

Acoustic Emission Sensors and Preamplifiers

Specification

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Specifications are subject to change as product developments are made.

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Revision Record

Date	Changes
2022-08	new sensors added: SHM-MP1, VS150-F, VS150-RSC-V2, VS30-SI-V2-0dB. VS375-LT-V2 sensor removed: VS150-RIC (replaced by VS150-RSC) AEP3N: available bandpass and ordering code added. For many sensors datasheets exchanged because of new pictures.
2021-11	Contact address updated

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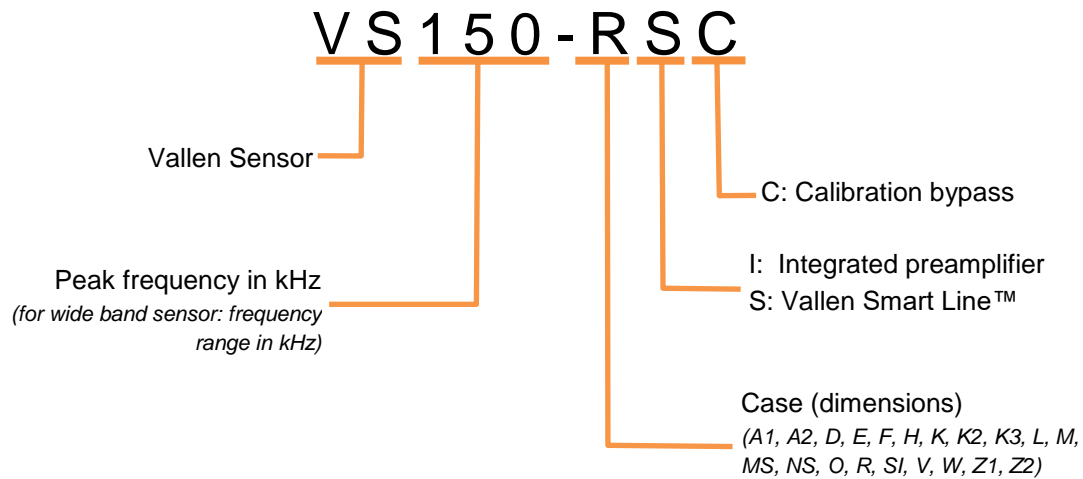
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1. AE Sensor's Product Code

Most Vallen Sensors are named systematically by its peak frequency and information about the case type and preamplifier information. An exception is the VS900-xyz where the number in the code indicates the bandwidth in which it is most sensitive.

Code convention:



Some sensor codes show an extension like “-V2” indicating a certain variant of the sensor type or e.g. “-34dB” to indicate the gain of an integrated preamplifier.

Third party sensors are labeled differently; these sensors are AExxxx, M31 and M58.

2. Important Information for Your Safety

Read the instructions carefully and follow them in order to safely operate the equipment and to maintain safety throughout its usage. Always make sure that the equipment is used in the intended way. Keep the instructions available for later usage.

Do not operate damaged equipment. Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, remove power and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to a Vallen Systeme GmbH sales and service office for service and repair to ensure that safety features are maintained.

Only use accessories that are approved by Vallen Systeme GmbH.

Always make sure that you comply to all regulations at the site of installation.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

Damaging of AE-sensor

An AE-sensor can get damaged when it is not operated within specified limits or handled carelessly. The function of the AE-sensor may be compromised or it may even be inoperable although its appearance e.g. housing, connector or wear plate do not indicate any damage.

Risk

A damaged- or defective AE-sensor may not respond in the intended and expected way to critical Acoustic Emission. This can lead to potentially dangerous situations for the operator, uninvolved third parties and to damage of object under test or objects in its vicinity.

How to avoid the risk of damaging an AE-sensor:

- Do not store, transport or operate the sensor outside its specified environmental conditions
- Do not drop the AE-sensor and handle it with care
- Transport AE-sensors only in the boxes provided by Vallen Systeme

How to avoid using a non-functional AE-sensor:

- Do not use an AE-sensor that is visibly damaged.
- Check the function and response of an AE-sensor prior to an inspection or AE-test by the use of controlled artificial sources
- Check the function and response of an AE-sensor in regular intervals or when suspected to be damaged or to have undergone severe environmental conditions
- Use testing procedures which are based on point location of AE sources. Point location of AE sources requires that an area is monitored by more than just one sensor. Neighbouring sensors can detect AE sources in the vicinity of a failed sensor.

3. Overview of AE Sensors

3.1. Vallen Smart Line AE Sensor

AE-sensor Model	Freq. Range [kHz]	f _{Peak} [kHz]	Size DxH [mm]	Weight [g]	Wear Plate	Temp. Range [°C]	Connector	Capacity [pF]	Int. pre.
VS75-SSC-34dB	30-120	75	28.6 x 51.8	162	Ceramics	-5 to +85	BNC		y
VS150-RSC	100-450	150	28.6 x 31.5	81	Ceramics	-40 to +85	BNC		y
VS150-RSC-V2	100-450	150	28.6 x 31.5	81	Ceramics	-40 to +85	SMA		y
VS900-RSC	100-900	350	28.6 x 31.5	80	Ceramics	-40 to +85	BNC		y

3.2. Standard Environment AE Sensors

AE-sensor Model	Freq. Range [kHz]	f _{Peak} [kHz]	Size DxH [mm]	Weight [g]	Wear Plate	Temp. Range [°C]	Connector	Capacity [pF]	Int. pre.
VS12-E	7-58	12	20.3 x 59.0	154	Ceramic	-5 to +85	Microdot	159	n
VS30-V	25-80		20.3 x 37	69	Ceramics	-5 to +85	Microdot	140	n
VS30-SIC-46dB	25-80		28.6 x 51.8	170	Ceramics	-5 to +85	BNC		y
VS45-H	20-450	280	20.3 x 22	36	Ceramics	-20 to +100	Microdot	270	n
VS75-V	30-120	75	20.3 x 37	63	Ceramics	-5 to +85	Microdot	140	n
VS75-SSC-34dB	30-120	75	28.6 x 51.8	162	Ceramics	-5 to +85	BNC		y
VS75-SIC-34dB VS75-SIC-40dB	30-120	75	28.6 x 51.8	162	Ceramics	-5 to +85	BNC		y
VS75-SIC-V2	30-120	75	28.6 x 51.8	174	Stainless steel	-5 to +85	BNC		y
VS75-SI-40dB	30-120	75	28.6 x 51.8	161	Ceramics	-5 to +85	BNC		y
VS150-M	100-450	150	20.3 x 14.3	24	Ceramics	-50 to +100	Microdot	350	n
VS150-MS	100-450	150	20.3 x 14.3	24	Ceramics	-50 to +100	SMC	350	n
VS150-L	100-450	150	20.3 x 14.3	26	Stainless steel	-50 to +100	SMC	350	n
VS150-R	100-450	150	28.6 x 31.5	81	Ceramics	-40 to +85	BNC	350	n
VS150-K	100-450	150	20.3 x 22	45	Stainless steel	-50 to +100	SMC	350	n
VS150-RSC	100-450	150	28.6 x 31.5	81	Ceramics	-40 to +85	BNC		y

AE-sensor Model	Freq. Range [kHz]	f _{Peak} [kHz]	Size DxH [mm]	Weight [g]	Wear Plate	Temp. Range [°C]	Connector	Capacity [pF]	Int. pre.
VS150-RI	100-450	150	28.6 x 31.5	81	Ceramics	-40 to +85	BNC		y
VS370-A1	170-590	370	M7x0.75 x 13.5	3	Stainless steel	-40 to 125	SMC (top)	47	n
VS370-A2	170-590	370	8.5 x 13 M7x0.75 x 8.5	3.5	Stainless steel	-40 to 125	SMC (top)	47	n
VS370-A3	150-600	320	10.0 x 22.6 MF10x0.75	6.0	Stainless steel	-50 to 125	SMC (top)	36	n
VS375-M	250-700	375	20.3 x 14.3	21	Ceramics	-50 to +100	Microdot	390	n
VS375-RIC	250-700	375	28.6 x 31.5	80	Ceramics	-40 to +85	BNC		y
VS600-A1	390-850	600	M7x0.75 x 13.5	2.5	Stainless steel	-40 to 125	SMC (top)	109	n
VS600-A2	390-850	600	8.5 x 13 M7x0.75 x 8.5	3	Stainless steel	-40 to 125	SMC (top)	109	n
VS600-Z1	550-730	600	4.75 x 5.8	0.8 ¹ 20 ²	Ceramics	-10 to +110	SMA/BNC ³	200 ⁴	n
VS600-Z2	400-800	600	4.75 x 5.3	0.8 ¹ 20 ²	Stainless steel	-40 to +110	SMA/BNC ³	200 ⁴	n
VS700-D	150-800	600 - 800	7.0 x 11	1.5 ¹ 20 ²	Neodyne	-20 to +70	SMA/BNC ³	163 ⁴	n
VS900-M	100-900	350	20.3 x 14.3	22	Ceramics	-50 to +100	Microdot	540	n
VS900-RSC-34dB	100-900	350	28.6 x 31.5	80	Ceramics	-40 to +85	BNC		y
VS900-RIC	100-900	350	28.6 x 31.5	80	Ceramics	-40 to +85	BNC		y

¹ Weight without integral cable

² Weight with integral cable

³ SMA to BNC adapter included

⁴ Capacity with integral cable

3.3. Watertight AE Sensors

AE-sensor Model	Freq. Range [kHz]	f _{Peak} [kHz]	Size DxH [mm]	Weight [g]	Wear Plate	Temp. Range [°C]	Connector	Capacity [pF]	Int. pre.
VS30-SIC-V2-46dB	25-80		28.6 x 51.8	172	Ceramics	-5 to +85	SMA		y
VS150-F	100-450	150	22.3 x 18.2	27	Ceramics	-50 to +150	SMA	350	n
VS150-K2	100-450	150	20.3 x 22	56	Stainless steel	-40 to +100	SMC on 1 m integrated cable	350	n
VS150-K3	100-450	150	20.3 x 22	73	Stainless steel	-40 to +150	BNC on 1 m integrated cable	350	n
VS150-RSC-V2	100-450	150	28.6 x 31.5	81	Ceramics	-40 to +85	SMA		y
VS150-WIC-V01	100-450	150	32.0 x 48.0	184	Ceramics	-40 to +85	LEMO		y
VS375-WIC-V01	250-700	375	32.0 x 48.0	181	Ceramics	-40 to +85	LEMO		y
VS900-F	100-900	350	22.3 x 18.2	24.5	Ceramics	-50 to +150	SMA	540	n
VS900-WIC-V01	100-900	350	32.0 x 48.0	184	Ceramics	-40 to +85	LEMO		y

3.4. AE Sensors for hot/cold Surfaces

AE-sensor Model	Freq. Range [kHz]	f _{Peak} [kHz]	Size DxH [mm]	Weight [g]	Wear Plate	Temp. Range [°C]	Connector	Capacity [pF]	Int. pre.
VS160-NS	100-450	150	20.3 x 14.3	22	Ceramics	-50 to +180	SMC	350	n
VS375-LT-V2	250-700	375	20.3 x 17.5	12.5	Aluminum	-196 to +100	SMC	390	n

3.5. AE Sensors for Structural Health Monitoring

AE-sensor Model	Freq. Range [kHz]	f _{Peak} [kHz]	Size DxH [mm]	Weight [g]	Wear Plate	Temp. Range [°C]	Connector	Capacity [pF]	Int. pre.
SHM-MP1	25-80		160x110x70	680	Ceramics	-40 to +85	SMA		Y
VS30-SIC-V2-0dB	25-80		28.6 x 51.8	172	Ceramics	-40 to +85	SMA		y
VS30-SIC-0dB	25-80		28.6 x 51.8	170	Ceramics	-5 to +85	BNC		y

3.6. AE Sensors for Hazardous Areas

Vallen Systeme offers an intrinsically safe product family (ISAFE3). This product family is ATEX certified and consists not only of a family of AE-sensors but also of special signal isolator to fulfil all safety requirements for hazardous areas of zone 0, zone 1 or zone 2. For more details please see the 'Vallen ISAFE3 Operation Manual' or contact us at info@vallen.de.

3.7. Third Party AE Sensors

AE-sensor Model	Freq. Range [kHz]	f _{Peak} [kHz]	Size DxH [mm]	Weight [g]	Wear Plate	Temp. Range [°C]	Connector	Capacity [pF]	Int. pre.
AE1045S	100-1500	Flat	20 x 20	31	Ceramics	-20 to +80	Microdot	89	n
AE2045S	200-2500	Flat	20 x 20	31	Ceramics	-20 to +80	Microdot	140	n
AE104A	100-400	Flat	8 x 18	5	Ceramics	-20 to +80	Microdot	40	n
AE105A	450-1150	800	8 x 18	5	Ceramics	-20 to +80	Microdot	60	n
AE144A	100-500	200	8 x 18	5	Ceramics	-20 to +80	Microdot	30	n
AE204A	180-700	375	8 x 18	5	Ceramics	-20 to +80	Microdot	46	n
M31	300-800	750	3 x 3	0.2 ⁵	Ceramics	-20 to +80	Microdot / BNC ⁶	89 ⁷	n
M58	700-900	750 and 800	5 x 3	0.4 ⁵	Ceramics	-20 to +80	Microdot / BNC ⁶	260 ⁷	n

⁵ Weight without integral cable

⁶ Microdot to BNC adapter included

⁷ Capacity with integral cable

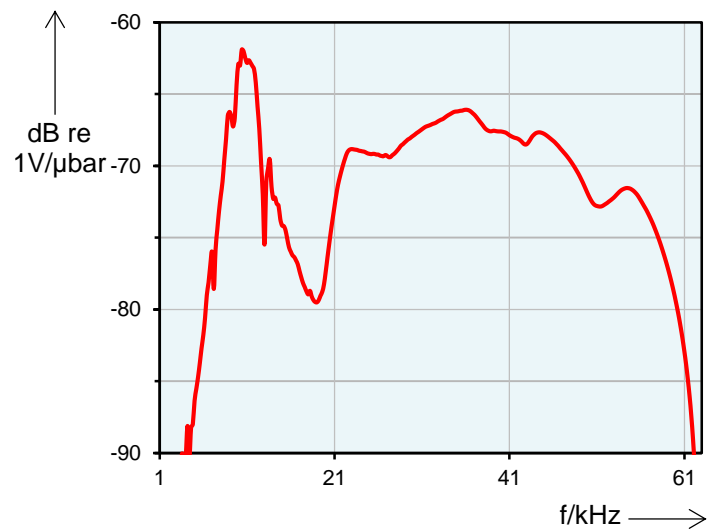
4. Datasheets

4.1. Datasheets of Standard Environment AE Sensors

VS12-E

The VS12-E is a passive piezoelectric AE sensor. The very low frequency response makes it especially suited for monitoring large objects, objects made of highly attenuating material or leakage. The VS12-E can be used for leak detection in pipelines and integrity testing of concrete structures.

Remark to frequency response curve below: cable used RG 178 / 0.3 m. VS12-E has 6 dB less sensitivity if used with 1.2 m long cable.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	7 to 58 (12)	Size (D x H) [mm]	20.3 x 59.0
Capacity [pF]	159	Weight [g]	154
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-5 to +85	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	Microdot
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

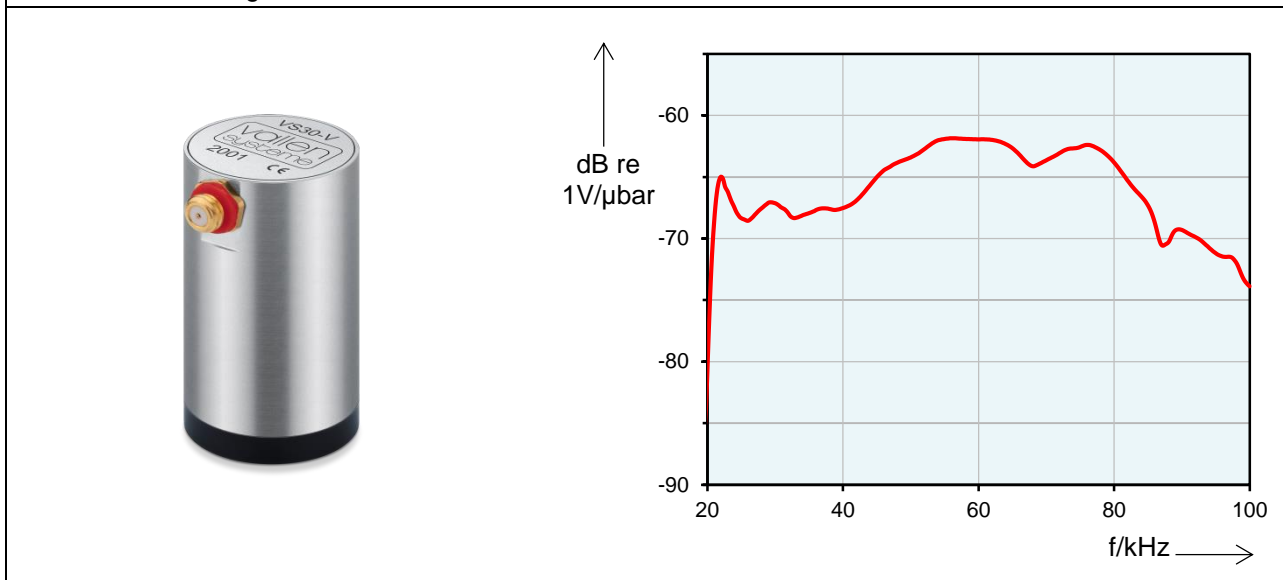
Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V5
Mounting Holder	MAG4E		

VS30-V

The VS30-V is a passive piezoelectric AE-sensor. The low frequency response makes it especially suited for monitoring large objects or objects made of highly attenuating material. The VS30-V can be used for tank floor corrosion and leak detection, leak detection in pipelines, partial discharge detection and integrity testing of concrete structures.

Remark to frequency response curve below: cable used RG 178 / 0.3 m. VS30-V has 6 dB less sensitivity if used with 1.2 m long cable.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	25 to 80	Size (D x H) [mm]	20.3 x 37.0
Capacity [pF]	140	Weight [g]	69
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-5 to +85	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	Microdot
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

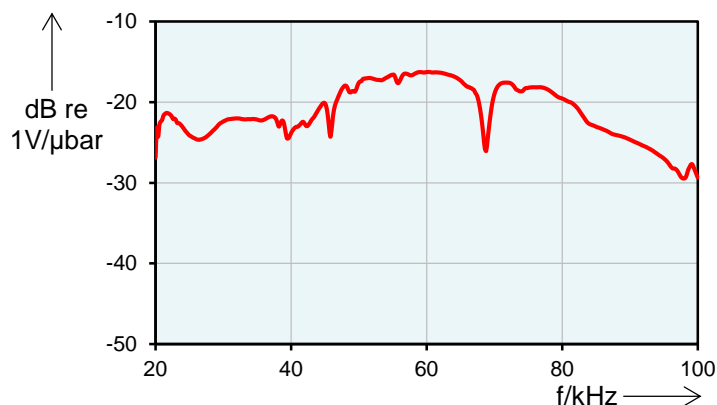
Accessories

Pre-amplifier	AEP5, AEP3N, AEP4H-ISTB	Sensor Cable	CBL-1-1M2-V5
Mounting Holder	MAG4V, AEP4H-ISTB		

VS30-SIC-46dB

The VS30-SIC-46dB is a piezoelectric AE-sensor with integrated preamplifier. The low frequency response makes it especially suited for monitoring large objects or objects made of highly attenuating material. The VS30-SIC-46dB can be used for tank floor corrosion and leak detection, leak detection in pipelines, partial discharge detection and integrity testing of concrete structures.

The integrated preamplifier has 46 dB gain and supports pulse through for automatic sensor testing. This sensor is also available with watertight design (VS30-SIC-V2-46dB).



Technical Specification

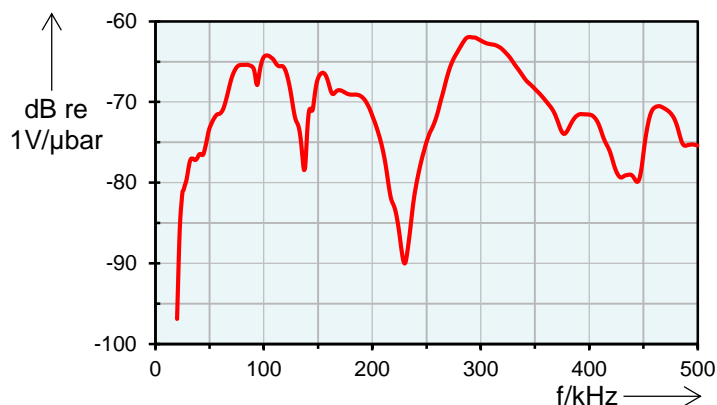
Frequency Range (f_{Peak}) [kHz]	25 to 80	Size (D x H) [mm]	28.6 x 51.8
Power Supply [V_{DC}]	28 ± 2	Weight [g]	170
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	46	Connector	BNC
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-5 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	18.5 @ 25 - 45 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	2.6 @ 25 - 45 kHz
Ingress Protection Rating	IP40		

Accessories

Mounting Holder	MAG4SI	Sensor Cable	CBL-1-xM-V1
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VS45-H

The VS45-H is a passive piezoelectric AE-sensor with a wide frequency response. Its frequency response is characterized by a peak at 280 kHz and can be used in the frequency range from 20 kHz to 450 kHz. It is a broad band response AE-sensor covering the low frequency and standard frequency range.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	20 to 450 (280)	Size (D x H) [mm]	20.3 x 22.0
Capacity [pF]	270	Weight [g]	36
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-20 to +100	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	Microdot
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

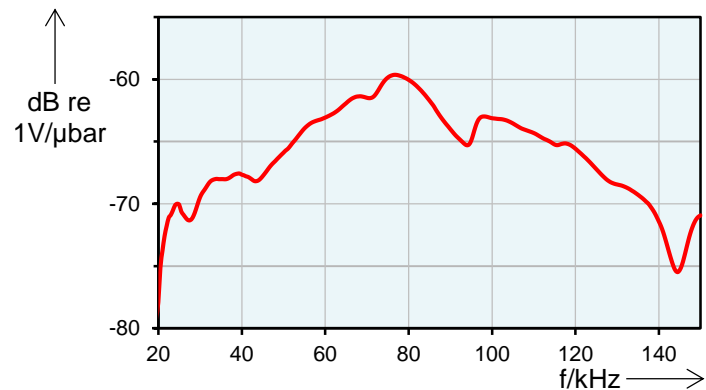
Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V5
Mounting Holder	MAG4H		

VS75-V

The VS75-V is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 75 kHz where it exhibits a resonance. The low frequency response makes it suited for monitoring large objects or objects made of highly attenuating material. The VS75-V can be used for integrity testing of bitumen coated pressure vessels and for detecting partial discharge.

Remark to frequency response curve below: cable used RG 178 / 0.3 m. VS75-V has 6 dB less sensitivity if used with 1.2 m long cable.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	30 to 120 (75)	Size (D x H) [mm]	20.3 x 37.0
Capacity [pF]	140	Weight [g]	63
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-5 to +85	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	Microdot
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

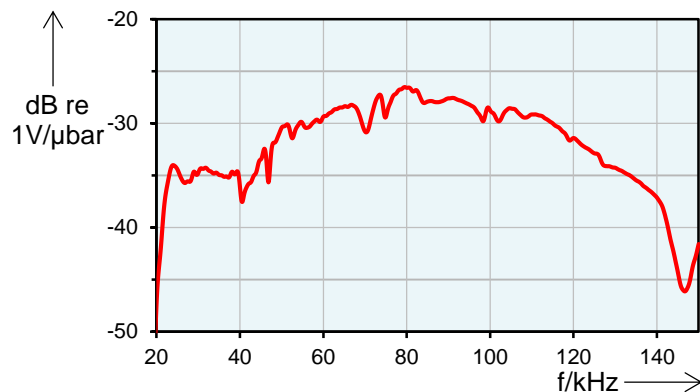
Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V5
Mounting Holder	MAG4V		

VS75-SSC-34dB

The VS75-SSC-34dB is an AE-sensor with integrated Vallen Smart Line™ preamplifier. Its frequency response is characterized by a peak at 75 kHz where it exhibits a resonance. The low frequency response makes it suited for monitoring large objects or objects made of highly attenuating material. The VS75-SSC-34dB can be used for integrity testing of bitumen coated pressure vessels and for detecting partial discharge. The integrated preamplifier has 34 dB gain and supports pulse through for automatic sensor testing. The VS75-SSC-34dB supports the Vallen Smart Line™ protocol. Vallen Smart Line™ products are supported since Release R2018.0726.

Vallen Smart Line™ features: sensor type, serial number and gain are automatically identified and read by the AE system.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	30 to 120 (75)	Size (D x H) [mm]	28.6 x 51.8
Power Supply [V_{DC}]	28 ± 2	Weight [g]	162
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes, Vallen Smart Line™	Wear Plate	Ceramics
Preamplifier Gain [dB]	34	Connector	BNC
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-5 to +85	Typ. Noise (max. 1/s) [dB_{AE Peak}]	29.2 @ 25 - 300 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	6.8 @ 25 - 300 kHz
Ingress Protection Rating	IP40		

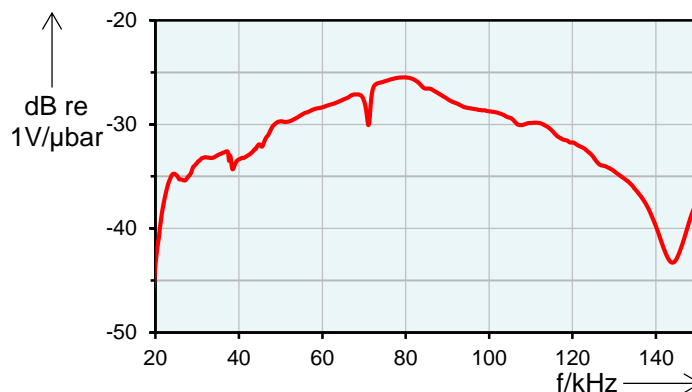
Accessories

Mounting Holder	MAG4SI	Sensor Cable	CBL-1-xM-V1
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VS75-SIC-34dB

The VS75-SIC-34dB is an AE-sensor with integrated preamplifier. Its frequency response is characterized by a peak at 75 kHz where it exhibits a resonance. The low frequency response makes it suited for monitoring large objects or objects made of highly attenuating material. The VS75-SIC-34dB can be used for integrity testing of bitumen coated pressure vessels and for detecting partial discharge.

The integrated preamplifier has 34 dB gain and supports pulse through for automatic sensor testing. This sensor is also available with Vallen Smart Line™ feature (VS75-SSC-34dB).



Technical Specification

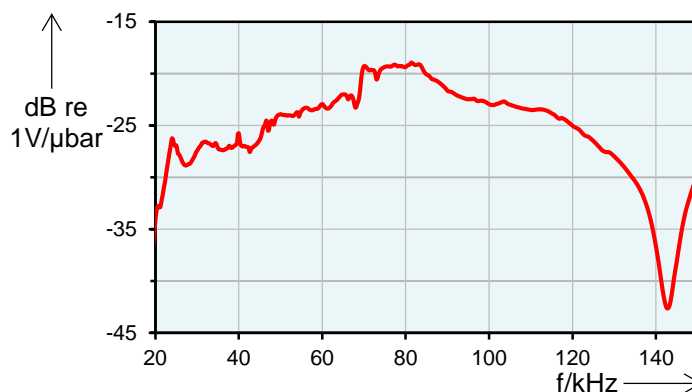
Frequency Range (f_{Peak}) [kHz]	30 to 120 (75)	Size (D x H) [mm]	28.6 x 51.8
Power Supply [V_{DC}]	28 ± 2	Weight [g]	162
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	34	Connector	BNC
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-5 to +85	Typ. Noise (max. 1/s) [dB_{AE Peak}]	29.2 @ 25 - 300 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	6.8 @ 25 - 300 kHz
Ingress Protection Rating	IP40		

Accessories

Mounting Holder	MAG4SI	Sensor Cable	CBL-1-xM-V1
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VS75-SIC-40dB

The VS75-SIC-40dB is a piezoelectric AE-sensor with integrated preamplifier. Its frequency response is characterized by a peak at 75 kHz where it exhibits a resonance. The low frequency response makes it suited for monitoring large objects or objects made of highly attenuating material. The VS75-SIC-40dB can be used for integrity testing of bitumen coated pressure vessels and for detecting partial discharge. The integrated preamplifier has 40 dB gain and supports pulse through for automatic sensor testing.



Technical Specification

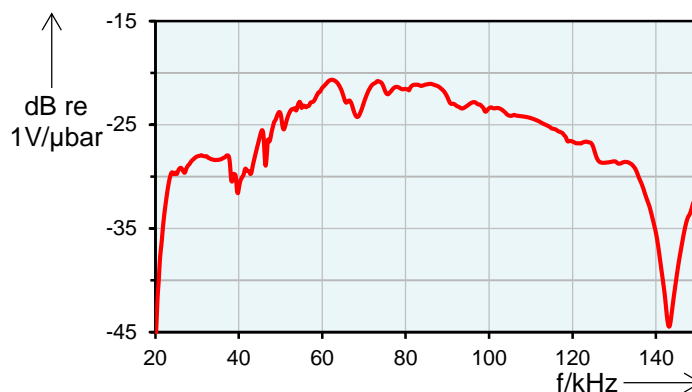
Frequency Range (f_{Peak}) [kHz]	30 to 120 (75)	Size (D x H) [mm]	28.6 x 51.8
Power Supply [V_{DC}]	28 ± 2	Weight [g]	162
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	40	Connector	BNC
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-5 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	29.5 @ 25 - 300 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	7.3 @ 25 - 300 kHz
Ingress Protection Rating	IP40		

Accessories

Mounting Holder	MAG4SI	Sensor Cable	CBL-1-xM-V1
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VS75-SIC-V2

The VS75-SIC-V2 is a piezoelectric AE-sensor with integrated preamplifier. Its frequency response is characterized by a peak at 75 kHz where it exhibits a resonance. The low frequency response makes it suited for monitoring large objects or objects made of highly attenuating material. The VS75-SIC-V2 can be used for integrity testing of bitumen coated pressure vessels and for detecting partial discharge. The VS75-SIC-V2 has a full metal housing that makes it especially suited for adhesively mounting it to a test object. The integrated preamplifier has 40 dB gain and supports pulse through for automatic sensor testing.



Technical Specification

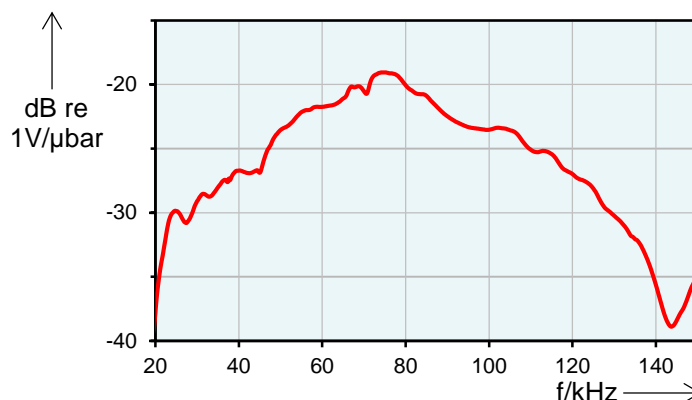
Frequency Range (f_{Peak}) [kHz]	30 to 120 (75)	Size (D x H) [mm]	28.6 x 51.8
Power Supply [V_{DC}]	28 ± 2	Weight [g]	174
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Stainl. Steel (1.4571/ 1.4404)
Preamplifier Gain [dB]	40	Connector	BNC
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-5 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	29.5 @ 25 - 300 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	7.3 @ 25 - 300 kHz
Ingress Protection Rating	IP40		

Accessories

Mounting Holder	MAG4SI	Sensor Cable	CBL-1-xM-V1
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VS75-SI-40dB

The VS75-SIC-40dB is a piezoelectric AE-sensor with integrated preamplifier. Its frequency response is characterized by a peak at 75 kHz where it exhibits a resonance. The low frequency response makes it suited for monitoring large objects or objects made of highly attenuating material. The VS75-SIC-40dB can be used for integrity testing of bitumen coated pressure vessels and for detecting partial discharge. The integrated preamplifier has 40 dB gain.



Technical Specification

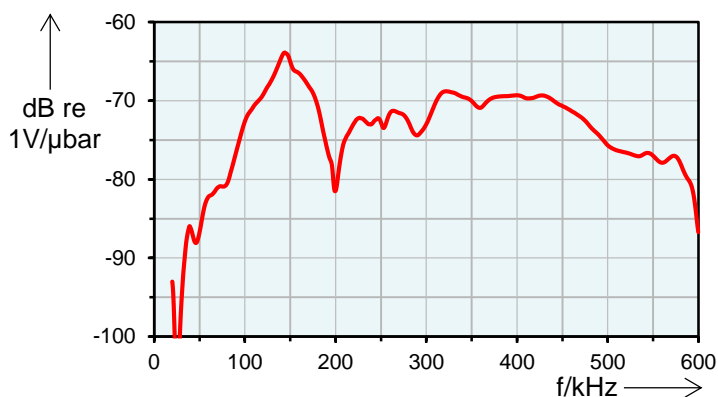
Frequency Range (f_{Peak}) [kHz]	30 to 120 (75)	Size (D x H) [mm]	28.6 x 51.8
Power Supply [V_{DC}]	28 ± 2	Weight [g]	161
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	40	Connector	BNC
Pulse Through	No	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-5 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	29.5 @ 25 - 300 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50Hz, 20 g	Typ. Noise [μV_{RMS}]	7.3 @ 25 - 300 kHz
Ingress Protection Rating	IP40		

Accessories

Mounting Holder	MAG4SI	Sensor Cable	CBL-1-xM-V1
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VS150-M

The VS150-M is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 150 kHz where it exhibits a resonance. It is suitable for almost all AE application and especially suited for integrity inspection of metallic pressure vessels.



Technical Specification

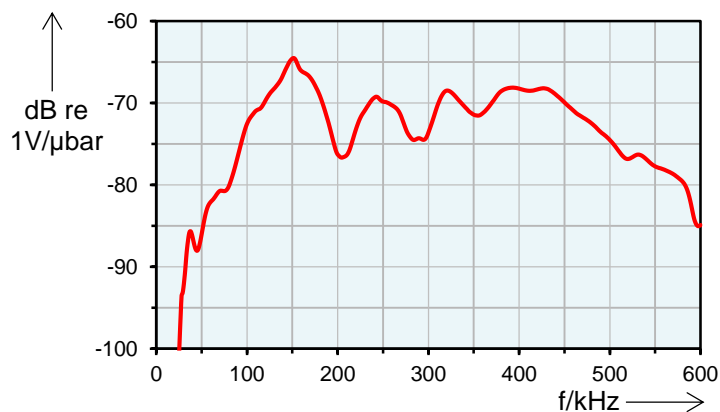
Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	20.3 x 14.3
Capacity [pF]	350	Weight [g]	24
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-50 to +100	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	Microdot
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V5
Mounting Holder	MAG4M		

VS150-MS

The VS150-MS is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 150 kHz where it exhibits a resonance. It is suitable for almost all AE application and especially suited for integrity inspection of metallic pressure vessels.



Technical Specification

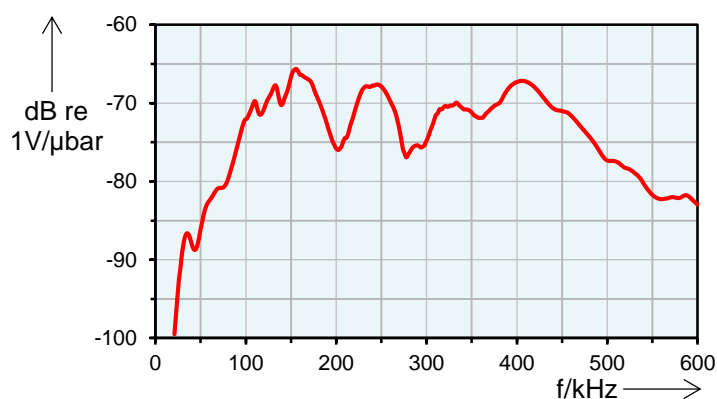
Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	20.3 x 14.3
Capacity [pF]	350	Weight [g]	24
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-50 to +100	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V15
Mounting Holder	MAG4M		

VS150-L

The VS150-L is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 150 kHz where it exhibits a resonance. It is suitable for almost all AE application. The VS150-L has a full metal housing that makes it especially suited for adhesively mounting it to a test object. In this respect it is suited for inspecting objects that have no ferro-magnetic surface such as composites and Al alloys.



Technical Specification

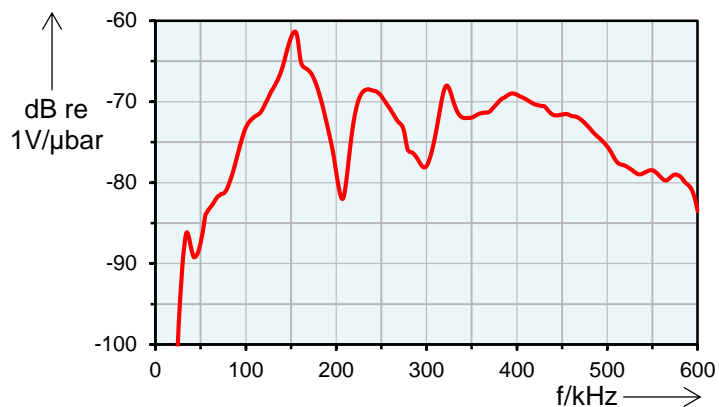
Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	20.3 x 14.3
Capacity [pF]	350	Weight [g]	26
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-50 to +100	Wear Plate	Stainl. Steel (1.4571/ 1.4404)
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V15
Mounting Holder	MAG4M		

VS150-R

The VS150-R is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 150 kHz where it exhibits a resonance. It is suitable for almost all AE application and especially suited for integrity inspection of metallic pressure vessels.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	28.6 x 31.5
Capacity [pF]	350	Weight [g]	81
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-40 to +85	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	BNC
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

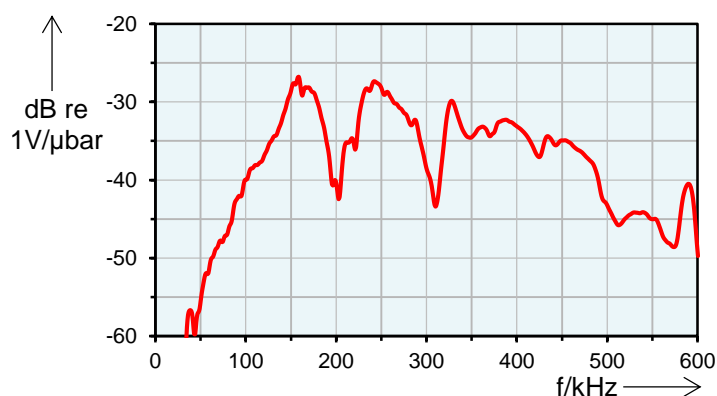
Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-xM-V1
Mounting Holder	MAG4R		

VS150-RSC

The VS150-RSC is a piezoelectric AE-sensor with integrated Vallen Smart Line™ preamplifier. Its frequency response is characterized by a peak at 150 kHz, where it exhibits a resonance. It is suitable for almost all AE application and especially suited for integrity inspection of metallic pressure vessels. The integrated preamplifier has 34 dB gain and supports pulse through for automatic sensor testing. The VS150-RSC supports the Vallen Smart Line™ protocol. Vallen Smart Line™ products are supported since Release R2018.0726.

Vallen Smart Line™ features: sensor type, serial number and gain are automatically identified and read by the AE system.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	28.6 x 31.5
Power Supply [V_{DC}]	28 ± 2	Weight [g]	81
Typ. Power [W]	0.8 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes, Vallen Smart Line™	Wear Plate	Ceramics
Preamplifier Gain [dB]	34	Connector	BNC
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	25.2 @ 95 - 300 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	5.0 @ 95 - 300 kHz
Ingress Protection Rating	IP40		

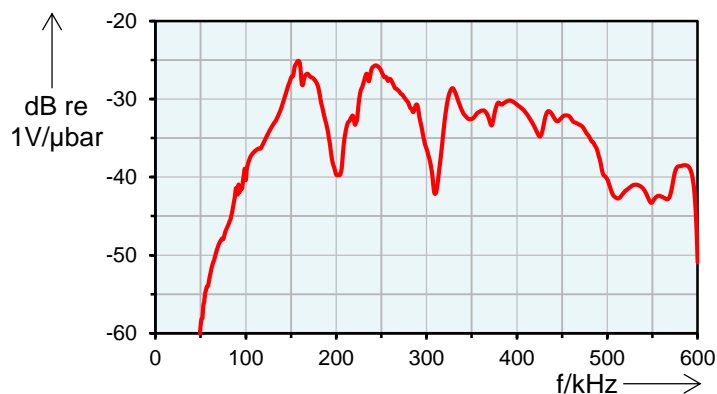
Accessories

Mounting Holder	MAG4R	Sensor Cable	CBL-1-xM-V1
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VS150-RI

The VS150-RI is a piezoelectric AE-sensor with integrated preamplifier. Its frequency response is characterized by a peak at 150 kHz where it exhibits a resonance. It is suitable for almost all AE application and especially suited for integrity inspection of metallic pressure vessels.

The integrated preamplifier has 40 dB.



Technical Specification

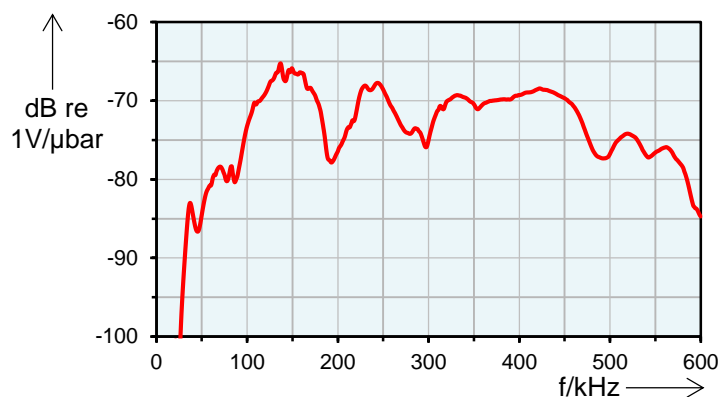
Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	28,6 x 31,5
Power Supply [V_{DC}]	28 ± 2	Weight [g]	80
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	40	Connector	BNC
Pulse Through	No	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	22.2 @ 95 - 300 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	3.0 @ 95 - 300 kHz
Ingress Protection Rating	IP40		

Accessories

Mounting Holder	MAG4R	Sensor Cable	CBL-1-xM-V1
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VS150-K

The VS150-K is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 150 kHz where it exhibits a resonance. It is suitable for almost all AE application. The VS150-K has a full metal housing and a watertight cap and it is rated IP54. The mechanical design makes it especially suited for adhesively mounting it to a test object.



Technical Specification

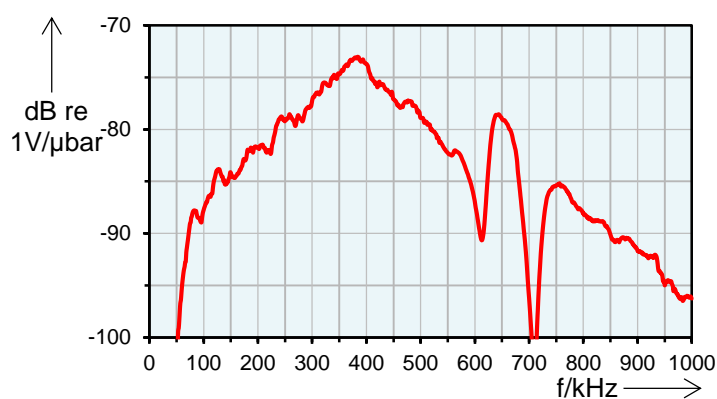
Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	20.3 x 22
Capacity [pF]	350	Weight [g]	45
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-50 to +100	Wear Plate	Stainl. Steel (1.4571/ 1.4404)
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC
Ingress Protection Rating	IP54 (with connected cable)	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V15
Mounting Holder	MAG4H		

VS370-A1

The VS370-A1 or -A2 is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 370 kHz where it exhibits a resonance. It is a small foot-print AE-sensor with a threaded housing and a top connector. The VS370-A* is intended for screwing it into a holding mechanism.



Technical Specification

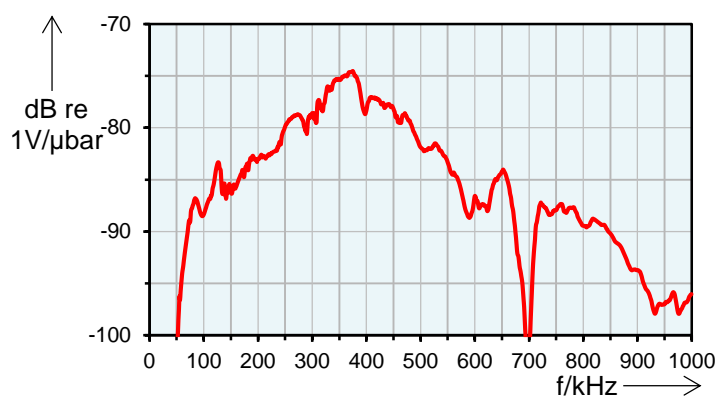
Frequency Range (f_{Peak}) [kHz]	170 to 590 (370)	Size (D x H) [mm]	7.0 x 13.5 (M7 x 0.75)
Capacity [pF]	47	Weight [g]	3
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-40 to +125	Wear Plate	Stainl. Steel (1.4571/ 1.4404)
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC (top)
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V15
Mounting Holder	MAG4A1		

VS370-A2

The VS370-A1 or -A2 is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 370 kHz where it exhibits a resonance. It is a small foot-print AE-sensor with a threaded housing and a top connector. The VS370-A* is intended for screwing it into a holding mechanism.



Technical Specification

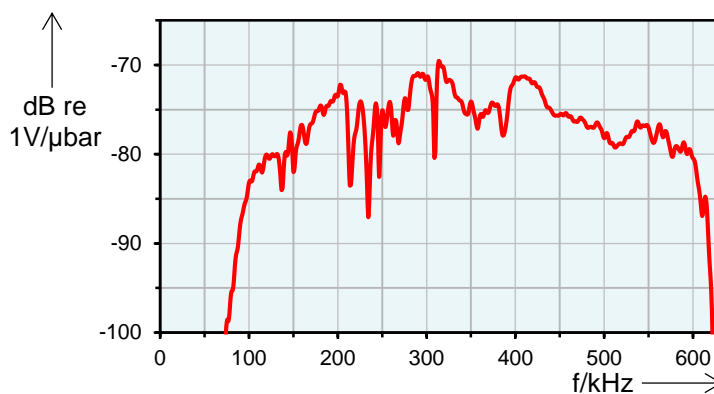
Frequency Range (f_{Peak}) [kHz]	170 to 590 (370)	Size (D x H) [mm]	8.5 x 13.0 (M7 x 0.75 x 8.5)
Capacity [pF]	47	Weight [g]	3.5
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-40 to +125	Wear Plate	Stainl. Steel (1.4571/ 1.4404)
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC (top)
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V15
Mounting Holder	MAG4A1		

VS370-A3

The VS370-A3 is a passive piezoelectric AE-sensor. It is a small foot-print AE-sensor with a threaded housing, top connector, and ceramic wear plate. The VS370-A3 is intended for screwing it into a holding mechanism.



Technical Specification

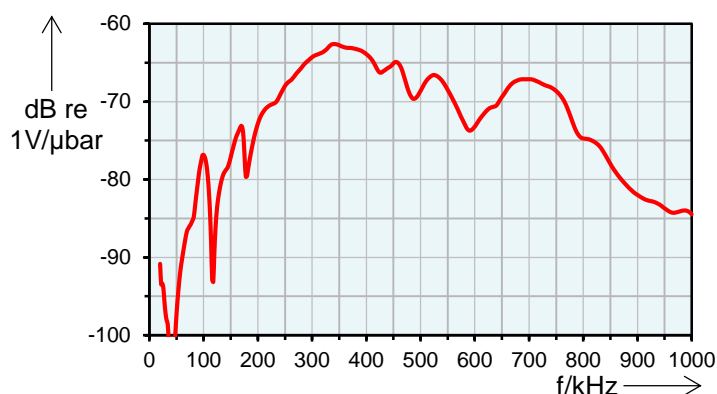
Frequency Range [kHz]	150 to 600	Size with connector (DxH) [mm]	10.0 x 22.6 (Thread MF10 x 0.75)
Capacity [pF]	36	Weight [g]	6
Integrated Preamp	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-50 to +125	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC (top)
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Preamp	AEP5H, AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V15
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VS375-M

The VS375-M is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 375 kHz where it exhibits a resonance. Its frequency response bridges the gap between standard frequency range and high frequency range. It is especially suited for integrity inspection of high energy piping in conjunction with using a waveguide.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	250 to 700 (375)	Size (D x H) [mm]	20.3 x 14.3
Capacity [pF]	390	Weight [g]	21
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-50 to +100	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	Microdot
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

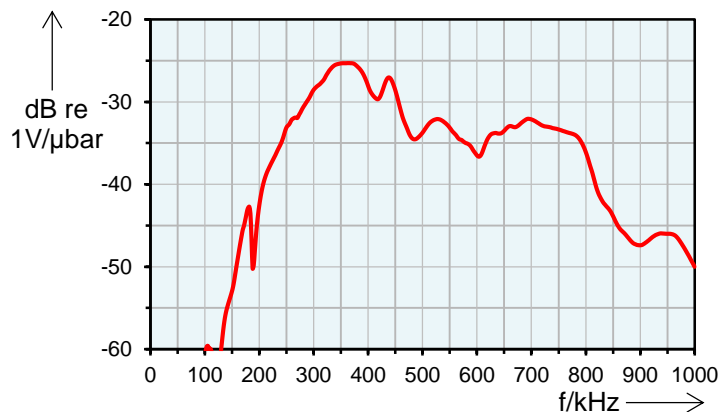
Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V5
Mounting Holder	MAG4M		

VS375-RIC

The VS375-RIC is a piezoelectric AE-sensor with integrated preamplifier. Its frequency response is characterized by a peak at 375 kHz where it exhibits a resonance. Its frequency response bridges the gap between standard frequency range and high frequency range.

The integrated preamplifier has 34 dB gain and supports pulse through for automatic sensor testing.



Technical Specification

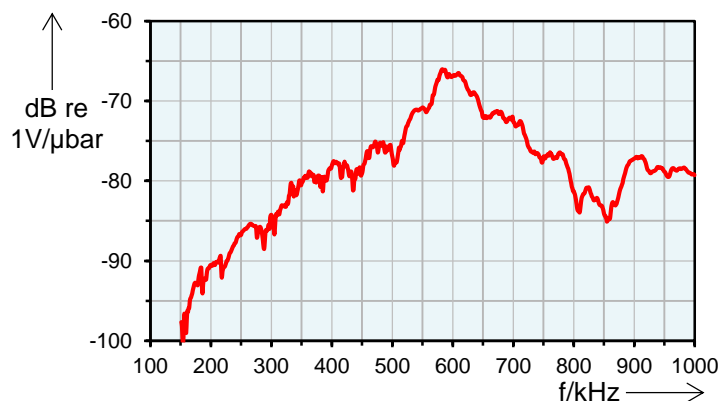
Frequency Range (f_{Peak}) [kHz]	250 to 700 (375)	Size (D x H) [mm]	28.6 x 31.5
Power Supply [V_{DC}]	28 ± 2	Weight [g]	80
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	34	Connector	BNC
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [dB_{AE Peak}]	28.0 @ 95 - 850 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	4.5 @ 95 - 850 kHz
Ingress Protection Rating	IP40		

Accessories

Mounting Holder	MAG4R	Sensor Cable	CBL-1-xM-V1
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VS600-A1

The VS600-A1 or -A2 is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 600 kHz where it exhibits a resonance. It is a small foot-print AE-sensor with a threaded housing and a top connector. The VS600-A* is intended for screwing into a holding mechanism. It is suitable for monitoring the crimping process.



Technical Specification

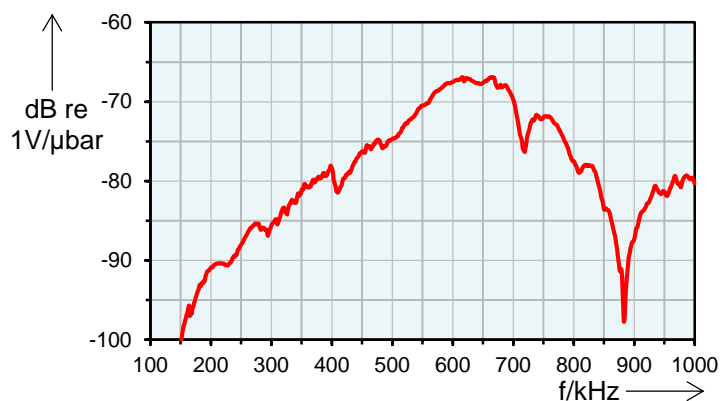
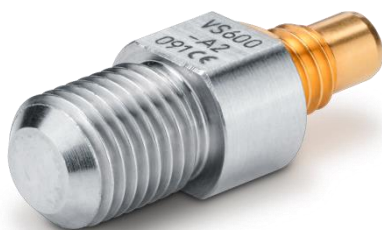
Frequency Range (f_{Peak}) [kHz]	390 to 850 (600)	Size (D x H) [mm]	7.0 x 13.5 (M7 x 0.75)
Capacity [pF]	109	Weight [g]	2.5
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-40 to +125	Wear Plate	Stainl. Steel (1.4571/ 1.4404)
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC (top)
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V15
Mounting Holder	MAG4A1		

VS600-A2

The VS600-A1 or -A2 is a passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 600 kHz where it exhibits a resonance. It is a small foot-print AE-sensor with a threaded housing and a top connector. The VS600-A* is intended for screwing it into a holding mechanism. It is suitable for monitoring the crimping process.



Technical Specification

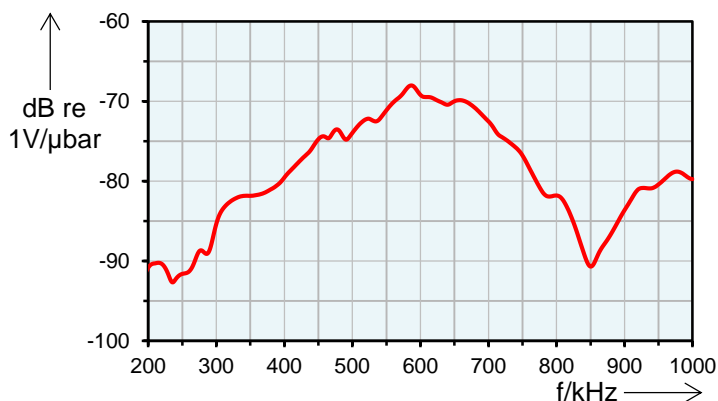
Frequency Range (f_{Peak}) [kHz]	390 to 850 (600)	Size (D x H) [mm]	8.5 x 13.0 (M7 x 0.75 x 8.5)
Capacity [pF]	109	Weight [g]	3
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-40 to +125	Wear Plate	Stainl. Steel (1.4571/ 1.4404)
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC (top)
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V15
Mounting Holder	MAG4A1		

VS600-Z1

The VS600-Z1 is a passive piezoelectric AE-sensor with integrated cable. Its frequency response is characterized by a peak at 600 kHz where it exhibits a resonance. Its small size makes it especially suited for being mounted on small samples where mounting space is restricted.



Technical Specification

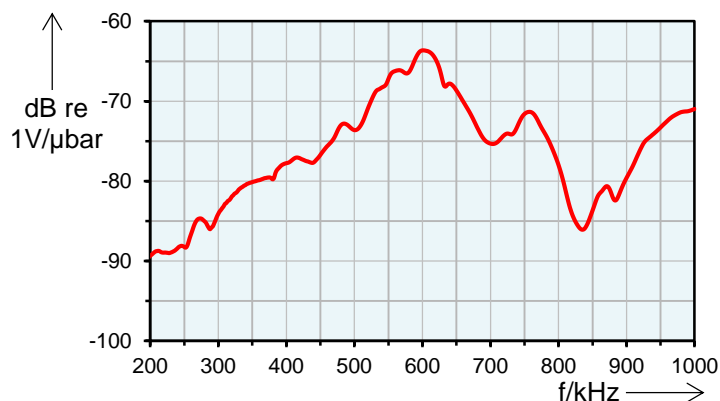
Frequency Range (f_{Peak}) [kHz]	550 to 730 (600)	Size (D x H) [mm]	4.75 x 5.8
Capacity [pF]	200 (incl. Cable)	Weight [g]	20
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-10 to +110	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMA/BNC
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	(integral)
Mounting Holder			

VS600-Z2

The VS600-Z2 is a passive piezoelectric AE-sensor with integrated cable and full metal housing. Its frequency response is characterized by a peak at 600 kHz where it exhibits a resonance. Its small size makes it especially suited for being mounted on small samples where mounting space is restricted. Additionally it is ideally suited for gluing to the sample because of the full metal housing.



Technical Specification

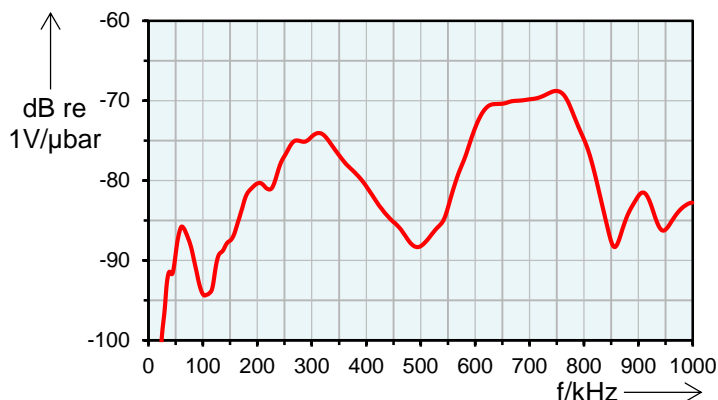
Frequency Range (f_{Peak}) [kHz]	400 to 800 (600)	Size (D x H) [mm]	4.75 x 5.3
Capacity [pF]	200 (incl. Cable)	Weight [g]	20
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-40 to +110	Wear Plate	Stainl. Steel (1.4571/ 1.4404)
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMA/BNC
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	(integral)
Mounting Holder			

VS700-D

The VS700-D is a passive piezoelectric AE-sensor with integrated cable. Its frequency response is characterized by a series of relatively flat peaks at 350 kHz, 600 kHz and 750 kHz with a limited response at 500 kHz. Its small size makes it especially suited for being mounted on small samples where mounting space is restricted. It was intended for characterizing paper during tensile tests and its mounting mechanism is optimized for this kind of task.



Technical Specification

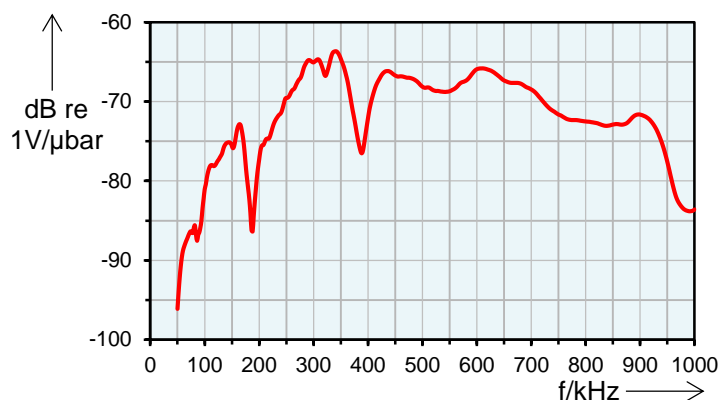
Frequency Range (f_{Peak}) [kHz]	150 to 800 (600 to 800)	Size (D x H) [mm]	7.0 x 11.0
Capacity [pF]	163 (incl. Cable)	Weight [g]	20
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-20 to +70	Wear Plate	Neodyne
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMA/BNC
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5H, AEP5, AEP3N	Sensor Cable	(integral)
Mounting Holder	integrated		

VS900-M

The VS900-M is a passive piezoelectric AE-sensor that has a broad frequency response. Its response is characterized by two peaks at 190 kHz and 350 kHz with accompanying anti-resonances at 200 kHz and 400 kHz. Benefits of the VS900-M are a high sensitivity over a broad frequency range with compromises regarding the flatness of response. It combines a good response in the standard frequency - and high frequency range.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	100 to 900 (350)	Size (D x H) [mm]	20.3 x 14.3
Capacity [pF]	540	Weight [g]	22
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-50 to +100	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	Microdot
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

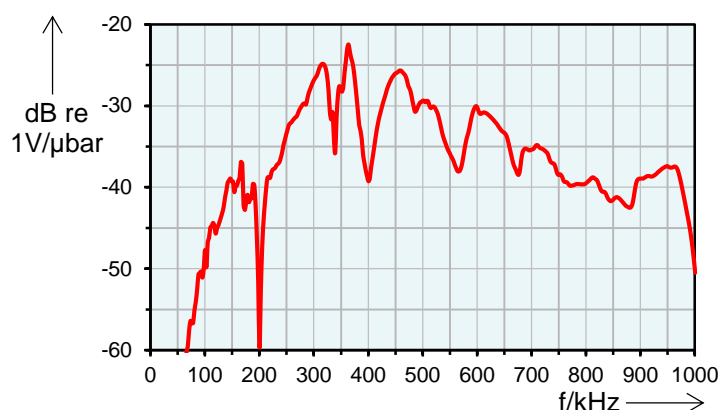
Accessories

Pre-amplifier	AEP5H, AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V5
Mounting Holder	MAG4M		

VS900-RSC-34dB

The VS900-RSC-34dB is a piezoelectric AE-sensor with integrated Vallen Smart Line™ preamplifier. Its frequency response is characterized by two peaks at 190 kHz and 350 kHz with accompanying anti-resonances at 200 kHz and 400 kHz. Benefits of the VS900-RSC-34dB are a high sensitivity over a broad frequency range with compromises regarding the flatness of response. It combines a good response in the standard frequency - and high frequency range. The integrated preamplifier has 34 dB gain and supports pulse through for automatic sensor testing. The VS900-RSC-34dB supports the Vallen Smart Line™ protocol. Vallen Smart Line™ products are supported since Release R2018.0726.

Vallen Smart Line™ features: sensor type, serial number and gain are automatically identified and read by the AE system.



Technical Specification

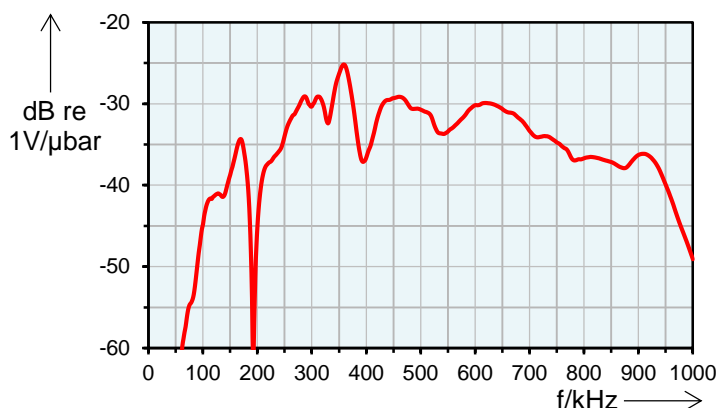
Frequency Range (f_{Peak}) [kHz]	100 to 900 (350)	Size (D x H) [mm]	28.6 x 31.5
Power Supply [V_{DC}]	28 ± 2	Weight [g]	80
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes, Vallen Smart Line™	Wear Plate	Ceramics
Preamplifier Gain [dB]	34	Connector	BNC
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [dB_{AE Peak}]	26.9 @ 95 - 850 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	4.5 @ 95 - 850 kHz
Ingress Protection Rating	IP40		

Accessories

Mounting Holder	MAG4R	Sensor Cable	CBL-1-xM-V1
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VS900-RIC

The VS900-RIC is a piezoelectric AE-sensor with integrated preamplifier. Its response is characterized by two peaks at 190 kHz and 350 kHz with accompanying anti-resonances at 200 kHz and 400 kHz. Benefits of the VS900-RIC are a high sensitivity over a broad frequency range with compromises regarding the flatness of response. It combines a good response in the standard frequency - and high frequency range. The integrated preamplifier has 34 dB gain and supports pulse through for automatic sensor testing.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	100 to 900 (350)	Size (D x H) [mm]	28.6 x 31.5
Power Supply [V_{DC}]	28 ± 2	Weight [g]	80
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	34	Connector	BNC
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	26.9 @ 95 - 850 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	4.5 @ 95 - 850 kHz
Ingress Protection Rating	IP40		

Accessories

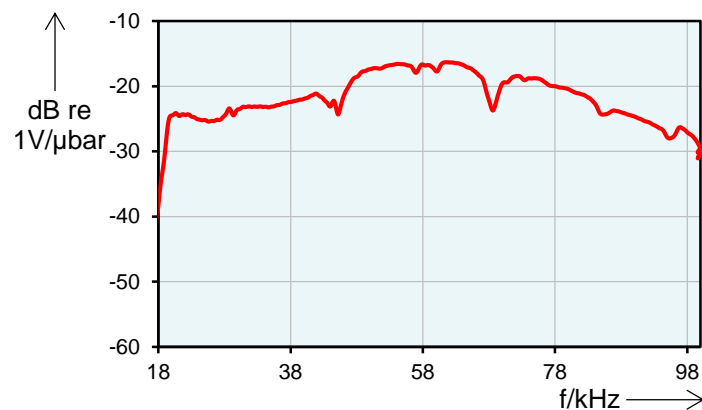
Mounting Holder	MAG4R	Sensor Cable	CBL-1-xM-V1
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4.2. Datasheets of Watertight AE Sensors

VS30-SIC-V2-46dB

The VS30-SIC-V2-46dB is a piezoelectric AE sensor with integrated preamplifier. The low frequency response makes it especially suited for monitoring large objects or objects made of highly attenuating material. The VS30-SIC-V2-46dB can be used for tank floor corrosion and leak detection, leak detection in pipelines, partial discharge detection and integrity testing of concrete structures. The watertight design allows outdoor usage.

The integrated preamplifier has 46 dB gain and supports pulse through for automatic sensor testing.



Technical Specification

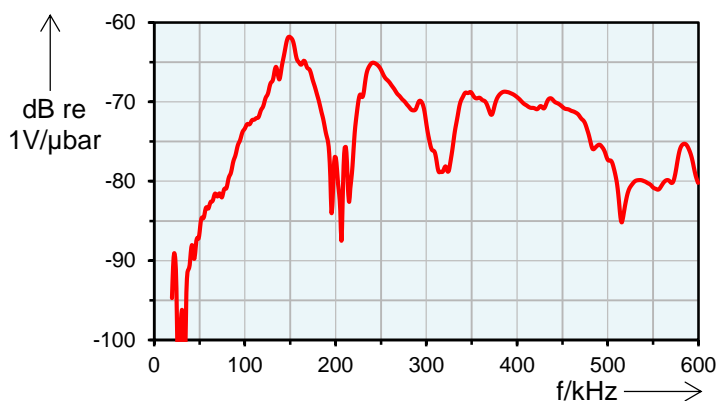
Frequency Range (f_{Peak}) [kHz]	25 to 80	Size (D x H) [mm]	28.6 x 51.8
Power Supply [V_{DC}]	28 ± 2	Weight [g]	172
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	46	Connector	SMA
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-5 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	18.5 @ 25 - 45 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	2.6 @ 25 - 45 kHz
Ingress Protection Rating	IP68, max. 0.2 bar with connected cable		

Accessories

Mounting Holder	MAG4SI	Sensor Cable	CBL-1-xM-V72
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VS150-F

The VS150-F is a IP68 rated passive piezoelectric AE-sensor. Its frequency response is characterized by a peak at 150 kHz where it exhibits a resonance. It is suitable for almost all AE application and especially suited for integrity inspection of metallic pressure vessels.



Technical Specification

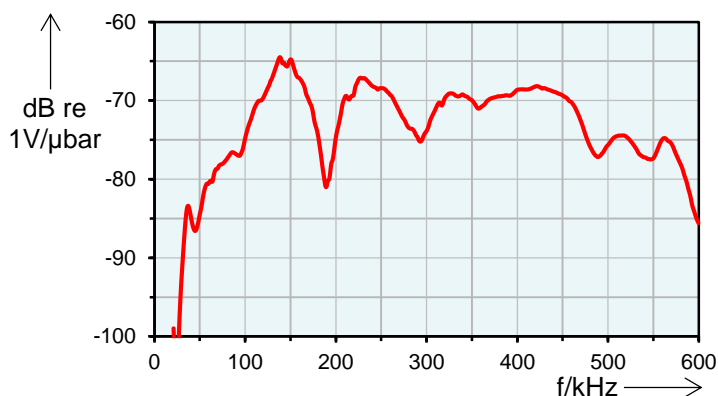
Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	max. 22.3 x 18.2
Capacity [pF]	350	Weight [g]	27
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-50 to +150	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMA
Ingress Protection Rating	IP68, max. 0.2 bar with connected cable	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5H, AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V61, CBL-1-1M2-V70
Mounting Holder	MAG4F		

VS150-K2

The VS150-K2 is a passive piezoelectric AE-sensor with integral cable. Its frequency response is characterized by a peak at 150 kHz where it exhibits a resonance. It is suitable for almost all AE application. The VS150-K2 has a full metal housing and a watertight cap. It is rated IP68 and watertight up to 10 bar (maximum water depth of 100 m). The mechanical design makes it especially suited for adhesively mounting it to a test object.



Technical Specification

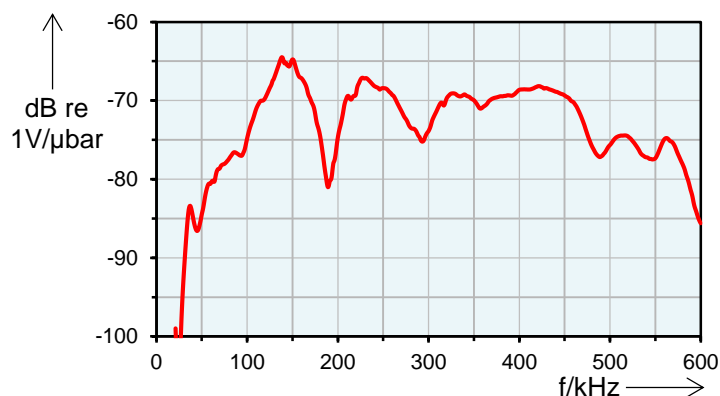
Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	20.3 x 22
Capacity [pF]	350	Weight [g]	56
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-40 to +100	Wear Plate	Stainl. Steel (1.4571/ 1.4404)
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC @ 1 m RG178 Cable
Ingress Protection Rating	IP68, max. 10 bar	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V15
Mounting Holder	MAG4H		

VS150-K3

The VS150-K3 is a passive piezoelectric AE-sensor with integral cable. Its frequency response is characterized by a peak at 150 kHz where it exhibits a resonance. It is suitable for almost all AE application. The VS150-K3 has a full metal housing and a watertight cap. It is rated IP68 and watertight up to 10 bar (maximum water depth of 100 m). The mechanical design makes it especially suited for adhesively mounting it to a test object.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	20.3 x 22
Capacity [pF]	350	Weight [g]	73
Integrated Pre-amplifier	No	Case Material	aluminum with electroless nickel plating
Operating Temperature [°C]	-40 to +100	Wear Plate	aluminum with electroless nickel plating
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	BNC @ 1.2 m RG178 Cable
Ingress Protection Rating	IP68, max. 10 bar	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	(integral)
Mounting Holder	MAG4H		

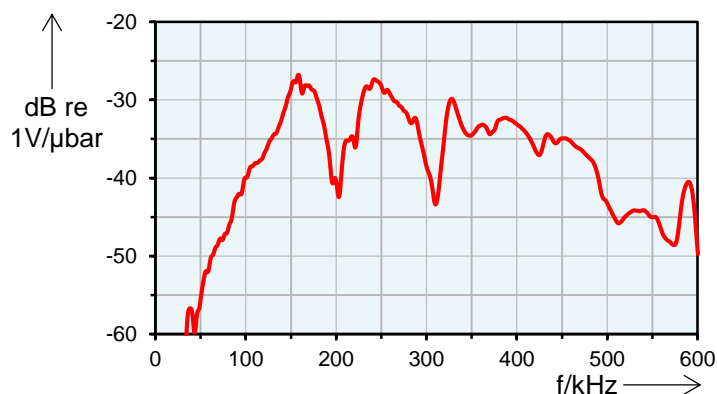
VS150-RSC-V2

The VS150-RSC-V2 is a piezoelectric AE-sensor with integrated Vallen Smart Line™ preamplifier. Its frequency response is characterized by a peak at 150 kHz, where it exhibits a resonance.

The integrated preamplifier has 34 dB gain and supports pulse through for automatic sensor testing. The VS150-RSC supports the Vallen Smart Line™ protocol. Vallen Smart Line™ products are supported since Release R2018.0726.

Vallen Smart Line™ features: sensor type, serial number and gain are automatically identified and read by the AE system.

It is certified for use in Ammonia vapour environment (see declaration of conformity).



Technical Specification

Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	28.6 x 31.5
Power Supply [V_{DC}]	28 ± 2	Weight [g]	81
Typ. Power [W]	0.8 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes, Vallen Smart Line™	Wear Plate	Ceramics
Preamplifier Gain [dB]	34	Connector	SMA
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	25.2 @ 95 - 300 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	5.0 @ 95 - 300 kHz
Ingress Protection Rating	IP68, max. 0.2 bar with connected cable		

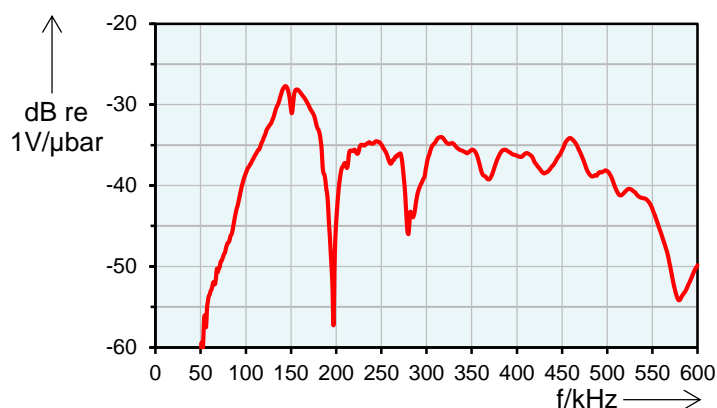
Accessories

Mounting Holder	MAG4R	Sensor Cable	CBL-1-xM-V72, CBL-1-xM-V93 (for Ammonia atmosphere)
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VS150-WIC-V01

The VS150-WIC is a piezoelectric AE-sensor with integrated preamplifier. Its frequency response is characterized by a peak at 150 kHz where it exhibits a resonance. The VS150-WIC is rated watertight up to 60 bar of water pressure. It is suitable for almost all AE application and especially suited for wet environments or for on-site monitoring of underwater installations.

The integrated preamplifier has 34 dB gain and supports pulse through for automatic sensor testing.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	32.0 x 48.0
Power Supply [V_{DC}]	28 ± 2	Weight [g]	184
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	34	Connector	LEMO 03 Series
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	25.2 @ 95 - 300 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	5.0 @ 95 - 300 kHz
Ingress Protection Rating	IP68, max. 60 bar (with connected cable)		

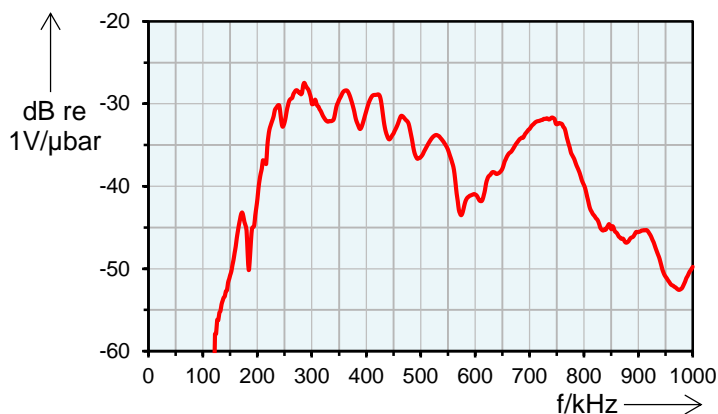
Accessories

Mounting Holder	MAG4W-V1	Sensor Cable	CBL-1-xM-V11
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VS375-WIC-V01

The VS375-WIC is a piezoelectric AE-sensor with integrated preamplifier. Its frequency response is characterized by a peak at 375 kHz where it exhibits a resonance. The VS375-WIC is rated watertight up to 60 bar of water pressure. Its frequency response bridges the gap between standard frequency range and high frequency range. The VS375-WIC is suited for wet environments or for on-site monitoring of underwater installations.

The integrated preamplifier has 34 dB gain and supports pulse through for automatic sensor testing.



Technical Specification

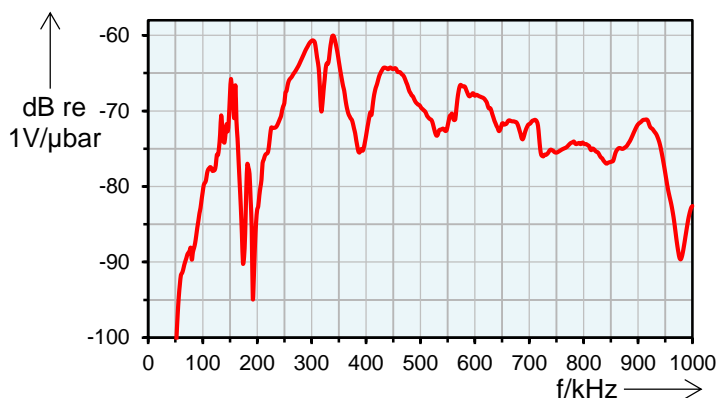
Frequency Range (f_{Peak}) [kHz]	250 to 700 (375)	Size (D x H) [mm]	32.0 x 48.0
Power Supply [V_{DC}]	28 ± 2	Weight [g]	181
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	34	Connector	LEMO 03 Series
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	28.0 @ 95 - 850 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	4.5 @ 95 - 850 kHz
Ingress Protection Rating	IP68, max. 60 bar (with connected cable)		

Accessories

Mounting Holder	MAG4W-V1	Sensor Cable	CBL-1-xM-V11
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VS900-F

The VS900-F is a IP68 rated passive piezoelectric AE-sensor that has a broad frequency response. Its response is characterized by two peaks at 150 kHz and 350 kHz with accompanying anti-resonances at 200 kHz and 400 kHz. Benefits of the VS900-F are a high sensitivity over a broad frequency range with compromises regarding the flatness of response. It combines a good response in the standard frequency - and high frequency range.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	100 to 900 (350)	Size (D x H) [mm]	max. 22.3 x 18.2
Capacity [pF]	540	Weight [g]	24.5
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-50 to +150	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMA
Ingress Protection Rating	IP68, max. 0.2 bar with connected cable	Shield Cross-Talk [dB]	< -80

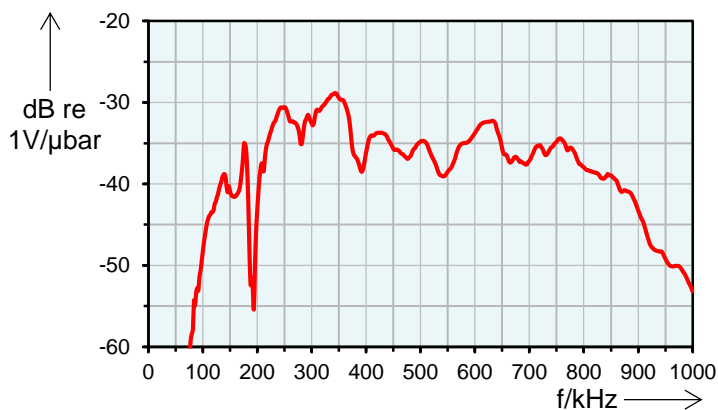
Accessories

Pre-amplifier	AEP5H, AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V61, CBL-1-1M2-V70
Mounting Holder	MAG4F		

VS900-WIC-V01

The VS900-WIC-V01 is a piezoelectric AE-sensor with integrated preamplifier. Its response is characterized by two peaks at 190 kHz and 350 kHz with accompanying anti-resonances at 200 kHz and 400 kHz. Benefits of the VS900-WIC-V01 are a high sensitivity over a broad frequency range with compromises regarding the flatness of response. It combines a good response in the standard frequency - and high frequency range. The VS900-WIC is rated water tight up to 60 bar of water pressure and is suited for wet environments or for on-site monitoring of underwater installations.

The integrated preamplifier has 34 dB gain and supports pulse through for automatic sensor testing.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	100 to 900 (350)	Size (D x H) [mm]	32.0 x 48.0
Power Supply [V_{DC}]	28 ± 2	Weight [g]	181
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	34	Connector	LEMO 03 Series
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [dB_{AE Peak}]	26.9 @ 95 - 850 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	4.5 @ 95 - 850 kHz
Ingress Protection Rating	IP68, max. 60 bar (with connected cable)		

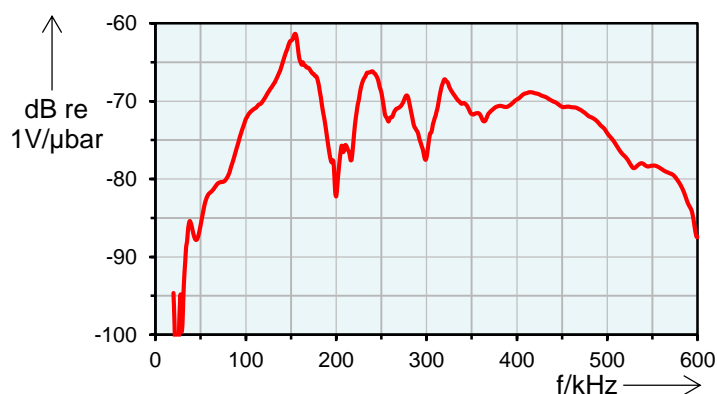
Accessories

Mounting Holder	MAG4W-V1	Sensor Cable	CBL-1-xM-V11
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4.3. Datasheets of AE Sensor for hot/cold Surfaces

VS160-NS

The VS160-NS is a passive piezoelectric AE-sensor suitable for hot environments (up to 180°C). Its frequency response is characterized by a peak at 160 kHz where it exhibits a resonance. It is suitable for almost all AE application and especially suited for integrity inspection of metallic pressure vessels.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	100 to 450 (150)	Size (D x H) [mm]	20.3 x 14.3
Capacity [pF]	350	Weight [g]	22
Integrated Pre-amplifier	No	Case Material	Stainl. Steel (1.4571/ 1.4404)
Operating Temperature [°C]	-50 to +180	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

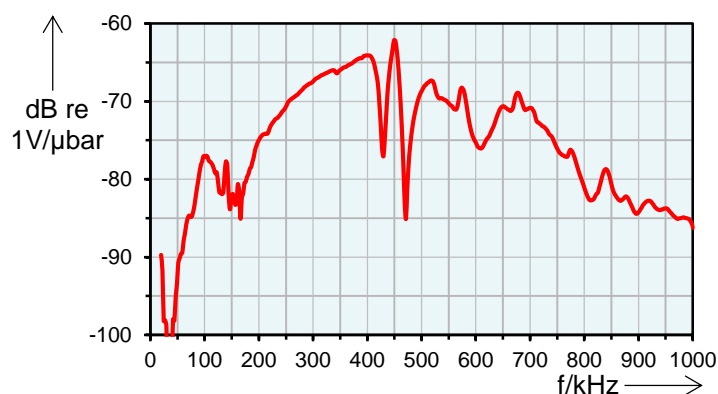
Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V15
Mounting Holder	MAG4NS		

VS375-LT-V2

The VS375-LT-V2 is a passive piezoelectric AE-sensor for low temperatures down to -196°C (77 K). It has a full metal housing.

Its frequency response is characterized by a peak at around 375 kHz. Its frequency response bridges the gap between standard frequency range and high frequency range.

The typical frequency response curve shown below was measured at room temperature.



Technical Specification

Frequency Range (f_{Peak}) [kHz]	250 to 700 (375)	Size (D x H) [mm]	20.3 x 17.5
Capacity [pF]	390	Weight [g]	12.5
Integrated Pre-amplifier	No	Case Material	Aluminum with electroless nickel plating
Operating Temperature [$^{\circ}\text{C}$]	-196 to +100	Wear Plate	Aluminum with electroless nickel plating
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	SMC
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP5H, AEP3N	Sensor Cable	CBL-1-1M2-V15
Mounting Holder			

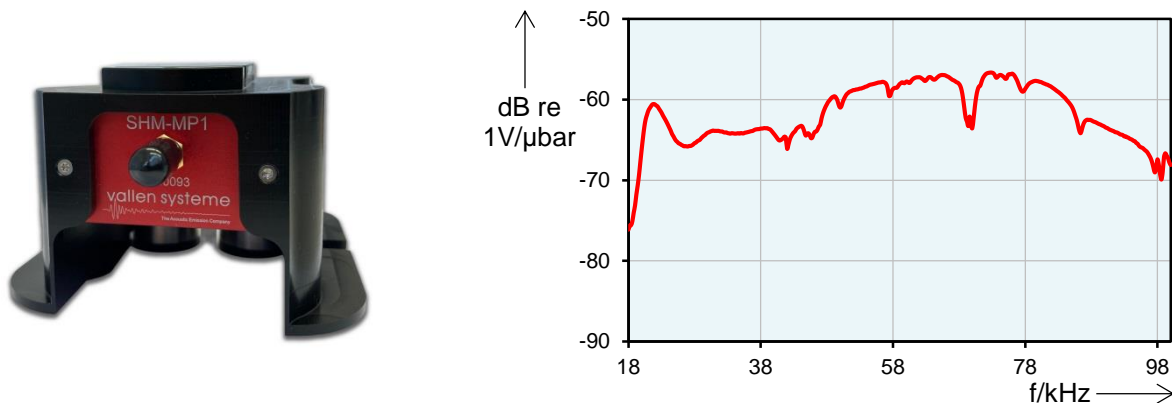
4.4. Datasheets of AE Sensor for Structural Health Monitoring

SHM-MP1

The SHM-MP1 is an acoustic emission measurement point optimized for structural health monitoring. It consists of

- a plastic holder which is screwed to the monitored structure
- a piezoelectric AE sensor
- a piezoelectric emitter which allows automatic sensor test
- an electronic device for preamplification/impedance conversion and control of the emitter
- a plastic hood for mechanical protection and strain relief

The low frequency response makes it especially suited for monitoring large objects or objects made of highly attenuating material. The preamplifier has no gain and just converts the high impedance piezoelectric transducer output to a low impedance signal suitable for long cable transmission. It is therefore suited for detecting high energy AE sources such as tendon or wire rupture in tensioned concrete. The watertight design of the components allows outdoor usage. The picture shows the device without the hood.



Technical Specification

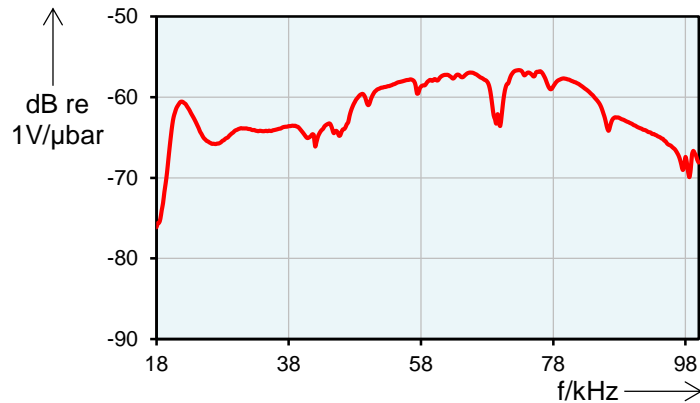
Frequency Range (f_{Peak}) [kHz]	25 to 80	Size (D x H) [mm]	160 x 110 x 70
Power Supply [V_{DC}]	28 \pm 2	Weight [g]	680
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	0	Connector	SMA
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [$\text{dB}_{\text{AE Peak}}$]	54 @ 25 - 45 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μVRMS]	163 @ 25 - 45 kHz
Ingress Protection Rating	IP68, max. 0.2 bar with connected cable		

Accessories

	Sensor Cable	e.g. CBL-1-xM-V86
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VS30-SIC-V2-0dB

The VS30-SIC-V2-0dB is a piezoelectric AE sensor with integrated preamplifier. The low frequency response makes it especially suited for monitoring large objects or objects made of highly attenuating material. The preamplifier has no gain and just converts the high impedance piezoelectric transducer output to a low impedance signal suitable for long cable transmission. It is therefore suited for detecting high energy AE sources such as tendon or wire rupture in tensioned concrete. The watertight design allows outdoor usage. The integrated preamplifier supports pulse through for automatic sensor testing.



Technical Specification

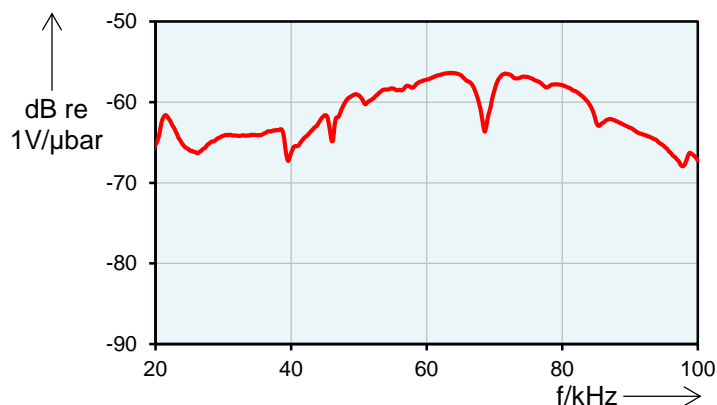
Frequency Range (f_{Peak}) [kHz]	25 to 80	Size (D x H) [mm]	28.6 x 51.8
Power Supply [V_{DC}]	28 ± 2	Weight [g]	172
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	0	Connector	SMA
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-40 to +85	Typ. Noise (max. 1/s) [$dB_{AE Peak}$]	54 @ 25 - 45 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	163 @ 25 - 45 kHz
Ingress Protection Rating	IP68, max. 0.2 bar with connected cable		

Accessories

Mounting Holder	MAG4SI	Sensor Cable	CBL-1-xM-V72
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VS30-SIC-0dB

The VS30-SIC-0dB is a piezoelectric AE sensor with integrated preamplifier. The low frequency response makes it especially suited for monitoring large objects. The preamplifier has no gain and just converts the high impedance piezoelectric transducer output to a low impedance signal suitable for long cable transmission. It is therefore suited for detecting high energy AE sources such as tendon or wire rupture in tensioned concrete. The integrated preamplifier supports pulse through for automatic sensor testing. This sensor is also available with watertight design (VS30-SIC-V2-0dB).



Technical Specification

Frequency Range (f_{Peak}) [kHz]	25 to 80	Size (D x H) [mm]	28.6 x 51.8
Power Supply [V_{DC}]	28 ± 2	Weight [g]	170
Typ. Power [W]	0.56 / 2.5 @ Signal 0% / 100%	Case Material	Stainl. Steel (1.4571/ 1.4404)
Integrated Preamplifier	Yes	Wear Plate	Ceramics
Preamplifier Gain [dB]	0	Connector	BNC
Pulse Through	Yes	Shield Cross-Talk [dB]	< -80
Operating Temperature [°C]	-5 to +85	Typ. Noise (max. 1/s) [dB_{AE Peak}]	54 @ 25 - 45 kHz
Vibration – Sinus Sweep	2 Oct/Min, 5 to 50 Hz, 20 g	Typ. Noise [μV_{RMS}]	163 @ 25 - 45 kHz
Ingress Protection Rating	IP40		

Accessories

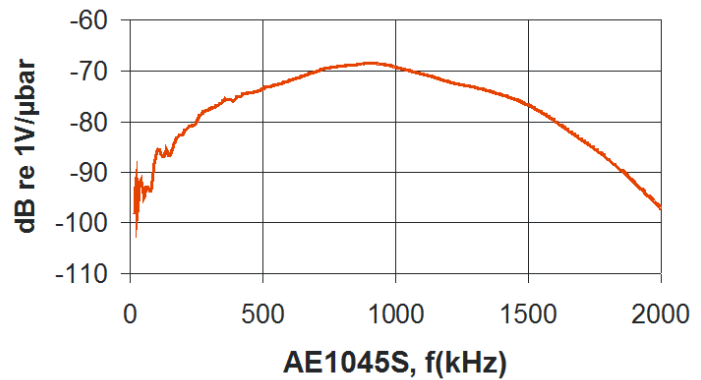
Mounting Holder	MAG4SI	Sensor Cable	CBL-1-xM-V1
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4.5. Third Party AE Sensors

AE1045S

The AE1045S is a wideband AE sensor. Comes with a calibration sheet from absolute reciprocal velocity calibration showing a very flat frequency response from 0.1 to 1.5 MHz.

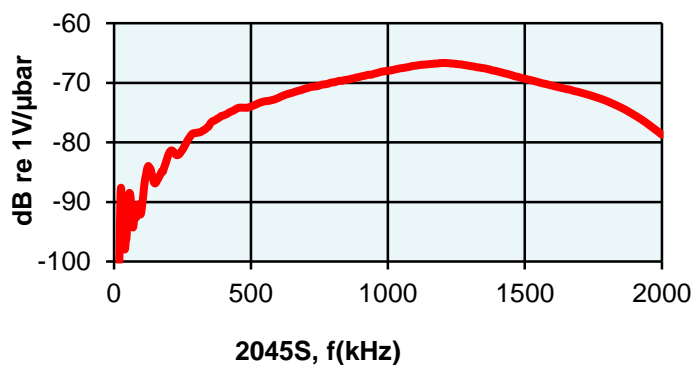
Response measured with 1 m cable (90 pF). 4 dB higher sensitivity with 10 cm cable due to the low internal capacity (90 pF).



AE2045S

The AE2045S is a wideband AE-sensor. Comes with a calibration sheet from absolute reciprocal velocity calibration showing a very flat frequency response from 0.2 to 2.5 MHz.

Response measured with 1 m cable (90pF). 3 dB higher sensitivity with 10 cm cable due to the low internal capacity (140 pF).



Technical Specification

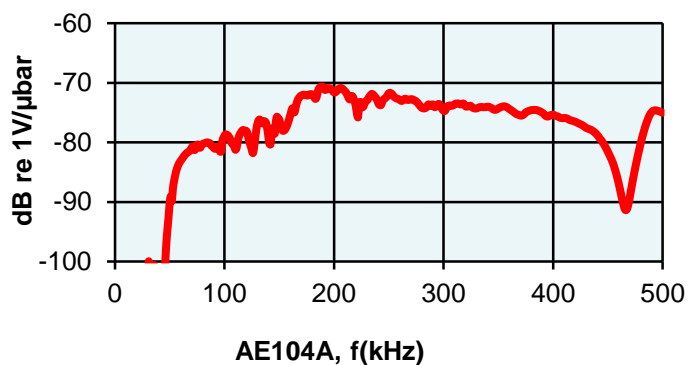
Frequency Range (f_{Peak}) [kHz]	200 to 2500 (flat)	Size (D x H) [mm]	20 x 20
Capacity [pF]	140	Weight [g]	30
Integrated Pre-amplifier	No	Case Material	Stainless Steel
Operating Temperature [°C]	-20 to +80	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	Microdot
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V5
Mounting Holder	MAG4S		

AE104A

AE sensor with a relatively flat frequency response between 100 and 400 kHz. Frequency curve measured with 1 m cable (90 pF). 6 dB sensitivity increase with 10 cm cable.



Technical Specification

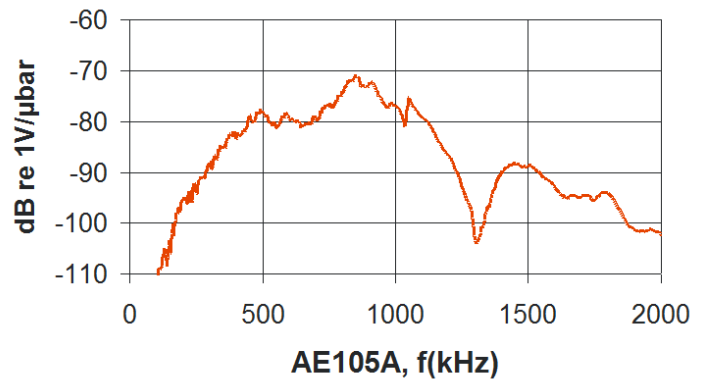
Frequency Range (f_{Peak}) [kHz]	100 to 400 (flat)	Size (D x H) [mm]	8 x 18
Capacity [pF]	40	Weight [g]	5
Integrated Pre-amplifier	No	Case Material	Stainless Steel
Operating Temperature [°C]	-20 to +80	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	Microdot
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	CBL-1-1M2-V5
Mounting Holder	MAG4A		

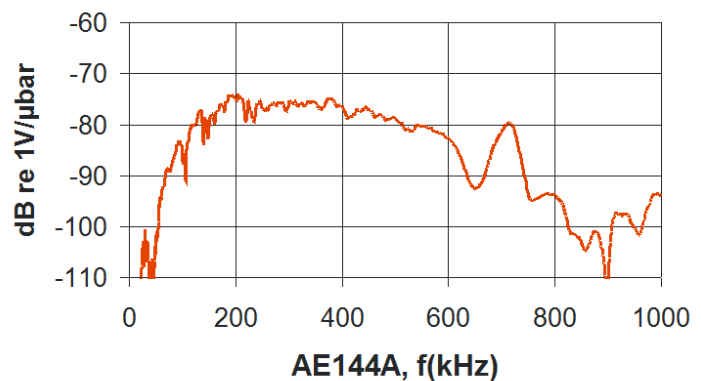
AE105A

AE sensor for high frequency applications. Frequency curve measured with 1 m cable (90 pF). 5 dB sensitivity increase with 10 cm cable.



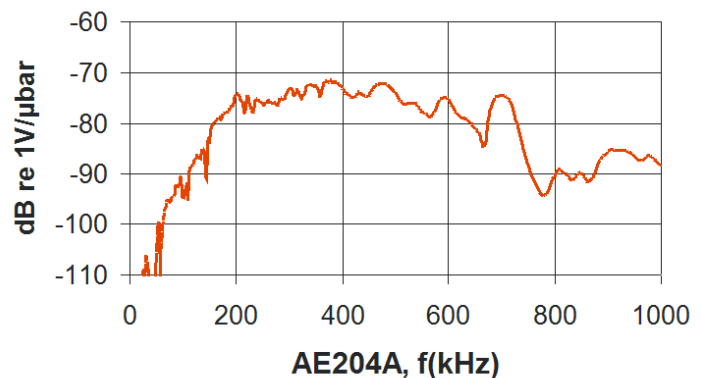
AE144A

AE sensor with a relatively flat frequency response between 100 and 500 kHz. Frequency curve measured with 1 m cable (90pF). 7dB sensitivity increase with 10cm cable.



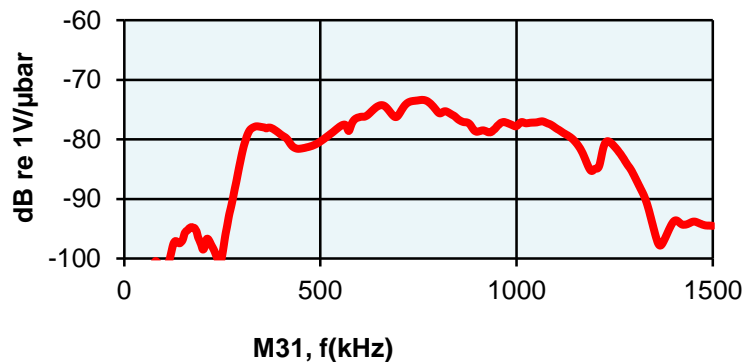
AE204A

AE sensor with a relatively flat response between 180 and 700 kHz. Frequency curve measured with 1 m cable. (90pF). 6 dB sensitivity increase with 10cm cable.



M31

Very small sensor for AE testing of small specimens or for high frequency applications. Frequency curve measured with 1 m integral cable.



Technical Specification

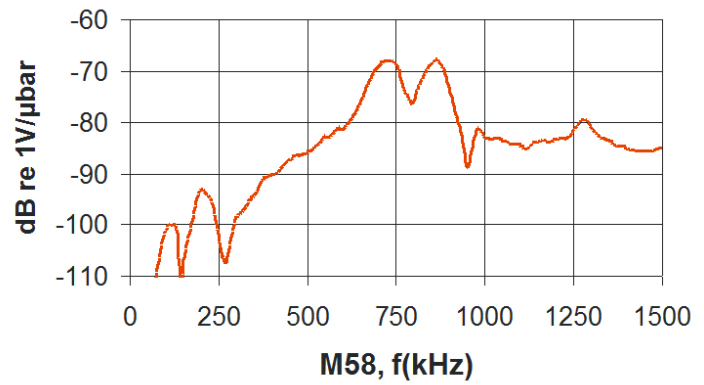
Frequency Range (f_{Peak}) [kHz]	300 to 800 (750)	Size (D x H) [mm]	3 x 3
Capacity [pF]	89 (with integrated cable)	Weight [g]	0,2
Integrated Pre-amplifier	No	Case Material	Stainless Steel
Operating Temperature [°C]	-20 to +80	Wear Plate	Ceramics
Vibration – Sinus sweep	2 Oct/Min, 5 to 180 Hz, 40 g	Connector	Microdot / BNC
Ingress Protection Rating	IP40	Shield Cross-Talk [dB]	< -80

Accessories

Pre-amplifier	AEP5, AEP3N	Sensor Cable	(integral)
Mounting Holder			

M58

Very small sensor for AE testing of small specimens or for high frequency applications. Frequency curve measured with 1 m integral cable.



4.6. Warranty Conditions

The warranty period three months, starting from the date of the delivery and provided the AE sensors have been correctly handled. This warranty does not cover the repair of any damage to the products generated by accident or improper handling.

We warrant that the goods as delivered will conform to the given specifications. If notified during the warranty period that the delivered goods contain defects such that it does not conform to the specifications, we will make it operate as specified by providing replacement parts as determined by us, free of costs and within a reasonable time. If transportation should become necessary, the customer has to provide the permits for export and re-import of replacement parts and bears the costs of transportation.

Except as expressed before, we disclaim all other warranties. We shall not be liable for any direct, indirect, consequential or incidental damage arising out of the use or inability to use of the delivered goods.

5. Preamplifiers

5.1. AEP3N



Special Feature:

differential and single ended input • exchangeable filter modules • programmable gain

The filter modules of the AEP3N can be exchanged to support different frequency ranges. The AEP3N supports both, single ended and differential sensor input. Its gain is programmable by software or can be adjusted manually by jumpers.



Figure 1: AEP3N preamplifier. Connectors from left to right are: (i) signal output and power supply input, (ii) differential BNO input and (iii) single ended BNC input.

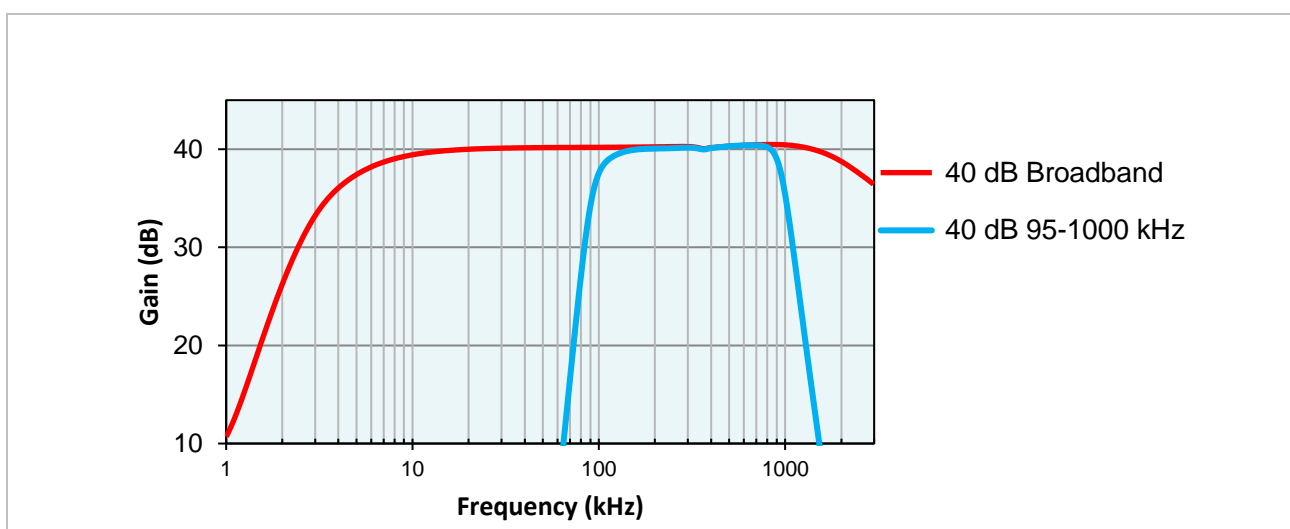


Figure 2: Frequency response of AEP3N with two different band-pass filters. "Broadband" refers to bypass-filter. Other frequency filter available, see table below.

AEP3N – Specifications (Typical):

Preamplifier gain:	Software selectable to 34, 37, 40, 43, 46, or 49 dB (can also be defined by jumper), into 50 Ω . Additional -34dB attenuator (jumper selectable), resulting in a total gain of 0, 3, 6, 9, 12 or 15 dB
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 k Ω parallel 15 pF
Power supply:	28 V _{DC} , 18 mA (no signal) / 55 mA (max. signal), fed-in via signal cable
Pulse through:	For up to 450 V _{PP} , suited for AMSY series
Output connector:	BNC
Input connectors:	BNC (single ended), BNO (differential), selected by manual switch
Input range:	17.7 mV _{PK} at 49 dB gain 100 mV _{PK} at 34 dB gain (200 mV _{PK} in filter stop-band) 0.89 V _{PK} at 15 dB (-34 dB (att.-stage)+ 49 dB) gain 5.0 V _{PK} at 0 dB (-34 dB (att.-stage) + 34 dB) gain input protected
Output range:	10 V _{PP} into 50 Ω
Dimensions & weight:	H x W x L: 57 x 80 x 125 mm (W + 18 mm BNC), 525 g
Temperature range:	5°C to 65°C
Noise (max. once per 1 s) (input: 50 Ohm)	14.0 dB _{AE} / 1.1 μ V _{RMS} at 95-300 kHz, 49dB Gain 20.0 dB _{AE} / 1.8 μ V _{RMS} at 95-850 kHz, 49dB Gain
Noise (max. once per 1 s) at 330 pF input:	16.7 dB _{AE} / 1.5 μ V _{RMS} at 95-300 kHz, 49dB Gain 19.6 dB _{AE} / 1.7 μ V _{RMS} at 95-850 kHz, 49dB Gain
Noise (max. once per 1 s) (input: VS150-M)	20.4 dB _{AE} / 2.6 μ V _{RMS} at 95-300 kHz, 49dB Gain 22.1 dB _{AE} / 2.7 μ V _{RMS} at 95-850 kHz, 49dB Gain

Frequency filters:

High pass filter (except dummy-filter): 54 dB/octave (9th order)
 Low pass filter: 30 dB/octave (5th order)

Following bandpass filters are available (DUM=dummy filter) for new AEP3N, frequency numbers in kHz:

HP \ LP	310	440	550	1000	2000
DUM	DUM-310		DUM-550	DUM-1000	DUM-2000
005		005-440			
17		17-440			
020	020-310		020-550	020-1000	020-2000
030	030-310				
050	050-310		050-550	050-1000	050-2000
075	075-310				
095	095-310		095-550	095-1000	095-2000
400				400-1000	400-2000

Ordering code is AEP3N-x-y, with x= high pass frequency, y= low pass frequency, e.g. AEP3N-095-1000 for bandpass 95-1000 kHz.

Additional high pass filters (code e.g. HP-DUM, HP-020, HP-050-HP-095) and low pass filters (code e.g. TP-0.44, TP-0.55, TP-1.00, TP-2.00, here frequency in MHz) with frequencies as given in table above can be ordered as accessory. To change the AEP3N frequency filter(s) you have to open the AEP3N by loosening four screws.

5.2. AEP5 / AEP5H

The AEP5(H) is a general-purpose preamplifier supporting single ended sensors. This preamplifier is a wide-band preamplifier available in two different bandwidth settings (AEP5 and AEP5H). Gain can be set to 34dB or 40dB. The gain selection switch is located inside the preamplifier to prevent any accidental changes of gain settings. As every preamplifier of Vallen Systeme GmbH the AEP5(H) can put a voltage pulse (up to 450 V_{PP}) through to the AE-sensor (sensor coupling test).



Figure 3: AEP5 preamplifier

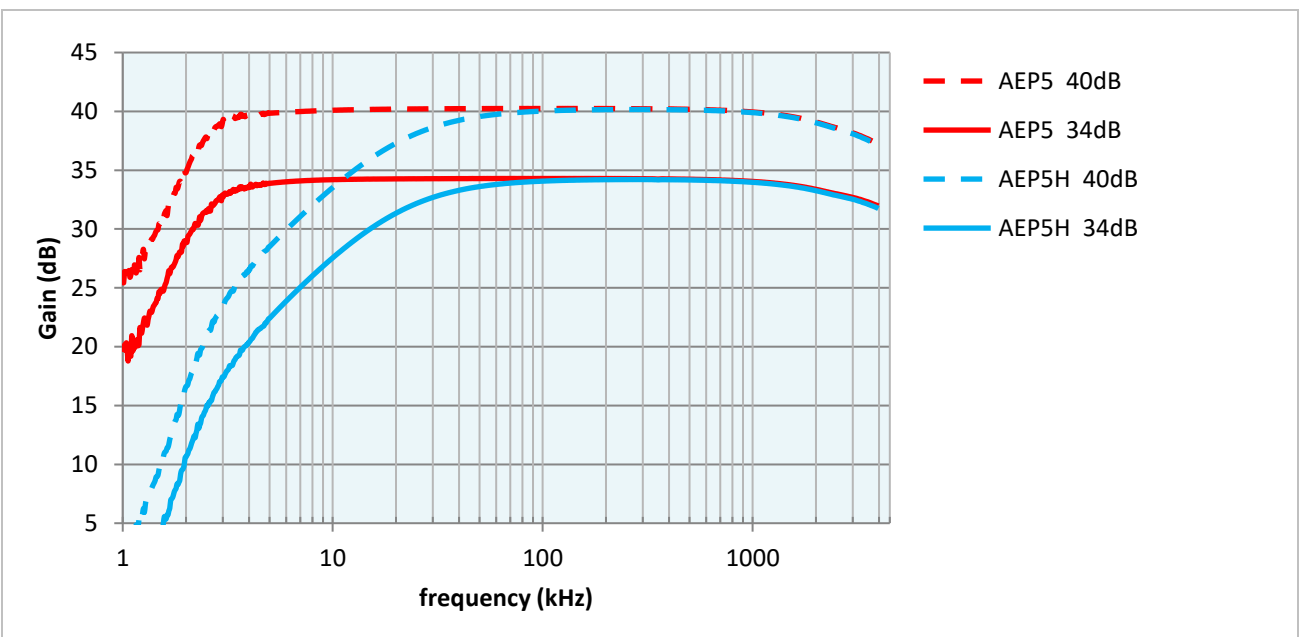


Figure 4: Frequency response of AEP5 and AEP5H preamplifier

AEP5 / AEP5H – Specifications (Typical):

Preamplifier gain:	34 dB or 40 dB (switch-selectable) into 50 Ω
Bandwidth (-3 dB):	AEP5: 2.5 kHz to 2.4 MHz (10 V _{PP}) AEP5H: 20 kHz to 2.4 MHz (10 V _{PP})
Preamp input impedance:	50 M Ω parallel 22 pF
Power supply:	28 V _{DC} , 24 mA (no signal) / 64 mA (max. signal), fed-in via signal cable
Pulse through:	For up to 450 V _{PP} , suited for AMSY acoustic emission system series
Output connector:	BNC
Output range:	10 V _{PP} into 50 Ω
Input connector:	BNC (input signal from single ended sensors)
Input range:	100 mV _{PK} at 34 dB gain 50 mV _{PK} at 40 dB gain
Dimensions & weight:	H x W x L: 30 x 55 x 90 mm, 160 g
Temperature range:	-20°C to 85°C
Noise (max. once per 1 s) (input: 50 Ohm):	12.5 dB _{AE} / 0.8 μ V _{RMS} at 95-300 kHz 18.5 dB _{AE} / 1.6 μ V _{RMS} at 95-850 kHz
Noise (max. once per 1 s) at 330 pF input:	10.9 dB _{AE} / 0.7 μ V _{RMS} at 95-300 kHz 16.9 dB _{AE} / 1.3 μ V _{RMS} at 95-850 kHz
Noise (max. once per 1 s) (input: VS150-M)	24.7 dB _{AE} / 4.3 μ V _{RMS} at 95-300 kHz 25.8 dB _{AE} / 4.9 μ V _{RMS} at 95-850 kHz
Filters:	To be located in subsequent measurement circuits (AMSY series)

5.3. Changing the Gain of an AEP5 / AEP5H

Gain is set by a switch on the PCB (Printed Circuit Board) of AEP5. In order to access the switch the PCB assembly has to be removed from the housing (see figure 5). First remove the lock-nut of the BNC socket on the “Sig OUT” side. Then remove the 4 screws on the opposite side (“Sensor IN”) and pull out the PCB assembly. Locate the switch for gain setting. Switch position for 34dB and 40dB gain are indicated on the PCB.

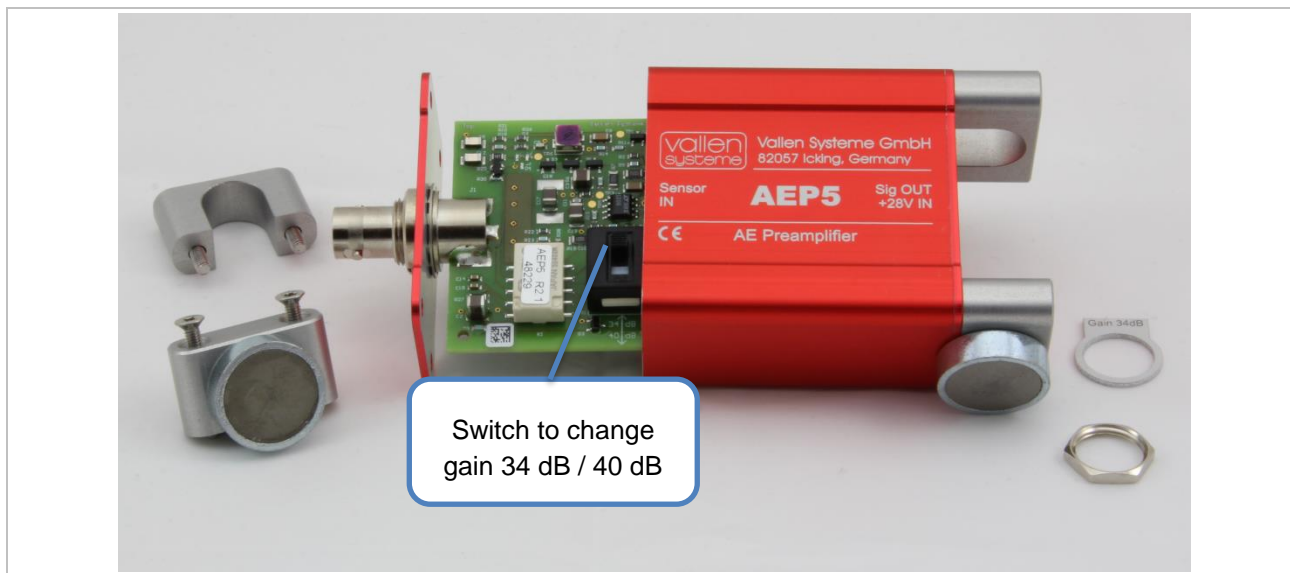


Figure 5: disassembled AEP5 with pulled out PCB assembly for changing gain setting.

5.4. AEP4H-ISTB



Special Feature:

compact unit, in combination with VS30-V optimized for tank bottom corrosion screening

The AEP4H-ISTB is a preamplifier specifically designed for the high sensitivity requirements of tank bottom tests and similar applications: It is a low-noise preamplifier, special gain (46 dB) and strong magnetic holders. The AEP4H-ISTB can accommodate a VS30-V or VS75-V sensor (spring loaded). The integrated sensor-to-preamplifier cable is well protected against EMI (electromagnetic interference).



Figure 6: AEP4-ISTB with VS75-V sensor

AEP4H-ISTB – Specifications (Typical):

Preamplifier gain:	46 dB into 50 Ω
Bandwidth (-3 dB):	20 kHz to 1 MHz (10 V _{PP})
Preamp input impedance:	50 M Ω parallel, 22 pF
Power supply:	28 V _{DC} , 24 mA (no signal) / 64 mA (max. signal), fed-in via signal cable
Pulse through:	For up to 450 V _{PP} , suited for AMSY series
Output connector:	BNC
Output range:	10 V _{PP} into 50 Ω
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 85°C
Noise (max. once per 1 s) (input: VS30-V)	12.3 dB _{AE} / 1.2 μ V _{RMS} at 25-45 kHz 27.2 dB _{AE} / 8.4 μ V _{RMS} at 20-300 kHz

5.5. Preamplifiers integrated in AE sensors



Special Feature:

AE-Sensors with integral preamplifier



Figure 7: Selection of different sensors with integral preamplifier

The RI / RIC / RSC and SI / SIC / SSC series are AE sensors with integrated preamplifier. The first “R” and “S” indicates the dimensions of the sensor housing. Whereas the “I” or “S” (Vallen Smart Line sensor) indicates an integrated preamplifier and the “C” the pulse through function.

All sensors are highly sensitive and are able to drive long cables (similar to AEP3N / AEP5 preamplifiers).

The advantage of these sensors with integrated preamplifiers is an easier handling due to the compact design and minimal loss between piezoelectric element and preamplifier for a better signal-to-noise ratio.

Model-Case	Freq. range (kHz)	Gain	Noise (Peak (max. 1/sec) /RMS):	Pulse through
VS30-SIC-0dB VS30-SIC-V2-0dB	25-80	0 dB	54.0 dB _{AE} / 163 μV _{RMS} at 25-45 kHz	yes
VS30-SIC-46dB VS30-SIC-V2-46dB	25-80	46 dB	18.5 dB _{AE} / 2.6 μV _{RMS} at 25-45 kHz	yes
VS75-SIC-34dB, VS75-SSC-34dB	30-120	34 dB	29.2 dB _{AE} / 6.8 μV _{RMS} at 25-300 kHz	yes
VS75-SIC-40dB	30-120	40 dB	29.5 dB _{AE} / 7.3 μV _{RMS} at 25-300 kHz	yes
VS75-SI-40dB	30-120	40 dB	29.5 dB _{AE} / 7.3 μV _{RMS} at 25-300 kHz	no
VS150-RSC VS150-RSC-V2	100-450	34 dB	25.2 dB _{AE} / 5.0 μV _{RMS} at 95-300 kHz	yes
VS150-RI	100-450	40 dB	22.2 dB _{AE} / 3.0 μV _{RMS} at 95-300 kHz	no
VS375-RIC	250-700	34 dB	28.0 dB _{AE} / 4.5 μV _{RMS} at 95-850 kHz	yes
VS900-RIC VS900-RSC-34dB	100-900	34 dB	26.9 dB _{AE} / 4.5 μV _{RMS} at 95-850 kHz	yes

5.6. Warranty Conditions

The warranty period is two years for preamplifiers and three months for AE-sensors, starting from the date of the delivery. This warranty does not cover the repair of any damage to the products generated by accident or improper handling.

We warrant that the goods as delivered will conform to the given specifications. If notified during the warranty period that the delivered goods contains defects such it does not conform to the specifications, we will make it operate as specified by providing replacement parts as determined by us, free of costs and within a reasonable time. If transportation should become necessary, the customer has to provide the permits for export and re-import of replacement parts and bear the costs of transportation.

Except as expressed before, we disclaim all other warranties. We shall not be liable for any direct, indirect, consequential or incidental damage arising out of the use or inability to use of the delivered goods.