

# ***SX Series***

**SX-100**

***EUROFINS***

***N° 1907061-1***

**USER MANUAL**

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## 1. Foreword

Thank you for your confidence in DARA for the acquisition of your pharmaceutical packaging machine. DARA applies cutting edge technology for the design and manufacture of its machines, using materials of the highest quality. Likewise, our machines include the best finishing fulfilling the demanding requirements of pharmaceutical industry.

This manual contains the description, installation and operation instructions and other technical guidelines required for thorough familiarity with the machine to ensure proper operation and achieve the best performance, with special attention to user safety.

Therefore, **it is mandatory to read paying attention and understand the instructions contained in this manual before installing, starting up or using this machine.** When the reading is finished, keep the manual on a safe place.

**DARA's** Documentation Department is at your service to answer any queries arising from your reading the manual and we thank you in advance for any suggestions you may care to make to improve it.

**DARA** reserves the right to modify the features of the machines without notice, provided they said changes are aimed at improving the performance, reliability, or operation of the same.

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**Maq. Ind. DARA, S.L.**  
**Polig. Ind. Coll de la Manya – Galileo Galilei 5-19**  
**08403 – GRANOLLERS (Barcelona) - Spain**  
**Tel.: 93 871 87 84 Fax: 93 871 83 75**

## 2. Safety

The **SX Series** Bench Top **DARA** machines are designed and constructed in accordance with the currently applicable European legislation and complies with all the pertinent safety regulations:

- **Safe start and stop devices**, which allow any servicing during automatic or manual cycle, when they are carried out after a cycle stop during an acknowledged stable stop status.
- **Emergency Stop Pushbuttons** with mechanical lock, located in the areas where operator is most commonly placed.
- **Electric and Pneumatic supply switch off devices**, which allow to carry out cleaning, maintenance and repair works with safety.
- **Fixed covers**, which require a tool to be opened, and must be only opened by authorized maintenance or repair personnel, and locked again after these operations.
- **Warning signals** about remaining risks around the machine and its covers.

All these safety devices form an integral part of the machine. Modification, removal or failure to maintain any of these items increases the risk of accidents and entails infringement of **Directive 2009/104/EC** on the use of work equipment.

The manufacturer declines all responsibility for damages arising from use of the machine with any modification, deletion or failure to maintain its components made without the express prior approval of the manufacturer.

Any repairs must be performed by qualified technicians. Inexpert repairs may entail serious risks for users.

HIT THE FRONT EMERGENCY PUSHBUTTON IN THE EVENT OF ANY EMERGENCY, ACCIDENT OR INCIDENT WITH THE MACHINE. IT WILL STOP INSTANTLY AT ANY POINT IN THE SEQUENCE.

THIS METHOD OF STOPPING THE MACHINE MUST ONLY BE USED IN EMERGENCIES, NEVER AS A NORMAL WAY TO STOP THE MACHINE.

*TO RETURN TO NORMAL OPERATION, RESET THE PUSHBUTTON BY ROTATING THE RED KNOB ONE TURN IN A CLOCKWISE DIRECTION ONCE THE EMERGENCY SITUATION HAS BEEN RESOLVED.*



## 2.1. Warning Signals and their Meaning

	EAR PROTECTION
	RISK OF INHALATION
	HAND FLATTENING OUT
	FINGERS TRAPPING
	ROLLERS HAND TRAPPING
	HAND TRAPPING IN PULLEY AND BELT
	HOT SURFACE
	HAND TRAPPING
	HIGH VOLTAGE
	UNDETERMINED RISK
 	HIGH VOLTAGE
	DANGER AREA

**NOTE** These are general signals. Your machine is provided with some but not all the following warnings.

### 3. CE Conformity Declaration



Maquinaria Industrial DARA, S.L.  
Polig. Ind. Coll de la Manyà - Galileo Galilei 5-19  
08403 - GRANOLLERS (Barcelona) - Spain

#### EU DECLARATION OF CONFORMITY

We declare, under our sole responsibility that the machine:

Type:	BENCH TOP
Model:	SX-100
Serial N°:	1907061-1
Year of Manufacture:	2019

Conforms the following European Directives:

Machinery Directive (2006/42/CE)  
Low Tension Directive (2014/35/UE)  
Electromagnetic Compatibility Directive (2014/30/UE)

the transposition regulation and provisions of the following applied rules:

<u>Stand.</u>	<u>Title</u>	<u>Edition/ Date of publication</u>
EN-ISO-12100:2012	Safety of machinery. General principles of design. Risk assessment and risk reduction.	2012
EN-ISO-14120:2016	Safety of machinery. Guards. General requirements for the design and construction of fixed and moveable guards.	2016
EN-894-3	Safety of machinery. Ergonomics requirements for the design of displays and control actuators. Part 3: Control Actuators.	2001+A1:2009
EN-ISO-13849-1	Safety of machinery. Safety related parts of control systems. Part 1: General principles of design.	2016
EN-ISO-13850	Safety of machinery. Emergency stop function. Principles for design.	2016
EN-60204-1:2007/ A1:2009	Safety of machinery. Electrical equipment of machines. Part 1: General requirements.	2007

This declaration is only valid for machines in the conditions and at the moment when they were commercialized, being expressly uncovered any possible future changes made by the final user.

Granollers, June 7<sup>th</sup> 2019

**Roberto Calvo**  
Technical Manager



Maquinaria Industrial DARA, S.L.  
Polig. Ind. Coll de la Manyà - Galileo Galilei 5-19  
08403 - GRANOLLERS (Barcelona) - Spain

## EU DECLARATION OF CONFORMITY

We declare, under our sole responsibility that the machine:

Type:	PERISTALTIC PUMP
Model:	SX-50
Serial N°:	012/17
Year of Manufacture:	2017

Conforms the following European Directives:

Machinery Directive (2006/42/CE)  
Low Tension Directive (2014/35/UE)  
Electromagnetic Compatibility Directive (2014/30/UE)

the transposition regulation and provisions of the following applied rules:

<u>Stand.</u>	<u>Title</u>	<u>Edition/ Date of publication</u>
<b>EN-ISO-12100:2012</b>	Safety of machinery. General principles of design. Risk assessment and risk reduction.	2012
<b>EN-ISO-14120:2016</b>	Safety of machinery. Guards. General requirements for the design and construction of fixed and moveable guards.	2016
<b>EN-894-3</b>	Safety of machinery. Ergonomics requirements for the design of displays and control actuators. Part 3: Control Actuators.	2001+A1:2009
<b>EN-ISO-13849-1</b>	Safety of machinery. Safety related parts of control systems. Part 1: General principles of design.	2016
<b>EN-ISO-13850</b>	Safety of machinery. Emergency stop function. Principles for design.	2016
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This declaration is only valid for machines in the conditions and at the moment when they were commercialized, being expressly uncovered any possible future changes made by the final user.

Granollers, June 7<sup>th</sup> 2019

**Roberto Calvo**  
Technical Manager

## 4. General Information

### 4.1. Functional Presentation

The bench top machines of the **SX Series** are composed by a frame where the container inlet tray, the rotary infeed table, the pneumatic positioning of containers and the filling station are located.

The machine is normally provided with a filling station that includes a product fill nozzle. The placement of stoppers and/or caps must be carried out by the operator manually, in the exit tray.

The control of the machine is performed from the control panel, in front of the peristaltic pump.

### 4.2. Use and Limitations

The machines of the **SX Series** are designed and constructed exclusively for the automatic fill (SX-100) and close (SX-200) of containers, to work with cylindrical glass, plastic or metal containers.

This machine is especially designed and constructed to condition the type of containers defined in the order, as displayed in the following page.

**DARA** manufactures several versions of machines suited to the different requirements depending on the products and containers to be conditioned.

Before using this machine for the filling or closing of containers, different to those the machine was designed for, please check with the manufacturer.

4.2.1. Format tables

		Recipe	A									
<b>Element</b>	4ML BOTTLE											
<b>Format mark</b>	F-1											
<b>Manufacturer</b>	IMMUNO-CELL											
<b>Manuf.'s ref.</b>	PSZ-004											
<b>Dara's ref.</b>	Ft1											
<b>Material</b>	HDPE											
<b>Weight</b>												
<b>Note:</b> BLACK COLOR												
<b>Recipe</b>	<b>Dose</b>	<b>Product</b>	<b>Tested on</b>									
A01	1,5ml	water	dosing & running internal test									
A02	2ml	water	dosing & running internal test									
<b>CUSTOMER'S APPROVAL</b> (Date, Name, Signature)		<table border="1"> <thead> <tr> <th></th> <th>Name</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>Drawn</td> <td>F. IBAÑEZ</td> <td>12/03/2019</td> </tr> <tr> <td>Approved</td> <td>L.FERNANDEZ</td> <td>12/03/2019</td> </tr> </tbody> </table>			Name	Date	Drawn	F. IBAÑEZ	12/03/2019	Approved	L.FERNANDEZ	12/03/2019
	Name	Date										
Drawn	F. IBAÑEZ	12/03/2019										
Approved	L.FERNANDEZ	12/03/2019										
Customer: <b>EUROPINS</b> EUROFINS Technika és Vegyesipari Kft. 1146 Budapest, Fehérvári út 166. A. ép. Tel: +36 (1) 25977990-241 Fax: +36 (1) 25977990-242 Cégjegyzékszám: 01-09-200678 IRÁNYELVÉZETŐ		<table border="1"> <tr> <td colspan="2" rowspan="2"> </td> <td><b>Number</b></td> <td><b>Rev.</b></td> </tr> <tr> <td><b>19070611CUST</b></td> <td><b>REV01</b></td> </tr> </table>				<b>Number</b>	<b>Rev.</b>	<b>19070611CUST</b>	<b>REV01</b>			
		<b>Number</b>	<b>Rev.</b>									
		<b>19070611CUST</b>	<b>REV01</b>									
All dimensions are in mm. This drawing is property of Dara and it is bonded and protected by Law.		ISO: OT-FOR-024_V01 Page 1/7										

Figure: F-1 Format Table

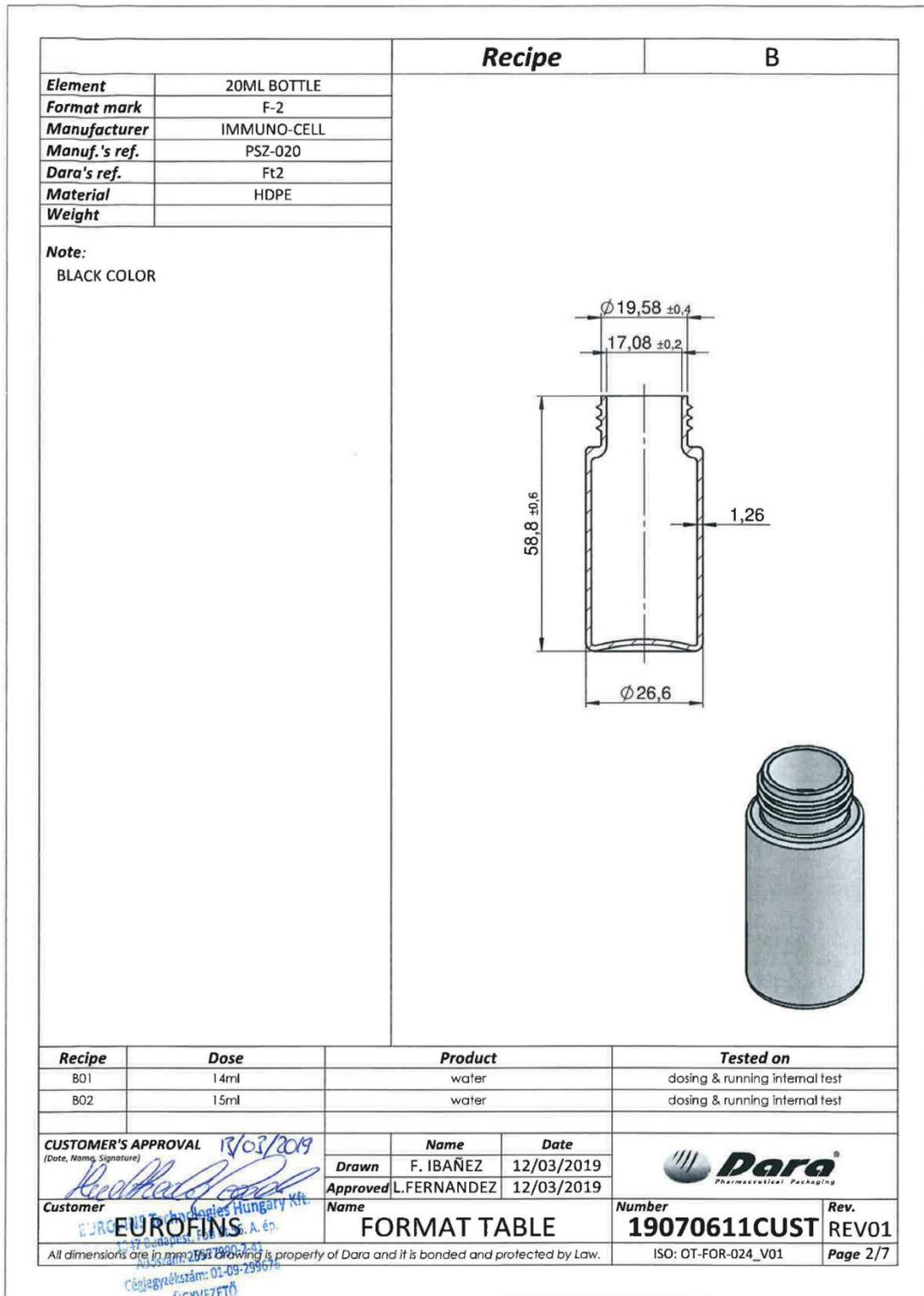


Figure: F-2 Format Table

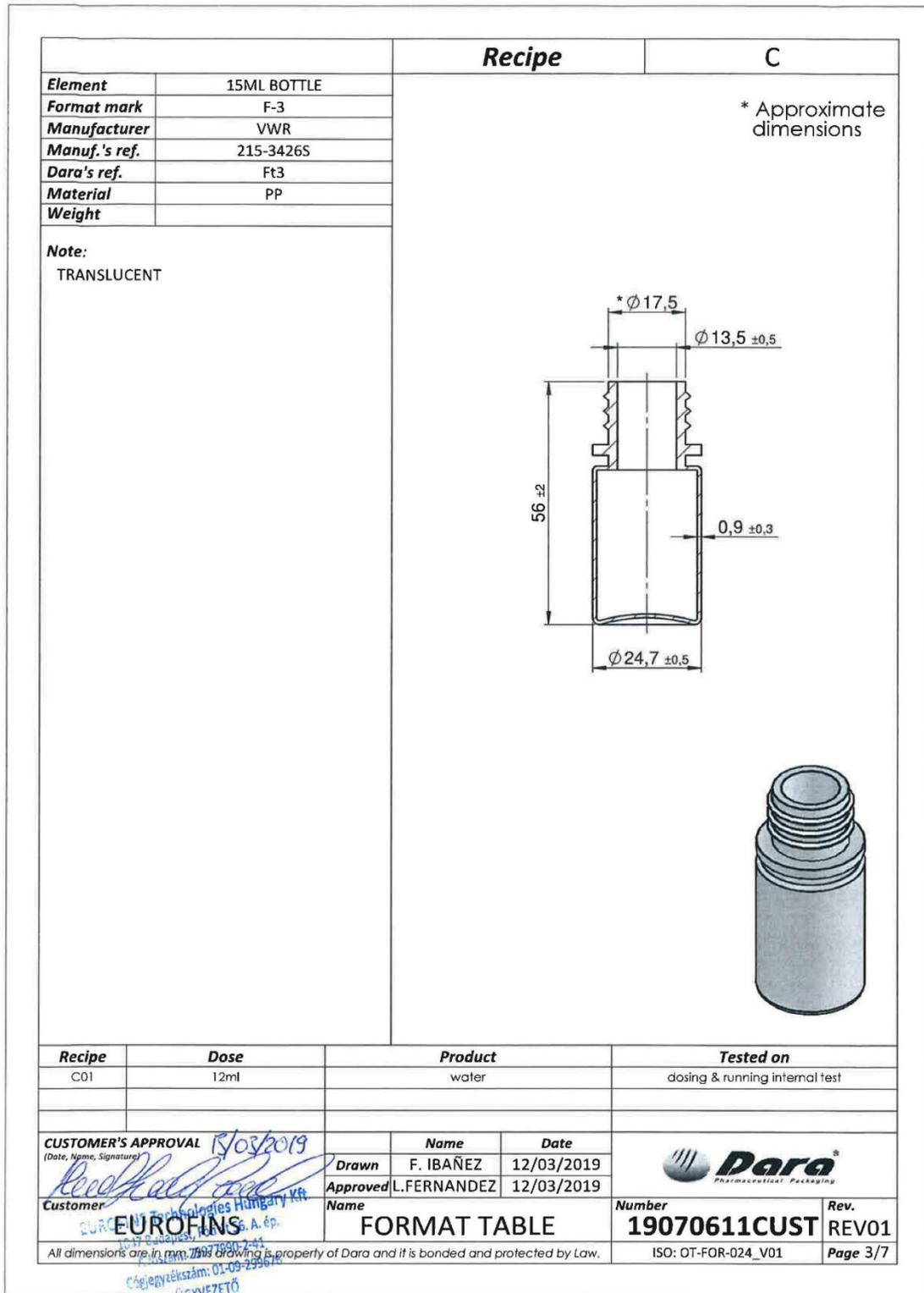


Figure: F-3 Format Table

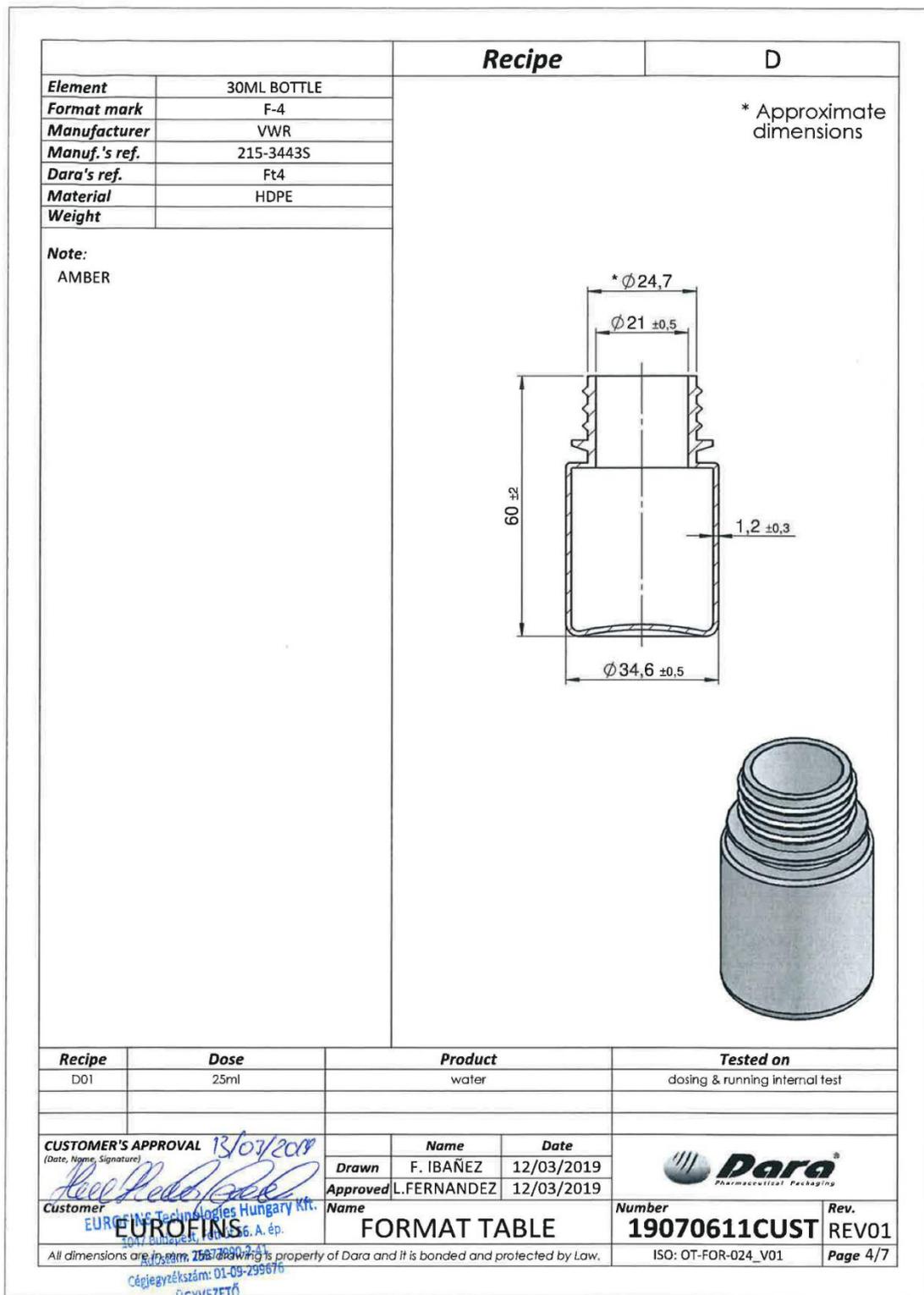


Figure: F-4 Format Table

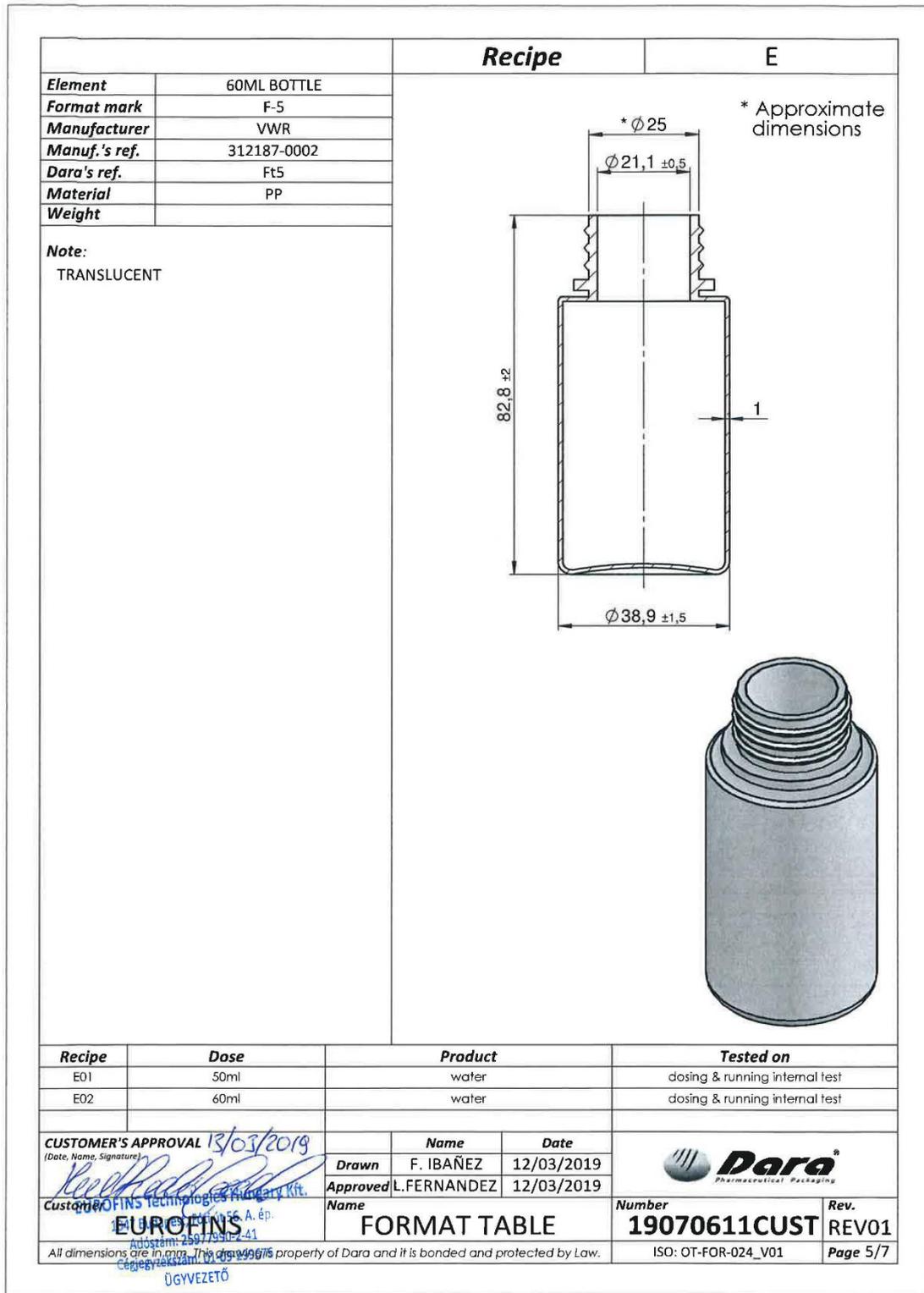


Figure: F-5 Format Table

		Recipe	F
<b>Element</b>	10ML VIAL		
<b>Format mark</b>	F-6		
<b>Manufacturer</b>	ORIGIN		
<b>Manuf.'s ref.</b>	TSV3220010C		
<b>Dara's ref.</b>	Ft6		
<b>Material</b>	GLASS		
<b>Weight</b>			
<b>Note:</b> TRANSPARENT GLASS VIAL			
<b>Recipe</b>	<b>Dose</b>	<b>Product</b>	<b>Tested on</b>
F01	8ml	water	dosing & running internal test
<b>CUSTOMER'S APPROVAL</b> 15/03/2015 (Date, Name, Signature) 		<b>Name</b> F. IBAÑEZ <b>Date</b> 12/03/2019	
Customer: EUROFIN S EUROFIN S Hódmezővásárhelyi út 56. A. ép. Hódmezővásárhely, 7570, Hungary Tel: +36 70 299575 Fax: +36 70 299576 Email: info@eurofins.com Gyártó: IGYVEZETŐ		<b>Drawn</b> L.FERNANDEZ <b>Approved</b> L.FERNANDEZ <b>Date</b> 12/03/2019	
<b>Customer Name</b> EUROFIN S		<b>Name</b> FORMAT TABLE	<b>Number</b> 19070611CUST <b>Rev.</b> REV01
All dimensions are in mm. This drawing is property of Dara and it is bonded and protected by Law.		ISO: OT-FOR-024_V01	Page 6/7

Figure: F-6 Format Table

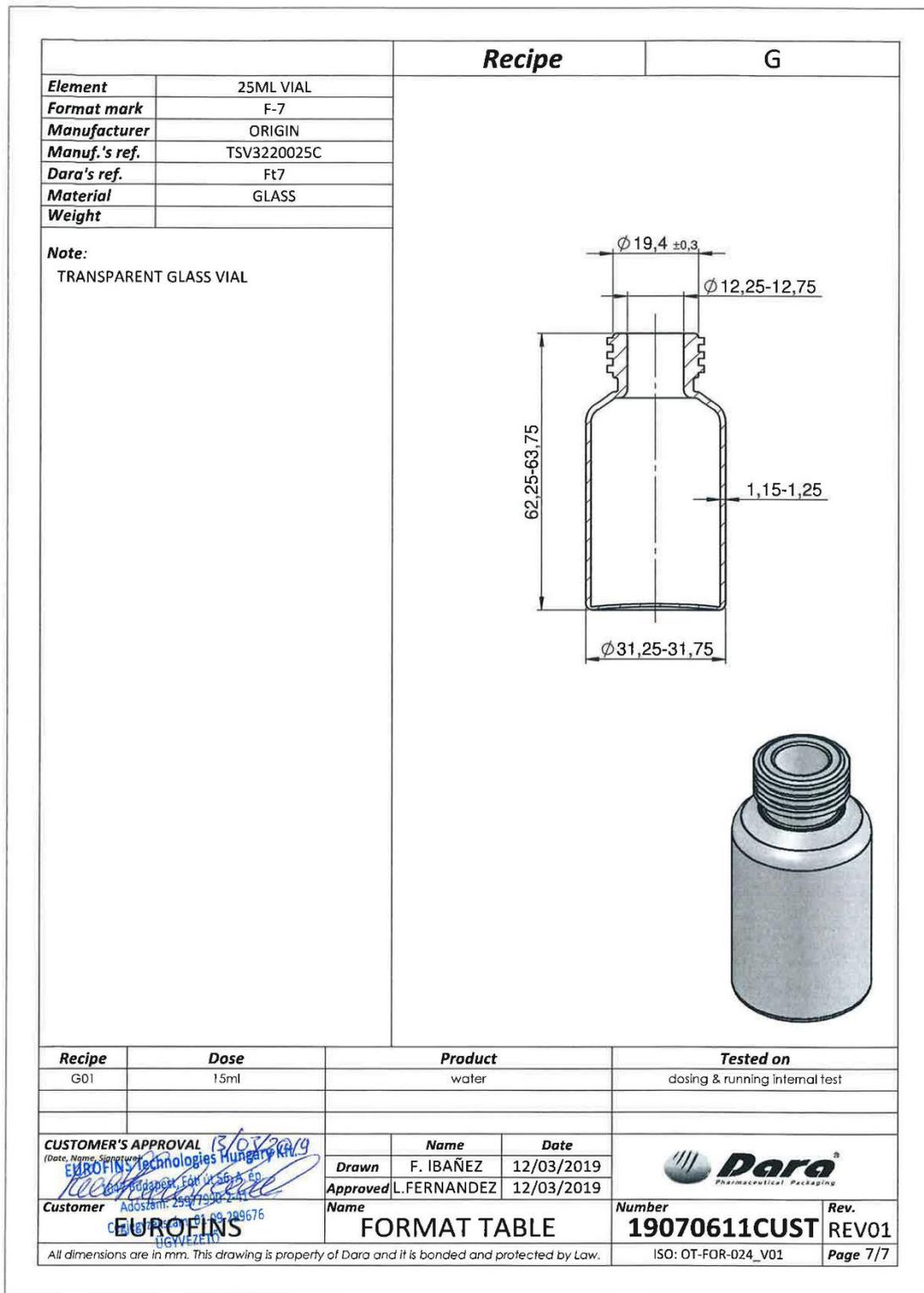


Figure: F-7 Format Table

**4.3. Layout**

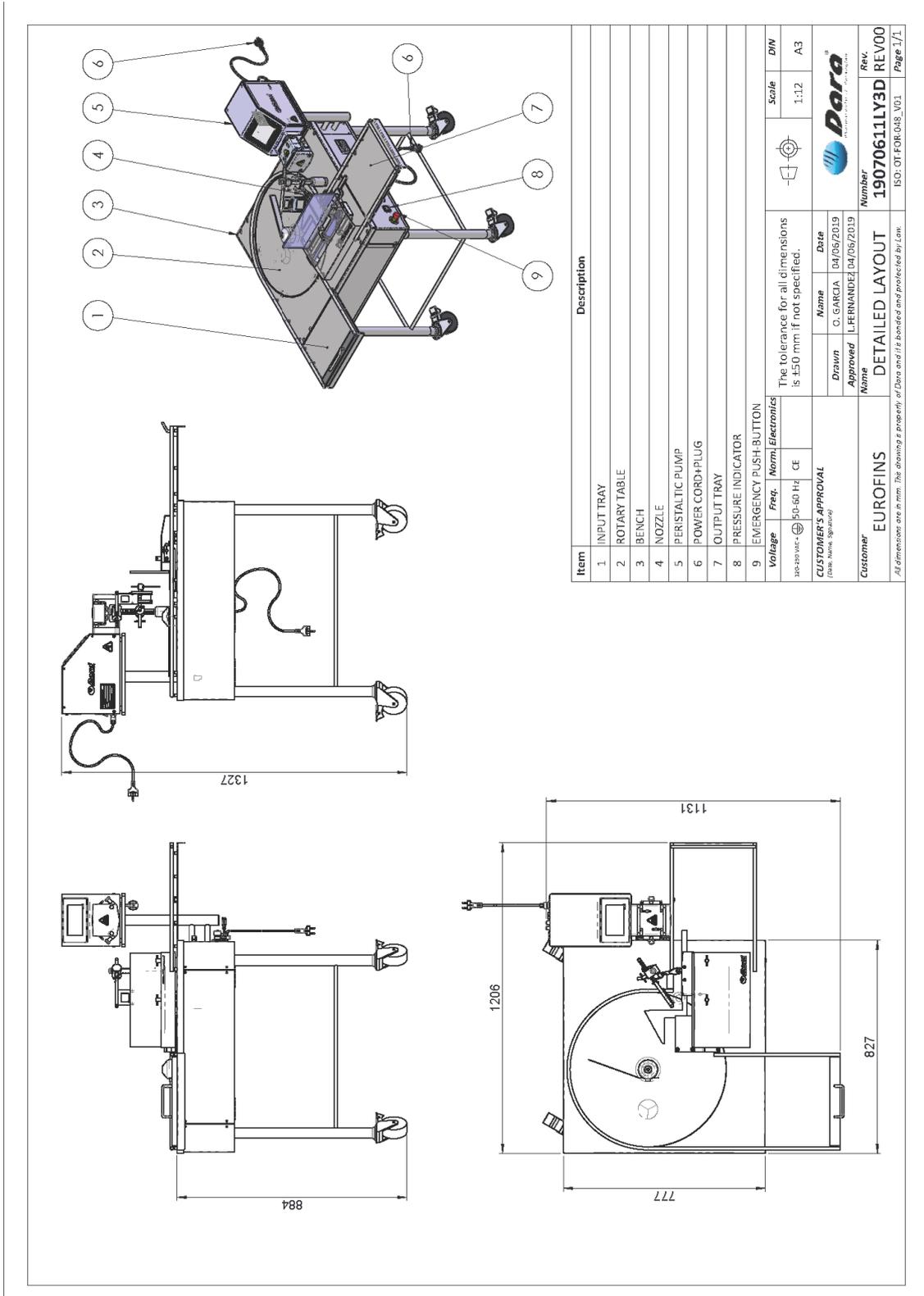


Figure: Machine Layout

### 4.4. Main Description

Once the filling station is programmed, and that the SX-100 is adjusted to the required bottle size, carry out the following steps:

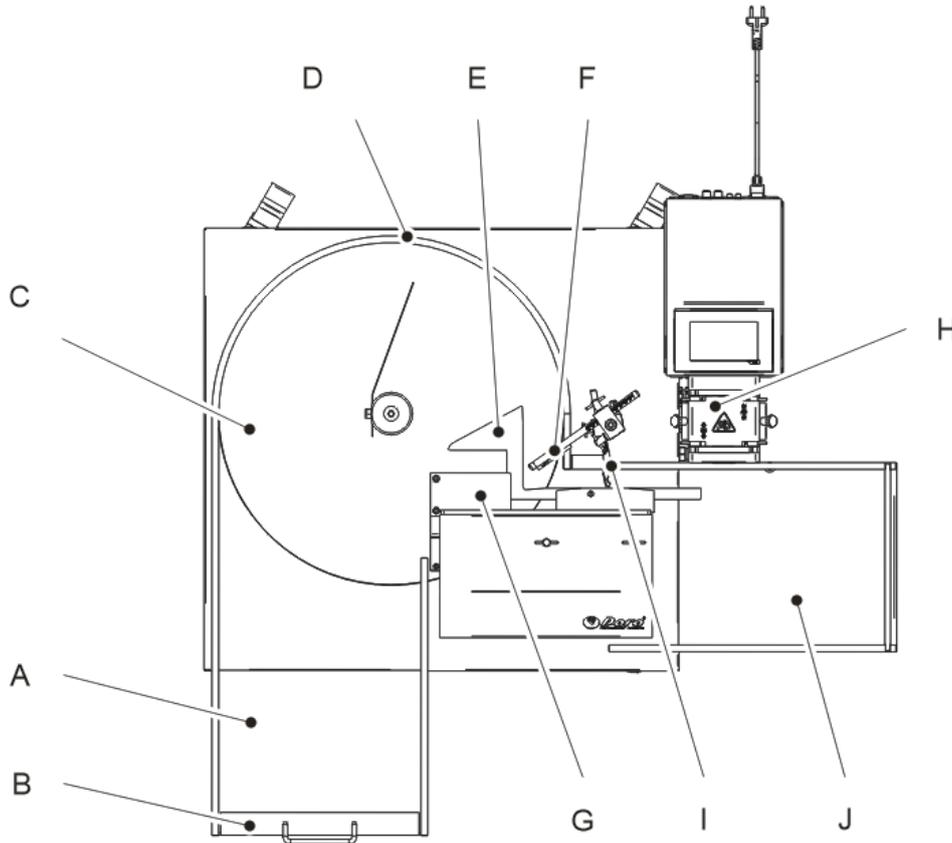


Figure: Top view

1. Place the required amount of bottles in the inlet tray **(a)**. Use the inlet pusher **(b)** to move the bottles closer to the inlet rotary table **(c)**.
2. Bottles are inserted in the inlet rotary table (clockwise sense), following the profile of the external guide **(d)** of it, towards the vial inlet guide **(e)**.
3. Once the sensor **(f)** detects a presence of a bottle, the pusher **(g)** takes a step, moving the bottle to the dosing station.
4. The dosing station is formed by the peristaltic pump **(h)** and the filling nozzle **(i)** located at the same support as the presence sensor.
5. Once the filling process is done, the filled bottles are directed to the outlet tray **(j)** where they must be picked up by the operator.

## 4.5. Identification plates

The machine is identified by a features plate located on the side frame of the machine.

This plate shows the Number, Model and Year of manufacture.



The image shows a rectangular identification plate for the SX-100 machine. At the top left is the Dara logo with the text 'Pharmaceutical Packaging' and a stylized graphic of three slanted bars. Below the logo, there are three input fields: 'Serial number / year:' containing '1907061-1/19', 'Type - model:' containing 'SX-100', and 'Electrical supply:' containing '120-230 VAC + ⊕', '50-60 Hz', and '0,15 kW'. At the bottom, it lists 'Maquinaria Industrial Dara SL' with the address 'Poligono Industrial Coll de la Manyà - C/ Galileu Galilei, 5-19 08403 Granollers (Barcelona) SPAIN - www.dara-pharma.com' and the CE mark.

Figure: SX-100 identification plate

The peristaltic pump is identified by a features plate located on the side frame of the machine.

This plate shows the Number, Model and Year of manufacture.



The image shows a rectangular identification plate for the SX-50 SpeedFill machine. At the top left is the Dara logo with the text 'Pharmaceutical Packaging' and a stylized graphic of three slanted bars. Below the logo, there are three input fields: 'Serial number / year:' containing '012/17', 'Type - model:' containing 'SX-50 SpeedFill', and 'Electrical supply:' containing '120-230 VAC ⊕', '50-60 Hz', and '0,5 kW'. At the bottom, it lists 'Maquinaria Industrial Dara SL' with the address 'Poligono Industrial Coll de la Manyà - C/ Galileu Galilei, 5-19 08403 Granollers (Barcelona) SPAIN - www.dara-pharma.com' and the CE mark.

Figure: SX-50 SpeedFill identification plate

## 5. Technical Features

### 5.1. Electric Features

Power (Main supply)	120-230 VAC	X
Controls Tension	24 V.C.C.	X

### 5.2. Functional Features

#### 5.2.1. Environment Conditions

- Temperature: between 5 ÷ 50°C.
- Humidity: between 30 ÷ 90% without condensation.

**Protection against fire:** The possible kinds of fire should be considered before selecting the type of fire extinguisher to be used. It is recommended to use

#### 5.2.2. Noise

Continue acoustic pressure level average equalled A:

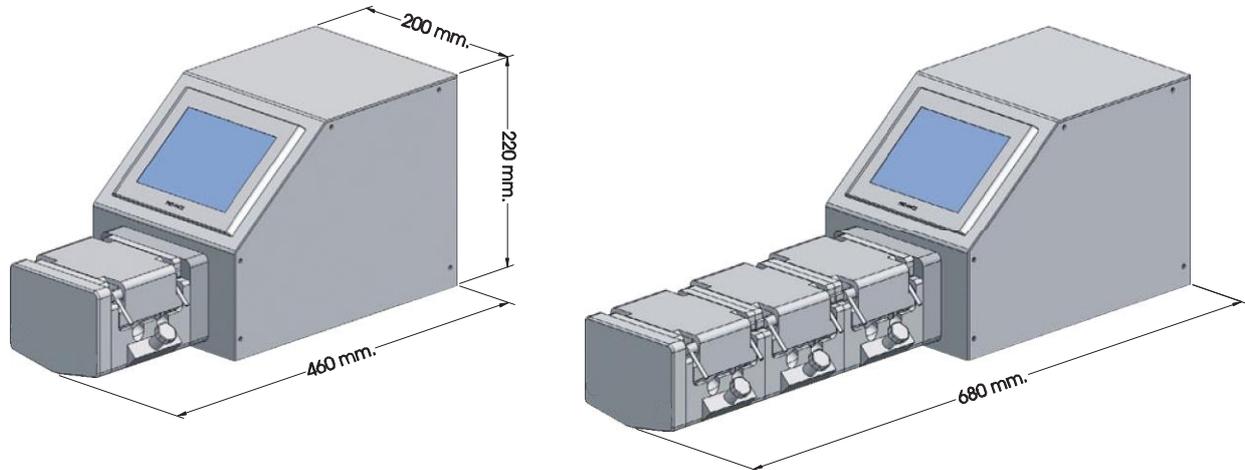
$$L_{eq} < 70 \text{ dB(A)}$$

### 5.3. Accessories

Peristaltic Pump	X
------------------	---

## 5.4. SX-50 Technical Features

### 5.4.1. Dimensions



<b>Dose margin:</b>	Between 0,1-1050 ml
<b>Accuracy / Precision of the dose:</b>	±1%
<b>Dosing Flow:</b>	6,4 L/min per head
<b>Peristaltic Head:</b>	One-piece construction monobloc head. Allows to incorporate up the three serial heads with 6/8 low inertia grinded stainless steel rollers with two, 90° phased out tracks. This ensures a dosing with no pulses.
<b>Tubes / dimensions:</b>	Platinum cured silicone. In conformity with GMP-US FDA. Int Ø.: 0,5 / 0,8 / 1,6 / 3,2 / 4,8 / 6,4 / 8 / 9,6 mm. Wall thickness: 2,4 mm.
<b>Electric Supply:</b>	120-230 VAC – 50/60 Hz – 500 W
<b>Electronics / Interface:</b>	Standard Electronics. Multi-language touchscreen. 1 x (24 VDC) dosing start input. 1 x output to report dosing end. 2 x RS-232/485 for printer / micro-scale.
<b>Weight (1 head):</b>	17.5 kg.
<b>Materials:</b>	AISI-304 / 316L Stainless Steel and anodised aluminium.

### 5.4.2. Optional Accessories

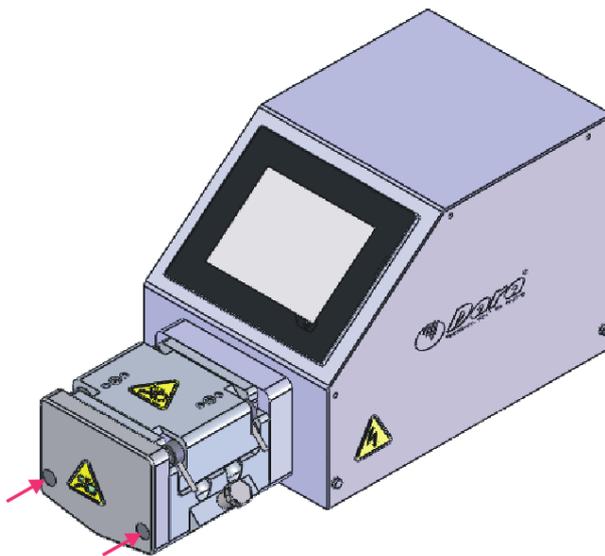
- Nozzles, support and dosing tubes
- Additional peristaltic head (up to 3 heads)
- Connection to micro-scale and automatic volume re-calibration
- Software for documentation and printing of relevant data
- X-proof Electric Execution
- IQ/OQ Validation Package

### 5.4.3. Additional Heads

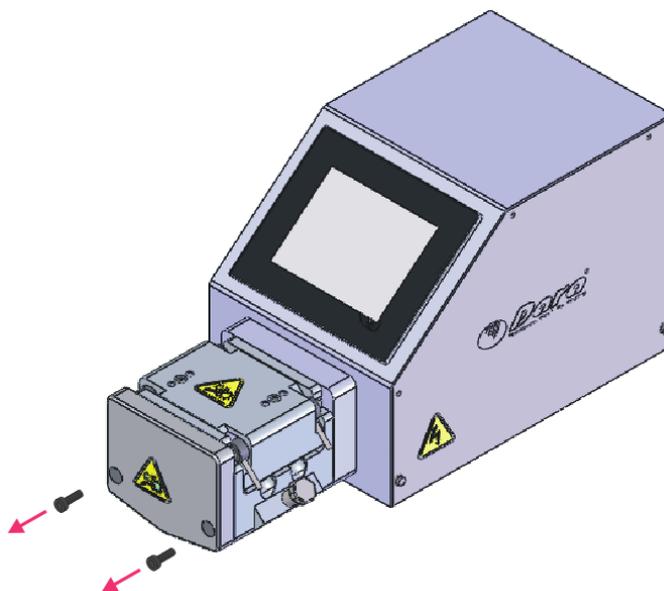
The SX-50 comes with one head as default. To assemble one additional head, proceed as follows:

First of all, ensure to turn off the power of the pump.

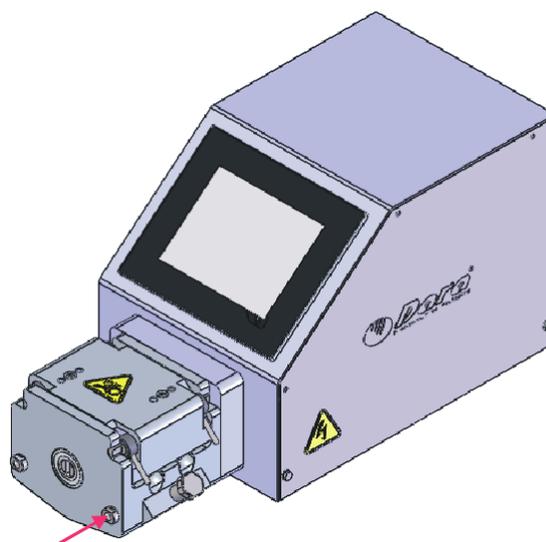
1. Remove cosmetic left and right caps (if damaged, don't worry because they are supplied with each new head).



2. Loosen and pull out two Allen screws that fasten front cover to the ties.

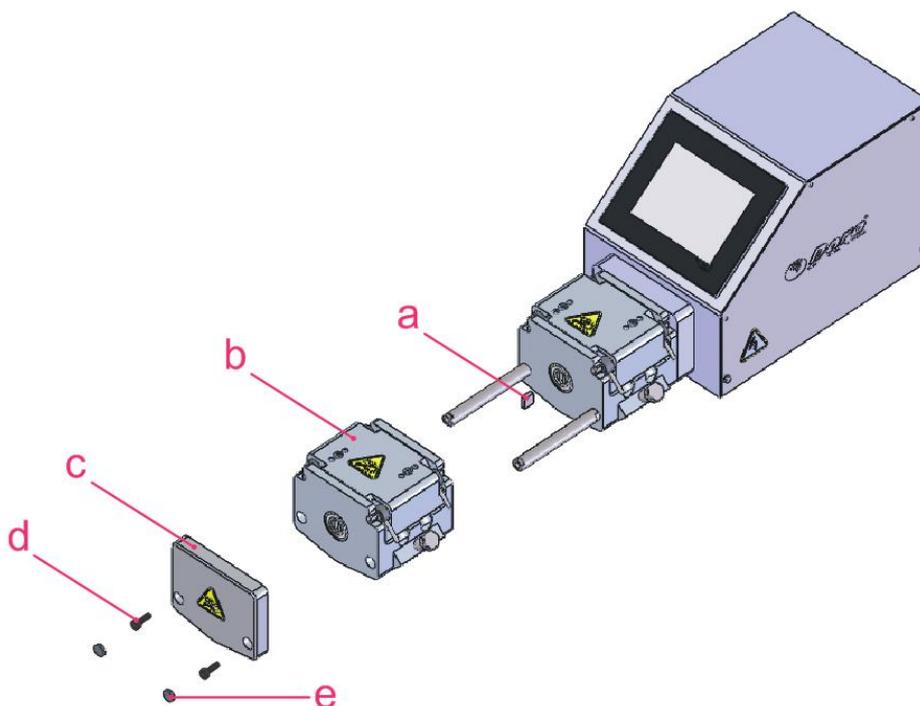


3. Use a 11mm wrench to unscrew and pull out the tie. Replace it by the two-heads tie. Insert the end with the threaded hole and screw by hand until it stops. Next, with the 11mm wrench, tighten it.



4. Pull out the second tie and replace it by the two-heads tie. Proceed in the same way as in the previous step.

5. Once both ties have been assembled, insert the pull parallel key **a** supplied in the slot of the shaft of the first pump, and insert the new head **b** turning the shaft to align the slot to the pull parallel key **a**. Align the ties to the holes in the pump, at the same time.
6. Once the second head is assembled, place the cover **c** and fasten it with the screws **d**. Once both screws are tightened, place the cosmetic caps **e** pushing against the screws.



### 5.4.4. Accuracy of the Pump

IN ORDER TO MAINTAIN THE ACCURACY OF THE PERISTALTIC PUMP, IT IS MANDATORY TO MAINTAIN THE MEASURES OF THE HOSES AS WELL AS THEIR SPECIFICATIONS.

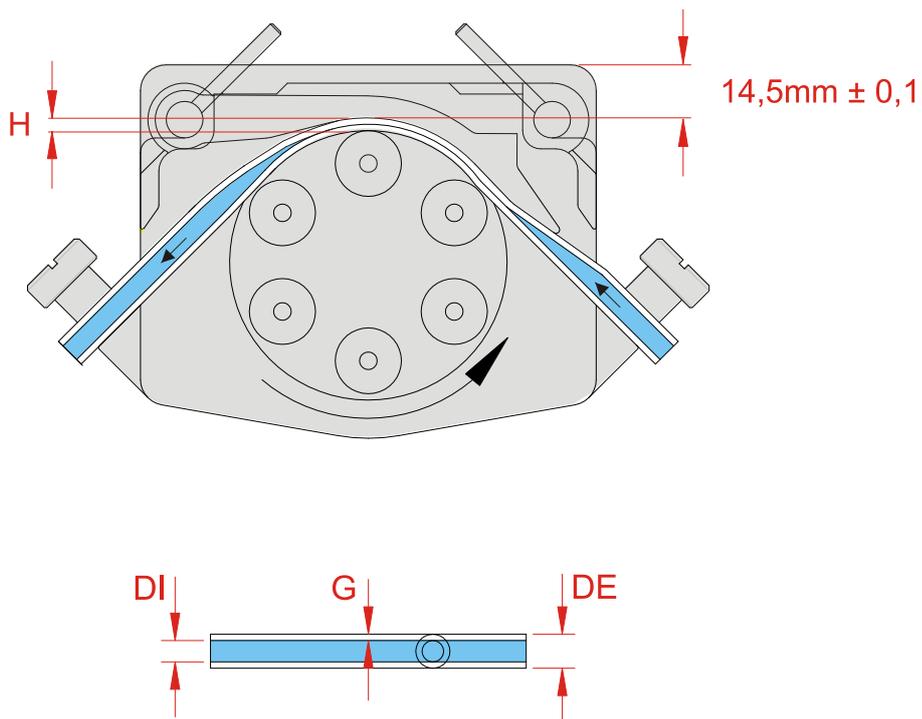
THESE ARE: **DI** INTERNAL DIAMETER OF HOSE  
**DE** EXTERNAL DIAMETER OF HOSE  
**G** THICKNESS OF HOSE

**WARNING**

TO WARRANTY A GOOD PRESSURE (**H**) AGAINST THE SILICONE TUBE, IT IS MANDATORY TO KEEP THE DISTANCE OF **14,5mm ± 0,1** IN THE POINT WHERE THE WALL IS NEAR THE ROLLERS.

HOSES MUST HAVE THE SAME SPECIFICATIONS AS THE ONES USED DURING THE **FAT**, WHICH ACCURACY HAS BEEN APPROVED BY THE CUSTOMER.

(A WIDE STOCK OF PREVIOUSLY APPROVED AND ACCEPTED HOSES FOR ITS PUMPS IS AVAILABLE FROM DARA).



## 6. Transport and Handling

To handle the machine once it has been unpacked, a fork truck or trans-palette must be used, according to the following instructions:

1. Check that the power supply has been switched off. All access and handling area must be cleared.
2. Unplug the supply wire of the machine.
3. Disassemble all the elements of the equipment which are not fastened to the machine (i.e. peristaltic pump) in case it is necessary.
4. Insert the forks of the truck or *trans-palette* below the frame of the machine, or push the frame after unlocking the wheels.
5. Place the machine in its final position.
6. Assemble again all elements that were disassembled.

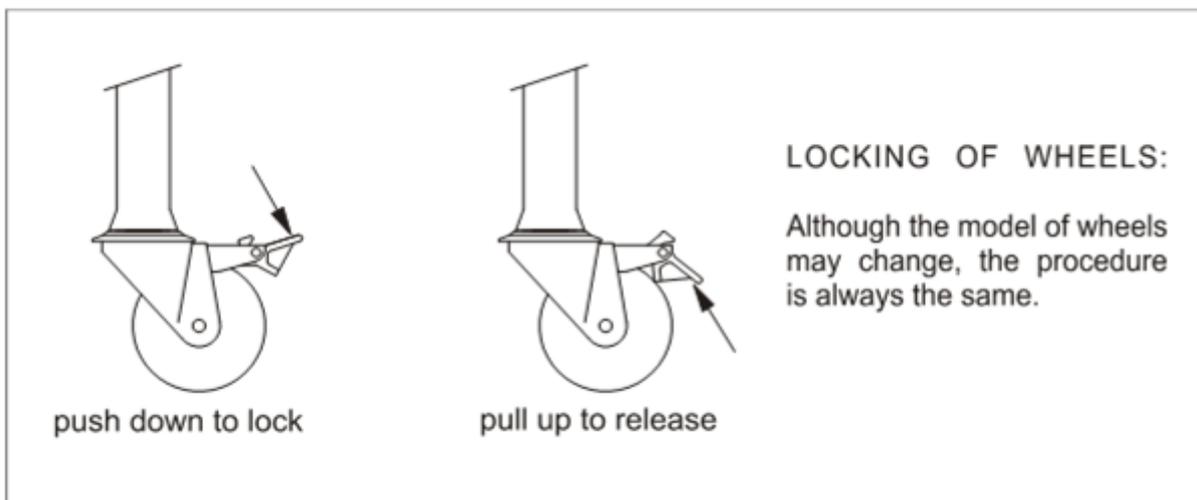


Figure: Locking of wheels

## 7. Installation and Start Up

### 7.1. Placement of the machine

The room required for the placement of the bench top must be wide enough for the user to carry out the work and see the indicators of the machine, as well as to carry out maintenance operations.

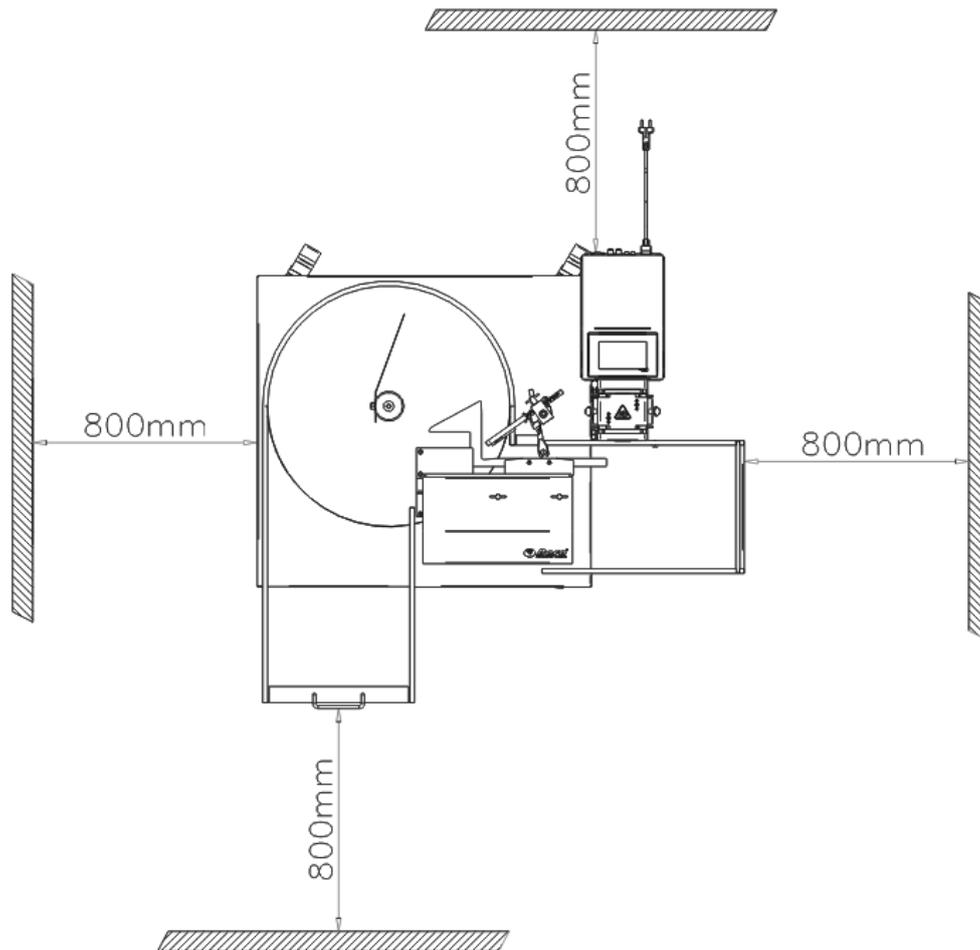


Figure: Layout for the machine placement

## 7.2. Connections

**Warning:** Liability of **DARA** begins at the power supply connection terminals of the machine. Protection against isolation failures, shortcuts and overcharge in connections before power supply connection terminals, is a full liability of the customer.

Before connecting the machine to power supply, the customer has to check the features of electric protection devices on their electric installation and the section of power supply wires arriving to connection terminals according to the maximum use intensity as shown in this manual, in order to ensure the protection of persons and goods.

### 7.2.1. Electric Connections

The machine is provided with a standard plug to be directly connected to AC mains. Nevertheless, the connection to the main switch is also provided, in case the plug should be changed.

**Linea:** See *Technical features*  
**Power:** 0.15 kW  
**Wiring:** The section of wires must be 1.5 mm<sup>2</sup>.  
**Location of connection:** Right panel power plug.

(\*) See electric drawings

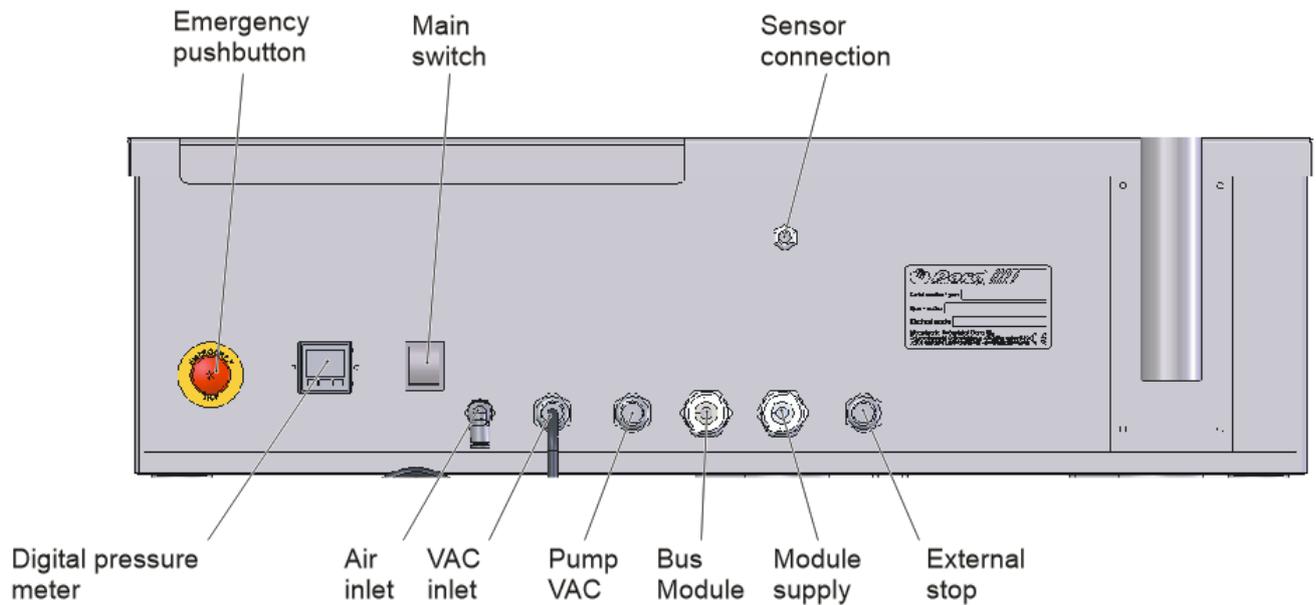
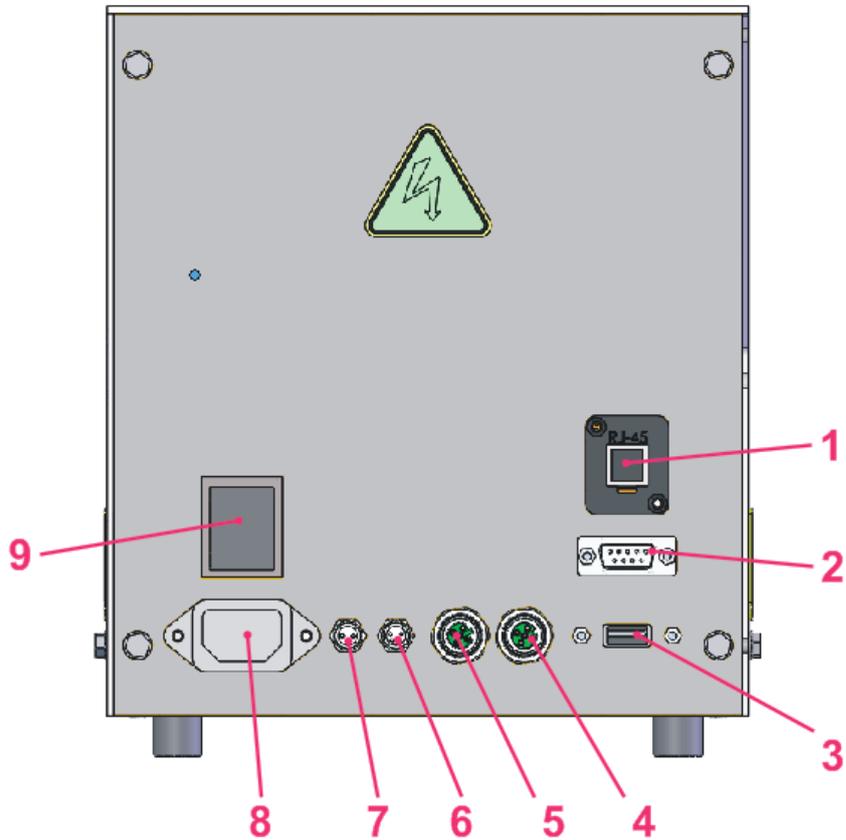


Figure: Lateral panel

**7.2.2. Pneumatic Connections**

**Main Inlet:** Ø10x1 (8mm interior)  
**Control valve:** Ø6 mm  
**Compressed Air Consumption:** 50L/min  
**Location of connection:** Right panel power plug

**7.2.3. SX-50 Rear Panel**



1	Ethernet Plug
2	RS-232 Scale Plug
3	USB Plug to Load/Save Recipes
4	Pedal/External Synchronism Signals Plug
5	SX-100 Modules Plug
6	SX-100 Plug
7	External Stop Plug
8	AC Power Plug
9	Main Switch

## **8. Operation**

### **8.1. Control Panel**

The controls are located in the control panel of the pump, located near the normal operator's position.

#### **8.1.1. Machine Control Screen**

This screen is connected to the PLC that controls all the systems. This screen is the interface between the machine and the operator. By means of several pages or screens, the operator can configure all the operation of the machine as well as obtain information about the status of each one of the stations.

#### **8.1.2. Emergency Pushbutton**

This is the strictest and shortest safety. When pushed, all the power to the machine is suddenly cut (air pressure and electric power).

##### **8.1.2.1 General process**

Before starting the machine, the required adjustments for the type of container to produce must be carried out.

First, the manual adjustments must be carried out in the different stations:

- 1 – Adjustment of the containers' inlet and outlet guide.
- 2 – Adjustment of the table deflection guide.
- 3 – Adjustment of container inlet presence sensor.
- 4 – Adjustment of the height for the filling station.
- 5 – Adjustment of the pusher stop.

In the control panel, after releasing the emergency pushbutton and pressing exit, the main screen is displayed.

Containers arrive to the machine through the rotary inlet table, once the operator has loaded them on the inlet tray.

At the end of the inlet guide, there is a fork photocell that starts the pneumatic cylinder that positions the container under the filling nozzle.

Once the pneumatic brake for locking the container is activated, the container is filled with the required dose.

In the control panel, there is an emergency pushbutton. When it is activated by the operator, the machine stops suddenly. The emergency pushbutton must be only used in case of emergency, and not as the usual way of stopping the machine.

## 8.2. Description of the Program

The control system of the machine is composed by two parts: software and hardware.

The hardware of the machine has five main parts:

- The PLC, where the software which controls the machine is stored.
- Inputs / Outputs module (I/O) which receives and sends information from/to the field elements.
- Touch Screen or HMI, which is the interface that allows the operator to configure and give the appropriate directions to the machine and shows the status of the process.
- Servo motors and actuators, which are in charge of performing the actions on the different machine modules to achieve the desired movements.
- Sensors, detectors and instrumentations, which are responsible of informing the PLC of the status of the machine. These sensors can be analogue or digital.

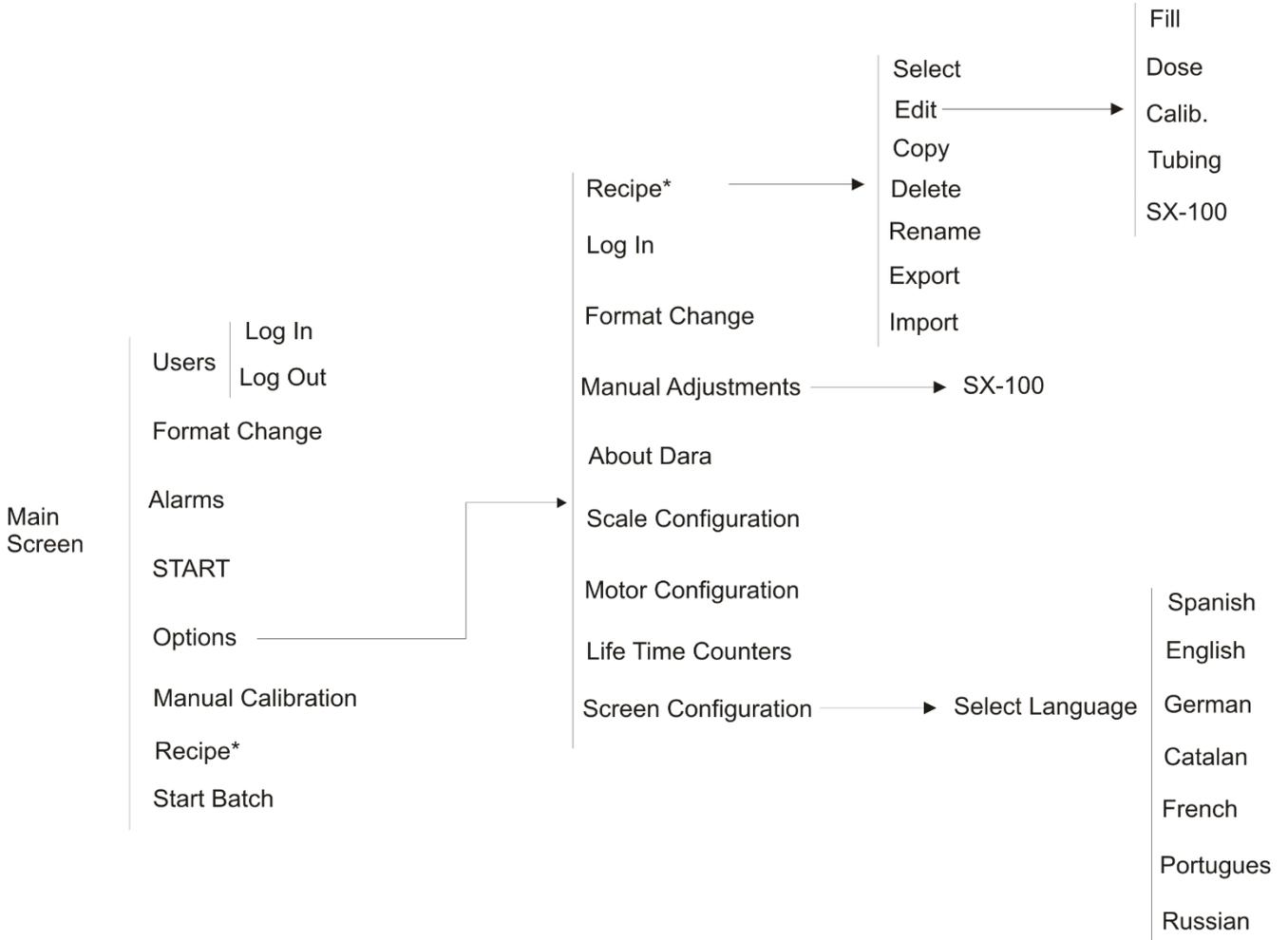
The software allows the user to parameterize the machine in order to adjust its behavior, making the operation values comprehensible to the operator. It also allows the configuration of the parameters related to the different products by means of recipes. These recipes can be configured, stored and called back when they are needed. In addition, general elements of the machine, not associated to the product, can also be parameterized to achieve different functionalities according to the machine's use range.

There are five different machine status which are the following:

- 1.- No power in machine .....No voltage neither air pressure.
- 2.- EMERGENCY .....There is voltage but no power neither air pressure.
- 3.- MANUAL .....Machine with power and air pressure but stopped.
- 4.- PERIPHERALS .....Machine stopped but with auxiliary elements activated.
- 5.- AUTOMATIC .....Machine running.

## 9. Screens

### 9.1. Tree of Screens

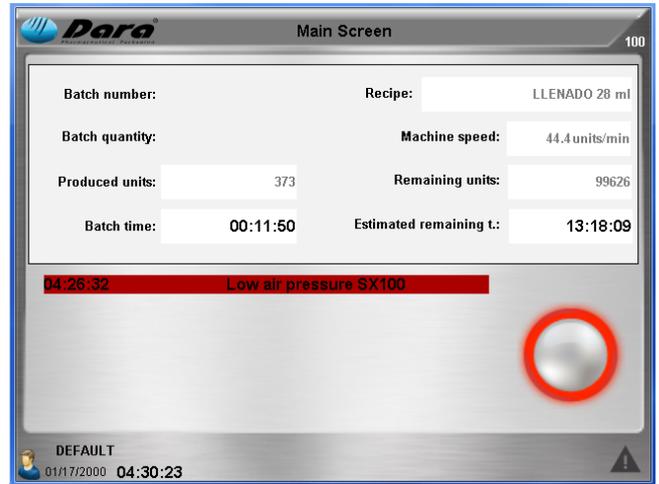


REF:1907061-1

## 9.2. Main Screen

This screen is the one which is loaded when the machine is turned on. From here all configuration screens of the machine can be accessed, but a password is required for certain parts of them.

Initially, at the bottom of the screen are only displayed two icons:



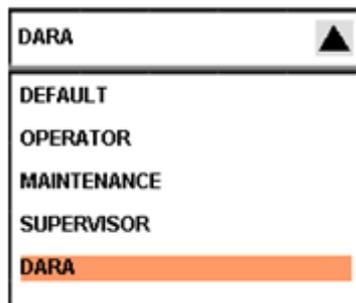
The figure at the left allows the change of user. If the default user is maintained, no more functions of the machine can be accessed

When the human figure is pushed up, the screen for user change is displayed:



When pushing the cursor at the right of the field User, the menu for the user levels is dropped-down:

The possible users are: DEFAULT, OPERATOR, MAINTENACE, SUPERVISOR y DARA.



The access levels for each user are:

DEFAULT	Only has access to Main screen and Alarms screen
OPERATOR	In the addition to previous accesses, Recipes selection (no recipes creation), Manual Calibration and Format Change
MAINTENACE	In addition to previous accesses, Manual Adjustments
SUPERVISOR	In addition to previous accesses, Recipes edition and creation
DARA	Total access

Once the password is inserted, validate it with Login. From now on, the complete menu for the operation of the pump is displayed.



**BATCH N°:** Alpha-numerical reference of the present lot. The operator can insert a number of lot or not. It is an information field.

**RECIPE:** Displays the current selected recipe.

**BATCH QUANTITY:** This is a pre-selection that can be edited which allows to configure the machine to stop and warn about an end of batch, when the amount of produced units equals or surpasses this pre-selection. If the value 0 is inserted, this function is overridden and the machine will never stop for such reason.

**MACHINE SPEED:** Units produced per minute.

**PRODUCED UNITS:** This is an increasing counter that shows the units produced by lot. It is updated when a finished container is ejected from the machine.

**REMAINING UNITS:** Units remaining to end the lot.

**BATCH TIME:** This displays the time elapsed during the production of the present lot in hours, minutes and seconds.

**ESTIMATED REMAINING TIME:** This is a time calculated in relation to the present speed of the machine to finish the pre-selected lot of production.

**START/STOP:** The round pushbutton located in the bottom right corner of the screen starts the automatic mode of the machine, if it was stopped. When the machine is in operation, it displays the pushbutton surrounded in green colour, and if any alarm is reported, the pushbutton is surrounded in red colour. To stop the machine, push again the round pushbutton. The pump is always started in the mode configured before stopping it.

**INDICATIONS:** In the lower left corner, the name of the logged user is displayed, as well as the current date and time.

**START BATCH:** It performs a rest of the field *Batch quantity*.

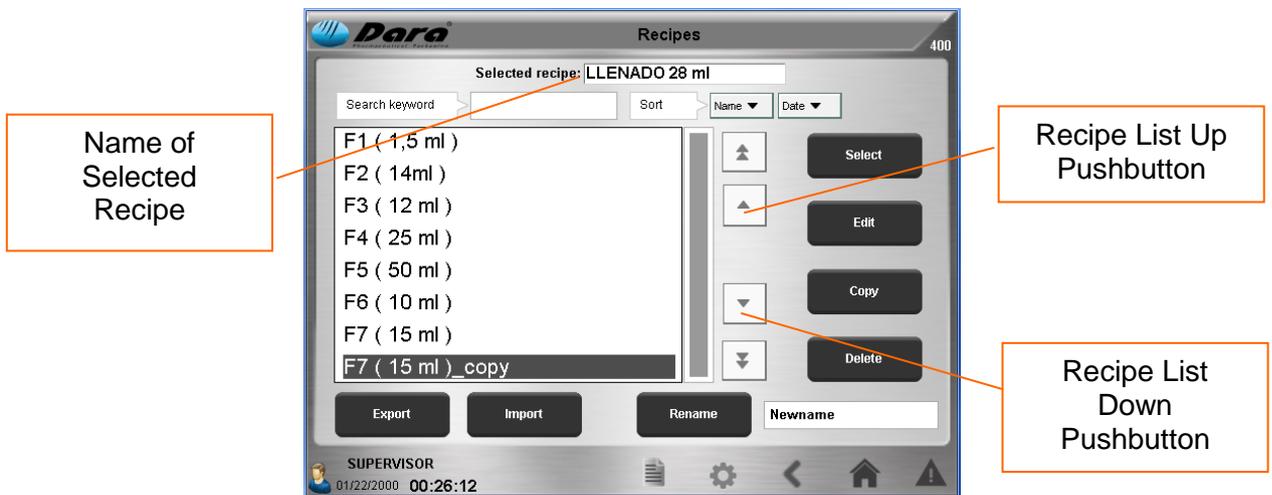
### 9.3. Options

This screen allows the access to the options menu for the pump operation. Each option is, at the same time a push button to open the screen to which it refers.

Depending on the user and the level of access, more or less pushbuttons are displayed, and more or less screens can be accessed.

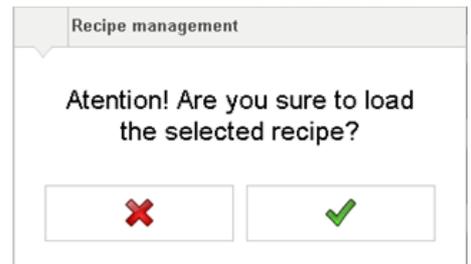


### 9.3.1. Recipes



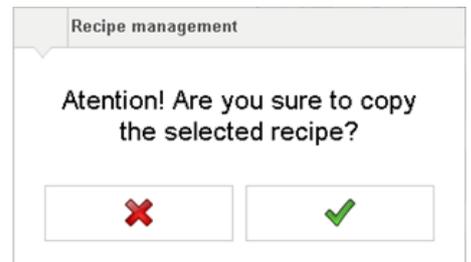
This screen displays the list of created recipes. Each recipe can have a name of up to characters, and the names are displayed one after another up to 20 recipes. Since there is space for only 8 recipes, the rest of recipes can be check with the cursor displacement buttons. The cursor on the recipe is shown with a dark background.

**SELECTION:** Opens a window to confirm that such recipe or format will be changed or, what's the same, that the set of parameters for that recipe will be changed. If *Cancel* is pushed, the program returns to the recipe selection screen. If *Selection* is pushed, the recipe where the cursor was placed becomes active.



**EDIT:** When this button is pressed the first screen of recipe edition is displayed. It is edited the recipe where the cursor is on, at the moment when the button is pressed. To do so, the CALIBRATION screen is displayed for the corresponding recipe. The edited recipe can be other than the currently selected recipe. When the button SELECTION is pressed, the edited recipe becomes the current recipe.

**COPY:** When this button is pressed, all parameters of the recipe where the cursor is placed are copied to the clipboard.



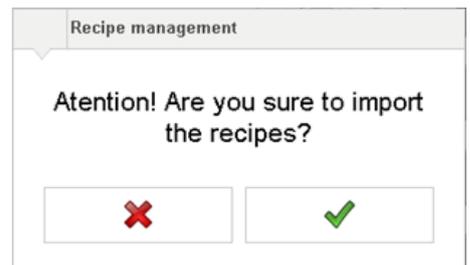
**DELETE:** When the Delete pushbutton is pushed up, the recipe where the cursor is positioned will be deleted. Before, the confirmation window is displayed.



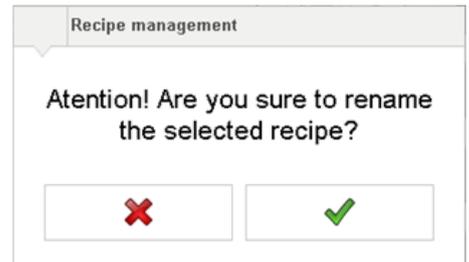
**EXPORT:** Saves the selected recipe in another external storing device. Before, the confirmation window is displayed.



**IMPORT:** Captures the recipe from an external storing device. Before, the confirmation window is displayed.



**RENAME:** Changes the name of the selected recipe. A new name must be inserted in the field at right, and push Rename. Before, the confirmation window is displayed.



When pushing inside of the field, an alpha-numerical keyboard is displayed. Key in the new name for the recipe and validate with ↵. To exit the screen, close it by pushing on x.



When pushing the Edit pushbutton, all the devices and parameters related to the recipe are displayed, which are accessed from other screens.

Depending on the user and the level of access, more or less pushbuttons are displayed, and more or less screens can be accessed.



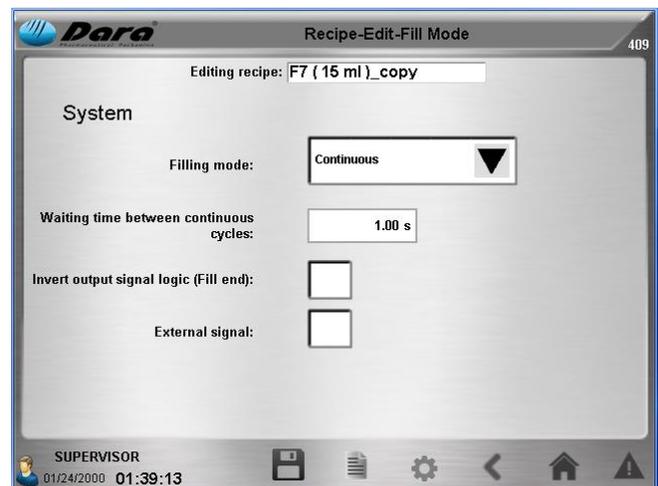
### 9.3.1.1 Fill mode

**Filling mode:** It allows to select between *Continuous* or *Step by Step*. The continuous filling is performed by means of an internal timer of the pump's PLC, while in the step-by-step filling the pump waits for an external signal to be activated.

**Waiting time between continuous cycles:** It allows the adjustment between each filling cycle. When *Step by Step* is selected, this parameter disappears.

**Invert output signal logic fill (Fill end):** When this option is selected, the change of the external signal that activates the pump is inverted. This is, if before the pump was activated when the signal changed from 0 to 1, now is activated when the signal changes from 1 to 0 or vice versa.

**External signal:** When this option is selected, the pump will be only started when receiving an external signal and will stop when the signal changes.



### 9.3.1.2 Dose

All these fields configure the 2 movements of the servo in the peristaltic pumps, **Dose** and **Drip-free**.

Each movement is configured by 4 parameters (Volume, Sped in rpm, Acceleration and Deceleration). For the **Drip-free**, instead of volume, revolutions in the opposite sense of dosing are configured. In addition, the option *Drip-free* must be selected if this function is required.

**Speed:** Numeric fields that can be edited and selected by the current recipe, to set the speed in rpm for each movement.

**Acceleration or Deceleration:** Numeric fields that can be edited, in seconds. The acceleration or deceleration cannot be bigger than the half of the total pulses for each movement.

**Density (g/ml):** Known density of the product to be dosed. If it is unknown, insert the value 1. When pushing *Calculate*, it can be adjusted.

**Weight:** Displays the weight of product which has been obtained, depending of the density and the dosed volume.

**Pump Max time:** It displays the maximum time allowed to the pump to perform the dosing. If this time is reached, and alarm will be displayed.

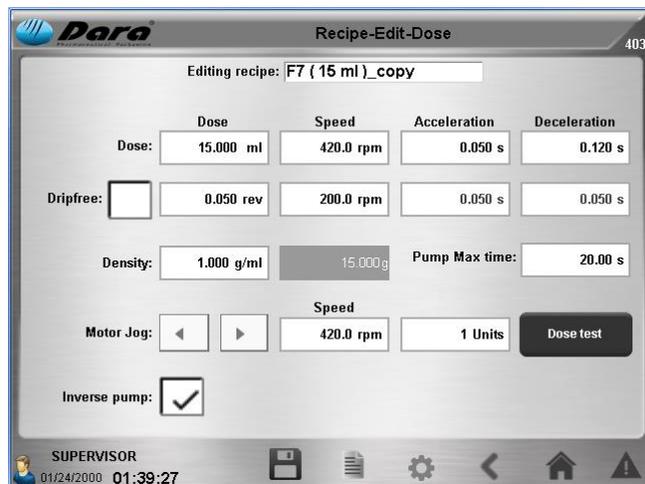
**Motor Jog (◀/▶):** It allows the operation of the pump CW (▶) or CCW (◀).

**Speed:** Speed of the pump during the manual operation, in rpm.

**Samples:** It displays the number of doses (Units) supplied by the pump at the same time for calibration. To perform the calculations, when the sample is weighed the result must be divided by the number of samples (units) that have been dosed.

**Dose test:** It performs a dose according the parameters configured in *Dose* and *Drip-free*. A tared container must be placed under the nozzle before pushing such button.

**Inverse pump:** When this box is selected, the pump reverses the turn sense. It can be used, for example, to purge the product that remains in the propelling tubes.

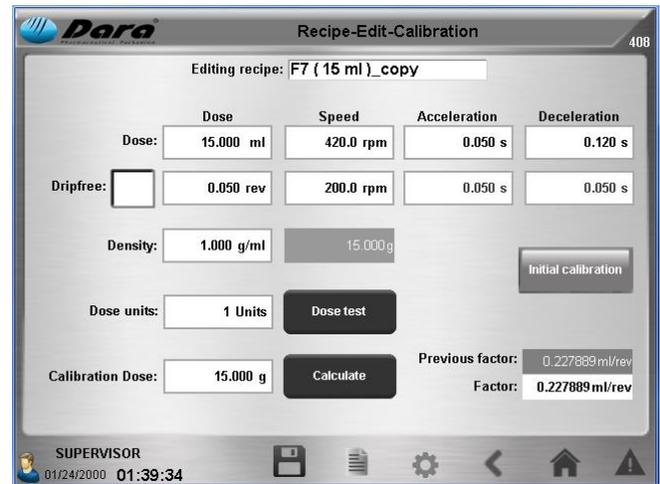


### 9.3.1.3 Calibration

This screen allows the adjustment of all parameters of the pump to allow its calibration. The data will be saved to the edited recipe.

All these fields configure the 2 movements of the servo in the peristaltic pumps, **Dose** and **Drip-free**.

Each movement is configured by 4 parameters (Volume, Speed in rpm, Acceleration and Deceleration). For the **Drip-free**, instead of volume, revolutions in the opposite sense of dosing are configured. In addition, the option *Drip-free* must be selected if this function is required.



**Speed:** Numeric fields that can be edited and selected by the current recipe, to set the speed in rpm for each movement.

**Accel (s) or Decel (s):** Numeric fields that can be edited, in seconds. The acceleration or deceleration cannot be bigger than the half of the total pulses for each movement.

**Density (g/ml):** Known density of the product to be dosed. If it is unknown, insert the value 1. When pushing *Calculate*, it can be adjusted.

**Weight (g):** This is the weight obtained from the known density and dosed volume.

**Initial Calibration:** Opens a new screen to perform an initial calibration. Only *DARA* user can access to this option.

**Dose units:** Number of doses supplied at the same time.

**Dose test:** It performs a dose according to the parameters configured up to that moment. A tared container must be placed under the dosing nozzle to collect the product.

**Calibration Dose:** This field is used to insert the result of weight of the obtained doses (total weight).

**Calculate:** This pushbutton is used to calculate the calibration Factor. Previously, insert the desired values for dose, speed, acceleration and deceleration, and activate the drip-proof if required. Next, push the *Dose Test* pushbutton, measure the obtained dose with a scale and insert the result in the field *Calibration Dose*. Finally, push the *Calculate* pushbutton to obtain the calibration Factor (ml/rev).

**Previous Factor:** Displays the previous calibration factor (current) until a new calibration is performed.

**Factor (ml/rev):** This value is the result of the calculation (can be edited) of the number of millilitres pumped at each turn.

## CALIBRATION OF THE DOSE

To adjust the exact dose for a head, the following procedure must be followed:

1. Choose the tube and nozzles according to the corresponding recipe. Insert the data on the screen
2. Prime the hose up to the nozzle by pushing ◀/▶ in *Edit-Dose*.
3. Tare a beaker.
4. Insert the value 1 in *Dose units*. Perform the 1 dose by pushing *Dose test*.
5. Weigh and insert it in the field *Calibration dose*.
6. Press once the *Calculate* (This operation adjusts the calibration factor).
7. Perform again 1 dose and weigh. The value of a single dose must be corrected.

In case that it is desired to repeat the calibration, follow the procedure again.

### 9.3.1.4 Tubing

**Ø In Tube:** Internal diameter of the tube that goes from the storage tank to the peristaltic pump.

**Ø Out Tube:** Internal diameter that goes from the peristaltic pump to the dosing nozzle.

**Ø Y Tube:** Internal diameter of the Y-shaped tube inserted inside the peristaltic pump head.

**Ø Nozzle:** Internal diameter of the dosing nozzle.

**Nozzle Height:** Length of the dosing nozzle.



### 9.3.1.5 SX100

(Only displayed if the pump is connected to such device)

This screen includes a series of selectors and parameters to control the dosing machine SX-100. To activate the synchronism with the SX-100, select the SX-100 box.

**Brake delay time:** Time after which the brake is activated.

**Table speed:** Rotary speed of the inlet rotary table.

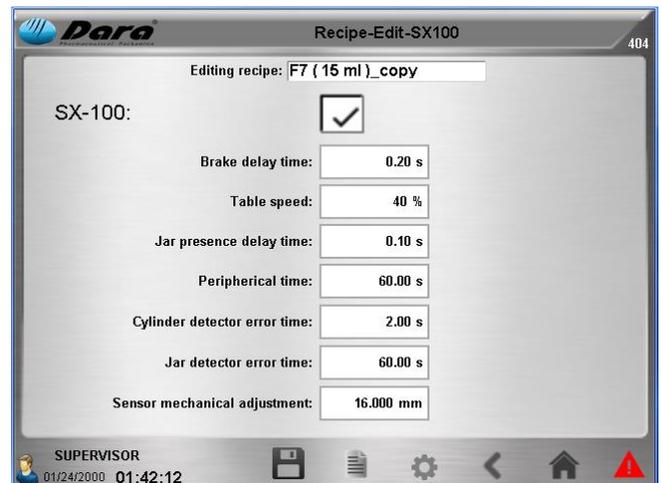
**Jar presence delay time:** Time required to check a constant presence or absence of container.

**Peripheral Time:** Time after stopping the pump to stop the inlet rotary table.

**Cylinder detector error time:** Maximum time allowed for the displacement of the pneumatic cylinders.

**Jar detector error time:** Maximum time allowed to detect the presence of container.

**Sensor mechanical adjustment:** This is the height at which the container's presence sensor has been adjusted.



### 9.3.2. Format change

**Ø In Tube:** Internal diameter of the tube that goes from the storage tank to the peristaltic pump.

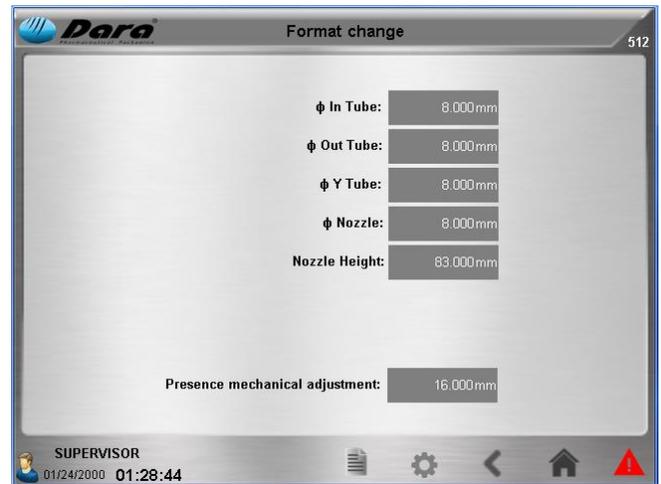
**Ø Out Tube:** Internal diameter that goes from the peristaltic pump to the dosing nozzle.

**Ø Y Tube:** Internal diameter of the Y-shaped tube inserted inside the peristaltic pump head.

**Ø Nozzle:** Internal diameter of the dosing nozzle.

**Nozzle Height:** Length of the dosing nozzle.

**Presence mechanical adjustment:** This is the mechanical adjustment of the presence sensor.



### 9.3.3. Manual Adjustments

**External start signal:** The led changes to yellow when the external machine that the pump is connected to, is running.

**Pump filling signal:** The led changes to yellow when the pump is dosing.

**Air pressure OK:** The led changes to yellow when the air pressure signal is OK.

For a correct synchronism, when the external machine is running, the pump must be stopped and vice versa, when the pump is running, the external machine must be stopped.



### 9.3.3.1 Manual Adjustments – SX100

(only displayed when there is a SX-100 machine connected)

**Air pressure OK signal:** The led changes to yellow when the air pressure is connected and is OK.

**Inlet Table Speed (%):** This is the speed of the inlet rotary table related to the production speed.

**Inlet Table Speed:** This is an ON/OFF selector to activate or deactivate the inlet rotary table movement, in manual mode.

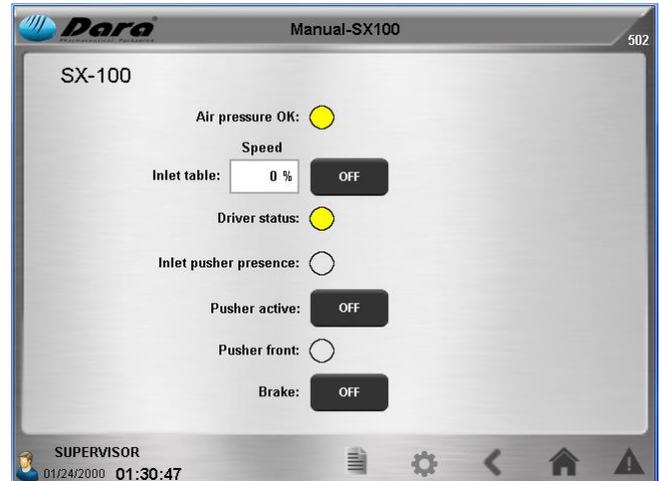
**Driver status signal:** The led changes to yellow when the inlet rotary table driver is OK.

**Inlet pusher presence signal:** The led changes to yellow when the inlet pusher sensor is detecting a bottle.

**Pusher active:** This is an ON/OFF selector to activate or deactivate the movement of the pusher. When it is in OFF selection the pusher is in rest position.

**Pusher front signal:** The led changes to yellow when the pusher is in the front position.

**Brake:** This is an OFF/ON selector to activate or deactivate the brake located under the nozzles that holds the container to fill it.



### 9.3.4. About Dara

This screen contains commercial data of the manufacturer, to help to get in touch in case of any failure of the machine.

- Name
- Direction
- Telephone
- Fax
- Internet

It also displays the PLC and HMI versions of the system.

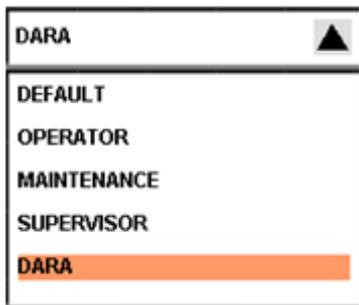


### 9.3.5. Log-in

When pushing the human figure , the user screen is displayed.

When pushing the cursor at the right side of the field *User*, the menu of user levels is dropped-down: The possible users are: DEFAULT, OPERATOR, MAINTENANCE, SUPERVISOR and DARA.

The access levels for each user are:



DEFAULT	Only has access to Main screen and Alarms screen
OPERATOR	In the addition to previous accesses, Recipes selection (no recipes creation), Manual Calibration and Format Change
MAINTENANCE	In addition to previous accesses, Manual Adjustments
SUPERVISOR	In addition to previous accesses, Recipes edition and creation
DARA	Total access

Once the password is inserted, validate it with *Login*. From now on the complete menu for the operation of the pump is displayed. To log with a different access than the current one, first exit with *Logout*, select another user level, key in the new password and validate with *Login*.

### 9.3.6. Scale Configuration

(Only displayed if the pump is connected to such device)

This screen allows to configure the communications between the pump and the scale through a serial port.

**Baud rate:** Transmission speed between the PLC of the pump and the scale in bits per second (between 300 and 19200).

**Parity:** Parity bit (even, odd or none).

**Data bits:** They can be 7 or 8.

**Stop bits:** They can be 1 or 2.

**Read data:** This field displays the information as received from the scale, as a data sequence. In the field at the right side, only the weight is displayed.



### 9.3.7. Screen Configuration

**Select Language:** It allows to change the language of the screens, when the cursor at the right side is pushed down. It can be selected between Spanish, English, German, Catalan, French and Portuguese.

**Touch Configuration:**

**Brightness:** The sliding cursor allows the adjustment of the brightness of the screen.

**Calibrate:** It allows to calibrate the positioning of the cursor in the screen.

**Network Settings:**

**IP Address:** It allows to modify the network address to communicate the pump with another device.

**Time and Date:** It allows to modify the time (HH:MM:SS) and date (yyyy/mm/dd) of the PLC of the pump. Key in the new



### 9.3.8. Motor Configuration

This screen displays the parameters about the motor.

**Positive speed:** Editable field to limit the maximum speed of the pump.

**Negative speed:** Editable field to limit the maximum speed of the pump in the opposite direction.

**Acceleration:** Editable field to limit the acceleration of the servo motor.

**Deceleration:** Editable field to limit the deceleration of the servo motor.

**Position error stop:** Editable field to set the maximum permissible position error of the servo motor.

**Position proportional gain:** Editable field to regulate the proportional gain in position loop mode.

**Speed proportional gain:** Editable field to regulate the proportional gain in speed loop mode.



### 9.3.9. Life Time Counters

The screen displays two parameters about the life time of the pump:

**Total Units Produced:** Displays the number of fillings performed by the pump.

**Total Life Time Machine:** Displays the total number of hours, minutes and seconds during which the pump has been running.



### 9.4. Change of Format

**Ø In Tube:** Internal diameter of the tube that goes from the storage tank to the peristaltic pump.

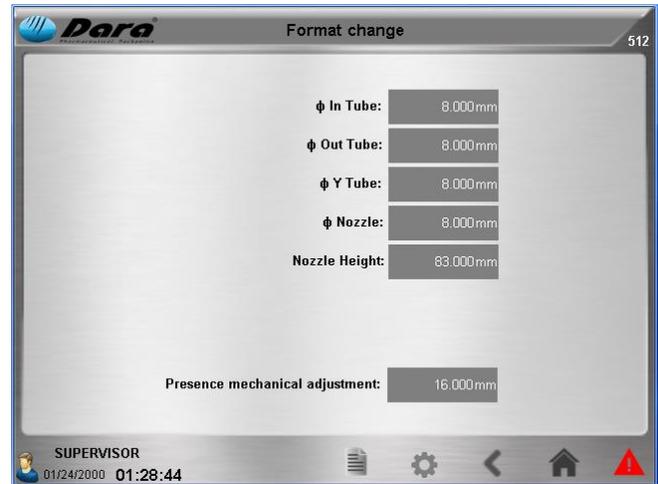
**Ø Out Tube:** Internal diameter that goes from the peristaltic pump to the dosing nozzle.

**Ø Y Tube:** Internal diameter of the Y-shaped tube inserted inside the peristaltic pump head.

**Ø Nozzle:** Internal diameter of the dosing nozzle.

**Nozzle Height:** Length of the dosing nozzle.

**Presence mechanical adjustment:** This is the mechanical adjustment of the presence sensor.



### 9.5. Manual Calibration

This calibration screen can be accessed by the user level OPERATOR. The result of the calibration factor can be used for the dosing while no other recipe is selected, but it cannot be saved with the user level OPERATOR. If another recipe is selected (even the one that was previously selected), the calibration factor will be the one stored in the recipe.

**Jog Motor (◀/▶):** The cursors allow to activate the pump CCW or CW. Depending on the arrangement of the tubes, the pump will suction or propel the product.

The fields displayed on the vertical columns configure the 2 movements of the peristaltic pump servo (**Dose** and **Drip-free**). Each movement is determined by 4 parameters (Volume/Revolutions, Speed and Acceleration/Deceleration).



**Speed:** Numeric fields that can be edited and selected by the current recipe, to set the speed in rpm for each movement.

**Acceleration or Deceleration:** Numeric fields that can be edited, in seconds. The acceleration or deceleration cannot be bigger than the half of the total pulses for each movement.

**Density (g/ml):** Known density of the product to be dosed. If it is unknown, insert the value 1. When pushing *Calculate*, it can be adjusted.

**Weight (g):** This is the weight obtained from the known density and dosed volume.

**Initial Calibration:** Opens a new screen to perform an initial calibration. Only DARA user can access to this option.

**Dose units:** Number of doses supplied at the same time.

**Dose test:** It performs a dose according to the parameters configured up to that moment. A tared container must be placed under the dosing nozzle to collect the product.

**Calibration Dose:** This field is used to insert the result of weight of the obtained doses (total weight).

**Calculate:** This pushbutton is used to calculate the calibration Factor. Previously, insert the desired values for dose, speed, acceleration and deceleration, and activate the drip-proof if required. Next, push the *Dose Test* pushbutton, measure the obtained dose with a scale and insert the result in the field *Calibration Dose*. Finally, push the *Calculate* pushbutton to obtain the calibration Factor (ml/rev).

**Previous Factor:** Displays the previous calibration factor (current) until a new calibration is performed.

**Factor (ml/rev):** This value is the result of the calculation (can be edited) of the number of millilitres pumped at each turn.

To activate the drip-proof turn, select the box *Drip-proof*.

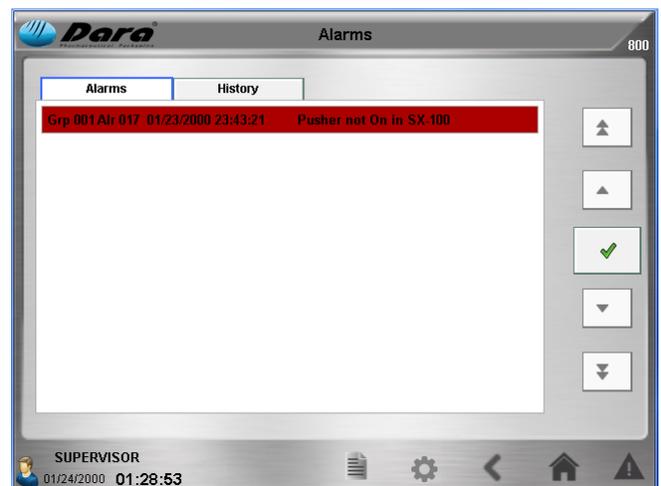
## 9.6. Alarms

These screens display the list of alarms and information messages.

The new alarms and messages are entering from the top pushing down the previous alarms.

These screens can be accessed while any other screen is displayed, whenever such screen displays at the bottom the alarms icon (▲).

The alarms, warnings or activations are displayed with date, message and time.



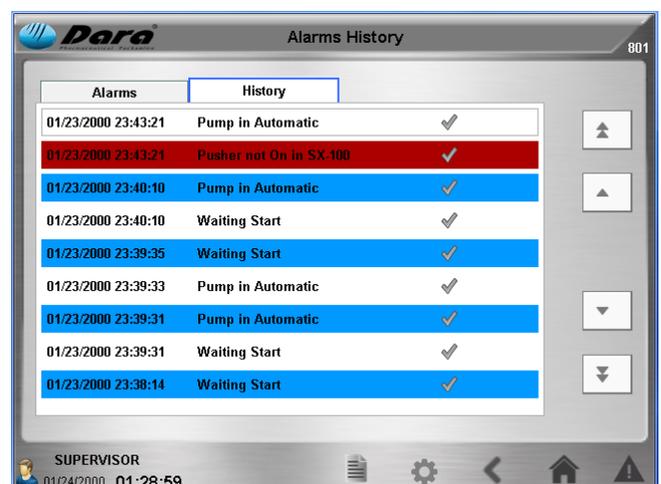
▲ **ROLL UP:** Shifts the cursor up one page.

▲ **UP:** Shifts the cursor up one line.

✓: Acknowledgement and Reset of the alarm.

▼ **DOWN:** Shifts the cursor down one line.

▼ **ROLL DOWN:** Shifts the cursor down one page.



**Alarm Messages (\*)**

Item	Alarm Text
1.	SX100 module not available
2.	SX80 module not available
3.	Nozzle cancelled, SX100 module not available
4.	Nitro cancelled, SX100 module not available
5.	Low level in tank
6.	Product entry Max time reached
7.	USB drive not available
8.	Emergency activated
9.	Calibration parameters invalid
10.	Dosification parameters invalid
11.	Low air pressure SX100
12.	Low air pressuse SX80
13.	Dripfree calibration parameters invalid
14.	Nozzle not rested
15.	Pump do not finished
16.	SX-100 table driver error
17.	Jars not available
18.	Pusher not On in SX-100
19.	Pusher error at entrance SX-80
20.	Pusher error at dose SX-80
21.	SX-80 table driver error

**NOTICE (\*)** Not all of these alarms are included in this machine.

## 9.7. Practical example of Recipe Edition and Calibration

This is a practical example for the operation of the pump:

### 9.7.1. To load a recipe

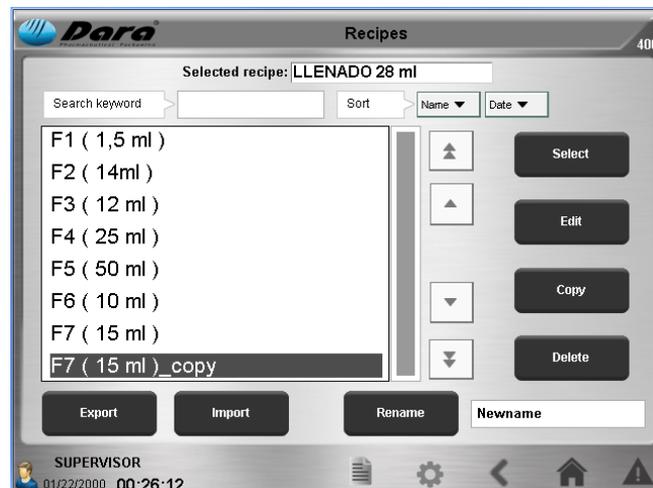
1. Insert User and Password by pushing *Login* in the Main Screen:

User	Password
DARA	Restricted
SUPERVISOR	3
MAINTENANCE	2
OPERATOR	1

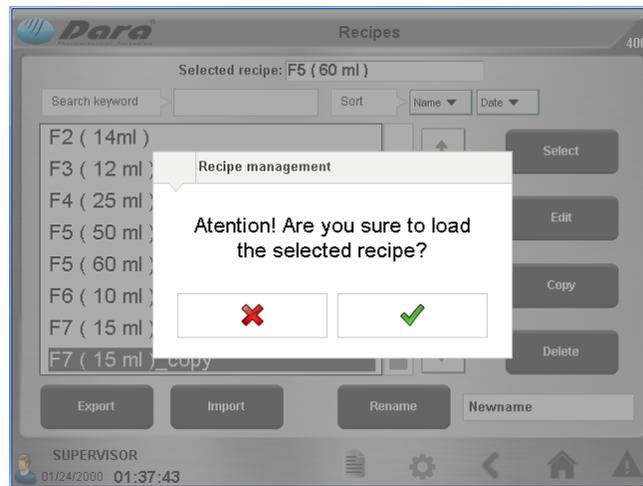
2. From the Main screen, push the Recipes icon (📄)



3. In the Recipes screen, move the cursor to the recipe to be selected with pushbuttons   ,  ,  .



4. Push the *Select* pushbutton. The confirmation window is displayed:

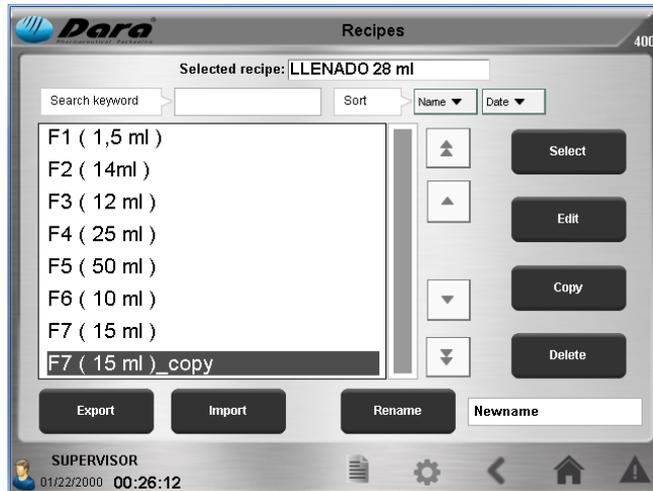


When pushing the confirmation button , the recipe where the cursor is set becomes the current recipe.

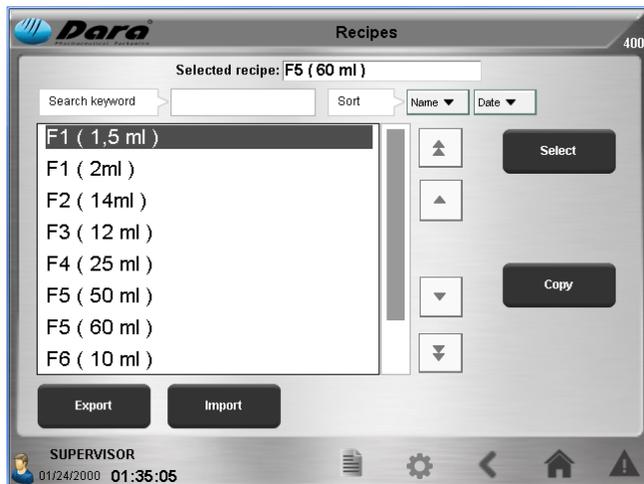
Push the button  to return to the *Main Screen*.

### 9.7.2. To copy a recipe

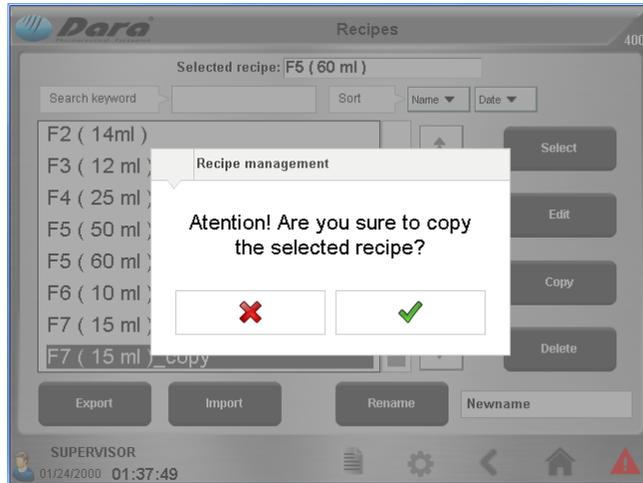
1. From the *Main Screen*, push the *Recipes* (📄) icon.



2. In the *Recipes* screen, shift the cursor to the recipe to copy with pushbuttons ▲, ▲, ▼, ▼



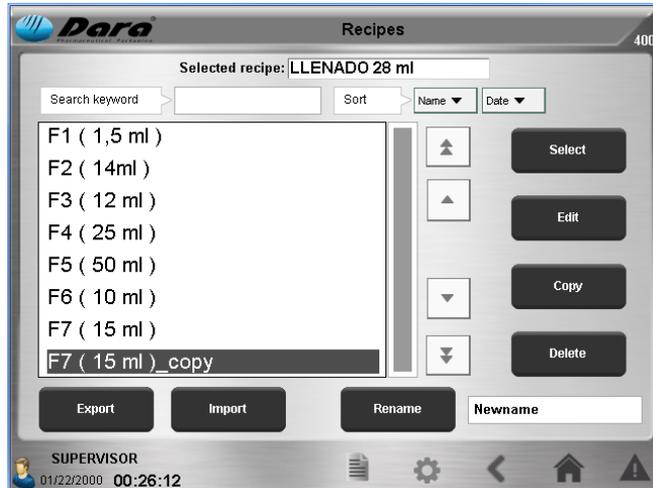
3. Push the *Copy* pushbutton. The confirmation window is displayed:



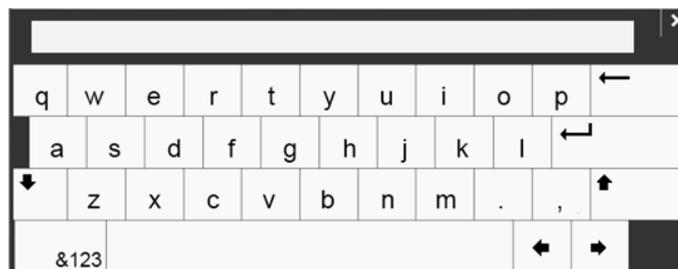
When pushing the confirmation button , the recipe will be displayed in the list with the former name followed by the word copy and will become the current recipe.

### 9.7.3. To change the name of a recipe

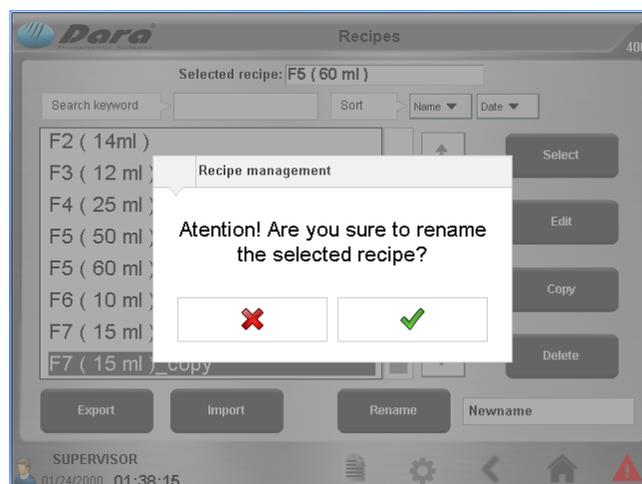
1. From the *Recipes* screen, shift the cursor to the recipe which name has to be changed with pushbuttons ▲, △, ▼, ▾.



2. When the cursor is on the recipe, push inside the fill *Newname*, at the right side of the *Rename* pushbutton. The alphanumeric keypad is displayed. Key in the name of the new recipe and push ↵.



The confirmation window is displayed:



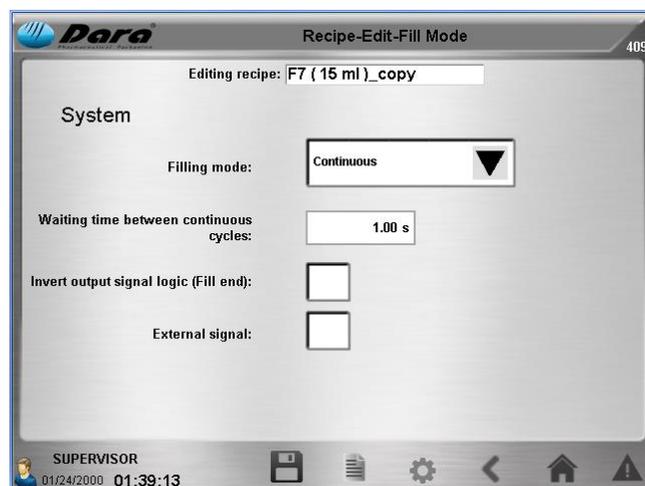
Push the confirmation pushbutton ✓ and the new name will be displayed in place of the former one, in the list of recipes.

### 9.7.4. To create a new recipe

1. Follow the same steps as explained in *To copy a recipe* and *To change the name of a recipe*.
2. With the cursor set on the copied and renamed recipe, push *Edit*. The recipe edition screen is displayed:



Push on *Fill mode* and select between *Continuous* or *Step-by-step*, according to pump's configuration. If *Continuous* is selected, configure the *wait time before cycles*, when the pump will stop its operation.



If *Step-by-step* is selected, the signals at bottom must be configured. If the pump is controlled by an external signal, coming from another machine or from an activation pedal, select the *External signal* box.

To invert the logic signal that the pump sends when dosing is over, select the box *Invert output signal logic (Fill end)*.

3. Push the back icon . In the screen *Recipes-Edit*, push on *Dose*.

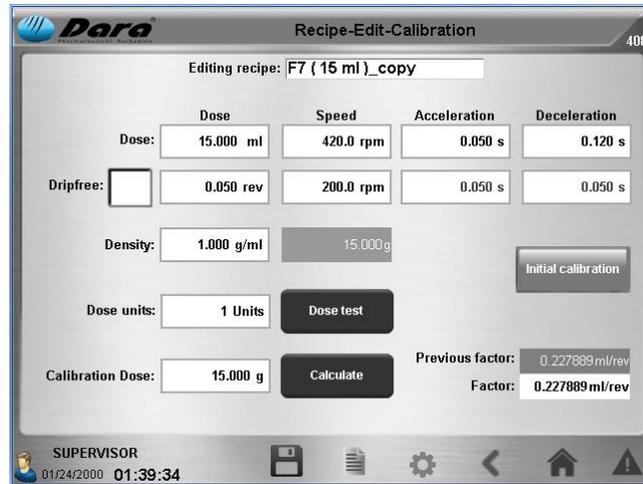


- For the dose, configure the nominal *Dose* to be obtained, turn *Speed* of the pump for dosing, *Acceleration* and *Deceleration*.
- For the *Drip-proof*, after selecting the box if it is required, select *revolutions* in the opposite sense the perform the drip-proof action, turn *Speed* in the opposite sense, *Acceleration* and *Deceleration*.

The configuration of the values *Speed*, *Acceleration*, *Deceleration* and *revolutions* is performed by experimentation. While the dosing speed must be set according the filling rate, if it is increased it can affect the accuracy of the dose. The increase of the *Acceleration* and *Deceleration* can affect also the accuracy and rise the tendency of certain liquids to dripping. To obtain proper values it is recommended to perform the tests with water and to start with the values from a similar recipe, when it is possible.

- Insert *Density* of the product, if known. Otherwise, insert 1 in the field.
- Insert the maximum time allowed to perform the dosing in *Pump Max. time*. Insert the number of doses to obtain at the same time (units) in the field at the right of manual *Speed*.
- Place a tared beaker under the nozzle of product and push *Dose test*. Divide the result of weighing the dose by the number of doses. If the result is not correct, execute the pump *Calibration*.
- Push the return icon .

- In the screen *Recipes-Edit*, push on *Calibration*. By means of this screen, the *Calibration factor* is obtained. This is a relation between the volume dosed by the pump and the turns to perform to obtain such volume. To perform such calculation, the data inserted in the screen *Calibration* is used. Most of the data is shared with the *Dose* screen.

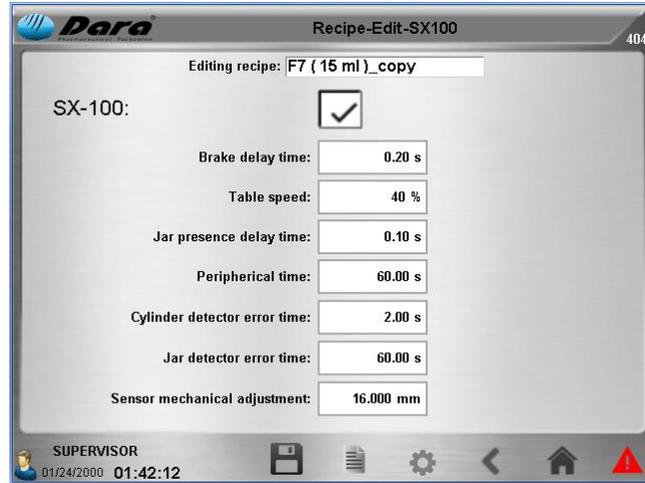


- From the screen *Edit-Calibration*, push *Dose Test*. If the result is not correct or more accuracy is wanted, weight the content and insert the result in the field *Calibration dose*. Push *Calculate* and a new *Factor* will be obtained.
  - Push the return icon .
- In the screen *Recipes-Edit-Tubing*, insert the values for the diameter of the *In tube* (from the storage tank to the pump), *Out tube* (from the pump to the nozzle), *Y Tube* (inner of the pump) and *Nozzle*. Always insert the INNER diameter. Insert also the height or length of the nozzle.



Once the recipe configuration has been completed, save it with . If you want to use it, select it and start production.

6. On the Recipes-Edit-SX100 screen, enter the values for Brake time delay, Table speed, Jar presence delay time, Peripheral time, Cylinder detector error time, Jar detector error time and Sensor mechanical adjustment.



## 10. After Sales Service

If a failure occurs and no solution is found in this User Manual, please get in touch with our After Sales service.

Whenever a query about the machine is necessary:

- About operation
- To order spare parts

**PLEASE ALWAYS REFER THE MODEL AND MANUFACTURING NUMBER**

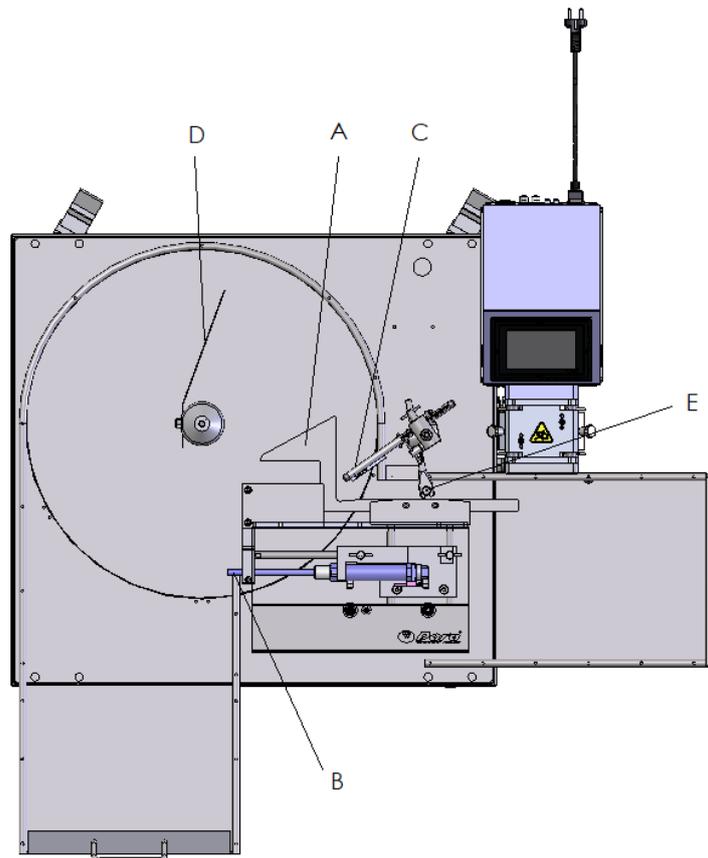
This information is essential and allows the After Sales Service to prepare the spare parts conveniently, so the machine could be repaired if necessary in the first visit of the service team.

Always head for our factory After Sales Service, or to an authorized workshop.  
Only the **DARA** original spare parts fulfil the necessary requirements!

## 11. Adjustments & Change of Format

### 11.1. Format components

In the following image a top view of the components that must be changed or adjusted is shown. Further indications for their assembling and disassembling can be found below.



**WARNING:**

Always check that there are not vials in the machine before starting it again after the change of format.

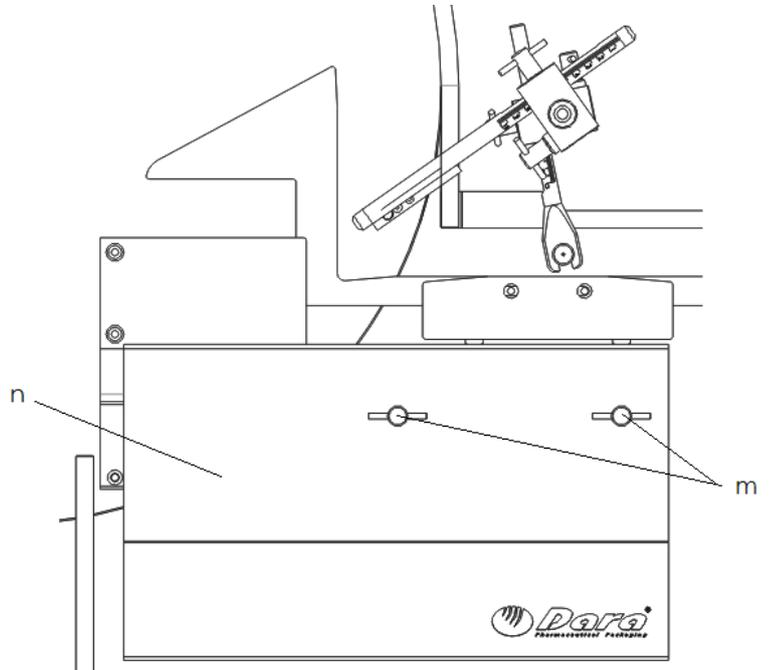
Some images in this point must be considered as a guide.

**11.1.1. (A) Inlet/Outlet Guide**

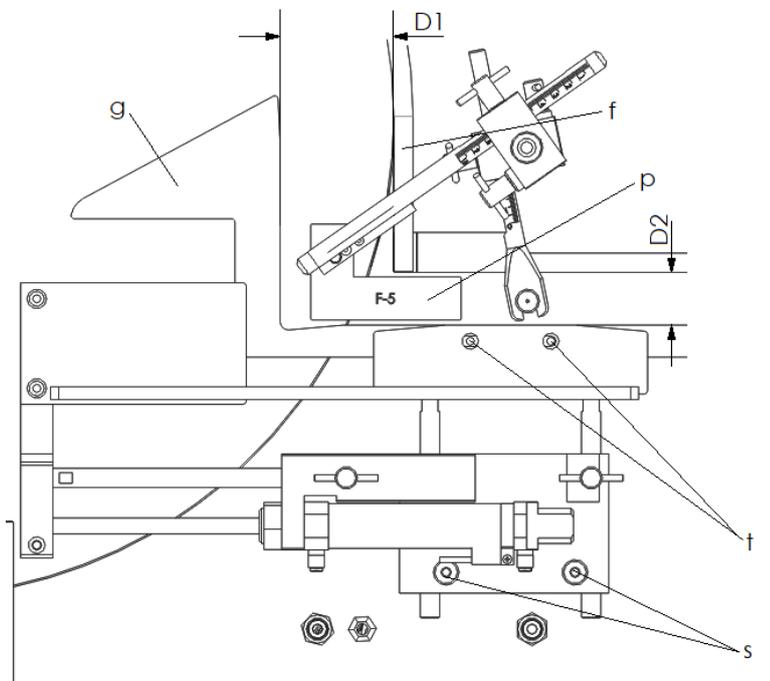
The change of format involves the adjustment of the vial inlet/outlet guide.

The steps to follow to carry out the mechanical adjustment are:

- 1- Loosen the lock handles **(m)** and pull them out.
- 2- Remove the cover guard **(n)**.



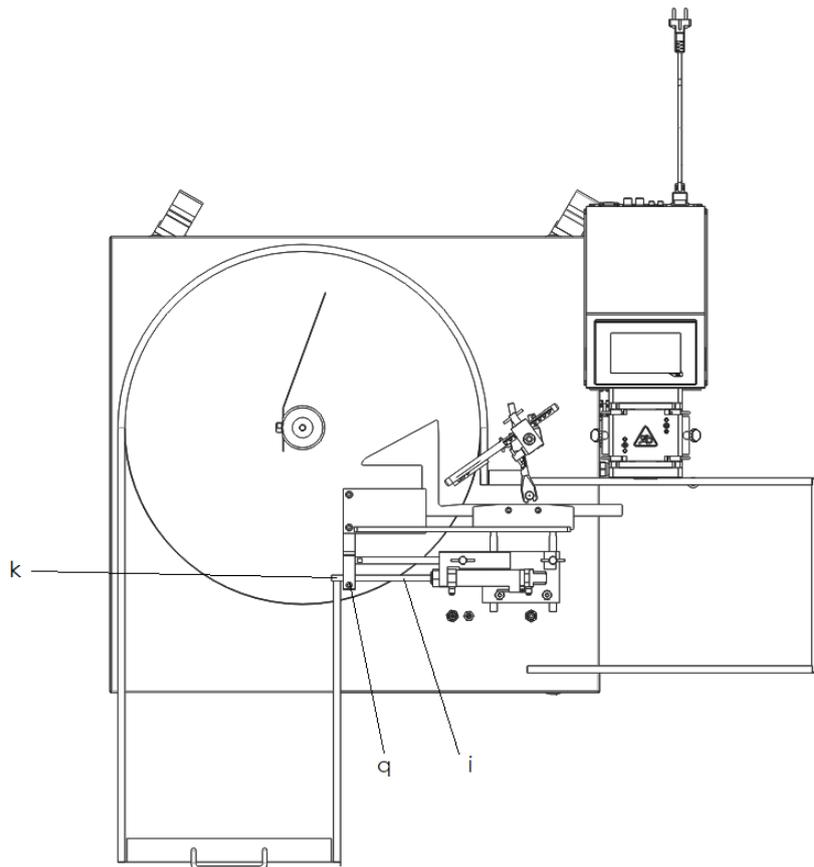
- 3- Loosen screws **(t)** and **(s)**.
- 4- Place the pusher tool **(p)** between the vial inlet guide **(g)** and the fixed guide **(f)**.
- 5- Adjust the separations **(D1)** and **(D2)** by moving the vial inlet guide **(g)**. The pusher tool **(p)**, the vial inlet guide **(g)** and the fixed guide **(f)** must fit together.
- 6- Tighten screws **(t)** and **(s)** again.
- 7- Remove the pusher tool **(p)**.
- 8- Place the cover guard **(n)**
- 9- Tighten the lock handles **(m)** again.



### 11.1.2. (B) Pusher Stop

The change of format involves the replacement of the pusher stop.

To remove the pusher stop **(k)**, loosen the screw **(q)** and push the pusher stop **(k)** from the pneumatic cylinder shaft **(i)**. Proceed in reverse mode to insert a new pusher stop.

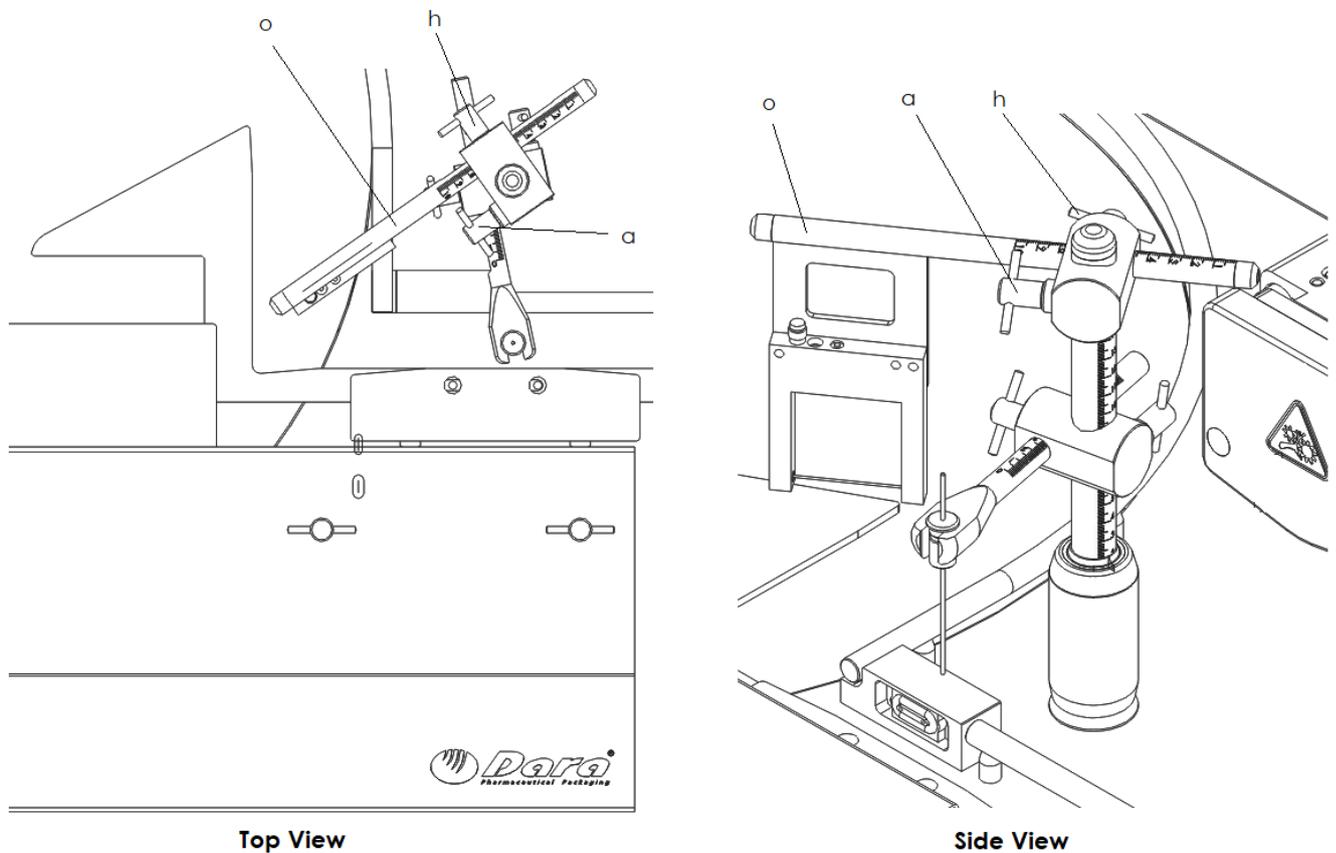


**11.1.3. (C) Inlet Sensor**

The reading of the sensor at the container inlet (through the PLC) causes the push unit to insert the container in the fill position. The correct reading position is that where the sensor is placed some millimeters above the muzzle of the container.

To carry out the mechanical adjustment loosen the handle **(h)** and move the arm forth and back, or turn it clockwise or counterclockwise until the sensor **(o)** is vertically aligned with the muzzle of the container.

If it is desired to raise or lower vertically the sensor **(o)**, loosen the handle **(a)** and raise or lower it to the required height. When this is accomplished, tighten the handle **(a)** again.



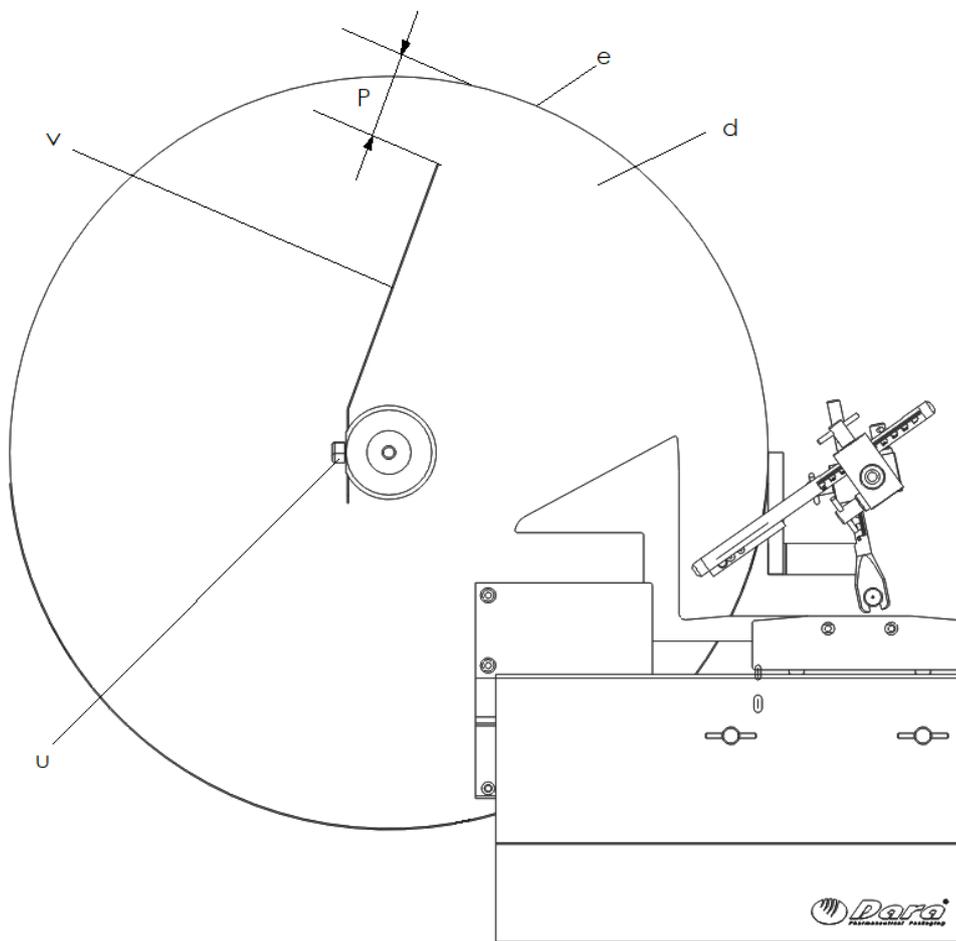
*Figure: Adjustment of the Inlet Sensor*

### 11.1.4. (D) Table Deflection Guide

The deflection guide (**v**) is designed to deflect the containers that clash to it towards the external guide of the rotary table (**d**). Containers rotate on the table (**d**) until they clash with the deflection guide (**v**). When this occurs, they tend to move out until they are stopped by the external guide (**e**). The distance (**P**) between the external guide (**e**) and the deflection guide (**v**) must be wide enough for three vials to pass.

To carry out the mechanical adjustment, loosen the knob (**u**) and shift the deflection guide (**v**) to the left or to the right, until the distance (**P**) is equal to the diameter of container to be produced, plus some millimeters. When it is at the desired position, tighten the knob (**u**) again.

If containers do not arrive to the inlet guide continuously, adjust the distance (**P**) again, giving a little more gap.

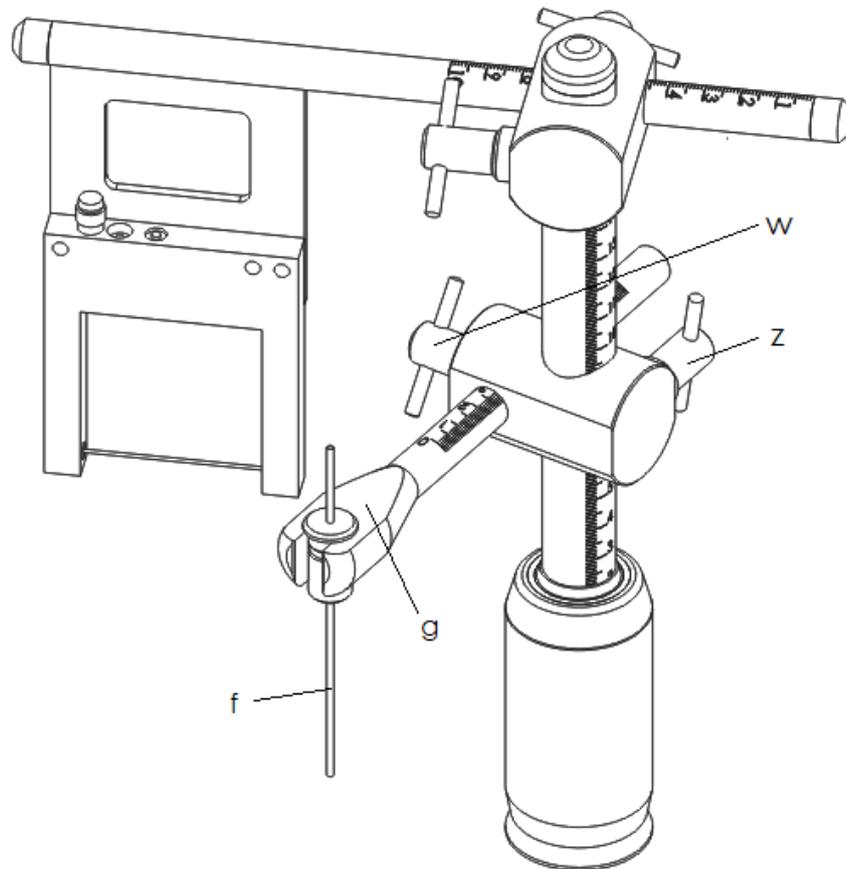


### 11.1.5. (E) Filling Nozzle

The change of format involves the replacement of the filling nozzle and its adjustment. In addition, it has to be removed periodically for cleaning purposes.

To carry out the mechanical adjustment loosen the handles **(w)** and **(z)** and position the filling nozzle in the centre of the container, horizontally and vertically.

To remove the filling nozzle **(f)**, push the nozzle up until it is out from support **(g)**. Proceed in reverse mode to insert the new nozzle.



## 11.2. Replacement of Pump Tubes

Depending on the format selected, or the product to be pumped, a specific type of tube must be used.

To do so, the impulsion tubes attached to the peristaltic pump must be changed as follows:

1. Loosen the handles that fasten the top cover (one at each side)



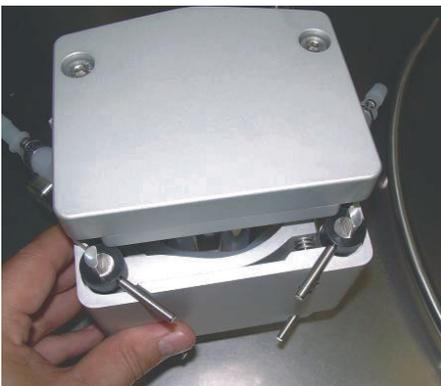
2. Remove the top cover



- 3 & 4. Remove the silicone double hose and hold it with the bolts



- 4 & 5. Place the cover, pressing with a slight pressure to fit the handles and close, turning the handles. Important: Check that the tubes are not trapped with the cover, when closing it.



## 12. Cares and Maintenance

It is recommended to keep all mechanisms, frame and outer coatings in perfect clean condition. This benefits the conservation of polished or sanded surfaces and the lifetime of the machine.

**The machine requires a reduced time for maintenance and cleaning. Please pay attention to it.**

These indications are given for normal operation conditions. For a continuous or intensive use or in a dusty environment increase the suggested frequencies.

A careful maintenance allows to reduce to a minimum no-production times, thus accomplishing a better performance.

### 12.1. Maintenance Operations

The maintenance operations to be carried out by the user are the following ones:

Group	Description	Check (*)		
		1	3	6
1- Drive group (Rotary table).	Tautness of transmission belt.			x
	Bearings and bushings.	-	-	-
2- Filling station	Filling Nozzle	x		
3- Sensors	Microswitches, detectors and fiberoptics (Check operation)			x

(\*) Frequency in months.

### 12.2. SX-50 Maintenance

The pump itself is free of maintenance. It is made of a compact closed assembly which must be sent to the factory for any repair. The periodic re-calibration, at least when each lot is finished, is mandatory.

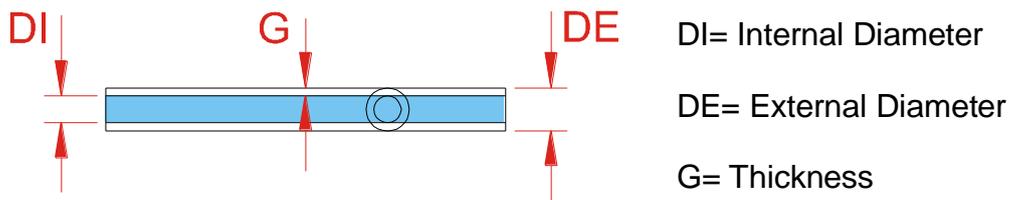
The only component subjected to wear is the Y-shape hose assembly. This is an external component and is considered as a consumable. The factors which increase the wear of such consumable are the type of product to be pumped, the treatments of sterilization to which it is subjected and the amount of production.

To ensure the precision, it should be checked for the wear in thickness every six months. This will only be noticed if after several recalibrations of the pump, the required accuracy is not accomplished.

Nevertheless, before considering the replacement, it must be checked that after several re-calibrations, the pump is not giving the correct accuracy.



Y-Shaped Hose Assembly



Hose Dimensions

### 12.2.1. Lubrication

All the bearings assembled in the pump are maintenance free and do not require lubrication.

### 12.2.2. Cleaning

The only mandatory cleaning is the check for cleaning, if necessary, of the internal rollers of the pump.

## 12.3. Daily Cleaning of Working Areas

The cleaning of working areas should be performed daily, with power switched off.

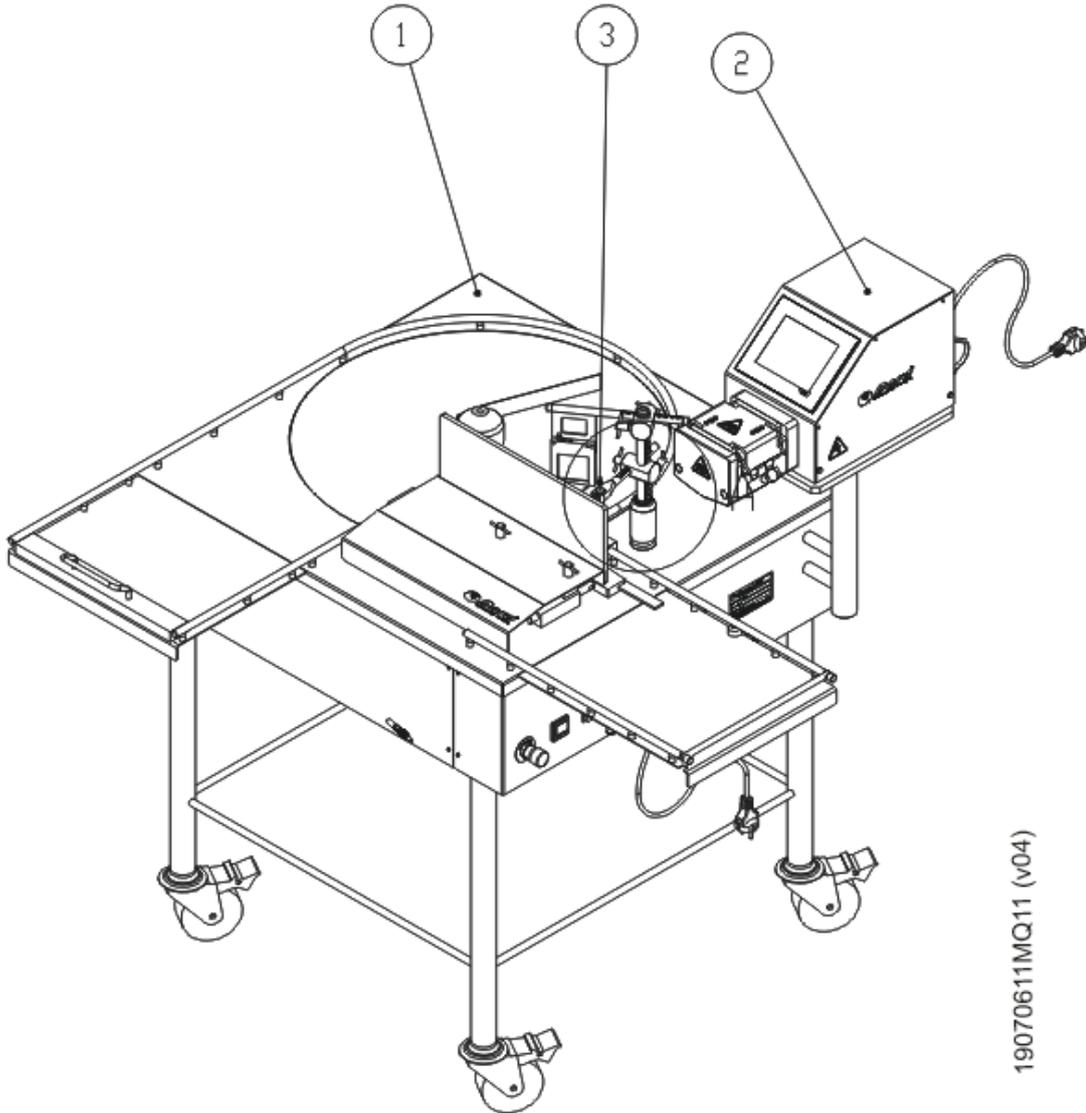
Make the cleaning of:

- Container inlet and outlet tables, as well as the rotary table.
- Fixed and moveable guards.

Carry out the cleaning with degreasing products and wipe with a dry rag. To clean the transparent guards (if it applies), use anti-static products. The use of solvents, petrol, alcohol, etc. can damage them.

**13. Spare Parts**

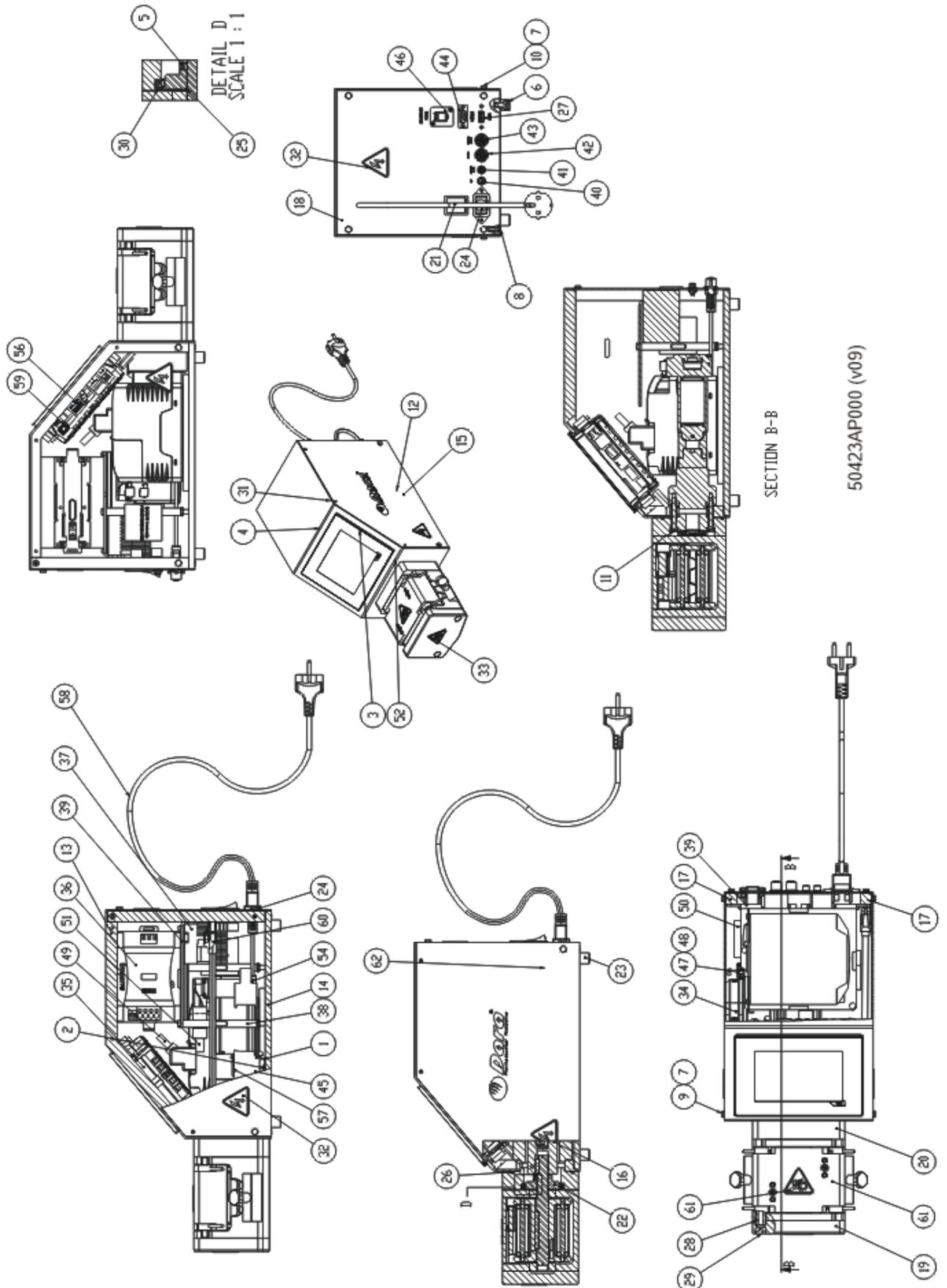
**13.1. SX-100 MACHINE GROUP (19070611MQ11-V4)**



<b>SX-100 MACHINE GROUP</b>			
<b>Pos.</b>	<b>Description</b>	<b>Qty.</b>	<b>Ref. N°</b>
1	SX-100 BASE MACHINE GROUP	1	51200AB000
2	SIMPLE SX-50 PERISTALTIC PUMP	1	50423AP000
3*	FILLING NOZZLE	1	50372BF022

\*RECOMMENDED SPARE PARTS

**13.1.1. SX-50 SIMPLE PERISTALTIC PUMP GROUP (50423AP000-V9)**

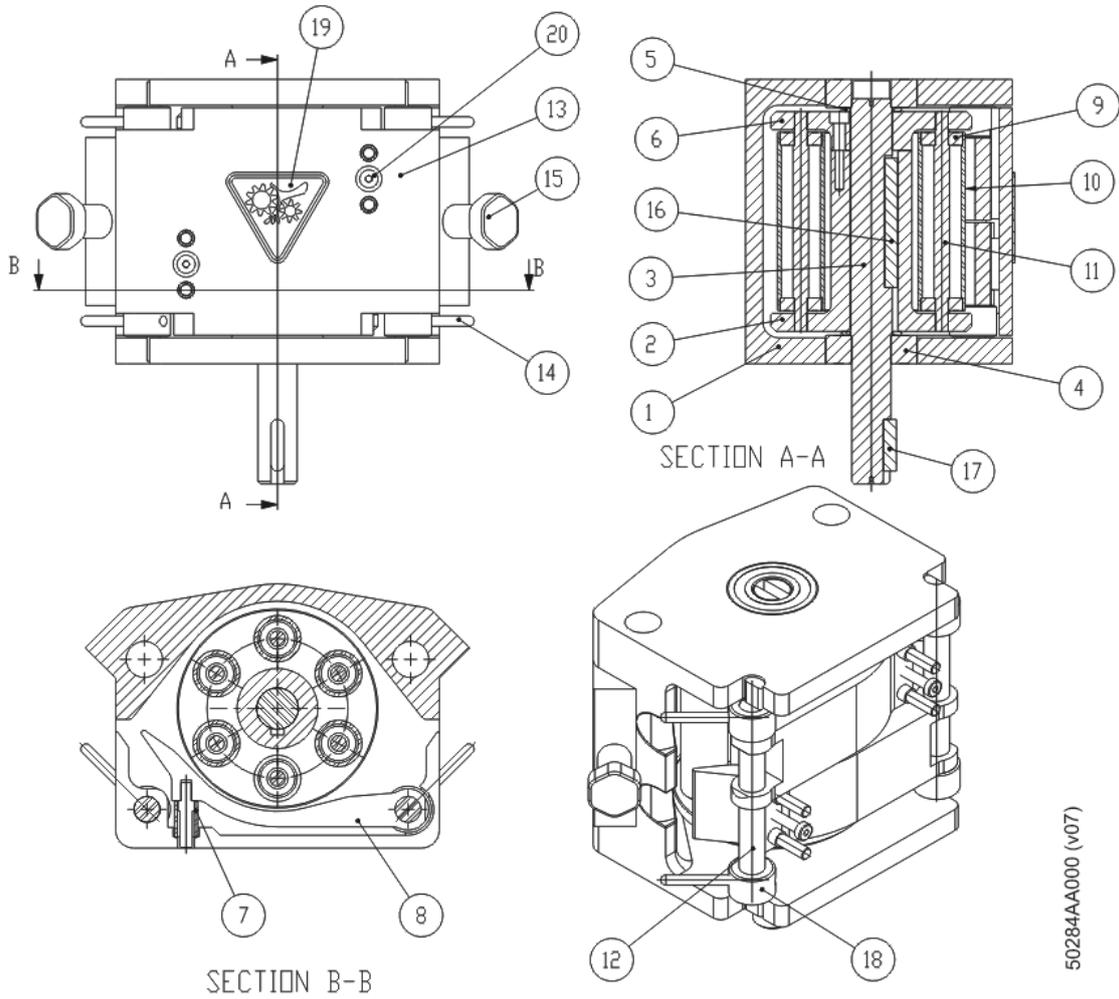


<b>SX-50 SIMPLE PERISTALTIC PUMP GROUP</b>			
<b>Pos.</b>	<b>Description</b>	<b>Qty.</b>	<b>Ref. N°</b>
1	GUIDE	1	50606AD162
2	SCREW	2	700105024
3	SHORT NUT	2	700604006
4	SCREW	2	700101221
5	STUD	2	700601010
6	SCREW	4	700104054
7	FLAT WASHER	8	700301001
8	SCREW	4	700104073
9	SCREW	4	700101020
10	SCREW	4	700101005
11	SCREW	4	700104050
12	CONNECTOR CABLE	1	800204006
13	SX-50 COVER	1	50376AA002
14	CONSOLE LOWER PLATE	1	50376AC002
15	CONSOLE SIDE PLATE	1	999.3945D
16	COUPLING	1	710605046
17	BACK BRIDGE	2	50376AB002
18	SX-50 CONSOLE BACK PLATE	1	50119DC002
19	PUMP UPPER SOCKET	1	55443AB002
20	SX-50 PUMP SOCKET	1	55443AD002
21	BLACK SWITCH	1	800119001
22	COUPLING BUSHING	1	55531AA002-REV2
23	PUMP LEG	4	50607AA002
24	MALE CONNECTOR	1	800204026
25	VITON O-RING	1	750101413
26	VITON O-RING	1	750101006
27	CABLE	1	800109072
28	PUMP TIE	2	55532AA032
29	PUMP SCREW CAP	2	50891AB002
30*	SEAL	1	750103060
31	HEXAGONAL SPACER	4	800109053
32	LABEL, HAZARD, ELECTRIC SHOCK	3	800306018
33	LABEL, HAZARD, HAND ENTANGLEMENT ROTATING GEARS	1	800306017
34	DRIVER	1	800403279
35	POWER PANNEL	1	800403280
36	FEED PORT	1	800111063

<b>SX-50 SIMPLE PERISTALTIC PUMP GROUP</b>			
<b>Pos.</b>	<b>Description</b>	<b>Qty.</b>	<b>Ref. N°</b>
37	FEEDER	1	800111062
38	SPACER	2	50169AK002
39	FEED PORT SUPPORT	1	50325BD002
40	CONNECTOR	1	800204225
41	CONNECTOR	1	800204268
42	CONNECTOR	1	800204226
43	CONNECTOR	1	800204227
44	CONNECTOR	1	800204031
45	FUSE	2	800112013
46	PANEL CONECTOR	1	800109200
47	TERMINAL BLOCK 2 PINS	1	800403288
48	TERMINAL BLOCK 4 PINS	1	800403289
49	CABLE	1	800403290
50	SCREW CLAMP TERMINAL BLOCK	1	800403291
51	ENGINE CABLE	1	800403292
52	SX-50 FLANGE PUMP	1	50929AY002
53	SCREW	3	700104057
54*	SERVO ENGINE + GEARBOX	1	800403281
55	PLUG NUT	2	800204238
56	PLUG	1	800204269
57	FUSE	2	800106058
58	FEMALE FEEDER CABLE	1	800204033
59	ETHERNET CABLE	1	800204179
60	ETHERNET CABLE	1	800403387
61*	PRIMARY PERISTALTIC HEAD	1	50284AA000
62	CONSOLE SIDE PLATE	1	56151AQ002

\*RECOMMENDED SPARE PARTS

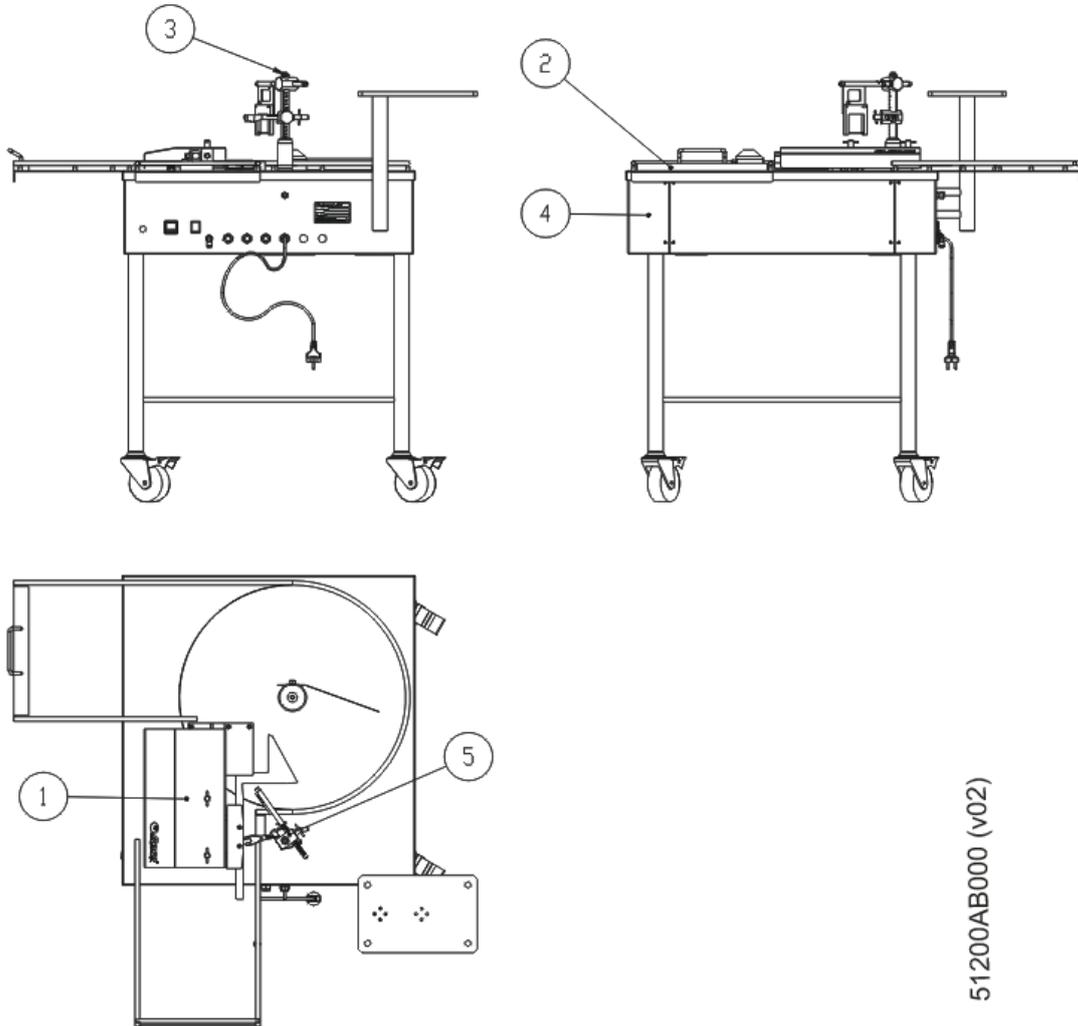
**13.1.1.1 PRIMARY PERISTALTIC HEAD GROUP (50284AA000-V7)**



50284AA000 (v07)

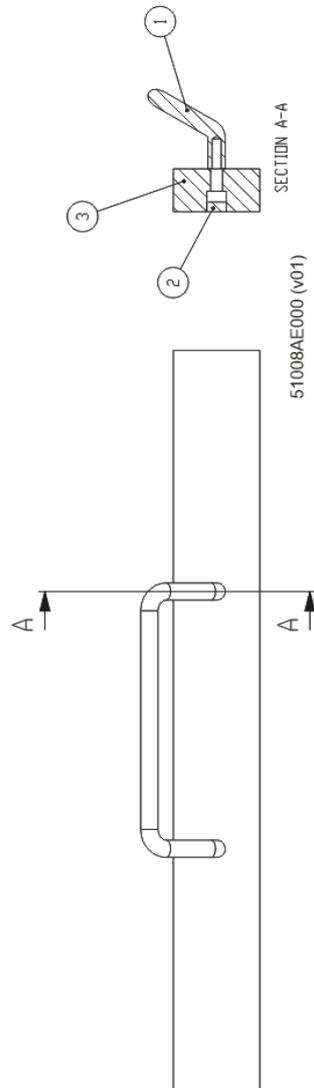
PRIMARY PERISTALTIC HEAD GROUP			
Pos.	Description	Qty.	Ref. N°
1	PUMP BODY	1	55539AA002
2	DRUM PUMP BODY	1	55540AA002
3	PUMP SHAFT	1	55541AA002
4	BEARING	2	720101006
5	PUMP WASHER	2	50190AB492
6	DRUM PUMP PLATE	1	55540AB002
7	SPRING TUBE	4	50634AA032
8	TUBE THREADER	2	55542AA002
9	BEARING	12	720101182
10	PUMP BEARING	6	55546AA002
11	PUMP BEARING SHAFT	6	55544AA002
12	CLOSED SHAFT	2	55548AA002
13	PUMP PLATE	1	55543AA002
14	HAND	4	55550AA002
15	TUBE BOLT	2	50599AJ002
16	PARALLEL KEY	1	700701001
17	PARALLEL KEY	1	700701013
18	STOPPER BUSHING	4	55549AA002
19	LABEL, HAZARD, HAND ENTANGLEMENT, ROTATING GEARS	1	800306017
20	SCREW	2	700103007

**13.1.2. SX-100 BASE MACHINE GROUP (51200AB000-V2)**



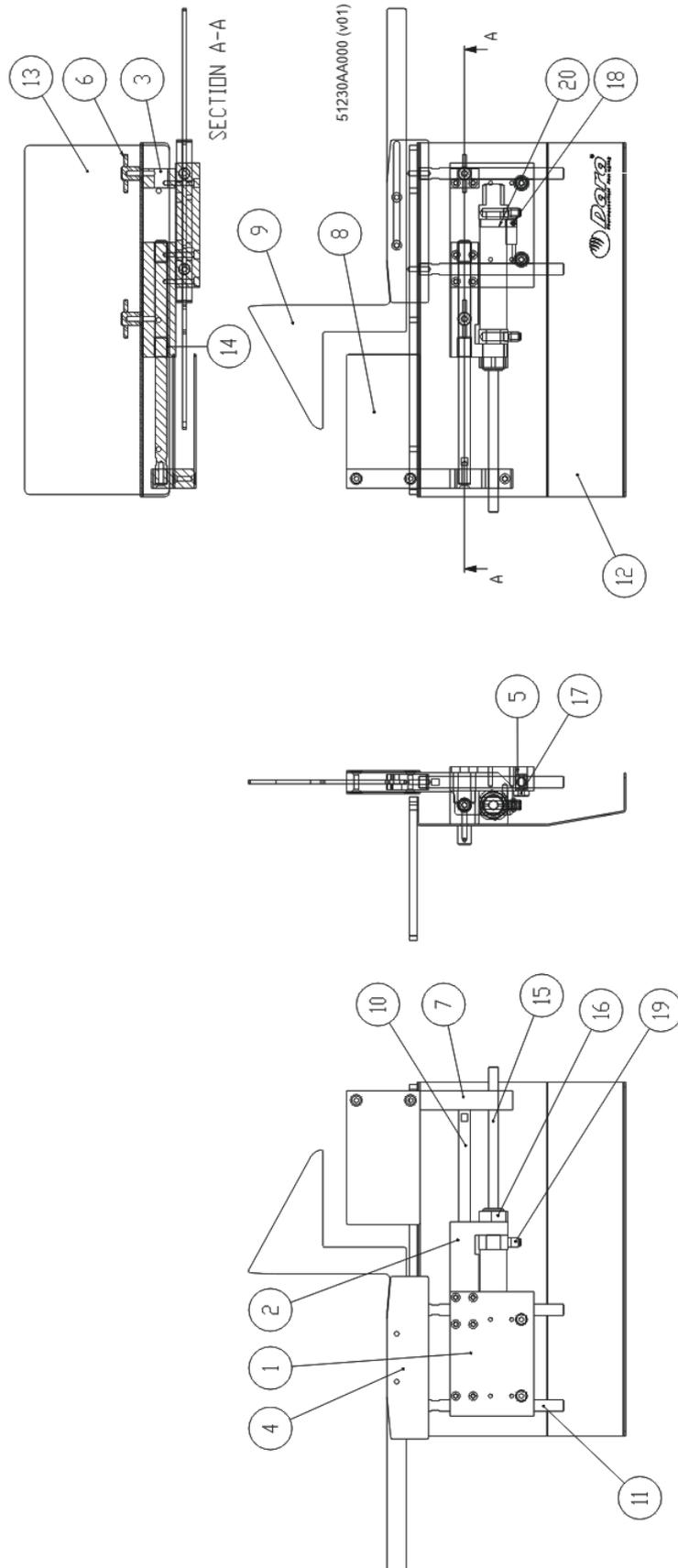
SX-100 BASE MACHINE GROUP			
Pos.	Description	Qty.	Ref. N°
1	VIAL FEEDER GROUP	1	51230AA000
2	INLET TRAY PUSHER GROUP	1	51008AE000
3	SX-100 MOBILE FILLING COLUMN GROUP	1	51006AK000
4	SX-100 FRAME GROUP	1	51210AB000-REV2
5	SX-100 NOZZLE GROUP	1	51220AG000

**13.1.2.1 INLET TRAY PUSHER GROUP (51008AE000-V1)**



INLET TRAY PUSHER GROUP			
Pos.	Description	Qty.	Ref. N°
1	HAND	1	700901002
2	POM COVER	2	50447AA002
3	PUSHER	1	50951AD002

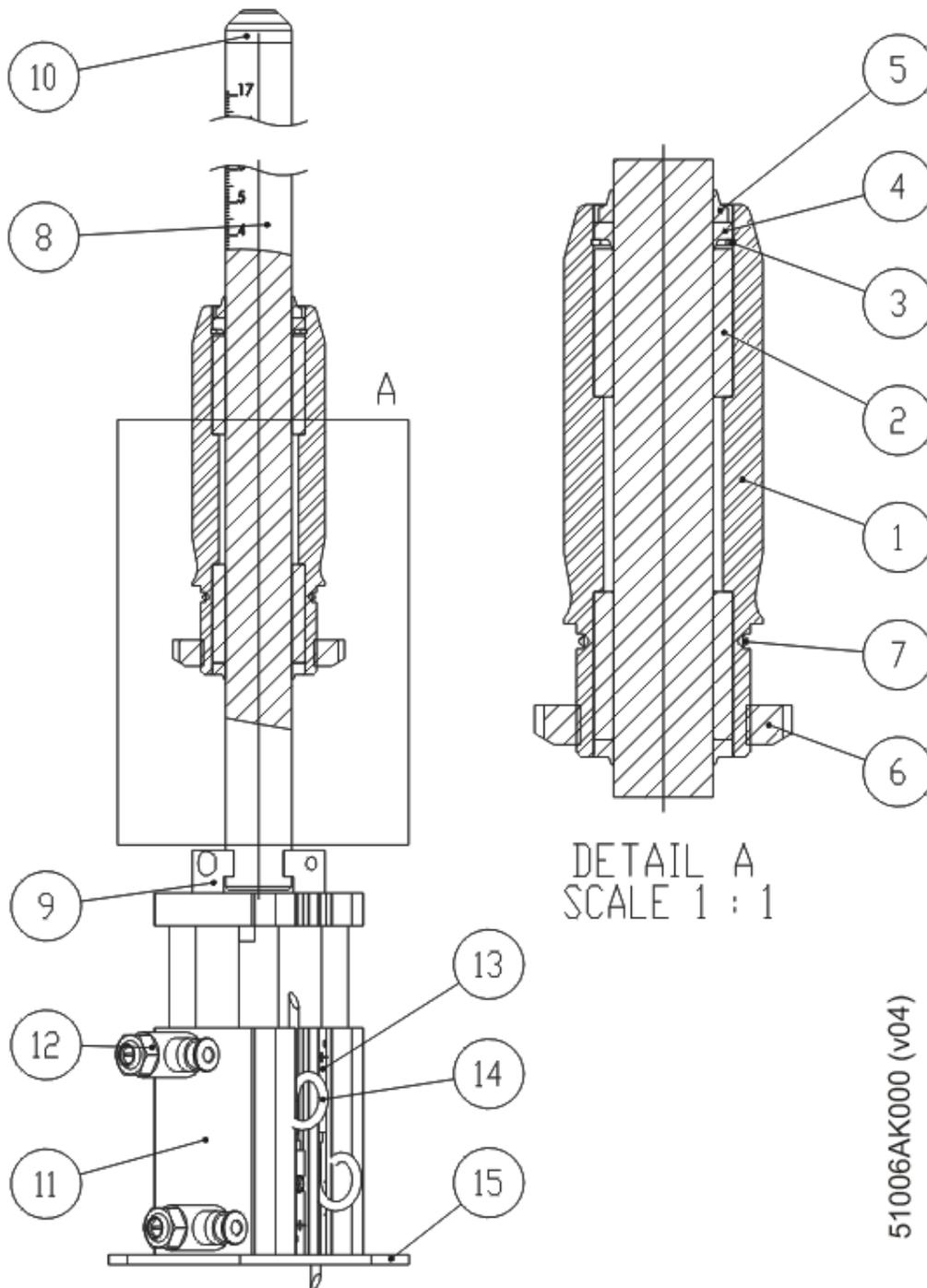
**13.1.2.2 VIAL FEEDER GROUP (51230AA000-V1)**



<b>VIAL FEEDER GROUP</b>			
<b>Pos.</b>	<b>Description</b>	<b>Qty.</b>	<b>Ref. Nº</b>
1	SUPPORT	1	50479AD002
2	GUIDE SHAFT SUPPORT	1	50479AE002
3	PROTECTION SUPPORT	1	50479AC002
4	GUIDE CONTROLLER	1	999.1131A
5	FLANGE SHAFT	2	999.1143AÑ
6	TIGHTEN HAND	2	50218BV002
7	PUSHER SUPPORT	1	50132AC002
8	PUSHER	2	50409AH002
9	VIAL INLET GUIDE	1	50409AJ002
10	GUIDE SHAFT	1	50224BY002
11	GUIDE SHAFT	2	50224BZ002
12	PROTECTION	1	50329BK002
13	PROTECTION SX-100	1	50248DT002
14	BUSHING	2	720301009
15	PIN	1	730302034
16	SHORT NUT	1	700204020
17	FLAT WASHER	2	999.1141E
18*	DETECTOR	1	730701012
19	QUICK START PLUG	2	730901094
20	ASSEMBLY BAND	1	730911013

\*RECOMMENDED SPARE PARTS

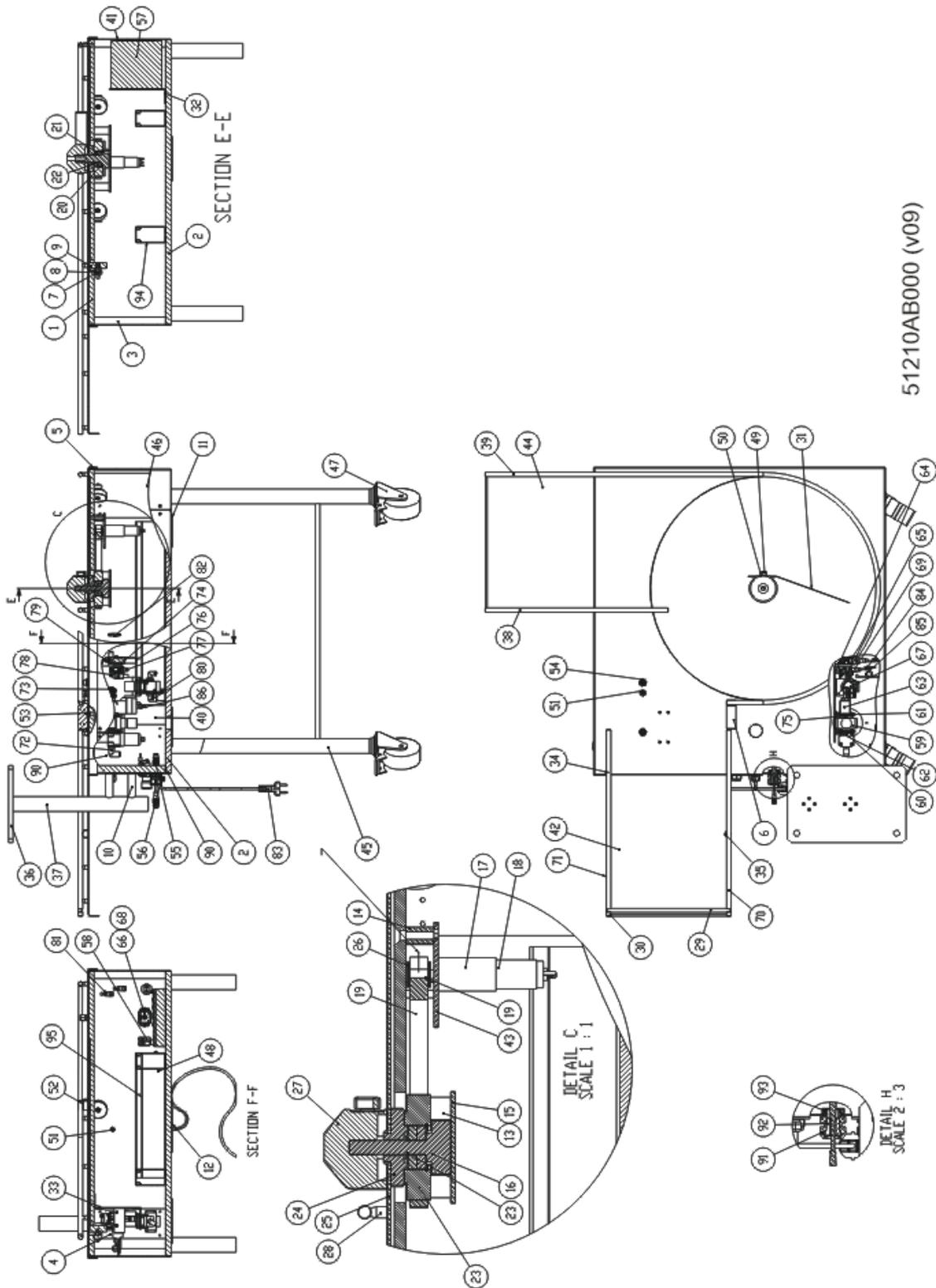
**13.1.2.3 SX-100 MOBILE FILLING COLUMN GROUP (51006AK000-V4)**



<b>SX-100 MOBILE FILLING COLUMN GROUP</b>			
<b>Pos.</b>	<b>Description</b>	<b>Qty.</b>	<b>Ref. N°</b>
1	P&P FILLING COLUMN	1	50528AA002
2	BALL LINEAR BEARING	2	720111002
3	ELASTIC RING	1	700506010
4*	SCRAPER	2	750104004
5*	SCRAPER	1	750104454
6	KM-7 NUT	1	700207032
7	Ø30xØ2 O-RING	1	750101017
8	NOZZLE SUPPORT COLUMN	1	50866AA002
9	DOSING SHAFT SWIVEL LOCK	1	50952AA002
10	NOZZLE SUPPORT COLUMN END	1	50724AA002
11*	PNEUMATIC DRIVE	1	730303007
12	CHECK VALVE	2	730209017
13*	PROXIMITY SENSOR	2	800703002
14	CABLE	2	800204196
15	CYLINDER SUPPORT COVER	1	50292AA002

\*RECOMMENDED SPARE PARTS

**13.1.2.4 SX-100 FRAME GROUP (51210AB000-V9)**



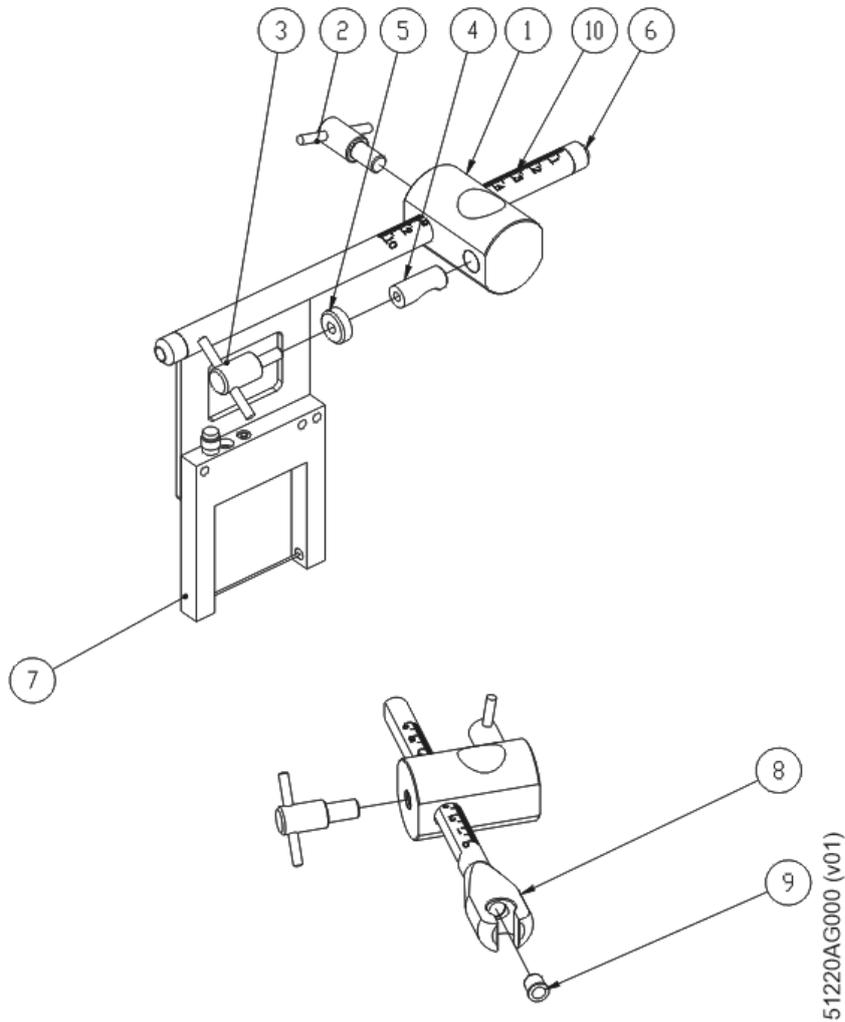
<b>SX-100 FRAME GROUP</b>			
<b>Pos.</b>	<b>Description</b>	<b>Qty.</b>	<b>Ref. Nº</b>
1	SX-100 UPPER PLATE	1	50344EV002
2	SX-100 LOWER PLATE	1	50344EW002
3	FRAME GROUP SUPPORT (SX-100)	4	999.844DB
4	FRAME GROUP SUPPORT (SX-100)	1	999.844DA
5	UPPER PROTECTION (SX-100)	1	50282CC002
6	CYLINDER SUPPORT	1	50997AM002
7	ROLLER SUPPORT	5	999.1134B
8	WHEEL SHAFT	5	999.1151B
9	DISK WHEEL	5	50336AB002
10	BUSHING	2	56174AA252
11	COVER	2	50292AC002
12	COVER	1	50292AG002
13	ENGINE SUPPORT SPACER	4	50169AE002
14	ENGINE SUPPORT SPACER	3	999.1566A
15	ENGINE SUPPORT	1	50462AH002
16	DISK SUPPORT SHAFT	1	999.1564E
17	REDUCTOR	1	710301004
18*	ENGINE 2642W	1	710301004
19*	BELT	1	710804002
20	ELASTIC RING	1	700502005
21	BEARING	2	720101009
22	RING	1	700501008
23	PLATE PULLEY	1	999.1622A
24	CENTERING PLATE	1	999.1623B
25	ROTATORY DISK	1	50427AC002
26	DRIVING PULLEY	1	999.1120C
27	SX-200 DEFLECTOR PLATE SUPPORT	1	999.1624
28	HUB SUPPORT	29	56073AA012
29	FRAME GROUP STOPPER STUD	1	999.1569A
30	FRAME GROUP STUD	1	999.1650A
31	SWORD	1	999.2848
32	SUPPORT MARK	1	50328AL002
33	SUPPORT MARK	1	50328AM002
34	EMERGENCY STOP INSIDE SEAL	1	50230AA022
35	VIAL DIVERTION	1	50438AB002
36	PUMP SUPPORT	1	50185AF002
37	PUMP SUPPORT COLUMN	1	50298AF002

<b>SX-100 FRAME GROUP</b>			
<b>Pos.</b>	<b>Description</b>	<b>Qty.</b>	<b>Ref. N°</b>
38	INLET TRAY SUPPORT	1	50829AF002
39	PLATE HUB	1	50829AJ002
40	FRONT COVER	2	50329BL002
41	POLYESTER PANEL ASSEMBLY PLATE	1	800120142
42	OUTLET TRAY GROUP	1	50426DZ002
43	ENGINE SUPPORT/TENSOR	1	999.1567B
44	OUTLET TRAY GROUP	1	50426AF002
45	SX-100 FRAME GROUP STRUCTURE	1	50442AA072
46	SIDE COVER	1	50329BP002
47*	WHEEL	4	720501001
48	GLAND	4	800107039
49	KNOB	1	700903001
50	WASHER	1	700301003
51	GLAND	2	800107003
52	CYLINDER	1	730906004
53	QUICK START PLUG	1	730901093
54	QUICK PLUG GLAND	2	730901498
55	STRAIGHT PLUG	1	730901091
56	QUICK ELBOW PLUG	1	730901050
57	BOX	1	800120061
58	BLACK SWITCH	1	800119001
59	REGULATOR	1	800115012
60*	FILTER	1	730805002
61	SPACER	2	730805003
62	ADAPTER	1	730911009
63*	ELECTROVALVE	1	730206036
64*	ELECTROVALVE	1	730209035
65*	ELECTROVALVE	1	730203009
66	PRESSURE SWITCH	1	730911011
67	PRESSURE SENSOR	1	730103093
68	ADAPTER	1	730911012
69	PRESSURE REGULATOR SUPPORT	1	50328AZ002
70	INLET FRAME GROUP SUPPORT	1	50829AG002
71	INLET FRAME GROUP SUPPORT	1	50829AH002
72	PLUG	1	730901032
73	PLUG	1	730909001
74*	ELECTROVALVE	1	730209039

<b>SX-100 FRAME GROUP</b>			
<b>Pos.</b>	<b>Description</b>	<b>Qty.</b>	<b>Ref. N°</b>
75	SILENCER	1	730905024
76	SILENCER	2	730905002
77	SILENCER	3	730905013
78	QUICK STRAIGHT PLUG	5	730901046
79	STRAIGHT PLUG	3	730901045
80	QUICK START PLUG	2	730901048
81	FLOW CONTROLLER	2	730103091
82	FEMALE CONNECTOR	1	800204005
83	CABLE 2 m	1	800206012
84	CABLE 1 m	2	800704022
85	CABLE 3 m	1	800204038
86	PLUG CONNECTOR	1	730911010
87*	EMERGENCY STOP BUTTON	1	800119004
88	EMERGENCY DISK	1	800119013
89	2 CONTACT EMERGENCY BUTTON CAMERA	1	800119005
90	SX-100 SIDE COVER	1	50329GE002
91	SPARE GLAND BODOY	2	800107202
92	SPARE GLANDE INSERT	2	800107203
93	DIVIDE LOCKNUT	2	800107204
94	CHANNEL	2	-
95	CHANNEL	1	-

\*RECOMMENDED SPARE PARTS

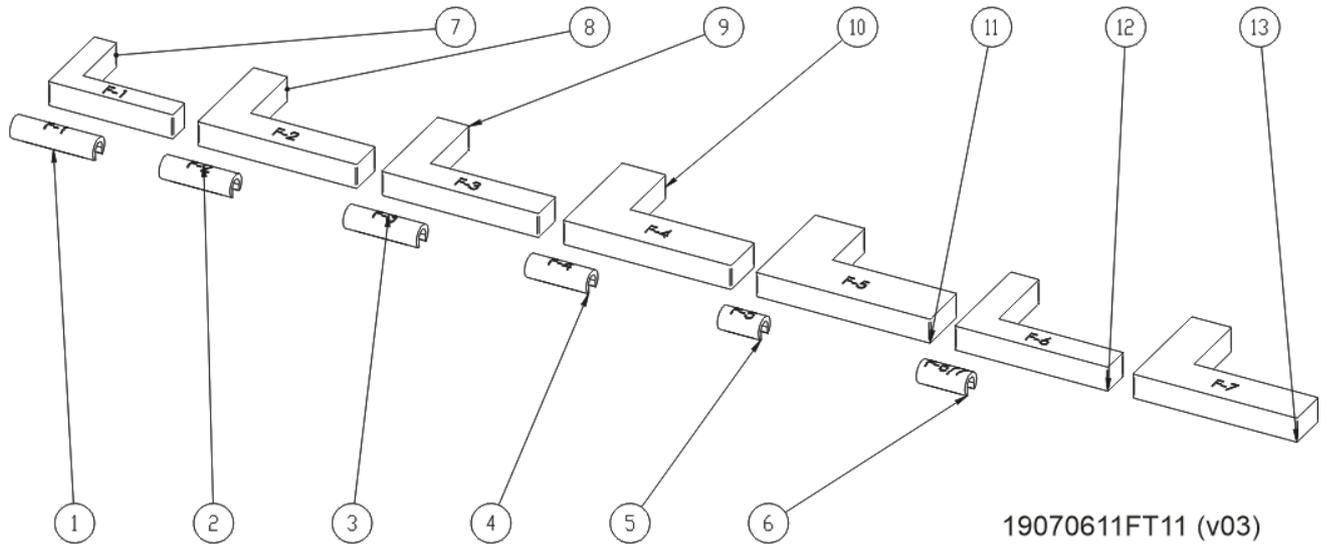
**13.1.2.5 SX-100 NOZZLE GROUP (51220AG000-V1)**



SX-100 NOZZLE GROUP			
Pos.	Description	Qty.	Ref. N°
1	FLANGE	2	50670AG002
2	KNOB	2	50218AB012
3	KNOB	2	50218AB082
4	FLANGE	2	50443AA102
5	FLAT WASHER	2	50190AA042
6	OPTIC FIBRE CABLE TOP	2	50506AA002
7*	PHOTOCELL FORK	1	800706077
8	FILLING NOZZLE SUPPORT	1	50672AA002
9	BALL POSTIONER	1	700802001
10	PHOTOCELL FORK SUPPORT	1	50294NV002

\*RECOMMENDED SPARE PARTS

**13.1.3. FORMATS GROUP (19070611FT11-V3)**



FORMATS GROUP			
Pos.	Description	Qty.	Ref. N°
1	PUSHER	1	65039GE002
2	PUSHER	1	65039GE012
3	PUSHER	1	65039GE022
4	PUSHER	1	65039GE032
5	PUSHER	1	65039GE042
6	PUSHER	1	65039GE052
7	PUSHER STOP	1	65039GF002
8	PUSHER STOP	1	65039GF012
9	PUSHER STOP	1	65039GF022
10	PUSHER STOP	1	65039GF032
11	PUSHER STOP	1	65039GF042
12	PUSHER STOP	1	65039GF052
13	PUSHER STOP	1	65039GF062

## 14. Warranty



Maquinaria Industrial DARAS.L.  
Pol. Ind. Coll de la Manya - Galileu Galilei 5-19  
08403 - GRANOLLERS (Barcelona)- Spain

### WARRANTY

Maquinaria Industrial Dara SL warranties this machine for a period of 1 Year or 1.900 hours, since the Start-Up of the machine is acknowledged to our technician by the Customer, and when the following conditions have been fulfilled:

The machine has been used according the instructions provided in the User Manual and its limitations, especially for the type and size of containers the machine has been designed for. The customer acknowledges that the User Manual has been read and understood

- In case of malfunction or failure during the Warranty period, this must be reported to Maquinaria Industrial Dara SL before 72 hours since it appears.
- Any part which has been substituted or replaced within the Warranty period becomes a property of Maquinaria Industrial Dara SL.
- All the substituted or replaced parts will be original parts from Maquinaria Industrial Dara SL, or authorised by it. If the assembled part is not original, Warranty is invalidated
- If the malfunction or failure arises from a service not undertaken by the Technical Service from Maquinaria Industrial Dara SL, Warranty is invalidated.
- In case that the machine is transferred or transferred to another Customer, the new Customer has the subrogated rights of this Warranty, with the following conditions:
  - The former Customer must deliver all documenttion of the machine, specially the User Manual and the corresponding Certificates to the new Customer.
  - The new customer must report to Maquinaria Industrial Dara SL about such change before 72 hours. Maquinaria Industrial Dara SL will communicate to the new customer the conditions and remaining period of Warranty
- This Warranty covers the replacement or repair of parts, labour and taxes in all components that Maquinaria Industrial Dara SL considers essential for a correct operation of the machine.

Warranty does not cover:

- The replacement, repair or adjustment of components submitted to wear during the normal use of the machine.
- The periodic preventive maintenance procedures included in the User Manual.
- The fill of oil or periodic lubrication as specified by the User Manual.
- The failures or damages caused by an erroneus manoeuvre or collision, fire, explosion or vandalism.
- The replacement or repair of non-original assembled parts.
- Damages or failures caused by a lack of maintenance or lubrication.
- Damages or failures caused by non-compliance of safety standards or overriding of safety devices.

Maquinaria Industrial Dara SL recommends a preventive check of your machine by our Technical Service, after one year from the start up of the machine. If you wish to apply for this check, please contact to our Sales Department.

Granollers, ..... 201 .....

