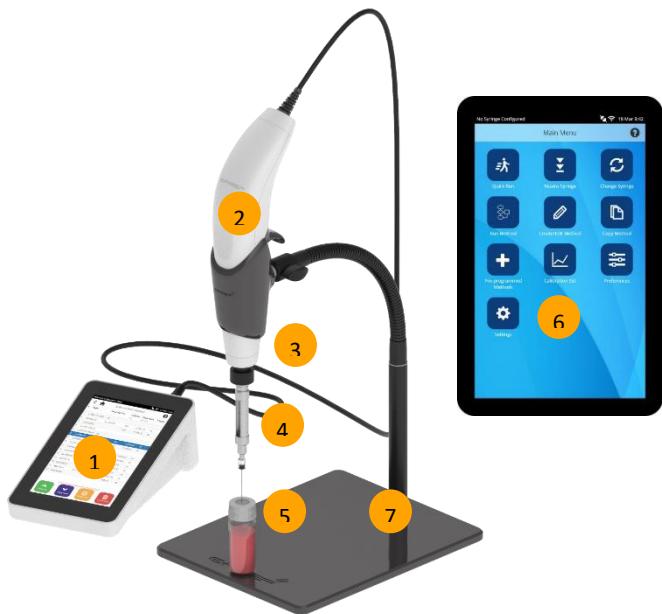
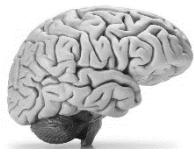


digiVOL®

The Analytical Syringe with a Brain

Product Lockout Specifications



*digiVOL Digital Syringe Driver with Stand
see the ePrep in action <https://youtu.be/Hlav548ntIA>*

1. Control Tablet
2. High force motor
3. Robotic easy syringe change
4. One digiVOL does nL to mL
Syringes changed in seconds
5. Needle, Luer and µSPEed connection
6. Automated routines built-in
7. Handheld or stand operation



digiVOL Capabilities

- Remembers dispense volumes and flow rates.
- Build, Save and Run methods
- WiFi Connected for easy sharing of methods.
- Calibration Stds calculator.
- Syringe Calibration routines.
- Access Privileging.
- Controlled syringe change.



Customers Really Love it.

- So simple it makes everyone an expert.
- Only need one digiVOL to cover volumes 0.1µL to 5mL
- Guaranteed error-free results.
- Its "brain" remembers and executes multi-step tasks.
- Consistent results that are operator and laboratory independent.



digiVOL is different

- Designed for Chromatography
- Uses Analytical Syringes, not pipettes.
- Can operate from sealed vial to sealed vial.
- Allows dispensing at pressure for SPE, microSPE and filtering.
- Can operate with organic solvents.

Customer Benefits

Benefit	digiVOL Operation	Advantage
Makes everyone an Expert, even the Lab Assistant.	Simple to operate, to lock of developed workflows, plunger accuracy to microns. The User prompted Operation.	Designed for the less skilled Lab Assistant providing 100% confidence in repeatable standards preparation
0.1µL-10mL Chromatography Liquid Dispensing	Volumes are dispensed accurately and precisely. Methods are programmed and stored using single or multi-step programming.	The ultimate tool for aliquoting liquids with control of (small) volumes, flow rate and process precision and accuracy.
Its “Brain” can Remember Complex Methods.	Its AI brain decides to run a sequence and prompts the User through the method.	No mistakes. Perfect for the low-skilled Lab Assistant or Technician. Method saved and locked for validity.
All Solvents Compatible	Accurate dispensing of solvents, aqueous, organic, volatile organics and viscous liquids. Air pipettes can only handle aqueous solutions.	digiVOL can prepare A gas-tight analytical syringe can be used to prepare chromatography samples
Calibration Standards Module	The dedicated Calibration Standards Module will automatically calculate calibration standard concentrations and dilutions to make a multi-point calibration curve. The software then prompts the user through each step of the method.	Eliminates mistakes using the digiVOL's "brain" instead of relying on the User's brain. The digiVOL never forgets the step it's currently doing. Ideal for the creation of calibration standards curves with high precision: accuracy and repeatability.
digiVOL O-ring Syringes	digiVOL uses gas-tight O-ring plunger tip syringes. Any syringe can be swapped in seconds using XCHANGE changeover.	Compared with standard Teflon Tip syringes, digiVOL syringes offer superior chemical resistance, longer life and can be used at very high pressure.
microSPE and pdSPE Compatible	Programmable for repeatable activation, conditioning, loading, washing and elution. Methods can be stored and copied.	The processing of µSPEed and pdSPE cartridges are easily reproducible using saved methods. The high-pressure capability of digiVOL allows a small particle sorbent to be used for improved recovery, reproducibility and eluent cleanliness.
Disk Filter Compatible	Samples are dispensed at pressure with highly accurate flow rates.	Microfiltration can be accurately controlled, maintaining repeatability. digiVOL can also be used for micro membrane separations such as Protein, DNA and RNA.

SPECIFIC LOCKOUT FEATURES

- 1) One digiVOL can cover a volume range from 0.1µL to 5mL (robotic syringe change)
- 2) Computer-controlled syringe driver. The program saves and recalls multi-step methods for precise process sequencing in liquid dispensing, calibration standards, microSPE, filtering and membrane applications

- 3) digiVOL is suitable for liquid handling organic solvents and viscous samples (not possible with pipette systems). Also, analytical syringes (with needles) can be used for sealed vials, plates, and tubes.
- 4) Handheld or Stand Operation versatility can be deployed for bench or instrument use.
- 5) digiVOL has a chromatography pedigree providing micron control over volume, flow rate and pressure for analytical chemistry accuracy, and repeatability with pressures up to 4300psi depending on the installed syringe
- 6) User permissions for "Analyst/Chemist" (Development Method) and "Laboratory Technician" (Run Method) operations.
- 7) XCHANGE® rapid syringe change system allows the selection of suitable syringe volume and termination to match the application
- 8) Unique program functions:
 - a. Quick Run
 - b. Intelligent Method Programming
 - c. Method Permission
 - d. Calibration Standards Module
 - e. Residual Volume and Plunger Compensation - to ensure accurate volume dispense
 - f. Software updates via Wi-Fi.
 - g. Method Sharing

LABORATORY OPERATION ADVANTAGES:

	digiVOL Operations	Advantages
Dispensing Liquids	Volumes are dispensed accurately and precisely. Methods are programmed and stored using single or multi-step programming.	Highly accurate and precise dispensing of liquids as small as 2µL. digiVOL removes the difficulties of syringe scale parallax inaccuracies often experienced in air pipetting. Programming of digiVOL can dispense to accuracies better than 0.04% of syringe volume (eg. 50µL syringe = 0.02µL) at speeds down to 0.65% of syringe volume per second (eg. 250µL syringe = 0.16µL/sec).
Dispensing Organic Solvents and Volatile Organic Compounds	Accurate dispensing of volatile organic liquids. You won't experience the boiling problems encountered with air pipette systems. Programmable methods can be customised to match the need.	Gas-tight analytical syringe does not rely on air movement for aspiration and dispensing. Syringes can even be used for gas and vapour pressure dispensing.
µSPEed micro SPE and more	Programmable for repeatable activation, conditioning, loading, washing and elution.	Processing of µSPEed cartridges is easily reproducible using saved methods. The high-pressure

	Methods can be stored and copied.	capabilities of digiVOL allow a small particle sorbent to be used for improved recovery, reproducibility and eluent cleanliness.
Calibration Standards	Dedicated Calibration Standards Module allows users to automatically calculate calibration standard concentrations and dilutions to make a multi-point calibration curve. It then steps and prompts the user through each step of the method.	Eliminates mistakes using the digiVOL's "brain" instead of relying on the user's brain. Ideal for creation of calibration standards curves with high precision: accuracy and repeatability.
Filtration	Samples are dispensed at pressure with highly accurate flow rates.	Microfiltration can be accurately controlled, maintaining repeatability. digiVOL can also be used for micro membrane separations such as Protein, DNA and RNA.
Kinetic Studies	Sample flow rate and pause are accurately controlled.	The ability to program flow rates with timed pauses makes digiVOL suitable for kinetic studies such as Trypsin digest through a μ SPEed cartridge.

USER TESTIMONIALS

	<p><i>ePrep's digiVOL is a capable gadget with a small footprint, enabling high throughput micro-SPE using ePrep's μSPEed cartridges. This combination works particularly well with low-volume (μL) sample size and, as a result, makes a significant reduction in extraction time and consumption of reagents, yet with comparable output to the traditional SPE. This is simply a step forward toward the future.</i></p> <p>Mohammad T., R&D Scientist, Envirolab</p>
	<p><i>The digiVOL is a user-friendly and portable platform allowing precise, low-volume extractions using ePrep's μSPEed® cartridges. Methods can be quickly developed via stepped process sequence and aspirate/dispense parameters. A must-have if you want to reduce sample volumes in environmental analyses.</i></p> <p>Dr Daniel Pasin, Postdoctoral Researcher, University of Copenhagen</p>
	<p><i>We are currently developing analytical methodologies using microextraction procedures combined with liquid chromatography coupled with tandem mass spectrometry to determine the occurrence of pyrrolizidine and tropan alkaloids in different food items (such as teas, herbs, spices, etc.) We have been doing assays with the digVOL, and it seems we are achieving promising results.</i></p> <p>Assoc Prof Natalia Casado Navas, Universidad Rey Juan Carlos</p>
	<p><i>I've used the digiVOL digital syringe driver for three years now. It's been a handy tool for method development, robust and easy to operate. I have used it to develop enzymatic micro-reactors with the μSPEed® cartridges, and its ability to aspirate and dispense accurate volumes at controlled flow rates has been extremely valuable.</i></p> <p>Dr Karen Duong, University of Technology Sydney</p>
	<p><i>μSPEed cartridges operated by the digiVOL make microSPE robust from an analytical perspective. This semi-automatic solution dramatically simplifies the experimental layout, minimising the user intervention experimental errors. From our experience, μSPEed/digiVOL is an excellent solution to extract from different matrices, mainly if you are working with low sample volumes.</i></p> <p>Dr Jorge Pereira, Universidade da Madeira</p>



I think it is an excellent tool for doing method development before transitioning to the full ePrep workstation robot.

Thomas Lockwood, PhD Candidate, University of Technology Sydney

EXAMPLE APPLICATIONS AND DATASHEETS

Publication No.	Description
digiVOL	
98-35025-02	digiVOL Quantitative Liquid Handling
98-55714-01	Trace Analysis of PFAS in Environmental Samples by Micro-SPE (Poster ASMS 2019)
98-35006-01	Drug Panel in Serum, Saliva, Urine and Blood
98-35012-01	Organochlorine Pesticides in Sedimentary River Water without Surrogate Standards
96-10017-01	Immunoaffinity and Enzymatic Reactor micro-SPE Cartridges for Rapid Protein Isolation and Digest
95-20002-01	digiVOL Calibration Standards Module
95-20001-01	digiVOL Syringe Calibration Results
98-35025-02	digiVOL Quantitative Liquid Handling
Paper	Green extraction approach based on µSPEed® followed by HPLC-MS/MS for the determination of atropine and scopolamine in tea and herbal tea infusions – Food Chemistry Volume 394, 15 November 2022, 133512

Applications copies available on request

YOUTUBE VIDEOS

URL	Description
https://youtu.be/8V99p79n7Y0	What is the digiVOL?
https://youtu.be/7JYNcvV9roo	digiVOL the Syringe with a Brain
https://www.youtube.com/watch?v=i8GUij2uc-k	Running an Internal Standard Addition Method
https://youtu.be/_Q4ltHbzz0	µSPEed and digiVOL: the Perfect microSPE Partnership
https://www.youtube.com/watch?v=YUBk4yWC96M	Changing a Syringe on the digiVOL
https://youtu.be/Hlav548ntIA	Creating a Method with the digiVOL
https://youtu.be/S6ei5A0c0Wo	Running Internal Standard Method with digiVOL
https://youtu.be/QV8ZJuBCLyY	Syringe Calibration

digiVOL STANDARDS COMPLIANCE

Standard	Description
IEC 61010- 1:2010 AMD1:2016	Safety requirements for electrical equipment for measurement, control and laboratory use.
AS 61010.1:2003	Safety requirements for electrical equipment for measurement, control and laboratory use – Australia
EN 61326-1: 2013	Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements
ETSI ENC 301 489-1 V2.1.1 (2017-02)	EMC Compatibility and Radio spectrum Matters (EMR), Electromagnetic compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirement.
ETSI EN 301 489-17 V3.1.1 (2017-02)	EMC Compatibility and Radio spectrum Matters (EMR), Electromagnetic compatibility (EMC) standard for radio equipment; Part 17; Specific conditions for Broadband Data Transmission System.
FCC Part 15, Subpart B (Class A) including test report with ICES 003 references	Radiated Emissions and Conducted Emission; CFR47 FCC Part 15, section 15. 109 and 107

Detail available on request

QUICK COMPETITIVE COMPARISON (ANALYTICAL SYRINGE TYPE)



Manufacturer	ePrep	SGE/Trajan	Hamilton
Model	digVOL	eVol®	Digital Syringe
Price (internet only)	US\$3000	No Longer Available US\$2200	US\$1000
Target Market	Analytical	Analytical	Analytical
Operation	Motor-Driven Handheld or Stand	Motor-Driven Handheld Only	Hand Operated Handheld
Driver Motor	Very High Force (24V) (Pressure Enabled)	Low Force (3.7V)	n/a
External Materials	Polypropylene (Chemical Resistance)	Polycarbonate (Not Resistant)	Unknown
Volume Range	0.1µL to 5mL	0.5µL to 1mL	Fixed Selected Model
Available Syringes	2.4, 50, 250, 1250, 2500, 5000µL Also 2.5mL Luer Syringe	5, 50, 100, 500, 1000µL	0.5, 1, 2 5, 10, 25, 50, 100, 250, 500µL
Flowrate	Programmable 0.02µL/min to 45 mL/min depending on the syringe type	Programmable Unknown	n/a
No. Program Steps	>1000	97	n/a
No. Method Functions	10	2	n/a
Programming	Quick Run, Method Build, Calibration Standards	Quick Run, Method Build,	n/a
Password Protection	Yes	Yes	n/a
Robotic Syringe Change	Yes	Yes	No
Syringe Serial Lock	Yes	No	n/a
Syringe Calibration	Single and Multipoint Auto Calculated	Single Manually Calculated	Factory
Syringe Serial Lock	Yes	No	n/a
Syringe Calibration	Single and Multipoint Auto Calculated	Single Manually Calculated	Factory
Residual & Backlash	Yes	No	n/a
SPE Enabled	pdSPE and microSPE	No	No
Filtering Enabled	Disk Filtering	No	No

WiFi Enabled	Yes	No	n/a
Browser Operation	Yes	No	n/a
External Backup	yes	No	n/a
Software Updates	Online	Factory	n/a

FAQS

Q: Why can't Organic Solvents be Used with an Air Pipettor?

A: Organic solvents cannot be used with an air-displacement pipette due to evaporation of solvents under vacuum, wetting of the plastic tip and possible leakage through the air seal. These affect precision and accuracy. digiVOL uses analytical syringes with no air cushion making the digiVOL compatible with aqueous and organic solvents.

Q: Viscous Sample dispensing?

A: Positive displacement syringe should be used for viscous samples such as glycerol, detergent and honey. Also, for high-density organic solvents such as chloroform.

Q: What Syringes are available for the digiVOL?

A: 2.4µL (plunger-in-needle) syringe, 50µL, 250µL, 1.25mL, 2.5mL, 5mL gas-tight eZy-connect and 2.5mL Gas Tight Luer connection. All digiVOL syringes feature XCHANGE Tool Change, Technology-enabling syringes to be easily changed for or during a method sequence.

Q: What is the length of a digiVOL syringe?

A: digiVOL uses a ½ “standard analytical syringe” plunger length (30mm) of a standard analytical syringe. Half-length syringes were specified for digiVOL to ensure the handle was not too long.

Q: How does digiVOL process “Syringe Calibration”?

A: Two calibration methods are available in the digiVOL. Single Point Calibration – where a single volume is used for the calibration, typically for standard addition. Multi-Point Calibrations – where 10%, 50% and 100% volume points are used for the calibration and linear regression to determine a correction factor at a selected volume.

Q: How does the Calibration Standards Module work?

A: The Calibration Standards Module follows a standard GLP process for calculation, programming and running a series of multi-point calibration standards for analytical analysis. This module is ideal for creating small volume calibration curve standards typically used in chromatography and bioscience analysis. The module selects typical commercially available Reference Standards or in-house stock solutions. Up to four Reference Additions such as Internal or Surrogate Standards can also be programmed as part of a method. Once created, a calibration method can be Saved and Locked, ready for running by a Lab Assistant or Technician. Methods are locked to the calibrated syringe serial number.

Q: How does digiVOL deal with air bubbles in a syringe?

A: Prime steps can be added to digiVOL methods to reduce trapped air bubbles. However, tiny air bubbles can remain after priming, typically the needle's volume. Although a bubble of "needle volume" does not affect the dispensed volume, digiVOL overcompensates for these by including a residual volume in the Syringe after dispensing.

Q: Does digiVOL allow User Access?

A: Methods and Settings can be locked by an administrator to maintain the integrity of a method.

PRODUCT AND SPARES ORDERING INFORMATION

Part No	Description
01-08105	digiVOL Digital Syringe Driver (D) Kit
01-08115	[BUNDLE] digiVOL Digital Syringe Driver (D) and Flexi Stand Kit (includes 01-08105 and 01-08150)
01-08210	digiVOL Calibration Standard Kit comprising Stand and 50µL, 250µL, 1.25mL, 2.5mL and 5mL syringes
01-08150	Flexi Stand for digiVOL with Syringe Cradle
01-09054	2.4µL digiVOL Syringe with 50mm Needle
01-09058	50µL digiVOL Syringe with eZy-Connect™
01-09061	250µL digiVOL Syringe with eZy-Connect™
01-09063	1.25mL digiVOL Syringe with eZy-Connect™
01-09064	2.5mL digiVOL Syringe with eZy-Connect™
01-09065	5mL digiVOL Syringe with eZy-Connect™
01-10990	eZy-Connect Needle - 0.64mm x 0.22mm (Pkt 10) for 50 and 250µL syringes
01-10992	eZy-Connect Needle - 0.64mm x 0.32mm (Pkt 10) for 1.25, 2.5 and 5mL syringes