Bottle labelling machine
SL 400 RE

MAINTENANCE MANUAL
Calibration, adjustment and maintenance.
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WARNINGS

Before starting any operation,
read this instruction manual carefully.

Neri S.p.A. declines all responsibility for malfunctions, damage to objects or injury to persons caused by
failure to observe the information in this manual. All international safety and accident prevention regulations in
force in the user’s country must be followed even if they are not specifically mentioned in this manual.
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PRELIMINARY INFORMATION

HOW TO READ AND USE THE MANUAL

IMPORTANCE OF THE MANUAL

This manual is an integral part of the machine.

This manual must be kept for the entire life cycle of the machine.

If the machine is sold, the manual must be passed on to the new owner of the machine.

This Manual gives useful instructions to operators and includes a separate set of drawings to be used when making size changes.

MANUAL STORAGE

The manual must be stored in a place which is protected from humidity and excessive heat.

Consult the manual with care and avoid damaging all or part of the contents.

CONTENTS OF THE MANUAL

The manual has been prepared in accordance with Machinery Directive 98/37/EC.

It basically consists of:
A. Labelled cover.
B. Chapter summary.
C. Machine instructions.

UPDATES

In case of substantial modifications to the Machine, the Manufacturer will supply the Customer with a new version of this manual.

SYMBOLS

Symbols are included in the Manual to draw the reader's attention to a specific operation:
Indicates a situation that could damage the machine or lead to a malfunction.

Indicates a situation that is dangerous for operators or persons close to the machine.

NOTE:
If while reading this manual you come across descriptions that could be interpreted in more ways than one, consult the Manufacturer or the Service Centre before proceeding with any action that may be incorrect.
1 CALIBRATING THE MACHINE

The NERI SL 400 series labellers (SL 400 - SL 400 RE - SL 400 VR - SL 400 VR RE) doesn't need any particular timing as all the individual moving parts are controlled directly by separate motors synchronised electronically by inverters controlled by the machine PLC.

This electronic control is programmed at the machine testing stage and all the moving parts are therefore synchronised perfectly. All that needs to be done (and saved if necessary) is to set on the operator terminal the step of the screwfeeder installed on the machine and the production rhythm requested, so that the system can coordinate the various motor speeds.

With regard to this, we would like to remind you that each screwfeeder provided with the machine has the step and the Ø of the bottle to be labelled stamped on one end of it. (The screwfeeder step depends on the diameter of the item to be labelled and the length of the label).

To be more specific, the SL 400 labeller motors drive 4 main units:

1. Product spacer screwfeeder
2. Product conveyor belt and label fixing belt
3. Label dispenser feed unit
4. Separate label web unwinder unit

The screwfeeder is driven by a separate electric motor, the speed of this motor is the parameter that determines production speed (pieces/min.1’). In fact the number of screwfeeder revolutions corresponds to the number of items labelled per minute. (See note on next page)

The conveyor belt and label fixing belt are two parts driven by the same asynchronous triphase motor, controlled by a frequency converter (inverter).

The label dispenser feed belt is moved forwards by a stepping motor controlled by its own card and drive motor.

The unwinder unit is driven by an asynchronous triphase motor that operates independently via an impulse sent by its various photocells.

All the frequency converter operating parameters and motor command cards are registered during the machine testing stage.

To help electricians, a list of the operating parameter values is given at the end of the machine wiring system section in the Instruction book.
A NOTE ON SCREWFEEDERS

The screwfeeder is an Archimedean screw device that is used in the labeller to space out the products.

**Screwfeeder selection criteria:**

The step of the screwfeeder should be chosen mainly on the basis of the length of the label to apply, as well as production speed.

There is a formula that defines the general relationship between label length and screwfeeder step:

\[
\text{Scroll Step} = \frac{\text{Label length}}{2} + 30
\]

where:
- "L. etiq." is the length of the label in "mm";
- "/2" is the divisor for determining product feed in relation to label fixing unit speed which is twice as fast as the conveyor belt;
- "+30" compensates for the distance the product moves while the label stops to wait for the printer to operate.

The result must be approximately the same as the step immediately above the available ones, which are:

- Step 1 – 60 mm
- Step 2 – 80 mm
- Step 3 – 96 mm
- Step 4 – 120 mm

**Caution!: Step should not be confused with the number of the screwfeeder.**

If the label is a wraparound type, the "L. etiq." value can be replaced with product circumference.

Maximum production is obtained by dividing maximum conveyor speed (24000 mm/min') by screwfeeder step (one screwfeeder revolution corresponds to one product dispensed).

For example: \(24000 \div 60 = 400\) Pc.s/min’

The diameter and the height of the product also play a part in determining the diameter of the screwfeeder. For example, a product that is very low but has a large diameter may be difficult to produce.
1.1 ADJUSTING THE OPERATING HEIGHT OF THE LABEL FIXING UNIT

The label fixing unit does not need continuous adjusting as it is position is fixed by NERI technicians during machine testing.

It may nevertheless be necessary to make a small adjustment in the operating height, so that it does not get in the way of the conveyor belt, which moves much slower than the label fixing unit (approximately half the speed).

This may cause a problem by wearing only the lower part of the rubber belt.

To adjust the belt proceed as follows:

- Turn the knob on the top of the label fixing belt in an anticlockwise direction in order to slacken tension, then lift it slightly above the conveyor belt, leaving a gap of 1 to 3 mm between them.

- Then turn the knob in a clockwise direction to restore belt tension.

- Check that the label fixing belt runs parallel to the conveyor belt.

Having made this adjustment, if the fixing belt slips down again it means that the pulley axes are no longer parallel and you must therefore perform the operations described in the relevant section of this manual.
1.2 ADJUSTING THE LABEL STOP SENSOR (NERI sensor)

Adjusting the label stop sensor is fundamental for correct labelling operations and it must be performed before starting up the operating cycle if the label characteristics require it.

Normally this is not necessary as the calibration and position of the sensor are established during machine testing by Neri technicians. Therefore we advise you not to change the position if it is reading correctly.

The operation adjusts the sensitivity of the device and is performed on the trimmer using a screwdriver.

1) With a label in front of the photosensor turn the trimmer in an anti-clockwise direction until the red LED comes ON

2) Then turn the trimmer in a clockwise direction until the red LED turns OFF again. Then rotate the trimmer 2 or 3 more turns in a clockwise direction.
2 PLANNED MAINTENANCE

2.1 PLANNED MAINTENANCE AND CLEANING

The planned maintenance operations to be carried out by the maintenance service are limited in number and type thanks to the superior reliability of the components used. Simply carry out the operations at the intervals indicated in the maintenance manual.

To ensure the machine continues to operate with perfect efficiency and to guarantee a high level of labelling quality it is essential to perform the simple cleaning operations indicated below. These cleaning operations must be carried out by the operator.

DAILY MAINTENANCE:

- Clean the label web guide rollers.
  **Maintenance:** If the feed rollers are visibly worn replace them as they may tear the label web.

- Clean the rubber label feed rollers: remove any labels that may have got stuck to them, and remove any dust and glue deposits that may cause the web to slip or tear.
  **Maintenance:** If these rollers are worn, before replacing them, first take them out, turn them round and reassemble them.

- Clean the label feed device metal knurled rollers: remove any glue deposits and any labels that may have got stuck between them.

- Clean the teflon plates in the web tensioning units.
  **Maintenance:** If you see that a groove has formed at the point in which the web passes and the unit does not tension the web properly, replace it immediately.

- Clean the machine table: remove any spilled product or labels that may have got stuck to it.

- Clean the photocells and optic fibres: remove any dust or foreign bodies from the end of the photocell reading unit or the optic fibres connected to it. Check that no liquid or dust has penetrated the optic fibre connections on the photocells.
NOTE: All the parts indicated in the diagram below must be cleaned every day, otherwise labelling precision will deteriorate significantly.

WEEKLY MAINTENANCE:

- Clean the reading slots on the label stop photosensors with a blast of compressed air.

- Clean the machine table and remove any spilled product or labels that may have dropped onto it.

- Maintenance: Check the operating pressure on the manometers.
MONTHLY MAINTENANCE:

- Clean the conveyor belt and remove any dust, glue or labels that may have got stuck. Clean the product guides and remove any dust, glue or labels that may have got stuck.

- Maintenance: Clean the electrical panel fan anti-dust filters; to access the filter, remove the outer cover.

SIX-MONTHLY MAINTENANCE:

- Maintenance: Check the state of the conveyor drive belt.

- Maintenance: Check the labelling head toothed drive belt and the take up roller polycord belt for wear. If they are worn replace them.

- Maintenance: Check whether the label web take up disc clutch linings are worn. Before changing the linings completely the load on the Belleville washers can be adjusted in order to restore the original level of compression, if the material used was thicker. If the linings are very worn change them immediately.

**Caution:** if the preload is too high, the clutch may cease to work efficiently. This may create irregular tension on the label web and tear it. The clutch must click over as soon as the take up diameter begins to increase noticeably.
TO REPLACE THE CLUTCH PROCEED AS follows:

- Remove the polycord belt from the pulley by pulling it lightly with your hands so that it comes out of the runner.

- Undo screw 1 which holds the clutch unit in position. Do this slowly due to the pressure of the Belleville washers.

THIS SCREW ALSO ACTS AS A WASHER PRELOAD, ALLOWING YOU TO REGISTER HOW THE CLUTCH FUNCTIONS.

- Remove the pressure plate and the key from the shaft, otherwise the bearing 5 on the pulley 4 will not pass and you cannot reach the upper lining.

- Remove and substitute the two linings F.

Carry out the operations in reverse order to reassemble, taking care to insert the key on the shaft correctly and checking that the linings and Belleville washers are in the correct positions.

CAUTION: IF THE PRELOAD ON THE CLUTCH WASHERS IS TOO HIGH LABELLING MAY BECOME MUCH LESS PRECISE.
ANNUAL MAINTENANCE:

-Maintenance: Check the state of wear on the conveyor belt drive chain and lubricate it using an adhesive grease for chains, preferably a spray.

To access the chain disassemble the conveyor belt by removing the track link pins and then the Table-Top belt nearest the motor.
3 EXTRAORDINARY MAINTENANCE

3.1 ADJUSTING THE LABEL FIXING UNIT

The label fixing unit does not need adjusting as it is position is fixed by NERI technicians during machine testing.

Nevertheless, after intensive use or following repairs to the machine, the rubber belt tends to come out of its housing and therefore a minor adjustment is called for.

This happens when the rotation axes of the two rollers on which the belt runs are not exactly parallel.

The problem occurs when either the belt moves up and slips out or when it slides down and obstructs the conveyor belt which moves much slower (about half as slow).

To adjust the belt proceed as follows:

- Use an appropriate Allen key to loosen screws 1 and 2 and then align the label fixing belt rollers.

- Check that the belt runs parallel to the conveyor belt and that there is a gap of 1 to 3 mm. (X) between them.

- Check that this gap is always between the two belts as this is the only way of ensuring that they are in the correct positions.
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