	O

Pin assignment of the connector GSC

Connector X7, CONTROL SIGNALS

On the CONTROL SIGNALS connector the upper row is used to access three relais contacts for signalisation purpose. The lower row supplies a 24V voltage for external signal lamps. The maximum current for the 24V is 200 mA.

CONTROL SIGNALS



Type: PHOENIX CONTACT MDSTB 2,5/9-G1-5,08

Pin	Name	In/Out
1	RUN A	O
2	RUN C	O
3	RUN R	O

Pin	Name	In/Out
4	ERROR A	O
5	ERROR C	O
6	ERROR R	O

Pin	Name	In/Out
7	NOK A	O
8	NOK C	O
9	NOK R	O

Pin assignment of the upper connector row CONTROL SIGNAL

Pin	Name	In/Out
1	STOP+	I
2	STOP-	I

Pin	Name	In/Out
3	IFEED+	O
4	IFEED-	O

Pin	Name	In/Out
5	+24V/200mA	
6	GND	

Pin assignment of the lower connector row CONTROL SIGNAL

How to connect a goods scanner

The goods scanners and incremental encoders are connected to the GSC connector. As described in the chapter **Inputs** NPN- or PNP-sensors may be connected. Figure 43 shows the connection of the standard Collamat Stralfors AG goods scanner:

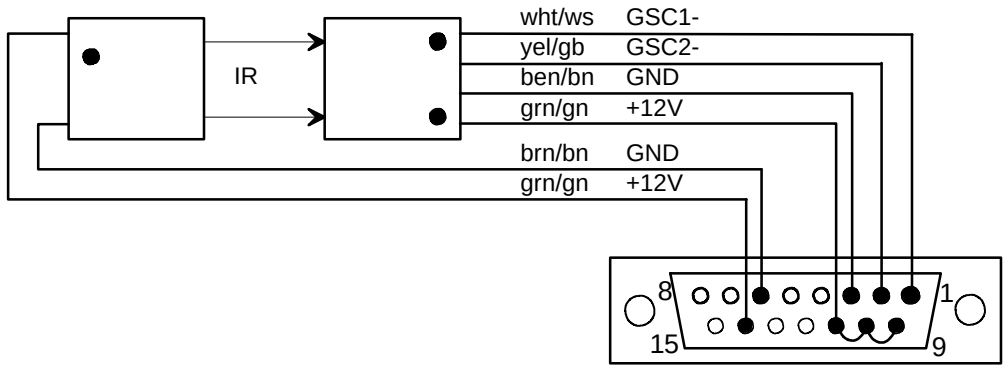


Figure 43: Connection of the G & S IR goods scanner

Figure 44 shows the connection of NPN- and a PNP-scanners respective:

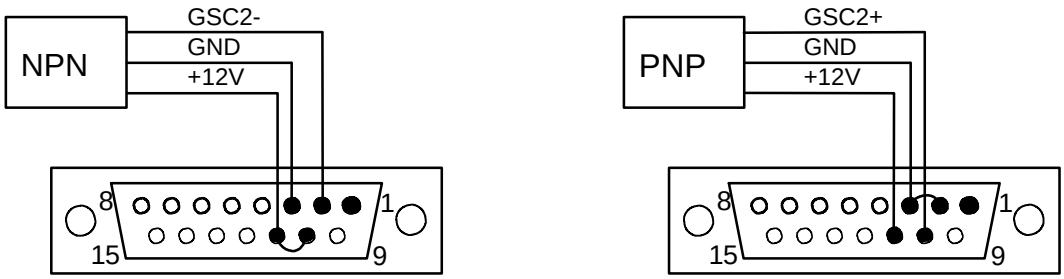


Figure 44: Connection of NPN- and PNP-scanners

Figure 45 shows the connection of NPN- and PNP-incremental encoders respective:

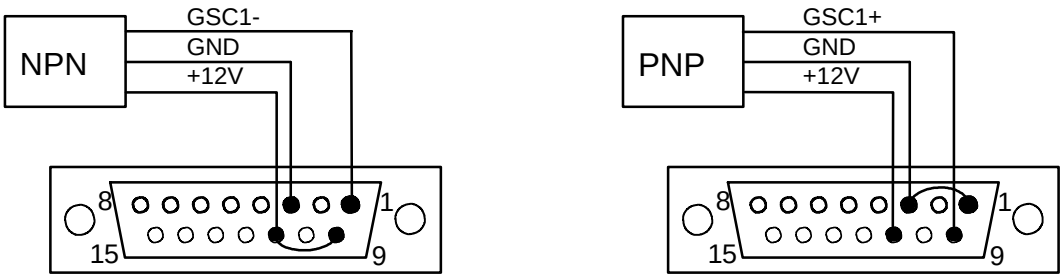


Figure 45: Connection of NPN- and PNP-incremental encoders

Nonstop labelling

When using two Collamat® 9100 it is possible to label goods with no down time. For this purpose the two monitors must be connected together by an electrical link. The necessary links are shown in figure 47. The placement of the two Collamat® to each other is shown in figure 48.

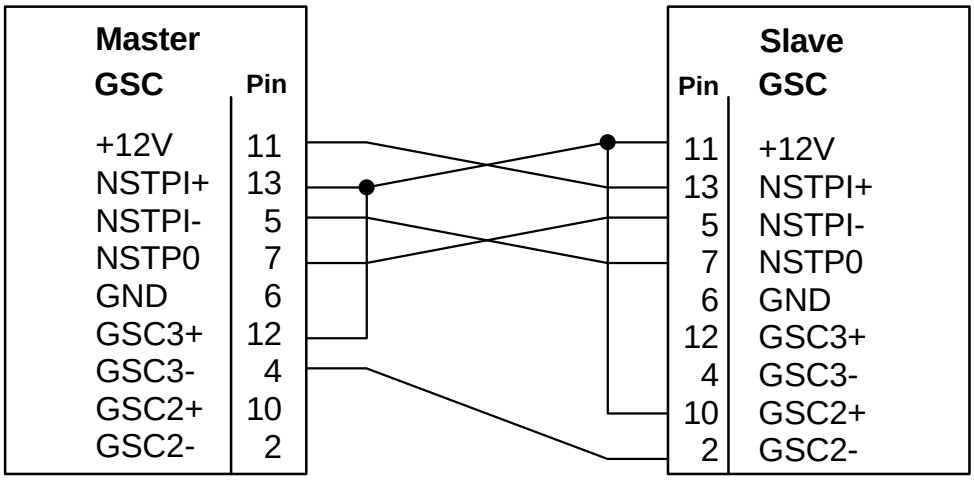


Figure 47: Connections for Nonstop labelling

Not shown is the connection of a possibly connected speed measuring equipment using an incremental encoder and the goods scanner of both Collamat® . For the speed measuring one incremental encoder could be used for both Collamat® together. Notice also that the goods scanner GSC2 of the slave is connected in parallel to the GSC3 input of the master.

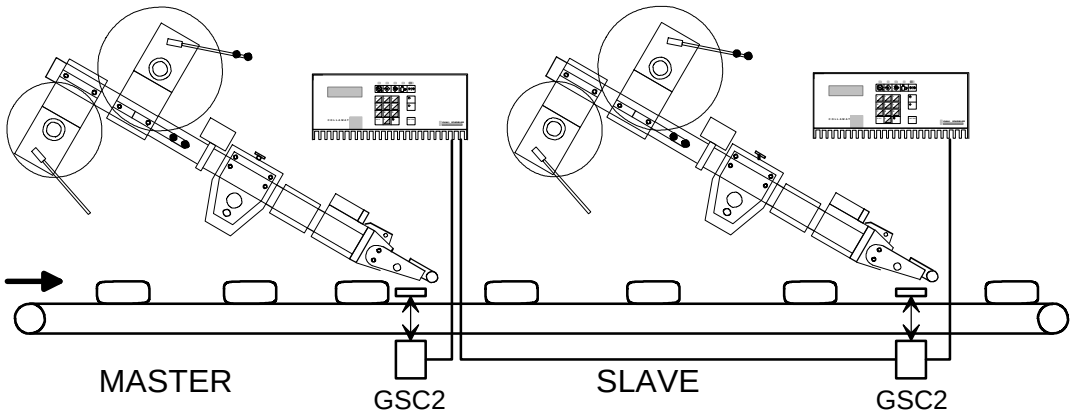


Figure 48: Placement of the two Collamat®

Proceeding

The Nonstop labelling is supervised and controlled by the master. Goods passing GSC2 of the master are counted up. Passing GSC2 of the slave the goods are counted down. If the master is unable to label the goods, it gives the grant to the slave at the moment when the first not labeled good reaches the GSC2 scanner of the slave.

At this moment the slave starts the labelling. Now the cause of the stop of the master can be serviced. The slave labels the goods until it is unable to label because of any reason. Now the slave signals the master to start labelling. The master starts immediately to label the goods. At this moment both Collamat® are labelling for a while. When the first labeled good arrives at the GSC2 of the slave, the slave stops labelling. Now the cause of the stop of the slave can be serviced.
The master always has the control over the goods which are labeled on which Collamat® . In the display of the control panel it is possible to display the goods count of the goods between the two GSC2 scanners of the two Collamat®. If an error occurs which causes both Collamat® to stop all goods in between of the both GSC2 scanners must be removed. Then the NONSTOP COUNTER must be cleared on the control panel of the master.

Setting up of the Nonstop mode

After the wiring of the Nonstop mode is made the installation must be set up as follows:

- Stop the conveyor or the goods transportation
- Remove all the goods in between of the two GSC2
- Set both monitors to STOP
- Set up the two labelers
- Choose Nonstop mode MASTER on the master
- Choose Nonstop mode SLAVE on the slave
- Set monitor master to RUN
- Set monitor slave to RUN
- Start the conveyor or the goods transportation

The goods are now labeled in the Nonstop mode. If an error occurs which causes a stop of a Collamat® the following procedure is necessary:

- Service the erroneous condition on the stopped Collamat® Confirm the errormessage on the monitor with the ENTER key

If an error occurs which stops both Collamat®, first the error condition must be serviced. Then all the goods in between the two GSC2 sensors must be removed. The nonstop counter must be cleared on the master.
For the supervision and setting up the Nonstop mode in the free selectable display, the counter of the goods in between the two GSC2 scanners can be displayed.

If a position value or a goods suppression is set, it will be considered by the monitor while labelling. The distance of the GSC2 to the peeling edge in this case must be the same on both labelers.

Incremental encoder

The electrical connection of an incremental encoder is described in the chapter **Connection of the goods scanners**. If the speedmeasuring is done by an incremental encoder, on the control panel the step width must be programmed so that the speed measuring is made correctly. The step width is the traveling way of a good in between two encoder steps. Figure 49 shows an example how to calculate the step width:

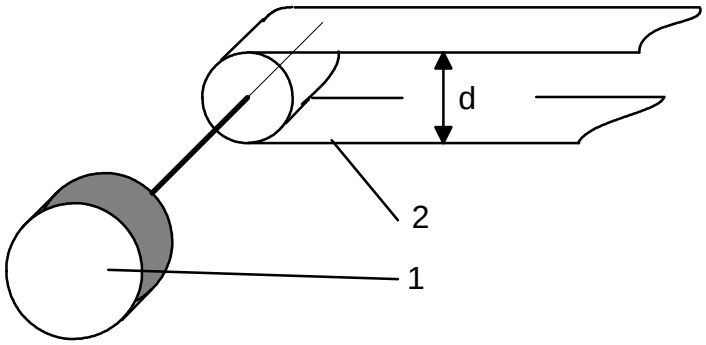


Figure 49: Incremental encoder

Example:

The incremental encoder **1** gives 200 pulses per revolution. It is attached directly to the shaft of the conveyor **2**. The diameter **d** is 100 mm. Calculation:

$$\text{Step} = \frac{d * Pi}{\text{Pulse}} = \frac{314\ \text{mm}}{200} = \mathbf{1.57\ mm}$$

Measuring goods scanner

The electrical connection of the measuring goods scanner is described in the chapter **Connection of the goods scanners**. If the speedmeasuring is done by a measuring goods scanner, on the control panel the distance **L** must be programmed so that the speed measuring is made correctly. Figure 50 shows the placement of the scanners:

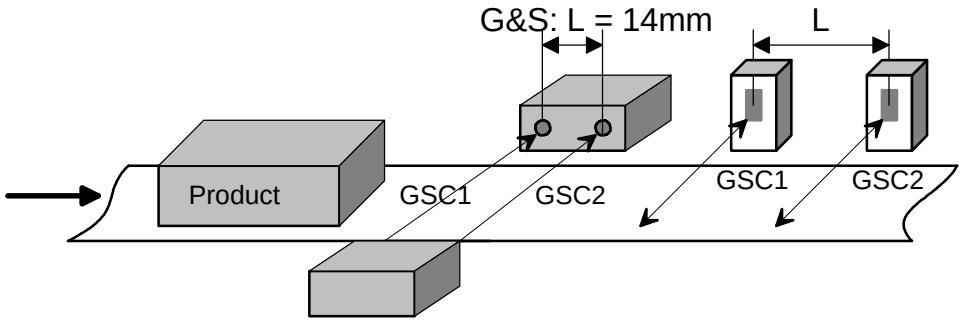


Figure 50: Measuring goods scanner

Motor and motorcable

Attention:

- **The motor never must be dismantled !**
- **For safety reasons and in order to guarantee interference suppression, the motor has to be connected to a ground conductor !**
- **Steppermotors heat up during operation !**
- **When connecting or disconnecting the motor, the monitor must be switched off !**
- **When working on the motor the monitor must be disconnected from mains !**

Motorcable

The motorcable is connected to the connector **MOTOR** on the backpanel of the monitor. Figure 51 shows the motorconnector and its pin assignment:

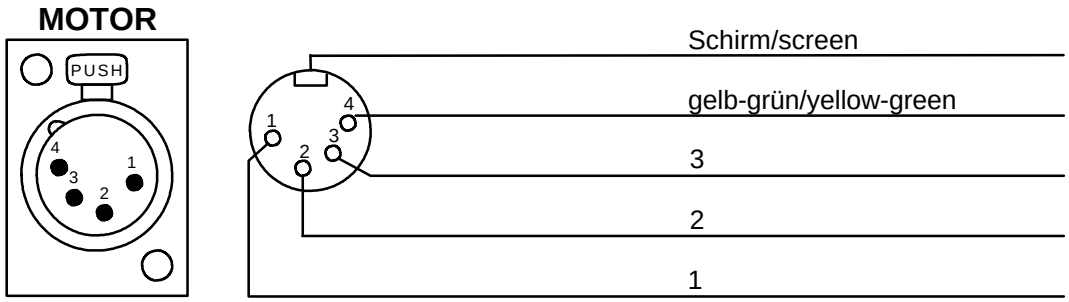


Figure 51: Motorcable

Motor wiring

The connection of the motor usually is done in the terminal box of the motor. The numerated wires of the cable are connected to the terminals inside of the terminal box. The earth connection is made via the motor grounding terminal. See also figure 52:

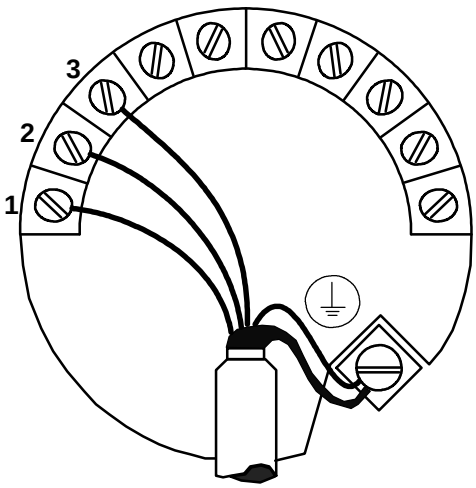


Figure 52: Connection inside the terminal box

Control of a Hotstamp with the IFEED signal

The connection of a hotstamp printer to the IFEED signal is described below. On the CONTROL SIGNALS connector the IFEED signal can be attached. It can be connected with two different types (NPN or PNP) of hotstamp inputs. Figure 54 shows the connection of different hotstamps. Figure 55 shows the timing diagram.

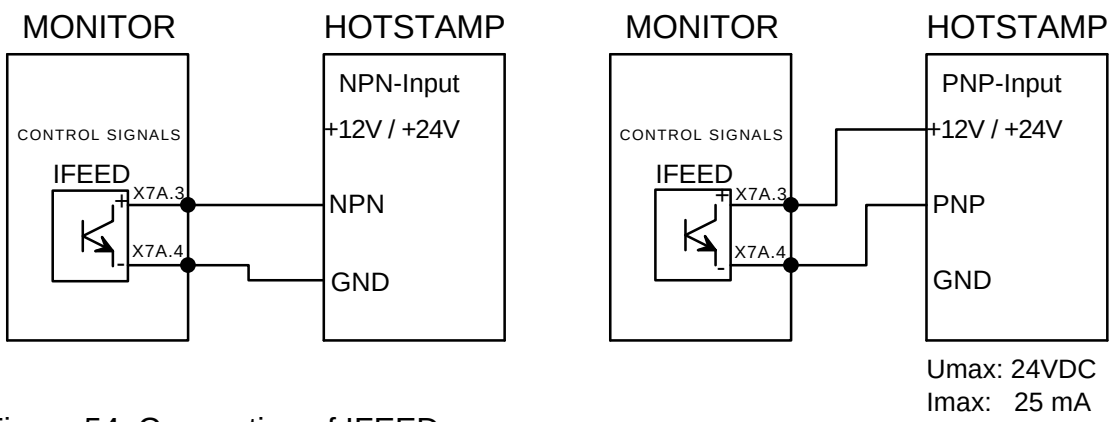


Figure 54: Connection of IFEED

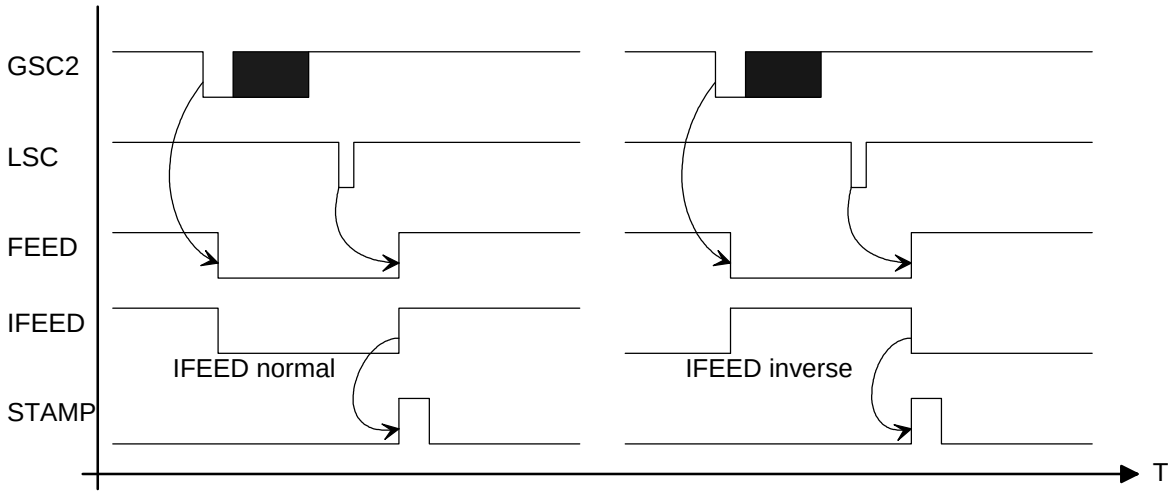


Figure 55: Timing diagram

Dependent on the manufacturer, the polarity of the triggering signal of the hotstamp must be changed. This adjustment is to be set in the configuration menu **IFEED POLARITY** to **normal** or **inverse**. See also figure 55.

Control of the flap adapter

The signal FLAP which is accessible inside of the connector box is used to control the flap adapter. The NPN-signal is active during the labelling simultaneously to the FEED signal. See also figure 36 on page 40. Figure 56 shows how to connect a pneumatic valve to the FLAP signal. The pneumatic valve controls the compressed air for the adapter movement. The mechanical adapting of the pneumatic cylinder to the adapter must be made by the customer. The pneumatic valve also can be used to control a pressing station for the labels.

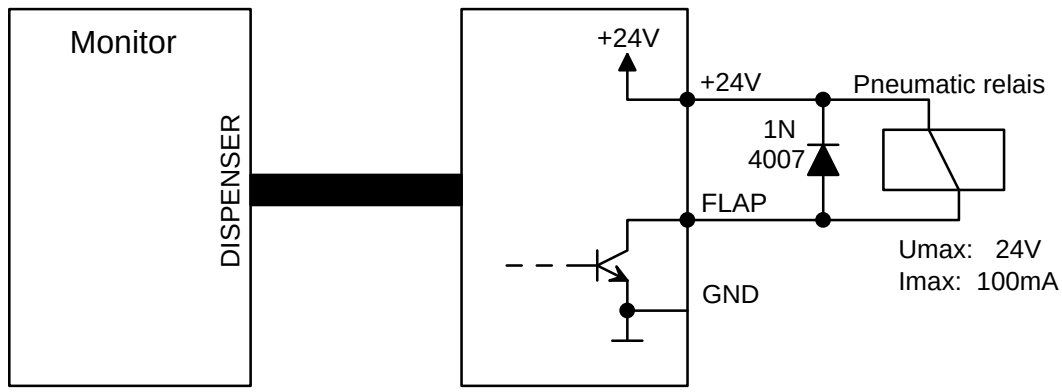


Figure 56: Connection of a pneumatic relais

ATTENTION:
Connecting a relais, a free wheeling diode must be provided. If this is not made electromagnetic interferences can cause malfunction to the Collamat® . Keep care to the polarity of the diode !

The FLAP signal can be adjusted in the configuration menu of the monitor. The signal can be switched on or off. If it is turned off no FLAP signal is generated. If it is turned on FLAP is simultaneously generated to the FEED signal. The FLAP signal additionally can be extended. This adjustment also is made in the configuration menu when the adapter magnet is turned on. The time can be adjusted in 0.1s steps.

Testing the monitor with the diagnostic connector

In the firmware of the monitor C9100 there is a self-test function for the monitor electronics. This test only may be successful with a diagnostic connector attached to the three connectors on the back plane of the monitor. Figure 57 shows the diagram of the wiring of this connectors:

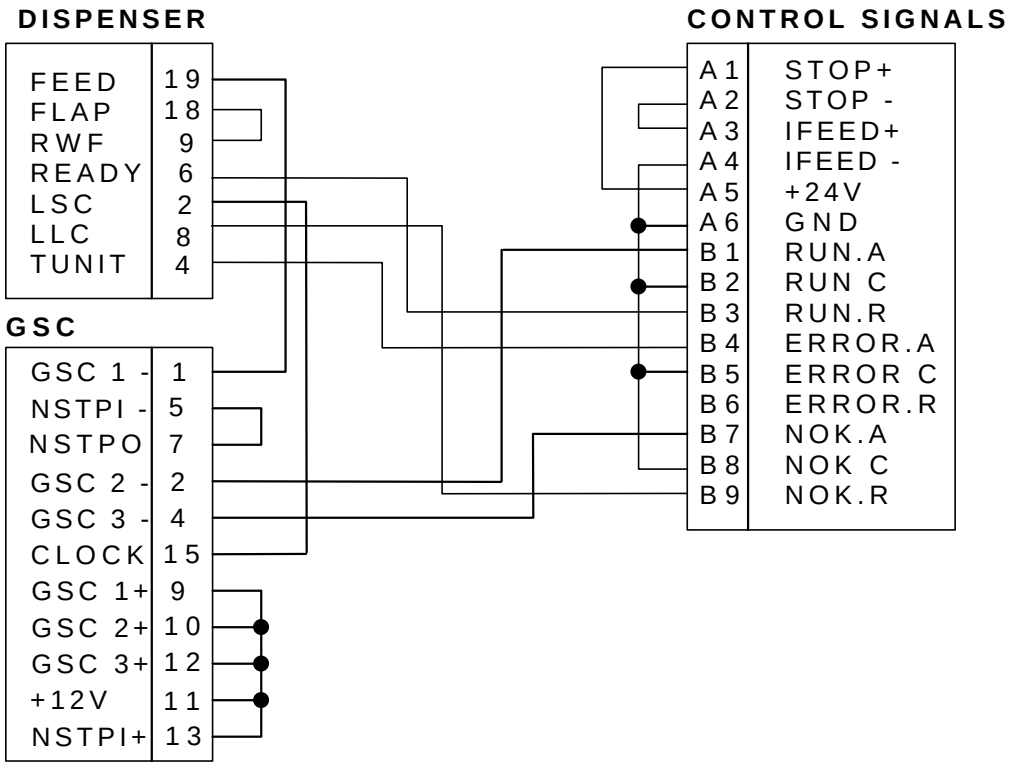


Figure 57: Diagnostic connector

Cabling and setting up

For a troublefree operation of the Collamat® 9100 following items must be observed:

- Trained personnel
- Ambient temperature
- Dirt and dust
- Splashing water
- Installation and setting up of the installation
- Installation and setting up of the Collamat® 9100
- Electromagnetic interferences
- Safety regulations and safety requirements

Cabling

Electromagnetic interferences can lead to non repeatable and not obvious errors while labelling. Often misplaced layout of the cabling, RMI and ESD interferences disturb the labelling. Because of this the following rules must be observed for the cabling:

- Separated mains and signal cables
- Use shielded cables
- All units must be grounded
- Connect only devices which meet the RMI standards
- Use power filtering units in interfered environments and interfered mains supplies

Setting up

The setting up must be done carefully by trained personnel. The following items must be observed:

- Visual control of the control unit
  Are all electrical and mechanical units correctly attached ?
  Are all connectors accessible ?
- Connect the monitor to mains and switch it on
  Is the display illuminated ?
  Does the startup message appear ?
- Turn off the monitor and unplug it from mains
- Set up the winder and unwinder and connect it to the connector box
  Are the jumpers inside of the winders set correctly ?
- Attach the goods scanner signals to the DISPENSER connector
- Connect the monitor to the mains voltage an turn it on
  Do the winder turn the right way ?
- Turn off the monitor and unplug it from mains
- Connect the remaining units to the connector box of the Collamat®
- Connect the monitor to the mains voltage and turn it on
  Do the peripheral units work OK ?
- Turn off the monitor and unplug it from mains
- Attach the motorcable
- Connect the monitor to the mains voltage and turn it on
  Does the motor work in the MOTORTEST-menu ?
  Is the turning direction OK ?
- Thread the paperweb and adjust the label scanner
- Dispense a label by the control panel
  Is it dispensed correctly ?
- Connect the goods scanners (and possible incremental encoder)
- Dispense a label by the goods scanner
  Watch to the error messages on the display

Fuses

Fuse	Rating	Part Number
Monitor	110/120V: 10 AT 220/230/240V: 5 AT	7403.0833 7403.0822
Interface F1	4 AT	7403.0800
Interface F2	10 AT	7403.0333
Connector box F1	5 AT	7403.1224

Glossary

Short cuts

ESD **E**lectro**S**tatic **D**ischarge
RMI **R**adio **M**agnetic **I**nterference
GND **G**rou**ND**
IR **I**nfra **R**ed
LCD **L**iquid **C**rystal **D**isplay
LED **L**ight **E**mitting **D**iode
nc **n**ot **c**onnected
RS232 Standard serial data exchange protocol

Signals

ERROR Errorsignal caused by any error of the Collamat®
FEED Signal indicating the labelling process
GND **G**rou**ND**
GSC **G**oods **SC**anner
IFEED **I**solated **FEED** signal
LLO **L**abel **LO**w signal indicating the end of the label stock
LSC **L**abel **SC**anner
nc not connected
NOK **N**ot **OK**, something not OK
NSTPI **N**on**ST**o**P** **IN**-put
NSTPO **N**on**ST**op **OUT**-put
READY READY signal from peripheral units
RWF **R**e**W**inder **F**ull
TCY **T**ransparen**CY**, Control current for the label scanner IR-diodes
TUNIT **T**raction **UNIT**, signal that supervises the traction unit

Terms

Stopping accuracy: Accuracy of the papertransportation
Unwinder: Device that carries the full paperweb rolls and unwinds it
Adapter: Part of the labeler. Here the label is peeled of the paperweb by pulling it over a sharp edge
Rewinder: Device that takes the empty paperweb from the traction unit and rewinds it
CE-Mark: Certification for the European market, means: **C**onformité **E**uropéenne
Collamat®: Brand name for a labeler built by Collamat Stralfors.
C9100: Labeler type C9100
GSC: Goods **SC**anner
Flap adapter: Adapter which moves to the product during the labelling
LSC: Label **SC**anner
LC-Display, LCD: Liquid crystal display
Machinestatus: Working mode of the Collamat®. E.g..: Stop, OK, ERROR
Monitor: Controlbox containing all electronic boards of the Collamat®
Position: Sticking position of a label on the good
Predispensing: Predispensing of a label on the peeling plate
Motorstep: Travelling way of the label for one motorstep
Dispensing speed: The speed of the goods to which the labels are sticked
Speed: See also dispensing speed
Startfrequency: Highest possible frequency for a steppermotor to start moving without loss of steps
Traction unit: Part of the dispenser in which the paperweb is pulled

Technical data

Dispenser general data (standard values)

System	Units	C9110	C9120	C9130
Version		right/left		
Dispensing speed	m/min	0.5-80	0.5-60	0.5-40
Min. label width	mm	20		
Max. width of the paperweb	mm	95	160	250
Min. label length	mm	10	15	20
Min. label length @ max. dispensing speed	mm	28	13	10
Stop accuracy	mm	@ 40 m/min ± 0.5		
Minimal gap between labels for optical scanner	mm	3		
Minimal gap between labels for mechanical scanner	mm	2		
Max. diameter of paperroll	mm	350		
Max. weight of paperroll	kg	20		
Noise figure max.	dB(A)	< 70		

Traction unit

System	C9100
Driver	3-phase steppermotor 500 steps
Motor voltage	120V
Max. phase current	5.0 A
Type of protection	IP40
Ambient temperature	+5-40 °C
Ambient humidity	15-90%, non condensing
Noise figure max.	70 dB(A) @ 1 m distance

System	C9110	C9120	C9130
Weight	8.2 kg	9.0 kg	10 kg

Midi-unwinder

Diameter of the roll core	42 mm
Max. outside diameter of roll	350 mm
Max. weight of roll	20 kg
Empty weight	4.2 kg
Spring dancer with automatic brake	

Motor driven rewinder and unwinder

System	Rewinder	Unwinder
Diameter of roll core	42 mm	
Max. diameter of roll	350 mm	
Drive	current controlled DC-motor, electromagnetic brake	
Electric power	24 V DC, 3A max.	24 V DC, 3A max.
Type of protection	IP54	
Ambient temperature	+5-40 °C	
Ambient humidity	15-90% non condensing	
Noise figure max.	70 dB(A) @ 1 m distance	
Weight	5 kg	

Flap adapter

System	C9110	C9120	C9130
Max. width of paperweb	95 mm	160 mm	250 mm
Weight	4.5 kg	5.0 kg	5.6 kg

Version	right/left
Adapter angle	±90°, with adjustable snap-in locking
Recuperating spring force	adjustable
Additional press time of adapter	adjustable
Max. cadence on max. turning angle	10'000 cycles/h
Max. turning angle	15°
Ambient temperature	+5-40°C
Ambient humidity	15-90% non condensing

Label scanner

Optical label scanner
Mechanical label scanner
Black mark reader (optional)

Monitor

System	C9100
Mains voltage	110/120V AC, 220/230/240V AC, ±10%
Power consumption	480 VA
Main fuse	110V : 10 AT, 230V : 5 AT
Display	LCD, 4 lines, 20 characters each
Dimensions (LWH in mm)	375 * 305 * 155 mm
Ambient temperature	+5-40°C
Max. ambient humidity	15-90% non condensing
Type of protection	IP40
Weight	approx. 15.5 kg

The information in this handbook reflects the state of the publication date.
We reserve the right to make design modifications.

Trouble shooting checklist

Machine-Type:		Ser.No. Monitor:	Ser.No. Labeler:
Ser.No Control panel:	Software-Version:	Ser.No. Motordriver:	Ser.No. Interfaceboard:
Environment	Mains voltage:	Frequency Hz:	Temperature °C:
	Humidity %:	Interference level (Burst):	Interference level ESD (Static):
Labels	Width:	Length:	Gap:
	Thickness:	Transparency:	Material:
Paperweb	Width:	Thickness:	Transparency:
Goods	Kind:	Material:	Shape:
	Length:	Width:	High:
	Speed m/min	Length in transportation:	Distance:
Labeler	Speed m/min:	Pieces / min.:	Measuring:
Settings	Predispensing:	Position mm:	Suppression:
	TCY value:	Label length:	Suppression:
Special:			
Machine-environment	Goodstransport:	Feeder:	Taker:
	Other machines around:		
Peripheral units	1	2	3
Screening	Mains cable:	Sensorcables:	
ESD-Phenomena	Description:		
Description of the malfunctions:	Accumulation	frequent: repeated:..... spontaneous:	sec
Date / ev. date and time of the last disturbances:			
Comments:			
Disturbance registered by Name: Date:			

Please make a copy of this list before using it.