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RSC-200

Rapid Solution Changer



BioLogic
Science Instruments

RSC-200

The study of neurotransmitters, ligands, and changes of concentration of ions are important issue in modern patch-clamp experiments. Bio-Logic's Rapid Solution Changer, the RSC-200 is a simple and easy-to-use system that allows scientist to address these issues.

The RSC-200 uses a principle known as "sewer pipes" in which the cell or the tip of the electrode (in excised-patch mode) is positioned close to the output of a capillary. The solution to be assayed flows out of the capillary at a moderate flow rate gravimetrically. The cell, exposed to this stream, rapidly equilibrates in the perfusion solution.

The fact that all the solutions flow in individual tubes right to their end eliminates any problems of dead volumes, washing and cross-contamination between the solutions to be assayed. This perfusion principle has been used in many laboratories where it has been proven that it was a excellent system for solution assays.



RSC-200 motor can be mounted on any 3-axis manual Manipulator providing that the motor will have a mechanically stable fixation.

Fast and automated solution change

The solutions to be assayed are driven to the rotating head of the RSC-200. The solution exchange is performed by a very precise rotation of the RSC-200 head which exposes the patch pipette or the cell to the flow of one of the tubes.

The time of rotation from one tube to the adjacent one can be programmed from 5 to 800 ms. The motor is light and vibration free thanks to the disk rotor technology and to the micro step command delivered by the controller.

Due to the high number of tubes it is possible to have one tube for every solution to be assayed. Compared to fixed tube devices, the rotating head permits fast changing of the perfusion solution around the patch pipette without any contamination from the previous solution.

UNIQUE FEATURES

- Fast and automated solution change
- No dead volume
- No cross contamination between solutions
- Up to 36 channels
- Compatible with Axon and Heka software



The straight head

One of the important features of RSC head is the easy changing of solution delivering tubing which eliminates the necessity of washing and the risk of residual contaminations. Every RSC-200 system is delivered with one head. The straight head was designed to carry standard capillary glass, OD 1.00 mm.

This head gives the following advantages:

- capillaries protrude, giving better approach to a cell,
- the number of capillaries installed is up to the user,
- capillaries take minimum space in the cuvette.
- easy changing of capillaries,
- easy attachment to the flexible tubing.

The head is made of Delrin, reinforced by an internal metal rod, for best shape stability.
The outside diameter of the head is manufactured with the highest precision (±10 microns) to give a good reproducibility in the positioning of the tube.
The head is equipped with two guiding pins to provide straight and parallel positioning of capillaries.
The capillaries are kept in their position by two O-rings for easy installation and alignment. The capillaries are connected to a short piece of polyethylene tubing, which is connected to larger tubing going through electro valves into the reservoir syringes.

9-electrovalves EVH-9

EVH-9 is a set of 9 valves and is included with RSC-200. The RSC-200 is capable of driving up to 36 valves (4 sets of valves). The EVH-9 can also be an optional device which opens the flow only on the selected tubes. If valves are not used, all solutions would flow simultaneously. The set of 9 valves are mounted into their housing. The valves used for RSC-200 are normally-closed pinch valves. The valves can be controlled from front panel of the controller or by software. All valves can be programmed to open or close synchronously with a tube position change.



More than one valve can be opened at a time, or valves can be opened or closed independent of the head rotation. For example, the flow in the next tube to be tested can be established a few seconds before rotation occurs.

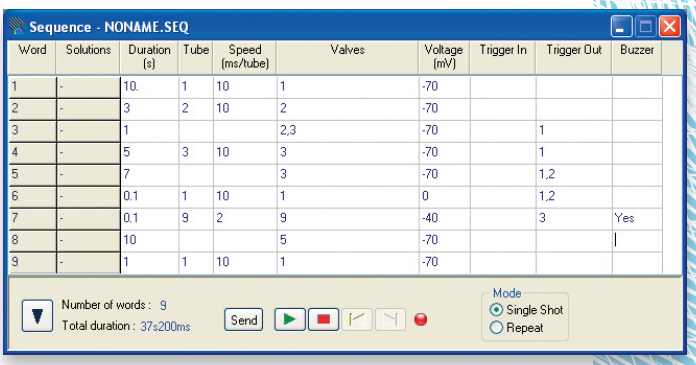
Software control

The RSC-200 instrument is delivered with a 32-bit Windows software able to do the following operations:

- manual positioning of the head,
- manual opening of the valves,
- resting Vhold setting.

Sequences can be easily programmed by setting the following:

- duration of stay in the active position for a given tube number,
- speed of solution change (head rotation),
- stimulation pulse level (range ±10 V),
- TTL signal activation (4 lines of signal available),
- triggering of other auxiliary instruments.



RSC-200 can also be controlled through external user interface. Such as those provided by Heka and Axon. The patch clamp and the perfusion system are then controlled from for the same software.

Specifications



GENERAL

Stepping motor	
Control	Electronic micro-step drive
Type	Low inertia rotor
Delay to adjacent tube	5 ms to 800 ms
EV number	Maximum 36 electrovalves Can be used as 36 TTL outputs
Stimulator	
Output	±10 V output
Resolution	16-bit (0.50 mV step)
Linearity	±3 bit
Rise time	7 µs
Noise	1 mV peak to peak
Analog control input	
Maximum ratings	-1 V to 5.5 V
Not under analog control	0 V
Tube voltage step	100 mV/tube ±40 mV
Pulse width	10 ms minimum
Analog control output	
Tube voltage step	100 mV/tube ±20 mV
During head motion	0 V
Trigger input	
In Auto mode	A rising edge TTL synchronisation
Trigger output	
In Auto mode	4 general purpose TTL outputs
TTL levels	
logic low level or '0'	0.8 V max
logic high level or '1'	3.15 V min
General	
Input voltage range	100-240 Vac
Power	100 W max
Frequency	47 to 63 Hz
PC interface	Windows 7, 8 or 10 (32 or 64 bytes)
Communication	USB
Size	140 x 430 x 360 mm (H x W x D)
Weight	9 kg
EVH-9	
Electrovalves	Normally closed micro pinch electro-valves
Valve number	9
Power	12 V (2 A)
Command	TTL input
Weight	2 kg

Pictures and specifications subject to change



Ordering information

The RSC-200 is delivered complete with:

- command box,
- stepping motor,
- driving software,
- one syringe rack with 18mm holes,
- one straight head and a tubing kit composed of:
  - 100 x glass capillaries of an outside diameter 1.00 mm (ref: GB 100TF 8P - thin wall with filament, ID: 0.78 mm, length: 8 cm, ire polished ends),
  - polyethylene tubing (5 meter length, ID: 0.3 mm, OD: 0.70 mm),
  - C-Flex tubing (7,5 meter length, ID: 0.5 mm, OD: 2.1 mm),
  - 9 x luer lock female.
  - 9 x 10 ml plastic syringe
  - 2 x O-Rings.

Contents	**Catalog No.**
RSC-200 rapid solution changer	**025-50/2**
Optional	
EVH-9 9-electrovalve unit	**025-00/13**
Syringe rack holder (1 or 2 racks)	**025-00/06**
Syringe rack 18 mm holes	**025-00/05**
Syringe rack 32 mm holes	**025-00/27**

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Bio Logic Science Instruments

Headquarters
Bio-Logic SAS
4, rue de Vaucanson
38170 Seyssinet-Pariset - France
Phone: +33 476 98 68 31
Fax: +33 476 98 69 09
www.bio-logic.net

Affiliate offices
Bio-Logic USA, LLC
P.O.Box 30009 - Knoxville, TN37930 - USA
Phone: +1 865 769 3800 - Fax: +1 865 769 3801
Bio-Logic Science Instruments Pvt Ltd
Unit No.204, Odyssey IT Park, Road No. 9, MIDC
Wagle Estate,Thane, West, Mumbai-400604 MH, India
Phone: +91 2225842128

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