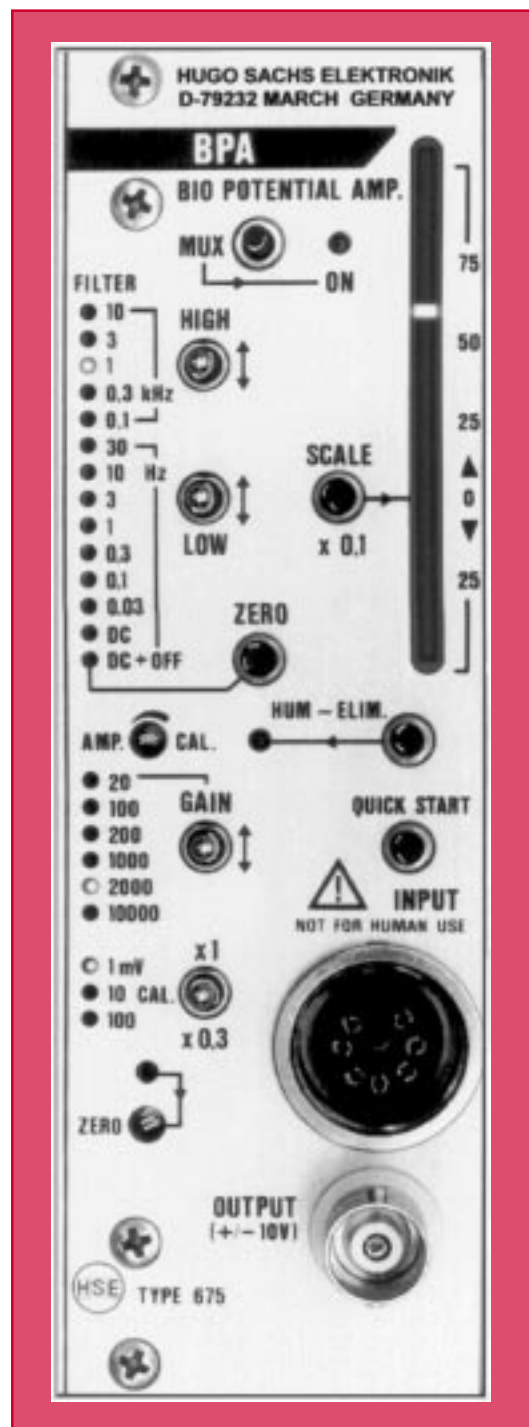


## HSE-Harvard Biopotential Amplifier Module (BPA)

- Universal biopotential preamplifier for ECG, EMG, EEG, ENG, MAP
- Transducers (e.g., pressure, force) can also be connected
- Bar graph display for visualizing dynamic signals
- External isolated preamplifier available

The HSE-Harvard Biopotential Amplifier module (BPA) is used to amplify ECG, EMG, EEG, ENG biopotentials in the PLUGSYS system. It can also be used with strain gauge transducers like the HSE-Harvard\* isometric transducers, see page Inn. The BPA amplifier module is a non-isolated amplifier (i.e. there is no potential separation between sensing electrodes and circuit ground of the PLUGSYS measuring system). It is designed specifically for physiological and pharmacological animal experiments. For applications where potential separation is required, a headstage with an isolation amplifier circuit IPH is available.



### Specifications

<b>Input</b>	Direct for biological signals (ECG, EMG, EEG, ENG) and for strain gauge bridge transducers
<b>Input Impedance</b>	Higher than 100 MOhm
<b>Input Bias Current</b>	30 nA Max.
<b>Input Capacity</b>	1.5 nF
<b>Input Circuit</b>	Differential amplifier with protection circuit against static discharges and 15 kHz input filter for H.F. suppression
<b>Signal Input</b>	8-pin binder (Amphenol) socket with screw lock; pin connections correspond to those of standard 3-pin ECG input cable with binder (Amphenol) plug
<b>Signal Output</b>	<ol style="list-style-type: none"> <li>1. Internally through system bus of PLUGSYS measuring system; signal output is assigned to connecting lines AV-1 to AV-16 through jumper</li> <li>2. On front panel through BNC socket <math>\pm 10</math> V with output impedance of 100 <math>\Omega</math></li> </ol>
<b>Analog Indication</b>	Through LED bar graph +13/-7 LEDs for monitoring applied signal; display sensitivity can be changed by key from +10/-5 V to +1/-0.5 V
<b>Transducer Supply</b>	5 V as bridge supply for strain gauge transducers and supply for external amplifiers (headstages)
<b>Gain</b>	20x, 100x, 200x, 1000x, 2000x and 10 000x selected by switch, can be varied by multi-turn trimmer within range of 10 to 100 % (based on current amplification setting)
<b>Electrical Calibration</b>	CAL automatic calibration steps operated by zero key, for transducer calibration and evaluation of input signal; calibration voltage 0.3, 1, 3, 10, 30, 100 mV is changed automatically to suit amplification setting
<b>Frequency Range</b>	D.C. to 10 kHz (-3 dB)
<b>High-Pass Filter</b>	12 settings, range 0.03 Hz to 10 kHz (-3 dB)
<b>Low-Pass Filter</b>	10 settings, range d.c. to 100 Hz (-3 dB)
<b>Filter Indication</b>	Settings of high-pass and low-pass filters are indicated as frequency pass band using LED line on front panel
<b>Notch Filter</b>	(HUM-ELIMINATION) Blocking filter can be switched in by pressing key to suppress interference from 50 (60) Hz main power supply
<b>Quick Start</b>	Rapid discharge of coupling capacitors (e.g., on ECG) by pressing key
<b>Auto Zero</b>	Automatic zero adjustment by pressing key
<b>Manual Zero</b>	Manual zero adjustment for correcting high input offset voltages which exceed automatic adjustment range of Auto Zero
<b>Dimensions, H x W x D</b>	128.7 x 40.5 x 220 mm (5.1 x 1.6 x 8.7 in)
<b>PLUGSYS Width*</b>	2 slot units
<b>Connector</b>	DIN 41612 96-pin VG (PLUGSYS system bus)
<b>Power Supply</b>	5 V 1.2 A from PLUGSYS system bus
<b>Weight</b>	0.5 kg (1.1 lbs)

### Catalog No.

### Product

CGS 8401.71	BPA Biopotential Amplifier Module
CGS 8402.71	Input Cable for Electrophysiological Signals
CGS 8403.71	Transducer Adapter Cable for BPA