

TOP Inclinometer MEMS technology.

Top performance, high IP rating, resistance to shock and vibrations, and high electromagnetic compatibility make this sensor suitable for mobile hydraulics applications.

Developed to guarantee a robust, high-performance solution for applications such as agricultural vehicles, earth-moving machines, and hoisting equipment.

## TECHNICAL SPECIFICATIONS

### Measurement Range

$\pm 10^\circ$   $\pm 15^\circ$   $\pm 20^\circ$   $\pm 30^\circ$   $\pm 45^\circ$   $\pm 60^\circ$   $\pm 85^\circ$  (dual XY axis)  
 $\pm 180^\circ$  (single Z axis)

### Supply voltage

+5VDC; +10...+36VDC (see output signal for right supply voltage)

### Output signal

0.5...4.5V (ratiometric if powered at +5VDC); 0...10V; 4...20mA;  
 CANopen output

### Electrical connections

M12 connector output; cable output

### Resolution

Analog output:  $0.01^\circ$  (from  $\pm 10^\circ$  to  $\pm 20^\circ$ );  $0.02^\circ$  ( $\pm 30^\circ$ );  $0.03^\circ$  ( $\pm 45^\circ$ );  
 $0.04^\circ$  ( $\pm 60^\circ$ );  $0.05^\circ$  ( $\pm 85^\circ$ );  $0.1^\circ$  ( $\pm 180^\circ$ ).

CANopen output:  $0.01^\circ$  (on request more precise resolutions for the dual axis version, max  $\pm 30^\circ$ )

### Linearity

$< \pm 0.15\%$  FS (from  $\pm 15^\circ$  to  $\pm 60^\circ$ ;  $\pm 180^\circ$ );  $< \pm 0.3\%$  FS ( $\pm 85^\circ$ )

### Working temperature and Coefficient of temperature

$-40^\circ\text{C}$  ...  $+85^\circ\text{C}$  thermal drift  $< 0.005^\circ/\text{C}$  in range ( $T = -10^\circ\text{C}..+60^\circ\text{C}$ )  
 otherwise  $< 0.008^\circ/\text{C}$

### Vibrations

20g between 10 Hz ... 2000 Hz EN 60068-2-6

### Shock

Pulse on 3 axes; 50g 11 ms EN 60068-2-27

### Electromagnetic compatibility

According to Directive 2004/108/CE

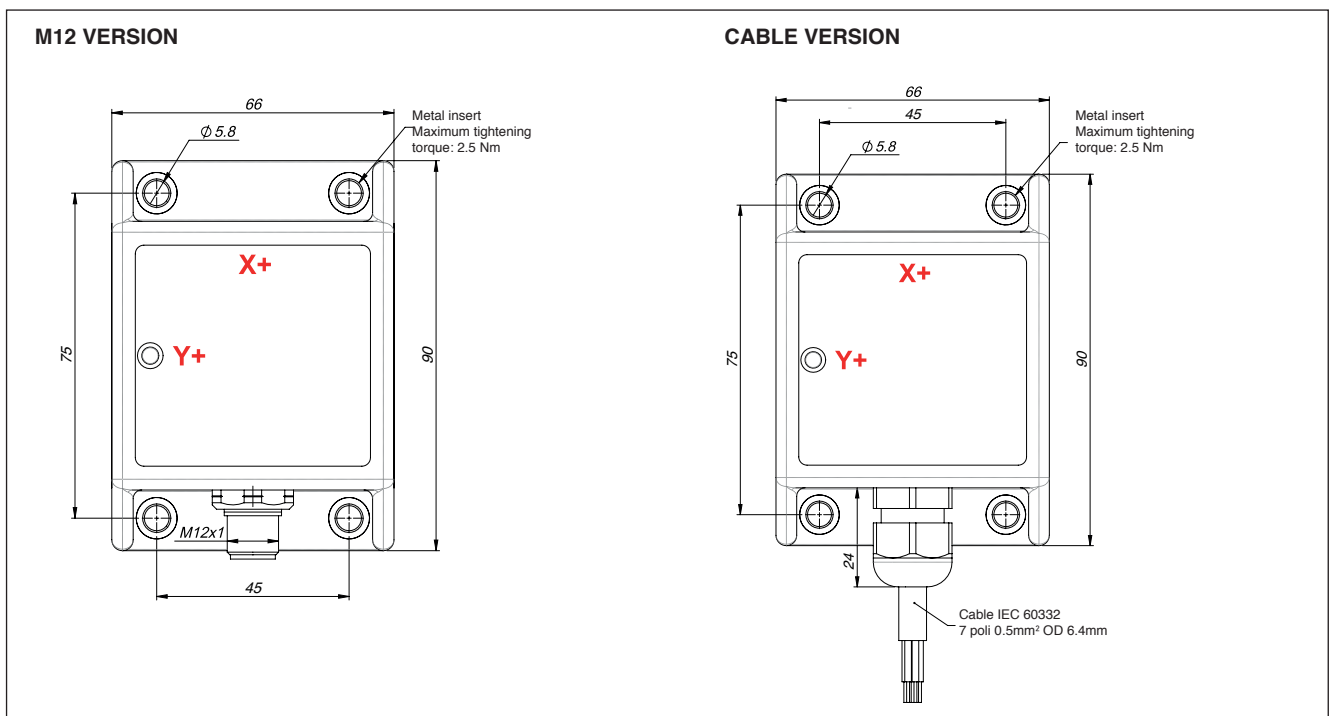
### IP Protection Level

M12 connector output (IP67); cable output (IP X9K)

### Housing body

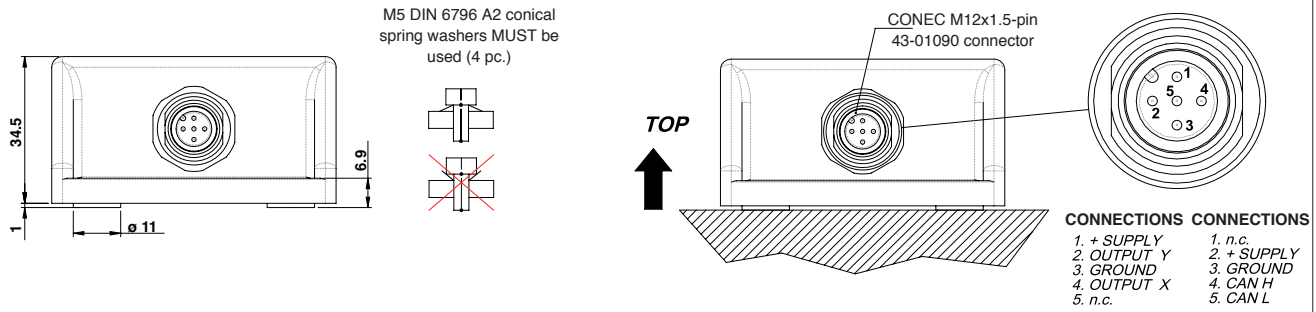
PBT

## MECHANICAL DIMENSIONS

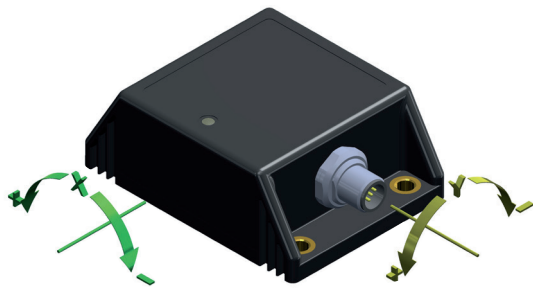


# ELECTRICAL CONNECTIONS

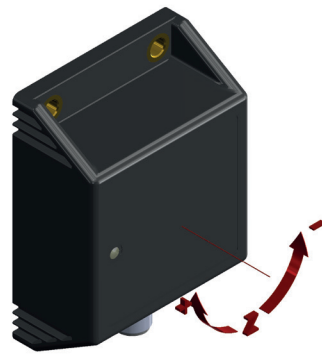
## M12 VERSION



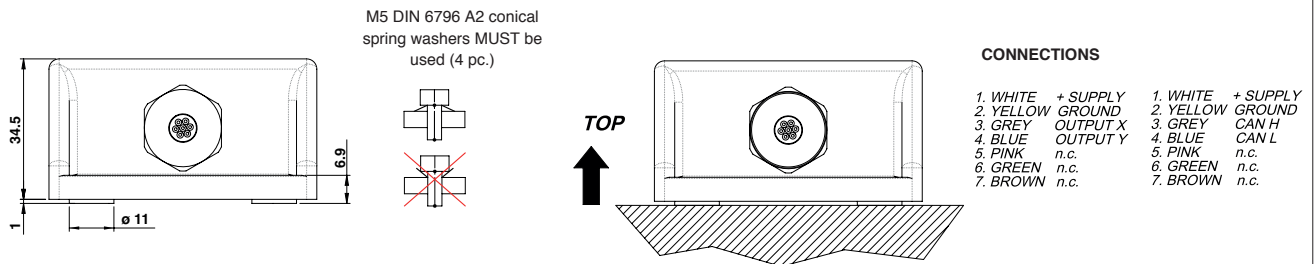
## DUAL AXIS



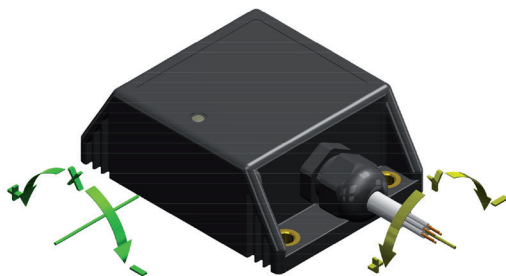
## SINGLE AXIS



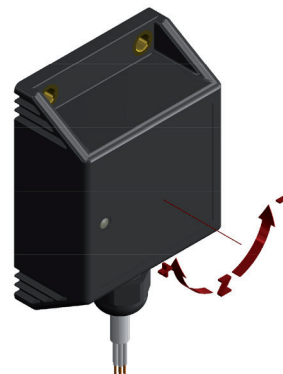
## CABLE VERSION



## DUAL AXIS



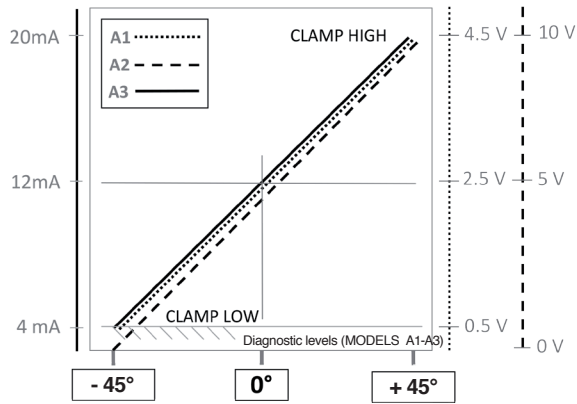
## SINGLE AXIS



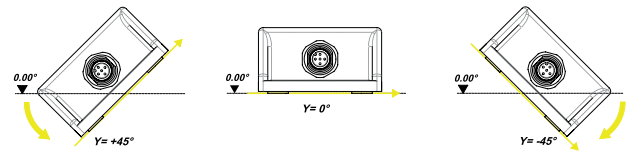
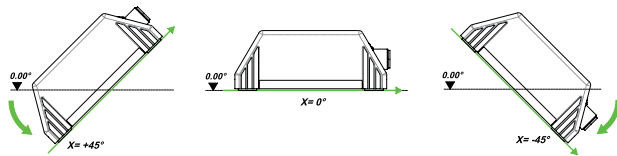
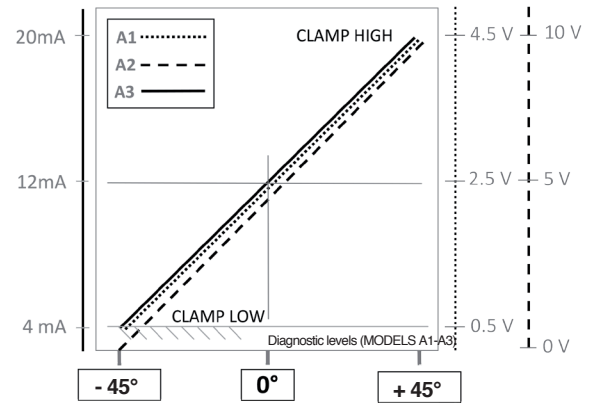
ITEMS MARKED "n.c." SHOULD NOT BE CONNECTED

# OPERATING SPECIFICATIONS: OUTPUT SIGNAL GRAPHS

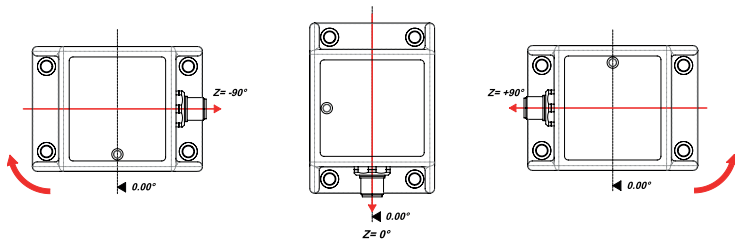
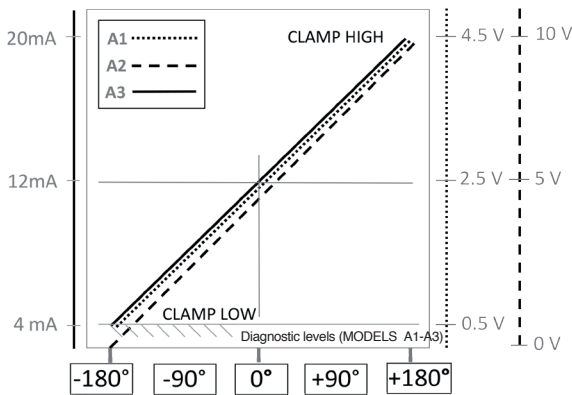
DUAL AXIS INCLINOMETER (XY) – X AXIS



DUAL AXIS INCLINOMETER (XY) – Y AXIS



SINGLE AXIS INCLINOMETER ( $\pm 180^\circ$ ) – Z AXIS



## LOAD CONDITIONS

- +0.5Vdc...+4.5 Vdc output with power +10...36Vdc and +0...10Vdc output with power +11...36Vdc: apply a load resistance > 100Kohm
- +0.5VDC...+4.5VDC output (powered at +5VDC): apply a load resistance > 10Kohm
- 4...20mA output (powered at < + 15...36Vdc): maximum allowed load resistance is 200 ohm
- 4...20mA output (powered at >+ 15...36Vdc): maximum allowed load resistance is 500 ohm

## ORDERING CODE

ELECTRICAL CONNECTIONS	
M12 connector output	<b>M</b>
Cable output (specify length)	<b>F</b>

AXIS TYPE	
Dual axis (XY)	<b>O</b>
Single axis Z ( $\pm 180^\circ$ )	<b>V</b>

CIRCUIT TYPE	
Single	<b>S</b>
Redundant	<b>R</b>

OUTPUT1 MEASUREMENT RANGE (SINGLE AXIS)	
measurement range (specify) (single axis $\pm 180^\circ$ - dual $\pm 10^\circ \pm 15^\circ \pm 20^\circ \pm 30^\circ$ $\pm 45^\circ \pm 60^\circ \pm 85^\circ$ )	<b>XXX</b>

OUTPUT 2 MEASUREMENT RANGE	
measurement range (specify) (single axis $\pm 180^\circ$ - dual $\pm 10^\circ \pm 15^\circ \pm 20^\circ \pm 30^\circ$ $\pm 45^\circ \pm 60^\circ \pm 85^\circ$ )	<b>XXX</b>

SUPPLY VOLTAGE	
+5VDC (for 0.5..4.5VDC output only)	<b>L</b>
+10...+36VDC	<b>H</b>

OUTPUT TYPE	
+0.5...+4.5VDC (ratiometric if powered at +5VDC)	<b>A1</b>
0...+10VDC (powered at +11..36VDC) otherwise +10..36Vdc	<b>A2</b>
4...20mA output (powered at +10..36VDC)	<b>A3</b>
CANopen output (powered at +10...36VDC)	<b>C1</b>

CABLE	
Single cable without connector	<b>0</b>

CERTIFICATES	
<b>0</b>	No certificate enclosed
<b>L</b>	Linearity curve enclosed

ACCESSORIES	
<b>X</b>	No accessory

CABLE LENGTH	
<b>01</b>	100 mm cable
<b>02</b>	200 mm cable
<b>05</b>	500 mm cable
<b>10</b>	1m cable
<b>20</b>	2m cable
<b>.....</b>	other lengths on request

### Example of description

<b>GIT</b>	<b>M</b>	<b>O</b>	<b>S</b>	<b>030</b>	<b>XXX</b>	<b>H</b>	<b>A3</b>	<b>0</b>	<b>0</b>	<b>000</b>	<b>X</b>	<b>00</b>
	M12 output	Double axis XY	Single	range $\pm 30^\circ$		+10..36Vdc	4..20mA output	cable only	No certificate required	Special execution	No accessories	ND

GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice.

**GEFRAN spa**  
 via Sebina, 74  
 25050 PROVAGLIO D'ISEO (BS) - ITALIA  
 tel. 0309888.1 - fax. 0309839063  
 Internet: <http://www.gefran.com>

**GEFRAN**

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