

## 520Di DISPENSING PUMPS

**NEW**

Precise, programmed production



**Precision  
performance  
from the most  
sophisticated  
dispensing pump  
available**

## A dose of quality

**Accurate, powerful, programmed dispensing: that's what the 520Di can bring to your production process.**

- Accurate dispensing to  $\pm 0.5\%$
- Dial-up flow rates from 43  $\mu\text{l}/\text{min}$  to 4.4  $\text{l}/\text{min}$
- Calibration by weight or by volume
- Brushless DC motor with 3500:1 speed control
- Dosing triggered by keypad, remote signal or additional footswitch, handswitch or proximity switch
- Output batch records for cGMP requirements
- Washdown NEMA 4X model: RS485 control  
IP31 model: RS232 control
- Calibration on-the-fly can take place without disturbing batch dispensing

The new 520Di/L pump combines extraordinary levels of functionality with an on-screen menu, easy-to-use tactile membrane keypad and an alphanumeric, high-visibility display in English, German, French, Spanish and Italian. Up to 50 dispensing programs with full file name, including all dose parameters and calibration, can be stored in the memory. Simple security code to protect set functions, and comprehensive security to protect dispensing parameters and calibration values are built-in options.



## Integration

The 520Di is designed with two functions in mind: as a stand-alone dispensing unit; and as a fully integrated part of a filling machine. The wide-ranging industrial logic I/O control options and serial communications offer the flexibility for the pump to be linked to other filling equipment via a PLC.



## Sterile

Residues of pumped product can be major sources of contamination in other pumps: but not with the crevice-free 520Di. The pumped fluid touches only the tube bore. A new tube provides instant sterility.



## Accurate

True positive displacement pumping with no product back-flow or slip, coupled with unprecedented set speed range of 3,500:1 gives repeatable dispensing better than  $\pm 0.5\%$  with minimal pulsation.



## Quick-change

Change of duty fluids is very fast. There is no need to take the pump apart. Just change the tube, select (or create) the required program and press the Start key on the waterproof keypad. That's all there is to it.

## 50 programs

Store 50 dispensing programs for immediate use, complete with batch size, dose size, flow speed and dosing interval. You can even save the ramp and drip settings. Need a variation? Instant changes are easy.



## Why Peristaltics?

Compared with other positive displacement pumps, peristaltic pumps win on every count. They handle difficult fluids and suspended solids with ease, and provide precision dosing and metering. Cleaning and maintenance are quick and easy. They self-prime, can run dry and have no valves or seals to leak, corrode or clog, and the duty fluid is totally contained within the tube – so no contamination. That's why Watson-Marlow Bredel pumps outperform piston, progressive cavity, lobe, gear and diaphragm pumps.

## Easy-use

Dosing can be triggered by keypad, external switch, remote signal or timed interval, allowing individual or batch dispensing and process integration via serial communications. The 520 has logical software structure.



## Low-shear

With no impellers, vanes or valves, the 520Di dispenses delicate fluids without damage or degradation – even fragile cell cultures. Suspended solids are no problem. The result: higher yield, no product damage, improved product quality.

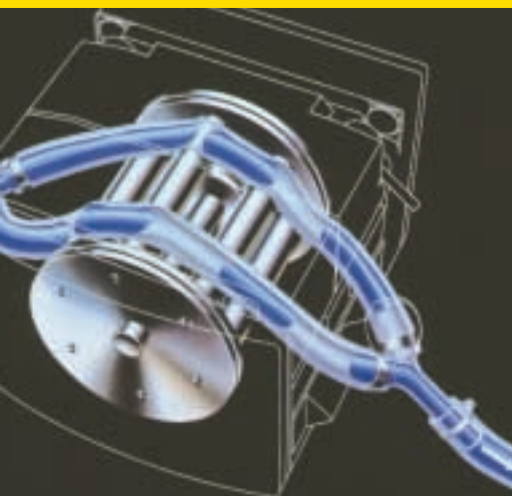
## Integration and reporting

Industrial connectivity is only the start. Add a PC and the details of every dispensing job are recorded: when it started, what it was, when it ended. Production records were never so simple.



## Versatile

Single shot runs as well as routine high volume production. New batch programs take moments for instant use or storage.



## 505L pumphead

The 505L pumphead has six low-inertia stainless steel rollers and twin offset tracks to provide smooth flows using double tube elements, or two individual tubes up to 9.6mm bore with 2.4mm wall thickness.

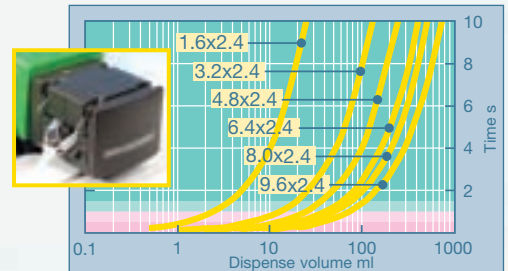
# The pumphead for the process

The 520Di is highly versatile. Its power, precision and controllability mean it can perform a host of production operations. Just choose the perfect pumphead for your process.

## 505L

Our standard precision dispensing pumphead. Use the 505L if you require high accuracy of  $\pm 0.5\%$ , combined with virtually pulsation-free flow. 505L pumpheads can be ganged to create a dual-head system.

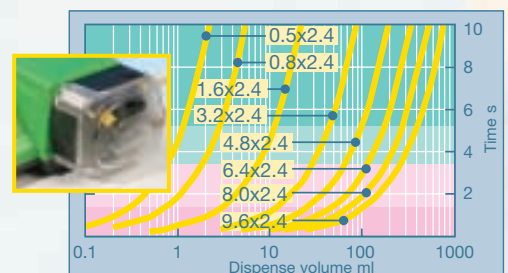
Recommended dose sizes						
Tube #	119	120	15	24	121	122
Tube bore	1.6 mm	3.2 mm	4.8 mm	6.4 mm	8.0 mm	9.6 mm
	1/16 in	1/8 in	3/16 in	1/4 in	5/16 in	3/8 in
Min dose	0.9 ml	4.5 ml	8.5 ml	14.0 ml	18.0 ml	25.0 ml
Max dose	15 ml	75 ml	150 ml	250 ml	300 ml	400 ml



## 520R2

The 520R2 is our robust, single-channel pumphead that is easy-to-use, simple to set-up and designed for general use in high-throughput dispensing applications. The recommended accuracy is  $\pm 1\%$  or better.

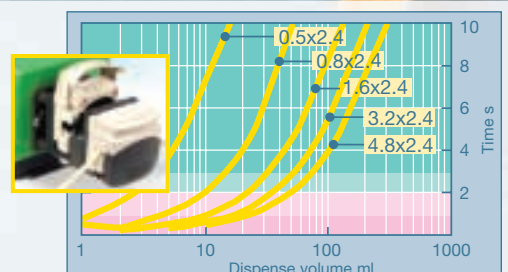
Recommended dose sizes								
Tube #	105	108	119	120	15	24	121	122
Tube bore	0.5 mm	0.8 mm	1.6 mm	3.2 mm	4.8 mm	6.4 mm	8.0 mm	9.6 mm
	1/50 in	1/32 in	1/16 in	1/8 in	3/16 in	1/4 in	5/16 in	3/8 in
Min dose	0.1 ml	0.2 ml	1.0 ml	3.5 ml	8.0 ml	14 ml	22 ml	32 ml
Max dose	1.5 ml	3.5 ml	15 ml	55 ml	125 ml	250 ml	350 ml	500 ml



## 313 and 314

313 three roller and 314 four roller pumpheads are used where multi-channel flows to 1100ml per minute per channel are required. Up to six channels can be ganged to achieve accuracies of  $\pm 2\%$  per channel.

Recommended dose sizes							
Tube #	105	108	119	120	15	24	121
Tube bore	0.5 mm	0.8 mm	1.6 mm	3.2 mm	4.8 mm	6.4 mm	8.0 mm
	1/50 in	1/32 in	1/16 in	1/8 in	3/16 in	1/4 in	5/16 in
Min dose	0.1 ml	0.2 ml	0.5 ml	2.0 ml	5.0 ml	7.5 ml	10.0 ml
Max dose	1.0 ml	2.5 ml	10.0 ml	30 ml	70 ml	150 ml	200 ml

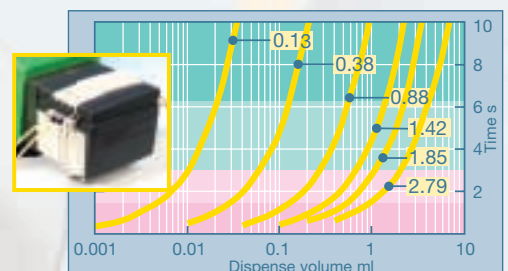


## 505CA

The 505CA is designed for low-flow, multi-channel dispensing. It should be used where single channel accuracy up to  $\pm 0.5\%$  is required. Up to 48 channels can be ganged from one drive.

Recommended dose sizes						
Tube bore	0.13 mm	0.38 mm	0.88 mm	1.42 mm	1.85 mm	2.79 mm
Min dose	0.001 ml	0.015 ml	0.06 ml	0.16 ml	0.25 ml	0.48 ml
Max dose	0.04 ml	0.25 ml	1.00 ml	2.5 ml	3.75 ml	7.50 ml

NOTE These figures relate to a single calibrated channel. For channel to channel accuracy details, please consult Watson-Marlow for full information.



## I/O

Logic signals can be used to control the pump and monitor its status. The logic inputs for control operate by contact closure, 5V TTL or 24V industrial standard logic for: trigger dose, run/stop, direction or leak detection. The logic outputs available are single dose, batch dose, run/stop, direction, manual or network mode, leak detection and general alarm.

## RS232/RS485

The 520Di can be controlled remotely via a serial communications link. This updated control system allows remote configuration of new programs as well as initiating existing programs. Dose sizes can be monitored and the pump can be calibrated to maintain the highest accuracy.

Recommended tube sizes					
Accuracy	10 ml	25 ml	50 ml	100 ml	250 ml
Bore	1.6 mm	3.2 mm	4.8 mm	8 mm	9.6 mm
Dose time ±0.5%	4.0 secs	1.9 secs	2.0 secs	1.9 secs	3.4 secs
Bore	1.6 mm	4.8 mm	6.4 mm	9.6 mm	9.6 mm
Dose time ±1.0%	4.0 secs	1.0 secs	1.2 secs	1.4 secs	3.4 secs
Bore	3.2 mm	6.4 mm	8.0 mm	9.6 mm	9.6 mm
Dose time ±2.0%	0.8 secs	0.6 secs	1.0 secs	1.4 secs	3.4 secs

505L

Recommended tube sizes					
Accuracy	10 ml	25 ml	50 ml	100 ml	250 ml
Bore	0.8 mm	1.6 mm	3.2 mm	3.2 mm	6.4 mm
Dose time ±0.5%	18.2 secs	11.4 secs	5.7 secs	11.4 secs	7.1 secs
Bore	1.6 mm	1.6 mm	3.2 mm	4.8 mm	8.0 mm
Dose time ±1.0%	4.5 secs	11.4 secs	5.7 secs	5.1 secs	4.5 secs
Bore	1.6 mm	3.2 mm	4.8 mm	6.4 mm	9.6 mm
Dose time ±2.0%	4.5 secs	2.8 secs	2.5 secs	2.8 secs	3.2 secs

520R2

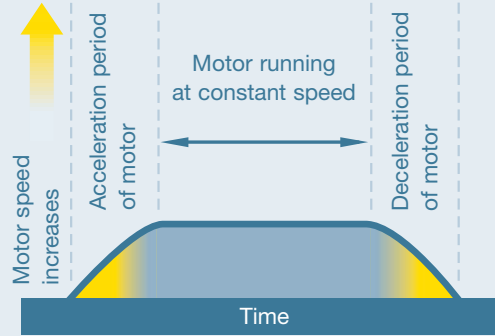
Recommended tube sizes					
Accuracy	10 ml	25 ml	50 ml	100 ml	250 ml
Bore	1.6 mm	3.2 mm	4.8 mm	8.0 mm	8.0 mm
Dose time ±0.5%	6.3 secs	4.3 secs	2.2 secs	3.4 secs	8.6 secs
Bore	1.6 mm	3.2 mm	6.4 mm	8.0 mm	8.0 mm
Dose time ±1.0%	6.3 secs	4.3 secs	2.4 secs	3.4 secs	8.6 secs
Bore	3.2 mm	4.8 mm	8.0 mm	8.0 mm	8.0 mm
Dose time ±2.0%	1.7 secs	1.9 secs	1.7 secs	3.4 secs	8.6 secs

313

Recommended tube sizes					
Accuracy	0.1 ml	0.5 ml	1.0 ml	2.0 ml	5.0 ml
Bore	0.25 mm	0.76 mm	1.14 mm	1.65 mm	2.79 mm
Dose time ±0.5%	13.6 secs	8.0 secs	6.8 secs	6.9 secs	7.4 secs
Bore	0.5 mm	1.14 mm	1.65 mm	2.54 mm	2.79 mm
Dose time ±1.0%	3.2 secs	3.4 secs	3.5 secs	3.2 secs	7.4 secs
Bore	0.76 mm	1.65 mm	2.54 mm	2.79 mm	2.79 mm
Dose time ±2.0%	1.6 secs	1.7 secs	1.6 secs	2.9 secs	7.4 secs

505CA

### The principle of ramping



The 520Di can be set to “ramp” up to full speed at the start of a dose and ramp down to zero speed at the end. The slope of each ramp can be independently adjusted. Ramping aids accuracy and allows filling to start and stop at speeds which avoid splashing or foaming, but still allows the highest speed to be used for the main part of the dose: filling is faster. End-of-dose drips are easily avoided using the pump’s anti-drip feature: a momentary direction reverse at the end of each dose.

The 520Di can dispense with an accuracy better than ±0.5%. Achieving this depends on the number of pumphead roller passes needed to dispense a dose: the more passes the greater the accuracy.

Where high accuracy is required, it is important to fit a tube small enough to require sufficient roller passes.

Assuming that the pump is running at the top speed appropriate to each pumphead, the graphs in the panel, left, indicate in green the time needed to dispense a dose with an accuracy better than ±0.5%.

Pumping time per dose: accuracy

- = within ±0.5%
- = within ±1.0%
- = within ±2.0%
- = within ±5.0%

**Call 1-800-282-8823 for further information on the 520 pump range including technical data sheets.**

**or log on to our web site: [www.watson-marlow.com](http://www.watson-marlow.com) to view details on our complete peristaltic pump range.**

**Watson-Marlow Bredel Pumps  
37 Upton Technology Park  
Wilmington, MA 01887**

**Tel: 1-800-282-8823**

**Fax: 1-978-658-0041**

**Email: [support@wmbpumps.com](mailto:support@wmbpumps.com)**

**Web: [www.watson-marlow.com](http://www.watson-marlow.com)**

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**United States of America**  
Telephone 800 282 8823  
Fax: 978 658 0041  
Email [support@wmbpumps.com](mailto:support@wmbpumps.com)  
[www.watson-marlow.com](http://www.watson-marlow.com)

**Belgium**  
Telephone +32 (0) 2 481 60 57  
Fax: +32 (0) 2 481 60 58  
Email [info@watson-marlow.be](mailto:info@watson-marlow.be)

**Brazil**  
Telephone +55 11 4616 0404  
Fax: +55 11 4616 0403  
Email [info4brazil@watson-marlow.com](mailto:info4brazil@watson-marlow.com)  
[www.watson-marlow.com.br](http://www.watson-marlow.com.br)

**China**  
Telephone +86 21 6485 4898  
Fax: +86 21 6485 7366  
Email [mingshao@cn.spiraxsarco.com](mailto:mingshao@cn.spiraxsarco.com)  
[www.watson-marlow.com.cn](http://www.watson-marlow.com.cn)

**France**  
Telephone +33 (0) 2 37 38 92 03  
Fax: +33 (0) 2 37 38 92 04  
Email [info@watson-marlow.fr](mailto:info@watson-marlow.fr)

**Germany**  
Telephone +49 (0) 2183 42040  
Fax: +49 (0) 2183 82592  
Email [info@watson-marlow.de](mailto:info@watson-marlow.de)  
[www.watson-marlow.de](http://www.watson-marlow.de)

**Italy**  
Telephone +39 030 6871184  
Fax: +39 030 6871352  
Email [info@watson-marlow.it](mailto:info@watson-marlow.it)  
[www.watson-marlow.it](http://www.watson-marlow.it)

**Korea**  
Telephone +82 (0) 2 525 5755  
Fax: +82 (0) 2 525 5764  
Email [support4k@watson-marlow.co.uk](mailto:support4k@watson-marlow.co.uk)

**Malaysia**  
Telephone +60 (3) 5635 3323  
Fax: +60 (3) 5635 7717  
Email [sales@my.SpiraxSarco.com](mailto:sales@my.SpiraxSarco.com)

**Netherlands**  
Telephone +31 (0) 10 462 1688  
Fax: +31 (0) 10 462 3486  
Email [info@watson-marlow.nl](mailto:info@watson-marlow.nl)

**South Africa**  
Telephone +27 11 796 2960  
Fax: +27 11 794 1250  
Email [info@wmbpumps.co.za](mailto:info@wmbpumps.co.za)

**Sweden**  
Telephone +46 8 556 556 00  
Fax: +46 8 556 556 19  
Email [info@watson-marlow.nu](mailto:info@watson-marlow.nu)

**United Kingdom**  
Telephone +44 (0) 1326 370370  
Fax: +44 (0) 1326 376009  
Email [support@watson-marlow.co.uk](mailto:support@watson-marlow.co.uk)  
[www.watson-marlow.co.uk](http://www.watson-marlow.co.uk)

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