

Operation and Maintenance Manual

A101W Wrap-around Labeling System



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1. Introduction

1.1. About This Manual

Welcome to read this user's manual for the A101W Wrap-around Labeling System. This manual is written for frequent reference for the users of the machine. It covers the following topics.

- Introduction – an overview of this manual and important safety and hazard information about the machine.
- Transportation – instructions on transporting the machine.
- Installation – information on installing and setting up the machine.
- Overview – here we will give an overview on various main components.
- Labeling Engine – introduce the labeling engine.
- Technical Specifications – technical specifications of the machine
- Start-Up – provides guidance information to help the user to start using the machine quickly.
- Adjustments – adjustment steps and parameters for the operating components of the machine.
- Touch Control Panel - introduction of the user interface.
- Maintenance – routine maintenance procedures and change of the wear-and-tear parts.
- Trouble shooting – system alert messages and procedures to resolve problems.
- Appendix – reference materials and information to use along with this manual.

1.2. Safety

This section contains important safety advices. They must be read carefully before using the machine.

A101W Wrap-around Labeling System is designed and manufactured with safety in mind. However, even with the best safety features installed, non-compliance with the safety measures or procedures during operation or service of the machine may still lead to accidents which may damage the machine or cause body injury. To avoid accidents, all personnel operating, maintaining or servicing the machine must follow

all safety procedures strictly when operating, maintaining or servicing the machine.

This section contains important safety rules and procedures. Everybody who will work with or on the machine must be read through this section first carefully and follow such rules and procedures strictly when operating, maintaining or servicing the machine.

Safety warnings are classified in three levels, namely,

DANGER, WARNING and CAUTION (in decreasing order of seriousness). Throughout this manual, the following notations will be used to denote the different level of safety warnings.



Danger description. This warning symbol highlights a description of circumstance that is hazardous to the body or health of the user. The description explains the details of the hazard and the corresponding measures to avoid.



Warning description. This warning symbol highlights a description of circumstance that contains potential hazard to the body or health of the user. The description explains the details of the potential hazard and the corresponding measures to avoid.



Caution description. This warning symbol highlights and a description of circumstance that contains potential hazard to the physical status of the machine or the integrity of the machine software, but is not harmful to the user. The description explains the potential hazards and the measures to avoid

1.2.1. Danger Circumstances



High Voltage. When the machine is connected to the power source, there will be high voltage present in the machine. Only trained and authorized personnel may carry out maintenance work on the machine. When it is really necessary to open the control cabinet of the machine for service, the machine should be disconnected from the power source first to avoid body injury or possible fatal accident.

 **DANGER – Mechanical Injury**

Mechanical Injury. Whenever the machine is running automatically or under manual control, no part of the body should get close to or get into the running components of the machine to avoid the danger of being pull into the machine or other mechanical injury to the body.

When it is necessary to carry out machine maintenance or service work, always put a warning sign showing the “Maintenance in progress” status of the machine at a visible position nearby the machine to alert people around the machine. Always make sure the machine is disconnected from the power source when inspecting, maintaining or servicing the machine.

1.2.2. Warning Circumstances

 **WARNING – Emergency Stop Button**

Emergency Stop Button. Please always remember the position of the emergency stop button(s) and understand how to use it in order to be able to push the button soonest possible at emergency.

Before starting the machine, please always understand the function and reaction of the emergency stop button(s), the safety switches of the safety enclosure/ doors, and all the photo-sensors. Whenever abnormal reaction is recognized, from these components, do not operate the machine and call for service from the machine’s manufacturer or distributor.

**- When more than one operator**

When more than one operator. When there is more than one operator, someone in contact with the machine can be hurt if another operator turns on the machine without acknowledging the others.

When there are more than one persons working with the machine, any person needs to turn on the machine, prior to doing so, must acknowledge clearly and make sure that no other persons are in contact with or within a dangerous distance to the machine.

**- Restarting upon sudden power break****when machine is running**

Sudden power break when machine is running. When the power is broken suddenly, the machine will stop immediately. Turn the main switch to the OFF position as soon as possible. Identify the cause of the power breaks and fix it first. Clear up any material at the Conveyor and Dispensing Blade. Then, turn the power on again and re-start the machine running.

**- Restarting after pressing the emergency****stop button when machine is running**

When the emergency stop button is pressed when the machine is running, the machine will stop immediately. Identify the relevant problem and resolve it first. Clear up materials at the Conveyor and Dispensing Blade. Then, release the emergency stop button and re-start the machine running.

1.2.3. Caution Circumstances

**- Damaging Machine**

Damaging machine. Whenever the machine is connected to the

power source, do not engage or disengage any electric connectors of or to the machine, otherwise it may damage the machine.



- Do not touch the machine immediately after motion stopped

Do not touch the machine immediately after motion stopped.

Although the machine motion is stopped, the stoppage can be temporary pending for materials or the next operation step. The machine may re-start motion automatically upon fulfillment of certain conditions. Even though the condition may be manual input in some circumstances, mis-operation may also cause the machine to re-start suddenly.



- Installing the Machine

Installing the machine. If the machine is installed in user's own mounting bracket, make sure that the machine is held firmly and stably. The mounting for the control panel can be rotatable with limited turning degree.



- Lock the Mountings before Operation

Lock the mountings of all components before operation. All the components should be properly installed. After necessary adjustment on the position and orientation, lock the mounting brackets to provide stable support. Loose mounting may cause unstable performance and damage to parent machine and operator.



- Cleaning the Machine

Cleaning the machine. For the daily cleaning of the machine, preference should give to the use of suction device to clean the dust and dirt. If compressed air is used to blow clean the machine, make sure that necessary safety measures and acknowledgement are done

to avoid blown up debris hurting the people around.

For cleaning the machine surface with detergent is needed, always use pH neutral detergents. If detergents of other acidity are used, make sure the safety advice of the detergent is followed and make the necessary precaution.

Do not wash the machine directly with water or detergent directly which may cause permanent damages to the machine.



- Dismantling Parts from the Machine

Dismantling parts from the machine. When dismantling change parts from the machine for change over, or dismantling parts for services, please always pay attention to the necessary safety measures to avoid possible body injury on one hand and possible damages on the machine on the other. Please also make sure proper tools are used to dismantle the parts.

Before doing such work, always make sure the machine is in a fully stopped status, and then hang up a sign at a visible position of the machine to indicate the machine's status.



- Do not stop the machine by directly disconnect power supply

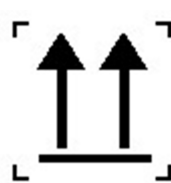
Do not stop the machine by directly disconnect power supply.

Do not always use such way to stop the machine. Otherwise it may damage the components of machine.

2. Transportation

2.1. Shipping Transportation

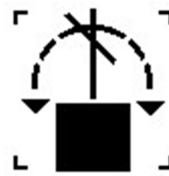
The machine is packed in wooden crate when shipped from the factory. The wooden crate is good for long distance transportation and handling. The packaging is marked with the following shipping and handling instructions:



Upright



Keep dry



Do not roll

The handling instructions must be strictly followed when transporting the machine with the packaging.

The machine is good for shipping transportation only when properly packed in the original packaging or in a package of equivalent strength and protection. In any circumstances, the machine position should be fixed correctly and firmly inside the package.

The packaged machine or the bare machine is not designed for hoisting. Hoisting of the machine can only be done with proper packaging and by competent persons strictly following all relevant safety standards and practice.

2.2. Storage

The storage environment should fulfill the following,

- Relative humidity between 10%~90%
- Temperature between -25°C~55°C

High humidity and temperature may cause water condensing on the machine surface.

The equipment can withstand up to 70°C for transportation and storage in short periods not exceeding 24 hours.

2.3. On Site Movement

When moving the machine on site, a frog-lifter can be used to lift and relocate the machine between installation points. The frog-lifter should provide a lifting arm of at least 1m long. The lifting arm should go fully across the width of the machine underneath the base beams. The operator should also understand the safety instruction of using the frog-lifter.

Short distance movement on sufficiently flat floor within the same factory floor can be done by pushing the machine with its casters. Sufficient care must be taken to avoid any part of the machine from running into any external items when doing so.



– Relocating the Machine

Relocating the machine. When it is needed to move the machine within the same factory, the casters of the machine can be used. The movements should be on flat floors and in small steps. The operators must be well aware of the necessary safety measures and must avoid over-pushing the machine or banging the machine with other items.

If a frog-lifter is used to transport the machine, the frog-lifter should provide a lifting leg of no less than 1000 mm long. It must also ensure that the lifting leg goes under the full width of the base cabinet and lift on the base beams of the cabinet. The operator should also understand the safety instruction of using the frog-lifter.

3. Installation

The machine must be installed by a qualified service engineer, and must be checked up regularly as suggested in this manual

3.1. Power Source

Make sure that the power source is within the range of power source requirement as labeled at the machine's main switch. If the rated voltage of the power source is different from the machine's requirement, consult Colamark or your local distributor.

Only use the power cable come with the machine. The power cable should be housed inside an electric duct at the installation point. If electric duct is not available, the cable must be adequately protected by a sufficiently strong conduit to avoid any physical damages on the cable. Only use approved power plug on the cable. The power plug should be equipped with adequate grounding leg.

Always maintain the cable, power plug and the power socket clean and dry.

3.2. Earth Connection

The machine must only be connected to an A/C power source with proper earth connection complying with the IEC requirements or the local regulations. Any disconnection from the protective earth connection will be dangerous and may also result in damages to the equipment.

3.3. Compressed Air

The machine uses compressed air. Always ensure the compressed air is clean, dry, steady and of sufficient pressure. The compressed air supplied must be dried and cleaned with 10u (or above) filtration to avoid damages on the machine.

3.4. Documentation and Components

Make sure the machine is complete with all components, and all necessary change parts are ready. Make sure the operation and maintenance manual is available before and during operating the machine.

4. Overview

The Colamark A101W Wrap-around Labeling System is designed particularly for the automatic labeling on round bottles for the pharmaceutical, food and beverage, cosmetics industry.

PLC controlled and designed with ease of use, compact structure, and flexibility in mind, the system offers touch control HMI, stepless speed control, and stand alone or in-line usage mode.

The system can also be equipped with various in-line coding equipment including thermal transfer overprinters, inkjet printers, or high-speed hot stamping coder.

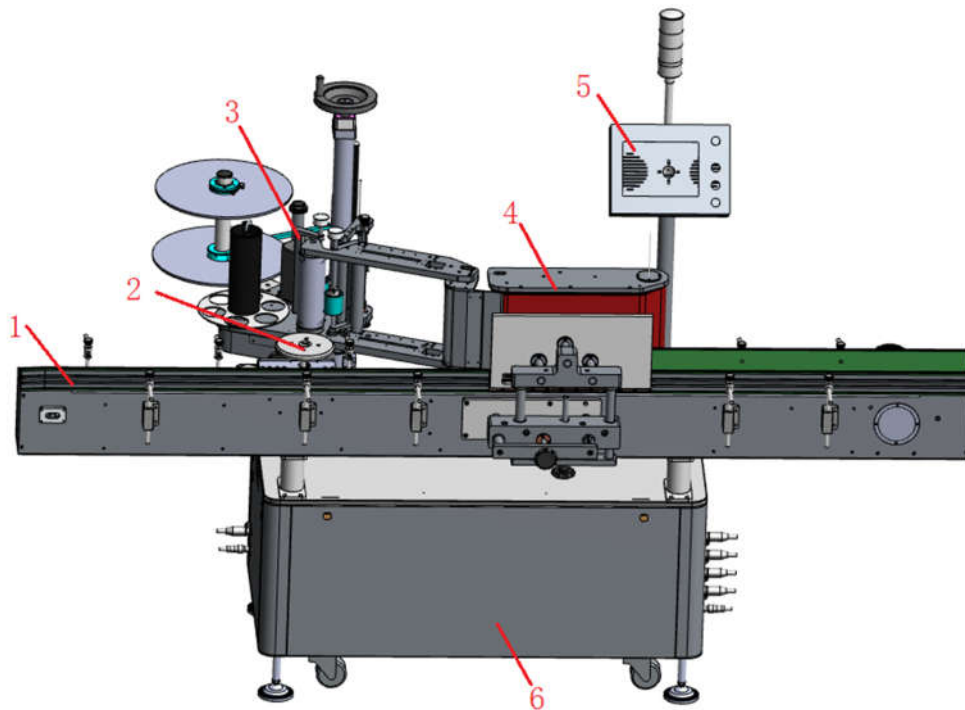
The system can be used in-line with other equipment or stand alone with manual feeding or automatic feeding with an optional turntable.

4.1. Features

- Servo motor driven labeling engine to ensure high speed and precise labeling position.
- Controlled by touch control panel, parameters input and adjustment is straight forward and easy.
- Applicable on wide range of bottle diameter.
- The stepless speed adjustment on feeder, main conveyor and collecting conveyor caters different requirements.
- High precision photo sensors with digital display, automatic and manual sensitivity adjustment.
- Object sensor with noise elimination to avoid interference from external lighting and ultrasound sources, ensuring precise object detection.
- Rust-free material construction such as stainless steel and aluminum profile for GMP compliance.
- Optional high speed hot stamping coder to give crisp and clear marks of batch number, date codes etc. at low cost, achieving up to 350 codes/min synchronized with the labeling action.
- Optional loading turntable automatically and continuously feeds bottle stably to the machine.
- All control components used are of world class brands to ensure long term system reliability.

- System log and error log to record all major events and system detected errors for easy operation management and maintenance support.
- Factory setting of control parameters can be reloaded when necessary.
- Control interface provides memory to save up to 50 set of parameters.
- Low label alert or reach of pre-set quality alert to facility label quantity management.
- Intelligent and automatic parameters adjustment.

4.2. System Architecture



1. Conveyor
2. Separation Wheel
3. Labeling Engine

4. Wrap-around Device
5. Touch Control Panel
6. Electric Cabinet

4.3. Main Components

4.3.1. Bottle Separating Device

The Bottle Separating Device consists of a forward turning wheel at lower speed

than the conveyor. The gap between the Separating Wheel and guide of conveyor is just a little smaller than the bottle width so that the bottles can be driven through slowly one by one at the pace of the wheels. Thus, the bottles are separated into the required minimum spacing for the labeling afterward.

4.3.2. Object Sensor

The Object Sensor is a reflective optical sensor. Its amplifier detects the reflected light intensity to distinguish the arrival of the object. As default the label dispensing starts after the Object Sensor is triggered, the Object Sensor should be located in front of and close to the dispensing blade.

4.3.3. Labeling Engine

There is a servo driven Labeling Engine installed on the side of the main conveyor. It dispenses label when triggered each time and adapt the label on the product. Please refer to Section 0 for more details.

4.3.4. Wrap-around Device

It contains Wrap-around Belt and Backing Plate. When the bottle arrives the Wrap-around Device, Labeling Engine dispenses one label. The bottle is then rotated by the Wrap-around Belt and the label is adapted onto the bottle.

4.3.5. Touch Panel

The Touch Panel is the user interface of the system. Users can set operating parameters, view the statuses and control the machine through the panel.

4.4. Electric Control Cabinet

The motion control components, the logic control components, and the controller box of the optional items are installed in the base cabinet of the machine.

The main control components are:

- **Inverter and Motor Speed Controller:** The turntables, loading conveyor, bottle separator and the wrap around belt use inverters for speed adjustment. The stabilizing conveyor uses a motor speed controller for speed adjustment.
- **Servo Motor Controller:** The labeling engine uses a servo motor controller.
- **PLC:** The system uses PLC for overall control of motions.
- **Photo-electric Sensors:** The system uses photo-electric sensors to determine presences and position of the objects.
- **Touch Control Panel:** Provide user interface of system control.

4.5. Pneumatic Components

Compressed air is used in label dispensing process. The main components used are as follow.

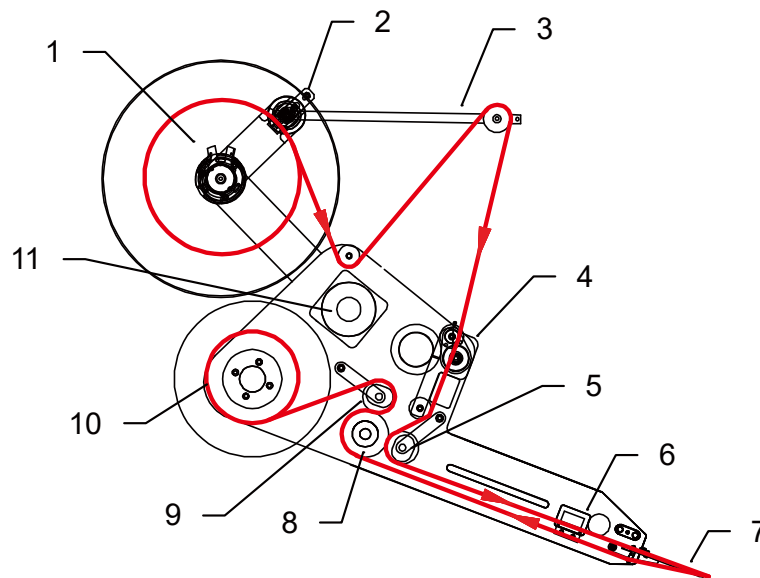
- **Air filter and regulator:** Connect to the main air supply to filter out the particles and moisture from the input compressed air.
- **Pressure regulators:** There are small pressure regulators to regulate the air pressure and provide the right pressure to the relevant components.
- **Electric Valve:** To control the motion of the pneumatic components.
- **Cylinder:** To execute the motion of the device.

For the requirement of compressed air, please refer to the details in the Section 3.3.

5. Labeling Engine

A101 is a standard labeling engine that can be used stand alone or as a component in various Colamark labeling machines. It can be fitted with various coding devices for synchronized online coding.

5.1. System Architecture



- | | |
|---------------------------|------------------------|
| 1. Label Unwind | 7. Dispensing Blade |
| 2. Unwind Braking Pin | 8. Traction Roll |
| 3. Dancing Arm | 9. Liner Pressing Roll |
| 4. Label Braking Assembly | 10. Liner Rewind |
| 5. Label Pressing Roll | 11. Servo Motor |
| 6. Label Sensor | |

5.2. Working Principle

1. When the object reaches and triggers the object sensor, the labeling process starts.
2. The Traction Roll pulls the label liner. The Label Unwind supplies label.
3. When the label liner moves around the edge of the Dispensing Blade, the label will be peeled off from the liner.
4. The Label Rewind picks up the blank liner after label dispensing.
5. The Label Sensor detects the next label gap and the Traction Roll stops.

6. Process repeats when another object triggers the object sensor.

5.3. Main Components

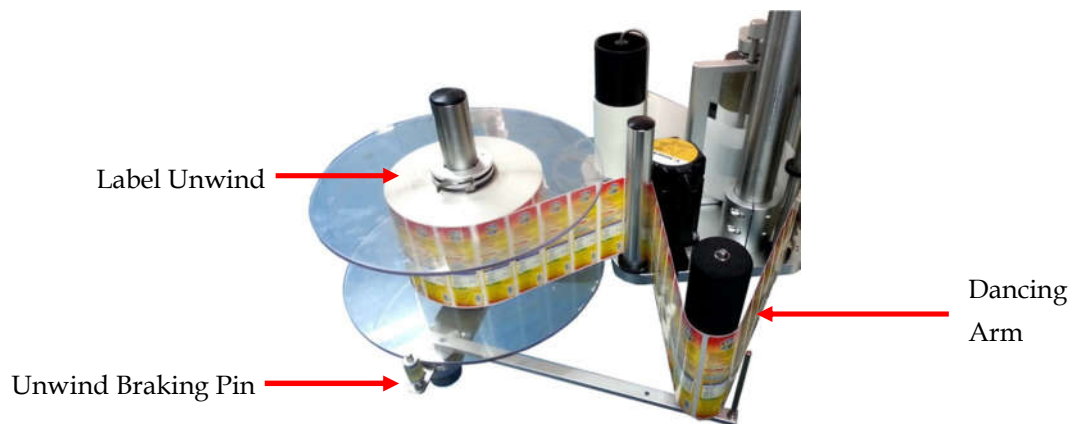
5.3.1. Label Unwind

It holds the label roll and supplies labels to the Labeling Engine in a stable tension range.

5.3.2. Dancing Arm

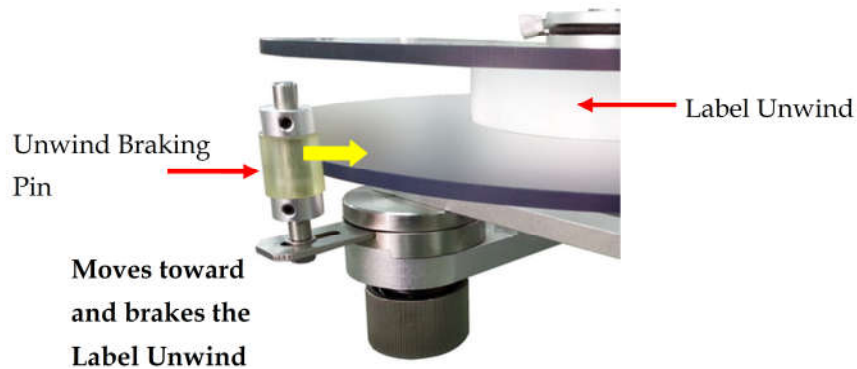
The Servo Motor drives the label web through the Traction Roll. Because of the momentum of the label roll, a Dancing Arm providing a buffer of labels is used to ensure smooth and even-tension pulling from the Traction Roll.

When the Traction Roll pulls the label web, the Dancing Arm moves toward the labeling engine and releases labels from the buffer. The Dancing Arm then pulls labels out from Label Unwind to replenish the buffer when it bounces back



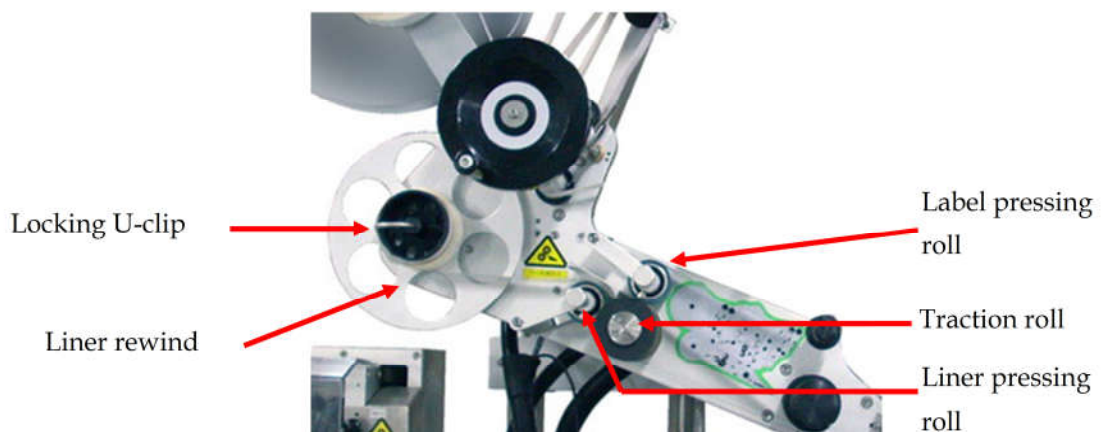
5.3.3. Unwind Braking Pin

This pin serves to brake the Label Unwind. When the Dancing Arm bounces back and pull label out from the label roll, the momentum of the label roll tends to release more label even when the Dancing Arm stops. Unwind Braking Pin is designed to move toward the rim of the Label Unwind and stop its movement when the Dancing Arm is about fully released, as shown in the figure below.



5.3.4. Liner Rewind

The liner rewind is a turning shaft with a locking u-clip to collect the blank liner after the labels are dispensed.



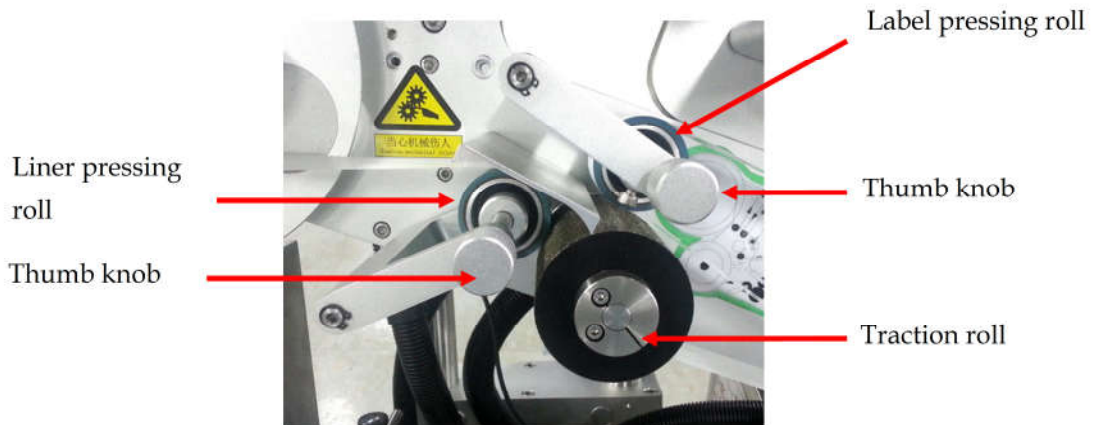
5.3.5. Traction Roll

Driven by the servo motor, the traction roll drives the label web movement at a system controlled pace. Its rough surface provides friction grip to the liner.

5.3.6. Label Pressing Roll and Liner Pressing Roll

The Label Pressing Roll and Liner Pressing Roll are rubber rolls to hold the label and liner against the traction roll to create sufficient friction for the traction. These rolls are latched and can be opened and closed with a thumb knob when threading the label. Close the latch during operation otherwise the label movement will not be accurate. These rolls also use a “floating” design so that they are self-aligned to avoid side-shifting of the label web at high speed

movement.



5.3.7. Label Braking Assembly

The assembly consists of a latched metal plate pressing on the label web against a backing roll. It brakes the motion of the label web while it is pulled by the traction roll to prevent the label web from slack. This plate and the roll also serve as a no-label detector. When the label is finished or the label liner is broken, this plate will be in direct contact with the backing roll, thus shorting a detection circuit and triggering the no-label alarm.

When threading the label, it is important to pass the label web between this plate and the backing roll; otherwise the no-label alarm will always be on. It is important to tighten up the latch of the metal plate so that the label web can be maintained tight when pulled by the traction roll. Slack label web will cause excessive label stopping error.



5.3.8. Dispensing Blade

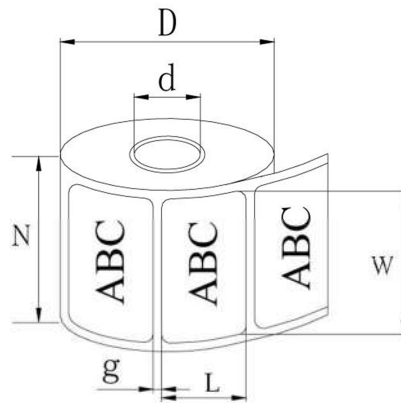
The Dispensing Blade provides an abrupt tuning at the liner path so that the label can be peeled off and dispensed. The Dispensing Blade can be customized when necessary to cater for the particular geometry of the object and the installation.

5.3.9. Label Sensor

The Regular Label Sensor (Standard) near the Dispensing Blade is able to detect the gap between two non-transparent labels during the motion of the label web and tells the Traction Roll to stop. Tune and set the threshold value to trigger the sensor. Please refer to section 9.5.

5.4. Label Requirements

The labeling engine requires certain specifications from the label and this should be met. The required specifications on the label are:



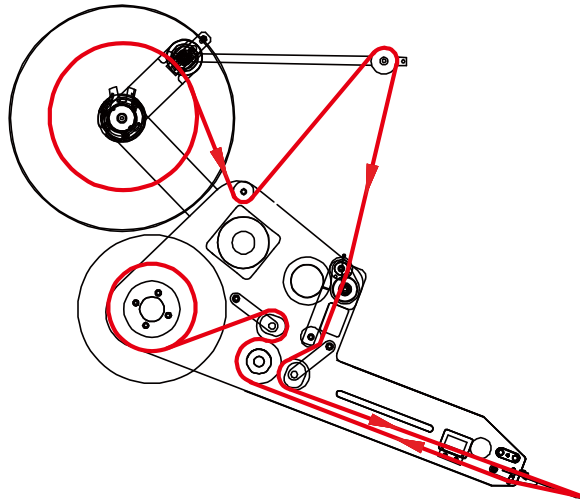
- The label roll should use a liner of sufficient tensile strength, translucent. Recommended liner materials are Glassine paper or synthetic films.
- The face stock of the label should be of sufficient stiffness and of thickness not less than 5×10⁻⁶ m (5μm)
- The external diameter (D) of the label roll should be less than 340mm while the internal core diameter (d) should be 76.2mm.
- The gap between consecutive labels (g) should be larger than 2.5mm.
- The label length (L) should be within the range of 10mm to 300mm.
- The liner width (N) should be within the range of 18mm to 100mm.

5.5. Threading Label

Take out the side plate of the label unwind by holding the spring loaded tension ring

on the side plate. Put the label roll into the shaft. Draw out a label web from the roll for about 1m long. Detach the labels on this portion of liner to form a leader. Loosen the label pressing roll and label breaking assembly. Then, thread the label correctly as illustrated underneath. Fix the leader of the liner to the liner rewind with the locking u-clip. Lock up the label pressing roll and label breaking assembly before operation.

Thread the label web according to the figure below,



5.6. Label Dispensing Parameters

There are several parameters needed to be set for the labeling process. They are:

- **Speed:** The label dispensing speed (S) (3-50 m/min). It is necessary to match with the linear speed of the substrate surface. If the speed is too slow, the liner will be pulled by the label, causing slack liner thus inaccurate label stopping position. If the speed is too fast, the label may wrinkle on the substrate.
- **Label Offset:** This refers to the offset position (0-500mm) of the label when it stops after the label sensor. For different length of labels, if the label stops immediately once the label gap is detected, the pre-dispensing length of the label at the dispensing edge may not fulfill the application need. (normally 0.5~2mm pre-dispensed ideally). Thus it is necessary to adjust the Label Offset to obtain the desired pre-dispensing length.
- **Delay:** This refers to the delay of the labeling action when the object sensor is triggered (e.g. bottle detected). (0-1000ms)
- **Label Length:** This provides a reference value for the system to detect label roll defects such as missing label or un-removed matrix on the liner etc. Recommend to set this value to the length of an actual label plus the width of the gap between labels. If this value is set to be less than the actual label length, the system will always alarm for the label length error and stop. (5-500mm)

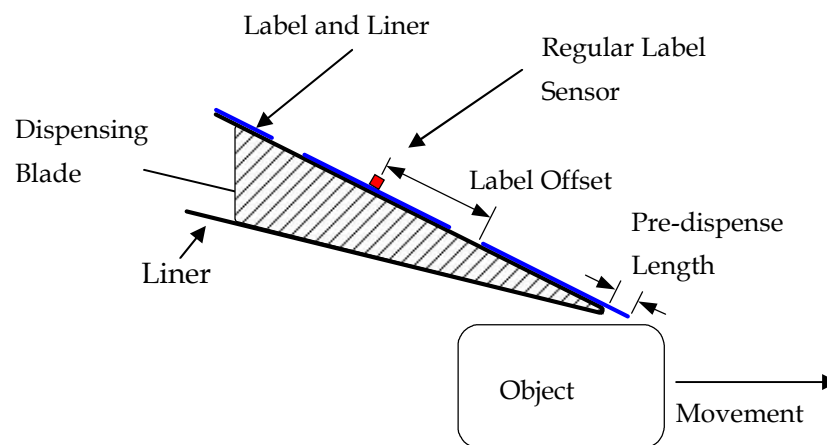
Check with Control Panel section for the procedures of parameter settings.

5.7. Adjustments

5.7.1. Pre-dispense Length

To achieve the most appropriate labeling effect, the label should be pre-dispensed to some extent such that the label is closer to the substrate than the dispensing edge but without touching the substrate. The pre-dispense length cannot be too short, otherwise it may cause higher error in labeling or missing label. If the pre-dispense length is too long, wrinkling may occur.

To adjust the pre-dispense length, adjust the label offset parameter. The relationship between these is shown below. Ideally, the pre-dispense length is about 0.5~2mm.

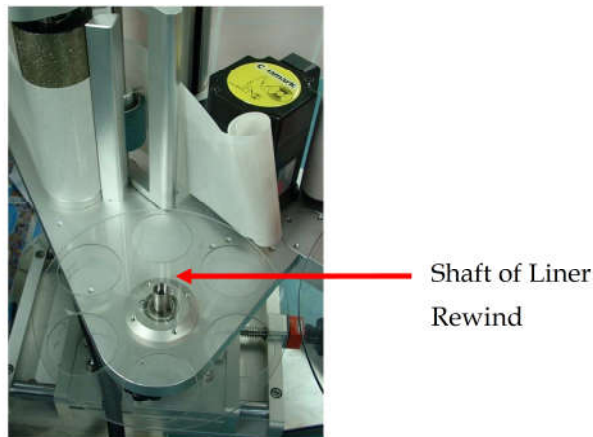


5.7.2. Tension of Rewinding

Observe the motion of the liner rewind. It should be in such a way that it picks up the used liner always timely when the traction roll moves so that the portion of liner after the traction roll is always tight. If the liner becomes noticeably slack before or after it is picked up by the liner rewind, it indicates excessive slipping at the friction washers. In another extreme, if the liner after the traction roll appears too tight to the extent that it is about to break (particular for narrow liner), it indicates excessive pressure on the friction washers. Excessive pressure may also cause premature failure of the friction washers.

To adjust the pressure on the friction washers, remove the core of Liner Rewind

by releasing the two screws at the lower part of the core. Then, access the shaft of the Liner rewind as shown below.

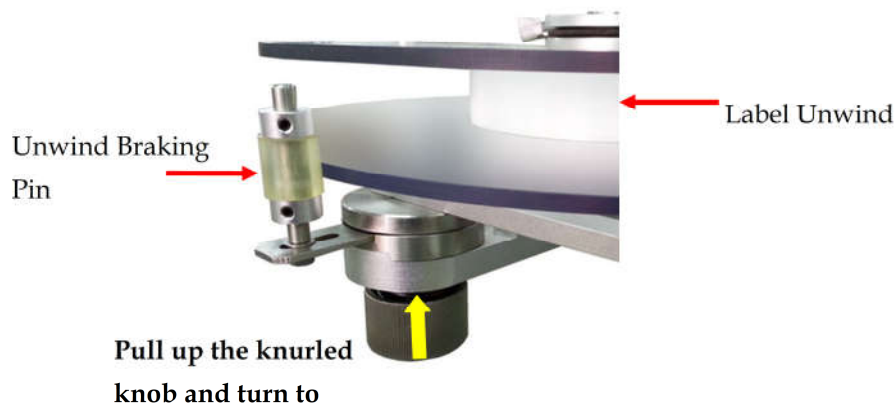


Turn the screw which is inside the shaft to adjust the pressure on the friction washers, thus adjust the tension of rewinding.

If the label liner still cannot be fully picked up at the full pressure, replacement of the friction washers is needed. Please refer to section 11.3.

5.7.3. Dancing Arm Tension

The Dancing Arm serves as a buffer in the label path so that the resistance from the inertia of the label roll will be evened out. Adjust the Dancing Arm tension by pulling up the knurled knob at the end of the arm, and turn it to another latch position then put it back. The Dancing Arm tension should not be adjusted too light otherwise it will not bounce back, and it should not be adjusted too tight otherwise it may cause too much resistance to the Traction Roll. Either way, it is not providing the adequate buffering effect. The tension should be adjusted correctly such that the arm will be pulled downward when label web is moving forward, and then bounces back and pulls label out from the Label Unwind.



6. Technical Specification

6.1. Machine Parameters

Conveyor Speed	0~30 m/min
Wrap-around Belt Speed	0~30 m/min
Label dispensing speed	3-50 m/min
Labeling Speed	Max. 200 bottles/min, depends on bottle and label size
Labeling precision	± 1.0mm
Power	1050W
Power Supply	120V 60Hz
Compressed air	>0.5MPa, Clean, dehumidified

6.2. Label Roll Specification

Minimum label length	10mm
Minimum label width	10mm
Minimum label gap	2.5mm
Maximum label roll outer diameter	340mm
Label roll core diameter	76.2mm

6.3. Operation Environment

Temperature	Storage: 0~40℃; Operation: 4~30℃
Relative humidity	non-condensing 15~90%

7. Start-up

7.1. Daily Check-up

- Clear up all foreign substances and obstacles on the conveyors, wrap around belt, labeling engine and the exit conveyors.
- Inspect labeling engine, wrap around belt, printing device and ensure that they are in the normal operation position.

7.2. Start Up Procedures

1. Check and confirm the electricity supply is of the correct specifications.
2. Check and confirm the compressed air supply if of the correct specifications.
3. Make sure the bottles and the labels are ready. Install the label roll to the Labeling Engine and ribbon to the thermal transfer printer.
4. Check whether all components of the machine are well adjusted according to the size of the bottle and the label.
5. Make sure that the door of Electric Cabinet is closed.
6. Turn on the power supply. The system will carry out a self-diagnosis and the Touch Control Panel will start up.
7. Setting the parameters or loading program through the touch screen panel (Refer to the Touch Control Panel Operation Manual).
8. Start the operation by pressing “RUN” on the touch screen panel.
9. Place a bottle on the conveyor to test the performance.

7.3. Trial Run

When setting up the machine for a new product, always set the speeds of the devices and conveyors to the minimum possible and put single pieces of bottles through the system for set up. Fine tune the positions and speeds setting of each devices and conveyors by trial and error then put a larger batch of bottles for a trial run before actual operation run.

When change over from one product to another, recall the parameter setting of the next product from the memory. Make the mechanical set up adjustments. Reduce the operation speeds and run a single bottle through to confirm the mechanical

adjustment before bring back the speed to the normal and going into normal operation run.

7.4. Stopping the System

7.4.1. Normal stop

Click the "Stop" button on the main menu (or press down the "Stop" button on the control panel box directly) to stop the system from running. The system will stop upon completing the labeling process of the last item. The red light of the beacon will be on steadily.

7.4.2. Emergency stop

Whenever there is any accident or abnormalities, press the emergency stop on the control panel. The system will stop immediately. The red light of the beacon will flash with intermittent buzzer alarm. The main menu on the control computer will also show the emergency stop status.

7.4.3. Stop by safety protection

When the safety door of the system is opened, the system will stop immediately. The red light of the beacon will flash with intermittent buzzer alarm. The main menu on the control computer will also indicate the status of the safety door being opened.

7.4.4. Stop due to detected error.

When the system detects an error, it will stop immediately. The red light of the beacon will flash with intermittent buzzer alarm. The main menu on the control computer will also indicate the detected error.

Upon normal stop of the system, exit the Labeling program, and then shut down the Windows operating system. Turn off the main power of the system when the computer requests to do so.

Please always use the normal shut down procedures to shut down the system. After

shutting down, clean the major areas of the system.



CAUTION - Sudden power break

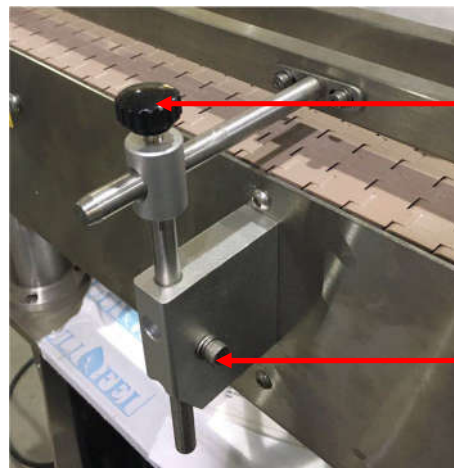
Do not break the power suddenly to stop the system. This may cause permanent damages to the computer of the system.

8. Adjustment

8.1. Guide Rails

Adjust the height of the guide rails with reference to the height of the vial so that the vials can be guarded stably by the rails.

Adjust the separation between the two guide rails to just a little wider than the width of the bottle so that the bottles will be able to pass smoothly.



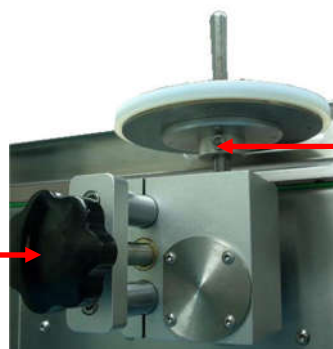
Loosen these screws to adjust the separation between the two guide rails

Loosen this lock to adjust the height of the guide rail

8.2. Separating Wheel

Adjust the height of the Separation Wheels to the height of the Guide Rail so that the wheels will engage into the elongated hole of the Guide Rail while not touching the Guide Rail.

Adjust the front and back position of the wheels according to the width of the bottle so that the wheels will give just sufficient pressure (as little as possible) to separate the bottles.



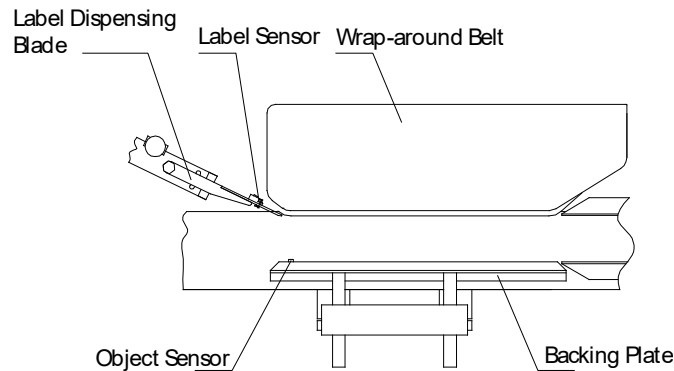
Front and back adjustment knob

Height adjustment lock

Unlock this to adjust the height

8.3. Label Dispensing Blade

The Label Dispensing Blade should be maintained at a stable and adequate position in relation to the Inner Guide Rail and the Wrap Around Belt's wrapping surface to ensure the label to engage on to the bottle surface at the right angle stably.



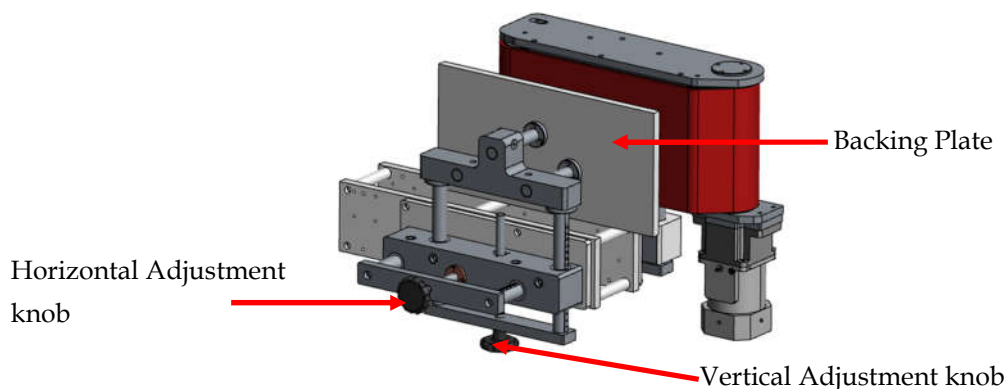
The edge of the Label Dispensing Blade should be approximately 2mm behind the wrapping surface of the Wrap-around Belt.

The Label Dispensing Blade should be at approximately 30 degree inclination to the wrapping surface of the Wrap-around Belt.

8.4. Wrap-around Device

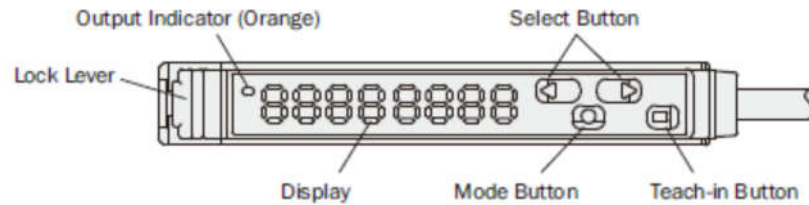
The machine uses a Wrap-around Belt mechanism to hold the bottle and wrap the label around. The speed and pressure of the Wrap-around Belt will affect the labeling effect. The speed of the Wrap-around Belt should be synchronized with the dispensing speed of the Labeling Engine.

Adjust the position of the Backing Plate, so that the distance between the plate and Wrap-around Belt is slightly smaller than the diameter of the bottle. Adjust this position to tune the pressure in the wrap-around labeling.



8.5. Label Sensor

It is a through beam type fiber optic sensor with an amplifier (Sick WLL180T).



Below describes automatic method to set the threshold value for triggering. Please refer to the amplifier manual for more details.

Firstly press "Teach-in" button for 3 seconds. Press the "Select buttons" to select 2-points teach-in mode. The displays should be "2 Pt 1Pt".

Then thread the label web and put a label underneath the sensor. Press "Teach-in" button once. The amplifier will check the intensity of the light receipt automatically at this point.

Now the display should be "2 Pt 2 Pt". Move the label web so that the gap between labels is underneath the sensor. Press "Teach-in" button again. The amplifier will check the intensity again and take the average of these two values as the threshold value. The threshold value flashes and the display will return to normal.

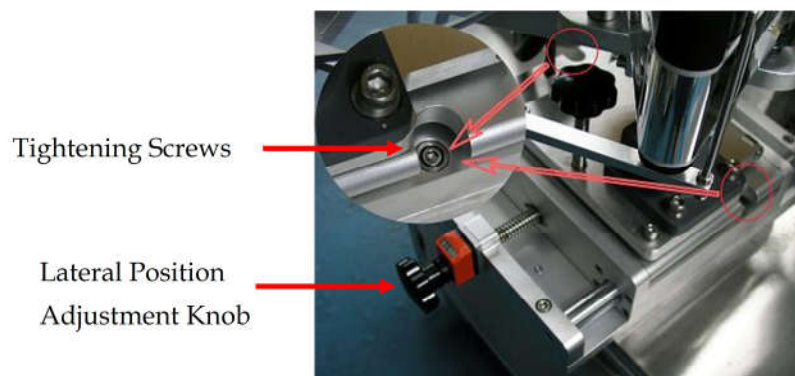
This will ensure consistent triggering each time when a gap passes through the sensor.

8.6. Position of Labeling Engine

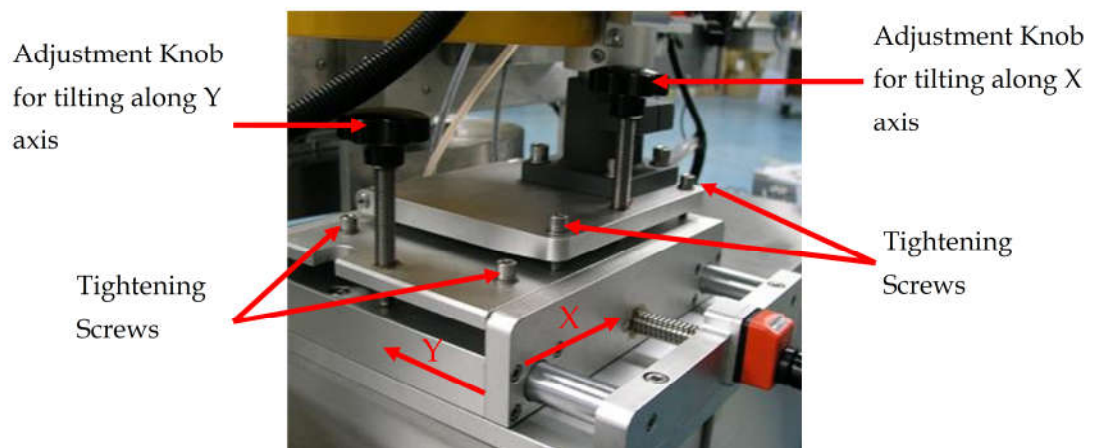
Loosen the tightening screws at the cross-joint of the labeling engine mounting stand. Then turn the vertical adjustment wheel to adjust the height of the labeling engine.



Adjust the lateral position of the labeling engine as needed by adjusting the in-out adjustment screw at the mounting base of the engine, as illustrated below.



Under normal circumstances, the label dispensing edge should be a vertical line. Tilting of the dispensing edge can be adjusted along two independent axes by adjusting the adjustment screws at the mounting base, as illustrated below.

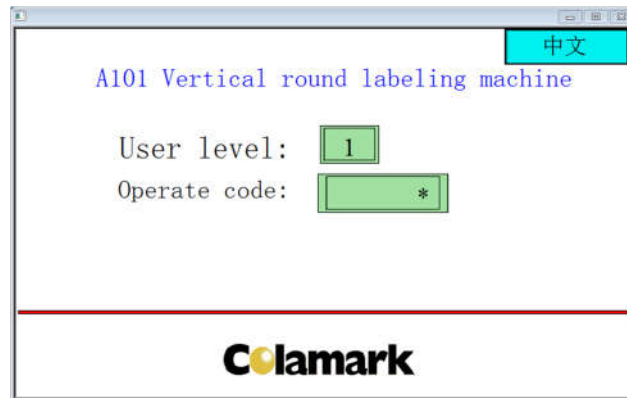


After the adjustments, lock up the tightening screws.

9. Touch Control Panel

9.1. User Logon and Operations

Upon power on, the system will run a self-diagnosis and then prompt for the operator password.

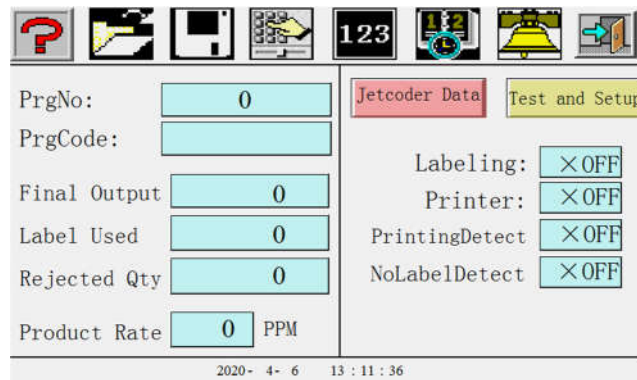


There are three user levels:

- “1” is the lowest level that only allows user to run/stop the machine and load the saved program. Default password: 1234
- “2” is the middle level that allows user to access all operation except changing the password. Default password: 1111
- “3” is the highest level that allows user to access all operation including password changing. Default password: 8888

Click the “User level” and “Operate code” box to call up a number pad. Enter the user level and corresponding password from the number pad and then click “Enter”.

9.2. Main Menu




Open Program: Click here to choose a program to run (a program is a pre-defined set of operating parameters for a particular product. There are up to 51 programs).



Save Program: Click here to save the current parameter settings in the system to a program.



Parameters Setup: Click here to enter into a screen to set up the system parameters and functions.



Counters Setup: Click here to view system information, setup Counters and reset counters.



Time and Date: Click here to display and set up the system time and date. There are also factory reserved functions in this menu.



Alarm History: Click here to view the log record of system alert.



Exit: Back to the login page.




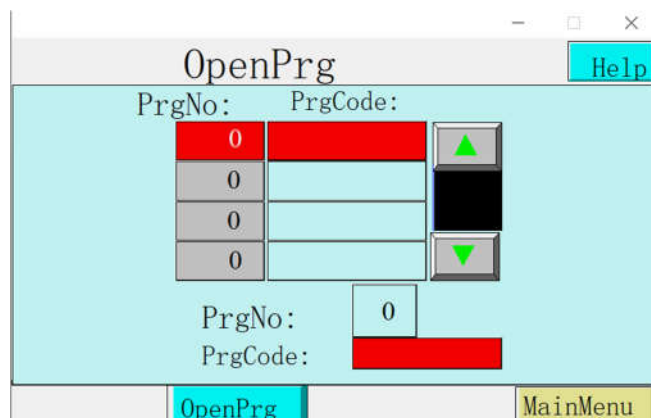
Help: Click here to enter the Help menu for the current page.



9.3. Open Program

(Note:- The Program Menu can only be accessed when the system is stopped.)



On the Main Menu click the icon  to enter into the Open Program screen, as follows:-



Click  or  to scroll up and down on the program. There are up to 51 programs. The last set (51st) of program contains factory default setting parameters. The user may open this program but cannot alter it.

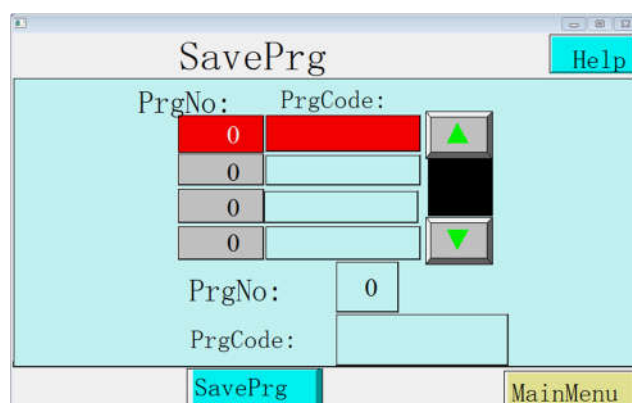
Click the “OpenPrg” button to open the program and load the corresponding parameters. Then Click “MainMenu” to go back to the Main Menu.



Note: The parameters of the labeling head shall be reset every time opening a new program which takes approximately 5 seconds.

9.4. Save Program

(**Note:** The Save Program Menu can only be entered when the system is stopped.)

On the Main Menu, click the Save Program icon  .



Click  or  to scroll up and down on the program. Click the “PrgCode” box to enter a reference name (max. 8 characters) for the program via the pop-up key

pad.

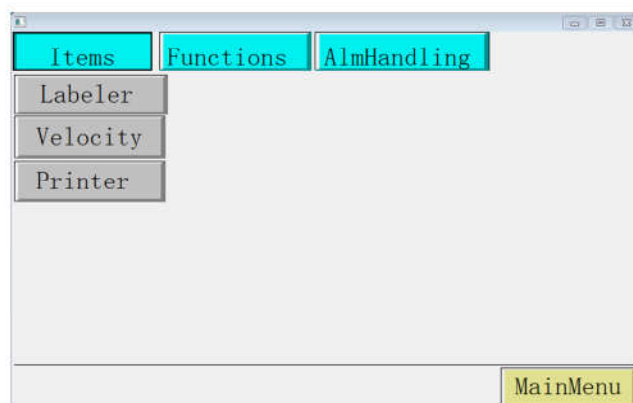
Click "SavePrg" to save the current parameters to the program.

9.5. Parameters Setup

(Note: The Parameters Setup menu can only be entered when the system is stopped.)

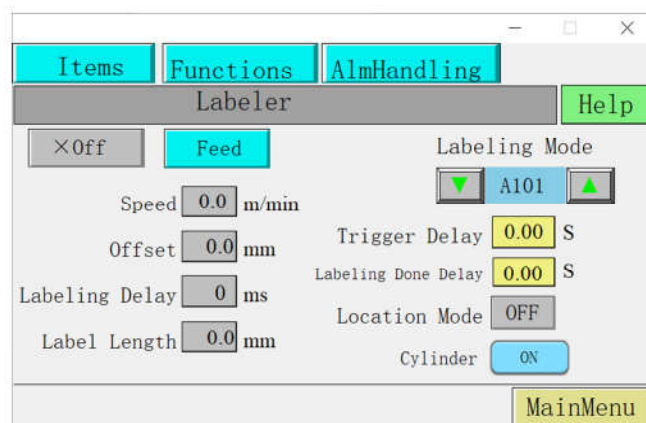
On the main menus, entering the parameters setup menu by clicking the icon .

"Items" options include the Labeling Engine, speeds and Hot Stamping Coder setting.



9.5.1. Items Parameters -- Labeling Engine

Enter the Labeling Engine menu by clicking the "Items" button and select the "Labeler" from the list.



In the Labeling Engine menu, click the parameter boxes to enter the values for the parameters via the pop-up number pad. User can switch on/off the labeling

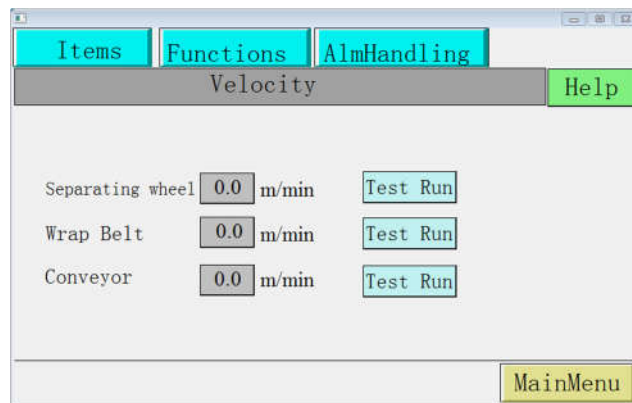
engine by choosing “On/Off” button. Press “Feed” to test the labeling engine by dispensing one label.

The parameters to define here are:

- **Speed (3-50 m/min):** the label dispensing speed of the Labeling Engine.
- **Offset:** This refers to the offset position of the label when it stops after the label sensor. Due to the different length of labels, if the label stops immediately when the label gap reaches the label sensor, the pre-dispense length of the label at the dispensing edge may not fulfill the application need (normally just 0.5~2mm pre-dispensed at the dispensing edge), thus, by adjusting this parameter, the desired pre-dispense label length can be obtained. (0-500 mm)
- **Labeling Delay (0-500 ms):** the delay of the labeling action when the object sensor is triggered.
- **Label Length (5-500 mm):** the length of the product to be labeled.
- **Labeling Mode:** Choose the “A101” mode as the labeling mode for this machine when using the Wrap-around Belt and Backing Plate as the Wrap-around Device. Otherwise choose the “A107” mode when using the Wrap-around Belt and the Pneumatic Holder as the Wrap-around Device.
- **Trigger Delay:** To set the delay time of pushing out the Pneumatic Holders after the object sensor is triggered. Ignore this setting when the labeling mode is A101.
- **Labeling Done Delay:** To set the delay time of the Pneumatic Holders bouncing back after the labeling is completed. Ignore this setting when the labeling mode is A101.
- **Location Mode:** To enable or disable the orientation labeling function. Ignore this setting when the labeling mode is A101.
- **Cylinder:** To enable or disable the Pneumatic Holders function. Ignore this setting when the labeling mode is A101.

9.5.2. Items Parameters -- Speeds Setting

On the Parameters Setup menu, click the “Items” button and select “Velocity” to go into the speeds setup menu.



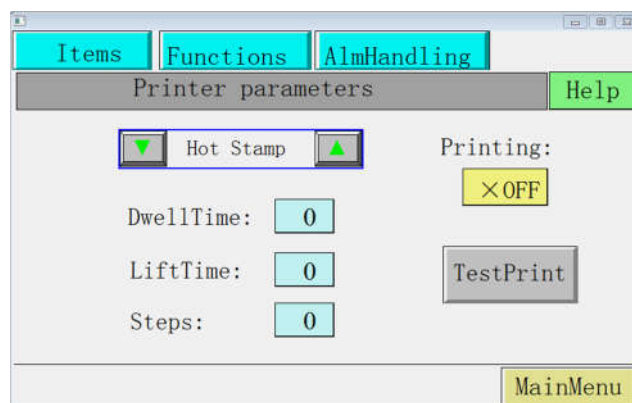
The parameters to define here are:

- **Separ.Wheel** (0-60 m/min): speed of Separating Wheel.
- **WrapBelt** (0-60 m/min): speed of Wrap-around Belt.
- **Coveyor** (2-40 m/min): speed of conveyor.

After inputting the speed number, click the “Test Run” buttons to test run the respective device. When it is triggered, the system will give a beacon light and sound alarm before running. Click the button again to stop the test run.

9.5.3. Items Parameters -- Hot Stamping Coder

On the Parameters Setup menu, click the “Items” button and select “Printer” to go into the hot stamping coder setup menu.



The parameters to define here are:

- **Dwell time (10-99 ms):** It refers to the time that the Printing Head holds on the foil and label for ink transfer. The larger the dwell time setting, the darker the print will be. The range is between 10~99 mil.sec. Within the limitation of the acceptable print quality, the lowest possible dwell time

should be used so as not to slow down the throughput of the whole system.

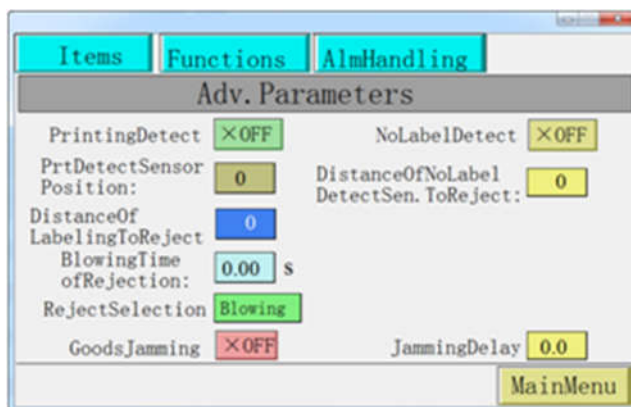
- **LiftTime:** the delay of the foil walking after the air cylinder of the printer is lifted.
- **Steps (3-99):** the movement of step of the hot foil. This should be set according to the number of lines of information to code. Proper setting of this parameter will help saving foil consumption substantially. The unit is in the stepper motor movement steps. Adjust by trial and error to a value that moves the foil by just enough for the information to print.
- **Printing Time (10-99 ms):** the time that the Printing Head holds on the foil and label for ink transfer.

By clicking “On/Off” to switch on/off the printer. Press “TestPrint” to print one test print.

9.5.4. Functions -- Adv.Parameters

On the Parameters Setup menu, click the “Functions” button to go into advanced parameters setup menu.

This menu includes parameters setting and optional detection functions.

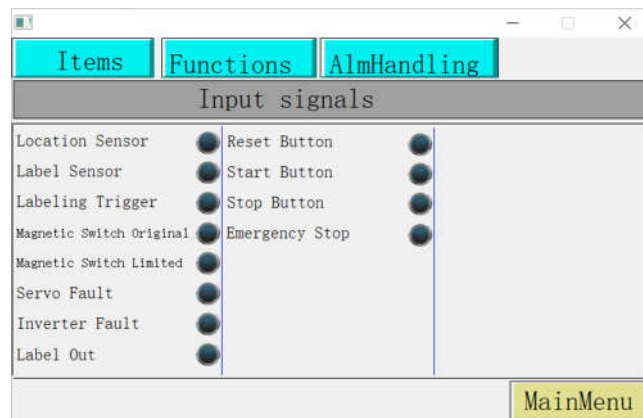


- **PrintingDetect:** enable of disable the Printing Inspection System.
- **PrtDetectSensor Position:** the quantity of the label between the label dispensing and the Printing Inspection System.
- **DistanceOf LabelingToReject:** the distance between the label dispensing and the Rejection device.
- **BlowingTime ofRejection:** the time of the blowing rejection action.
- **RejectSelection:** the method of the rejection.

- **GoodsJamming:** enable of disable the goods jamming detection function.
- **NoLabelDetect:** enable of disable the missing labeling detection function.
- **DistanceOfNoLabelDetectionSen. ToReject:** the distance between the missing labeling detection and the Rejection device.
- **JammingDelay:** the stop delay of the machine when the jamming sensor is triggered.

9.5.5. Functions -- Input Signals

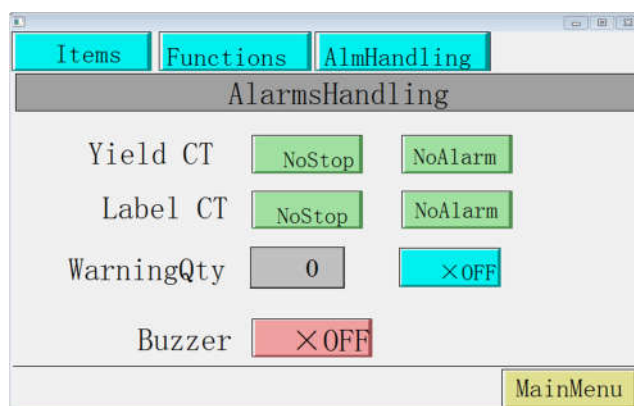
On the Parameters Setup menu, click the “Functions” button and select “Input Signals” to go into the diagnosis menu as follows. In this menu, the signals at various input points can be viewed to assist the diagnosis of different problems.



9.5.6. Alarms Handling

The way how system generated alarm are handled can be set, such as “stop machine” or “not stop machine”.

The counters available here include the label counter, product counter and warning.




The “Yield CT” is the finished product counter. It adds 1 when one bottle is finished labeling. Counter Overflow means the actual counter is larger than the preset value in the counter. If the counter overflows, user can set the action of the machine: Stop/NoStop and prompt alarm on screen or buzzer.

The “Label CT” is the label counter. It adds 1 when the label sensor is triggered. Counter Overflow means the actual counter is larger than the preset value in the counter. If the counter overflows, user can set the action of the machine: Stop/NoStop and prompt alarm on screen or buzzer.

User can input number at "WarningQty" so that the system give warning when the warning is more than this value. Choose the warning is showed on buzzer.

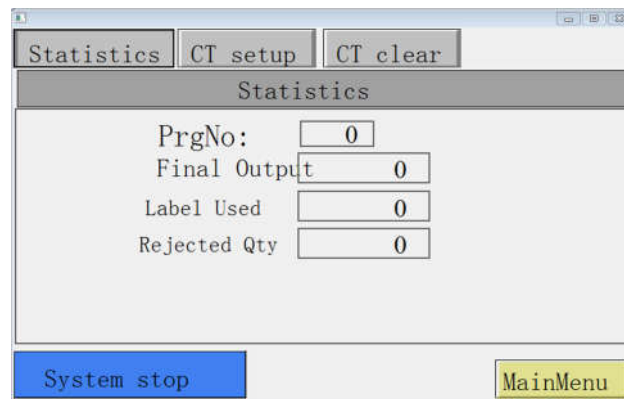
9.6. Counters Setup

The Counters Setup screen allows setup and reset the counters and the view the related information.

In the Main Menu click the icon  to go into the Counters Setup menu. There are three submenus for counter status, setting and clearing. User can also control “Run/Stop” of the system in this page. But the alarm message can not be shown at this page.

9.6.1. Statistics

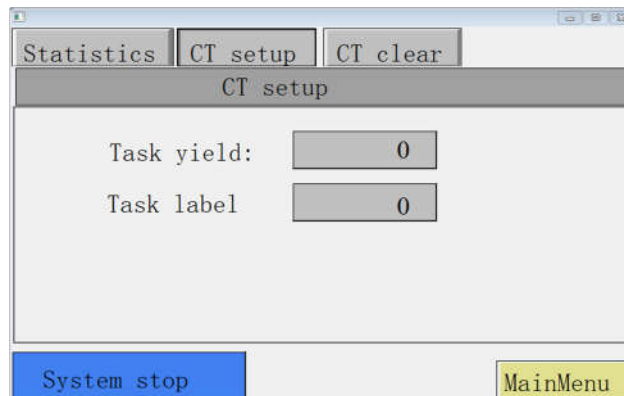
Click “Statistics” to enter the following page.



- **PrgNo:** Display the current Program number.
- **Final Output:** Quantity of product finished labeling.
- **Label Used:** Labels used based on count from the label sensor.
- **Rejected Qty:** Quantity of failed products have been rejected if the rejection device is installed.

9.6.2. Counter Setting

In the Counters Setup menu, click the “CT setup” button to go into the counter setting screen:

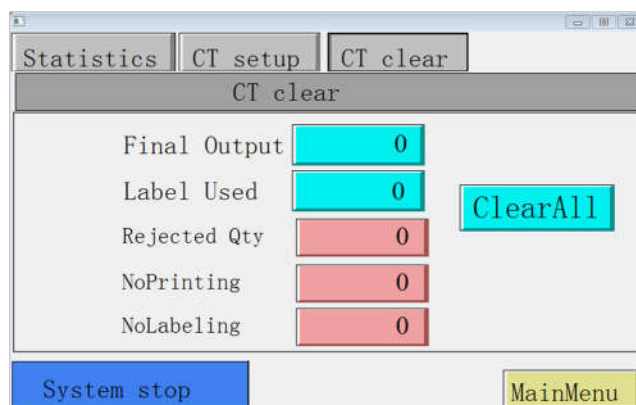


A preset value for each of the product counter and the label counter can be set here so that system alarm will be triggered at counter overflow. The range of the input value is 0-99999999.

9.6.3. Reset Counters

On the Setup Counters screen, click the “CT clear” button to go into the Reset Counters screen. Click the displayed value of a counter to reset the counter to

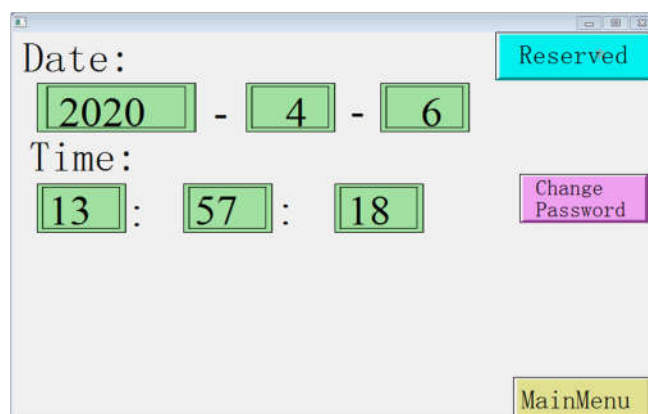
zero.



9.7. Time Adjustment



Click the Time Adjustment icon to go into the Time Adjustment menu.



The time setting can be adjusted on the screen. The date setting is system reserved.

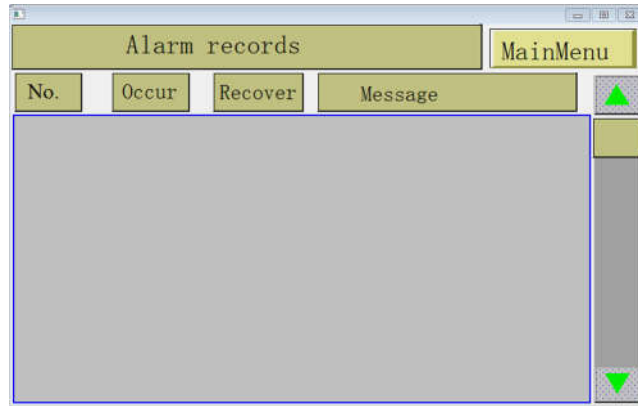
“Reserved” button: This is reserved function for periodical service reminder.

If user of level 3 is logged in, can access the page "Password" to manage the password of different level.





9.8. Alarms History

On the Main Menu, click the icon  to go into the “Alarms Records” menu.



When there are alarms generated by start and stop of the machine or operation problems, the system will keep track of the causes and settlement of the events.

Click  and  to scroll up and down to view the list. The latest alarm is recorded at the top.

10. Maintenance

All the operators on the machine should be properly trained. To ensure maximum efficiency and performance from the machine, the user should carry out routine maintenances on the machine.

The following operations must be carried out while safety is ensured. Unless really necessary, always disconnect the power supply for the maintenance operations.

10.1. Routine Maintenance Schedule

! Attention:

- When using compressed air to clean the machine, the operator must wear a protective goggle.
- Before accessing any transmission components to carry out service work, make sure that the system and all components are fully stopped. The power is disconnected and there is clear sign put up on the machine indicating the machine is being serviced.
- When it is necessary to wash any area of the machine, make sure all electrical components are properly covered and guarded from water and moisture.
- It is prohibited to draw power from the machine for any other purposes.
- It is prohibited to change the parameter setting of the inverters of the machine.

10.1.1. Daily Maintenance

- Use suction cleaner to remove the dirt and foreign substances from the Turntable, Labeling Engine and Conveyor. Do not recommend the use of compressed air for cleaning on these components.
- Use a solvent that can dissolve label adhesives (e.g. adhesive remover, alcohol etc.) to clean all the areas that can be in contact with the label adhesives.
- Use also the above solvent to clean the label path on the labeling engine.



- Use of cleaning solvents

Always use pH neutral solvent only to clean the machine. If a special kind of solvent is needed to clean any area of the machine,

please always refer to the operation manual of the solvent carefully for safe application.

Do not use any strong acid, alkaline, or organic solvents on the machine. In particularly, the protective casing of the machine can be damaged by such solvents.

10.1.2. Weekly Maintenance

- Use compressed air to clean the Object Sensor.
- Use compressed air to clean the Label Sensor.
- Release all the water from the moisture condenser of the pneumatic control devices, when equips pneumatic device.
- Use a piece of soft cloth and alcohol to clean the pressing roller of the labeling engine.



- Use of compressed air

Always wear a protective goggle.

10.1.3. Monthly Maintenance

- Use alcohol to clean the following sensors:
 - Object Sensor
 - Label Sensor
- Use a dedicated lens cleaner and lint-free soft cloth to clean the vision device, if vision camera is equipped.
- Clean away the open grease on the torsion spring of the label dancing arm and then put on fresh lubricating grease.

10.1.4. Quarterly Maintenance

- Change the filter at the main compressed air inlet, if equips pneumatic device.
- Test all the leakage circuit breakers of the machine.

10.1.5. Semi-annual Maintenance

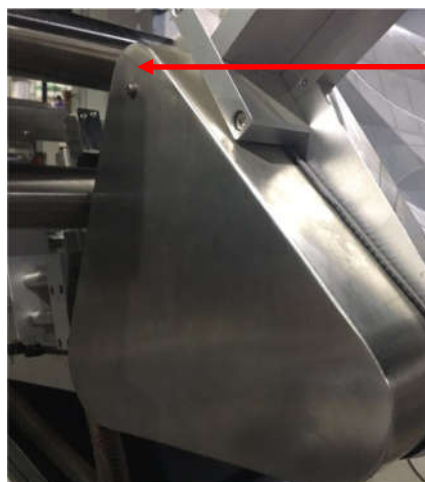
- Adjust the compressed air input pressure and check the pressure sensor if equips pneumatic device.
- With the Input diagnosis function at the control screen, check the responses of all the input points.
- Check all the cables, sensors' optical fibers, air lines. Change whenever necessary.
- Change the filter at the air inlet if equips pneumatic device.
- Change the main gear belt of the labeling engine.
- Clean up the dirt at the transmission gears and lubricate with fresh grease.
- Check all the mounting screws. Make sure they are firm.

10.1.6. Yearly Maintenance

- Change all the transmission gear belts if worn.
- Clean the transmission gear box and lubricate with fresh grease.

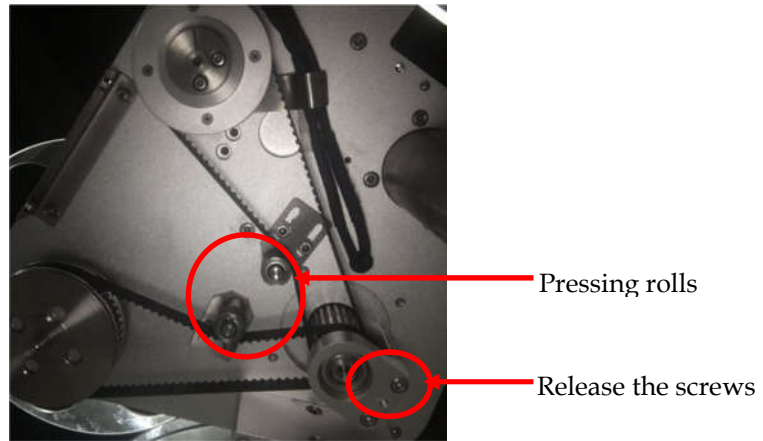
10.2. Replacing Gear Belt

The gear belts are used for motion transmission from servo motor to the Traction Roll and Label Rewind. To replace the worn belts, release the screws of the back cover under the labeling engine.



Release this screw

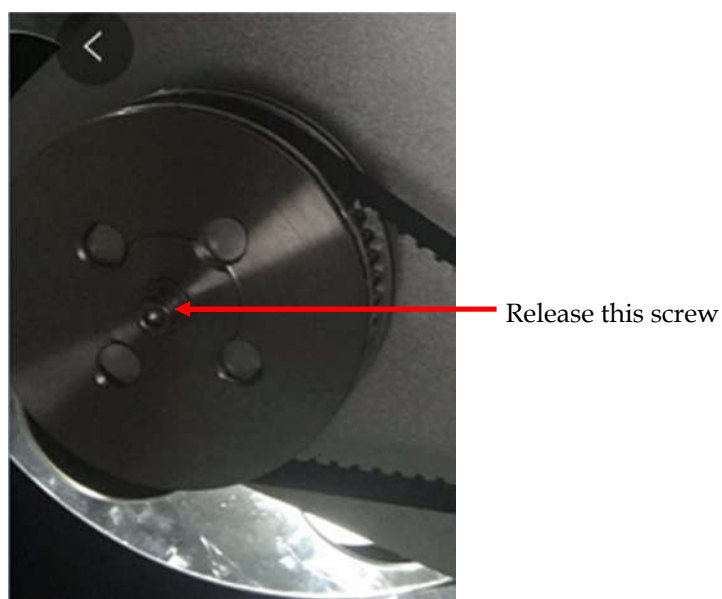
To remove the worn belts, release the pressing rolls and the screws. The belt connected to the Liner Rewind can be taken out first, and then the other one connected to the Traction Roll can be removed. Install the new belts with reverse orders.

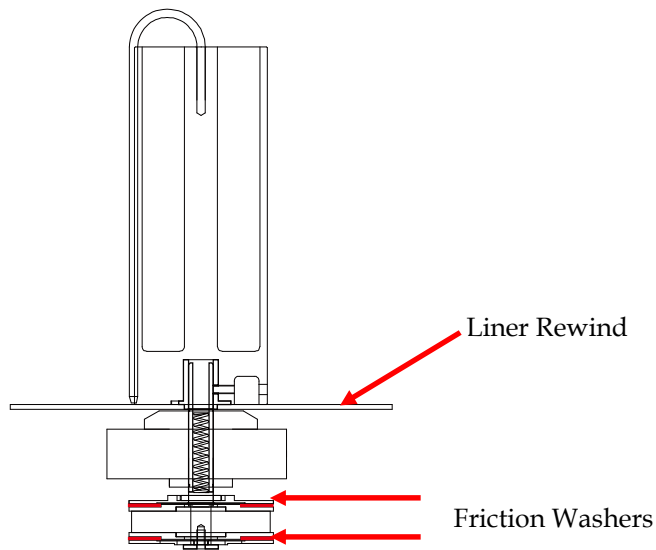


10.3. Replacing Friction Washers

To replace worn friction washers, open the back cover to access the back of the Servo Motor, Traction Roll and Label Rewind. Release the screw on the Label Rewind shaft. Replace the worn friction washers and install back the screws and the case. Tune the pressure on the friction washers.

Please note that the friction washers comes in a pair, always replace that in pair.





10.4. Replacing the Wrap-around Belt

It needs to change the belt if it is worn out. To replace:

1. Release the lock and flip over the Wrap-around Belt.
2. Release the tension adjustment screw.
3. Loosen the screws and remove the front cover.
4. Replace the belt.
5. Put back and tighten the cover.
6. Tighten the tension adjustment screw. Adjust the tension.

11. Trouble Shooting

Symptoms	Cause and Solution
Does not dispense label	1. Incorrect object sensor position. Adjust properly.
	2. Defective object sensor. Change the sensor.
	3. Not enough tension on the label liner. Adjust and tighten the label liner.
	4. The color of bottles cannot be detected by the object sensor. Change object sensor with advanced resolution.
	5. No power to the labeling engine. Check connections and reconnect.
Dispense labels continuously	1. Incorrect label sensor position. Adjust properly.
	2. Defective label sensor. Adjust sensitivity or change the sensor.
Inaccurate labeling position	1. Incorrect vertical position of dispensing blade. Adjust vertical position adjustment wheel.
	2. The position of the label web is incorrect on the labeling engine. Adjust accordingly.
Label does not affix on the object	1. Label dispensing speed too slow. Adjust the label dispensing speed.
	2. The Pre-dispensed label length is not sufficient. Increase the pre-dispensed label length.
	3. Label dispensing speed too fast. Reduce the label dispensing speed.
	4. The object sensor is too far apart from the label dispensing edge. Adjust the object sensor accordingly.
	5. Inadequate label adhesive or dirty substrate surface. Change label materials or use objects with clean surface.
Wrinkle label surface	1. The Pre-dispensed label length is too long. Reduce the pre-dispensed label length
	2. Label dispensing speed is much faster than the label adapting roll speed. Adjust the speeds accordingly and make sure they are the same.
Missing labels on some objects	1. Object sensor sensitivity too low. Adjust the sensitivity accordingly.
	2. Labeling speed is too slow or conveyor speed is too fast. Adjust accordingly.

Label liner is loosen	1. Label dispensing speed is much slower than the wrap-around belt speed. Adjust the speeds accordingly to make sure they are the same.
	2. The distance between dispensing blade and wrap-around belt is too close.
Misalignment on wrap-around belt	1. Deviation on the shaft. Adjust the misalignment adjustment screw which is at the front side of the wrap-around belt.
Error is large between the front and end of label after wrapping	1. Dispensing blade is not alignment with the surface of the bottles. Adjust the inclination of the dispensing blade.
	2. The bottles are not in perfect cylinder shape. Change the bottles.
	3. Dispensing blade is located too far or has slight collision with the bottles. The normal distance between the dispensing blade and bottle surface is 1mm. Adjust accordingly.
	4. Dispensing blade is located too far from wrap-around belt.
	5. The labeling engine is not held firmly throughout the labeling. Lock the labeling engine firmly.
	6. Inadequate label adhesive or dirty substrate surface. Change label materials or use bottles with clean surface.
No print	1. Printer is not connected. Connect accordingly.
	2. Signal fault on the printer. Serving accordingly.
	3. Ribbon run out. Replace accordingly.
	4. No air pressure. Turn on the input air source.
	5. Printing dwell time is too short. Reset the dwell time.
Unclear mark	1. Temperature too low. Reset and increase the type temperature.
	2. Types are not inserted properly or there are no types. Put back the types in position properly. Preheat the types before operation again.
	3. Insufficient printing pressure. Reduce the distance between the Backing Cushion and Type Holder, or increase the air pressure
	4. Foil rewind is not working properly. Reduce the foil tension
	5. Printing dwell time is too short. Increase the printing dwell time.

Appendix A: Safety Instructions for Machine Operation

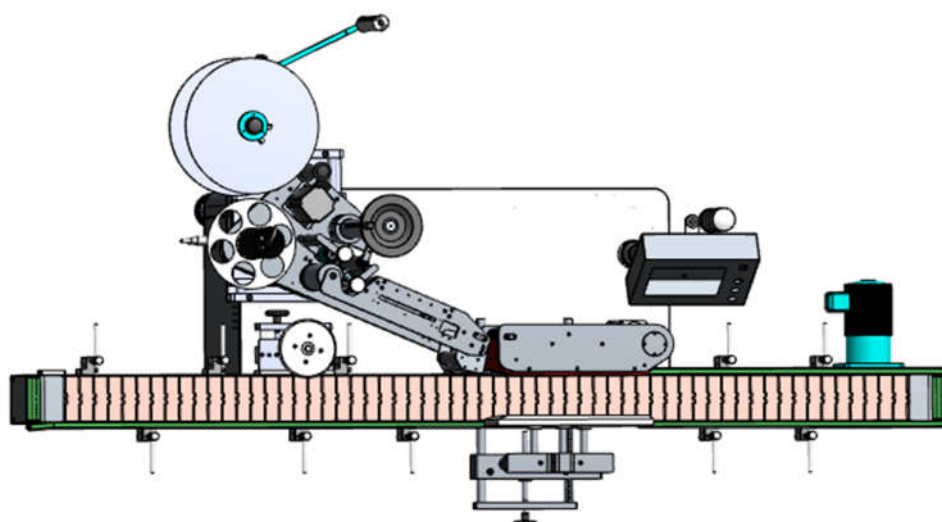
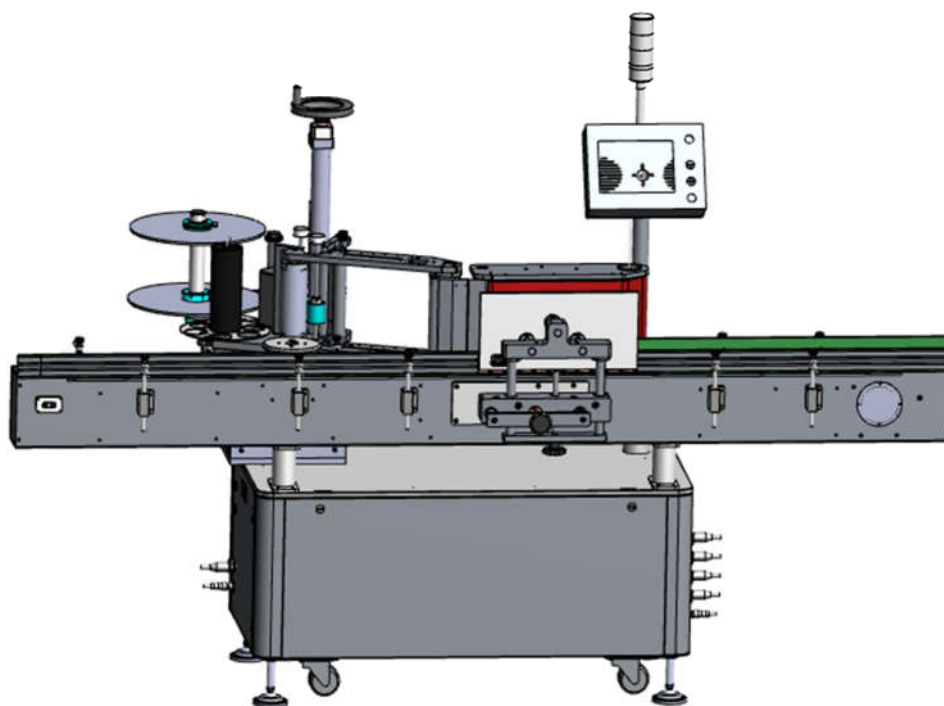
1. Before starting the machine, remove all foreign substances from the machine. Particularly, make ensure that there are no hardware tools or cleaning rag etc. left on or in the machine.
2. All operators must be properly trained, particularly on safety procedures before operating the machine.
3. When there is more than one operator, designate only one operator to start the machine. The others should not turn on the machine. Each time starting the machine, the designated operator should pay particular attention to ensure nobody is endangered and always aware people around about his action.
4. When an operation needs to manipulate, adjust, or check on any part of the machine, he must inform the operator designed for the machine starting before doing so.
5. During operation, any operator noticing any abnormalities should immediately press the emergency button and notify the other operators accordingly.
6. Unless necessary and with sufficient protection, do not touch any moving parts of the machine directly or via any items. In case really necessary, it must be done by someone with adequate training. All operators must be fully informed before doing so.
7. Before restarting the machine after an emergency stop, always pay attention to the surroundings including people, machine, and any transmission parts and make sure that they are in a safe status. If in doubt, do not start the machine.
8. When needed to disassemble or clean the machine, always press down the emergency button to avoid any accidental start of the machine. It is strictly prohibited to carry out any unusual operation (including cleaning) when the machine is running.
9. When cleaning the machine or its surrounding area, make sure no water get into the electric cabinets, electric boxes, or on to any electric components.
10. During maintenance on the machine, always turn off the main switch, disconnect the power source, and display a warning sign "DO NOT TURN MACHINE ON" on the main switch.
11. Do not disassemble or make any alteration on any parts of the machine, in particular, parts for protection against accidents.
12. Always maintain the safety signs intact and clearly visible.
13. When re-starting the machine after maintenance or emergency stops, always jog the machine slowly first to make sure the movement is smooth before entering into

normal operation.

14. When all operators are away from the machine, always turn off and lock up the main switch to avoid unauthorized machine start up.
15. When there is machine malfunction, always inform the service engineer or the vendor immediately. Untrained or unqualified person should not try to service the machine.
16. When opening the safety cover in the testing and commissioning mode, always wear a protective goggle.
17. Do not use compressed air to blow on the foreign substance on the machine.

People who do not follow this safety instructions take his/her own risk.

Appendix B: Schematic Diagram



Appendix C: Electric Wiring Diagrams