Technical Data Sheet



imc Accelerometers: imc AS series



The capacitive accelerometers are based on microelectromechanical systems (MEMS technology) and allow static measurement of acceleration forces from 0 Hz upward. The scope of application possibilities includes the fields of vehicle dynamics, endurance strength testing, vehicle inspections, brake testing, driving comfort measurement, structure monitoring, or in general wherever reliable measurement of acceleration is needed.

The sensors feature especially low noise and excellent stability over a wide operating temperature range (-40°C to +100°C), so that even the smallest accelerations can be precisely measured. The sensors are enclosed in waterproof sealing and are available in a choice of either

low-weight anodized aluminum housings, or for extreme environmental conditions a stainless steel housing (IP68). Versions with different measurement ranges (±2 g up to ±400 g) can be ordered, where the upper cutoff frequency (bandwidth) is between 100 and 1000 Hz depending on the model. All types are available in uni-axial and tri-axial versions.

At a nominal measurement range, the active sensors output a ± 4 V signal at a differential output (\pm OUT) and are supplied with 8 to 30 V DC. They can be directly connected at any imc voltage amplifier having sensor power supply, as well as to any imc bridge amplifier - the supply power is provided via the amplifier. In conjunction with the integrated TEDS-chip, reliable and error-free "Plug'n'Play" operation is ensured.

Features

- very low signal noise (low-noise sensor elements)
- compact and light-weight
- TEDS comes standard
- direct connection to all imc bridge amplifiers or voltage amplifiers having sensor power supply
- LEMO terminal connectors with imc pinout optional
- any desired cable lengths

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Overview of available variants

MEMS sensors uniaxial aluminum: imc AS1Axxx						
WILL S'8 12,5 mm						
SEN/ACC-AS1A002	accelerometers MEMS 2 g uniaxial	13900001				
SEN/ACC-AS1A005	accelerometers MEMS 5 g uniaxial	13900002				
SEN/ACC-AS1A010	accelerometers MEMS 10 g uniaxial	13900003				
SEN/ACC-AS1A025	accelerometers MEMS 25 g uniaxial	13900004				
SEN/ACC-AS1A050	accelerometers MEMS 50 g uniaxial	13900005				
SEN/ACC-AS1A100	accelerometers MEMS 100 g uniaxial	13900006				
SEN/ACC-AS1A200	accelerometers MEMS 200 g uniaxial	13900007				
SEN/ACC-AS1A400	accelerometers MEMS 400 g uniaxial	13900008				
Included accessories: inclu with M3 x 12 screws to ap	ding mounting plate (material: aluminum, dimensions: 30 x 25 x 7 mm) ply the sensor on the plate, detailed calibration certificate					
Options:						
SEN/ACC-AS1A-1M	one meter cable	13940001				
SEN/ACC-AS1A-LEMO	one LEMO plug in imc pinout	13940002				
SEN/ACC-AS1A-BLOCK	i1A-BLOCK triaxial mounting plate, material: aluminum, with M3 x 12 screws to apply up to 3 sensors on the plate, dimensions: 27 x 27 x 27 mm, for up to three SEN/ACC-AS1Axxx					
MEMS sensors uniaxial s	tainless steel: imc AS1Exxx					
Unc AS1E010 SN 17-28002 27,0 mm 27,0 mm						
SEN/ACC-AS1E002	accelerometers MEMS 2 g uniaxial	13900009				



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MEMS sensors uniaxial stainless steel: imc AS1Exxx						
SEN/ACC-AS1E005	accelerometers MEMS 5 g uniaxial 1390					
SEN/ACC-AS1E010	accelerometers MEMS 10 g uniaxial 1390001					
SEN/ACC-AS1E025	accelerometers MEMS 25 g uniaxial 13900012					
SEN/ACC-AS1E050	accelerometers MEMS 50 g uniaxial 13900013					
SEN/ACC-AS1E100	accelerometers MEMS 100 g uniaxial 1390001					
SEN/ACC-AS1E200	accelerometers MEMS 200 g uniaxial	13900015				
SEN/ACC-AS1E400	accelerometers MEMS 400 g uniaxial 1390					
MEMS sensors uniaxial stainless steel: imc AS1Exxx						
Included accessories: including mounting plate (material: stainless steel, dimensions: 30 x 30 x 10 mm) with M3 x 22 screws to apply the sensor on the plate, detailed calibration certificate						
Options:						
SEN/ACC-AS1E-6M	six meter cable 4-pin comtronic socket, without plug 1					
SEN/ACC-AS1E-1M	one meter cable 139400					
SEN/ACC-AS1E-LEMO	10one LEMO plug in imc pinout13940006					

MEMS sensors triaxial aluminum: imc AS3Axxx						
W 1728005 390 mm 1,1 m						
SEN/ACC-AS3A002	accelerometers MEMS 2 g triaxial	13900017				
SEN/ACC-AS3A005	accelerometers MEMS 5 g triaxial	13900018				
SEN/ACC-AS3A010	accelerometers MEMS 10 g triaxial 1390001					
SEN/ACC-AS3A025	SEN/ACC-AS3A025 accelerometers MEMS 25 g triaxial 13900020					
SEN/ACC-AS3A050	accelerometers MEMS 50 g triaxial	13900021				
SEN/ACC-AS3A100	accelerometers MEMS 100 g triaxial	13900022				
SEN/ACC-AS3A200	accelerometers MEMS 200 g triaxial	13900023				
SEN/ACC-AS3A400	accelerometers MEMS 400 g triaxial	13900024				
Included accessories: including mounting plate (material: aluminum, dimensions: 28,5 x 30,5 x 7 mm) with M3 x 25 screws to apply the sensor on the plate, detailed calibration certificate Options:						
SEN/ACC-AS1A-1M	one meter cable	13940008				
SEN/ACC-AS1A-LEMO	one LEMO plug in imc pinout	13940009				



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Technical Specs - imc AS series

Sensor types

Type designation ¹		AS <i>xy</i> 002	AS <i>xy</i> 005	AS <i>xy</i> 010	AS <i>xy</i> 025	AS <i>xy</i> 050	AS <i>xy</i> 100	AS <i>xy</i> 200	AS <i>xy</i> 400
Measurement range	±g	2	5	10	25	50	100	200	400
Sensitivity	mV/g	2000	800	400	160	80	40	20	10
Analog bandwidth ²	Hz	100	100	300	500	650	650	1000	1000
Destruction limit	±g	2000	2000	4000	4000	4000	4000	4000	4000
Non-linearity	% FSO				<	:1			
Transverse sensitivity	%					3			
Settling time	ms				<	:1			
Power supply ³	V DC				8	.30			
Current demand	mA				1	.0			
Output signal (nom. range) ⁴	v	±4							
Output impedance	Ω				1	00			
Zero offset ⁵	±mV	150	150	80	80	80	80	80	80
Spectral noise density	µg/√Hz	5	7	10	25	50	100	200	400
Inherent noise/Broadband noise ⁶	μV	100	60	70	90	100	100	125	125
Zero drift	mg/°C	0.15	0.4	0.75	2	4	7.5	15	30
Temperature coefficient ⁷	%/°C	0,015							
Operating temperature	°C	-40°C +100°C							
Storage temperature	°C	-55°C +125°C							
Sensor element		MEMS capacitive							
TEDS		yes							
Isolation to ground		yes							

Remarks

- 1 x = axes (1/3), y = housing (A/E)
- 2 Linear frequency range (±5%)
- 3 Compatible with imc measurement amplifiers with sensor supply

All stated specifications are typical values.

- 4 Differential output signal ±OUT
- 5 Compensated at the amplifier by taring
- 6 Over full bandwidth
- 7 Sensitivity drift

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Housing types

Туре	Uni-axial aluminum	Tri-axial aluminum	Uni-axial stainless	
Code (xy)	1A	3A	1E	
Sealing	epoxy resin	epoxy resin	IP68	
Housing material	aluminum	aluminum	stainless	
Cable length	3 m, open end	3 m, open end	30 cm, MicroCom-plug-in connector	
Cable type	AWG 30, polyurethane, Ø 3 mm, 12 grams/m	AWG 30, polyurethane, Ø 4,4 mm, 30 grams/m	AWG 30, polyurethane, Ø 3 mm, 12 grams/m	
Plug-in connector	optional	optional	optional LEMO configured in imc pinout	
Mounting holes	2 x	2 x	4 x	
Weight	10 g	20 g	68 g	
Included accessories	mounting plate with four screws	mounting plate with two screws	mounting plate with four screws	
Optional accessories	triaxial mounting cube (no screws), additional cable length n x 1 m, LEMO configured in imc pinout	additional cable length n x 1 m, LEMO configured in imc pinout	extension cable n x 1 m with MicroCom-plug-in connector and open end, LEMO configured in imc pinout	

Pin configuration

Sensor	AS1Axxx		AS1Exxx			
Signal		x-axis:	y-axis:	z-axis:		
+Supply	red	red/violet	red/grey	red	red	
-Supply	black	black/violet	black/grey	black	black	
+Signal	green	green/violet	green/grey	green	green	
-Signal	white	white/violet	white/grey	white	white	
TEDS	yellow	yellow/violet	yellow/grey	yellow	yellow	
LEMO in imc pinout ²	Pin	Signal	Remarks			
$ \begin{array}{c} 7 \\ 6 \\ 2 \\ 3 \\ 0 \\ 4 \end{array} $	1	+IN	measurement signal (voltage +OUT, ±4 V differential)			
	2	-IN	measurement signal (voltage -OUT, ±4 V differential)			
	3	+SUPPLY	bridge supply (+VB) or sensor supply (+SUPPLY): adjustable from 10 V to 24 V			
Chassis	4	GND	reference of sensor supply (-VB / -SUPPLY) and TEDS_GND			
	5	TEDS	TEDS (OneWire sensor PROM)			
view on LEMO.1B socket	6 and 7	n.c.				

1 The dimensions of the mounting plates differ between one another, see "<u>overview</u> ¹, apply the flat surface of the mounting plate on your test object.

2 a different pinout is available upon request