FlexiPump®

Dispensing pump for culture media preparation

User's manual and installation guide

EN

interscience

Thank you for choosing **Flexi*Pump*®** peristaltic pump.

This manual will give you all the information you need to use your **Flexi*Pump*®** at its best. If you have any other question, do not hesitate to contact us:

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1 Introduction

FlexiPump® is a programmable peristaltic pump designed for liquid distribution from 50 µl to 99 liters.
It dispenses manually or in serial dispensing agar, diluents or any other liquid.
With a precise and repeatable flow, FlexiPump® is a great tool for filling tubes, containers, broth bags and Petri dishes preparation.

Powerful, it guarantees from 10 to 550 Rotations Per Minute (RPM). The liquid flow is kept closed and sterile : tubes, bottle and connectors are autoclavable up to 121°C.

FlexiPump® is in compliance with AFNOR V08-010-1 (ISO 6887-1) standards for food sample preparation and ISO 7218 general recommendations for food microbiology. 2% precision can be achieved in many applications.

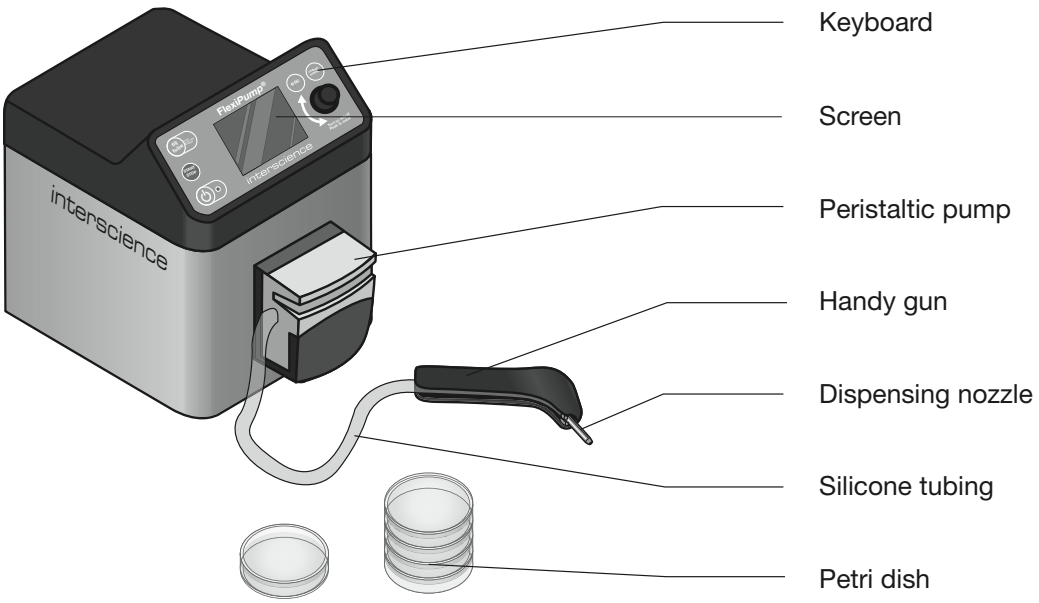
With a user-friendly interface and great ergonomics, FlexiPump® guarantees an efficient and precise lab work.

It is also very compact, only 16 cm width, and easily fits under a PSM hood. It is a robust equipment, stainless steel and heavy duty polycarbonate top shell, designed to last long.

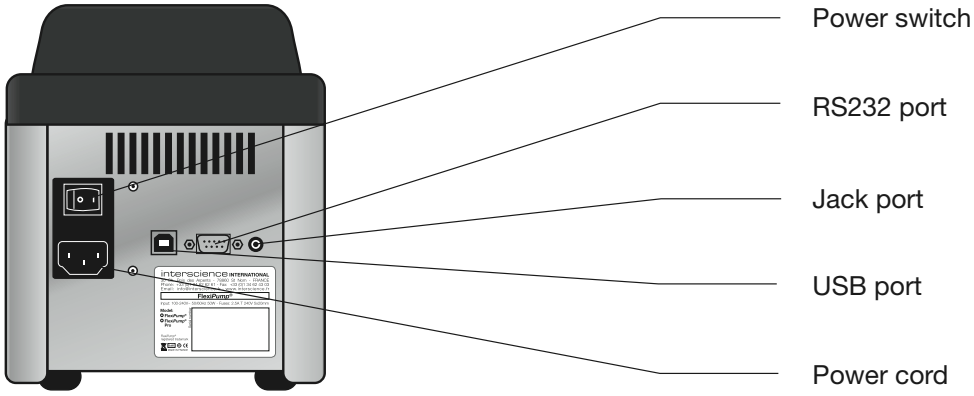
2 Installation

2.1 Description of equipment

Front



Back



1. FlexiPump®, delivered with

- FlexiPump® unit

The unit is all stainless steel with a heavy duty ABS/PC top shell. Its 4 non-skid feet provide great stability. Its small size enables to keep a large workspace.

- Watson Marlow™ high quality pump heads

- Complete dispensing assembly

Single pump head tubing : nozzle + GL45 bottle connector + filter + 3,2 mm inner diameter Tygon™ tubing + tube weight

Note : other tubings' diameters are available.

- Power cord
- User's manual
- Quick user guide
- Free sterile pack of BagPage® and BagFilter® filter bags

2. FlexiPump® Pro, delivered with

- FlexiPump® Pro unit

The unit is all stainless steel with a heavy duty ABS/PC top shell. Its 4 non-skid feet provide great stability. Its small size enables to keep a large workspace.

- Double high quality Watson Marlow™ pump heads

- 2 complete dispensing assembly

Double pump head tubing : nozzle + GL45 bottle connector + filter + 3,2 mm and 6,4 mm inner diameter Tygon™ tubing + tube weight

Note : other tubings' diameters are available.

- USB cable
- Power cord
- User's manual
- Quick user guide
- Free sterile pack of BagPage® and BagFilter® filter bags

3. Accessories

- Adjustable dispensing arm (ref. 561 002)

Holds the dispensing head to deliver large volumes and/or to keep it sterile.

- Handy gun (ref. 561 001)

For easy dispensing, use it in 3 positions and start dispensing with the elctronic start button:

*as a pen to dispense in tubes

* as a mouse to dispense in Petri dishes

*as a gun to dispense large volumes

Store the gun on the side magnet of the equipment.

- Foot pedal (ref. 507 008)

When seated, use the foot pedal for easy dispensing.

- RS232 thermal printer (ref. 521 000)

Available with FlexiPump® Pro, the RS232 printer connects with the RS232 port at the back of the unit.
All dispensing informationss are printed on a label.

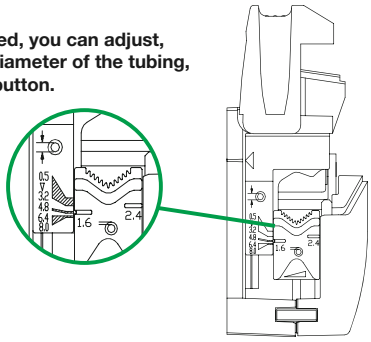
2.2 Installation

To use FlexiPump® at its best, we suggest to install it on a stable, flat and rigid surface. Check that the bottle is placed at the same level or lower than the FlexiPump® to avoid that the water flows after the pumping is stopped. The bottle can be placed on the ground to save space.

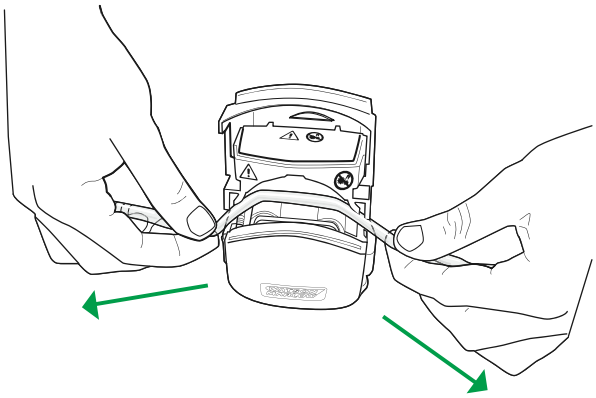
Proceed as shown below:

- Put the tube into the peristaltic pump (from front to back). Be careful to center it to avoid to pinch the tubing when closing the pump. (BE CAREFUL: carefully read the tubing installation guide provided).

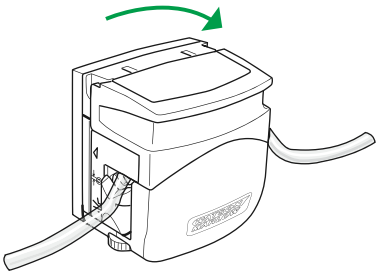
1 **When the pump is opened, you can adjust, according to the inner diameter of the tubing, by moving the rotating button.**



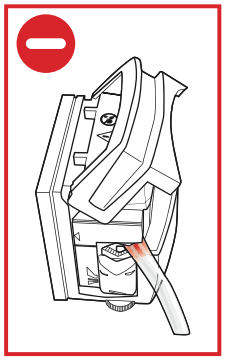
2 **Insert the tubing in the pump.**



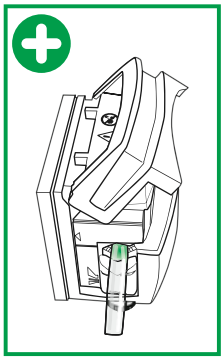
3 **Shut the top-shell of the pump.**



4



NOT CORRECT
The tubing is pinched.
It can be perforated.



CORRECT
The tubing is not pinched.
It cannot be perforated.

- Connect the power cord, press the « ON » button (at the back of the unit).

To choose the most suited tubing, please read chapter 3.5.2.

3 First steps

3.1 Principles of use

FlexiPump® has 3 dispensing modes: continuous, dose and multi-dose.

Continuous mode:
In this mode, the user controls (by hand or by foot) the starting and stopping moments of the pump. The pump speed controlling the flow, is initially programmed by the user.

Dose mode:
In this mode, the user controls (by hand or by foot) the starting moment of the pump. The pump immediately stops when the programmed volume is dispensed. The pump speed and the volume to distribute are initially programmed by the user.

Multiple-dose mode:
In this mode, the user controls (by hand or by foot) the starting moment of the pump for the first dose. The pump automatically stops when the programmed volume is dispensed. Then it automatically dispenses again after a programmed delay. The speed of the pump, the volume to dispense, the number of doses and the delays in-between are programmed initially by the user.

3.2 Principle of operations

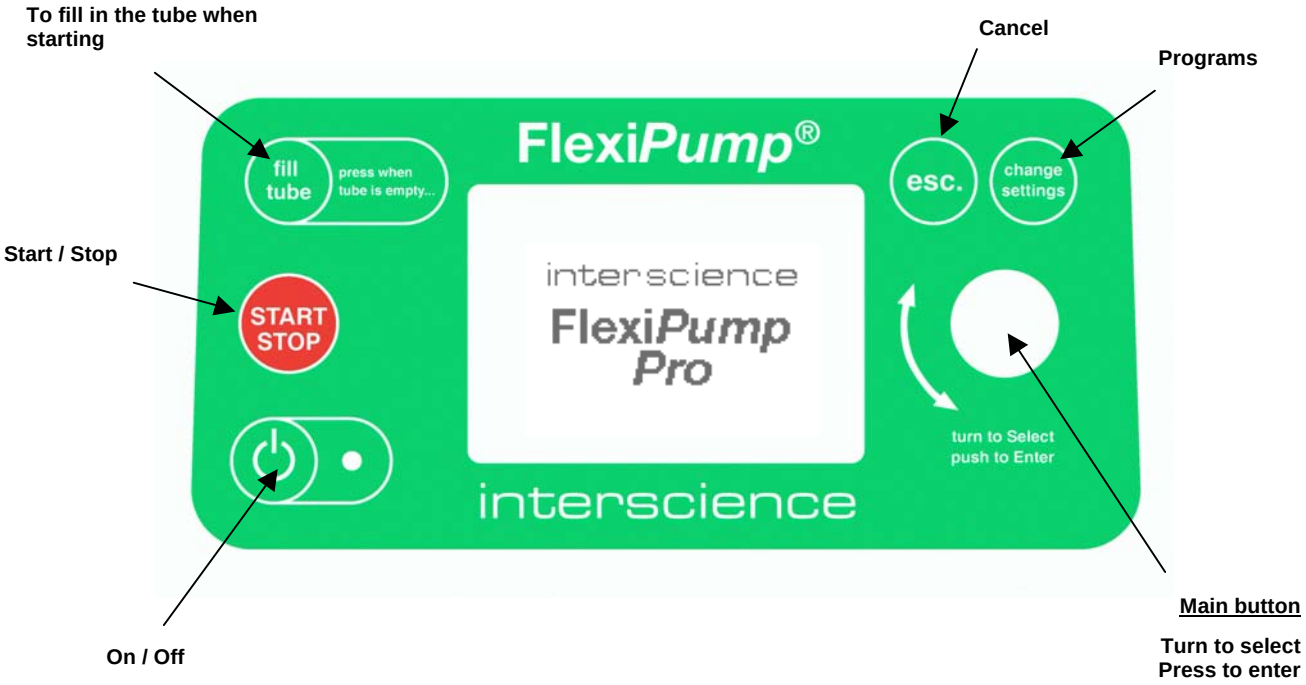
FlexiPump® is a peristaltic pump controlled by a microprocessor.

When a dispensing is programmed, the microprocessor controls the pump in movement and stopps it when the pump has done the asked number of rotations.

A calibration operation is necessary to settle and memorize the number of necessary rotations.

3.3 Display and control buttons

The general use of FlexiPump® is easy. The front panel is composed of a screen, a rotating button and a few other buttons.



Informations and menus appear on-screen. The rotating button at the right side of the screen is the main control of the FlexiPump®: it enables to choose in the menu the options, launch the operations (e.g. dispense liquid, calibrate or set a program).

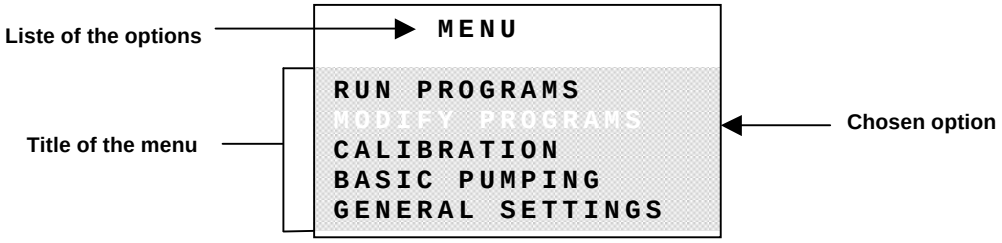
The other buttons have specific functions. They act as shortcuts for specific actions. For example:

START/STOP :	To start or stop the pump
esc. :	To cancel an operation or a choice
change settings :	To put on-screen the program menu.

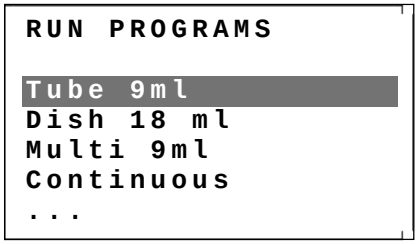
3.4 Menu

A *menu* is a list of choices appearing on-screen. The user turns the rotating button to look at the menu and presses the button to validate his choice. If the list is too long to fit on the screen, the list scrolls as the user turns the button.

Example of the main menu, when the FlexiPump® is turned on:



The on-screen menu are hierarchical: the user can, when choosing an option in the menu, go to another menu, called sub-menu. For example, the option **"MODIFY PROGS"** of the main menu leads to the following sub-menu:



At any time the "*esc.*" button makes the user quit the on-screen menu and to get back to the main menu or the top menu.

3.5 Concept of program

FlexiPump® is a programmable equipment.

The user can choose his preferred programs and memorize them.

Each preferred user mode, (for example 9 mL in mono dose at a 3 mL/s flow) is then called a *program*. The user can then enter other programs and name them so they can easily distinguish them.

FlexiPump® is delivered pre-programed with the following programs:

- **9 ml tube**: distribution of 9 mL doses
- **18ml dish**: distribution of 18 mL doses
- **9ml Multi**: multiples 9 mL doses
- **Continuous**: continuous and fixed flow

3.5.1 Programs and tubings

FlexiPump® can be equipped with tubes with various diameters. If you have several tubes and wish to change it according to your application: either specific flow or viscosity.

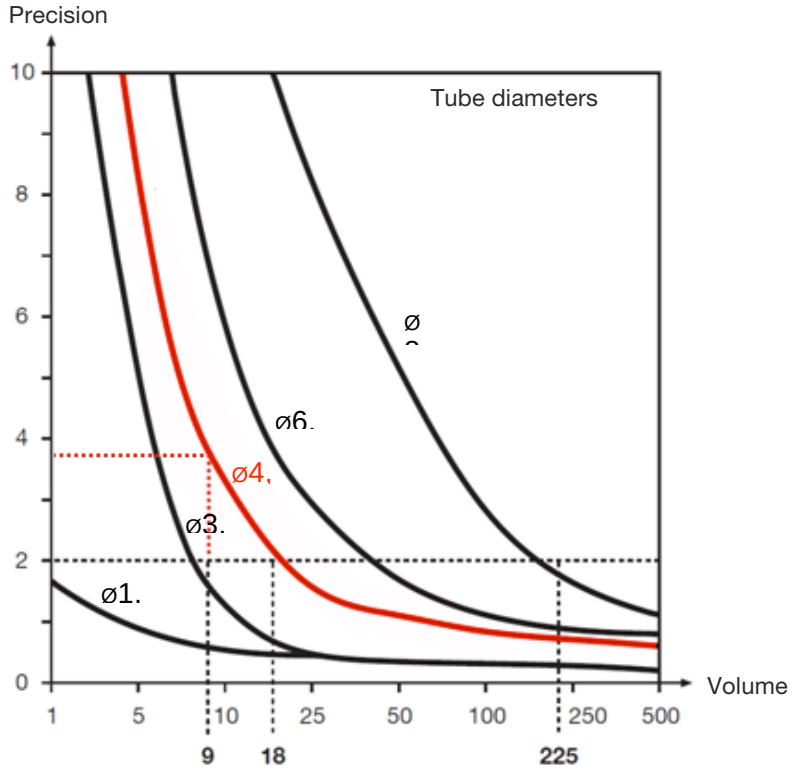
Please keep in mind that a program is made to function with a pre-determined diameter tubing. The flow distributed by the pump depends on the tubing's diameter and its speed fixed by the program.

Advice for the choice of a tubing

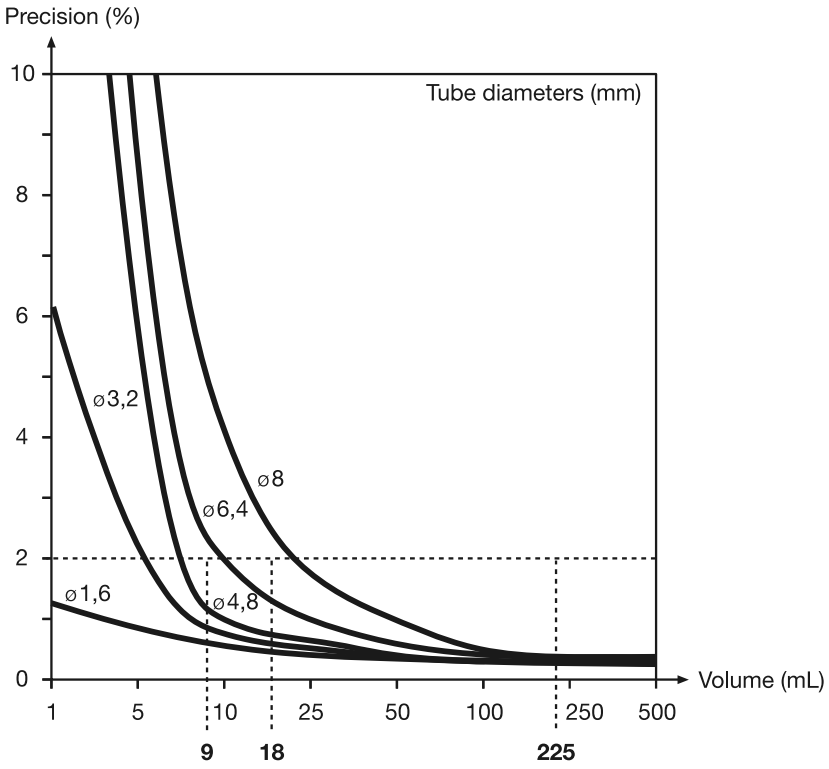
During the liquid flow the inner diameter of the tubing is important to get a good precision. The more the tubing has a bigger diameter, the more the flow (milliliters per minute) and less it will be adapted for dispensing of little volumes.

On the side of the FlexiPump® are engraved 2 diagrams for FlexiPump® and FlexiPump® Pro. They show the precision that you can get according to your volume and the inner diameter of the tubing.

Example, with the FlexiPump®:



FlexiPump® Pro :



How to read the diagram :

For a given tubing diameter, the curve indicates the guaranteed precision according to the volume of a dose. Example : in this figure, for a tubing with inner diameter of 4,8 mm (red curve) and a volume of 9 mL, the guaranteed precision is inferior to 4% (follow the dots in red).

On the contrary, knowing the volume of your dose (for example 9 mL) and the maximum precision you want (for example 2%) - follow the dots in black -, a tubing with an inner diameter of 3,2 mm is sufficient because its curve goes underneath the intersections (lines in dots).

Note : the lines in black dots are engraved on the side of the FlexiPump®, but not the red ones.

9 mL = typical volume to dilute a 1mL sample at 1/10th.
18 mL = typical volume to fill a 90 mm Petri dish with agar.
225 mL = typical volume to dilute a 25 g sample at 1/10th.

With FlexiPump® Pro, you get a better precision than with the FlexiPump® thanks to the 2 tubings associated with the 2 pumps out of phase.

The typical precision values obtained, with a tubing with an inner diameter of 3,2 mm are the following :

FlexiPump® :

9 mL : 1,8 % - 18 mL : 1 % - 225 mL : 0,5 %

FlexiPump® Pro :

9 mL : 0,9 % - 18 mL : 0,5 % - 225 mL : 0,4 %

3.5.2 Programs and calibration

A calibration is necessary for programs distributing doses with a fixed volume. The calibration enables the FlexiPump® to measure the real flow with the conditions of the program, to memorize it and to take it into account at each dose delivered. The flow rate being known, the FlexiPump® makes the number of rotations necessary for each dose.

The flow delivered by the pump will indeed depend on the rotation speed; the given rotation speed of a given pump, will depend upon the diameter of the tubing and the viscosity of the liquid. The flow directly proportionnally depends on the rotation speed but this proportionnality depends on the tubing diameter and the viscosity of the liquid.

Moreover, with a same tubing and liquid, the medium flow can vary according to the volume of a dose, especially when going from a few microliters to several liters.

As each program has different parameters: volume of a dose, tubing diameter and liquid viscosity; a calibration is necessary for each program.

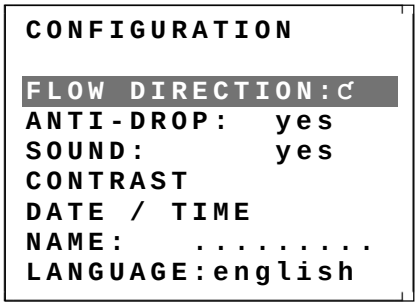
3.5.3 Programs: user manual

More information about the use of programs are given at the chapter 3.7 Programs.

3.6 General settings

The access to programing functions in the general settings is made by the choice of the **"CONFIGURATION"** option in the main menu or by pressing the "*change settings"* button on the top right of the rotating button.

Here are the options appearing in the settings menu in the general settings:



3.6.1 Flow direction of the pump

The arrow displayed in front of "**FLOW DIRECTION"** indicates the direction towards which goes the pump and consequently the direction in which the tubing must be placed. If the arrow indicates a direction from left to right like this :  then the source must be placed on the left side of the pump and the container on the right side.

To change the direction of the pumping, please select the line and then press on the rotating button. Get back to the main screen by pressing on the "*esc."* button.

Note: The direction of the pumping is a general parameter, meaning that when using the FlexiPump®, the direction will be set whatever the programm you use.

3.6.2 Anti-drop system

The *Anti-drop* option enables to prevent that a drop shows up at the end of the tubing at the end of a distribution. Such a drop can be a trouble if the user shakes the tubing and the drop falls into the container, because it would alter the precision.

To prevent that a drip appears, the pump goes back and sucks the drop back in the tubing. This operation can take a fraction of a second after dispensing.

To activate or disactivate the option, select the **"ANTI-DROP"** line and then press on the rotating button. Go back to the main screen by pressing on the "*esc."* button.

3.6.3 Sound

FlexiPump® makes a little sound after each operation.

To activate or disactivate the sound, select the line **"SOUND"** and then press on the rotating button. Go back to the main menu by pressing on the "*esc."* button.

3.6.4 Contrast

This option lets you adjust the contrast on the screen. Depending on the brightness of your environment, you may want to increase or decrease the contrast.

Select the **"CONTRAST"** line and press on the rotating button. Set up the contrast by turning the button and press again to validate.

3.6.5 Date/time

The setting of the date and time guarantees traceability (on FlexiPump® Pro).

To set the date and time, select the line **"DATE/TIME"** and press the rotating button. With the rotating button, set up the date and press the button. Repeat the operation to set up the number of the month and the year. Proceed the same way to set up the time and minutes.

3.6.6 Language

FlexiPump® displays its information in french or english. To set up the language, select the language line **"LANGUAGE"** and press the rotating button to go to a language to another.

3.6.7 Specific configurations of FlexiPump® Pro

FlexiPump® Pro has a bonus menu: **"OUTPUT SETTINGS" .**

Name of the user

The introduction of a user name in the device allows this name to appear on the printed labels when finished.

How to enter a name for the first time:

To enter a new user name, select the line **"NAME"** and press on the rotating button. The cursor is then on the first letter. Press again on the button to change the letter under the cursor. Use the button to select the first letter of the name then press to confirm.

The cursor moves when the next letter, and then proceed to all the letters of the name you want to enter.

When you have entered and validated the last letter, press "*esc*." twice.

How to change the name:

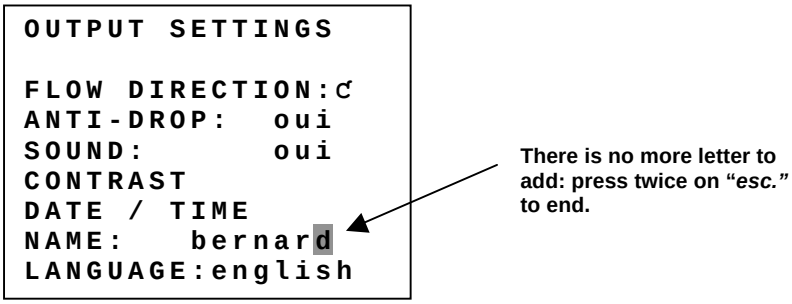
To change the user name, select the line **"NAME"** and press on the rotating button. The cursor is then on the first letter. Then select with the rotating button the first letter you want to change and press on to validate.

For all letters (or other typeface) that you want to change, follow these steps: use the rotating button to select the new letter (or another typeface, such as a punctuation mark) and press the button. The cursor then moves to the next letter.

For every letter that you do not want to change, simply press on the rotating button. The cursor moves to the next letter.

For all the letters you wish to erase (when the new name is shorter than the old one), turn the rotating button to the left until the letter disapears. Press on the button to validate. The cursor then goes to the next letter.

When you have erased the last letter, press on "*esc.*" twice.



Language

FlexiPump® Pro displays info in french and english. To set the language, select the line **"LANGUAGE"** and press on the rotating button to go from a language to another.

Printing formats

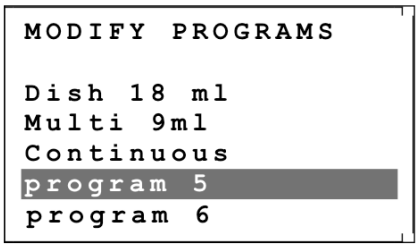
FlexiPump® Pro enables prints on labels or on paper rolls. To set up the print format, select the line **"PRINTING"** and press on the rotating button to go to a format to another.

3.7 Programs

3.7.1 Create a program

In the main menu, choose the option **"MODIFY PROGRAMS".** On the screen will appear the list of the programs already created. If you scroll the list, at the end will appear a list of standard names: program 5, program 6, etc… These are unused programs. If you want to create a new program for your needs, use one of them.

Select it as indicated below and press on the rotating button. Please look at the next chapter 3.7.2 Modify a program. In this chapter you will learn how to rename a program and change parameters.

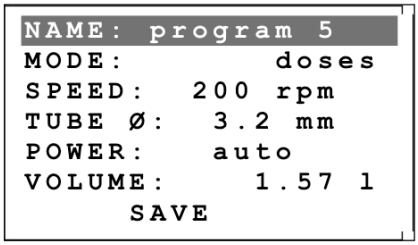


3.7.2 Modify a program

From the main menu, select **"MODIFY PROGRAMS"**. A screen displays the list of names of programs already created. Select the program you want to edit and press on the rotating button.

The screen that appears shows under the name of the program, a list of all its parameters.

Example :



The list of parameters vary depending on how the program works : by dose or continuous. Here is the list of all the parameters:

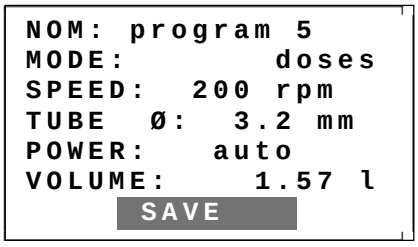
- Name of the program
- Distribution mode
- Pump speed
- Tubing inner diameter
- Power of pump motor
- Volume of a dose (unless the functionning mode is continuous)

and for the muti-dose only:

- Number of doses
- Delay in-between the doses

Please find later in the chapter, the meaning of each parameter and how to modify it. To generally modify a parameter, turn the button to select the line where the parameter appears and press the button.

When you have finished modifying these parameters, turn the button until you select the word **"SAVE"** at the bottom of the screen and press on the button.

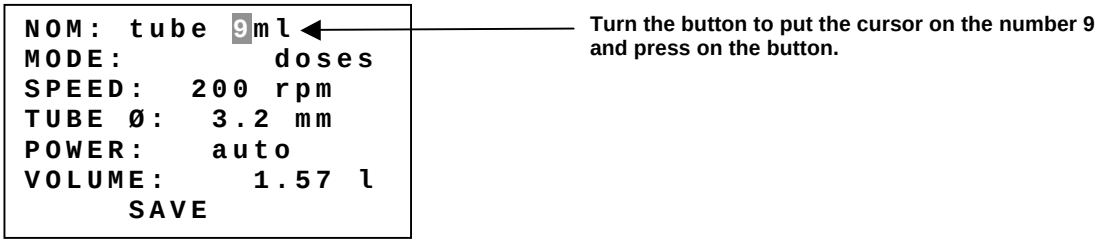


You can also press on the "*esc.*" button to come back to the main menu.

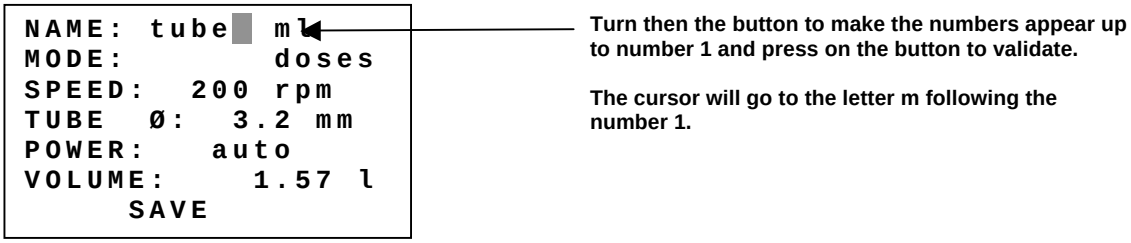
Rename a program

To change the name of a program, select the line **"NAME"** and press the rotating button. The cursor place itself on the first letter. Select then with the rotating button the letter you wish to change and press on the button.

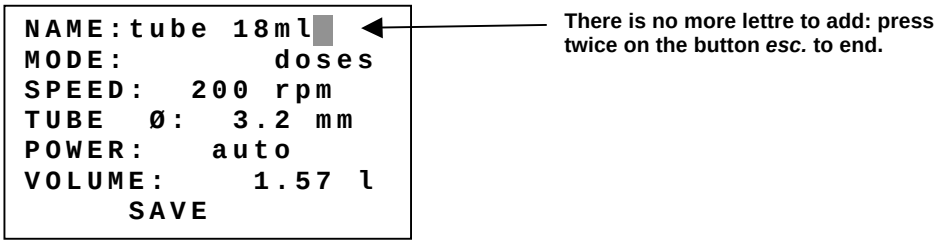
Example to change from 9mL tubing to 18mL tubing:



Turn then the button to modify the character under the cursor. Typographic characters scroll: numbers first and then alphabetic letters and punctuation characters. Turn the button until the character appears under the cursor and press on the button to validate. The cursor then goes to the next letter.



Turn again the button to modify the next letter. Repeat the operation for all the letters you have to change. For all the letters you do not want to change, when the cursor is on the letter, just press on the button to validate. The cursor goes to the next letter. When you have chosen and validated the next letter, press twice on "*esc*.".



How to delete characters :

When the cursor is on a letter you wish to delete, in the case the name the new name is shorter than the rpevious one, turn the rotating button to the left or to the right until the letter disappears. Press then on the button to validate the suppression. The cursor then goes to the next position.

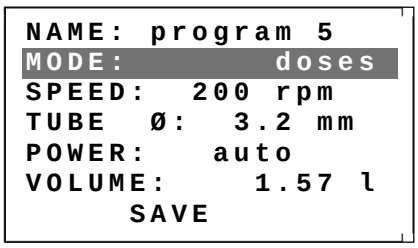
Repeat until everything is erased. When you have erased the last letter, press on « *esc.* » twice.

Distribution mode

Each program must have at least one dispensing mode : dose, multi-dose or continuous. (Cf. paragraph 3.1 Principles of use)

To change this mode, select the line **"MODE"** and press on the rotating button.
Then, by turning the button, make the display mode you want and validate by pressing the rotating

button. The cursor then goes to the next line **(SPEED).**



Pump speed

The speed is measured in RPM (Rotation Per Minute), that is to say, rotations per minute. The pump speed and inner diameter of the tubing condition the flow. (The flow also depends upon the viscosity of the liquid.)

To change the speed, select the line **"SPEED"** and press on the rotating button.

Then by turning the button, change the number and validate by pressing the button.

Another method, to change the speed in a experimental mode :

Launch the program (see chapter 3.7.4 Use a program). When the pump is working, the speed is displayed on-screen and you can modify with the rotating button. The last chosen figure is memorized in the program.

Inner diameter of the tubing

You have to enter and memorize this information for each program. It will then be useful to calibrate the pump.

To change this figure, select the line **"TUBE"** and press the rotating button.
Then by turning the button, change the figure and validate by pressing the button.

Note : after having changed the figure of the tubing's diameter, it is recommended to make a calibration. (Cf. chapter 3.7.3 Calibration*).*

Power of the pump motor

You can choose the maximum power, economy (minimum) or automatic mode. In the automatic mode, the power of the pump is settled according to the speed and diameter of the tubing.

Volume of a dose

If you have chosen the mode *dose* OR *multi-dose*, enter here the volume in mL.

Number of doses

In the *multi-dose* mode, the FlexiPump® dispenses several doses consecutively making a pause in between each one.

If you choose the *multi-doses* mode, select the line **"DOSES"** and the number of doses to dispense.

Delay between each dose

If you choose the *multi-doses* mode, select the line **"DELAY"** and enter the number of doses to deliver.

3.7.3 Calibration

When ?

- When you change program because calibration is made for each program even if the tubing diameter remains the same.

- Each time you put the tubing back in the pump head, because the tubing is inserted differently and can change flow.

Necessity of a calibration

Dispensing of a dose

See introduction on this subject chapter 3.5.2 Programs and calibration.

Dispensing in continuous mode

In the continuous mode, the flow appears on-screen. The flow is proportional to the rotation speed of the pump. The calibration enables to evaluate precisely this proportionality and put on-screen the precise flow.
The operation of calibration is not absolutely necessary: if you fill in correctly information about the inner diameter of the tubing, the FlexiPump® can then figure out the flow for an average viscosity and function correctly. But to maintain an optimal precision, calibration is recommended.

Principle of operations

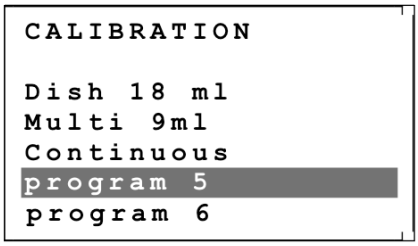
The operation consists in pouring a fixed volume of liquid in conditions closest to real conditions, to measure it and then enter the value of the volume in the machine so that it can calculate the ratio between the volume and the number of rotations made, that is to say the flow rate.
The method to measure a volume is generally to weigh the poured liquid and convert its weight in volume, knowing the weight of the liquid.

The conditions that must be met:

- diameter of the tubing : install the tubing shown in the program
- viscosity : pour the appropriate liquid, at the appropriate temperature (not other settings)
- volume : choose a container accordingly to a dose

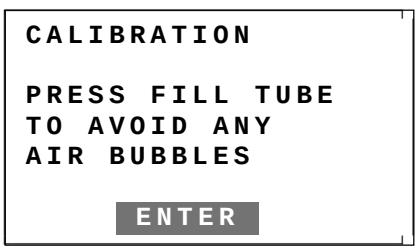
Procedure

Summary: Tare a container corresponding to the volume of a dose. Fill it with the FlexiPump® and measure the volume of the liquid. Then enter the volume in the machine.
In the main menu, choose the option **"CALIBRATION"** and in the displayed menu, choose the program to calibrate. **Example** :



Follow the instructions on-screen and press on the rotating button to go to the next steps.

At one point, the screen shows:



The button "*fill tube*" is at the top left side of the screen. Press on this button if the tubing is not totally

filled with liquid on either side of the pump. Keep your finger pressed until the tubing is not filled.

Be careful not to fill up the container during the operations!

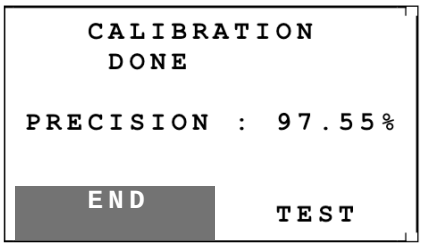
Press then on "*START/STOP"* (or on the rotating button) to start the pump and press again to stop it.

Finally measure the dispensed volume following the instructions and enter the figure thanks to the rotating button. Even if the container is not totally filled, as soon as the dispensed volume in the container approaches to the dose, the calibration will be valid.

The calibratIon is then done. FlexiPump® displays on-screen the obtained menu. According to the functionning mode, it shows according to the functionning mode:

- Continuous mode: precision on the flow measurement
- Doses mode: precision on the volume of a dose

Example :



Test

If you want to test the calibration you just made, turn the button to select **"TEST"** and validate. Place an empty container, possibly calibrated beforehand and then press on the button. The pump activates itself and dispenses the theoretical volume of a dose. Check, possibly by weighing, the volume of the poured liquid.

Calculation of accuracy

The accuracy depends on 2 things :

- tubing inner diameter
- dispensed volume during calibration

Tubing inner diameter :

The tubing inner diameter is important in the d*ose* mode. It must be adapted to the volume of the wanted dose : for a small volume, the tubing must be thin. If you use a large tubing to dispense a small volume, inaccuracies may increase.

Dispensed volume during calibration :

Theoratically, the flow measurement after calibration is more precise after you have dispensed a large volume because you would have measured the real flow during a longer time.

However all the phases of the movement of the pump: start, stop and continuous rotation, are also important in the precision of the volume used. Therefore, it is better that the volume dispensed during calibration be equal to the volume dispensed during use.

That is to say:

- Dose mode: the volume of a dose
- Continuous mode: the volume the most often dispensed

Accuracy displayed by the FlexiPump® is calculated on the basis of two parameters discussed above (tubing diameter and volume added) and based on data drawn from experiments in the laboratories of the manufacturer of the FlexiPump®.

3.7.4 Use a program

To run a program, the main menu, select **"LAUNCH PROGRAMS".** A screen displays the list of

program names. Select the one you want with the rotating button.

Immediate launching

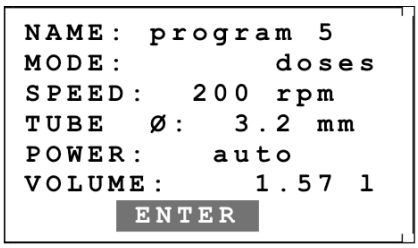
To start the program immediately, without prior verifications, press on the red button "*START/STOP".*

Note : if you have an accessory: gun or pedal (see Accessories chapter), you can use it instead of the "START/STOP" button.

Start after verifications

If you validate the choice of a program appears on-screen the display parameters of the chosen program. You can check that you have chosen the right program. If your program is in multi-dose, turn the button to scroll the information on-screen.

Example :



Press then on the button to display the last calibration's date.

Example :

Press then on the button or on the red "*START/STOP"* or on an accessory to start the pump.

Suspend an operation

You can temporarily suspend the operation by 3 ways : by pressing the « *START/STOP »* button, or on the rotating button or on the « *esc*. » button.

You can start again the dispensing by pressing again on the « *START/STOP »* button or on the rotating button.

Cancel an operation

When the dispensing is suspended, you can then cancel it totally by pressing on the « *esc. »* button.

Change the speed during dispensing

While the pump is running, you can change the speed by turning the rotating button, thereby changing the liquid flow.

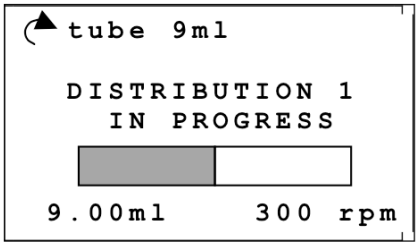
The used speed is memorized in the FlexiPump®. When you will launch the same program later, the pump will run at the speed you had chosen.

Be careful, this may change the calibration value.

Dispensing in « dose » mode

During dispensing the FlexiPump® displays a progress indicator and a reminder of the program name, the dose volume and the direction and speed of the pump.

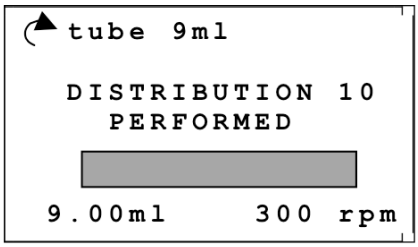
Example :



At the end of dipensing, the screen displays **"DISTRIBUTION PERFORMED".** You can then start the dispensing of another dose by pressing on "*START/STOP"* or on the rotating button using the gun or the foot pedal.

During the dispensing and at the end of each dose, the screen displays a count of the number of doses.

Example, after 10 doses :



Press on "*esc."* to quit the program.

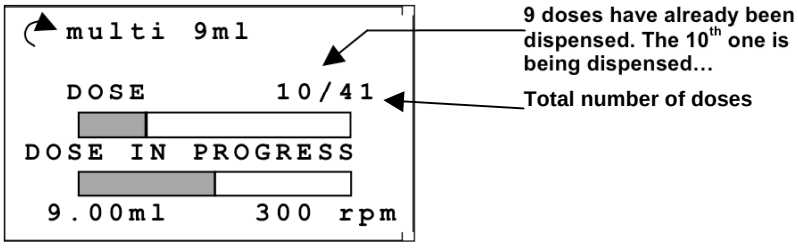
Dispensing in "multi-doses" mode

During dispensing FlexiPump® displays a reminder of the name of the program, the dose volume, the number of doses of the program and the direction and speed of the pump.

It also displays two progress indicators:

- on the number of doses
- on the dose in dispensing

Example :



Note: during dispensing and during the waiting delay between 2 doses, you can temporarily suspend the operations by pressing on the "START/STOP" button.

At the end of all dispensings, the screen displays nothing special but that the 2 progression indicators are complete. The FlexiPump® makes a little "bip" sound if the option **"SON"** is activated (Cf. 3.6.3

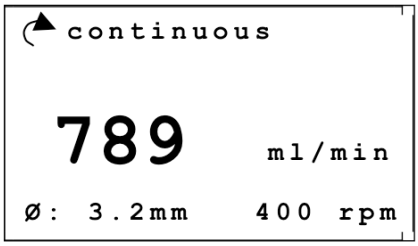
Sound).

You can then start the dispensing of another serie of doses by pressing on "*START/STOP"* or on the rotating button or by using the gun or the pedal. If not, press on "*esc."* to quit the program.

Dispensing in continuous mode

During dispensing FlexiPump® displays the name of the program, the inner diameter of the tubing and the direction and rotation speed. It also displays the flow in milliliters per minute, the large number at the center of the screen.

Example :



To stop the flow, press on the red "*START/STOP"* button or on the rotating button. If you use an accessory (foot pedal or handy gun) (see the Accessories chapter), you can use it instead. To quit the program, press on « *esc.* »

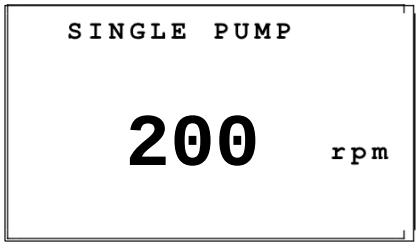
3.8 Basic pumping

When you just want to dispense a liquid and manually control the process, use the **"SINGLE PUMP"** function in the main menu.

To do so, select the option in the main menu and then press on the "*START/STOP"* button or on the rotating button and then press again on the same button. Stop the pump by pressing again on the "START/STOP" button or on the rotating button.

During dispensing, the pump displays the rotation speed of the motor in RPM.

Example:



During dispensing, you can change the rotation speed by turning the button.

Press on "*esc."* to get back to the main menu.

3.9 Use with diluent broth bags

3.9.1 How to install a diluent broth bag

- Disconnect the GL45 bottle cap from the tubing.
- Place instead of GL45 bottle cap the trocar for broth bags (ref. 513 020).
- Connect the bag using the trocar.
- Install the diluent broth bag on the independant stand (ref. 513 015).

3.9.2 Using the FlexiPump® to fill in Dry-bags from Oxoid (Thermo Fisher Scientific)

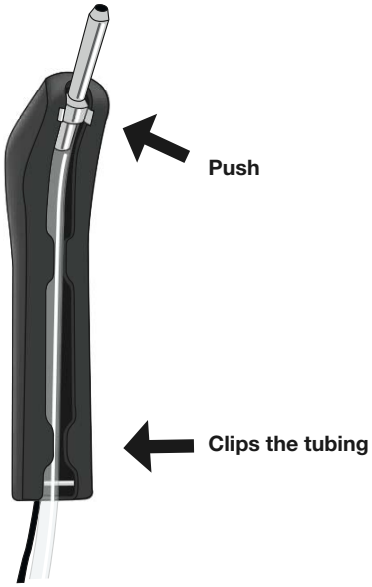
For this, we recommend you to use a FlexiPump® Pro with a tubing of inner diameter of 8 mm to obtain the maximum flow of 2.5 L/min. This will help to fill the 20 L Dry-bags in 8 minutes.
This requires replacing the tip of the stainless steel tubing with the trocar for broth bags. (ref. 513 020).

3.10 Using the handy gun (ref. 561 001)

For a highly precise work, you can use the handy gun (Also see chapter 2.1)

How to install the handy gun

- Connect the Jack 3,5 mm connector at the back of the unit of the FlexiPump®.



- Insert the stainless steel nozzle in the gun.

Be careful to aim in the slot where you can distinguish white rollers.

- To take out the stainless steel nozzle, un-clip it by translating it down. Be careful not to press too much.

3.11 Advanced features (FlexiPump® Pro)

FlexiPump® *Pro* has a serial port to connect with a thermal printer. If a printer is connected to it, FlexiPump® *Pro* prints a report at the end of each program.

FlexiPump® *Pro* has an USB port to be connected with a computer. When a computer is connected to it, FlexiPump® *Pro* sends a report to the computer at the end of each program.

3.11.1 Printed report

In *multi-doses* mode, the FlexiPump® *Pro* prints a report at the end of a series of doses, that is to say at the end of automatic execution of the program.

In *simple doses* mode, the FlexiPump® *Pro* prints a report at the end of a manual serie of doses by pressing on "*esc.".* The format of the report is the same than in the *multi-doses* mode.

Example of a report in *doses* or *multi-doses* mode:

Multi 9ml
Date / Time: 06/04/2012 10:42
Calibrated on: 12/12/2011 11:30
User: bernard
Inner tube diameter: 3.6 mm
Speed: 300 rpm
Volume: 9 ml
Nb Doses: 40

In the continuous mode, the FlexiPump® prints a report at the end, when the user exits the program by pressing on "*esc.".* The printed report shows that the program was used, by whom and on what date and time, and recalls its characteristics.

Example of a report in *continuous* mode :

Continu
Date / Time: 06/04/2012 10:42
Calibrated on: 12/12/2011 11:30
User: bernard
Inner tube diameter: 3.6 mm
Speed: 452 rpm
Flow: 789.17 ml/min

3.11.2 Data export to computer

Connect the FlexiPump® to a computer. The first time, the computer shows a message indicating a new device had been connected and is ready for use.

The FlexiPump® is seen by the computer like a keyboard. In other words, like everything you type on the keyboard usually appears on the screen, all info that the FlexiPump® will send, will also automatically appear there.

The appearance of the displayed text is of course depending on which program you use: word processing, spreadsheet, etc. ...

The FlexiPump® is designed to send its data to a spreadsheet like Microsoft Excel™ or the OpenOffice Calc.™. If the computer is running such a program "spreadsheet", data sent by the FlexiPump® appear on a line in consecutive columns.

On-screen data with "*dose*" mode *and "multi-dose"* mode

Exemple :

Name of progr.	Date / Hour	Calibration date	User	Tubing inner diameter	Speed (rpm)	Volume	Nb. Doses
Tube 9ml	06/04/12 12:53	12/12/2011 11:30	Bernard	3.2	299	9.00ml	1
Multi 9ml	06/04/12 12:54	12/12/2011 11:30	Bernard	3.2	300	9.00ml	40

The FlexiPump® sends the title line just before sending the first data line to the computer.

In the column "Volume", the units are not displayed in the title but in each square, according to the

program because the volume of a unit dose can vary between micro, milliliter and liter.

On-screen data with "*continuous*" mode

Exemple :

Name of progr.	Date / Hour	Calibration date	User	Tubing inner diameter	Speed (rpm)	Volume	Nb. Doses	Flow (ml/min)
Continuous	06/04/2012 12:53	12/12/2011 11:30	bernard	3.2	452			789.17

In this mode, the FlexiPump® does not inform the columns Volume and number of doses but adds a column about the flow data.

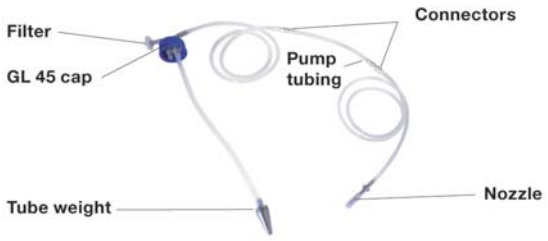
4 Tubing details

Tubing details

FlexiPump®

Complete dispensing assembly

Ref 561 101	Dispensing assembly inner ø 1.6 mm	By 1
Ref 561 102	Dispensing assembly inner ø 3.2 mm	By 1
Ref 561 103	Dispensing assembly inner ø 4.8 mm	By 1
Ref 561 104	Dispensing assembly inner ø 6.4 mm	By 1
Ref 561 105	Dispensing assembly inner ø 8 mm	By 1



Silicone tubing

Ref 561 201	Silicone tubing inner ø 1.6 mm	By 5
Ref 561 202	Silicone tubing inner ø 3.2 mm	By 5
Ref 561 203	Silicone tubing inner ø 4.8 mm	By 5
Ref 561 204	Silicone tubing inner ø 6.4 mm	By 5
Ref 561 205	Silicone tubing inner ø 8 mm	By 5

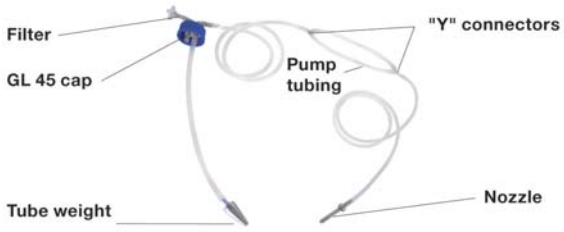
Silicone tubes for pump head

Ref 561 301	Silicone tubes for pump inner ø 1.6 mm	By 5
Ref 561 302	Silicone tubes for pump inner ø 3.2 mm	By 5
Ref 513 011	Silicone tubes for pump inner ø 4.8 mm	By 5
Ref 561 304	Silicone tubes for pump inner ø 6.4 mm	By 5
Ref 561 305	Silicone tubes for pump inner ø 8 mm	By 5

FlexiPump® Pro

Complete dispensing assembly

Ref 562 101	Dispensing assembly inner ø 1.6 mm + "Y" connectors	By 1
Ref 562 102	Dispensing assembly inner ø 3.2 mm + "Y" connectors	By 1
Ref 562 103	Dispensing assembly inner ø 4.8 mm + "Y" connectors	By 1
Ref 562 104	Dispensing assembly inner ø 6.4 mm + "Y" connectors	By 1
Ref 562 105	Dispensing assembly inner ø 8 mm + "Y" connectors	By 1



Silicone tubing + "Y" connectors

Ref 562 201	Silicone tubing inner ø 1.6 mm + "Y" connectors	By 5
Ref 562 202	Silicone tubing inner ø 3.2 mm + "Y" connectors	By 5
Ref 562 203	Silicone tubing inner ø 4.8 mm + "Y" connectors	By 5
Ref 562 204	Silicone tubing inner ø 6.4 mm + "Y" connectors	By 5
Ref 562 205	Silicone tubing inner ø 8 mm + "Y" connectors	By 5

Silicone tubes for pump head

Ref 561 301	Silicone tubes for pump inner ø 1.6 mm	By 5
Ref 561 302	Silicone tubes for pump inner ø 3.2 mm	By 5
Ref 513 011	Silicone tubes for pump inner ø 4.8 mm	By 5
Ref 561 304	Silicone tubes for pump inner ø 6.4 mm	By 5
Ref 561 305	Silicone tubes for pump inner ø 8 mm	By 5

The dispensing assembly is **entirely autoclavable** with a bottle for contamination free dispensing.

5 Maintenance

FlexiPump® requires little maintenance.

- Daily :

Autoclave the tubing set (when the FlexiPump® is used in a sterile environment).
The tubing supports are fully autoclavable.

- Change the silicone tubing :

In the event of leakage, hardening or sticking of the tubing.

- Every 20 autoclavaging cycles :

Filter change-to-air (only for operation in a sterile environment).

Note : INTERSCIENCE can provide complete dispensing assembly.

Note : To clean the top shell, do not use bleach because it damages the stainless steel. We recommend the use of INTERSCIENCE Clinet® 101 disinfectant wipes.

6 Technical specifications

	 FlexiPump®	 FlexiPump® Pro
Reference	**561 000**	**562 000**
Dose volume	50 µL to 99 L	
Watson Marlow™ pump	Single pump head	Low pulsation double pump head
Typical precision with 3.2 mm ID tube	9 mL: 1.8 % - 18 mL: 1 % - 225 mL: 0.5 %	9 mL: 0.9 % - 18 mL: 0.5 % - 225 mL: 0.4 %
Delivered with (tubing inner diameter)	3.2 mm dispensing assemblies	3.2 mm and 6.4 mm dispensing assemblies
Flow rates	1.5 mL/min. to 1.25 L/min.	3 mL/min. to 2.5 L/min.
Traceability	3.5 mm jack	USB, RS 232 connectors, 3.5 mm jack
Rotation per minute	10 to 550 rpm	
Tubing inner diameter	From 1 to 8 mm only	
Tubing wall thickness	1.6 mm only	
Tubings made from	Tygon™ for pump head and Versilic™	
Dimensions (H x W x D)	21 x 16 x 27 cm	21 x 16 x 33 cm
Weight	5.5 kg	5.8 kg
Input voltage	100-240 V~ 50-60 Hz	
Inner diameter of optional tubings	1.6 mm, 3.2 mm, 4.8 mm, 6.4 mm, 8 mm	
All stainless steel	✔	
Made in France	✔	

WEEE 2002/96/EC RoHS 2002/95/EC ISO 9001 2008 MADE IN FRANCE CE

7 After-Sales

For any other question, with your FlexiPump® serial number question, contact us:

By email : tech@interscience.fr / info@interscience.fr

By phone : +33 (0)1 30 56 64 01

INTERSCIENCE wiil repair the unit **free-of-charge** according to the guarantee conditions under the terms of the guarantee card. The unit must be returned carriage-paid to our factory and **only after prior agreement** with INTERSCIENCE After-Sales department.

Our garantee becomes void in case of incorrect use or opening of the unit by unqualified or unauthorized persons.

8 Certificates and guarantee

LRQA
Business Assurance

CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

INTERLAB
Route de Jalenques
15340 MOURJOU, France

has been approved by Lloyd's Register Quality Assurance
to the following Quality Management System Standards:

ISO 9001:2008

The Quality Management System is applicable to:

Manufacture of laboratory equipment, sterile bags and filter bags for laboratories and of mixers using these bags. Processing of laboratory products and equipment for INTERSCIENCE.

Approval
Certificate No: FQA 0950488

Original Approval: 6th June 1997

Current Certificate: 1st July 2012

Certificate Expiry: 30th June 2015

Issued by: Lloyd's Register Quality Assurance France SAS
For and on behalf of LRQA Limited

UKAS MANAGEMENT SYSTEMS
001

This document is subject to the provision on the reverse
1, boulevard Vivier Merle, 69443 Lyon cedex 03
For and on behalf of 71 Fenchurch Street, London EC3M 4BS United Kingdom. Registration number 1879370
This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.
The use of the UKAS Accreditation Mark indicates Accreditation in respect of those activities covered by the Accreditation Certificate Number 001
Macio Revision 13

interscience

ISO 9001

30 Chemin du Bois des Arpents - 78860 ST NOM LA BRETECHE - France
Tél : +33 (0)1.34.62.62.61 - Fax : +33 (0)1.34.62.43.03 – Mail : info@interscience.fr – Site : www.interscience.fr

« CE » CERTIFICATE OF COMPLIANCE

We, interscience, guarantee that the following products:

- MiniMix® 100 VP
- MiniMix® 100 VW
- MiniMix® 100 CC
- CoolMix® 100 VP

- BagMixer® 400 P
- BagMixer® 400 W
- BagMixer® 400 VW
- BagMixer® 400 CC
- CoolMix® 400
- iMix®

- JumboMix® 3500 VP
- JumboMix® 3500 VW
- JumboMix® 3500 VW WarmMix®
- JumboMix® 3500 CoolMix®

- Baby Gravimat®
- Gravimat®

- FlexiPump®
- FlexiPump Pro®

- EasySpiral®
- EasySpiral® Pro
- EasySpiral® Dilute

- Scan 100®
- Scan 300®
- Scan 500®
- Scan 1200®

➢ Are made in CE compliance with the following directives:

- European Directive 2006/42/EC relating to machines.
- European Directive 2004/108/EC about electromagnetic compatibility.
- European Directive 2006/95/EC relating to low voltage electrical goods

St Nom-la-Bretèche,
June 21th, 2012

Emmanuel JALENQUES
Director

interscience

ISO 9001

30 Chemin du Bois des Arpents - 78860 ST NOM LA BRETECHE - France
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CERTIFICATE OF COMPLIANCE

We, interscience, guarantee that the following products:

- MiniMix® 100 VP
- MiniMix® 100 VW
- MiniMix® 100 CC
- CoolMix® 100 VP

- BagMixer® 400 P
- BagMixer® 400 W
- BagMixer® 400 VW
- BagMixer® 400 CC
- CoolMix® 400
- iMix®

- JumboMix® 3500 VP
- JumboMix® 3500 VW
- JumboMix® 3500 VW WarmMix®
- JumboMix® 3500 CoolMix®

- Baby Gravimat®
- Gravimat®

- FlexiPump®
- FlexiPump Pro®

- EasySpiral®
- EasySpiral® Pro
- EasySpiral® Dilute

- Scan 100®
- Scan 300®
- Scan 500®
- Scan 1200®

➢ Are compliance with the following directives:

- **2002/95/EC** (the RoHS Directive) restricting the use of hazardous substances in electrical and electronic equipment (Based on information provided by our suppliers)

- **2002/96/EC** (the WEEE Directive) imposing selective recovery of Electrical and Electronic Components (return carriage costs to Interscience to be borne by the sender).

- 94/62/CE relating to packaging and packaging waste

- SJ/T11363-2006 restricting the use of hazardous substances in electrical and electronic equipment (RoHS China Concentration Standard)

- SJ/T11364-2006 imposing the marking of the products concerned with the standard above and their packaging (RoHS China Labelling Standard)

- GB18455-2001 describing the imposed marking of packaging of the RoHS products.

St Nom-la-Bretèche,
June 21th, 2012

Emmanuel JALENQUES
Director

interscience

FlexiPump®

GUARANTEE/GARANTIE

FlexiPump® Serial number / *Numéro de série :*	Date of purchase / *Date d'achat :*

Thank you for choosing **FlexiPump®**.

PLEASE VALIDATE YOUR GUARANTEE WITHIN 8 DAYS TO ENJOY THE 1-YEAR GUARANTEE. (Please read our general guarantee conditions overleaf)

Merci d'avoir choisi **FlexiPump®**.

VALIDEZ VOTRE GARANTIE SOUS 8 JOURS POUR BÉNÉFICIER DE LA GARANTIE DE 1 AN. (Voir nos condition générales de garantie au verso)

3 WAYS TO VALIDATE YOUR GUARANTEE:

- Online: www.interscience.fr
- By fax: +33 (0)1 34 62 43 03
- By postal mail

To validate your guarantee by fax or by postal mail, please send us the card below. Keep this part as proof.

3 FAÇONS DE VALIDER VOTRE GARANTIE :

- *En ligne : www.interscience.fr*
- *Par fax : +33 (0)1 34 62 43 03*
- *Par courrier postal*

Pour valider votre garantie par fax ou par courrier, merci de nous renvoyer le coupon ci-dessous. Conservez ce certificat.

FlexiPump® Serial number / *Numéro de série :*	Company (user) / *Société (utilisateur) :*
First name / *Prénom :*	
Family name / *Nom de famille :*	
Address/*Adresse :*	
Country/*Pays :*	
Phone/*Tél. :*	

Fax:
Email:
Applications:
Date of purchase / *Date d'achat :*
Distributor's name / *Nom du distributeur :*
Any comments? Please inform us, we appreciate your advice! *Des critiques, des appréciations ? Dites-le nous, nous en tiendrons compte !*

interscience

GENERAL GUARANTEE CONDITIONS

Flexi*Pump*® is guaranteed for a period of 12 months starting on the shipment date indicated on the delivery note. The guarantee is valid if the end-user returns the card within 8 days following the purchase.

This guarantee covering parts and workmanship will be ensured by contacting your distributor or interscience by sending an e-mail at tech@interscience.fr.

The return of a unit will only be accepted with a repair reference number (issued by the interscience after-sales services). The unit must be returned to us freight pre-paid, in its original packaging or in a similarly protected case after our written agreement.

It is hereby stipulated that this unit must be used for laboratory applications only, and must be maintained according to the instructions in the present user's handbook.

In the case of damage caused by use of the unit for which it was not designed or by unauthorized repairs, the liability of interscience to honor the guarantee will be void.

CONDITIONS DE GARANTIE UTILISATEUR

Flexi*Pump*® *est garanti pendant 12 mois à partir de la date d'expédition indiquée sur le bon de livraison. La garantie est valide si l'utilisateur du* **Flexi*Pump*®** *retourne la carte dans les 8 jours suivant l'achat.*

Cette garantie couvrant pièces et main-d'oeuvre sera assurée en contactant soit votre distributeur soit interscience *au +33 (0)1 34 62 62 61 ou en envoyant un courriel à tech@interscience.fr.*

Les retours de matériel sont acceptés uniquement avec un numéro de retour ou de SAV (obtenu en nous contactant). Le matériel doit nous être retourné franco à notre usine, emballé dans l'emballage d'origine ou dans un emballage de protection équivalent après notre accord écrit.

De convention expresse, cet appareil est garanti pour l'usage de laboratoire pour lequel il est prévu et doit être entretenu selon les recommandations du présent manuel.

En cas de dommages résultant d'interventions ou d'utilisation inadéquates du matériel, l'obligation de garantie par interscience *sera caduque.*

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