S5MA

MEMS
ANALOG TILTMETERS

INCLINOMETERS
& PENDULUMS

SISGEO

S5MA_EN_04_01/2019

MEMS
ANALOG TILTMETERS

Inclinations measurement is essential for the supervision and for the security of civil structures in elevation during the construction and the operation phases.

MEMS tiltmeters monitor tilt changes in either one or two axial planes perpendicular to the surface of the base plate.

MEMS analog tiltmeters are permanently installed to provide a long term observation and are designed for manual readings or remote data acquisition by OMNIAlog or any other compatible logger.

APPLICATIONS

- Structural Health Monitoring
- Bridges and piers
- Hystorical buildings
- Structural load testing
- Building safety along adjacent excavations
- Berms in open pit mines
- Retaining walls
- Ground subsidence

FEATURES

- Uniaxial and biaxial versions
- Easy to install
- High performances
- Very low thermal dependency
- Long-term stability
- High dynamic range
- Precision and durability
- Small dimensions and low visual impact

Meet the essential requirements of the EMC Directive 2014/30/EU

TECHNICAL SPECIFICATIONS

MODELS	0S541MA0202 (±2.5° FS) 0S541MA0502 (±5° FS) 0S541MA1002 (±10° FS)	0S542MA0202 (±2.5° FS) 0S542MA0502 (±5° FS) 0S542MA1002 (±10° FS)	0S521MA0500 (±5° FS) 0S521MA1000 (±10° FS)	0S522MA0500 (±5° FS) 0S522MA1000 (±10° FS)
Measurement principle	self-compensated MEMS inclinometer		self-compensated MEMS inclinometer	
Application	vertical surface		vertical surface	
Number of axes	uniaxial	biaxial	uniaxial	biaxial
Measuring range [1]	±2.5°, ±5°, ±10°		±5°, ±10°	
Sensor sensitivity [3]	see Calibration Report		see Calibration Report	
Accuracy: Lin. MPE[4]	±0.008° for ±2.5° range ±0.012° for ±5° range ±0.020° for ±10° range		±0.012° for ±5° range ±0.020° for ±10° range	
Pol. MPE[4]	±0.004° for ±2.5° range ±0.006° for ±5° range ±0.010° for ±10° range		±0.006° for ±5° range ±0.010° for ±10° range	
Sensor stability @ 30 days [2]	<0.008°		not available	
Sensor resolution	0.01 % FS		0.01 % FS	
Sensor mechanical bandwidth	18 Hz		18 Hz	
Offset temperature dependency (from -20°C to +70°C)	±0.003° / °C		±0.003° / °C	
Power supply	from 18 to 30 Vdc		from 18 to 30 Vdc	
Temperature operating range	from -30°C to +70°C		from -30°C to +70°C	
On-board temperature sensor - measuring range - accuracy	NTC 3 kΩ Thermistor from -50°C to +150°C ±0.5 °C (0 to +50°C)		NTC 3 kΩ Thermistor from -50°C to +150°C ±0.5 °C (0 to +50°C)	
Output signal	4-20 mA current loop (inclination), Ohm (temperature)		4-20 mA current loop (inclination), Ohm (temperature)	
Signal cable	0WE106IP0ZH		0WE106IP0ZH	
Cabling	M12 male 8-pin connector on sensor body		cable wired at factory into sensor body to grant waterproofing	
Max. cable length to logger	1000 m (for more information see FAQ #073) [5]			

(1) Other ranges available on request

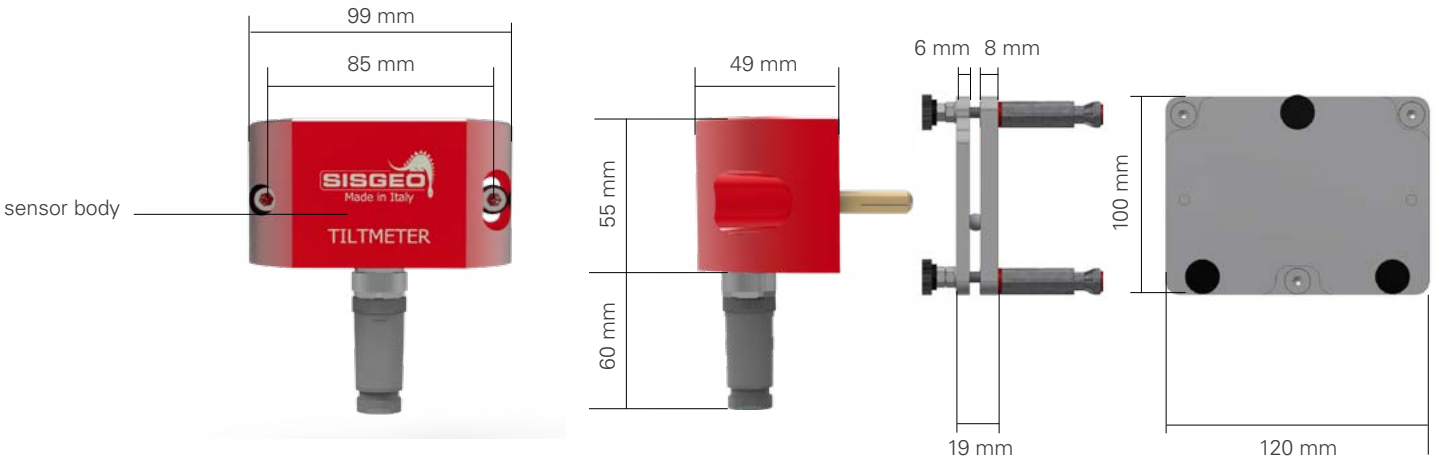
(2) Stability calculated as difference after 30 days under repeatability conditions.

(3) Sensitivity is a specific paramenter different for every gauge. The sensitivity is calculated during gauge calibration test and inserted into the Calibration Report.

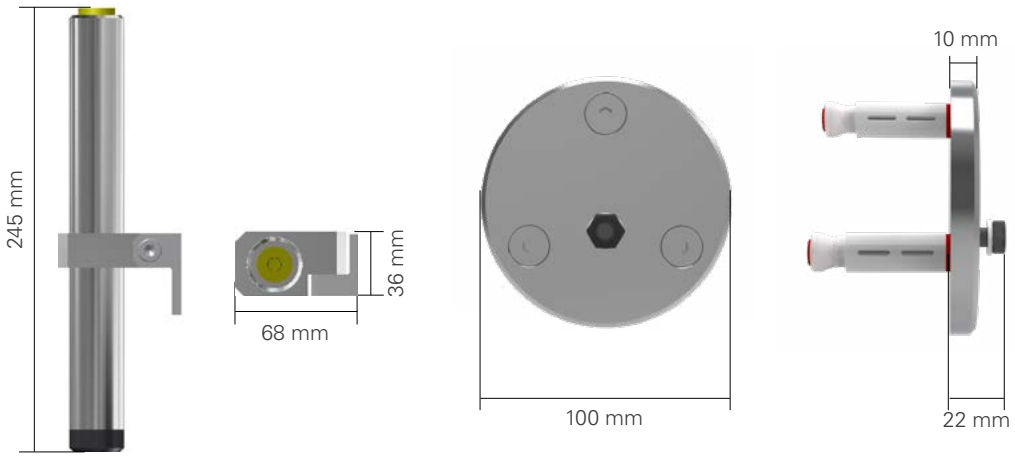
(4) MPE is the Maximum Permitted Error on the measuring range (FSR). In the Calibration Report, the accuracies of the gauge are calculated using both linear regression (≤ Lin. MPE) and polynomial correction (≤ Pol. MPE)

(5) Refer to FAQ section on Sisgeo website: www.sisgeo.com/faq

PHYSICAL FEATURES



DIMENSIONS AND MATERIALS	TILTMETERS S541MA, S542MA	ADJUSTMENT PLATE 0S540AP3D02
Sensor body dimensions (LxHxW)	99 x 55 x 49 mm	-
Mounting screws	N.2 fischer anchor bolts model PO M6	N.3 fischer anchor bolts model SL M6
Overall dimensions (LxHxW)	99 x 115 x 49 mm (including connector)	100 x120 x 61 mm
Material	anodized aluminum	stainless steel
IP class	IP67	-



	TILTMETERS S521MA, S522MA	MOUNTING PLATE 0S500PF1000
Sensor body dimensions	Ø 30x245 mm	-
Mounting screws	-	N.3 fischer anchor bolts model SL M6
Overall dimennsion (LxWxH)	36x68x245 mm	diam 100 mm, thikness 10 mm
Material	stainless steel	stainless steel
Protection	IP68 (2.0 MPa)	-

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ACCESSORIES AND SPARE PARTS

ADJUSTEMENT PLATE FOR S541/S542 0S540AP3D02

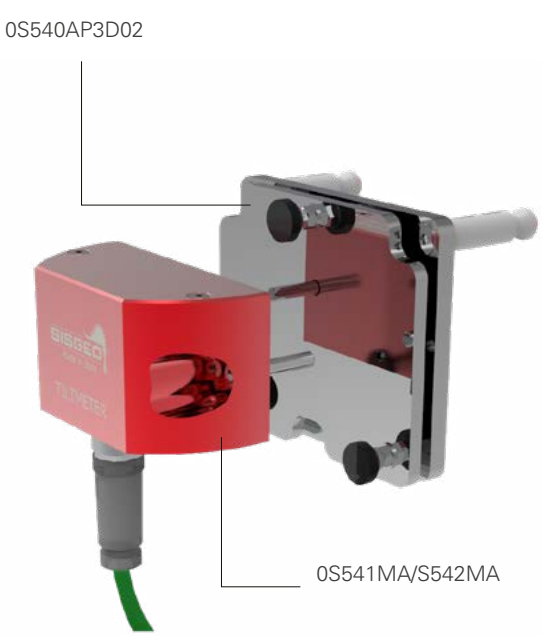
Fine adjustment plate for S541MA and S542MA tiltmeters, especially recommended for the small ranges (±2.5° and ±5°). Working on three knobs, you can set the tiltmeter at the right position.

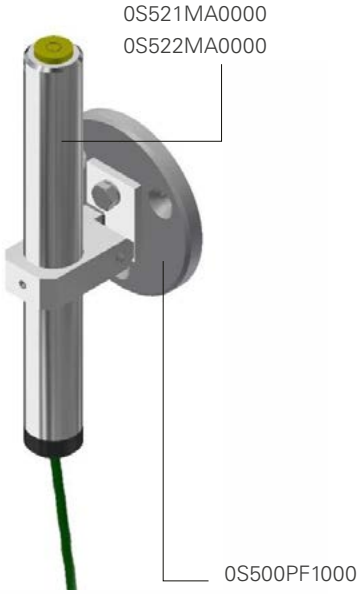
MOUNTING PLATE FOR S520 0S500PF1000

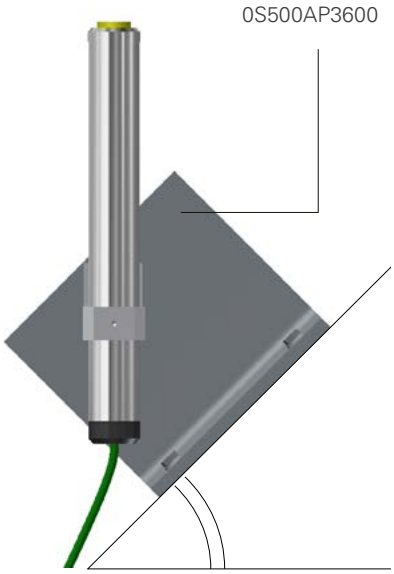
Stainless steel circular plate with three anchors for S521MA and S522MA wall mounting.

PLATE FOR SLOPED SURFACE 0S500AP3600

Plate for installation of S521MA and S522MA tiltmeters onto sloped surface. It consists of a galvanized iron bracket with overall dimensions 130x140x65mm.







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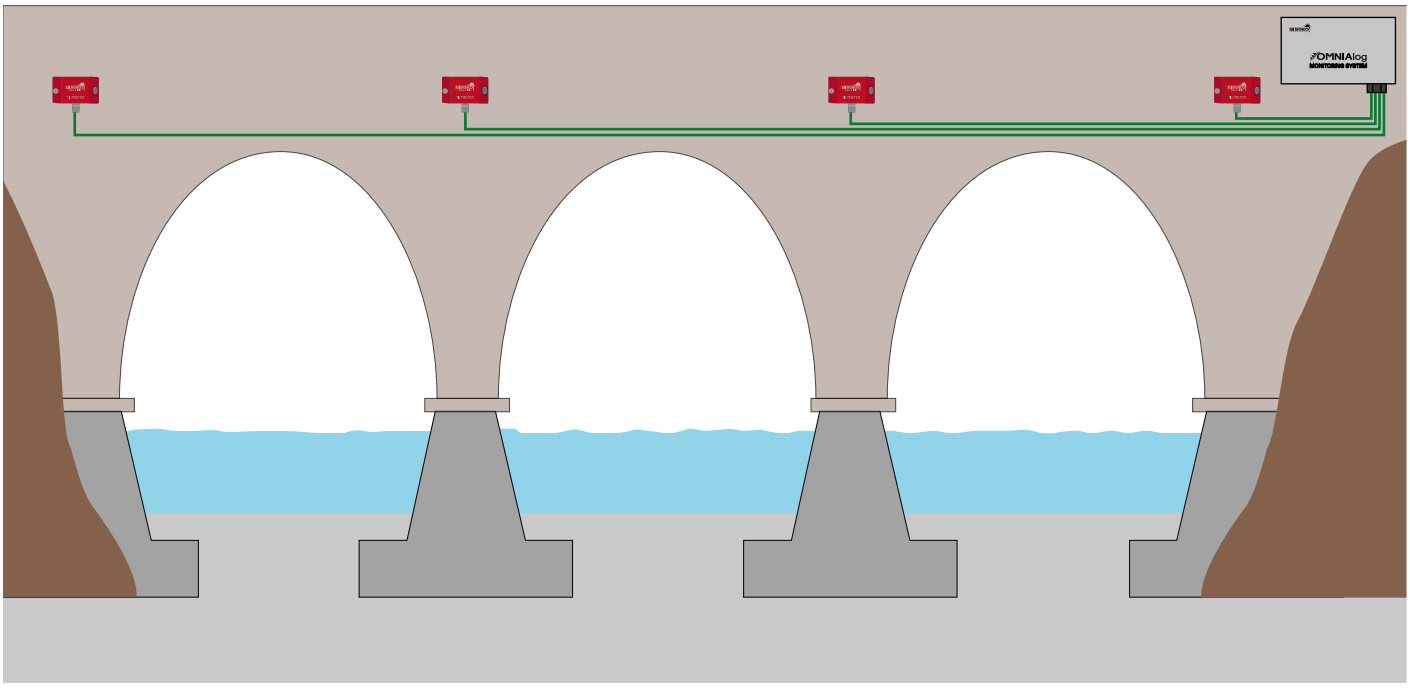
AN EXAMPLE OF INSTALLATION ON ARCH BRIDGE



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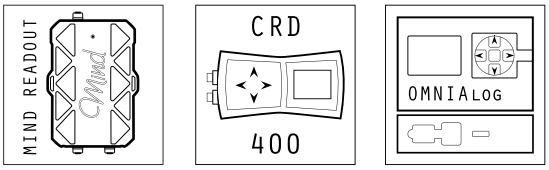

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ADDITIONAL SUPPORT

SISGEO offers on-line assistance service to the Customers in order to maximize the performance of the system and training on the correct use of the instrument/readout.

For more information contact mail: ***assistance@sisgeo.com***