

**Top Quality for
Field Testing, Process Monitoring, and Laboratory**

Acoustic Emission Preamplifiers

The Vallen AEP series preamplifiers are designed for the AE measurement systems of the Vallen AMS/AMSY series. Various models have been designed to match all kinds of AE applications regarding bandwidth, gain, etc. The AEP series comprises also models with incorporated sensor. Sensors with integrated preamplifiers are also available. There are preamplifiers with fixed and programmable gain.

Most models can pass-through a calibration pulse to the crystal, for automatic sensor coupling verification. Only high quality components have been chosen, providing stable operating parameters as well as highest possible signal-to-noise-ratios. The rugged BNC/BNO connectors and the strong aluminum cases make them well suited for field testing and laboratory use.



Think AE - think Vallen ! user friendly, reliable, up to date

AEP4 / AEP4-H

compact · robust · wide-band
low-noise · 400V_{PP} pulse-through

The AEP4 is a compact preamplifier optimized for the Vallen AE systems of the AMS/AMSY series, with two selectable gain settings and a wideband response from 2,5 kHz to 3 MHz (AEP4-H: 20 kHz to 3 MHz). This general purpose preamplifier supports single ended sensors and is equipped with a calibration bypass. The 28V_{DC} voltage is supplied via the signal line connecting the AEP4 (-H) to the AMS/AMSY systems.



AEP4 / AEP4-H - Specifications:

Preamplifier gain:	34 dB or 40 dB (jumper-selectable) into 50 Ohm
Bandwidth (-3 dB):	AEP4: 2,5 kHz to 3 MHz (1 V _{PP}) AEP4: 2,5 kHz to 1 MHz (10 V _{PP}) AEP4-H: 20 kHz to 1 MHz (10 V _{PP})
Preamp input impedance:	50 MOhm parallel 22 pF
Power supply:	28 V _{DC} 24 mA (no signal), 64 mA (max. signal), fed-in via signal cable
Calibration bypass:	For up to 400 V _{PP} , suited for the AMS/AMSY series
Output connector:	BNC
Output range:	10 V _{PP} into 50 Ohm
Input connector:	BNC
Input range:	100 mV _{PK} at 34 dB gain 50 mV _{PK} at 40 dB gain
Dimensions & weight:	H x W x L: 35 x 60 x 65 mm (L + 2x 18 mm BNC), 200 g
Temperature range:	5°C to 105°C
Noise (Peak (5 s)/RMS) at 50 Ohm input:	12,9 dB _{AE} / 0,67 μV _{RMS} at 95-300 kHz 17,6 dB _{AE} / 1,40 μV _{RMS} at 95-850 kHz
Noise (Peak (5 s)/RMS) at 330 pF input:	11,6 dB _{AE} / 0,62 μV _{RMS} at 95-300 kHz 16,6 dB _{AE} / 1,20 μV _{RMS} at 95-850 kHz
Noise (Peak (5 s)/RMS) at VS150-M input:	21,2 dB _{AE} / 1,90 μV _{RMS} at 95-300 kHz 23,0 dB _{AE} / 2,48 μV _{RMS} at 95-850 kHz
Filters:	To be located in subsequent measurement circuits (AMS/AMSY series)

AEP4-IS

compact · robust · wide-band
integrated sensor · magnet holder

The AEP4-IS is based on the AEP4, but has three strong magnets at its bottom and can house a sensor (spring loaded). It is available for sensor models with -M and -H case, e.g. VS150-M or VS45-H (order separately). The sensor can easily be replaced in case of a defect. The AEP4-IS delivers up to 11 dB more signal amplitude than preamplifiers with bipolar input and 1,2m sensor cable, due to the short internal cable and the AEP4 technology input stage. Sensor, preamplifier and magnet holder form a compact unit.



AEP4-IS - Specifications:

Preamplifier gain:	34 dB (40 dB on request) into 50 Ohm
Bandwidth (-3 dB):	2,5 kHz to 3 MHz (1 V _{PP}) 2,5 kHz to 1 MHz (10 V _{PP})
Preamp input impedance:	50 MOhm parallel 22 pF
Power supply:	28 V _{DC} 24 mA (no signal), 64 mA (max. signal), fed-in via signal cable
Calibration bypass:	For up to 400 V _{PP} , suited for the AMS/AMSY series
Output connector:	BNC
Output range:	10 V _{PP} into 50 Ohm
Input connector:	Internal Microdot, no external access
Input range (internal):	100 mV _{PK} at 34 dB gain 50 mV _{PK} at 40 dB gain
Dimensions & weight:	H x W x L: 35 x 60 x 65 mm (L + 18 mm BNC), 270 g (with -M case sensor)
Temperature range:	5°C to 105°C
Noise (Peak (5 s)/RMS) at VS150-M input:	21,2 dB _{AE} / 1,90 μV _{RMS} at 95-300 kHz 23,0 dB _{AE} / 2,48 μV _{RMS} at 95-850 kHz
Filters:	To be located in subsequent measurement circuits (AMS/AMSY series)
Magnet hold-down force:	3 x 60 N
Sensor hold-down force:	10 N (spring loaded)
Molding:	Internal electronics protected by epoxy molding

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AEP4H-ISTB + VS30-V

*compact · robust · low noise
pulse-through preamplifier-sensor
optimized for tank bottom testing*

The AEP4H-ISTB is a preamplifier specifically designed for the high sensitivity requirements of tank bottom tests: It is a low-noise preamplifier with 46 dB gain that can house a VS30-V or VS75-V sensor (spring loaded). This perfect combination for testing the tank floors of storage tanks can be easily mounted due to three strong magnets on the bottom. Sensor (order separately), preamplifier and magnet holder form a compact unit.



AEP4H-ISTB - Specifications:

Preamplifier gain:	46 dB into 50 Ohm
Bandwidth (-3 dB):	20 kHz to 1 MHz (10 V _{pp})
Preamp input impedance:	50 MOhm parallel 22 pF
Power supply:	28 V _{DC} 24 mA (no signal), 64 mA (max. signal), fed-in via signal cable
Calibration bypass:	For up to 400 V _{pp} , suited for the AMS/AMSY series
Output connector:	BNC
Output range:	10 V _{pp} into 50 Ohm
Input connector:	Internal Microdot, no external access
Input range (internal):	25 mV _{PK} at 46 dB gain
Dimensions & weight:	H x W x L: 60 x 57 x 65 mm (L + 18 mm BNC), 370 g (incl. VS30-V)
Temperature range:	-5°C to 80°C
Noise (Peak (5 s)/RMS) at VS30-V input:	2,9 dB _{AE} / 0,21 μV _{RMS} at 25-45 kHz 22,9 dB _{AE} / 2,73 μV _{RMS} at 20-300 kHz
Filters:	To be located in subsequent measurement circuits (AMS/AMSY series)
Magnet hold-down force:	3 x 95 N
Sensor hold-down force:	10 N (spring loaded)
Molding:	Internal electronics protected by epoxy molding

AEP3

*differential and single ended input
very sharp filter modules
programmable gain*

The AEP3 is the most flexible preamplifier of the AEP series. Depending on the application, different frequency ranges can be selected using sharp and easy-to-exchange filter modules. The AEP3 supports both, single ended and differential sensor input and its gain is programmed via software or adjusted by jumper settings. The AEP3 is very flexible due to the many options. The AEP3 can be used with the AMS/AMSY series or stand alone. For stand alone use, a power supply circuit is recommended as shown on the next page.



AEP3 - Specifications:

Preamplifier gain:	Software selectable to 34, 37, 40, 43, 46, or 49 dB (can also be defined by jumper), into 50 Ohm
Bandwidth (-3 dB):	Defined by plug-in filter modules (easily exchangeable), 5 kHz to 2 MHz when using dummy filter modules
Preamp input impedance:	10 kOhm parallel 15 pF
Power supply:	28 V _{DC} 22 mA (no signal), 60 mA (max. signal), fed-in via signal cable
Calibration bypass:	For up to 400 V _{pp} , suited for the AMS/AMSY series
Output connector:	BNC
Input connectors:	BNC (single ended), BNO (differential), selected by manual switch
Input range:	100 mV _{PK} at 34 dB gain 17,7 mV _{PK} at 49 dB gain
Dimensions & weight:	H x W x L: 58 x 79 x 174 mm (W + 18 mm BNC), 800 g
Temperature range:	5°C to 65°C
Noise (Peak (5 s)/RMS) at 50 Ohm input:	12,8 dB _{AE} / 0,93 μV _{RMS} at 95-300 kHz 20,2 dB _{AE} / 1,75 μV _{RMS} at 95-850 kHz
Noise (Peak (5 s)/RMS) at 330 pF input:	17,4 dB _{AE} / 0,93 μV _{RMS} at 95-300 kHz 21,5 dB _{AE} / 2,00 μV _{RMS} at 95-850 kHz
Noise (Peak (5 s)/RMS) at VS150-M input:	19,5 dB _{AE} / 1,95 μV _{RMS} at 95-300 kHz 22,6 dB _{AE} / 2,40 μV _{RMS} at 95-850 kHz
Filters: High pass modules:	54 dB/octave (9 th order), one frequency of: 17, 20, 25, 30, 35, 40, 50, 65, 75, 85, 95, 110, 125, 140, 160, 180, 230, 300, 340, 400, 520, 600 kHz
Filters: Low pass modules:	30 dB/octave (5 th order), one frequency of: 310, 330, 380, 440, 550, 630, 800, 1000, 1350, 2000 kHz

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Further information to our preamplifiers:

AEP4 Technology

The AEP4 has been designed as low noise preamplifier, optimised for AE measurements with the Vallen-Systeme hardware.

The Output BNC-connector is also used for:

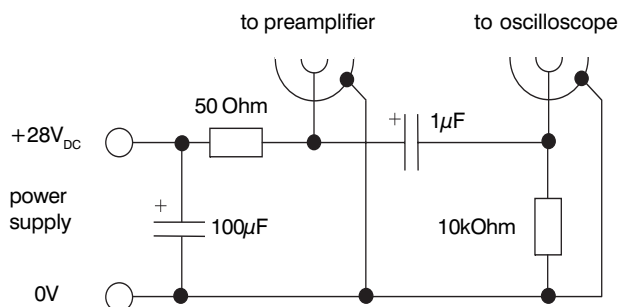
- feeding in the DC power-supply.
- setting the preamplifier into calibration mode.
- input of the Calibration Pulse to be sent to the sensor.
- transfer of programmable gain (AEP3 only).

Conditions of noise measurement:

Sensor connected to preamplifier input over 1 m sensor cable, filter plug-ins 95 kHz to 1 MHz (unless other information is given), amplifying the preamplifier output by 60 dB (0,03-2MHz) dividing the measured result by the total gain. Values are typical for the given model.

Power-Supply:

All Vallen-Systeme preamplifiers can be used with the AMS/AMSY systems or stand alone. For stand alone use, a 28 V_{DC} power supply circuit as shown below to decouple the AE-signal is recommended.



AE-Sensors with integrated preamplifier

AE-Sensors with integrated preamplifier and BNC-connector

VS150-RI /-RIC /-RTIC

The VS150-RI /-RIC /-RTIC sensor is more and more popular over the years for a variety of field and laboratory applications. Due to its high sensitivity and compactness it is used by many AE specialists. The VS150-RIC /-RTIC is a very sensitive AE-sensor with integrated preamplifier and calibration bypass. It is optimized for performing field tests on pressure vessels, piping systems, and other structures. It is able to drive long cables (like the AEP3/AEP4 preamplifiers).

Model-Case	Freq. range	Peak freq.	Size (mm)
VS150-RIC	100-450 kHz 34 dB gain, calibration bypass	150 kHz	D29 x H32
VS150-RI	100-450 kHz 40 dB gain, no calibration bypass	150 kHz	D29 x H32
VS150-RTIC	100-450 kHz 34 dB gain, calibration bypass, top BNC	150 kHz	D29 x H32

Noise (Peak (5 s)/RMS): 22,9 dB_{AE} / 2,80 µV_{RMS} at 95-300 kHz

VS375-RIC

The VS375-RIC is the optimum selection, when the 150kHz signal is contaminated by mechanical noise. It is ideally suited to detect crack-growth signals in noisy environments. The VS375-RIC is a high sensitivity AE-sensor with integrated preamplifier and calibration bypass. It is optimized for performing field tests on pressure vessels, piping systems, and other structures when lower frequency noise is present. It is able to drive long cables (like the AEP3/AEP4 preamplifiers).

Model-Case	Freq. range	Peak freq.	Size (mm)
VS375-RIC	250-700 kHz 34 dB gain, calibration bypass	375 kHz	D29 x H32

Noise (Peak (5 s)/RMS): 22,6 dB_{AE} / 2,90 µV_{RMS} at 95-850 kHz

VS900-RIC

The VS900-RIC is a high sensitivity **wideband** AE-sensor with integrated preamplifier and calibration bypass. It is optimized for applications requiring sensitivity from 100-900kHz. It is able to drive long cables (like the AEP3/AEP4 preamplifiers).

Model-Case	Freq. range	Peak freq.	Size (mm)
VS900-RIC	100-900 kHz 34 dB gain, calibration bypass	multiple	D29 x H32

Noise (Peak (5 s)/RMS): 22,6 dB_{AE} / 2,45 µV_{RMS} at 95-850 kHz

For more information please see our documentation 'AE-Sensor Frequency Response' and 'AE-Sensor Overview'.

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ISO9001 certified by TÜV CERT

Represented by:

Specifications are subject to change as product developments are made.

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