

# SERVO INCLINOMETER

## ES 261



- For INDUSTRIAL, CIVIL, MILITARY and SEISMIC APPLICATION
- RESOLUTION down to FEW MICRONS/METER • ROBUST • CONVENIENT

### FEATURES AND APPLICATIONS

The model ES261 breaks off the monopoly of prices exorbitant and not justifiable by the real production costs. It shows a high quality and exceptional technical specifications as required for avionics, while its price brings it suitable for industrial and civil applications and also competitive compared with the usual strain gauge, inductive, capacitive, with Hall effect, with electrolytic levels and integrated sensors.

The *servoinclinometer ES261* finds applications also as servoaccelerometer for semistatic and static phenomena ( gravity ) and for vibrations up to 55 Hz. ( earthquakes ) with the advantage of a linear response down to the zero frequency ( gravity ).

#### **Operational principle:**

The *servoinclinometer ES261* includes a seismic mass ( = target ) which inclination, referred to the horizon line, is sensed by two optical sensors in differential circuit. A feedback "torque motor" connected to the sensors, keeps the target in its rest position. The lack of movement of the target is corresponding to an infinite linearity, repeatability and resolution.

The output signal is proportional directly to the linear acceleration and to the sine of the angle referred to the horizon line.

#### **Constructive peculiarities:**

- Extreme solidity: distributed protections against shocks on the torque motor, on the seismic mass, on the pivot suspensions
- Pivot on spring loaded jewel bearings
- Pivot settled on the tip of the target and torque motor between pivot and sensors: peculiarity which reduces the torsional frictions and the swinging in the measure position ( zero )
- Sizeable length of the pendulum: to increase sensitivity and resolution
- Feedback sensors in differential circuit
- Calibration directly on the torque motor: for a full operating control of the measuring chain
- All the electronics enclosed in the unit
- SMD technology with a multilayer printed board
- Aluminium flat enclosure with seal
- CE approved
- D.S. Europe complete measuring systems.

#### *How to order*

Mod. ES 261 - OC - 30°

OC = cable

OP = connector

Full range in degrees

# TECHNICAL SPECIFICATIONS

**Measuring ranges:** as inclinometer:  $\pm 5,75^\circ$ ;  $\pm 14,5^\circ$ ;  $\pm 30^\circ$ ;  $\pm 45^\circ$ ;  $\pm 90^\circ$  degrees.  
as accelerometer:  $\pm 100$ ;  $\pm 250$ ;  $\pm 500$ ;  $\pm 707$ ;  $\pm 1000$  millig.

**Signal output:**  $\pm 5V$  ( $\pm 10V$  option).  
**Frequency bandwidth:**  $0 \div 55$  Hz (see diagram below).  
**\*Non repeatability:**  $\leq \pm 0,02\%$  FS.  
**Bias:**  $\leq \pm 0,5\%$  FS.  
**Temperature effect** on zero:  $< \pm 0,005\%$  FS/ $^\circ C$ .  
**Operating temperature:**  $- 40$  to  $+ 85^\circ C$ .  
**Environmental protection:** at least IP65.

**Supply voltage:**  $\pm 15V$  ( $\pm 10\%$ ).  
**\*Non linearity:**  $\leq \pm 0,05\%$  FS.  
**\*Resolution:**  $\leq \pm 0,02\%$  FS.  
**\*Cross-axis sensitivity:**  $\leq \pm 0,02\%$  FS.  
**on sensitivity:**  $\leq \pm 0,002\%$  FS / $^\circ C$ .  
**Shock resistance:** up to 1000 g.  
**CE conformity:** EN50081-2 for emission;  
EN50082-2 for immunity.

Note: \* Due to environmental vibrations and electrical disturbances in our factory, the minimum measure is  $\pm 1$  mV. Bold ranges: more common.



## AN401: Indicator, 5 full digits ( $\pm 99999$ ) LED

- Display of the angle directly in sessagesimal degrees.
- Some of the software functions: 4 alarm levels ( for machineries, boom angles of cranes, gondola inclinations ); peak levels; difference between the preset value and the actual value ( for foundations and base controls, for asphalt-surfacing machines, for old buildings, towers, skyscrapers and smoke-stacks, for land and snow slips ); print and computer connection.
- A / D converter: 16 bit; digital output: RS232 or RS485; digital filters.

## Frequency response

