APTechnology International B.V.
Catalog 2012

AP Tech

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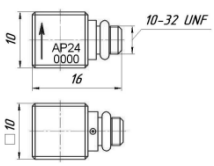
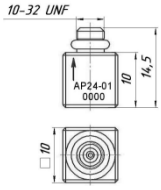
General purpose accelerometers

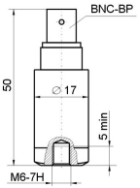
Parameter	Unit	AP24 (-01)	AP28-10	AP28-30	AP28-50	AP28-100 (-01)	AP34
Charge sensitivity (+/- 10%)	pC/g	3	-				3
	pC/ms²	0.31	-				0.31
Voltage sensitivity (+/- 10%)	mV/g	-	10	30	50	100	-
	mV/ms²	-	1.02	3.1	5.1	10.2	-
Amplitude range	g rms	3,000	500	160	100	50	7,000
Resolution (1 Hz to 10 kHz)	g rms	-	<0.0005	<0.0002	<0.0002	<0.0002	-
Mechanical shock limit	g peak	6,000	1,000				15,000
Frequency range (+/- 1 dB)	Hz	1 to 10,000	0.5 to 10,000				1 to 20,000
Resonant frequency	kHz	>30	>30				>60
Transverse sensitivity	%	<5	<5				<5
Base strain sensitivity	g/µm	<0.0005	<0.005				<0.005
Temperature range	°C	-60 to +150	-40 to +125				-60 to +150
Insulation resistance	MΩ	>10,000	-				>1,000
Capacitance	pF	600 to 900	-				600 to 900
Isolated base		No	No				No
Excitation voltage	Volt DC	-	+15 to +30			+18 to +30	-
Constant current	mA	-	2 to 20				-
Output impedance	Ω	-	<500				-
Output bias voltage	Volt DC	-	+8 to +11			+10 to +13	-
Settling time	second	-	4				-
Construction		Shear	Shear				Shear
Piezo material		ZTP19	ZTP19				ZTP19
Sensor connector		10-32 UNF	BNC or 10-32UNF (-01 version)				M3
Integral cable length	meter	-	-				-
Connecting cable		AK02	AK19 or AK15 (-01 version)*				AK06
Cable connector		10-32 UNF	BNC				10-32 UNF
Side/Top connection		Side Top	Top				
Mounting method		Adhesive	M6				M3
Housing material		Aluminum alloy	Stainless steel				Titanium
Weight without cable	gram	4.5	40 / 25 (-01 version)				2.9
Notes		Hermetically sealed					



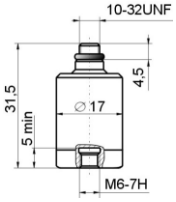
AP24



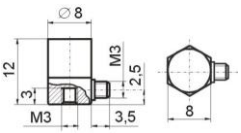
AP24-01



AP28



AP28-01



AP34

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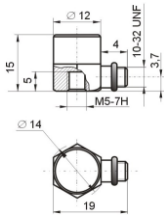
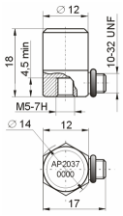
The sensitivity of piëzo electric elements is largely depending on the dimensions of the element. As such, a higher sensitivity will usually result in a larger transducer whereas the frequency range is inverse proportional to this. The APTech general-purpose accelerometers have been designed to cover a wide range of applications and offer medium range in sensitivity and frequency response. The annular shear construction makes these accelerometers relatively insensitive to external influences such as temperature changes, base-strain and magnetism. Each transducer is delivered with an individual calibration-chart, connection cable and mounting stud (if applicable).

General purpose accelerometers

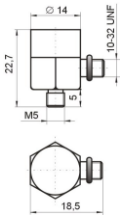
Parameter	Unit	AP37	AP2037(-100)	AP39	AP40 (-02)
					
Charge sensitivity (+/- 10%)	pC/g	10	-	20	20
	pC/ms²	1.02	-	2.04	2.04
Voltage sensitivity (+/- 10%)	mV/g	-	10* 100*	-	-
	mV/ms²	-	1.02* 10.2*	-	-
Amplitude range	g rms	10,000	500 50	5,000	5,000
Resolution (1 Hz to 10 kHz)	g rms	-	0.0005 0.00035	-	-
Mechanical shock limit	g peak	15,000	1,500	10,000	10,000
Frequency range (+/- 1 dB)	Hz	0.5 to 15,000	0.5 to 15,000	0.5 to 10,000	0.5 to 10,000
Resonant frequency	kHz	>45	>45	>35	>35
Transverse sensitivity	%	<5	<5	<5	<5
Base strain sensitivity	g/µm	<0.005	<0.005	<0.02	<0.025
Temperature range	°C	-60 to +150	-40 to +125	-60 to +150	-60 to +150
Insulation resistance	MΩ	>10,000	-	>10,000	>10,000
Capacitance	pF	600 to 800	-	600 to 800	600 to 800
Isolated base		No	No	No	No
Excitation voltage	Volt DC	-	+15 to +30 +18 to +30	-	-
Constant current	mA	-	2 to 20	-	-
Output impedance	Ω	-	<500	-	-
Output bias voltage	Volt DC	-	+8 to +11 +10 to +13	-	-
Settling time	second	-	4	-	-
Construction		Shear	Shear	Shear	Shear
Piezo material		ZTP19	ZTP19	ZTP19	ZTP19
Sensor connector		10-32 UNF	10-32 UNF	10-32 UNF	10-32 UNF
Integral cable length	meter	-	-	-	-
Connecting cable		AK04	AK15	AK04	AK04
Cable connector		10-32 UNF	BNC	10-32 UNF	10-32 UNF
Side/Top connection		Side	Side	Side	Side Top
Mounting method		M5	M5	M5 stud	M5
Housing material		Titanium	Titanium	Titanium	Titanium
Weight without cable	gram	9	6	12	12
Notes			* available with normalized sensitivity (2%) and TEDS		



AP37



AP2037



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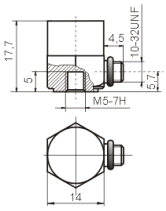
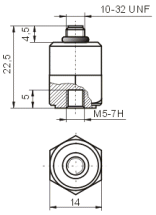


AP40



AP40-02

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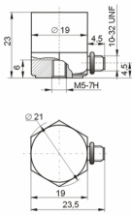
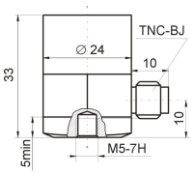
General purpose accelerometers



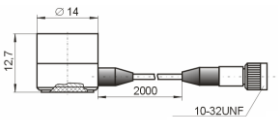
Parameter	Unit	AP57	AP58	AP77	AP90
Charge sensitivity (+/- 10%)	pC/g	80	80	20	80
	pC/ms²	8.16	8.16	2.04	8.16
Voltage sensitivity (+/- 10%)	mV/g		-	-	-
	mV/ms²		-	-	-
Amplitude range	g rms	2,000	500	5,000	2,000
Resolution (1 Hz to 10 kHz)	g rms		-	-	-
Mechanical shock limit	g peak	4,000	1,000	10,000	4,000
Frequency range (+/- 1 dB)	Hz	0.5 to 8,000	0.5 to 5,000	0.5 to 12,000	0.5 to 8,000
Resonant frequency	kHz	>20	>15	>35	>20
Transverse sensitivity	%	<5	<5	<5	<5
Base strain sensitivity	g/µm	<0.005	<0.05	<0.005	<0.005
Temperature range	°C	-60 to +150	-40 to +150	-60 to +150	-60 to +150
Insulation resistance	MΩ	>10,000	>10,000	>10,000	>10,000
Capacitance	pF	1,000 to 1,500	700 to 1,000	2,000	1,000 to 1,500
Isolated base		No	No	Optional	No
Excitation voltage	Volt DC	-	-	-	-
Constant current	mA	-	-	-	-
Output impedance	Ω	-	-	-	-
Output bias voltage	Volt DC	-	-	-	-
Settling time	second	-	-	-	-
Construction		Shear	Shear	Shear	Shear
Piezo material		ZTP19	ZTP19	ZTP19	ZTP19
Sensor connector		10-32 UNF	TNC	-	-
Integral cable length	meter	-	-	2	2
Connecting cable		AK04	AK36	-	-
Cable connector		10-32 UNF		10-32 UNF	10-32 UNF
Side/Top connection		Side	Side	Side	Top
Mounting method		M5	M5	Adhesive	M5
Housing material		Titanium	Stainless steel	Titanium	Titanium
Weight without cable	gram	32	65	10	26
Notes					Leak detection sensor



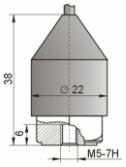
AP57



AP58



AP77



AP90

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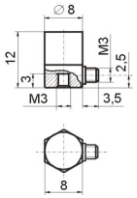
General purpose accelerometers

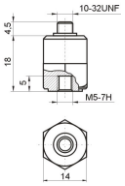




Parameter	Unit	AP95	AP96	AP97	AP98-30 / -100 / -500 (-01)		
Charge sensitivity (+/- 10%)	pC/g	3	10	10	-		
	pC/ms²	0.31	1.02	1.02	-		
Voltage sensitivity (+/- 10%)	mV/g	-	-	-	30	100	500
	mV/ms²	-	-	-	3.1	10.2	51
Amplitude range	g rms	1,500	10,000	10,000	160	50	10
Resolution (1 Hz to 10 kHz)	g rms	-	-	-	0.0003	0.0002	0.0002
Mechanical shock limit	g peak	2,500	20,000	20,000	1,500	1,000	1,000
Frequency range (+/- 1 dB)	Hz	1 to 15,000	1 to 10,000	1 to 10,000	0.5 to 12,000		
Resonant frequency	kHz	>50	>45	>45	>40		
Transverse sensitivity	%	<5	<5	<5	<5		
Base strain sensitivity	g/µm	<0.001	<0.001	<0.001	<0.001		
Temperature range	°C	-70 to +250	-70 to +250	-70 to +250	-40 to +125		
Insulation resistance	MΩ	>1,000	>1,000	>1,000	-		
Capacitance	pF	600 to 900	800 to 1,200	800 to 1,200	-		
Isolated base		No	No	No	No		
Excitation voltage	Volt DC	-	-	-	+15 to +30	+18 to +30	+18 to +30
Constant current	mA	-	-	-	2 to 20		
Output impedance	Ω	-	-	-	<500		
Output bias voltage	Volt DC	-	-	-	+8 to +11	+10 tp +13	+10 to +13
Settling time	second	-	-	-	4		
Construction		Shear	Shear	Shear	Shear		
Piezo material		ZTP26	ZTP26	ZTP26	ZTP19		
Sensor connector		M3	10-32 UNF	10-32 UNF	BNC or 10-32UNF (-01 version)		
Integral cable length	meter	-	-	-	-		
Connecting cable		AK06	AK04	AK04	AK19 or AK15 (-01 version)*		
Cable connector		10-32 UNF	10-32 UNF	10-32 UNF	BNC or 10-32 UNF (-01 version)		
Side/Top connection		Side	Top	Side	Top		
Mounting method		M3	M5	M5	M7		
Housing material		Titanium	Titanium	Titanium	Stainless steel		
Weight without cable	gram	1.6	7	7	40 / 25 (-01 version)		
Notes							



AP95



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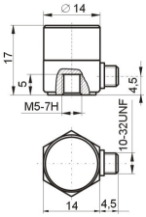

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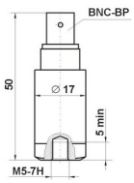
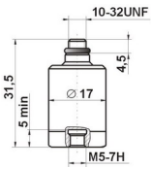


AP98



AP98-01

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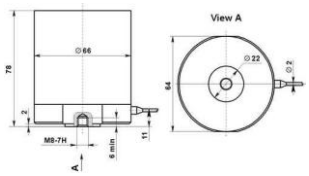
AP47 is a high sensitivity charge mode accelerometer designed for low frequency seismic applications while AP50, AP2050 and AP98-500 combine relatively high sensitivity with a large frequency range. AP2050 is optimized for measurement of building vibrations where low noise level is important.

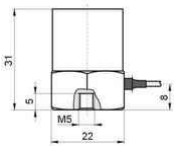
High sensitivity seismic accelerometers



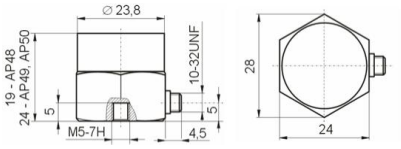
Parameter	Unit	AP46	AP47	AP48 / 49 / 50		
Charge sensitivity (+/- 10%)	pC/g	8.000	500	200	400	600
	pC/ms²	815.5	51.0	20.4	40.8	61.2
Voltage sensitivity (+/- 10%)	mV/g	-	-		-	
	mV/ms²	-	-		-	
Amplitude range	g rms	10	200	1,000	400	200
Resolution (1 Hz to 10 kHz)	g rms	-	-		-	
Mechanical shock limit	g peak	100	500	2,000	800	400
Frequency range (+/- 1 dB)	Hz	5 to 700	5 to 5,000	0.5 to 2,000	0.5 to 1,500	0.5 to 1,000
Resonant frequency	kHz	>2.5	>15	>6	>5	>4
Transverse sensitivity	%	<10	<5		<5	
Base strain sensitivity	g/µm	<0.001	<0.001		<0.001	
Temperature range	°C	-60 to +150	-60 to +150		-60 to +150	
Insulation resistance	MΩ	>1,000	>1,000		>1,000	
Capacitance	pF	7,000	7,000		7,000	
Isolated base		Yes	Yes		No	
Excitation voltage	Volt DC	-	-		-	
Constant current	mA	-	-		-	
Output impedance	Ω	-	-		-	
Output bias voltage	Volt DC	-	-		-	
Settling time	second	-	-		-	
Construction		Compression	Compression		Bend	
Piezo material		ZTP19	ZTP19		ZTP19	
Sensor connector		-	-		10-32 UNF	
Integral cable length	meter	2	2		-	
Connecting cable		-	-		AK04	
Cable connector		Open end	Open end		10-32 UNF	
Side/Top connection		Side	Side		Side	
Mounting method		M8	M5		M5	
Housing material		Stainless steel	Stainless steel		Titanium	
Weight without cable	gram	1.200	70	20	21	21
Notes			Floating output			



AP46



AP47



AP48 / 49 / 50

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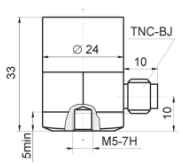
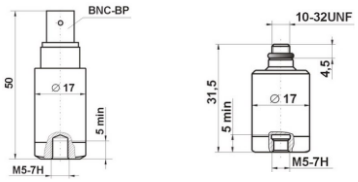
High sensitivity seismic accelerometers

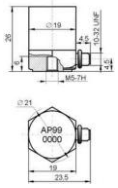
Parameter	Unit	AP2050	AP98-500 (-01)		AP99-500 (-1,000)	
						
Charge sensitivity (+/- 10%)	**pC/g**	-	-		-	
	pC/ms²	-	-		-	
Voltage sensitivity (+/- 10%)	**mV/g**	600	500		500	1,000
	mV/ms²	61.2	51		51	101.9
Amplitude range	**g rms**	8	10		10	5
Resolution (1 Hz to 10 kHz)	**g rms**	0.00002	0.0002		0.0002	0.0001
Mechanical shock limit	**g peak**	25	1,000		500	250
Frequency range (+/- 1 dB)	**Hz**	0.5 to 5,000	0.5 to 12,000		0.5 to 5,000	
Resonant frequency	**kHz**	>15	>40		>15	
Transverse sensitivity	**%**	<4	<5		<5	
Base strain sensitivity	**g/µm**	<0.001	<0.005		<0.005	
Temperature range	**°C**	-40 to +125	-40 to +125		-40 to +125	
Insulation resistance	**MΩ**	-	-		-	
Capacitance	**pF**	-	-		-	
Isolated base		No	No		No	
Excitation voltage	**Volt DC**	+18 to +30	+18 to +30		+18 to +30	
Constant current	**mA**	2 to 20	2 to 20		2 to 20	
Output impedance	**Ω**	<500	<500		<500	
Output bias voltage	**Volt DC**	+10 to +14	+10 to +13		+10 to +14	
Settling time	**second**	5	5		4	
Construction		Shear	Shear		Shear	
Piezo material		ZTP19	ZTP19		ZTP19	
Sensor connector		TNC	10-32 UNF	BNC	10-32 UNF	
Integral cable length	**meter**	-	-		-	
Connecting cable		AK24	AK15	AK19	AK15	
Cable connector		BNC	BNC	10-32UNF	BNC	
Side/Top connection		Side	Top		Side	
Mounting method		M5	M5		M5	
Housing material		Stainless steel	Stainless steel		Stainless steel	
Weight without cable	**gram**	65	25	40	35	
Notes		* available with normalized sensitivity (2%) and TEDS				



AP2050



AP98-500 (-01)



AP99-500 (-1,000)

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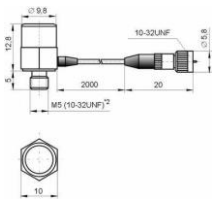
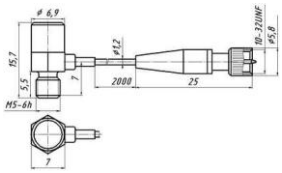
The combination of a robust housing and integral mounting stud, high resonance frequency and high mechanical shock limit makes Type AP31 the best choice for measurement of strong impulsive signals such as found on pneumatic tools.

Shock accelerometers

Parameter	Unit	AP11	AP12
Charge sensitivity (+/- 10%)	pC/g	0.04	0.02
	pC/ms²	0.004	0.002
Voltage sensitivity (+/- 10%)	mV/g	-	-
	mV/ms²	-	-
Amplitude range	g rms	50,000	70,000
Resolution (1 Hz to 10 kHz)	g rms	-	-
Mechanical shock limit	g peak	100,000	150,000
Frequency range (+/- 1 dB)	Hz	2 to 25,000	2 to 50,000
Resonant frequency	kHz	>70	>160
Transverse sensitivity	%	<5	<5
Base strain sensitivity	g/µm	<0.3	<0.3
Temperature range	°C	-60 to +200	-60 to +200
Insulation resistance	MΩ	>10,000	>10,000
Capacitance	pF	300 to 400	300 to 400
Isolated base		No	No
Excitation voltage	Volt DC	-	-
Constant current	mA	-	-
Output impedance	Ω	-	-
Output bias voltage	Volt DC	-	-
Settling time	second	-	-
Construction		Compression	Compression
Piezo material		Quartz	Quartz
Sensor connector		-	-
Integral cable length	meter	2	2
Connecting cable		-	-
Cable connector		10-32 UNF	10-32 UNF
Side/Top connection		Side	Side
Mounting method		M5 stud	M5 stud
Housing material		Stainless steel	Stainless steel
Weight without cable	gram	8	2.8
Notes			



AP11



AP12

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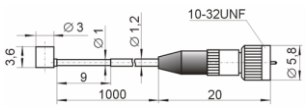
The APTech range of miniature accelerometers is designed to offer good stability, large dynamic range and very small dimensions. In all situations where mass-loading of the test-object has to be considered, Type AP19 or AP33 is the best choice. AP31 and AP2031 have an integral M5 mounting-stud, all other miniature versions are designed for glue- or wax-mounting.

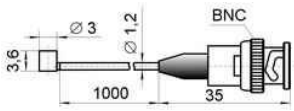
High frequency/miniature accelerometers



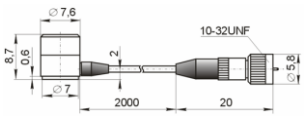

Parameter	Unit	AP19 (-HT)	AP2019	AP30	AP2030
Charge sensitivity (+/- 10%)	pC/g	0.25*	-	1.1	-
	pC/ms²	0.03	-	0.1	-
Voltage sensitivity (+/- 10%)	mV/g	-	0.5	-	3
	mV/ms²	-	0.05	-	0.3
Amplitude range	g rms	20,000	7,000	10,000	1,500
Resolution (1 Hz to 10 kHz)	g rms	-	0.005	-	0.002
Mechanical shock limit	g peak	40,000	40,000*	20,000	3,000
Frequency range (+/- 1 dB)	Hz	0.5 to 30,000	5 to 30,000	0.5 to 20,000	0.5 to 20,000
Resonant frequency	kHz	>100	>100	>60	>60
Transverse sensitivity	%	<5	<5	<3	<3
Base strain sensitivity	g/µm	<0.005	<0.005	<0.005	<0.005
Temperature range	°C	-60 to +150 -60 to +250	-40 to +125	-60 to +150	-40 to +125
Insulation resistance	MΩ	>10,000	-	>10,000	-
Capacitance	pF	500 to 700	-	500 to 700	-
Isolated base		No	No	Yes	Yes
Excitation voltage	Volt DC	-	+15 to +30	-	+15 to +30
Constant current	mA	-	2 to 20	-	2 to 20
Output impedance	Ω	-	<500	-	<500
Output bias voltage	Volt DC	-	+8 to +11	-	+8 to +11
Settling time	second	-	4	-	4
Construction		Shear	Shear	Shear	Shear
Piezo material		ZTP19	ZTP19	ZTP19	ZTP19
Sensor connector		-	-	-	-
Integral cable length	meter	1	1	2	2
Connecting cable		-	-	-	-
Cable connector		10-32 UNF	BNC	10-32 UNF	BNC
Side/Top connection		Side	Side	Side	Side
Mounting method		Adhesive	Adhesive	Adhesive	Adhesive
Housing material		Titanium Alloy	Titanium	Titanium	Titanium
Weight without cable	gram	0.14	0.18	1.3	1.6
Notes		* Charge sensitivity +/- 20%	* max shock for connector 10,000 g		



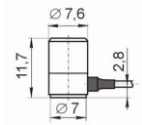
AP19



AP2019



AP30



AP2030

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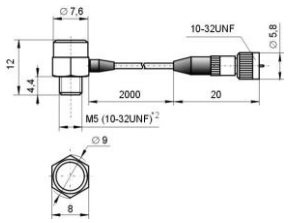
The APTech range of miniature accelerometers is designed to offer good stability, large dynamic range and very small dimensions. In all situations where mass-loading of the test-object has to be considered, Type AP19 or AP33 is the best choice. AP31 and AP2031 have an integral M5 mounting-stud, all other miniature versions are designed for glue- or wax-mounting.

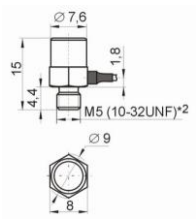
High frequency/miniature accelerometers



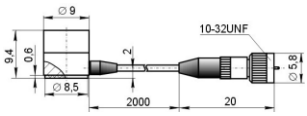

Parameter	Unit	AP31	AP2031	AP32	AP33
Charge sensitivity (+/- 10%)	pC/g	1.1	-	2	0.2
	pC/ms²	0.1	-	0.2	0.003
Voltage sensitivity (+/- 10%)	mV/g	-	3	-	-
	mV/ms²	-	0.3	-	-
Amplitude range	g rms	20,000	1,500	10,000	20,000
Resolution (1 Hz to 10 kHz)	g rms	-	0.002	-	-
Mechanical shock limit	g peak	40,000	3,000	20,000	40,000
Frequency range (+/- 1 dB)	Hz	0.5 to 20,000	0.5 to 20,000	0.5 to 18,000	0.5 to 30,000
Resonant frequency	kHz	>60	>60	>50	>90
Transverse sensitivity	%	<3	<3	<3	<3
Base strain sensitivity	g/µm	<0.0001	<0.0001	<0.005	<0.0001
Temperature range	°C	-60 to +150	-40 to +125	-60 to +150	-60 to +150
Insulation resistance	MΩ	>10,000	>10,000	>10,000	>10,000
Capacitance	pF	600 to 900	-	600 to 900	500 to 700
Isolated base		No	No	Yes	No
Excitation voltage	Volt DC	-	+15 to+30	-	-
Constant current	mA	-	2 to 20	-	-
Output impedance	Ω	-	<500	-	-
Output bias voltage	Volt DC	-	+8 to +11	-	-
Settling time	second	-	4	-	-
Construction		Shear	Shear	Shear	Shear
Piezo material		ZTP19	ZTP19	ZTP19	ZTP19
Sensor connector		-	-	-	-
Integral cable length	meter	2	2	2	2
Connecting cable		-	-	-	-
Cable connector		10-32 UNF	BNC	10-32 UNF	10-32 UNF
Side/Top connection		Side	Side	Side	Side
Mounting method		M5 stud	M5 stud	Adhesive	Adhesive
Housing material		Titanium	Titanium	Titanium	Titanium
Weight without cable	gram	1.3	1.6	2	0.7
Notes					



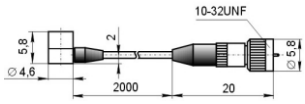
AP31



AP2031



AP32



AP33

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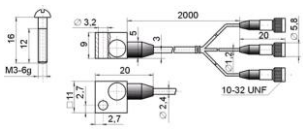
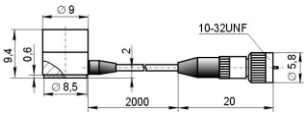
Mass-loading and base deformation is always a matter of concern in structural analysis applications. AP32 and AP2030 as well as the tri-axial sensor AP80 are specifically designed with this in mind. The accelerometers are packed in a small titanium housing offering a high stiffness in combination with low weight. For ease of mounting, all three versions may be attached to the test object with mounting wax.

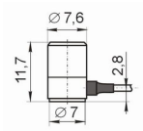
Structual analysis accelerometers

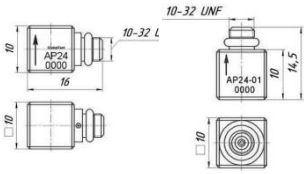



Parameter	Unit	AP80	AP32	AP2030	AP24 (-01)
Charge sensitivity (+/- 10%)	pC/g	2*	2	-	3
	pC/ms²	0.2	0.2	-	0.31
Voltage sensitivity (+/- 10%)	mV/g	-	-	3	-
	mV/ms²	-	-	0.3	-
Amplitude range	g rms	2,500	10,000	1,500	3,000
Resolution (1 Hz to 10 kHz)	g rms	-	-	0.002	-
Mechanical shock limit	g peak	5,000	20,000	3,000	6,000
Frequency range (+/- 1 dB)	Hz	0.5 to 20,000	0.5 to 18,000	0.5 to 20,000	1 to 10.000
Resonant frequency	kHz	>55	>50	>60	>30
Transverse sensitivity	%	<5	<3	<3	<5
Base strain sensitivity	g/µm	0.005	<0.005	<0.005	<0.0005
Temperature range	°C	-60 to +150	-60 to +150	-40 to +125	-60 to +150
Insulation resistance	MΩ	>10,000	>10,000	-	>10,000
Capacitance	pF	1,000	600 to 900	-	600 to 900
Isolated base		No	Yes	Yes	No
Excitation voltage	Volt DC	-	-	+15 to +30	-
Constant current	mA	-	-	2 to 20	-
Output impedance	Ω	-	-	<500	-
Output bias voltage	Volt DC	-	-	+8 to +11	-
Settling time	second	-	-	4	-
Construction		Shear	Shear	Shear	Shear
Piezo material		ZTP19	ZTP19	ZTP19	ZTP19
Sensor connector		-	-	-	-
Integral cable length	meter	2	2	2	-
Connecting cable		-	-	-	AK04
Cable connector		3x10-32 UNF	10-32 UNF	BNC	10-32 UNF
Side/Top connection		Side	Side	Side	Side Top
Mounting method		M3 bold	Adhesive	Adhesive	Adhesive
Housing material		Titanium	Titanium	Titanium	Aluminium alloy
Weight without cable	gram	6	2	1.6	4.5
Notes		Tri-axial * Charge sensitivity +/- 20%			AP24 side connector AP24-01 top connector









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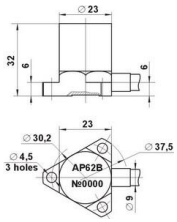
Using a different piezo electric material makes this range of accelerometers fit for applications where the surface temperature of the test-object is high (up to 250 degrees Celsius). Type AP63 may even be used up to 400 degrees Celsius. The integral cable of AP63 can also handle this high temperature thanks to a combination of ceramic and flexible metal tube screening.

High temperature accelerometers

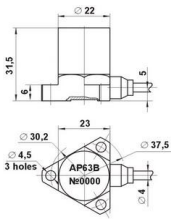




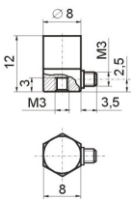
Parameter	Unit	AP62B (-02)		AP63B (-01)		AP95	AP96	AP97
Charge sensitivity (+/- 10%)	pC/g	100	500	10		3	10	10
	pC/ms²	10,2	50.97	1.02		0.31	1.02	1.02
Voltage sensitivity (+/- 10%)	mV/g	-		-		-	-	-
	mV/ms²	-		-		-	-	-
Amplitude range	g rms	1,000	500	1,000		1,500	10,000	10,000
Resolution (1 Hz to 10 kHz)	g rms	-		-		-	-	-
Mechanical shock limit	g peak	5,000	2,000	5,000		2,500	20,000	20,000
Frequency range (+/- 1 dB)	Hz	2 to 7,000	2 to 3,000	2 to 7,000	2 to 3,000	1 to 15,000	1 to 10,000	1 to 10,000
Resonant frequency	kHz	>18	>10	>18	>9	>50	>45	>45
Transverse sensitivity	%	<5		<5		<5	<5	<5
Base strain sensitivity	g/µm	<0.15		<0.01		<0.001	<0.001	<0.001
Temperature range	°C	-60 to +250		-60 to +400		-70 to +250	-70 to +250	-70 to +250
Insulation resistance	MΩ	>1,000		>100		>1,000	>1,000	>1,000
Capacitance	pF	4,000 to 4,800		1,300 to 1,700		600 to 900	800 to 1,200	800 to 1,200
Isolated base		Yes		Yes		No	No	No
Excitation voltage	Volt DC	-		-		-	-	-
Constant current	mA	-		-		-	-	-
Output impedance	Ω	-		-		-	-	-
Output bias voltage	Volt DC	-		-		-	-	-
Settling time	second	-		-		-	-	-
Construction		Compression		Compression		Shear	Shear	Shear
Piezo material		ZTP26		THAB		ZTP26	ZTP26	ZTP26
Sensor connector		-		-		M3	10-32 UNF	10-32 UNF
Integral cable length	meter	To be specified		To be specified		-	-	-
Connecting cable		Flexible metal tube		Metal tube		AK06	AK04	AK04
Cable connector		To be specified		To be specified		10-32 UNF	10-32 UNF	10-32 UNF
Side/Top connection		Side		Side		Side	Top	Side
Mounting method		3x M4		3x M4		M3	M5	M5
Housing material		Stainless steel		Stainless steel		Titanium alloy	Titanium alloy	Titanium
Weight without cable	gram	95	140	98	120	2,6	11	7
Notes		Floating output		Floating output				



AP62B



AP63B



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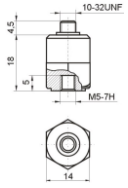

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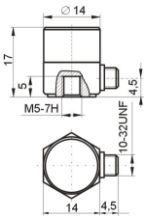

AP97

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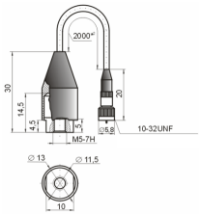
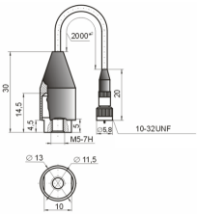
The single axis accelerometer AP78 and tri-axial version AP79 are specifically designed for under water use. The hermetically sealed housing and integral cable entry ensure trouble-free operation up to a depth of 50 meters. The well designed shear construction allows these sensors to be used over a wide linearity range and up to relatively high shock levels. The standard length of the integral cable is 2 meters but any length up to 30 meters can be delivered on order.

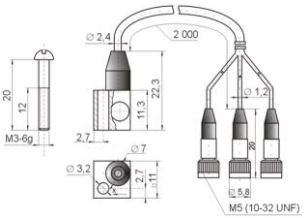
Underwater accelerometers



Parameter	Unit	AP78	AP2078	AP79
Charge sensitivity (+/- 10%)	pC/g	10	-	2*
	pC/ms²	1.02	-	0.2
Voltage sensitivity (+/- 10%)	mV/g	-	10	-
	mV/ms²	-	1.02	-
Amplitude range	g rms	5,000	500	2,500
Resolution (1 Hz to 10 kHz)	g rms	-	<0.0005	-
Mechanical shock limit	g peak	10,000	1,500	5,000
Frequency range (+/- 1 dB)	Hz	0.5 to 15,000	0,5 to 15,000	0.5 to 15,000
Resonant frequency	kHz	>45	>45	>50
Max. underwater depth	meter	50	50	50
Transverse sensitivity	%	<3	<5	<5
Base strain sensitivity	g/µm	<0.005	<0.005	<0.0005
Temperature range	°C	-60 to +150	-40 to +125	-60 to +150
Insulation resistance	MΩ	>10,000	-	>10,000
Capacitance	pF	1,000	-	1,000
Isolated base		No	No	No
Excitation voltage	Volt DC	-	+15 to +30	-
Constant current	mA	-	2 to 20	-
Output impedance	Ω	-	<500	-
Output bias voltage	Volt DC	-	+10 to +13	-
Settling time	second	-	4	-
Construction		Shear	Shear	Shear
Piezo material		ZTP19	ZTP19	ZTP19
Sensor connector		-	-	-
Integral cable length	meter	2	2	2
Connecting cable		-	-	-
Cable connector		10-32 UNF	BNC	3x 10-32 UNF
Side/Top connection		Top	Top	Top
Mounting method		M5	M5	M3 bold
Housing material		Titanium	Titanium alloy	Titanium
Weight without cable	gram	10	15	6
Notes				Tri-axial * Charge sensitivity +/- 20%







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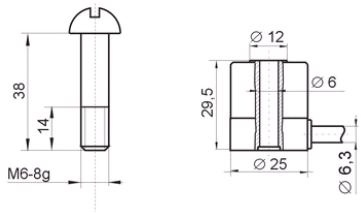
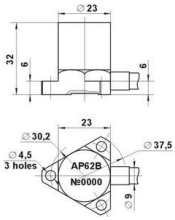
APTech industrial accelerometers are designed for vibration measurements under harsh environmental conditions. AP62 and AP63 have balanced outputs to increase noise immunity and providing high electrical insulation from the test-object . AP85 is a small but robust accelerometer with built-in electronics and a output cable protected by a flexible metal tube.

Industrial accelerometers

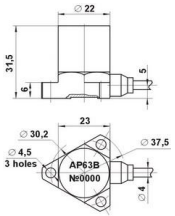
Parameter	Unit	AP35-10 /-30 /-50 /-100				AP62B(-02)		AP63B (-01)
								
Charge sensitivity (+/- 10%)	**pC/g**					100	500	10
	pC/ms²					10,2	51	1.02
Voltage sensitivity (+/- 10%)	**mV/g**	10	30	50	100	-		-
	mV/ms²	1.02	3.1	5.1	10.2	-		-
Amplitude range	**g rms**	480	160	100	50	1,000	500	1,000
Resolution (1 Hz to 10 kHz)	**g rms**	0.0005		0.0002		-		-
Mechanical shock limit	**g peak**	500				5,000	2,000	5,000
Frequency range (+/- 1 dB)	**Hz**	0.5 to 11,000				2 to 7,000	2 to 3,000	2 to 7,000
Resonant frequency	**kHz**	>40				>18	>10	>18
Transverse sensitivity	**%**	<5%				<5		<5
Base strain sensitivity	**g/µm**					<0.15		<0.01
Temperature range	**°C**	-40 to +125				-60 to +250		-60 to +400
Insulation resistance	**MΩ**					>1,000		>100
Capacitance	**pF**					4,000 to 4,800		1,300 to 1,700
Isolated base		No				Yes		Yes
Excitation voltage	**Volt DC**	+ 15 to 30			+18 to +30	-		-
Constant current	**mA**	2 to 20				-		-
Output impedance	**Ω**	<500				-		-
Output bias voltage	**Volt DC**	+8 to +11			+11 to +13	-		-
Settling time	**second**	3				-		-
Construction		Shear				Compression		Compression
Piezo material		ZTP19				ZTP26		THAB
Sensor connector		-				-		-
Integral cable length	**meter**	To be specified				To be specified		To be specified
Connecting cable		Flexible metal tube				Flexible metal tube		Metal tube
Cable connector		To be specified				To be specified		To be specified
Side/Top connection		Side				Side		Side
Mounting method		M6 bold				3x M4		3x M4
Housing material		Stainless steel				Stainless steel		Stainless steel
Weight without cable	**gram**	39				95	140	98
Notes		Floating output				Floating output		Floating output



AP35-10 /-30 /-50 /-100



AP62B



AP63B

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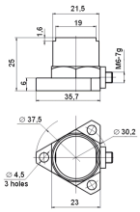
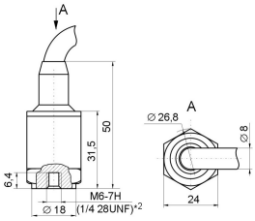
APTech industrial accelerometers are designed for vibration measurements under harsh environmental conditions. AP62 and AP63 have balanced outputs to increase noise immunity and providing high electrical insulation from the test-object . AP85 is a small but robust accelerometer with built-in electronics and a output cable protected by a flexible metal tube.

Industrial accelerometers

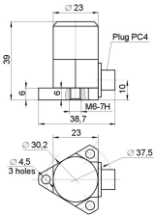
Parameter	Unit	AP68	AP85	AP91 (-01)
				
Charge sensitivity (+/- 10%)	**pC/g**	-	-	-
	pC/ms²	-	-	-
Voltage sensitivity (+/- 10%)	**mV/g**	80	10	30
	mV/ms²	8,15	1.02	3.06
Amplitude range	**g rms**	60	50	160
Resolution (1 Hz to 10 kHz)	**g rms**	0.0003	-	0.0003
Mechanical shock limit	**g peak**	500	500	500
Frequency range (+/- 1 dB)	**Hz**	0.5 to 8,000	2 to 7,000	0.5 to 5,000
Resonant frequency	**kHz**	>25	>25	>35
Transverse sensitivity	**%**	<5	<5	<5
Base strain sensitivity	**g/µm**	<0.01	<0.01	<0.01
Temperature range	**°C**	-40 to +125	-40 to +125	-40 to +125
Insulation resistance	**MΩ**	-	>100	-
Capacitance	**pF**	-		-
Isolated base		-	Yes	-
Excitation voltage	**Volt DC**	+18 to +30	+18 to +30	+15 to +30
Constant current	**mA**	2 to 20	2 to 20	2 to 20
Output impedance	**Ω**	-	<500	-
Output bias voltage	**Volt DC**	11 to 13	11 to 13	8 to 11
Settling time	**second**	3	3	3
Construction		Shear	Compression	Shear
Piezo material		ZTP19	THAB	ZTP19
Sensor connector		AR07	-	PC4 AR07
Integral cable length	**meter**	-	To be specified	-
Connecting cable		-	Metal tube	-
Cable connector		-	To be specified	-
Side/Top connection		Side	Side	Side
Mounting method		3x M4	3x M4	3x M4
Housing material		Stainless steel	Stainless steel	Stainless steel
Weight without cable	**gram**	65	98	90
Notes			Floating output	



AP68



AP85



AP91

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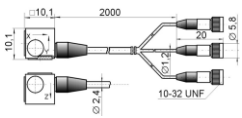
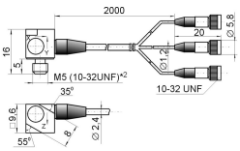
The range of tri-axial accelerometers have been developed for measurement of vibration in three perpendicular directions simultaneously.

Triaxial accelerometers

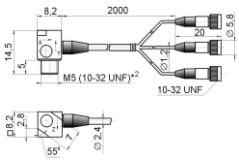
Parameter	Unit	AP20	AP21	AP22	AP23	AP26
						
Charge sensitivity (+/- 10%)	pC/g	2*	2*	1*	0.2 – 0.3	1*
	pC/ms²	0.2	0.2	0.1	0.02 – 0.03	0.1
Voltage sensitivity (+/- 10%)	mV/g	-	-	-	-	-
	mV/ms²	-	-	-	-	-
Amplitude range	g rms	5,000	10,000	25,000	20.000	5,000
Resolution (1 Hz to 10 kHz)	g rms	-	-	-	-	-
Mechanical shock limit	g peak	10,000	20,000	50,000	50.000	10,000
Frequency range (+/- 1 dB)	Hz	0.5 to 18,000	0.5 to 20,000	0.5 to 22,000	0.5 to 30.000	2 to 20,000
Resonant frequency	kHz	>50	>55	>80	>80	>60
Transverse sensitivity	%	<5	<5	<5	<5	<5
Base strain sensitivity	g/µm	<0.0005	<0.0005	<0.0005	<0.0005	<0.01
Temperature range	°C	-60 to +150	-60 to +150	-60 to +150	-60 to +150	-60 to +250
Insulation resistance	MΩ	>10,000	>10,000	>10,000	>1.000	>10,000
Capacitance	pF	600 to 900	600 to 900	500 to 700	400 to 700	600 to 800
Isolated base		Yes	No	No	No	No
Excitation voltage	Volt DC	-	-	-	-	-
Constant current	mA	-	-	-	-	-
Output impedance	Ω	-	-	-	-	-
Output bias voltage	Volt DC	-	-	-	-	-
Settling time	second	-	-	-	-	-
Construction		Shear	Shear	Shear	Shear	Shear
Piezo material		ZTP19	ZTP19	ZTP19	ZTP19	
Sensor connector		-	-	-	-	-
Integral cable length	meter	2	2	2	2	2
Connecting cable		-	-	-	-	-
Cable connector		3x 10-32 UNF	3x 10-32 UNF	3x 10-32 UNF	3x 10-32 UNF	3x 10-32 UNF
Side/Top connection		Side	Side	Side	Top	Side
Mounting method		Adhesive	M5 stud	M5 stud	M5 stud	4x M2
Housing material		Titanium	Titanium	Titanium	Titanium	Titanium
Weight without cable	gram	5	5	4	3.1	17
Notes		* Charge sensitivity +/- 20%	* Charge sensitivity +/- 20%	* Charge sensitivity +/- 20%	* Charge sensitivity +/- 20%	* Charge sensitivity +/- 20%



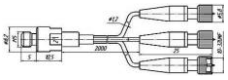
AP20



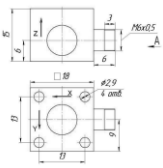
AP21



AP22



AP23



AP26

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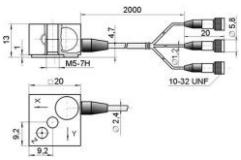
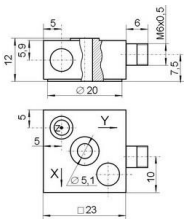
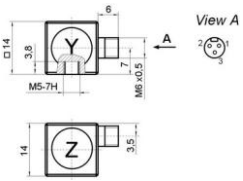
AP38 and AP2038(P) have a central hole for mounting with a M5-bolt. AP2038P has a miniature 3-pin connector at the side and comes with a separate cable AK21. AP79 is designed for underwater use and has a hermetically sealed integral cable.

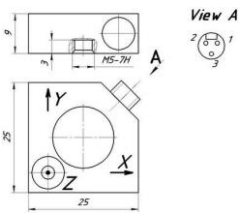
Triaxial accelerometers




Parameter	Unit	AP38	AP2038(P)			AP2044B(-30)		AP2082M	
Charge sensitivity (+/- 10%)	pC/g	10	-			-		-	
	pC/ms²	1.02	-			-		-	
Voltage sensitivity (+/- 10%)	mV/g	-	10	100	500	10	30	100	500
	mV/ms²	-	1.02	10.2	51	1.02	3,06	10.2	51
Amplitude range	g rms	5,000	500	50	10	500	100	50	10
Resolution (1 Hz to 10 kHz)	g rms	-	<0,0005	<0.0003	<0,0002	<0.002	<0.001	<0.0003	<0.0002
Mechanical shock limit	g peak	10,000	500	100	20	500	200	100	
Frequency range (+/- 1 dB)	Hz	0.5 to 10,000	0.5 to 12,000			05 to 12.000		0.5 to 10,000	
Resonant frequency	kHz	>35	>35			36		>30	
Max. underwater depth	meter	-	-			-		-	
Transverse sensitivity	%	<5	<5			<5		<5	
Base strain sensitivity	g/µm	<0.02	<0.02			-		-	
Temperature range	°C	-60 to +150	-40 to +125			-40 to 125		-40 to +125	
Insulation resistance	MΩ	>10,000	-			-		-	
Capacitance	pF	900 to 1,200	-			-		-	
Isolated base		No	No			No		No	
Excitation voltage	Volt DC	-	+15 to +30			+18 to 30		+18 to 30	
Constant current	mA	-	2 to 20			2 to 20		2 to 20	
Output impedance	Ω	-	<500			<500		<500	
Output bias voltage	Volt DC	-	+8 to +11			10 to 13		10 to 13	
Settling time	second	-	4			4		4	
Construction		Shear	Shear			Shear		Shear	
Piezo material		ZTP19	ZTP19			ZTP19		ZTP19	
Sensor connector		-	- | 3-pin miniature (P)			3-pin miniature		3-pin miniature	
Integral cable length	meter	2	2			-		-	
Connecting cable		-	- | AK21			AK21		AK21	
Cable connector		3x 10-32 UNF	3x BNC			3x BNC		3x BNC	
Side/Top connection		Side	Side			Side		Side	
Mounting method		M5 bold	M5 bold			M5 bold		-	
Housing material		Titanium	Titanium			Titanium		S. steel	
Weight without cable	gram	26	34			13		26	
Notes									





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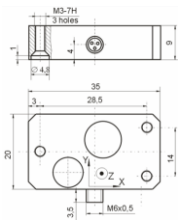
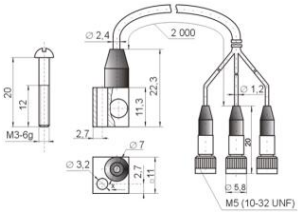
AP38 and AP2038(P) have a central hole for mounting with a M5-bolt. AP2038P has a miniature 3-pin connector at the side and comes with a separate cable AK21. AP79 is designed for underwater use and has a hermetically sealed integral cable.

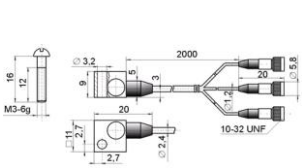
Triaxial accelerometers

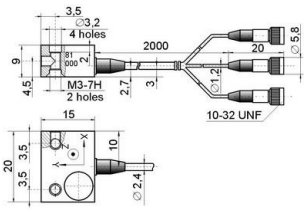



Parameter	Unit	AP2083	AP79	AP80	AP81
Charge sensitivity (+/- 10%)	pC/g	-	2*	2*	10
	pC/ms²	-	0.2	0.2	1.02
Voltage sensitivity (+/- 10%)	mV/g	10	-	-	-
	mV/ms²	1.02	-	-	-
Amplitude range	g rms	±500	2,500	2,500	2,000
Resolution (1 Hz to 10 kHz)	g rms	<0.0005	-	-	-
Mechanical shock limit	g peak	±500	5,000	5,000	5,000
Frequency range (+/- 1 dB)	Hz	0.5 to 10,000	0.5 to 15,000	0.5 to 20,000	0.5 to 10.00
Resonant frequency	kHz	>30	>50	>55	> 35
Max. underwater depth	meter	-	50	-	-
Transverse sensitivity	%	<5	<5	<5	<5
Base strain sensitivity	g/µm	-	<0.0005	<0.005	<0.02
Temperature range	°C	-40 to +125	-60 to +150	-60 to +150	-60 t0 +150
Insulation resistance	MΩ	-	>10,000	>10,000	>10,000
Capacitance	pF	-	1,000	1,000	900 to 1,200
Isolated base		No	No	No	No
Excitation voltage	Volt DC	+15 to +30	-	-	-
Constant current	mA	2 to 20	-	-	-
Output impedance	Ω	<500	-	-	-
Output bias voltage	Volt DC	8 to 11	-	-	-
Settling time	second	4	-	-	-
Construction		Shear	Shear	Shear	Shear
Piezo material		ZTP19	ZTP19	ZTP19	ZTP19
Sensor connector		3-pin miniature	-	-	-
Integral cable length	meter	-	2	2	2
Connecting cable		AK21	-	-	-
Cable connector		3x BNC	3x 10-32 UNF	3x10-32 UNF	3x10-32 UNF
Side/Top connection		Side	Top	Side	Side
Mounting method		3x M3	M3 bold	M3 bold	2x M3 bold
Housing material		Titanium alloy	Titanium	Titanium	Titanium
Weight without cable	gram	34	6	6	21
Notes			* Charge sensitivity +/- 20% Underwater	Charge sensitivity +/- 20%	Charge sensitivity +/- 20%









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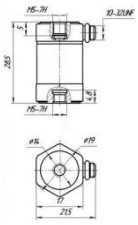
AP10 is a stable reference accelerometer intended for back-to-back comparison calibration of piezo electric accelerometers. The transducer has a inverted compression construction and the quartz element exhibits long term stability and low sensitivity to temperature changes. Each accelerometer is individually calibrated with a laser interferometer in accordance with ISO 5347.

Reference accelerometer

AP10

Parameter	Unit	AP10
Charge sensitivity (+/- 10%)	pC/g	1
	pC/ms²	0.102
Voltage sensitivity (+/- 10%)	mV/g	-
	mV/ms²	-
Amplitude range	g rms	1000
Resolution (1 Hz to 10 kHz)	g rms	-
Mechanical shock limit	g peak	2,000
Frequency range (+/- 1%)	Hz	4 to 1,250
Frequency range (+/- 3%)	Hz	0.5 to 5,000
Frequency range (+/- 6%)	Hz	0,5 to 10,000
Resonant frequency	kHz	>30
Transverse sensitivity	%	<3
Temperature range	°C	-60 to +200
Insulation resistance	MΩ	>5,000
Capacitance	pF	36
Isolated base		No
Excitation voltage	Volt DC	-
Constant current	mA	-
Output impedance	Ω	-
Output bias voltage	Volt DC	-
Settling time	second	-
Construction		Inverted Compression
Piezo material		Quartz
Sensor connector		10-32 UNF
Integral cable length	meter	-
Connecting cable		AK04
Cable connector		10-32 UNF
Side/Top connection		Side
Mounting method		M5
Housing material		Stainless steel
Weight without cable	gram	45
Notes		



AP10

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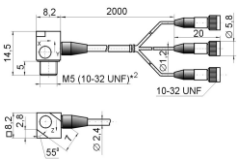
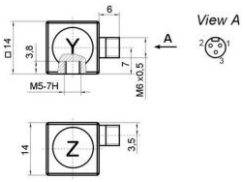
Type AP31, AP22 and AP2022 are specially designed for Hand/Arm vibration measurements in combination with the Hand/Arm adapters AP5022, AP5023 and AP5024. The high resonance frequency of these accelerometers avoids incorrect measurements on impulsive tools.

Human vibration Hand/Arm accelerometers

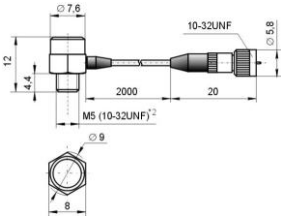
Parameter	Unit	AP22	AP2044B(-30)		AP31
					
Charge sensitivity (+/- 10%)	**pC/g**	1*	-	-	1.1
	pC/ms²	0.1	-	-	0.1
Voltage sensitivity (+/- 10%)	**mV/g**	-	10	30	-
	mV/ms²	-	1.02	3,06	-
Amplitude range	**g rms**	25,000	500	100	20,000
Resolution (1 Hz to 10 kHz)	**g rms**	-	<0.002	<0.001	-
Mechanical shock limit	**g peak**	50,000	500	200	40,000
Frequency range (+/- 1 dB)	**Hz**	05. To 22,000	05 to 12.000		0.5 to 20,000
Resonant frequency	**kHz**	>80	36		>60
Transverse sensitivity	**%**	<5	-		<3
Base strain sensitivity	**g/µm**	<0.0005	<5		<0.0001
Temperature range	**°C**	-60 to +150	-		-60 to +150
Insulation resistance	**MΩ**	>10,000	-40 to 125		>10,000
Capacitance	**pF**	500 to 700	-		600 to 900
Isolated base		No	-		No
Excitation voltage	**Volt DC**	-	No		-
Constant current	**mA**	-	+18 to 30		-
Output impedance	**Ω**	-	2 to 20		-
Output bias voltage	**Volt DC**	-	<500		-
Settling time	**second**	-	10 to 13		-
Construction		Shear	4		Shear
Piezo material		ZTP19	Shear		ZTP19
Sensor connector		-	ZTP19		-
Integral cable length	**meter**	2	3-pin miniature		2
Connecting cable		-	AK21		-
Cable connector		3x 10-32 UNF	3x BNC		10-32 UNF
Side/Top connection		Side			Side
Mounting method		M5 stud	Side		M5 stud
Housing material		Titanium	M5 bold		Titanium
Weight without cable	**gram**	4	Titanium		1.5
Notes		* Charge sensitivity +/- 20%			



AP22



AP2044B



AP31

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The transducer and adapterset AP5021 is developed for measurement and analysis of Hand/Arm vibrations according to ISO5349-1986 and ISO10819-1993. The sets come with three adapters for mounting a miniature accelerometer into the tool to be measured.

Transducer and adapter set for Hand/Arm vibration measurement Type AP5021/AP5221

All three adapters have provisions for mounting either a single-axis miniature accelerometer in three perpendicular directions or a miniature triaxial accelerometer to evaluate the vibration levels in three planes simultaneously.

AP5021/1 containing adapters and a single-axis accelerometer Type AP31
AP5221/1 containing adapters and a single-axis accelerometer Type AP2031
AP5021/3 including adapters and a triaxial accelerometer Type AP22
AP5244/3 including adapters and a triaxial accelerometer Type AP2044B

Hand/Arm adapters		**AP5022**	**AP5025**	**AP5026**
				
Parameter	**Unit**			
Frequency range ±10%	Hz	>3,000	>1,500	>2,000
Measuring directions for single axis accelerometer		X,Y,Z	X,Y,Z	Y,Z
Dimensions	mm	19x19x19	Base 50 x 12	87 x23
Housing material		Anodized aluminum	Anodized aluminum	Anodized aluminum
Weight	gram	16	19	30

Hand/Arm Accelerometers		**AP31**	**AP22**	**AP2044B(-30)**
				
Parameter	**Unit**			
Axial sensitivity ±10%	pC/g	1	1	-
	pC/ms²	0.1	0.1	-
Voltage sensitivity (+/- 10%)	mV/g	-	-	10
	mV/ms²	-	-	1.02
Frequency range ±10%	Hz	0.5 to 20,000	0.5 to 22,000	05 to 12.000
Max. shock limit +/-	g peak	40,000	50,000	500
Integral cable lenght	meter	2	2	2
Connector		10-32 UNF	3x 10-32 UNF	3x BNC
Weight without cable	gram	1.3	4	13
Notes			* Charge sensitivity +/- 20%10,000 g	

Accessories included
. 1x Allen key 5 mm
. 3x releasable tie-wrap 180 x 8 mm
. carrying case

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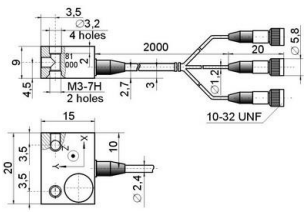
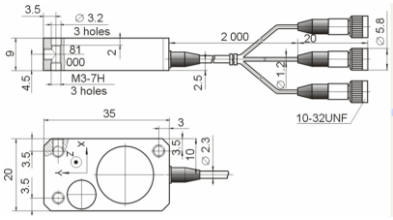
The tri-axial accelerometers AP81, AP2081 and AP2083 are intended for use inside the rubber seat pads for Whole Body vibration measurements. AP2081 is available with 10 mV/g and 100 mV/g sensitivity. AP2083 has a miniature multipin connector at the side allowing simple replacement of damaged cables and the use of cables with different connectors (BNC or Lemo)

Triaxial seat accelerometers

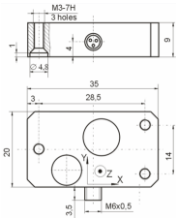
Parameter	Unit	AP81	AP2081(-100)		AP2083
					
Charge sensitivity (+/- 10%)	**pC/g**	10	-		-
	pC/ms²	1.02	-		-
Voltage sensitivity (+/- 10%)	**mV/g**	-	10	100	10
	mV/ms²	-	1.02	10.2	1.02
Amplitude range	**g rms**	2,000	500	50	500
Resolution (1 Hz to 10 kHz)	**g rms**	-	0.0005	0.0003	0.0003
Mechanical shock limit	**g peak**	5,000	500		700
Frequency range (+/- 1 dB)	**Hz**	0.5 to 10,000	0.5 to 10,000		0.5 to 10,000
Resonant frequency	**kHz**	> 35	> 30		> 30
Transverse sensitivity	**%**	<5	<5		<5
Base strain sensitivity	**g/µm**	< 0.02	< 0.02		< 0.02
Temperature range	**°C**	-60 to +150	-40 to +125	-40 to +80	-40 to +125
Insulation resistance	**MΩ**	> 10,000	-		-
Capacitance	**pF**	900 to 1,200	-		-
Isolated base		No	No		No
Excitation voltage	**Volt DC**	-	+15 to +30	+18 to +30	+15 to +30
Constant current	**mA**	-	2 to 20		2 to 20
Output impedance	**Ω**	-	<500		<500
Output bias voltage	**Volt DC**	-	8 to 11	11 to 14	8 to 11
Settling time	**second**	-	4		4
Construction		Shear	Shear		Shear
Piezo material		ZTP19	ZTP19		ZTP19
Sensor connector		-	-		Miniature 3-pin
Integral cable length	**meter**	2	2		-
Connecting cable		-	-		AK21
Cable connector		3x 10-32 UNF	3x BNC		3x BNC
Side/Top connection		Side	Side		Side
Mounting method		2x M3 bold	3x M3 bold		3x M3 bold
Housing material		Titanium	Titanium		Titanium
Weight without cable	**gram**	21	34		34
Notes		Used inside AP5011	Used inside AP5211		Used inside AP5213



AP81



AP2081(-100)



AP2083

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The tri-axial seat transducers AP5011, AP5211 and AP5213 are designed in accordance with the criteria stated in European Standard EN 1032, 1996 and intended for measurement of Whole Body Vibration according to ISO 2631 and ISO 7096.

Tri-axial seat transducers Type AP5011, AP5211 and AP5213

The flexible rubber pad houses a robust tri-axial accelerometer that can easily be removed from the seat pad for calibration and/or alternative use in other applications. The seat transducer is meant to be placed under a seated person or placed on a floor. The rubber pad has three slits that make it possible to use the transducer strapped to the human body. X-, Y- and Z-directions are clearly marked on the top of the transducer with a corresponding marking on the connectors at the end of the cable.

Human vibration whole body		**AP5011**	**AP5211(-100)**	**AP5213**
				
Parameter	**Unit**			
Charge sensitivity (+/- 10%)	**pC/g**	10	-	-
	pC/ms²	1.02	-	-
Voltage sensitivity (+/- 10%)	**mV/g**	-	10 100	10
	mV/ms²	-	1.02 10.2	1.02
Amplitude range	**g rms**	2,000	500 50	500
Resolution (1 Hz to 10 kHz)	**g rms**	-	0.0005 0.0003	0.0003
Mechanical shock limit	**g peak**	5,000	500	500
Frequency range (+/- 1 dB)	**Hz**	0.5 to 10,000	0.5 to 10,000	0.5 to 10,000
Resonant frequency	**kHz**	> 35	> 30	> 30
Transverse sensitivity	**%**	<5	<5	<5
Base strain sensitivity	**g/µm**	< 0.02	< 0.02	< 0.02
Temperature range	**°C**	-60 to +150	-40 to +125 -40 to +80	-40 to +125
Insulation resistance	**MΩ**	> 10,000	-	-
Capacitance	**pF**	900 to 1,200	-	-
Isolated base		No	No	No
Excitation voltage	**Volt DC**	-	+15 to +30 +18 to +30	+15 to +30
Constant current	**mA**	-	2 to 20	2 to 20
Output impedance	**Ω**	-	<500	<500
Output bias voltage	**Volt DC**	-	8 to 11 11 to 14	8 to 11
Settling time	**second**	-	4	4
Construction		Shear	Shear	Shear
Piezo material		ZTP19	ZTP19	ZTP19
Sensor connector		-	-	-
Integral cable length	**meter**	2	2	2
Connecting cable		-	-	AK21
Cable connector		3x 10-32 UNF	3x BNC	3x BNC
Side/Top connection		Side	Side	Side
Mounting method		-	-	-
Housing material		Rubber pad	Rubber pad	Rubber pad
Weight without cable	**gram**	395	408	410
Notes		Conforms EN 1032 1996	Conforms EN 1032 1996	Conforms EN 1032 1996

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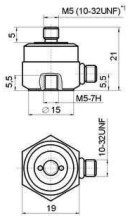
The piezo electric force transducers AC20, AC21 and AC22 have been developed for measurement of dynamic forces. AC21 is a special version of AC20 to be used with the impulse hammers AU01 or AU02. The miniature version AC22 can only be used for measurement of compression forces.

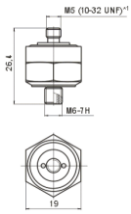
Force sensors



Parameter	Unit	AC20	AC21	AC22	AC23
Charge sensitivity (+/- 10%)	pC/N	2	2	4	4
Force range	N	-1,000 to +5,000	-1,000 to +5,000	+500 to +5,000	-1000 to +5000
Transverse sensitivity	%	<5	<5	<3	<5
Resonant frequency	kHz	>20	>20	>100	25
Effective mass (upper/lower)	gram	5/17	5/17	0.3/1.3	5/17
Base strain sensitivity	Nm/um	<0.05	<0.05	<0.1	<0.03
Temperature range	oC	-60 to +200	-60 to +200	-60 to +150	-60 to +200
Temperature sensitivity	N/oC	<0.05	<0.05	<0.1	<0.05
Insulation resistance	Mohm	>1,000	>1,000	>1,000	>1,000
Capacitance without cable	pF	20 to 35	20 to 35	200 to 350	10 to 14
Sensor connector		10-32 UNF	M6	-	10-32 UNF
Integral cable length	meter	-	-	2	-
Connecting cable		AK04	-	-	AK04
Cable connector		10-32 UNF	-	10-32 UNF	-
Side/Top connection		Side	Top	Side	Side
Mounting method		M5 stud/hole	M5 stud	Adhesive	M5 stud/hole
Housing material		Stainless steel	Stainless steel	Stainless steel	S. steel
Weight without cable	gram	23	23	1.6	25
Notes			Only for use with Impulse hammer AU01 or AU02	Only for compression type of forces	



AC20



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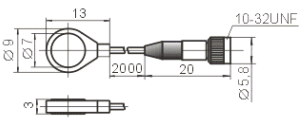
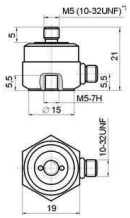


AC22



AC23

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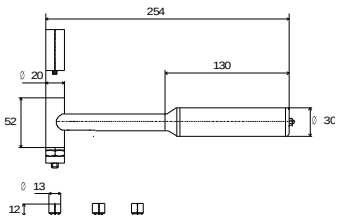
APTech Impulse Hammers are intended for measurement of frequency characteristics, mechanical mobility and impedance of mechanical structures. The hammers can be used both for testing the dynamic characteristics and for simulating the structures behaviour. The hammers are delivered with built-in, exchangeable force transducer and several hammer tips for different force and frequency ranges.

Impulse Hammers Type AU01 and AU02

	AU01	AU02
Force transducer type	AC21	AC21
Charge sensitivity (+/- 10%)	2 PC/N	-
Voltage sensitivity (+/- 10%)	-	1.5 mV/N
Transverse sensitivity	<5%	<5%
Force range	-1,000 to +5,000 N	-1,000 to +5,000 N
Resolution	-	0.003 N
Hammer mass	330 gram	330 gram
Mass of steel tip	10 gram	10 gram
Mass of rubber tip	9 gram	9 gram
Mass of nylon tip	7 gram	7 gram
Mass of extender	108 gram	108 gram
Excitation voltage	-	+15 to +30 Volt DC
Constant current	-	2 to 20 mA
Output impedance	-	<500 Ω
Output bias voltage	-	+8 to +11 Volt DC
Cable connector	10-32 UNF	BNC

	Force range/shock duration:
- steel tip	500 – 5,000 / 0.1 – 0.2 N/ms
- steel tip and extender	500 – 5,000 / 0.15 – 0.3 N/ms
- rubber tip	300 – 1,000 / 0.4 – 0.6 N/ms
- rubber tip and extender	300 – 1,000 / 0.5 – 0.8 N/ms
- nylon tip	100 – 700 / 1.2 – 2.6 N/ms
- nylon tip and extender	100 – 700 / 1.7 – 3.9 N/ms



Standard accessories:
AU0101 Steel hammer tip
AU0102 Rubber hammer tip
AU0103 Nylon hammer tip
AU0104 Extender mass
Connection cable, 2 meter length

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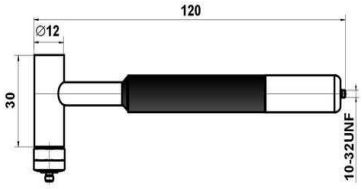
Miniature Impulse Hammer Type AU03

	AU03
Force transducer type	AC25
Charge sensitivity (+/- 10%)	400 PC/N (without amplifier)
Voltage sensitivity (+/- 10%)	4mV/N (with amplifier)
Transverse sensitivity	<5%
Force range	3 to 1,000 N (with amplifier) 3 to 200 N (without amplifier)
Resolution	0.0007 N
Hammer mass	70 gram (without amplifier) 90 gram (with amplifier)
Mass of steel tip	2.5 gram
Mass of rubber tip	2 gram
Mass of nylon tip	2 gram
Mass of extender	20 gram
Excitation voltage	+15 to +30 Volt DC
Constant current	2 to 20 mA
Output impedance	<500 Ω
Output bias voltage	+8 to +10 Volt DC
Cable connector	BNC



	Force range/shock duration:
- steel tip	30 – 1,000 / 0.5 – 0.8 N/ms
- steel tip and extender	
- rubber tip	10 – 500 / 0.7 – 1.0 N/ms
- rubber tip and extender	10 – 500 / 0.8 – 1.1 N/ms
- nylon tip	3 – 300 / 1.2 – 3.0 N/ms
- nylon tip and extender	3 – 300 / 1.1 – 2.7 N/ms

Standard accessories:
AU0301 Steel hammer tip
AU0302 Rubber hammer tip
AU0303 Nylon hammer tip
AU0304 Extender mass
Connection cable, 2 meter length

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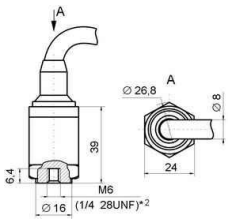
The advantage of a piezo electric velocity transducer such as AV01 is found in relatively small dimensions, excellent dynamic range and frequency independent directional characteristics. These properties make AV01 the best choice for a wide range of applications including measurements on rotating machinery.

Velocity sensors

AV01 (-01)

Parameter	Unit	AV01 (-01)	
Voltage sensitivity (+/- 10%)	mV/mm/s	4.1	
Amplitude range	mm/s rms	1,000	
Resolution	mm/s rms	0.05	
Mechanical shock limit	g peak	500	
Frequency range (+/- 1 dB)	Hz	2 to 2,000	50 to 5,000
Resonant frequency	kHz	>25	
Transverse sensitivity	%	<5	
Temperature range	degrees C	-40 to +125	
Excitation voltage	Volt DC	+18 to +30	
Constant current	mA	3.6 to 20	
Output impedance	Ohm	<500	
Output bias voltage	Volt DC	+9 to +13	
Settling time	second	5	
Sensor connector		-	
Integral cable length	meter	2	
Connecting cable		Flexible metal tube	
Cable connector		To be specified	
Side/Top connection		Top	
Mounting method		M6	
Housing material		Stainless steel	
Weight wo cable	gram	70	
Notes			



AV01 (-01)

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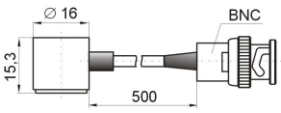
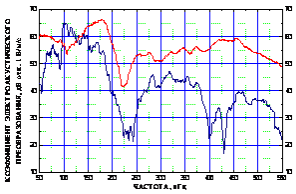
Acoustic Emission Transducers are designed to pick up the ultrasound energy caused by mechanical stresses inside metal constructions. A high amount of acoustic emission has shown to be a good indicator for possible defects in for example welding connections. A typical application is found in the quality control of high pressure vessels.

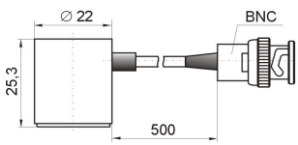
Acoustic Emission transducer

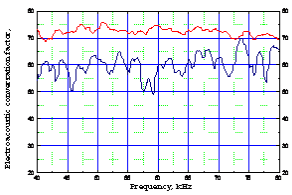
Parameter	Unit	GT200	GT205	GT300	GT301
					
Sensitivity	dB re.1V/m/s	>60	>50	>50	>55
Frequency range ±10dB	kHz	130 to 200	40 to 100	100 to 800	50 to 500
Resonant frequency	kHz	165	50	280	220
Temperature range	ºC	-40 to +150	-40 to +150	-40 to +150	-40 to +120
Insulation resistance	MΩ	>100	>100	>100	>1
Capacitance w.o. cable	pF	400 to 500	400 to 500	400 to 500	150
Supply voltage	V	-	-	-	-
Supply current	mA	-	-	-	-
Integral cable length	m	0.5	0.5	0.5	0.5
Extension cable supplied		-	-	-	-
Connector		BNC	BNC	BNC	BNC
Side/Top-connection		Side	Side	Side	Side
Housing material		Titanium alloy	Titanium alloy	Titanium alloy	Titanium alloy
Weight	gram	15	15	15	14
Type		Resonant	Wide band	Wide band	Wide band



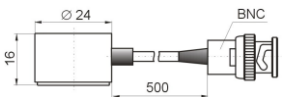


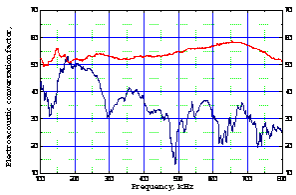
GT200



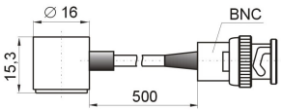


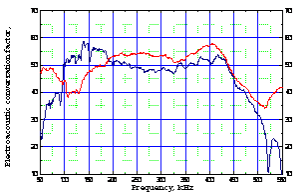
GT205





GT300





GT301

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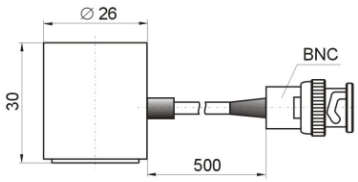
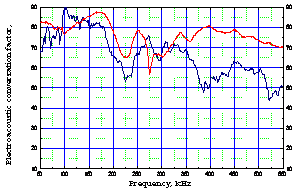
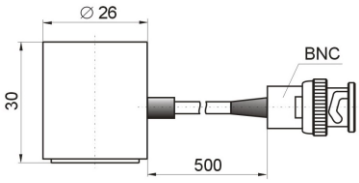
Acoustic Emission Transducers are designed to pick up the ultrasound energy caused by mechanical stresses inside metal constructions. A high amount of acoustic emission has shown to be a good indicator for possible defects in for example welding connections. A typical application is found in the quality control of high pressure vessels.

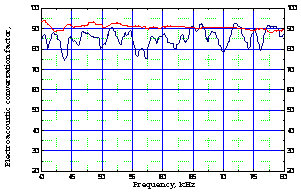
Acoustic Emission transducer		**GT200U**	**GT250**	**GT350**
				
Parameter	**Unit**			
Sensitivity	dB re.1V/m/s	>85	>90	>75
Frequency range ±10dB	kHz	130 to 200	40 to 100	100 to 800
Resonant frequency	kHz	165	50	120
Temperature range	ºC	-40 to +100	-40 to +100	-40 to +100
Insulation resistance	MΩ	-	-	-
Capacitance w.o. cable	pF	-	-	-
Supply voltage	V	12	12	12
Supply current	mA	30	30	30
Integral cable length	m	0.5	0.5	0.5
Extension cable supplied		-	-	-
Connector		BNC	BNC	BNC
Side/Top-connection		Side	Side	Side
Housing material		Stainless steel	Stainless steel	Stainless steel
Weight	gram	70	80	15
Type		Resonant with amplifier	Low frequency with amplifier	Wide band with amplifier



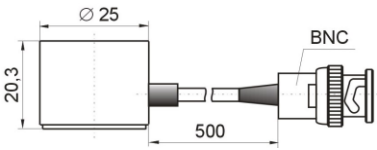


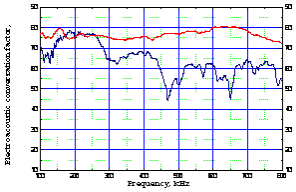
GT200U





GT250





GT350

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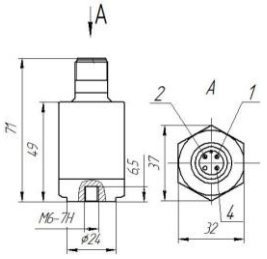
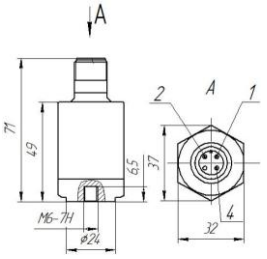
The new APTech vibroswitches combine piëzo electric vibration sensors with vibration monitoring capabilities in a very small and robust housing. The SV0x vibro switches are 2-wire systems and can drive cables up to 100 metres. The SV01-02 is capable of transmitting the RMS vibration levels over the standard 2–20mA current interface.
Vibroswitches are delivered pre-programmed or settings can be done using the optional SVprog programming device.

Vibroswitch		**SV01**	**SV01-01**	**SV01-02**
				
Parameter	**Unit**			
Frequency range (+/- 1 dB)	**Hz**	3 to 1,000	3 to 1,000	3 to 1,000
Measurement range & threshold range	**mm/s**	1-20/0.1 | 20-40/0.2 | 40-60/0.3 60-80/0.4 | 80-100/0.5 | 100-120/0.6 120-140/0.7 | 140-160/0.8 160-180/0.9 | 180/200/1.0 *[1]	1-20/0.1 20-100/0.5 100-200/1.0 *[1]	1-20/0.1 20-100/0.5 100-200/1.0 *[1]
Treshold accuracy	**%**	+/-3	+/-3	+/-3
Threshold hysteresis	**%**	6	6	6
Power-up time	**s**	<10	<10	<10
Signal treshold delay	**s**	0-9*[1]	0-9*[1]	0-9*[1]
Relay action		latching – non-latching	latching – non-latching	latching – non-latching
Start-up delay (after power-up or non-lathing)	**s**	0 or 20*[1]	0 or 20*[1]	0 or 20*[1]
Transverse sensitifity	**%**	<5	<5	<5
Temperature range (overall accuracy +/- 5%)	**°C**	-40 to + 85	-40 to + 85	-40 to + 85
Relay - switching current	**mA**	15 - 500	15 - 500	15 -500
Relay - power required	**V**	20 to 30	20 to 30	20 to 30
Relay – voltage drop	**V**	<4 @ 15mA | <7@ 500mA	<4 @ 15mA | <7@ 500mA	<4 @ 15mA | <7@ 500mA
Relay – position		open/close*[1]	open/close*[1]	open/close*[1]
Relay – leak current in open position	**mA**	<1.5	<1.5	<1.5
Output range	**mm/s**	-	-	0.2-20 | 0.4-40 | 0.6-60 0.8-80 | 1-100 | 1.2-120 1.4-140 | 1.6-160 | 1.8-180 2-200 *[2]
Output current conversion coefficient (4-20mA)	**mA to mm/s**	-	-	0.8 | 0.4 | 0.27 | 0.16 | 0.13 0.11 | 0.1 | 0.09 | 0.08 *[2]
Housing material		Stainless steel	Stainless steel	Stainless steel
Weight	**gram**	120	120	120
Notes		- 2-wire system		- 4-wire system - RMS – current conversion

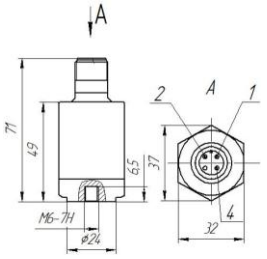
** [1] to be specified when ordering*
** [2] automaticaly selected based on threshold*



SV01



SV01-01



SV01-02

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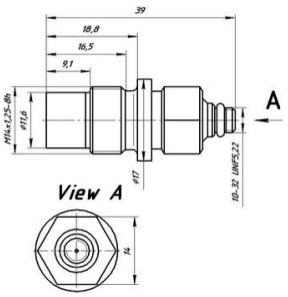
The APTech dynamic pressure transducers offer a wide dynamic range, quartz or lithium niobate sensing element and a long term stability. The PS2001 has a builtin IEPE amplifier and can be used at depth upto 50 metres.

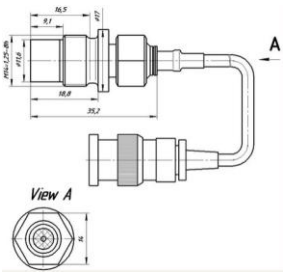
Dynamic pressure transducers




Parameter	Unit	PS01	PS01-01	PS01-02	PS01-03
Sensitivity	pC/bar	20	20	400	400
Measurement range	bar	0.1 to 250	0.1 to 250	0.1 to 250	0.1 to 250
Resonant frequency	kHz	> 120	> 120	> 120	> 120
Linearity	%	>2%	>2%	>2%	>2%
Temperature range	°C	-50 to +200	-50 to +200	-50 to +200	-50 to +200
Output signal polarity		positive	positive	positive	positive
Capacitance w.o. cable	pF	7 to 11	7 to 11	7 to 11	7 to 11
Insulation resistance	□	$>10^{10}$	$>10^{10}$	$>10^{10}$	$>10^{10}$
Sensor element		Quartz	Quartz	Lithium niobate	Lithium niobate
Housing material		Stainless steel	Stainless steel	Stainless steel	Stainless steel
Membrane material		Stainless steel	Stainless steel	Stainless steel	Stainless steel
Integral cable length	m	-	2	2	-
Cable connector		10-32 UNF	BNC	BNC	10-32 UNF
Connecting cable		AK04	-	-	AK04
Weight	gram	35	35	35	35



PS01/PS01-03



PS01-01/PS01-02

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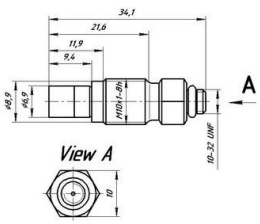
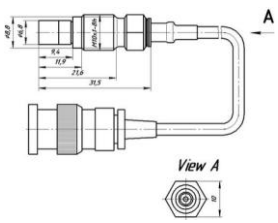
The APTech dynamic pressure transducers offer a wide dynamic range, quartz or lithium niobate sensing element and a long term stability. The PS2001 has a builtin IEPE amplifier and can be used at depth upto 50 metres.

Dynamic pressure transducers

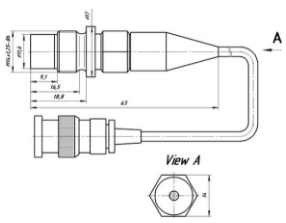
Parameter	Unit	PS02 (-01)		PS2001
Sensitivity	pC/bar	4		
	mV/bar			200
Measurement range	bar	1 to 2,500		0.1 to 50
Resonant frequency	kHz	> 200		> 120
Linearity	%	>2%		>2%
Temperature range	°C	-50 to +200		-40 to +125
Output signal polarity		positive		positive
Capacitance w.o. cable	pF	20		-
Insulation resistance	□	$>5.10^9$		-
Excitation voltage	**Volt DC**	-		+15 to +30
Constant current	**mA**	-		2 to 20
Output impedance	**Ω**	-		<500
Output bias voltage	**Volt DC**	-		8 to 11
Sensor element		Quartz		Quartz
Housing material		Stainless steel		Stainless steel
Membrane material		Stainless steel		Stainless steel
Integral cable length	m	-	2	2
Cable connector		10-32 UNF	BNC	BNC
Connecting cable		AK04	-	-
Weight	gram	12		40



PS02



PS02-01



PS2001

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Designed for in-the- field calibration of vibration measurement chains, this portable unit offers a stable and reliable vibration signal of 10 m/s^2. Due to the frequency of 159.2 Hz(1000 rad/s) this acceleration-level corresponds nicely to 10 mms velocity and 10µm displacement.
A built-in control loop with small reference transducer ensures the vibration level to be 10 m/s^2 within ± 3% for different transducer loads up to a weight of 150 gram. The specially designed electromagnetic shakertable keeps the transverse motion and distortion to an absolute minimum.

Hand-held vibration calibrator Type AT01

Frequency (± 0.5%)	159.15 Hz
Acceleration (± 3%)	10 ms^{-2} RMS
Velocity (± 3%)	10 mms^{-1} RMS
Displacement (± 3%)	10 µm RMS
Transverse motion	< 5%
Distortion	< 3%
Maximum load	150 grams
Ramp-up time	5 seconds
Automatic switch off	after 60 seconds
Power supply	internal batteries, 2x 9 Volt
Battery life	± 100 calibration cycles
Dimensions	58 mm round, 180 mm long
Weight	950 grams with batteries
Mounting thread	M8-7H
Max. mounting torque	110 Ncm
Operating temperature	-10 to +50°C

Standard accessories:

AD0305	Threaded insert M8 to M5
AD0310	Threaded insert M8 to 10-32 UNF
AD0303	Threaded insert M8 to M3
AH0806	Mounting stud M8 to M6
AH0805	Mounting stud M8 to M5
AH0810	Mounting stud M8 to 10-32 UNF
AD01	Mounting base for wax mounting
AS01	Soft bag

Optional accessories:

AW01	Mounting wax
PLC	Carrying case

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Vibration calibration system
Type AT02

Frequency (± 0.5%)	159.15 Hz
Acceleration (± 3%)	2 to 20 ms^{-2} RMS
Velocity (± 3%)	2 to 20 mms^{-1} RMS
Displacement (± 3%)	2 to 20 µm RMS
Transverse motion	< 5%
Distortion	< 3%
Maximum load	160 grams
Ramp-up time	5 seconds
Inputs	Charge and IEPE
PC connection	USB
Automatic switch off	after 60 seconds
Power supply	internal rechargeable battery
Battery life	120 calibration cycles
Dimensions	150mm x 130mm x 95mm
Weight	1,000 grams with batteries
Mounting thread	M8-7H
Max. mounting torque	110 Ncm
Operating temperature	+5 to +50°C

Standard accessories:

AD0305 Threaded insert M8 to M5
AD0310 Threaded insert M8 to 10-32 UNF
AD0303 Threaded insert M8 to M3
AH0806 Mounting stud M8 to M6
AH0805 Mounting stud M8 to M5
AH0810 Mounting stud M8 to 10-32 UNF
Power supply / charger

Optional accessories:

AW01 Mounting wax

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Designed for in-the- field calibration of low frequency accelerometers, this portable unit offers a stable and reliable vibration signal of 2.53 m/s^2. Due to the frequency of 40 Hz(1000 rad/s) this acceleration-level corresponds nicely to 10 mms velocity and 40µm displacement.
A built-in control loop with small reference transducer ensures the vibration level to be 2.53 m/s^2 within ± 3% for different transducer loads up to a weight of 200 gram. The specially designed electromagnetic shakertable keeps the transverse motion and distortion to an absolute minimum.

Hand-held vibration calibrator Type AT04

Frequency (± 1%)	40 Hz
Acceleration (± 3%)	2.53 ms^{-2} RMS
Velocity (± 3%)	10 mms^{-1} RMS
Displacement (± 3%)	40 µm RMS
Transverse motion	< 7%
Distortion	< 3%
Maximum load	200 grams
Ramp-up time	5 seconds
Automatic switch off	after 60 seconds
Power supply	Internal rechargeable battery
Battery life	90 calibration cycles
Dimensions	80 mm round, 190 mm long
Weight	1,500 grams with batteries
Mounting thread	M5-7H
Operating temperature	-10 to +50°C

Standard accessories:

AH0105	Mounting stud M5
AW01	Mounting wax
	Mounting base
	Power supply / charger
PLC	Carrying case

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Converts the charge output from the APTech piezoelectric transducers to a low-impedance voltage output. The converter-input connects directly via a 10-32 microdot-connector to the cable of the vibration transducers; the output signal is available from a standard BNC-connector.
AP5000 is powered over the signal-line from a constant current source such as found in most modern signal-analyzers.

In-line charge converter
Type AP5000

Conversion factor	10 mV/pC
Noise	< 5.10-6 pC/pF [1]
Dynamic range	> 100 dB
Frequency range	0.5 to 25,000 Hz
Max. input charge	500 pC
Temperature range	-40 to +85°C
Input capacitance range	10 to 10,000 pF
Excitation voltage	+18 to +30 Volt DC
Constant current	3.6 to 20 mA
Output impedance	< 500
Output bias voltage	+10 to +12Volt DC
Settling time	5 s
Input connector	10-32 UNF
Output connector	BNC
Dimensions	12.5 mm round, 55 mm long [2]
Weight	36 gram

[1] Noise depending on transducer capacitance
[2] *Including connectors*

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Battery powered IEPE power supply AS01

IEPE sensor voltage	22 – 30 V
IEPE sensor current	4,7 mA
Frequency range	0.5 Hz to 100 kHz
Noise	<2 µVolt RMS
Battery life	40 hour
Supply voltage	Internal Ni-CAD / 28 Volt <10mA
Dimensions	145 x 77 x 42 mm

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Battery powered IEPE power supply AS07

IEPE sensor voltage	22 – 30 Volt
IEPE sensor current	4,7 mA
Frequency range	0.5 Hz to 30 kHz
Input/output Voltage range	4,5 Volt
Noise	<5 µVolt RMS
Gain (+/- 1%)	1, 10, 100
Battery life	4 hour
Supply voltage	Internal Ni-CAD / 12 Volt <50mA
Dimensions	115 x 65 x 67 mm
Weight	300 gram (incl. batteries)

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Battery powered Charge and IEPE Amplifier

- USB interface
- Windows™ software
- Built in Volt meter

Parameter	Unit	AP5100 1-channel	AP5100-01 1-channel
Voltage range	V	10	
Charge range	pC	10^5	
Frequency range (-3dB … -1dB)	Hz	0.3 - 10^5	
Input resistance	Ω	> 10^9	
Output resistance	Ω	< 100	
Maximum output voltage	V	± 10	
Output noise	μV_{rms}	≤ 10	
IEPE sensor supply	V	+24	
	mA	3.6	
IEPE gain (± 0,5 %)		1, 2, 5, 10, 50, 100, 200, 500	1, 2, 5, 10, 50, 100, 200, 500, 1,000
Charge gain (± 0,5 %)	mV/pC	0,1, 0,2, 0,5, 1, 2, 5, 10, 20, 50, 100, 200; 500	0,1, 0,2, 0,5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1,000
Highpass filter (-40dB/decade)	Hz	0.3, 1.0, 3.0, 10	0,3 … 1 (step 0.01) 1 … 10 (step 1) 10 … 100 (step 10) 200
Lowpass filter (-40dB/decade)	kHz	1, 3, 10, 30	0,1 … 1 (step 0.01) 1 … 10 (step 1) 10 … 100 (step 10)
Input connector type	-	BNC, TWIN BNC, 10-32UNF	
Output connector type		BNC	
PC interface		USB	
Power supply		Internal battery / 12 Volt <600mA	
Dimensions	mm	195×145×120	
Weight	gram	1,200	
Notes		Free PC software for system configuration and basic measurement functions	

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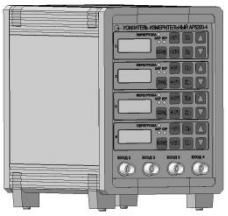
Charge and IEPE Amplifier

Parameter	Unit	AP5200 1-channel	AP5200 4-channel
			
Voltage range	**V**	10	
Charge range	**pC**	10^5	
Frequency range (-3dB … -1dB)	**Hz**	0.3 - 10^5	
Input resistance	**Ω**	> 10^9	
Output resistance	**Ω**	< 100	
Maximum output voltage	**V**	*±10*	
Output noise	**µV**	*≤10*	
IEPE sensor supply	**V**	+24	
	mA	3.6	
IEPE gain (± 0,5 %)		1, 2, 5, 10, 50, 100, 200, 500, 1,000	
Charge gain (± 0,5 %)	**mV/pC**	0,1, 0,2, 0,5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1,000	
Highpass filter (-40dB/decade)	**Hz**	0,3 … 1 (step 0.01) 1 … 10 (step 1) 10 … 100 (step 10) 200	
Lowpass filter (-40dB/decade)	**kHz**	0,1 … 1 (step 0.01) 1 … 10 (step 1) 10 … 100 (step 10)	
Input connector type	**-**	BNC, 10-32UNF	
Output connector type		BNC	
Power supply		12V <200mA	12V <600mA
Dimensions	**mm**	170x62x220	170x108x220
Weight	**gram**	500	800
Notes			

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Charge and IEPE Amplifier

- USB interface
- Windows™ software
- Built in Volt meter

AP5210 4-channel

Parameter	Unit	
Voltage range	V	10
Charge range	pC	10^5
Frequency range (-3dB … -1dB)	Hz	0.3 – 10^4
Input resistance	Ω	> 10^9
Output resistance	Ω	< 100
Maximum output voltage	V	± 10
Output noise	μV_{rms}	≤ 5
IEPE sensor supply	V	+24
	mA	3.6
IEPE gain (± 0,5 %)		1, 2, 5, 10, 50, 100, 200, 500, 1,000
Charge gain (± 0,5 %)	mV/pC	0,1, 0,2, 0,5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1,000
Highpass filter (-40dB/decade)	Hz	0,3 … 1 (step 0.01) 1 … 10 (step 1) 10 … 100 (step 10) 200
Lowpass filter (-40dB/decade)	kHz	0,1 … 1 (step 0.01) 1 … 10 (step 1) 10 … 100 (step 10)
Input connector type	-	BNC, TWIN BNC, 10-32UNF
Output connector type		BNC
PC interface		USB 2.0
Power supply		12 Volt <600mA
Dimensions	mm	170x62x220
Weight	gram	500
Notes		Free PC software for system configuration and basic measurement functions

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Accessories

Mounting studs

AH0103
M3, tightening torque: 0.5-0.7 Nm
AH0105
M5, tightening torque: 1.9-2.1 Nm
AH0106
M6, tightening torque: 2.5-2.7 Nm
AH0108
M8, tightening torque: 3.8-4.0 Nm
AH0110
10-32UNF, tightening torque :1.9-2.1 Nm
AH0503
M5/M3, tightening torque: 1.9-2.1 Nm
AH1003
10-32UNF M3, tightening torque: 1.9-2.1 Nm
AH0605
M6/M5, tightening torque: 1.9-2.1 Nm
AH0610
Stud M6, tightening torque: 1.9-2.1 Nm
AH0805
M8/M5, tightening torque: 1.9-2.1 Nm
AH0806
M8/M6, tightening torque: 2.5-2.7 Nm
AH0810
M8/10—32UNF, tightening torque: 1.9-2.1 Nm
AH1005
Insulating stud M5**,** tightening torque: 1.9-2.1 Nm
AH1006
M6, tightening torque: 2.5-2.7 Nm
AH1010
10-32UNF**,** tightening torque: 1.9-2.1 Nm

Magnetic mounting base

AM0105
Flat surface, M5
Breaking force: 50 N
AM0110
Flat surface, 10-32 UNF
Breaking force: 50 N
AM0305
Curved surface,M5
Breaking force: 60N
AM0306
Curved surface,M6
Breaking force: 60N
AM0310
Curved surface, 10-32 UNF
Breaking force: 60N
AM0408
Curved surface, M8
Breaking force 100N
AM0505
Isolating ,Curved surface, M5
Breaking force 100N
AM0506
Curved surface, M6
Breaking force 100N
AM0508
Curved surface, M8
Breaking force 100N
AM0600
for GT200, GT200B, GT301
breaking force: 60 N
AM0700
for GT200, GT205, GT250, GT300, GT350
breaking force: 50 N
AM0805
Isolating, Flat surface, M5
Breaking force: 50 N
AM1105
Isolating, Flat surface, M5
Breaking force: 50 N
AM1110
Flat surface, 10-32 UNF
Breaking force 50N

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Accessories

Mounting wax

AW01

Probe tip

AN01

Tri-axial mounting block

AY01
Tri-axial mounting block for accelerometers AP28, AP31, AP37, AP39, AP40 AP57 and AP98

AY02
Mounting block for AP19 accelerometer

AY19
Tri-axial mounting block for up to 3x AP19 accelerometers

Glue or wax mounting studs

AD05 M5-thread
AD06 M6-thread

Calibrator adapters for AT01

AD0305
Mounting stud M8 to M5
AD0310
Mounting stud M8 to 10-32 UNF
AD0303
Mounting stud M8 to M3
AH0806
Threaded insert M8 to M6
AH0805
Threaded insert M8 to M5
AH0810
Threaded insert M8 to 10-32 UNF
AD01
Mounting base for wax mounting

Hammer tips and extender

AU0101
Steel hammer tip for impulse hammer AU01 and AU02
AU0102
Rubber hammer tip for impulse hammer AU01 and AU02
AU0103
Nylon hammer tip for impulse hammer AU01 and AU02
AU0104
Mass-extender for impulse hammer AU01 and AU02

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Accessories

Cables

AK01
10-32 UNF (male) – LEMO1
Low noise cable, diameter: 2 mm
AK02
10-32 UNF (male) - 10-32 UNF (male)
Low noise cable, diameter: 1.2 mm
AK03
AR09 (3 pin M6 x 0.5) – 3x 10-32 UNF (male)
Diameter: 2.4 mm
AK04
10-32 UNF (male) - 10-32 UNF (male)
Low noise cable, diameter: 2 mm
AK05
10-32 UNF (male) - 10-32 UNF (male)
Armoured low noise, diameter: 6.3 mm
AK06
10-32 UNF (male) - M3 miniature
Low noise cable, diameter: 1.2 mm
AK08
10-32 UNF (male) - BNC (male)
Low noise cable, diameter: 1.2 mm
AK10
10-32 UNF (male) - BNC (male)
Low noise cable, diameter: 2 mm
AK11
3x 10-32 UNF (male) – 3x BNC (male)
Armoured low noise, diameter: 2.4 mm
AK12/13/14
BNC (male) – BNC (male)
Low noise, diameter: 1.2mm (AK12), 2 mm (AK13), 3,5mm (AK14)
AK15
10-32 UNF (male) - BNC (male)
Diameter: 2 mm
AK19
BNC (male) – BNC (male)
Diameter: 2 mm
AK20
TNC (male) – BNC (male)
Diameter: 2 mm
AK21
AR09 (3 pin M6 x 0.5) – 3x BNC (male)
Diameter: 2.4 mm
AK22
AR09 (3 pin M6 x 0.5) – 8-pin Lemo (male)
Diameter: 2.4 mm
AK23
AR09 (3 pin M6 x 0.5) – open end
Diameter: 2.4 mm
AK25
AR09 (3 pin M6 x 0.5) – 7-pin Lemo (male)
Diameter: 2.4 mm

Connectors

AR01
10-32 female coupler (connects 2x AR05)
AR03
10-32 female chassispart
AR04
10-32 female to BNC male adapter
AR051
10-32 male cable connector (cable diameter 1.2 mm)
AR052
10-32 male cable connector (cable diameter 2 mm)
AR0501
set of 25x AR051
AR0502
set of 25x AR052
AR0501S
set of 20x AR051 + toolkit
AR0502S
set of 20x AR052 + tool

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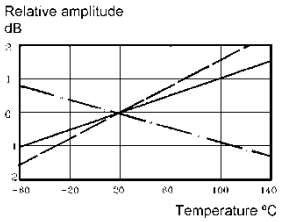
Ambient Temperature Changes
Piezo-electric accelerometers can be operated over a wide temperature range. Deviations from the standard temperature-value cause changes in both axial sensitivity as well as capacitance of the accelerometer. The parameters will recover after the accelerometer has stabilized to the standard temperature. Temperature dependency of sensitivity and capacitance is shown in the picture below.



If the operating temperature of the accelerometer is known, the changes in sensitivity and capacitance can be found from this diagram.

Alternating magnetic fields
The main contribution of alternating magnetic fields to the sensitivity of the accelerometer is made by the magnetic susceptibility of the base-materials of the accelerometer. Therefore, the basic structural elements of the AP-series accelerometers are made of nonferromagnetic materials whose magnetic susceptibility is close to zero.
The AP-series of accelerometers exhibit a sensitivity to alternating magnetic fields of no more than 10-5 g/A.m and it may have a noticeable effect in measuring low-level accelerations only.

Acoustic sensitivity
High pressure acoustic fields slightly affect the outputsignal of the AP-series accelerometers. For Sound pressures of 140 dB the acoustic sensitivity is within tenths of a g at 250 Hz.

Test object Strain effects
When accelerometers are mounted on a surface heavily deforming under shock and vibration, a parasitic signal may occur due to the strain transfer from the base element of the transducer into the sensing element. AP14 and AP22 accelerometers feature a very low strain sensitivity of no more than 0.5x10-3 g/m/µm at 300 µm/m strain.

Transverse sensitivity
Transverse sensitivity of the AP-series accelerometers is within 5% of the axial sensitivity. The calibration-chart of each accelerometer gives the max. transverse sensitivity for each transducer individually. To reduce the effects of transverse sensitivity on measurements, it is necessary to align as precisely as possible the main sensitivity-axis of the accelerometer with the expected direction of the acceleration. A bias within 15° of the main sensitivity-axis should be considered as optimum.

Cable Effects
The AP-series of accelerometers employs vibration-proof low-noise cables. In low acceleration measurements however there may be some effect as a result of triboelectric states in the cable. For shock-loadings this effect is proportional to the length of vibrating (unfixed) cablesection. For shocks with a duration of up to 10-20 msec this effect is negligible. At the same time, for low frequency vibrations the triboelectric effect may have a critical influence on the vibration measurements. Therefore it is advised to:
1. Shorten the cablesections which are exposed to vibration and shock disturbances
2. shorten the cablesection between the last point attached to the vibrating object and the first stationary point
3. Attach the cable to the vibrating testobject without tension or sag, using clamps, mastic, etc. with 200-300 mm spacing and the first mounting point 30-50 mm away from the accelerometer (2-5 mm for AP19)
4. Prior to taking the measurements, determine (if possible) the effect of the triboelectricity by using ‘background’ datacables

Ground Loop Effects
Acceleration measurements, using piezo-electric transducers may cause serious problems if an electrical loop arises from improper grounding of a testobject and the matching equipment.

In this case the accelerometer outputsignal shows an additional voltage which may bring about large errors in low-acceleration measurements. To avoid this problem, it is essential that both the testobject with accelerometers on it and the measurement-equipment are grounded at a single point. Moreover grounding via the measurement-equipment would be preferable.

If test requirements are such that groundloops are to be expected, then AP14, AP18 or AP20 accelerometers should be used. Their designs provide for the electrical isolation between body and testobject. AP37, AP40 and AP51 have isolated mountingbases to avoid groundloop problems.

Zero-line Offset
The zero-line offset in piezo-electric accelerometers may be reflected by a constant bias-component, which will reset exponentially. Zero-line offset may occur due to cable-effects, unsuitable grounding of the equipment or poor accelerometer-design. The AP-series accelerometers feature a shear-design which makes them very insensitive to zero-line offsets.

Radiation Effects
AP-series of accelerometers are operationally capable of handling gamma-radiation exposures as high as 3,106 rad and for the neutron-influence up to 1,018 neutrons/cm2. The latter would cause less than 5% changes in axial sensitivity and capacitance of the accelerometers.

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Attachment of piezo-electric accelerometers
Accelerometer-mounting must be secure and not restricting the effective frequency- and amplitude-ranges. For screw-attachment of accelerometers the testobject must be provided with a M5-7H hole no less than 4 mm deep for Model AP15. Models AP21, AP22, AP37 - AP40, AP51 and AP57 need a M8-7H hole no less than 9 mm deep. For Model AP67, three M4-7H holes are required with a minimum depth of 6 mm and uniformly arranged on a circle of 30.2 mm diameter. Accelerometer AP38 requires a M4-7H hole with a minimum depth of 6 mm.
Deviation of perpendicularity of the threaded holes relative to the mounting surface is no more than 0.1 mm. The testobject mounting surface must have a roughness better than Ra 3.2 and non-flatness should be no greater than 0.05 mm.
Tightening-torque for AP15 is 0.8-1 Nm and 2.5-3.5 Nm for all other types.
Attaching accelerometers without screw-attachment may be achieved by means of epoxy adhesive.

CAUTION: *To 'glue-mount' the triaxial AP21 and AP22 accelerometers, use only the surface which recesses 2 mm of the body having spanner-widths of 8 and 7 mm respectively. Do not use any of the other sides.*

For adhesive attachment the mounting surface of the testobject must have a roughness no worse than Rz25, non-flatness is to be less than 0.05 mm.
Proper adhesives for mounting accelerometers are epoxy and cyanoacrylate, also adhesive tape or wax may be used under limited conditions.

Note that for adhesive attachment the accelerometer-body and mounting surface must be carefully degreased.

Dismounting adhesively attached accelerometers
Always try to remove the accelerometer with a sharp tool. Avoid stroking the accelerometer or clamping the side-surfaces of the transducer.

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