



PG Dosing Unit PG1010

Manual
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IMPORTANT! Before taking this instrument in use we strongly advise you to read this manual carefully.

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1 PG DOSING UNIT

The PG Dosing Unit is a standalone pumping device designed to deliver liquid droplets from a disposable one mL syringe. Before you start using the Dosing Unit, please take a few minutes to read these guidelines to familiarise yourself with the different functions

1.1 Unpacking

The PG Dosing Unit is delivered in a hard case including the following accessories:

- Five disposable syringes
- Five PTFE tubings 1.5 / 0.9 mm with PINK dispensing tips
- Five PTFE tubings 1.5 / 0.5 mm with RED dispensing tips
- Five PTFE tubings 1.5 / 0.2 mm with LILAC dispensing tips
- 12 VDC power adaptor for 100-240VAC



1.2 Power connection

Connect the power adaptor to an electrical outlet of 100-240 VAC.

1.3 Filling the liquid system

Fill the syringe with the selected test liquid. Liquids similar to water can be filled with the tubing attached to the syringe. Higher viscosity liquids must be filled with the dispensing tip removed.

Alternatively, liquids of high viscosity can be poured into the syringe after the plunger has been pulled out from the syringe.

Turn the syringe with the tip pointing upwards and tap gently on the dispenser to bring air bubbles inside the liquid to the top. Push the plunger slightly forward to remove the air at the tip.

Make sure there are no visible air bubbles inside the liquid system.



To avoid contamination it is recommended to use separate dispensing units for each test liquid!

1.4 Installing the syringe

Line up the moving pusher with the MODE selector in position F (Fill) and press one of the buttons FWD or REV. A momentary key press will adjust the position a short distance.

If one of these buttons is kept depressed the pump will switch into a higher speed. In the reverse direction the pump will then continue until it reaches the end position unless one of the keys FWD/REV is pressed a second time.

Insert the syringe into the PG Dosing Unit and tighten the locking screw firmly at the end of the piston.

Insert the tubing end into the PG instrument so it extends slightly outside the visible end of the drop applicator. Then tighten the locking nut.

PG Dosing Unit – GuideLines October 19, 2007

1.5 Selecting an Operation Mode

The PG Dosing Unit offers different pump modes. Some of these will pump out a fixed, preset droplet volume whereas other modes are programmable by the operator. Some of the programmable modes are based on a pump cycle where the pump will reverse automatically to offer measurements of wetting hysteresis using the advancing/receding contact angle method. The list below describes the available operating modes:

FILL (F) is used when a new syringe is loaded into the PG Dosing Unit.

- Press button FWD/REV momentarily to pump out a small volume
- Keep button FWD/REV pressed to enter high-speed motion.

To stop the REV motion before it reaches the end position, press the FWD/REV button a second time.

FIXED (2/4/8) pumps out a single droplet of the preset size.

If the mode selector is switched to one of these positions, the indicator light remains green.

Press the FWD button to pump a droplet of the preset size.

SINGLE (S1, S2, S3) pumps out a single droplet of programmable size.

If the mode selector is switched to a position with a programmed volume, the indicator light remains green. Press the FWD button to pump out the programmed volume. If the selected position has no programmed volume, the indicator light becomes orange and no pump action can be initiated with the FWD button. To program a new droplet volume, press REV + FWD and the indicator will start to blink. Press the FWD button one or more times to enter the new droplet size. When the REV button is pressed, the new droplet size is stored and the indicator turns green.

CYCLE (C1, C2, C3) offers programmable pump cycles.

A pump cycle contains three phases; advancing, receding and 'top-up'. The initial 'advancing' phase pumps out liquid and the growing droplet advances across the dry surface. At the programmed droplet size, the pump halts for a short while before the pump flow is reversed. Now the decreasing droplet will recede from the wet surface until the droplet has lost its contact with the surface. Finally, the 'top-up' phase reverses the pump flow again and a small volume is pumped out to restore the missing liquid volume at the dispensing tip before the next pump cycle.

If the mode selector is switched to a position with a programmed cycle, the indicator light remains green. Pressing the FWD button once then carries out the complete pump cycle.

If the selected position has no programmed volumes, the indicator light becomes orange and no pump action can be initiated with the FWD button. To program a new droplet volume, proceed as follows:

- a) Press REV + FWD and the indicator will start to blink.
- b) Press the FWD button one or more times to enter the advancing droplet size.

Please note the droplet should reach the surface and then it should advance sufficiently across the surface without reaching the edge of the image.

- c) Press the REV button one or more times to reverse the pump flow. Please note the droplet should now be receding until the liquid has disappeared well inside the dispensing tip.
- d) Press FWD again until the liquid appears at the dispensing tip and is ready for a new pump cycle.
- e) Press REV to finish the programming cycle.

1.6 Liquid purging

If the PG Dosing Unit has been left standing for a short time, some of the droplet volume might be missing at the dispensing tip. Switch the mode selector to position 'F' (Fill) and press momentarily on the FWD button until the liquid reappears at the dispensing tip.

1.7 LED Indicator messages

Off	No power connected
Green	Ready to operate
Green Blink	Pumping
Orange	No program entered for this mode
Orange Blink	Programming in progress
Red	Syringe is empty

1.8 Functions

Mode	Button	Function
F(Fill)	(FWD)	Purges a small volume when pressed momentarily
	(REV)	Reduces the droplet volume
	FWD	Pumps out liquid until released
	REV	Backs the syringe to its end position if kept pressed
		-Abort operation by pressing FWD or REV
2, 4, 8	FWD	Pumps out a droplet of the preset size (e.g. 4 µL)
S1,S2,S3	FWD	Pumps out a droplet of programmed size
	<i>Programming</i>	
	REV+FWD	Enters programming mode
	FWD*	Enters the requested volume
	REV	Exits programming mode
C1,C2,C3	FWD	Performs a full pump cycle as programmed
	<i>Programming</i>	
	REV+FWD	Enters programming mode
	FWD*	Enters the requested advancing volume
	REV*	Enters the requested receding volume
	FWD*	Enters the requested 'top-up' volume
	REV	Exits programming mode

* Can be pressed repeatedly to increase the volume setting

1.9 Syringe Designs

The PG Dosing Unit has been designed with disposable low cost syringes in mind to avoid cleaning and contamination issues. These disposable syringes are equipped with a rubber plunger, which may not give exactly the same volume for each new pump cycle. Other very accurate syringes will fit into the PG Dosing Unit such as P/N860325, which contains five syringes with PTFE plunger and PTFE tubing with a steel cannulus fitted to the free end. Use of a PTFE or glass plunger is highly recommended for measurement of wetting hysteresis (advancing/receding contact angles) where the pump flow is reversed.