

# COMPUdil 3

HTZ

A twin-syringe diluter and dispenser for performing a wide range of sample pipetting, reagent addition, serial dilution and many other liquid handling tasks.



- Twin-syringe configuration for maximum dilution accuracy
- 11 Integrated methods with easy setup via a keypad
- Storage of up to 45 programs
- Syringes available for volumes from 1µl to 25 mls
- Lightweight handset for fatigue free operation
- Upload your own programs from a PC for even greater flexibility
- Direct RS232 interface option for external control



## INTRODUCTION

The Compudil 3 is a compact and versatile benchtop diluter/dispenser providing laboratories with cost-effective automation for a range of liquid handling tasks including:

- Sample pipetting
- Sample dilution
- Serial dilution
- Reagent addition

The Compudil 3 has a twin-syringe configuration and each syringe is independently driven by a stepper motor coupled to a high-precision, long-life drive mechanism.

Control of the Compudil 3 is achieved by an on-board microprocessor which is programmed via the keypad. The microprocessor also caters for external control of the instrument via an RS232 interface.

## PIPETTING CONTROL

The sample and dispense tip forms an integral part of an extremely lightweight handset\* (<20 grams) that is



\* Standard handset

comfortable to hold during prolonged use and minimises the risk of operator fatigue or injury.

The handset also contains a switch for finger-tip control of the execution of the pipetting sequence.

## EASY TO USE

The Compudil 3 is extremely easy to use. Simply select the desired program using the keypad and then control the pipetting sequence using the button on the handset.

## GRAPHICAL DISPLAY

During processing, the operator is prompted with the details of the syringe step that is about to be performed eg "Aspirate 500" or "Dispense 1000".

In addition, a light incorporated into the handset illuminates when the Compudil 3 is ready to perform the next critical step.



## INTEGRATED APPLICATIONS

The Compudil 3 incorporates a number of applications designed to accommodate the most commonly performed liquid handling tasks.

These applications cover 3 principle modes of operation:

- Dilution modes (4)
- Dispense modes (6)
- Transfer mode (1)

The DILUTION modes are primarily designed for performing sample dilution where the diluent is either primed through the syringes or aspirated via the tip.

The DISPENSE modes are designed primarily for reagent addition tasks or those where there is no need for dilution or washing of the probe tip.

The TRANSFER mode is designed for pipetting samples without dilution and for procedures where the probe needs to be rinsed to minimise sample to sample carryover.



Syringe options Top Entry Port - 25ml, 10ml, 5ml, 2.5ml, 1.0ml  
Side Entry Port - 1000µl, 500µl, 250µl, 100µl, 50µl

## SYRINGE, VALVE & HANDSET OPTIONS

Depending on the volume and type of fluid that you need to process there are a number of options available to ensure that the entire fluid path is optimised to achieve the best possible performance.

Sample syringes (fitted on the right) range from 50µl up to 5ml and Diluent syringes (fitted on the left) from 1ml to 25ml. There are also three valve options to choose from that are designed to provide minimum “dead volume” or maximum flow rate as appropriate.

In addition, there is a choice of handsets available incorporating tubing of 0.86mm, 1.6mm or 3.2mm internal diameter. Other more specialised and customised filling probes are available on request.



Handset with 3.2mm i/d tubing (9557/201)

## FOOTSWITCH CONTROL OPTION

A footswitch is also available for controlling the Compudil 3. This leaves both hands free to present items to a fixed probe or, alternatively, allows it to be operated from outside an enclosed safety cabinet.

## USER DEFINED APPLICATIONS

For an extended level of control, the Compudil 3 can be programmed\* using an external PC. Up to 15 user-defined programs can be uploaded and stored and then simply selected by the operator via the keypad menu.

These user-defined applications can accommodate virtually any sequence of syringe and valve movements to allow just about any liquid handling task to be performed.



Footswitch option (9407/002)

Another advantage of this method is that once disconnected from the PC, the applications cannot be modified thereby providing security of operation from a GLP perspective.

## OTHER BENEFITS

The Compudil 3 provides the laboratory a cost effective way of getting accurate and consistent dilutions with a minimal capital outlay.

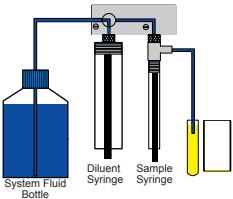
Dilutions can be performed more accurately, rapidly and with less fatigue than when using hand-held pipettes and motorised devices. Furthermore, there is less waste as no disposable tips are required\*\*.

In summary the Compudil 3 is a robust instrument that will provide your laboratory with years of reliable and accurate pipetting performance.

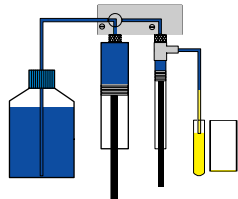
\* Requires optional extra software to be purchased

\*\* Increased risk of detectable carry-over with dilution ratios less than 1:5, or with immiscible liquids.

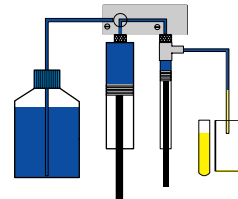
## DILUTION MODE 1



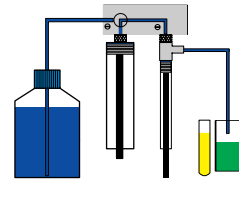
The syringes and probe tubing are initially primed with diluent contained in the system fluid bottle.



Sample is aspirated into the probe tip using the "Sample Syringe" and the Diluent syringe is simultaneously filled with system diluent

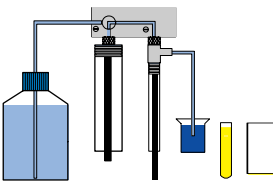


The valve switches to the probe

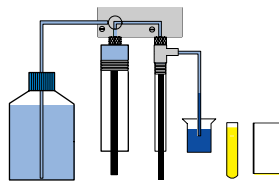


Both Sample and Diluent syringes move up and sample is dispensed and flushed out of the probe by the system diluent

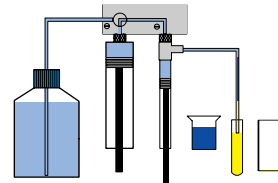
## DILUTION MODE 2



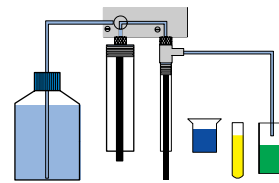
The syringes and probe are initially primed with system fluid - typically distilled water or saline



The Diluent syringe aspirates diluent into the probe tip from a container

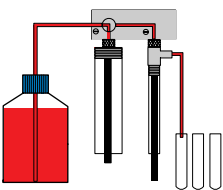


The "Sample" syringe aspirates sample into the probe tip

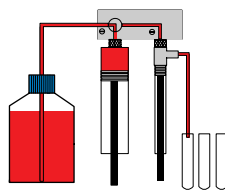


Both Sample and Diluent syringes move up and sample is dispensed and flushed out of the probe by the aspirated diluent

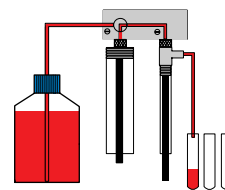
## DISPENSE MODE 1



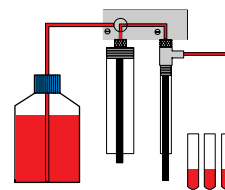
The syringes and probe are initially primed with the reagent present in the system fluid bottle



The Diluent syringe is filled with the volume of reagent required for 1 dispense

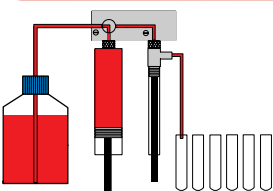


The valve switches to the probe and the Diluent syringe dispenses the full volume into the target container

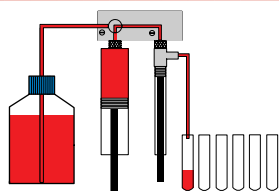


The previous two steps are repeated for each target container

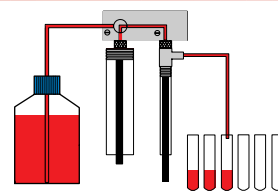
## DISPENSE MODE 2



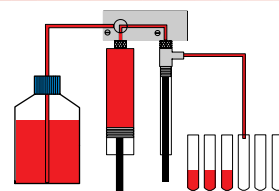
The Diluent syringe is filled with a volume which is a multiple of the required volume



The valve switches to the probe and the Diluent syringe dispenses the volume required for a single tube

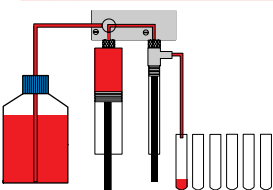


The previous step is repeated until the diluent syringe is empty. Equal volumes of reagent are dispensed into each container

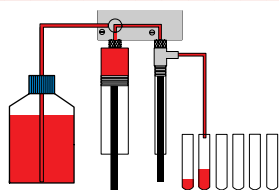


The valve switches to the system fluid bottle and refills with reagent ready to dispense another set of aliquots

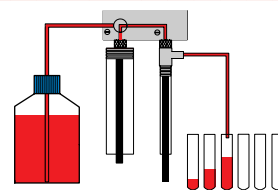
## DISPENSE MODE 3



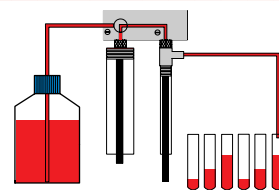
The first step is as per Dispense Mode 1 & 2. The Diluent syringe is filled with a volume sufficient for multiple aliquots and the first aliquot is dispensed.



Up to 20 individually specified volumes can be dispensed subject to the volume limitations of the syringe fitted



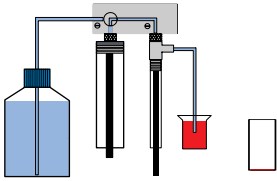
Aliquots are dispensed until the syringe is empty and needs to be refilled. The example shows 3 different volumes being dispensed



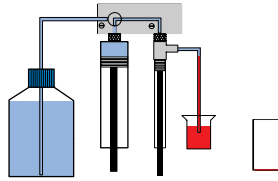
The syringe is refilled and another set of aliquots is dispensed

Key: ■ = System Fluid / Wash Fluid ■ = Diluent ■ = Sample ■ = Reagent

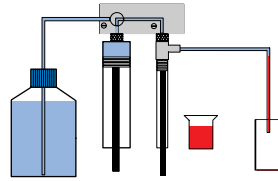
**DISPENSE MODE 4**



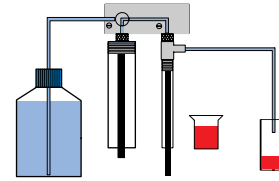
The syringes are initially primed with the diluent in the system fluid bottle



Sample is aspirated into the probe tip using the "Sample Syringe" and diluent is aspirated into the Dilution syringe at the same time

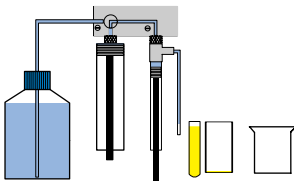


The valve switches to the probe

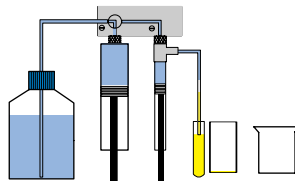


Both Sample and Diluent syringes move up and sample is dispensed and flushed out of the probe by system diluent

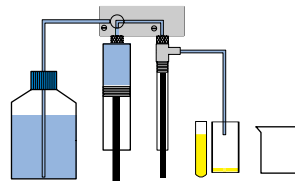
**TRANSFER MODE 1**



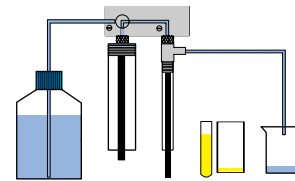
The syringes and handset tubing are primed with system fluid - typically distilled water or saline. An air gap is introduced into the probe tip to separate sample from system fluid.



Sample is aspirated into the probe tip using the Sample Syringe and a specified volume of wash fluid is simultaneously aspirated into the Diluent syringe



The valve switches to the probe and the Sample syringe dispenses all (or part) of the sample that has been aspirated into the probe



Finally the Diluent Syringe dispenses the diluent/wash fluid into a waste container removing any residual sample from the interior of the probe

**OTHER MODES**

**Dilution Mode 3**  
As per Dilution Mode 1 with air gap separation of sample and diluent

**Dispense Mode 5**  
As per Dispense Mode 2 but with reagent aspirated through the probe

**Dilution Mode 4**  
As per Dilution Mode 2 with air gap separation of sample and diluent

**Dispense Mode 6**  
As Dispense Mode 3 but with reagent aspirated through the probe

Sample Syringes Side Entry Port					Sample Syringes Top Entry Port Only (No Side Entry Port)			VALVE TYPE	Diluent Syringes Top Entry Port Only (No Side Entry Port)				
50 µl	100 µl	250 µl	500 µl	1000 µl	1 ml	2.5 ml	5 ml		1 ml	2.5 ml	5 ml	10 ml	25 ml
7350/002	7350/003	7350/004	7350/005	7350/006	7350/007	7350/008	7350/009		7350/007	7350/008	7350/009	7350/010	7350/013
✓	✓	✓	✓	✓	X	X	X	"Low Dead Volume" Internal Port = 1.5mm 9550/250	✓	✓	✓	X	X
✓	✓	✓	✓	✓	X	X	X	"Standard" Internal Port = 2.4mm 9550/251	✓	✓	✓	✓	✓
X	X	X	X	✓	✓	✓	✓	"Maximum Flow" Internal Port = 2.4mm 9550/252	✓	✓	✓	✓	✓

Syringe and valve compatibility table

There are three different valve blocks requiring two different Sample syringe types. The 9550/250 and 9550/251 both require Sample syringes with an integral side entry port which is connected directly to the handset.

The 9550/252 requires a Sample syringe without a side entry port. Both inlet and outlet ports are a "push fit" type and allow a larger diameter of tubing to be used for maximum possible flow rate. The handset is connected to the valve via the outlet spigot.

The 9550/250 version has an internal port diameter of 1.5mm which minimises "dead volume". The 9550/251 has an internal port diameter of 2.4mm to provide a faster flow rate.

## PRODUCT ORDERING CODES

COMPUDIL 3 complete with valve, tubing kit and handset (excl. syringes)	9559/001	Handset complete with 3.2mm i/d FEP tubing	9557/201
		Handset complete with 0.86 mm i/d FEP tubing	9557/202
		Handset complete with 1.6mm i/d LDPE tubing	9557/203
Low Dead Volume Valve Block	9550/250		
For use with 0.8 mm ID tubing		Handset Outlet Tubing 75cm x 0.86mm (PTFE)	5550/039
Syringes: Sample <= 1ml, Diluent <= 5ml		Handset Outlet Tubing 75cm x 1.6mm (PTFE)	5550/089
		Handset Outlet Tubing 75cm x 3.2mm (PTFE)	5550/084
Standard Valve Block	9550/251	Handset Outlet Tubing 75cm x 1.6mm (LDPE)	5550/040
For use with 1.6 mm ID tubing and		Handset Outlet Tubing 75cm x 3.2mm (FEP)	5550/052
Syringes: Sample <= 1ml, Diluent - All			
Maximum Flow Valve Block		Reagent inlet tubing 60cm x 1.6mm i/d (LDPE)	5550/038
For use with 3.2mm ID tubing and		Compatible with valve 9550/250 & 9550/251	
Syringes: Sample >= 1ml, Diluent - All	9550/252		
Sample Syringe 50µl	7350/002	Reagent inlet tubing 60cm x 0.86mm i/d (PTFE)	5550/043
Sample Syringe 100µl	7350/003	Compatible with valve 9550/250 & 9550/251	
Sample Syringe 250µl	7350/004		
Sample Syringe 500µl	7350/005	Reagent inlet tubing 60cm x 3.2mm i/d (FEP)	5550/051
Sample Syringe 1000µl	7350/006	Compatible with valve 9550/252. Incl. clamp	
Sample/Diluent Syringe 1000µl	7350/007		
Sample/Diluent Syringe 2.5ml (incl. spacer)	7350/108	Reagent inlet tubing 60cm x 1.6mm i/d (PTFE)	5550/085
Sample/Diluent Syringe 5ml (incl. spacer)	7350/109	Compatible with valve 9550/250 & 9550/251	
Diluent Syringe 10ml (incl. spacer)	7350/110		
Diluent Syringe 25ml (incl. spacer)	7350/113	Reagent inlet tubing 60cm x 3.2mm (PTFE)	5550/083
		Compatible with valve 9550/252. Incl. clamp	
Software pack for RS232 programming	9557/100		
Footswitch	9407/002	Tubing clamp - for 3.2mm tubing	2540/001

i/d = Internal Diameter

## SPECIFICATIONS

### Resolution:

Full stroke of each syringe drive = 5000 steps

### Speeds:

Approx. 2-15 seconds for full stroke of syringe.

### Precision:

< 0.1% C.V.

### Accuracy

+/-1% of the full syringe volume

### Dead Volume:

Approx. 1ml, of which 95% is recoverable using the PRIME function (standard 30cm length 1.6mm I.D. reagent inlet tube, 1ml and 50ml syringes).

### Power Requirement

110-120 or 210 to 240 volts (selectable). AC single phase 50 or 60 Hz

### Power Consumption

25 Watts max

### Chemical Resistance:

All valves, syringes and tubing are manufactured from glass or PTFE-based materials for total chemical resistance (except HF and HF compounds).

### Controls:

Rear panel:

POWER on/off switch, socket for handset or footswitch control.

RS232 socket for computer control.

Front panel: 48 character display and 14 button tactile keypad.

### Dimensions:

300mm(W) x 200mm(D) x 215mm(H).

### Weight:

7.5kg, (packed for shipment: 9.5kg).

Distributed by:

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