

Instruction manual

VWR® Gravimetric Dilutor 3 kg and 5 kg

EU cat. no **Dilutor Gravimetric 3 kg:**
Single pump - 710-2091
Double pump - 710-2092

Dilutor Gravimetric 5 kg:
Single pump - 710-2122
Double pump - 710-2123



For manuals in other languages,
please visit vwr.com

CE

UK
CA

Legal address of Manufacturer

Europe

VWR® International bv,
Researchpark Haasrode 2020
Geldenaaksebaan 464 B-
3001 Leuven
+3216385011
<http://be.vwr.com>

UK Importer:
VWR International Ltd
Hunter Boulevard, Magna Park
Lutterworth, Leicestershire, LE17 4XN
<http://uk.vwr.com>

Country of Origin

FRANCE

Table of Contents

Warning.....	4
Safety Information	4
Package Contents.....	5
Unpacking.....	6
Installation	8
Intended use	12
Product Specifications	12
Overview	14
Description of Buttons and Switches	15
Operational keys	18
Getting Started	18
Important Guidelines.....	21
Operation.....	22
Troubleshooting.....	29
Repair and maintenance of Gravimetric Dilutor	31
User replaceable accessories and spare parts	33
Technical service	33
Warranty	34
Compliance with local laws and regulations.....	34
Equipment disposal	34

Warning

The Gravimetric Dilutor must be placed on a horizontal, rigid, stable surface, to prevent it from falling on the user.

The device must be used in a ventilated room, under normal conditions of temperature (between 15°C and 40°C), pressure, and maximum relative humidity (80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C). In case the device is stored below 10°C, a period during which it returns to room temperature must be observed.

Do not put your finger in the pump as it may be pinched.

Only qualified technicians, duly authorized by customer support, can open the device.

Do not use or store flammable liquids (kerosene, gasoline, etc.) in your Gravimetric Dilutor or nearby. These substances may evaporate and present a risk of fire or explosion.

Please carefully follow all these operating and maintenance instructions

Safety Information

Avoiding Electrical Shock

Please follow the guidelines below, and read this manual in its entirety to ensure safe operation of the unit.



To avoid electrical shock:

To reduce fire risks, electric shocks or injuries during the use of the Gravimetric Dilutor, please carefully read the safety precautions and keep them next to the unit.

The power connection should be made with an undamaged power cord provided with a ground terminal.

If the Gravimetric Dilutor is powered by an extension cord or a portable device with electrical outlets, make sure that these devices are not exposed to water splashing or moisture.

Do not install the Gravimetric Dilutor in a very humid place. This may cause an electric shock or short circuit.

If liquid gets inside the Gravimetric Dilutor through the ventilation cut-outs at the back of the unit, you must:

- Avoid any contact with the unit
- Turn the power off
- Contact customer support

Avoiding Damage to the Instrument

The bag + sample + diluent must not exceed the authorized weight on the weighing platform. For the Gravimetric Dilutor: 3000 g, for the Gravimetric Dilutor 5 kg: 5000 g.

The weighing cell should not bear a shock or excessive pressure.

Leave a free space of at least 5 cm behind the back of the Gravimetric Dilutor not to obstruct the ventilation of the unit.

Use your finger to press the keyboard (no pens, sharp nails...)

Use only accessories provided by VWR (foot pedal, USB cable...)

Before any use, check that the drip tray is correctly positioned. If it is not so, it may cause malfunction of the weighing platform.

- Be sure that there are no visible defaults (e.g.: unstable zero, zero drift...)
- Check that there is no obstacle which may interfere with the weighing cell.
- For the Gravimetric Dilutor 5 kg, check that there are no obstacles that could interfere with the robotic arm.

Do not activate the robotic arm manually. The arm must not undergo any kind of shock or pressure.

Package Contents

Gravimetric Dilutor 3 kg

Description	Quantity
Distribution arm	1
Drip tray 400	1
Pumps	1 or 2
Dispensing assembly (GL45 - Ø 6.4 mm)	1 per pump
USB cable	1
Monitoring software	1
Set of power cables (EU, UK, CH)	1
Bag holder 400 for dilutor	1
User's manual	1
Conformity certificate	1
Adhesive gum	1 set of 10

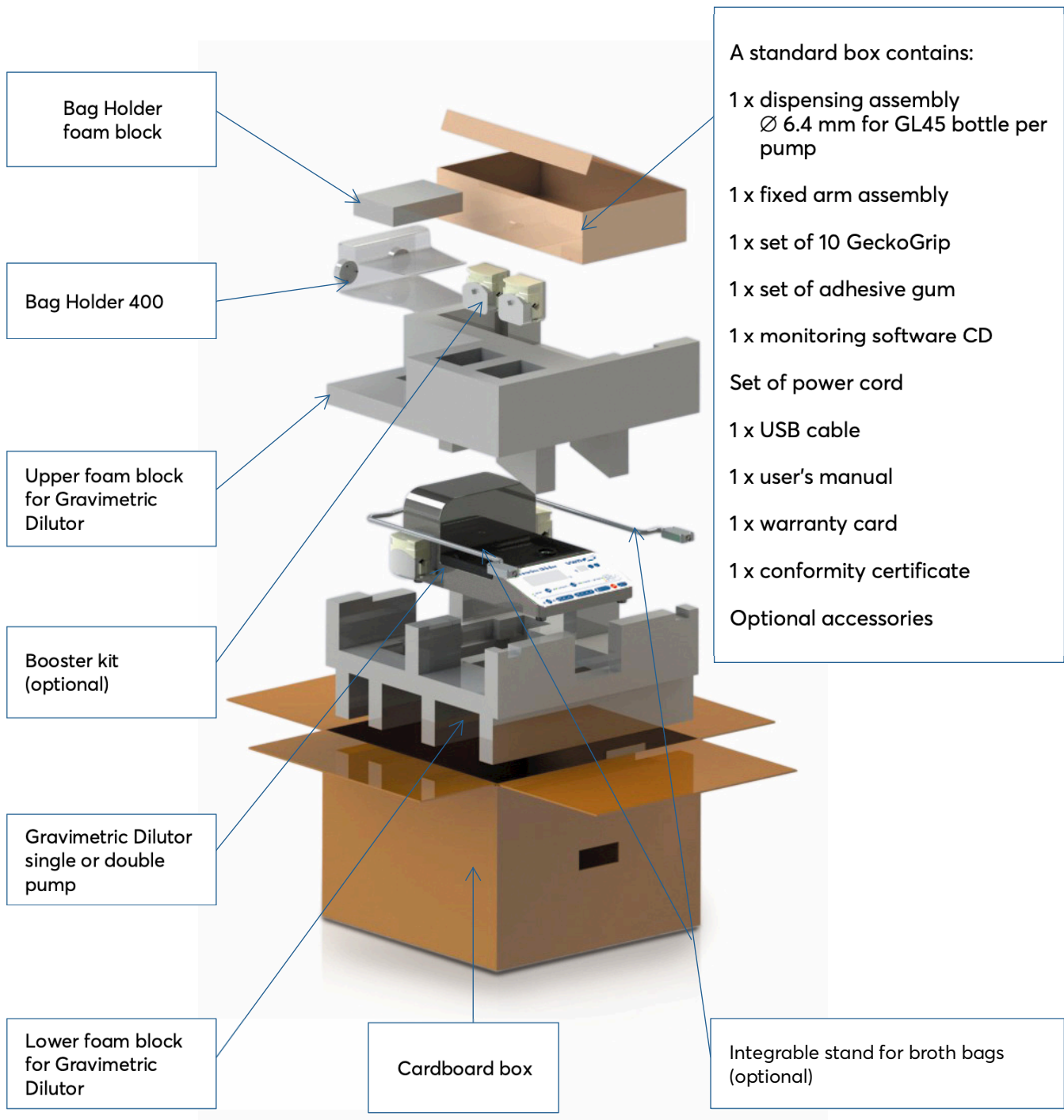
Gravimetric Dilutor 5 kg

Description	Quantity
Drip tray 400	1
Pumps	1 or 2
Protection plate for nozzles	1
Dispensing assembly (GL45 - Ø 6.4 mm)	1 per pump
USB cable	1
Monitoring software	1
Set of power cables (EU, UK, CH)	1
Bag holder 400 for dilutor	1
User's manual	1
Conformity certificate	1
Adhesive gum	1 set of 10
Allen wrench	1

Unpacking

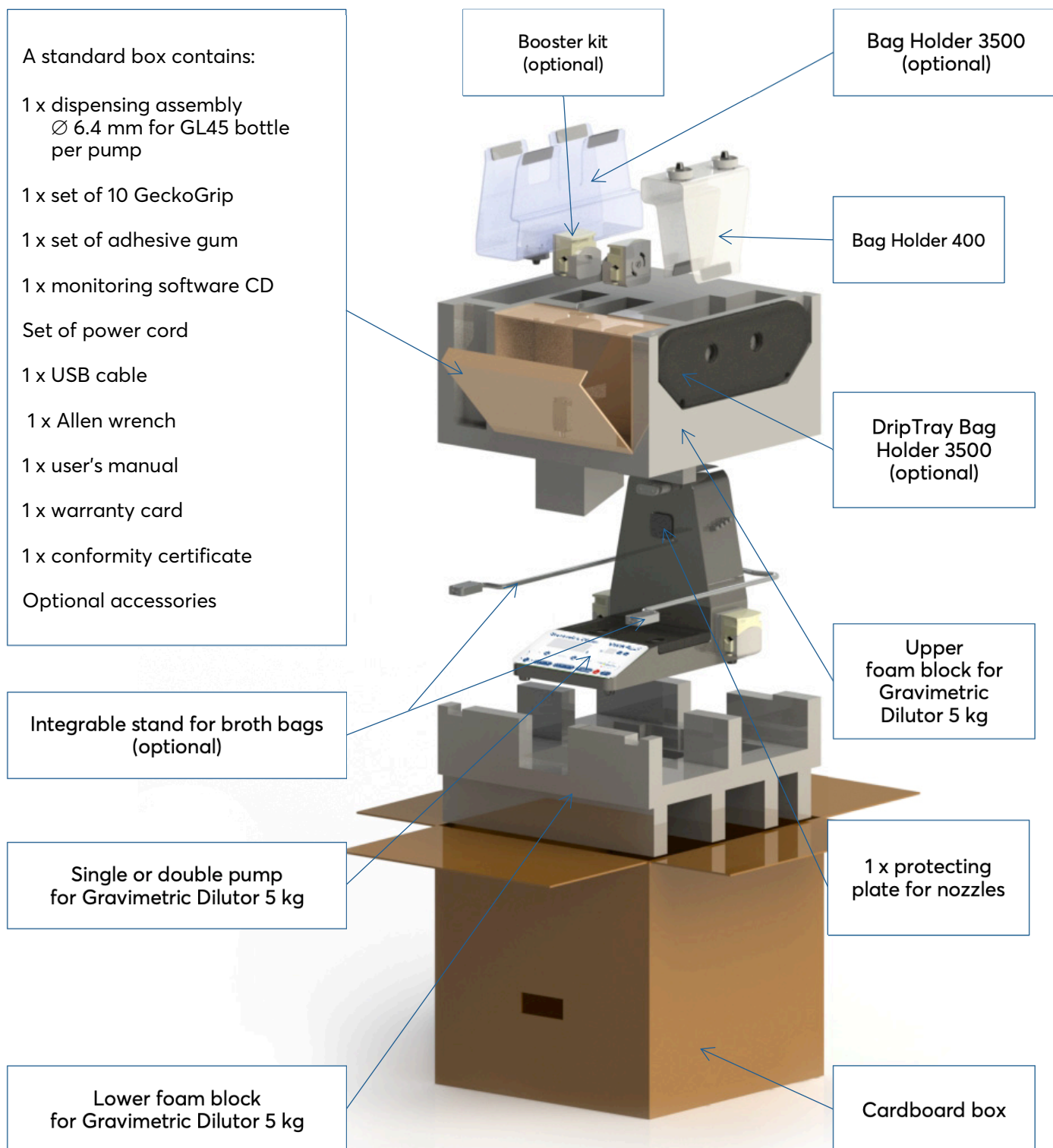
Please check the following diagram showing how to unpack the unit.
Keep the packaging (foam blocks & cardboard box) in case you have to move or ship the unit for maintenance purposes.

Unpacking Gravimetric Dilutor



Picture 1

Unpacking Gravimetric Dilutor 5 kg



Picture 2

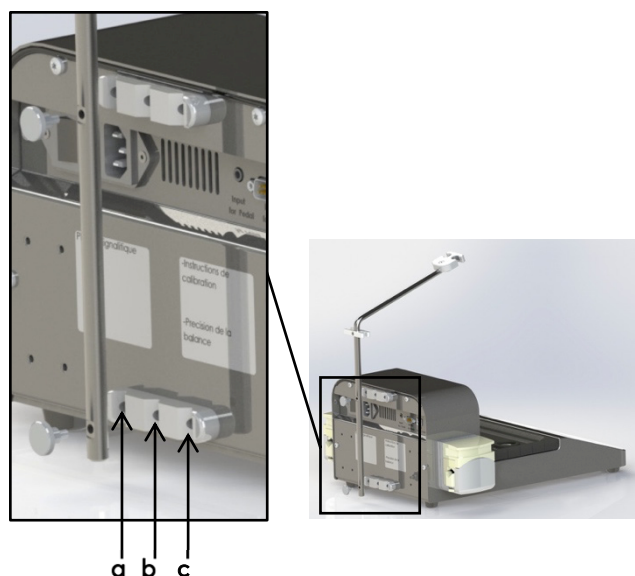
Installation

Install your Gravimetric Dilutor on a flat, stable, horizontal surface, which is important for the accuracy of the weighing platform. Also, keep it away from any vibrating devices.

If you use a bottle as a diluent container, place it on the same horizontal level or lower than the Gravimetric Dilutor, to prevent the water from flowing after the pump stops. The bottle may be placed on the floor to save space on the bench.

Fixed arm (Gravimetric Dilutor only)

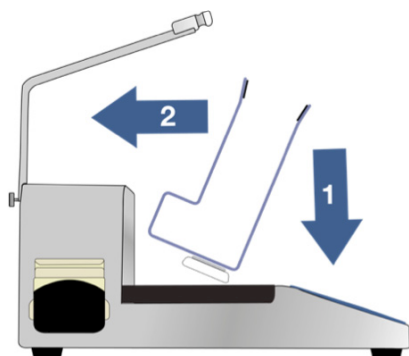
Install the fixed arm at the back of the unit by manually screwing 2 screws provided with the arm. Choose between the three possible positions: a, b or c.



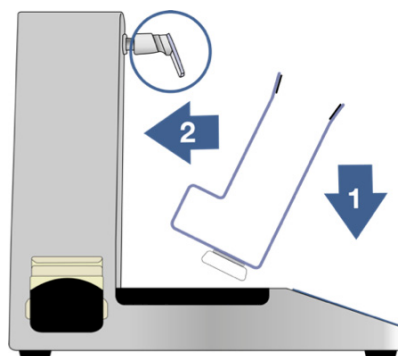
Picture 3: Screwing the fixed arm

Bag Holder

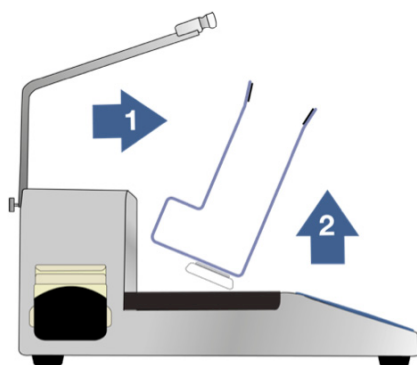
Clip the Bag Holder into the two holes provided for this purpose. For Gravimetric Dilutor 5 kg only, clip also the magnetized nozzle protection.



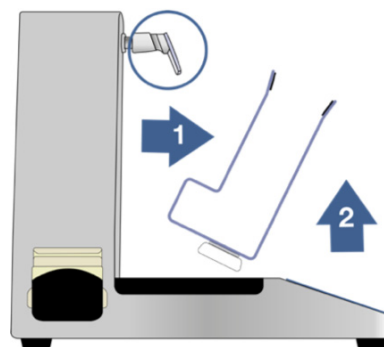
Picture 4: Setting-up of the Bag Holder for Gravimetric Dilutor



Picture 5: Setting-up of the Bag Holder and the protecting plate for nozzles for the Gravimetric Dilutor 5 kg



Picture 6: Removal of the Bag Holder for the Gravimetric Dilutor



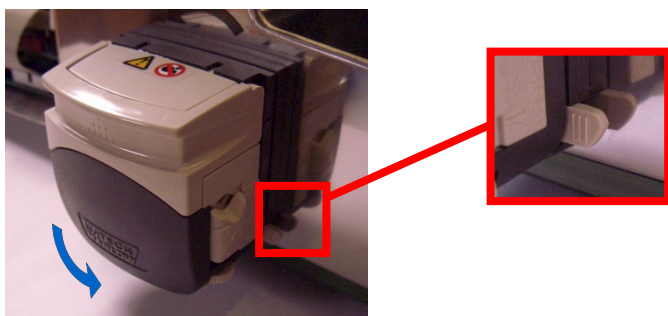
Picture 7: Removal of the Bag Holder and the protecting plate for nozzles for the Gravimetric Dilutor 5 kg

IMPORTANT: The best way to remove the Bag Holder is to tilt it towards you before lifting it up (see Picture 6 and Picture 7).

Booster kit (optional)

The booster kit is composed of a pump and a pump extension. To insert the pump extension between the pump and the pump holder:

- Remove the tube from the pump.
- Remove the pump: press the tab (see Picture 8) and turn it at the same time in the direction of the arrow. Release the pump.



Picture 8

- Clip the pump extension (see Picture 9) on the pump and then open the 2 covers (see Picture 10):

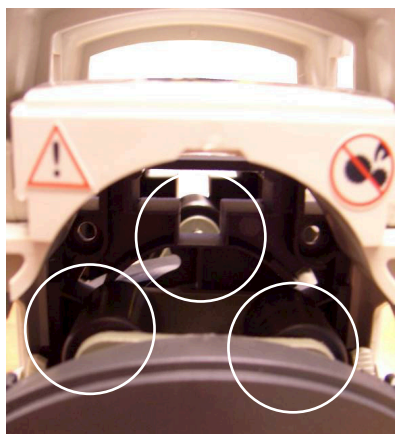


Picture 9



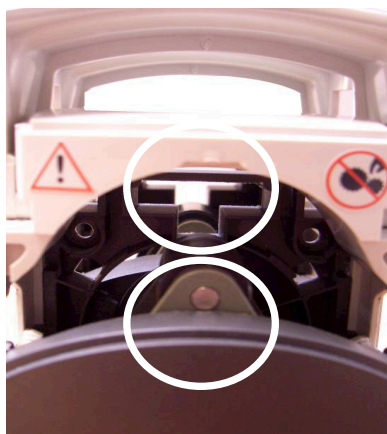
Picture 10

d) Make sure that the rollers of the main pump and pump extension are NOT aligned but staggered in relation to each other:



Picture 11

RIGHT



Picture 12

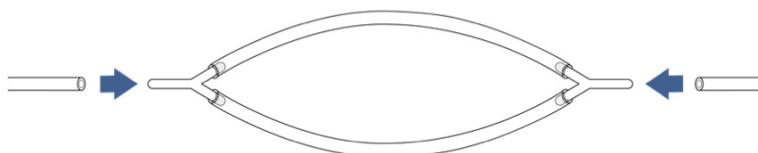
WRONG

If **WRONG**, separate the pump from the pump extension by pushing the tab (see section b). Move aside the rollers wheel a little bit and clip the pump and the pump extension together again.

e) Replace the booster kit on the pump holder.

Assembly tubings for kit booster:

Remove the pump tubing from the current assembly and replace it with the double tubing for kit booster.



Picture 13

GL45 bottle:

Place the tube weight at the bottom of the bottle and screw the GL45 cap on the top.

Place the tubings paying attention to the direction of the flow. *This direction is indicated by the arrows on the housing.*

If you are using tubings with an internal diameter smaller than 6.4 mm (delivered as standard), please refer to chapter "Adjusting the pump and insertion of the tubings".

Place the tubing in the tubing holder.

Remove the protection cap and insert the nozzle in the nozzle holder.

Broth bag:

Screw the integrable stand for broth bags (delivered with 4 screws and a screwdriver).

Replace the GL45 cap, the small tubing and its weight with a trocar.

Insert the trocar in the pouch and install the pouch on its stand.

Place the tubings paying attention to the direction of the flow, which is *indicated by the arrows on the housing of the Gravimetric Dilutor*.

If you are using tubings with an internal diameter smaller than 6.4 mm (delivered as standard), please refer to chapter "Adjusting the pump and insertion of the tubings".

Place the tubing in the tubing holder.

Remove the cap and insert the nozzle in the nozzle holder.

Adjusting the pump and insertion of the tubings

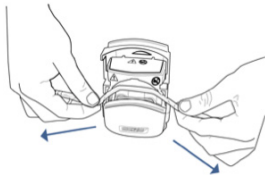
1



When the pump is opened, you must adjust it according to the inner diameter of the tubing by moving the rotating button.

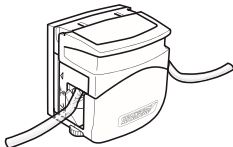
Turn the wheel on each side of the pump to get the correct setting according to the diameter (1.6 / 3.2 / 4.8 / 6.4 / 8 mm) and the thickness of the tubing (1.6 mm).

2



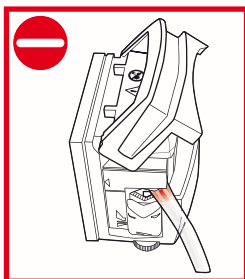
Insert the tubing into the pump.

3



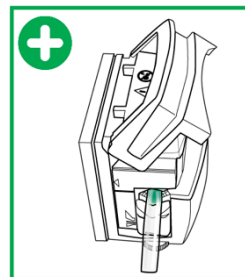
Keep the tubing stretched while you close the pump.

4



WRONG

The tubing is pinched.
It can be pierced.



RIGHT

The tubing is not pinched.
There is no risk.

Intended use

Microbiological analyses are becoming increasingly demanding: sample-taking, diluting and blending are essential factors ensuring the quality and reproducibility of the results.

The Gravimetric Dilutor range will answer your needs. Easy-to-use, with a removable drip tray to make cleaning easy, it is an accurate device in compliance with the latest international standards: ISO 7218, ISO 6887-1, FDA-BAM.

The Gravimetric Dilutor has been designed to facilitate work in a microbiological safety cabinet: it has the lowest height of any dilutor on the market.

Thanks to its 3 positions adjustable arm and its robotic arm, the Gravimetric Dilutor enables you to have free space to manipulate the samples above the Bag Holder.

Product Specifications

Gravimetric Dilutor 3 kg

Reference: Single pump 710-2091 – Double pump 710-2092

Weighing range: 0.1 g to 3 000 g

Weighing accuracy: 0 to 100 g: ± 0.05 g - 100 g to 3 000 g: $\pm 0.1\%$

Minimum weight for dilution: 5 g

Minimum weight for distribution: 5 g

Maximum weight without support: 4 500 g

Dilution factor: 1/2 to 1/99

Dilution/distribution accuracy: $> 99\%^*$

Dilution time for a 25 g sample diluted at 1/10: < 9 s**

Dispensing time for 90 mL: < 7 s**

Dispensing time for 225 mL: < 10 s**

Max number of pumps: 2 integrated

Dispensing/distribution mode: Fast / Standard / Accurate

Traceability: Printer / Monitoring software (data export to Excel™, OpenOffice™, CSV file, printer)

Exported data: Sample weight / Total weight / Dilution factor / Dilution accuracy / Right or left pump + with monitoring software: Sample number / Name of operator / Date / Time

Connection: RS232 output for printer - USB output: To connect a computer - Jack output: To connect a pedal

Weight: Single pump: 10.1 kg – Double pump: 12.5 kg

Dimensions (w x d x h): Single pump: 31.3 x 43.7 x 39.4 cm – Double pump: 37 x 43.7 x 39.4 cm

Voltage – Frequency: 100-240V~ / 50-60Hz

Fuses: T3. 15A L 250V 5x20 mm

Power: 60 W

International protection marking: 22

In compliance with: ISO 7218 / ISO 6887

* In STANDARD or ACCURATE mode in optimal conditions ** with booster kit in FAST mode

Gravimetric Dilutor 5 kg

Reference: Single pump 710-2122 – Double pump 710-2123

Weighing range: 0.1 g to 5 000 g

Weighing accuracy: 0 to 100 g: ± 0.05 g - 100g to 5 000 g: $\pm 0.1\%$

Minimum weight for dilution: 5 g

Minimum weight for distribution: 5 g

Maximum weight without support: 7 000 g

Dilution factor: 1/2 to 1/99

Dilution/distribution accuracy: $> 99\%$ *

Dilution time for a 25 g sample diluted at 1/10: < 9 s**

Dilution time for a 375 g sample diluted at 1/10: < 80 s**

Dispensing time for 90 mL: < 7 s**

Dispensing time for 225 mL: < 10 s**

Max number of pumps: 2 integrated

Dispensing/distribution mode: Fast / Standard / Accurate

Traceability: Printer / Monitoring software (data export to Excel™, OpenOffice™, CSV file, printer)

Exported data: Sample weight / Total weight / Dilution factor / Dilution accuracy / Right or left pump + with monitoring software: Sample number / Name of operator / Date / Time

Connection: RS232 output for printer - USB output: To connect a computer - Jack output: To connect a foot pedal

Weight: Single pump: 12.3 kg – Double pump: 14.8 kg

Dimensions (w x d x h): Single pump: 31.3 x 42.1 x 37.7 cm – Double pump: 37 x 42.1 x 37.7 cm

Voltage – Frequency: 100-240V~ / 50-60Hz

Fuses: T3. 15A L 250V 5x20 mm

Power: 60 W

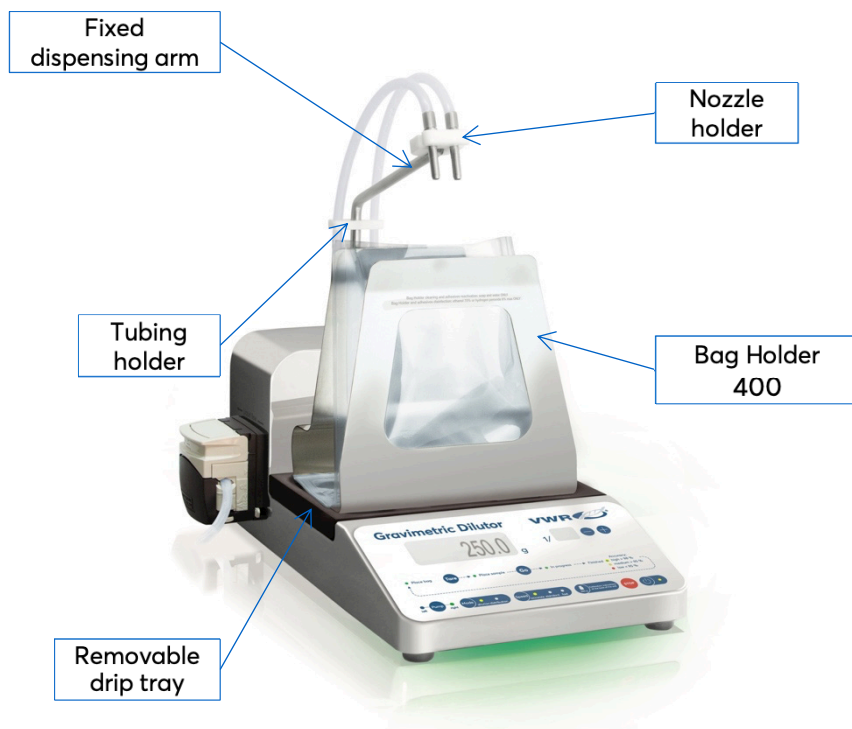
International protection marking: 32

In compliance with: ISO 7218 / ISO 6887

* In STANDARD or ACCURATE mode in optimal conditions ** with booster kit in FAST mode

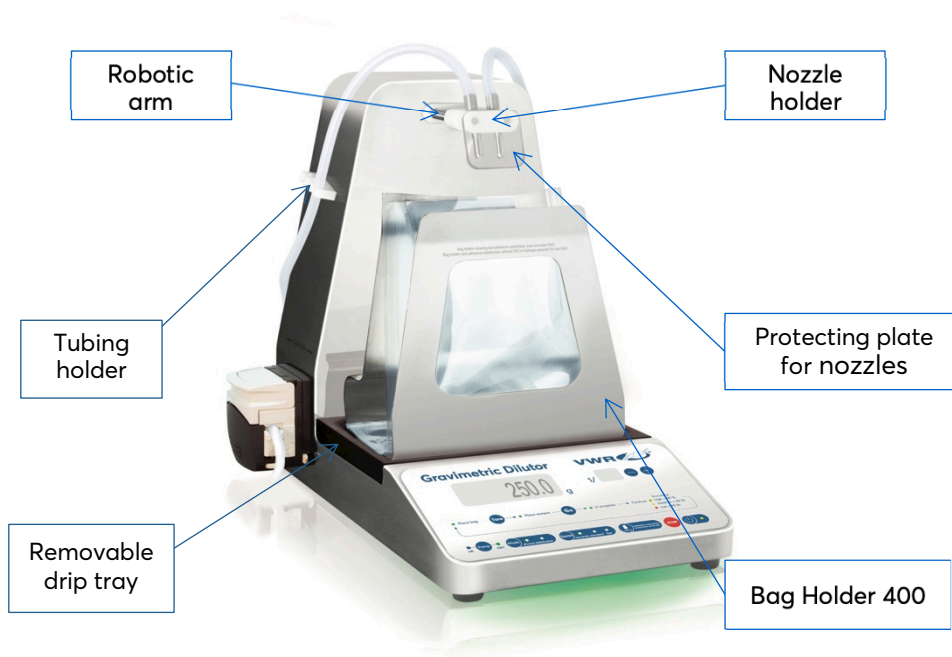
Overview

Gravimetric Dilutor 3 kg



Picture 14

Gravimetric Dilutor 5 kg



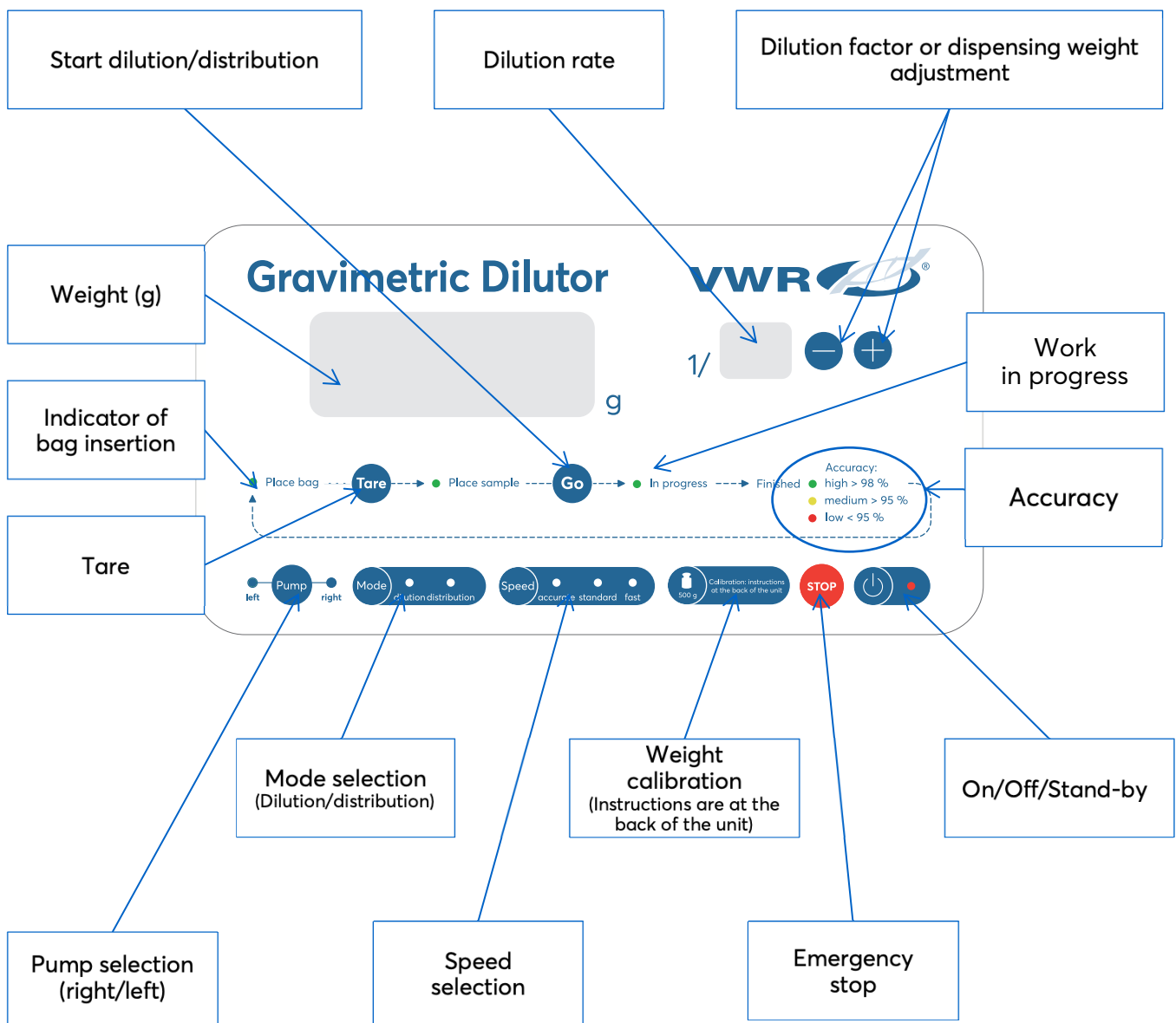
Picture 15

Description of Buttons and Switches

Front View of Gravimetric Dilutor

The interface has:

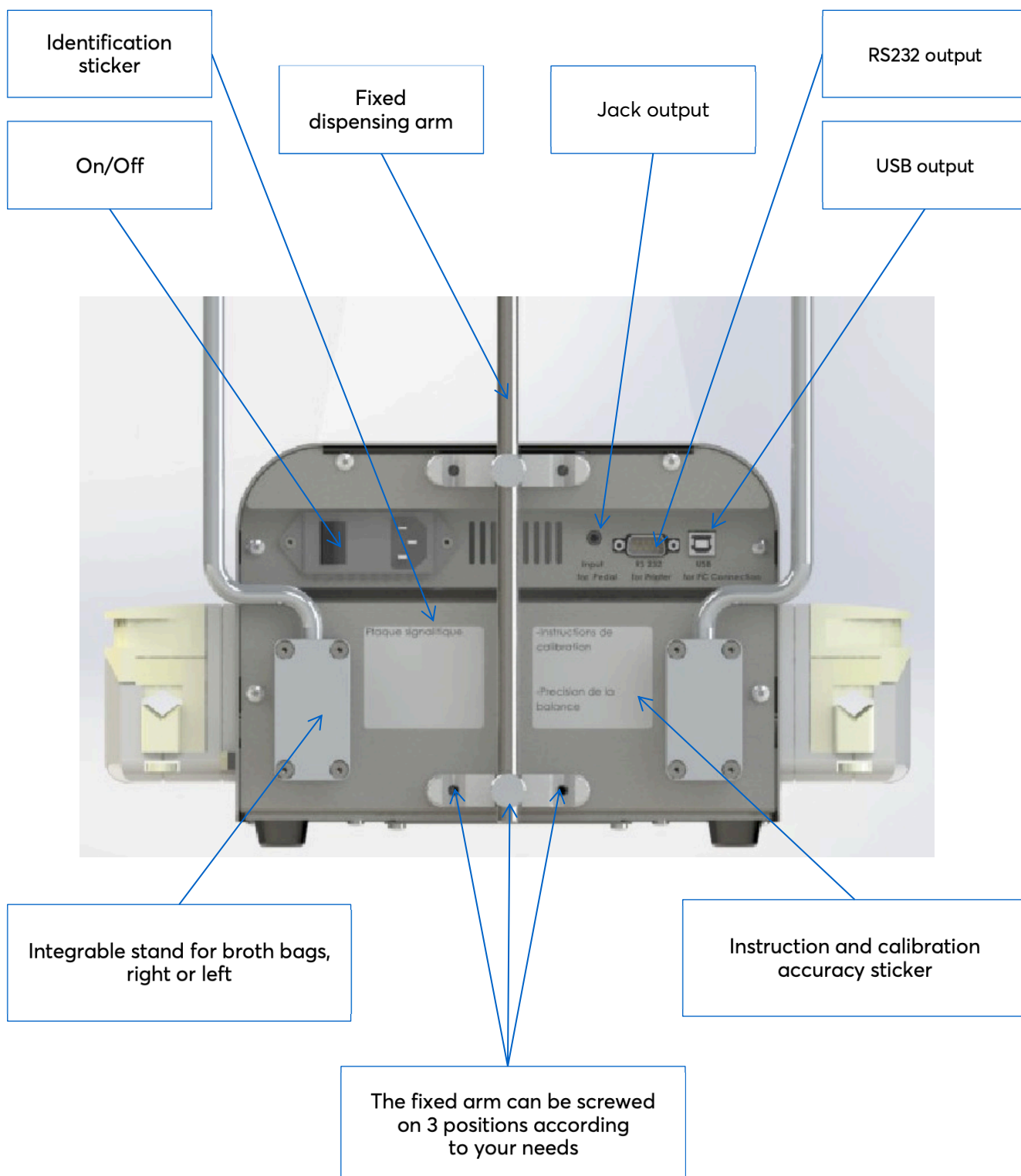
1. 10 keys indicating an action
2. 14 control LEDs indicating the current status of the process and the result of the dilution/distribution process.
3. 2 control screens showing the weight and dilution rate (dilution mode), the adjustable weight targeted by the user (distribution mode)



Picture 16

Rear View

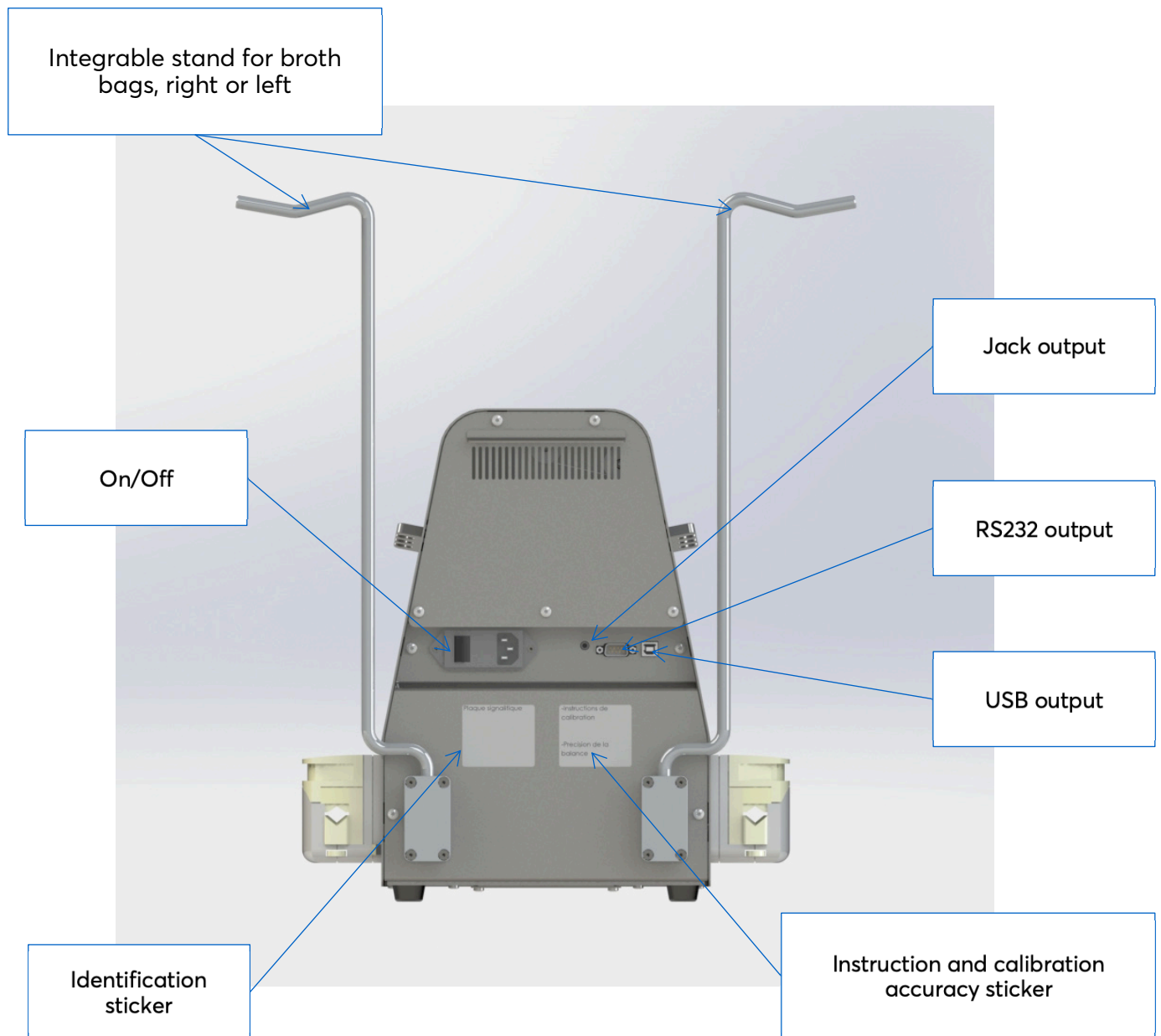
Back of the unit of Gravimetric Dilutor 3 kg



Picture 17

RS232 output: to connect a printer
USB output: to connect a computer
Jack output: to connect a foot pedal

Back of the unit of Gravimetric Dilutor 5 kg:



Picture 18

RS232 output: to connect a printer
USB output: to connect a computer
Jack output: to connect a foot pedal

Operational keys



Ignition key: Used to switch On/Off/Stand-by the Gravimetric Dilutor



Tare key: Used to tare



Go key: Used to start dilution/distribution



STOP key: Used to stop operation from the Running Screen



Less key: Used to increase dispensing weight



Plus key: Used to decrease dispensing weight



Pump key: Used to select right or left pump



Mode key: Used to select dilution or distribution mode



Speed key: Used to select the speed diution/distribution



Weight calibration key: Used to calibrate the weight

Getting Started

Installing the Gravimetric dilutor

Plug the power cord to an electrical outlet and flip the switch at the back of the unit in "I" position to turn it on.

A green lighting glows under the device, indicating that it is ready to function. Gravimetric Dilutor 5 kg: the arm is initialized.

To ensure greater accuracy of the weighing platform, it is recommended to wait 10 minutes before the first use so that the weighing cell goes to room temperature. Then, go to dilution mode by pressing the  key, tare by pressing , put a certified standard weight of 500 g on the Bag Holder and check that the displayed weight corresponds to 500 ± 0.5 g. If not, proceed to a calibration (see chapter Calibration).

Dilution

1. Place the Bag Holder on the unit. Insert a bag.
2. With the  key, select the "Dilution" mode. Two audible beeps sound. The "Dilution" LED should be lit.
3. With the  key, select the pump (right or left).
4. With the  key select one of the 3 modes:
 - FAST: Fast flow with lower accuracy
 - STANDARD: Standard flow – standard accuracy
 - ACCURATE: Slow flow for optimal accuracy

It is recommended to choose the ACCURATE mode to prime the Gravimetric Dilutor to guarantee an accuracy superior to 98% for the first dilution, after opening the pumps, changing the tubings or changing the container.

5. Select your dilution rate with the 2 keys  .

NOTE: The Dilution/Distribution mode, the selected pump, the dilution rate and the chosen speed are memorized even when the unit is switched off.

6. Place the bag in the **Bag Holder**. Press the  key. An audible beep sounds.
7. Once the LED "Place sample" is lit, place the sample in the bag. The weight of the sample shows up on the screen. Check the color of the light under the unit:
 - Blue indicates that the weighing cell is not stable. Wait for the unit to stabilize before processing.
 - Green indicates that the weighing platform is stable. You may proceed with your operation.
8. Press the  key or press on the pedal to start the dilution. The LED "in progress" lights up, indicating that the dilution is proceeding. The lights under the Gravimetric Dilutor become orange and will flash slowly. For the Gravimetric Dilutor 5 kg the robotic arm moves simultaneously forward.
9. The dilution can be stopped anytime by pressing the  key. An audible beep is heard.
10. To resume the dilution, press  key.

It is possible to do this operation again, as many times as necessary, during the dilution. You may, during these interruptions, change the diluent, the tubings, the pump, (right/left) and speed before ending the current dilution.
11. You may also start all over again and decide to stop everything by pressing a second time on the  key. There will be 3 audible beep sound.
12. Once the dilution is over, an audible beep is heard. The final weight is displayed and one of the 3 LEDs "high" (green), "medium" (orange) or "low" (red) indicates the obtained accuracy of the dilution. The lights under the unit flash quickly showing the accuracy with a color code. For the Gravimetric Dilutor 5 kg, the robotic arm goes backward.
13. To do the operation again with the same type of bag, just press the  key again once the bag is in the **Bag Holder**.

This functionality enables automatic tare of the bag by memorizing the weight of the empty bag. It is very useful for successive dilutions with bags of the same weight: it enables you to prepare beforehand a bunch of samples beforehand in their bags and dilute them in a row. Please check that the weight of the bags is always the same.

Distribution

1. Plug the power cord to an electrical outlet and flip the switch at the back of the unit in "I" position to turn it on.
2. A green light lights up under the unit, indicating it is ready for use. Gravimetric Dilutor 5 kg: the arm initializes itself.
3. To ensure greater accuracy of the weighing platform, it is best to wait 10 minutes before the first use, so that the weighing cell goes to room temperature. Next, switch to dilution mode by pressing the  key, tare by pressing the  key, place a 500 g calibration weight on the Bag Holder and check that the displayed weight corresponds to 500 ± 0.5 g. If not, proceed to a calibration (see chapter Calibration).

4. Place the **Bag Holder** on the unit. Insert a bag. In case you are using another container, remove the **Bag Holder** and place the container on the suitable support.

5. With the  key select the "Distribution". Two audible beeps are heard. The "Distribution" LED should be on. In the "Distribution" mode, the small display, at the top right, is off.

The main display shows the target weight. The target weight value can be changed by pressing the   keys.

6. Select the pump (right or left) by pressing the  key.

7. With the  key, select one of the 3 modes: accurate, standard or fast.

- FAST: Fast flow with lower accuracy
- STANDARD: Standard flow – standard accuracy
- ACCURATE: Slow flow for optimal accuracy

It is recommended to choose the ACCURATE mode to prime the Gravimetric Dilutor to guarantee an accuracy superior to 98% for the first dilution, after opening the pumps, changing the tubings or container.

NOTE : The chosen Dilution/Distribution mode, the selected pump, the amount of liquid to distribute and the chosen speed are memorized even after turning off the unit.

8. Press the  key or press the foot pedal to start the dispensing. The "in progress" LED lights up, indicating that the dispensing is in progress. The lights under the Gravimetric Dilutor become orange and will flash slowly. For the Gravimetric Dilutor 5 kg the robotic arm will move simultaneously forward.

The distribution can be interrupted anytime by pressing  key. An audible beep is heard.

9. To resume the distribution, press the  key.

It is possible to repeat the operation as many times as necessary during the dispensing. You may, during these interruptions, change the diluent, the tubings, the pump (right/left) and speed before ending the current dispensing.

10. You may also start all over again and decide to interrupt the process by pressing again on  . Three audible beep are heard.

11. Once the dispensing is over, an audible beep is heard. The final weight is displayed and one of the three LEDs "high" (green), "medium" (orange) or "low" (red) indicates the accuracy of the dispensing. The lighting under the unit flashes quickly with the color of the accuracy. For the Gravimetric Dilutor 5 kg the robotic arm goes backwards automatically.

To do the operation again with the same kind of container, just place the container and press the  key again.

Important Guidelines

Calibration

How to do a calibration

A calibration can be necessary, if after taring, the displayed weight is not as accurate as:

± 0.05 g for weights inferior to 100 g

± 0.1 % for weights superior to 100 g

ATTENTION: To calibrate the unit, use a certified weight of 500 g. The unit must NOT be calibrated with another weight.

Please find the calibration instructions at the back of the unit.

Get in "Dilution" mode

Press the  key for 2 seconds.

"0.00 g" flashes on the screen and 3 audible beeps are heard.

Check that the Bag Holder or the weighing platform is clean and empty and press again the  .

1 audible beep is heard and then "500.0 g" flashes on the screen. Carefully place your standard 500 g weight in the middle of the Bag Holder or in the middle of the weighing platform.

Press the  key again. The Gravimetric Dilutor beeps 3 times.

Remove the standard weight, the Gravimetric Dilutor is calibrated and ready for use.

Metrological data

Minimal weight of the sample: 1 g

Maximum authorized weight: 3000 g for Gravimetric Dilutor

5000 g for Gravimetric Dilutor 5 kg

Ideal functioning temperature for optimal accuracy of the weighing platform: - 10°C / + 40°C

Accuracy of the unit from 1 to 100 g: ± 0.05 g

Accuracy of the unit from 100 to 5000 g: ± 0.1 %

Operation

Traceability

Printer

Zebra™ printer is optional (Ref: 710-2118) and can be connected directly to Gravimetric Dilutor via the RS232 port on the back of the unit. It is delivered with a RS232 cable and a power cord.

Before using the printer, you need to load paper or labels.

Loading label roll

1. Open the printer pulling the two yellow buttons (on the sides of the printer) toward the front of the printer.



Figure 19

2. Open the roll holders and pull on the paper guides with your free hands to open them ❶, then place the paper roll on the brackets. Release the guides. Orient the roll of paper so that its printable surface is facing up or on the pickup roller ❷.

- ❶ Guides papier
- ❷ Contre-rouleau d'entraînement

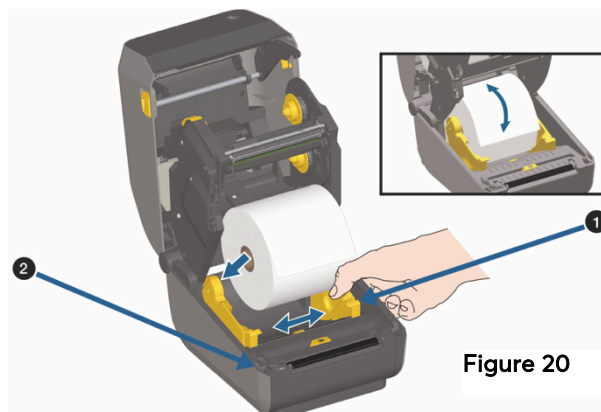


Figure 20

3. Pull the labels so that they come out of the front of the printer. Make sure that the roll turns freely. The roll must not sit in the bottom of the compartment. Push the label roll under both of the media guides ❸.

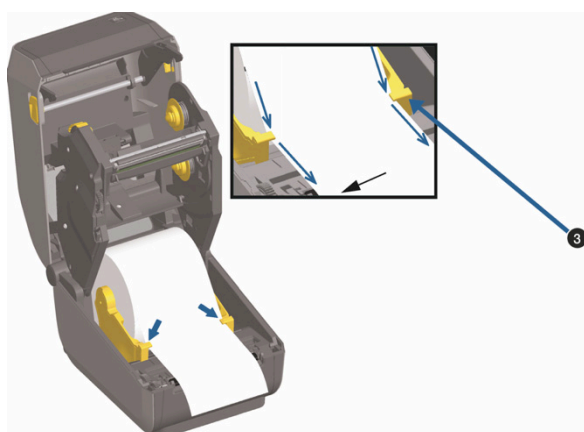


Figure 21

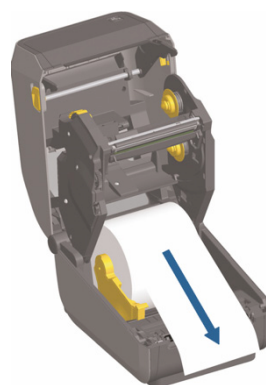


Figure 22

4. Adjustment of the mobile cell to the central position.

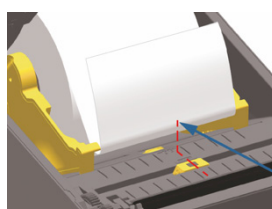


Figure 23

How to use

Once it is connected to the Gravimetric Dilutor, plugged to the mains and loaded with paper or labels, the printer issues a report on paper or label after each dilution or distribution.

WARNING:

The Gravimetric Dilutor is set by default on paper rolls. For label rolls, a reconfiguration of the Gravimetric Dilutor is necessary.

Put the Gravimetric Dilutor in standby mode by pressing the standby  key.

Then press successively the ,  and  keys.

Turn the Gravimetric Dilutor back on by pressing the standby  key.

The configuration is saved on the machine. If you want to switch back to rolls of continuous paper, put

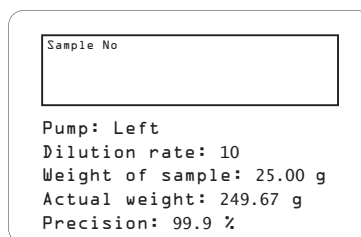
the machine in standby mode with the  key. Then press successively the ,  and  keys.

Turn the Gravimetric Dilutor back on by pressing the standby  key.

The configuration is saved on the machine.

Dilution information printed on the report:

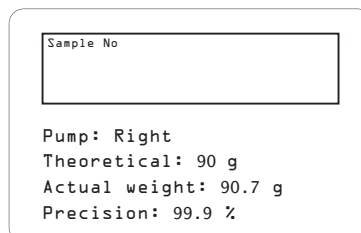
- Right or left pump
- Dilution factor
- Sample weight
- Total weight
- Dilution accuracy



Picture 24

Dispensing information printed on the report:

- Right or left pump
- Target weight
- Dispensed weight
- Dispensing accuracy

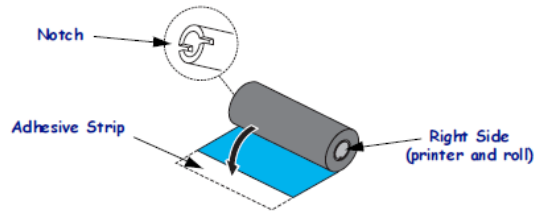


Picture 25

NOTE: More information may be printed if using the monitoring software (See Stickers).

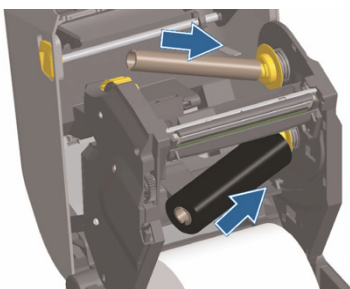
Loading transfer film

Prepare the ribbon by removing its wrapping and pulling its adhesive strip free.

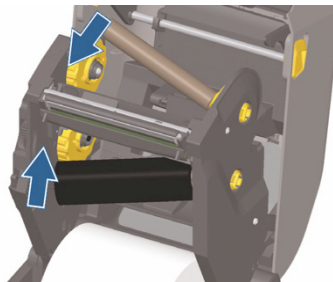


Picture 26

1. Place a new roll of ribbon on the printer's lower feed core. Rotate the roll until the notches on the left side are aligned. Attach it to the right mandrel and secure the left side. (The recovery roll is already present on the upper side.)



Picture 27



Picture 28

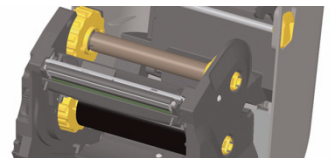
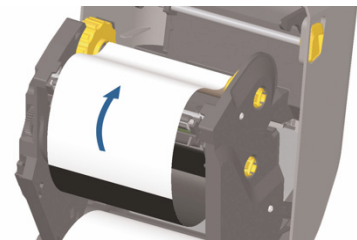


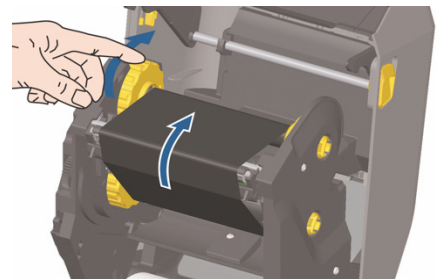
Figure 29

2. Pull the transfer film leader off the roll and attach it with the adhesive strip on the leader to the empty roll on the supply spindle. Center the ribbon on the ribbon core.



Picture 30

3. Rotate the ribbon take-up mandrel, with the top moving backwards, to remove the ribbon slack. Rotating the hub will align the position of the recovered ribbon with the ribbon roll. The ribbon leader must be completely covered by the ribbon.



Picture 31

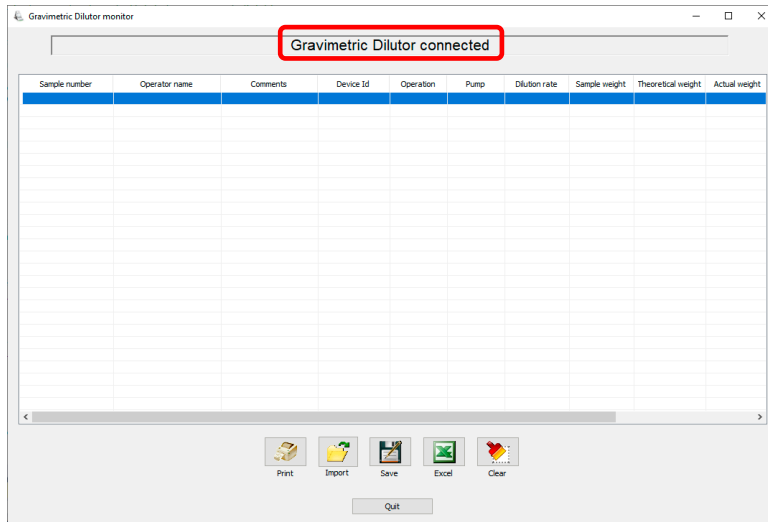
4. Make sure the paper is loaded and ready for printing, then close the printer cover.
5. Once the printer is switched on, press the FORWARD button to feed at least 20cm of paper through the printer to remove slack and wrinkles from the ribbon and align the ribbon on the cores.

Monitoring software

The "Gravimetric Dilutor" monitoring software enables the traceability of dilution and distribution via a spreadsheet (Microsoft™ Excel® or OpenOffice™ Calc™) and the printing of results.

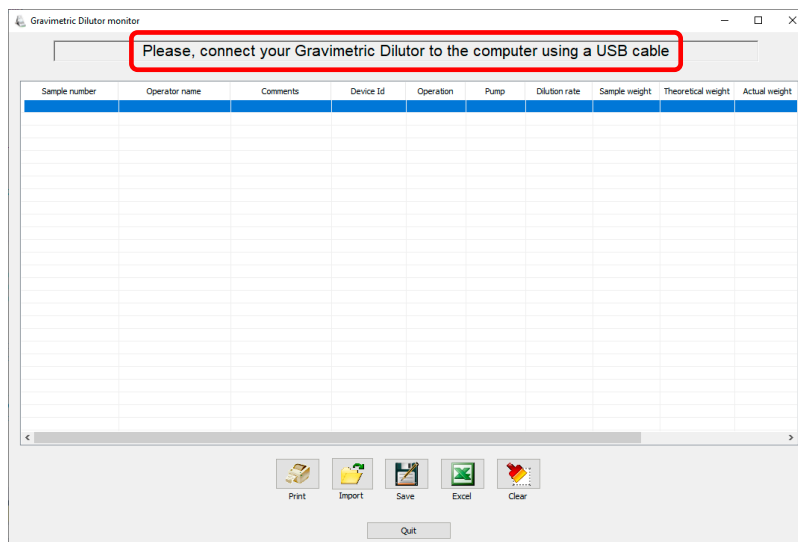
Download

- Connect your computer to the Gravimetric Dilutor with the supplied USB cable.
- Insert the CD supplied with the unit and launch the "GravimetricDilutor.exe" software.



Picture 32

- When this screen (Picture 32) is displayed, the Gravimetric Dilutor is connected.



Picture 33

- If a screen such as Picture 33 is displayed, check that:
 - The Gravimetric Dilutor is turned on
 - The cable is connected
 - Relaunch the "GravimetricDilutor.exe" software

To complete missing data (Number of sample, name of operator, comments), click on the corresponding cell, fill in the data and press *Enter* on your computer's keyboard. The cursor then moves to the next input field. To stop the editing process, press the "*Esc*" on your computer's keyboard or simply click elsewhere on the screen.

Examples

The data of the first columns can be entered after operations, as shown in Picture 34. As each new operation will automatically be recorded below the previous ones, it is recommended to enter the data of the first columns before hand, as shown in Picture 35.

Sample number	Operator name	Comments	Operation	Pump	Dilution rate	Sample weight	Theoretical weight	Actual weight	Precision	Time	Date
124SL-638-MP	Henri Michel										
1227E-178-PA	Jean Durand										
ME-58965-552	Maurice Dupond										
LP-5897-MAZ	Marie Bernard										

Picture 35

Buttons at the bottom of the screen



To save your operations in a file, click on  and save in the directory and the desired file. The format will be CSV: values separated by comas or semicolons, depending on your country.

It is possible to export data under Excel™ or to Open Office™ or Libre Office calc™ by clicking on  provided that one of this software is already installed in your computer.

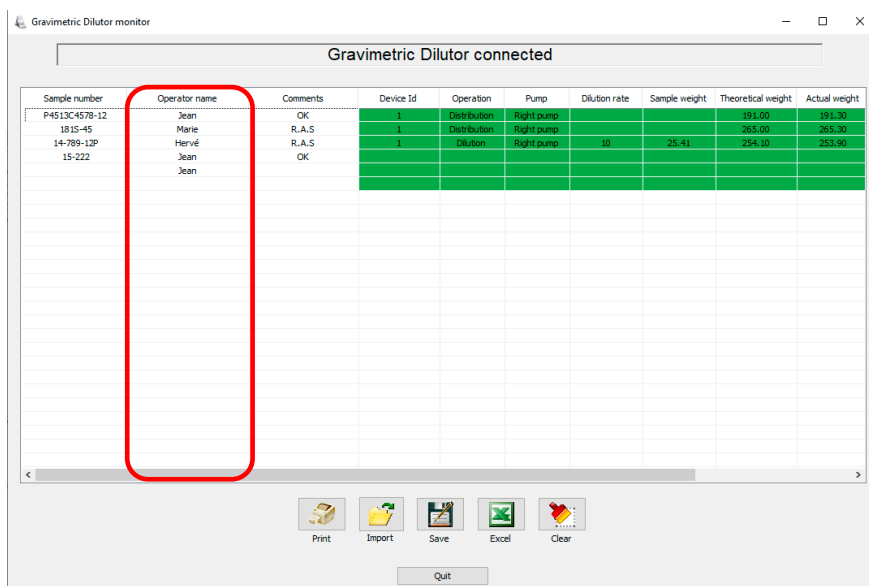
Click on  to erase all the content of the sheet.

Stickers

Introduction

The Gravimetric Dilutor monitoring software enables you to print on a Zebra™ printer (available in option) a label per operation (dilution or distribution), to be stuck on your sample. On this label are printed the key parameters of your dilution or distribution.

The operator is mentioned by *operator name*. It must be written in the 2nd column of the sheet and may contain 30 characters. The name will be printed on the labels.

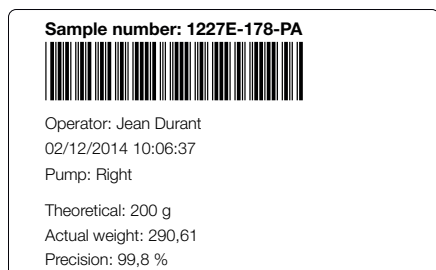


Picture 36

How to use

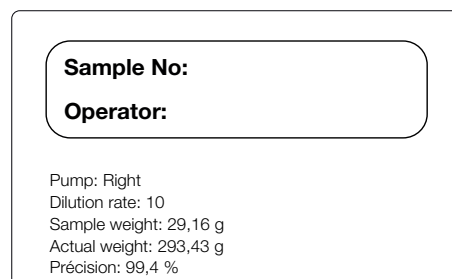
When a printer is connected to the Gravimetric Dilutor, the software automatically prints a label after each operation (dilution or distribution).

You must enter the sample number and the operator's name before the operation.
The sticker is printed as below:



Picture 37

If the sample number is not specified, the Gravimetric Dilutor prints a label with an empty frame allowing you to write down the missing information.



Picture 38

To print a new label again, as long as the sample number is entered, you must select the corresponding line and click . To select a line, click on its right, green, part. The selected line then becomes dark blue.

Troubleshooting

Error messages

If operation fails, the device displays "Err" followed by a number.
Here are the different cases:

Err 1: (Gravimetric Dilutor 5 kg only) The automatic move of the robotic arm could not take place. Check that nothing is in the way and repeat the operation.

Err 2: For a dilution, the weight of the sample is too low (lower than 0.5 gram) or too high (the total weight after dilution should not exceed the weight capacity of the Gravimetric Dilutor). Replace the sample and start over.

Err 3: The liquid does not flow. Check that the tubing is correctly placed in the pump and nothing prevents the liquid from flowing in the tubing and then press again the 

Err 4: At the end of a calibration, one of the 2 measures, the one of the empty weight or the one of the 500 g calibrated weight is wrong. Check that nothing is resting on the weighing platform that could disturb the measurement.

Problem	Cause	Solution
The GeckoGrip is not efficient anymore	The GeckoGrip is dirty or too old	- Clean it with water and soap - After several cleanings, replace it with a new cut (a set of 10 is provided with the unit). You may also order them. - If the GeckoGrip is not adapted to your application, use the adhesive gum provided with the unit.
This display shows Err n°	Several possibilities	See chapter Error messages
Gravimetric Dilutor does not start	- The power switch is OFF - The power cord is not correctly plugged - The fuses are blown	- Check that the switch is on "I" - Check that the power cord is correctly plugged to the power supply and to the Gravimetric Dilutor. - Check that the 2 fuses at the back of the unit are OK (value: T3.15A).
There are air bubbles in the diluent	The tubing is not positioned in the correct direction	- Check that you have correctly inserted the tubing in the peristaltic pump respecting the direction of the flow indicated on the side of the unit. If it is not the case, open the pump and insert the tubing the right way.
The indicated weight cannot remain stable	The installation or the environment is not stable	- Check that the unit has been turned on for 10 mn. - Check that the DripTray is well positioned. - Check that the weighing cell holes are free. - Check that there are no vibrations on the bench where you have installed the Gravimetric Dilutor. - Check that the unit is horizontal. - Check that there is no airflow affecting the weighing. - Switch the unit off and on to re-initialize it. - Repeat a calibration.

Problem	Cause	Solution
The motor makes a noise but the pump does not start	The pump and/or the tubings are not well positioned/set	- Check that the tubing is correctly positioned in the pump (see Adjusting the pump and insertion of the tubings). - Check that the tubing along its whole length is not pinched. - Check that the rollers of the pump are not blocked. - Check that the pumps are set correctly (see Adjusting the pump and insertion of the tubings). - If all these elements have been checked, stretch the tubings on both sides without opening the pump.
The pump perforates the tubings	The tubing is not correctly positioned in the pump	- Check that the tubings have been correctly inserted and center them in the pump (see Adjusting the pump and insertion of the tubings) - Check that the pumps are set correctly (see Adjusting the pump and insertion of the tubings).
The pump does not intake the liquid	The pump and/or the tubings are not well positioned/set	- Check that the pumps are correctly set (see Adjusting the pump and insertion of the tubings). - Check that you have inserted the tubing in the peristaltic pump the correct direction, respecting the direction flow indicated at the side of the unit. If it is not the case, open the pump and insert the tubing the proper way.
The liquid flows back to the bottle or the pouch	The tubing is not pressured enough in the pump	- Check that the pumps are correctly set (Adjusting the pump and insertion of the tubings). - Check that the tubings are not pinched.
STANDARD or ACCURATE Mode: the pump slows down before the end of the dilution or dispensing	Mechanical vibrations disturb the device.	Place the Gravimetric Dilutor on a table with a rigid and heavy platform.
FAST Mode: The Gravimetric Dilutor dispenses too much or not enough liquid and the accuracy is not satisfactory	An error occurred during auto-calibration of the pump flow.	Proceed with a new dispensing/dilution operation.
The printer does not switch on	There is no power in the printer.	- Check that the ON/OFF switch is well positioned. - Check that the power cord is connected to the power source and to the printer.
The printer does not work and an orange circle flashes around the green key of the printer	Several possibilities.	- There is no more paper. Please put some more. - The cover of the printer is not shut. - Check the connection printer/ Gravimetric Dilutor. - Press on the green key until the flash stops and put back the housing.
The computer does not display dilution or dispensing reports	A connection issue has occurred.	Check that the Gravimetric Dilutor is connected to the USB cable. To do this, disconnect and then reconnect the cable and check that the computer makes a sound every time (the sound must be active). If the computer does not have ability to make sounds, after the connection, check in the list displayed by the device manager that a new device has been added.

Repair and maintenance of Gravimetric Dilutor

How to clean the unit

Gravimetric Dilutor requires little maintenance as long as leakages are cleaned quickly and thoroughly.

Autoclavable items: dispensing assemblies, filter, bottle.

Non-autoclavable items (15 mn at 121°C): the unit itself, pumps, Bag Holder, DripTray, fixed arm, the nozzle holder, protecting plate for nozzles.

Accessories: refer to the "User replaceable accessories and spare parts"

ATTENTION: Do not use bleach to clean the housing of the Gravimetric Dilutor as it could corrode the stainless steel. We recommend to disinfect with ethanol 70°

- During cleaning, do not let any liquid drip into the unit.
- Autoclave all the dispensing assemblies every day when working in sterile conditions.
- Replace the silicone tubings whenever the tubing is not air-tight or becomes sticky or stiff.
- Every 20 autoclaving: replace the air filter.
- To rinse the tubing using the Gravimetric Dilutor:
 - Take a bottle with water or another rinsing fluid.
 - Place the tube weight and its tubing in the bottle.
 - Pull the nozzle out of the nozzle holder by leaving the tubing in the pump and place it in the rinsing bottle to close the circuit.
 - Select the distribution mode by pressing  , choose 100 g to dispense and press  .
 - The tubing is rinsed.
 - Do this operation again as many times as necessary.

How to clean the Bag Holder

The Bag Holder is not autoclavable and cannot be put in a dish water. You can clean it with soap and water. For disinfection use ethanol at 70% or hydrogen peroxide at 6% maximum only.

Cleaning and disinfection will be based on daily usage.

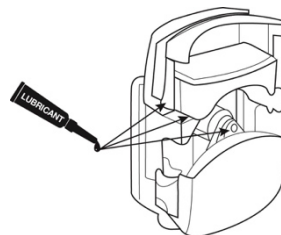
Pump heads maintenance

The pump head is not autoclavable. To clean it, once the unit is unplugged, wipe out the dust and dirt with a soft cloth.

Once a week, grease the pump head with a universal multi-purpose grease to the friction areas (see Picture 39) to prevent premature wearing.

Signs of wearing of pump head are:

- Difficulties to prime
- Over-time to distribute
- Unsuccessful trial with a new tubing
- Gap between the cover and the body of the pump



Picture 39

If you notice these symptoms, please replace the pump head. The frequency of replacement depends on use and handling conditions. For information, peristaltic heads have been tested to undergo approximately 10,000 openings.

Gravimetric Dilutor 5 kg: how to clean the robotic arm

A **daily** cleaning of the two metallic rods of the arm is mandatory to ensure that the unit functions correctly. (see Picture 40)



Picture 40

- Switch the unit to standby mode by pressing the  key
- Press twice the  button. The arm then pulls initializes and stops.
- Clean the 2 rods with ethanol 70° and wipe immediately.
- Turn the unit on again by pressing the  key. The arm initializes and retracts.

Gravimetric Dilutor 5 kg: how to clean the nozzle holder

- Put the machine in standby mode by pressing the  key.
- Double press the  button. The arm initializes, comes out and stops.
- Unscrew the nozzle holder using the Allen key supplied with the instrument. The screw is located under the holder. Take the holder out.
- Clean the holder (Caution: roller is not autoclavable)
- Put the holder back into place and screw
- Turn the unit on by pressing the  key. The arm initializes and retracts.

User replaceable accessories and spare parts

Description	Quantity	Cat. No.
Foot pedal for VWR Gravimetric Dilutor	1	710-2093
Booster pump + 2 "Y" + 1x Tubing Silicone set Ø 6,4 for pumphead for VWR Gravimetric Dilutor	1	710-2094
5 L autoclavable bottle	1	215-0057
Set of silicone tubings + GL45 screw cap + tube weight + nozzle + filter, for VWR Gravimetric Dilutor	1	710-2095
Set of dispensing tubings for VWR Gravimetric Dilutor	1	710-2096
Set of silicone tubings + GL45 screw cap + tube weight + nozzle + filter+"Y" for VWR Gravimetric Dilutor	1	710-2097
Set of dispensing tubings + "Y" for VWR Gravimetric Dilutor	1	710-2098
500g F1 calibrated weight VWR	1	611-8248
Autoclavable 0.2 µm PTFE filter for GL45 cap for VWR gravimetric dilutor	1	710-2099
Set of silicone tubings for pump part (20 cm each) for VWR Gravimetric Dilutor	1	710-2100
Set of silicone tubings + GL45 screw cap + tube weight + nozzle + filter for VWR Gravimetric Dilutor	1	710-2101
Set of dispensing tubings for VWR Gravimetric Dilutor	1	710-2102
Set of small silicone tubings + GL45 screw cap + tube weight + nozzle + filter+"Y" for VWR Gravimetric Dilutor	1	710-2103
Set of dispensing small tubings + "Y" for VWR Gravimetric Dilutor	1	710-2104
Set of silicone tubings for pump part (20 cm each) for VWR Gravimetric Dilutor	1	710-2105
Weighing platform for dispensing and support a container for VWR Gravimetric Dilutor	1	710-2106
To hold a tube/container (Ø 10 - 60 mm) for VWR Gravimetric Dilutor	1	710-2107
Integrated to the unit, stand for One broth bag for VWR Gravimetric Dilutor	1	710-2108
Stand to store independently broth bags for VWR Gravimetric Dilutor	1	710-2109
Adjustable arm for dispensing for 3kg VWR Gravimetric Dilutor	1	710-2110
Trocar for broth bags for VWR Gravimetric Dilutor	1	710-2111
Set of stainless steel nozzles for tubing Ø 6,4 mm for VWR Gravimetric Dilutor	1	710-2112
Set of stainless steel nozzles for tubing Ø 3,2 mm for VWR Gravimetric Dilutor	1	710-2113
Set of tube weights for VWR Gravimetric Dilutor	1	710-2114
Stand in polycarbonate for 400 mL bags for VWR Gravimetric Dilutor	1	710-2115
Stand in stainless steel for 400 mL bags for VWR Gravimetric Dilutor	1	710-2116
Set of 10 adhesives for VWR Gravimetric Dilutor	1	710-2117
Thermal transfer printer for VWR Gravimetric Dilutor	1	710-2118
Film direct transfer for printer for VWR Gravimetric Dilutor	1	710-2119
Sticker roll for printer for VWR Dilutor	1	710-2120
Thermic paper roll for printer for VWR Gravimetric Dilutor	1	710-2121
Adjustable arm for dispensing for 5kg VWR Gravimetric Dilutor	1	710-2124
Jumbo kit:Incl. Bag holder 3500 + 3500 mL drip tray + 2 sets of adhesives + 1 protection cover for 5kg VWR Gravimetric Dilutor	1	710-2125
Stand in stainless steel for 400 mL bags for VWR Gravimetric Dilutor	1	710-2116
Drip tray for Gravimetric Dilutor	1	710-2147

Technical service

Web Resources

Visit the VWR website at www.vwr.com for:

- Complete technical service contact information
- Access to the VWR Online Catalogue, and information about accessories and related products
- Additional product information and special offers

Contact us For information or technical assistance contact your local VWR representative or visit. www.vwr.com.

Warranty

VWR warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

Compliance with local laws and regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorisations necessary to run or use the Product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorisation, unless any refusal is due to a defect of the product.

Equipment disposal



This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.

Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.

For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you

Local VWR offices in Europe and Asia Pacific

Austria

VWR International GmbH
Graumannsgasse 7
1150 Vienna
Tel.: +43 1 97 002 0
Email: info.at@vwr.com

Belgium

VWR International BV
Researchpark Haasrode 2020
Geldenaaksebaan 464
3001 Leuven
Tel.: +32 016 385 011
Email: vwr.be@vwr.com

China

VWR (Shanghai) Co., Ltd
Bld.No.1, No.3728 Jinke Rd,
Pudong New District
Shanghai, 201203- China
Tel.: +400 821 8006
Email: info_china@vwr.com

Czech Republic

VWR International s. r. o.
Veetee Business Park
Pražská 442
CZ - 281 67 Strábrná Skalice
Tel.: +420 321 570 321
Email: info.cz@vwr.com

Denmark

VWR International A/S
Tobaksvejen 21
2860 Søborg
Tel.: +45 43 86 87 88
Email: info.dk@vwr.com

Finland

VWR International Oy
Valimotie 9
00380 Helsinki
Tel.: +358 9 80 45 51
Email: info.fi@vwr.com

France

VWR International S.A.S.
Le Périgares – Bâtiment B
201, rue Carnot
94126 Fontenay-sous-Bois cedex
Tel.: 0 825 02 30 30* (national)
Tel.: +33 (0) 1 45 14 85 00
(international)
Email: info.fr@vwr.com
* 0,18 € TTC/ min + prix appel

Germany

VWR International GmbH
Hilpertstrasse 20a
D - 64295 Darmstadt
Freecall: 0800 702 00 07
Tel.: +49 (0) 6151 3972 0
(international)
Email: info.de@vwr.com

Hungary

VWR International Kft.
Simon László u. 4.
4034 Debrecen
Tel.: +36 (52) 521-130
Email: info.hu@vwr.com

India

VWR Lab Products Private Limited
No.139. BDA Industrial Suburb,
6th Main, Tumkur Road,
Peenya Post,
Bangalore, India – 560058
Tel.: +91-80-28078400
Email: vwr_india@vwr.com

Ireland / Northern Ireland

VWR International Ltd / VWR
International (Northern Ireland) Ltd
Orion Business Campus
Northwest Business Park
Ballycoolin
Dublin 15
Tel.: +353 01 88 22 222
Email sales.ie@vwr.com

Italy

VWR International S.r.l.
Via San Giusto 85
20153 Milano (MI)
Tel.: +39 02-3320311/02-487791
Email: info.it@vwr.com

Korea

VWR International ~
17, Daehak 4-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do
Tel.: +82 31 645 7256
saleskorea@avantorsciences.com

Middle East & Africa

VWR International FZ-LLC
DSP Laboratory Complex
125, Floor 01
Dubai, United Arab Emirates
Tel.: +971 4 5573271
info.mea@vwr.com

The Netherlands

VWR International B.V.
Postbus 8198
1005 AD Amsterdam
Tel.: +31 020 4808 400
Email: info.nl@vwr.com

Norway

VWR International AS
Brynsalleen 4
0667 Oslo
Tel.: +47 22 90 00 00
Email: info.no@vwr.com

Poland

VWR International Sp. z o.o.
Limbowia 5
80-175 Gdansk
Tel.: +48 058 32 38 210
Email: info.pl@vwr.com

Portugal

VWR International - Material de
Laboratório, Lda
Centro Empresarial de Alfragide
Rua da Indústria, nº 6
2610-088 Amadora
Tel.: +351 21 3600 770
Email: info.pt@vwr.com

Singapore

VWR Singapore Pte Ltd
18 Gul Drive
Singapore 629468
Tel: +65 6505 0760
Email: sales.sg@vwr.com

Spain

VWR International Eurolab S.L.
C/ Tecnología 5-17
A-7 Llinars Park
08450 - Llinars del Vallès
Barcelona
Tel.: +34 902 222 897
Email: info.es@vwr.com

Sweden

VWR International AB
Fagerstagatan 18a
163 94 Stockholm
Tel.: +46 08 621 34 00
Email: info.se@vwr.com

Switzerland

VWR International GmbH
Lerzenstrasse 16/18
8953 Dietikon
Tel.: +41 044 745 13 13
Email: info.ch@vwr.com

UK

VWR International Ltd
Customer Service Centre
Hunter Boulevard
Magna Park
Lutterworth
Leicestershire
LE17 4XN
Tel.: +44 (0) 800 22 33 44
Email: uksales@vwr.com