

## BrainAmp series | Brain Products GmbH > Solutions

| BrainAmp series                                | Technical specifications                                                             |                                                                                      |                                                                                            |
|------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Amplifier                                      | BrainAmp Standard                                                                    | BrainAmp DC                                                                          | BrainAmp ExG                                                                               |
| Number of channels (per unit)                  | 32                                                                                   | 32                                                                                   | 8 or 16 bipolar                                                                            |
| Channel type / reference                       | Referential channels/ acquisition of a reference using a single electrode (unipolar) | Referential channels/ acquisition of a reference using a single electrode (unipolar) | 8 channels: 8 bipolar 16 channels: 16 bipolar or 8 bipolar + 8 AUX by means of ExG AUX Box |
| Input impedance                                | 10 MΩ (for DC)                                                                       | Switchable: 10 MΩ / 10 GΩ (for DC)                                                   | Switchable: 10 MΩ / 10 GΩ (for DC)                                                         |
| Input noise                                    | ≤ 2 μVpp                                                                             | ≤ 1 μVpp                                                                             | ≤ 2 μVpp                                                                                   |
| Common-mode rejection (CMR)                    | ≥ 90 dB                                                                              | ≥ 110 dB                                                                             | ≥ 100 dB                                                                                   |
| Lower cutoff frequency (high pass)             | 0.016 Hz/10 s                                                                        | 0 Hz in DC mode or 0.016 Hz/10 s in AC mode; switchable between AC and DC modes      | 0 Hz in DC mode or 0.016 Hz/10 s in AC mode; switchable between AC and DC modes            |
| Filter type                                    | First-order filter with 6 dB/octave                                                  | First-order filter with 6 dB/octave                                                  | First-order filter with 6 dB/octave                                                        |
| High-cutoff frequency (low-pass)/time constant | 1,000 Hz                                                                             | 1,000 Hz / 250 Hz (switchable for the resolutions 0.1 μV / 0.5 μV per bit)           | 1,000 Hz / 250 Hz (switchable for the resolutions 0.1 μV / 0.5 μV per bit)                 |
| Filter type                                    | Fifth-order Butterworth filter with 30 dB/octave                                     | Fifth-order Butterworth filter with 30 dB/octave                                     | Fifth-order Butterworth filter with 30 dB/octave                                           |
| Measuring range                                | ±3.28 mV                                                                             | ±3.28 mV / ±16.384 mV (switchable)                                                   | ±3.28 mV / ±16.384 mV (switchable)                                                         |
| Resolution                                     | 0.1 μV per bit                                                                       | 0.1 μV / 0.5 μV per bit (switchable)                                                 | 0.1 μV / 0.5 μV per bit (switchable)                                                       |
| Power Supply                                   | PowerPack (external rechargeable battery) or Mains Power Supply for BrainAmp         | PowerPack (external rechargeable battery) or Mains Power Supply for BrainAmp         | PowerPack (external rechargeable battery) or Mains Power Supply for BrainAmp               |
| Current consumption (in operation)             | Max. 110 mA                                                                          | Max. 130 mA                                                                          | Max. 120 mA                                                                                |
| Current consumption (in standby)               | Typically 7 mA                                                                       | Typically 7 mA                                                                       | Typically 7 mA                                                                             |
| Amplitude accuracy                             | ±2%                                                                                  | ±2%                                                                                  | ±2%                                                                                        |
| Bit width of the A/D converter (EEG and AUX)   | 16 bit                                                                               | 16 bit                                                                               | 16 bit                                                                                     |
| Sampling rate                                  | 5 kHz per channel                                                                    | 5 kHz per channel                                                                    | 5 kHz per channel                                                                          |

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|-------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------|
| DC offset tolerance                 | ±300 mV                                                                | ±300 mV                                                                | ±300 mV                                                             |
| Signal transmission                 | Optically coupled using duplex fiber optic cables                      | Optically coupled using duplex fiber optic cables                      | Optically coupled using duplex fiber optic cables                   |
| Operating time between charges      | Typically 30 hours with one amplifier, 15 hours with two amplifiers    | Typically 30 hours with one amplifier, 15 hours with two amplifiers    | Typically 30 hours with one amplifier, 15 hours with two amplifiers |
| Dimensions (H x W x D)              | Approx. 68 mm x 160 mm x 187 mm                                        | Approx. 68 mm x 160 mm x 187 mm                                        | Approx. 68 mm x 160 mm x 187 mm                                     |
| Weight                              | Approx. 1.1 kg                                                         | Approx. 1.1 kg                                                         | Approx. 1.1 kg                                                      |
| Integrated impedance measurement    | Present; measurement includes ground electrode and reference electrode | Present; measurement includes ground electrode and reference electrode | Present; no measurement of ground electrode and reference electrode |
| Deblocking function                 | Present                                                                | Present                                                                | Present                                                             |
| Blocking of unused channels         | Present                                                                | Present                                                                | Present                                                             |
| Suitable for use in MR scanner room | No                                                                     | No                                                                     | No                                                                  |