



## EPC 7 PLUS

### Patch Clamp Amplifier



After more than 20 years of successful manufacturing of the EPC 7 classic patch clamp amplifier, HEKA is pleased to introduce the new EPC 7 PLUS. Following the tradition of the manually controlled EPC 7 patch clamp amplifier, the EPC 7 PLUS has all the features of the EPC 7 classic but it offers many improvements that have been implemented according to the wishes, suggestions and proposals of our customers.

The EPC 7 patch clamp amplifier has withstood the test of time and, to this day, it is reliably used in laboratories and teaching facilities around the globe. The manual controls of the amplifier provide a hands-on environment that is ideal for instruction and stimulates user awareness of proper adjustment of critical parameters (e.g., C-fast, C-slow and RS compensation).

The EPC 7 PLUS is a high quality patch clamp amplifier featuring a range-changing headstage. Two different switchable feedback resistors (50 GOhm, 500 MOhm) in the headstage allow performing single-channel and whole-cell recordings with one headstage. Furthermore, for low-noise high-resolution recordings it is possible to switch to high gain during a whole-cell recording.

#### Improvements in comparison to the EPC 7 classic

- Holding potential range is increased from  $\pm 200$  mV to  $\pm 500$  mV.
- Pipette offset compensation is increased from  $\pm 50$  mV to  $\pm 200$  mV.
- RS compensation and C-Fast cancellation are active in current clamp mode.
- A variable 7-pole Bessel filter with 12 steps (0.1, 0.3, 0.5, 0.7, 1, 3, 5, 7, 10, 20, 30 kHz, FULL bandwidth) on the current monitor channel replaces the two 3-pole Bessel filters of the EPC 7
- C-slow compensation has been extended with a third range from 10 to 1000 pF

#### Features of the EPC 7 PLUS

- High time resolution and low noise for single-channel and whole-cell recordings
- Whole-cell voltage clamp and current clamp studies
- Recordings from artificial membranes
- Range-changing capabilities of the headstage. Two different feedback resistors: 50 GOhm, 500 MOhm
- Extremely wide bandwidth available from the current monitor signal
- Integrated transient cancellation and series-resistance compensation in voltage and current clamp mode.
- 11 selectable gain ranges from 0.5 to 1000 mV/pA

## Technical Specifications

### EPC 7 PLUS Main Unit:

#### Dimensions Main Unit (D x W x H):

(31.1 x 48.3 x 14.5) cm,

(12.3 x 19.0 x 5.7) inch

#### Weight:

7.6 kg / 16.5 lbs

Mounts in a 19" rack.

Operates on standard 115 V / 230 V.

### EPC 7 PLUS Headstage:

#### Dimensions (D x W x H):

(70 x 40 x 19) mm

(2.75 x 1.57 x 0.75) inch

#### Current measuring resistors:

50 G (high range)

500 M (medium range)

#### Largest measurable currents:

200 pA (high range)

20 nA (medium range)

#### Noise measured with open input:

##### (8-pole Bessel filter, high range)

up to 1 KHz: < 30 fA RMS

up to 3 KHz: < 85 fA RMS

up to 10 KHz: < 350 fA RMS

### Current Monitor Signal:

*Gain:* 0.5 to 1000 mV/pA, switch-selected

#### Maximum bandwidth:

100 KHz (medium range)

60 KHz (high range)

### Filters:

The Current Monitor signal of the EPC 7 PLUS is filtered by a 7-pole Bessel filter from 0.1 to 30 kHz in 11 steps. In the additional 'FULL' setting, a 3-pole Bessel filter is used and the current signal is provided at full bandwidth of the EPC 7 PLUS.

### Capacitance Compensation:

Manual adjustment of the fast and slow capacitance cancellation.

*C-fast:* 0 to 10 pF, 0.5 to 5  $\mu$ s tau

*C-slow:* 0.2 to 10 pF, calibrated

2 to 100 pF, calibrated

10 to 1000 pF

#### Series conductance adjustment:

0.01 to 1  $\mu$ S

### Series Resistance Compensation:

Automatically determined from transient cancellation controls.

*Fractional compensation:* 0 – 90 %

### Pipette Offset:

Manual adjustment within a  $\pm$  200 mV range.

### Holding Potential:

Hardware controlled holding potential with a  $\pm$  500 mV range.

### Current Clamp CC Command Resolution:

1 pA/mV input; up to  $\pm$ 1 nA

### Noise Monitor Facility:

LCD displays RMS current at gain setting of 100 mV/pA in units of fA for checking background noise. The bandwidth is set by the filter frequency.

## Related Products

### LIH 1600

16-bit multi-channel data acquisition system.

### PATCHMASTER

Multi-channel patch clamp data acquisition and analysis software for Windows and Mac OS.

### FITMASTER

Data analysis software supporting PATCHMASTER data structure for Windows and Mac OS.

### PULSE/PULSEFIT

Patch clamp data acquisition and analysis software for Windows and Mac OS.

### EPC 8

Manually and remote controllable patch clamp amplifier.

### EPC 10

The fully computer controlled patch clamp amplifier with built-in LIH 1600 interface.

### PIP 5

Temperature controlled micro pipette puller.

### MIM 4

Motorized 3-axis micromanipulator with video option.

### General notice:

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We reserve the right to effect technical changes as development progresses. Special versions are available on request. Further technical data are provided by a detailed description, which is available on request. A guarantee of one year applies on all instruments.

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