PicoScale Angular Measurement Head - PS-ACC-HA-3A-C01

The assembly is composed of three PS-SH-C01 sensor heads in an L-shaped configuration. The distance between neighboring sensor heads is 12.7 mm (0.5"). Given the picometer resolution of the **PICO**SCALE interferometer, the theoretical angular resolution of the measurement is in the low nanoradians. The outer dimension of the assembly is 25.4 mm, which means that it fits into every commercially available 1 inch kinematic mount. The three optical fibers are 1.5 m long and collected into a common tube for routing to the **PICO**SCALE controller. The beam specifications are the same as for the C01 sensor heads which the assembly is composed of. For details, please refer to the specs sheet PS-SS00001.

OPTICAL PROPERTIES

The angular working range can be expanded by relaxing the beam interrupt tolerance in the **PICO**SCALE software. A recommended value which combines a larger angular working ranges with good reliability of the resulting measurement is 75 %. This allows for an angular working range of 100 m° measured at a working distance of 100 mm. However, the angular working range does not depend strongly on the working distance, which means that the value of 100 m° holds true for the whole recommended working distance range from 13 to 300 mm.

FINE ALIGNMENT

In order to obtain the maximum angular working range and measurement accuracy, it is important to align the sensor heads to the target in a way that all three channels show similar signal qualities. If this is not possible, the individual sensor heads have to be fine-adjusted. Therefore, maximize the signal quality of one sensor head with the help of a kinematic mount holding the whole assembly or the target mirror. Then, use a 0.7 mm Allen key to adjust the small setscrews indicated in figure 1 to achieve maximum signal quality for the other sensor heads as well. The mechanics are quite delicate, so be careful not to push the setscrews in too far or pull them out. Since the heads are pre-aligned at SmarAct, only minor adjustments should be necessary to ensure parallelism between the sensor heads. Do not use the small setscrews for global alignment of the PS-ACC-HA-3A-C01 to a target.

Table 1. *Summary of specifications.*

Property	Value
Angular range (pitch/yaw)	±100 m° (pitch or yaw)
	±70 m° (pitch and yaw)
Resolution	≈ 60 n°
Sensor head separation	12.7 mm ±0.2 mm
Outer diameter	25.4 mm (1”)

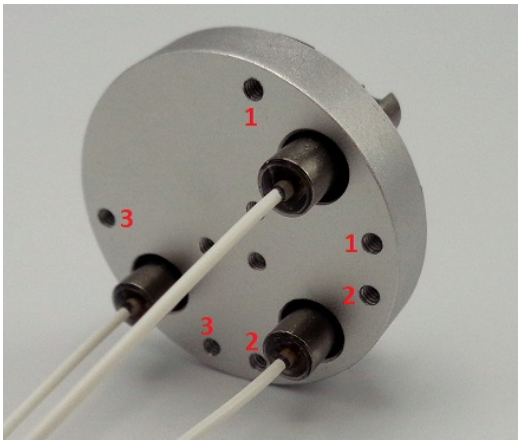

Figure 1. *Backside of the PS-ACC-HA-3A-C01 with setscrews to align the individual sensor heads.*

ORDER CODE

The order code for the assembly is PS-ACC-HA-3A-C01. For questions or pricing information, please contact the SmarAct Metrology sales team.

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