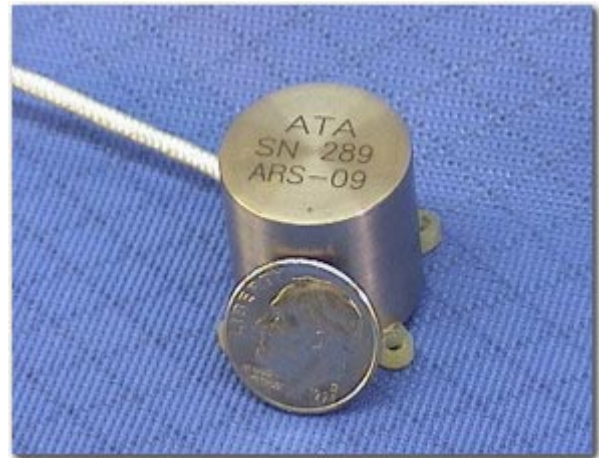


## ARS-09 & 09S

### MHD Angular Rate Sensor

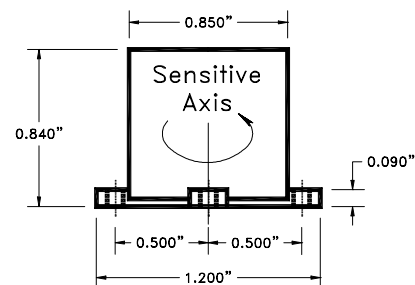
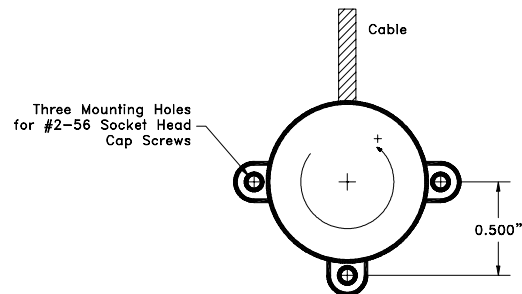
The ARS-09 is a versatile angular rate sensor that offers an economical price while meeting the shock and acceleration limits required in most general motion testing methods. It exhibits a high sensitivity with low to moderate angular range. Originally designed for automobile suspension analysis and machinery monitoring applications, the ARS-09 is small enough to be mounted in compact spaces and has an integral cable assembly. The ARS-09 is available in two standard models: the ARS-09 and the ARS-09S.

Custom scale factors and ranges are available.



ATA Sensors' patented MHD angular motion sensors utilize the finest materials and workmanship combined in durable packages that feature:

- *No moving parts*
- *Dynamic range > 100 dB*
- *Hermetically sealed units*
- *Low power consumption*
- *Low cross axis angular sensitivity*
- *Low linear acceleration sensitivity*
- *Integral electronics/low noise*
- *High survivable shock limits*
- *Superior applications support*
- *One-year warranty against defects in materials and workmanship on sensors, 90 days on cables.*



Weight: < 50 grams (not including cable)  
Case Material: Stainless Steel 430 and Epoxy

# Specifications

## ARS-09 & 09S

### MHD Angular Rate Sensor

#### Dynamic

ARS-09 Range <sup>1</sup> . . . . .	± 1.75 radian/sec (± 100 degree/sec)
ARS-09S Range <sup>2</sup> . . . . .	± 0.60 radian/sec (±35 degree/sec)
Scale Factor <sup>3</sup> . . . . .	5700 mV/radian/sec (100 mV/degree/sec)
Bandwidth <sup>4</sup> . . . . .	0.3 to 1000 Hz
Cross-axis Angular Error . . . . .	< 2 %
Linear Acceleration Sensitivity . . . . .	< 0.009 radians/sec/g (<0.5 degrees/sec/g)
Voltage Noise PSD <sup>5</sup> . . . . .	1.1 × 10 <sup>-6</sup> V <sup>2</sup> /Hz
Noise Equivalent Angle . . . . .	< 80 microradians ( rms)
Non-linearity . . . . .	< 0.1 %
Temperature Coefficient <sup>6</sup> . . . . .	< 0.1 % Scale Factor / °C

#### Electrical

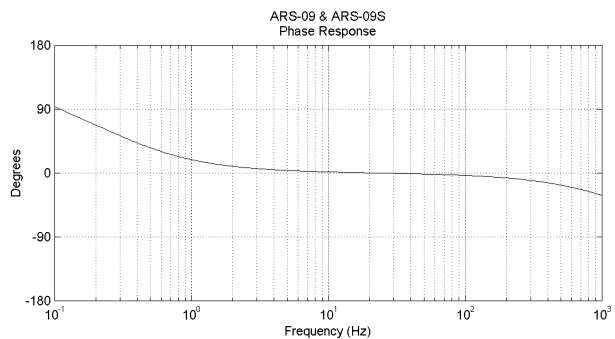
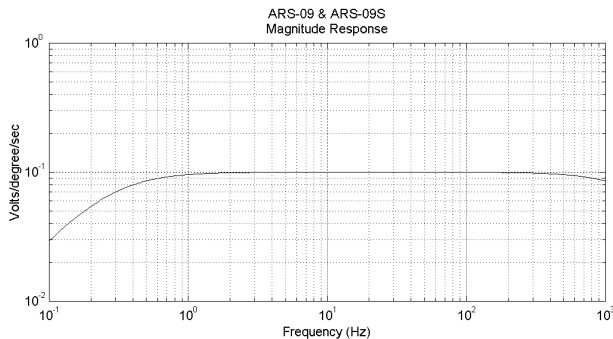
Power Dissipation . . . . .	< 0.3 Watts
Output Impedence . . . . .	< 100 Ohms
Grounding <sup>7</sup> . . . . .	Mounting flange isolated from signal return

#### Wiring

ARS-09		ARS-09S	
Red Lead . . . . .	+Power (+5 Vdc to +15 Vdc)	Red Lead . . . . .	+Power (+10 Vdc)
White Lead . . . . .	-Power (-5 Vdc to -15 Vdc)	White Lead . . . . .	-Power (0 Vdc)
Black Lead . . . . .	Power and Signal Common (0 Vdc)	Black Lead . . . . .	Signal Common (+5 Vdc, internally generated reference voltage)
Yellow Lead . . . . .	Signal	Yellow Lead . . . . .	Signal

#### Environmental

Temperature - operating . . . . .	-35 to +60 °C (-31 to +140 °F)
Temperature - Non-operating . . . . .	-40 to +85 °C (-40 to +185 °F)
Humidity . . . . .	Unaffected - Epoxy sealed unit
Linear Acceleration <sup>8</sup> , Max. Operating . . . . .	200 g any axis
Linear Acceleration <sup>8</sup> , Max. Survivable . . . . .	200 g any axis



**Notes:**

1. Based on a ± 10V output voltage swing.
2. Based on a ± 3.5V output voltage swing.
3. Measured @ 10 Hz.
4. The standard frequency response of MHD sensors can be extended significantly by the use of digital filtering in post processing of signal data as covered in ATA Sensors' application note AN-01.
5. Power spectral density flat to angular velocity over specified bandwidth.
6. Percent change in Scale Factor per °C @ 100 Hz.
7. Signal return connected to case (isolated from mounting flange). Do not ground case to mounting fixture to avoid ground loops.
8. Peak, 100 Hz half sine.