



Dynamic Inclinometer Application Note for Excavators

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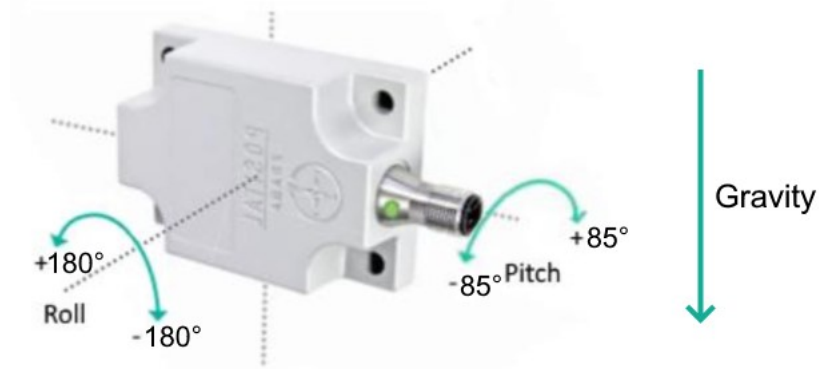
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Products needed:

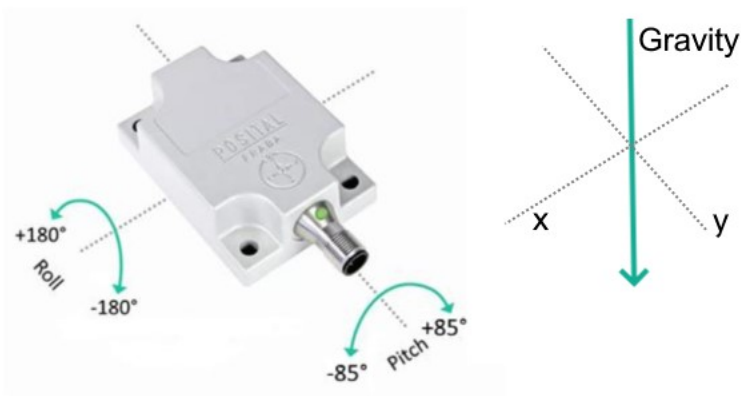
- 1x AKS-180-E (on chassis for horizontal leveling)
- 3x AKS-180-F (1 sensor for each boom segment)

Product and Angle description:

AKS-180-F Vertical mounting



AKS-180-E Horizontal mounting



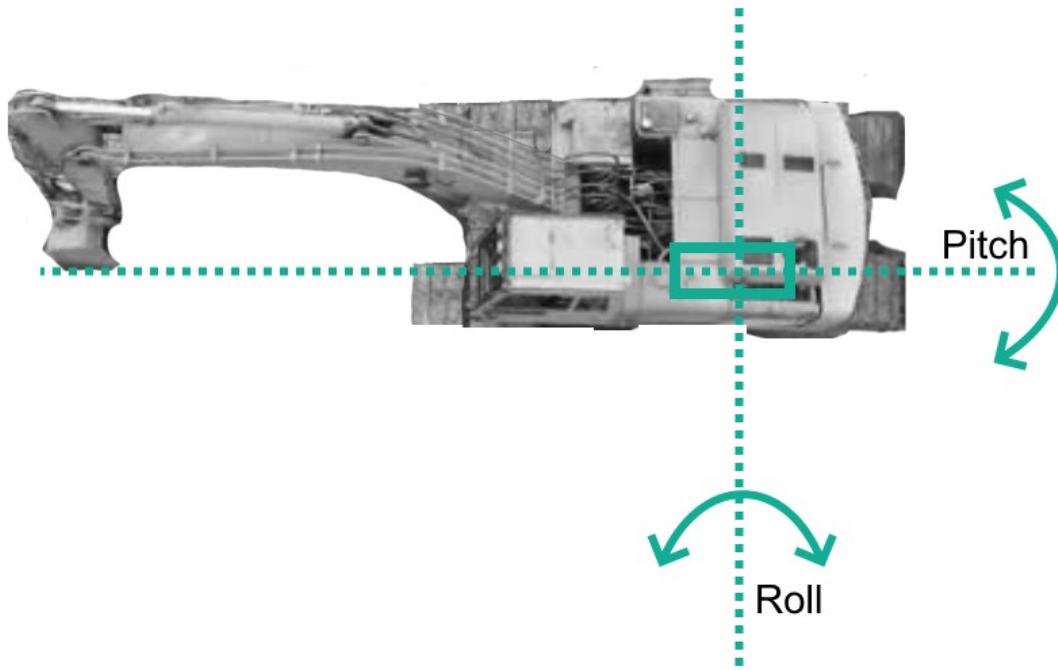
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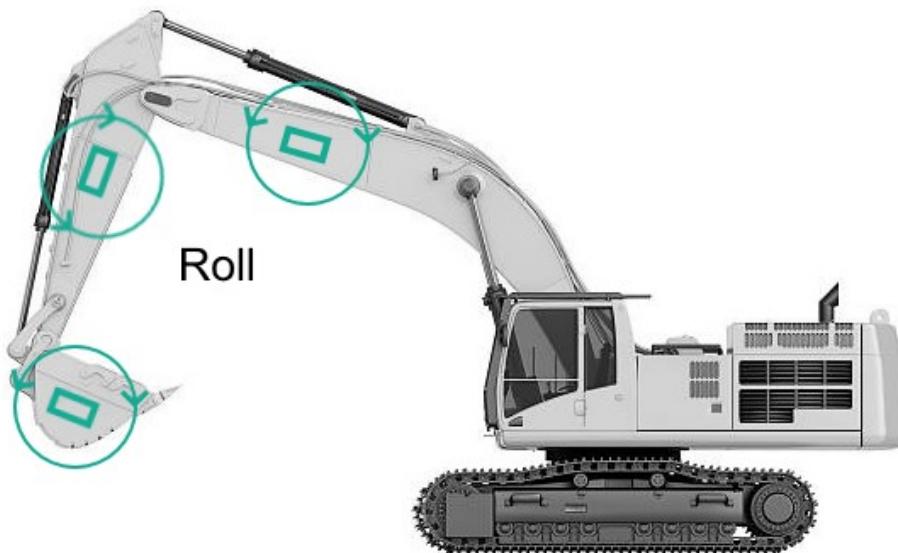
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Sensor mounting positions (refer to picture on page 1):

Position 1: AKS-180-E



Position 2-4: AKS-180-F



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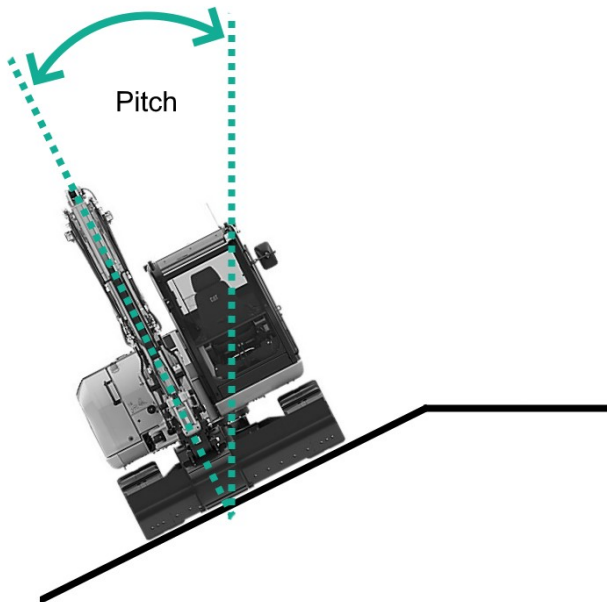
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Description:

It is important to note that the angles of AKS-180-E and AKS-180-F are Euler-angles, meaning that the roll-rotation is measured about the pitch-rotation. Cartesian coordinates (like used for AKS-090-2) on the other hand, measure x- and y-rotation about the fixed horizontal plane.

Advantage of using Euler-angles for excavators:

The pitch angle reflects the vertical misalignment, e.g. when the excavator is driving on a slope. The roll angle outputs the angle position of the boom segments independent from the vertical misalignment. One main task is to monitor and track the bucket position which is calculated via trigonometry. Here it is much easier to add the roll angles of each boom segment to the calculation.

**Additional advantages of the dynamic inclinometer:**

All AKS inclinometers output acceleration and gyroscope signals for all three axes in addition to the angle output. Customers can monitor those values in the plc and integrate functions that increase the overall safety of the machine, e.g. a “stop” function can be executed when certain threshold limits are reached.