

GLM711AVB

Tooth Sensor Module with Integrated Magnet

The sensor GLM711AVB is intended for the use with passive scales with a pitch of 1 mm. A bias magnet for the necessary magnetic field and the sensor element is combined in a very small housing. The integration supports an optimal adjustment between sensor and magnet which helps to generate a very high quality of sensor signals.

Together with a ferromagnetic tooth structure, the sensor delivers two 90 degree phase shifted analog signals (sine and cosine).



Product Overview

Part no.	Article	Description
5127.2322.0	GLM711AVB-UA	GMR Sensor module with 1.5 m cable and LEMO connector

Measurement Setup

Depiction	Configuration	Application
	Ferromagnetic toothed rack or toothed wheel with fixed pitch; sensor with bias magnet mounted perpendicularly to the rack	Continous position detection with analog output

Features GMR Sensor

- Very small size
- Magnetically biased
- Wired ready for connection

Applications

- Valve lift measurement in fired engines
- Valve rotation measurement
- Tappet rotation measurement
- Toothed wheel or rack measurement
- Measuring at sliding cam mechanism
- Many other applications with toothed structured elements



Technical Data

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{CC}	Supply voltage		-	+5.0	-	V
I_C	Current consumption		1.0	1.2	1.4	mA
R_S	Sensor resistance		2.4	2.8	3.2	k Ω
V_{out}	Sensor output voltage ¹⁾	Working distance 150 μ m	-	25	-	mV
f_{out}	Frequency range		1.0 ²⁾	-	-	MHz
p	Sensor pitch		-	1.0	-	mm
T_{amb}	Ambient temperature		-25	-	+150	$^{\circ}$ C
$V_{Sensoff}$	Offset voltage per V_{CC}		-3.0	-	+3.0	mV / V_{CC}
TC_{Voff}	Temperature coefficient of V_{off}	$T_{amb} = (-25...+125) ^{\circ}$ C	-3.0	-	+3.0	μ V/K
v	Movement speed		0	-	40	m/s
Δ_{radial}	Working distance (sensor head to scale)		-	150	200	μ m

¹⁾ Depends on the air gap between sensor head and scale

²⁾ No significant amplitude loss in this frequency range.

System Schematics

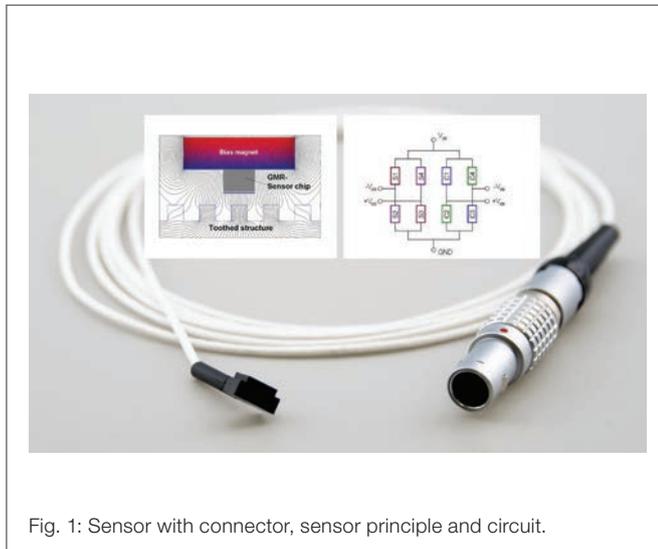


Fig. 1: Sensor with connector, sensor principle and circuit.

Typical Performance Graphs

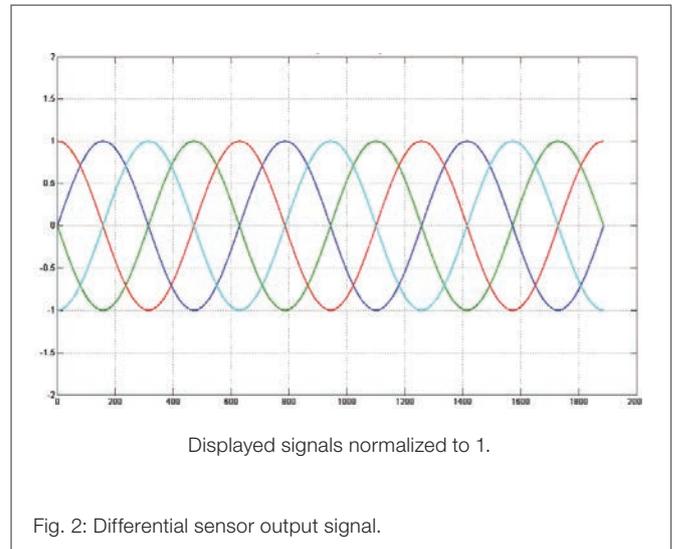
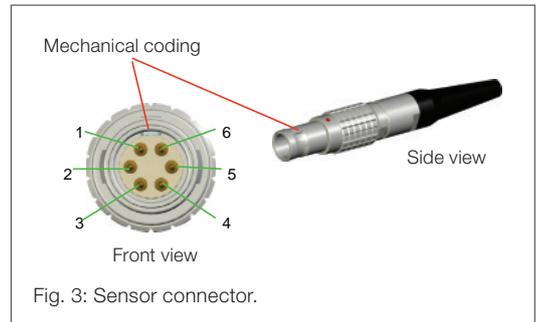


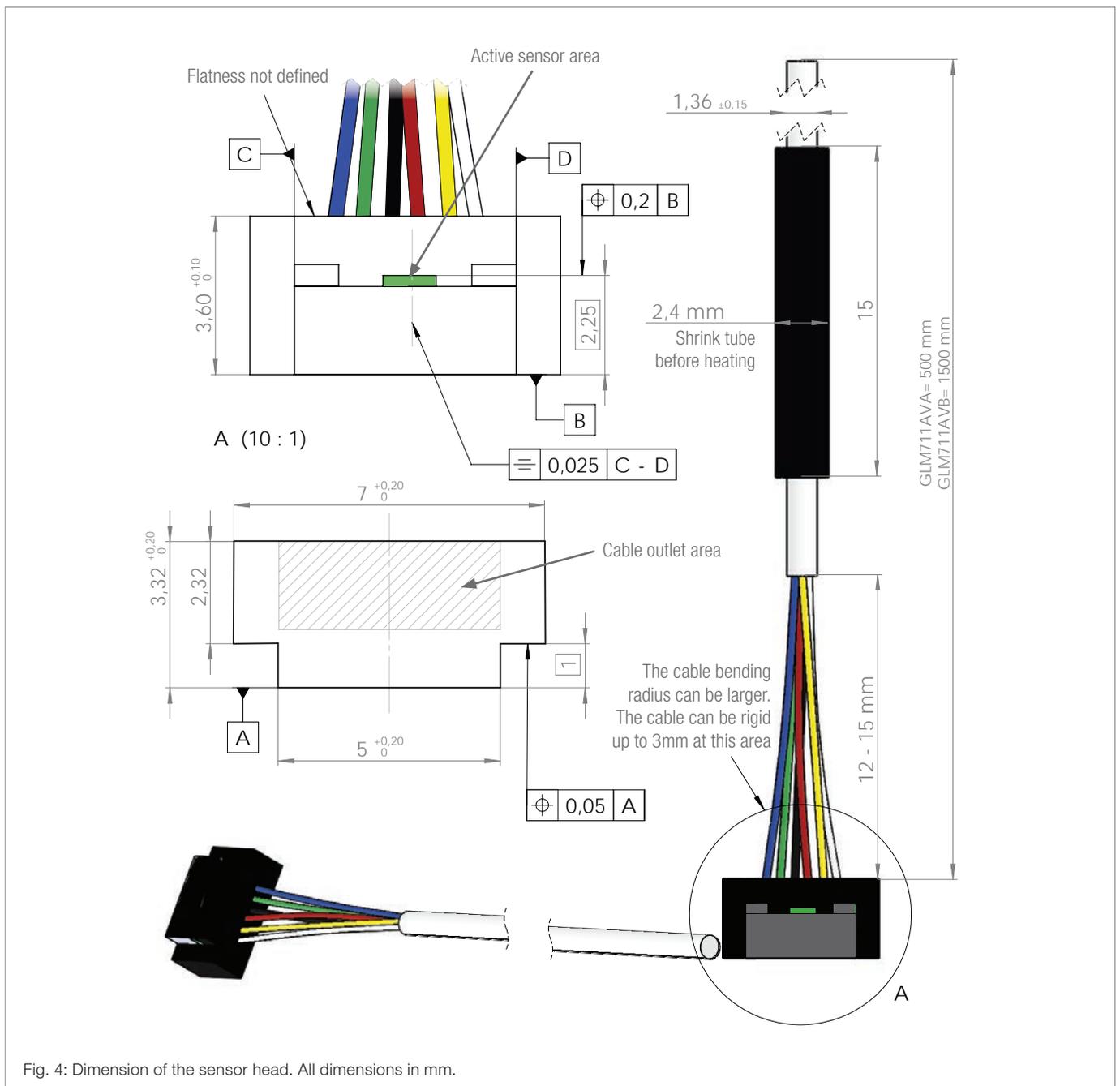
Fig. 2: Differential sensor output signal.

Pinning of GLM711AVB

Pin	Symbol	Parameter
1	+COS	Positive cosine output
2	-COS	Negative cosine output
3	+SIN	Positive sine output
4	-SIN	Negative sine output
5	GND	GND
6	V _{cc}	Supply voltage (5 V)



Dimension of GLM711AVB



Adjustment and Mounting of the Sensor Head

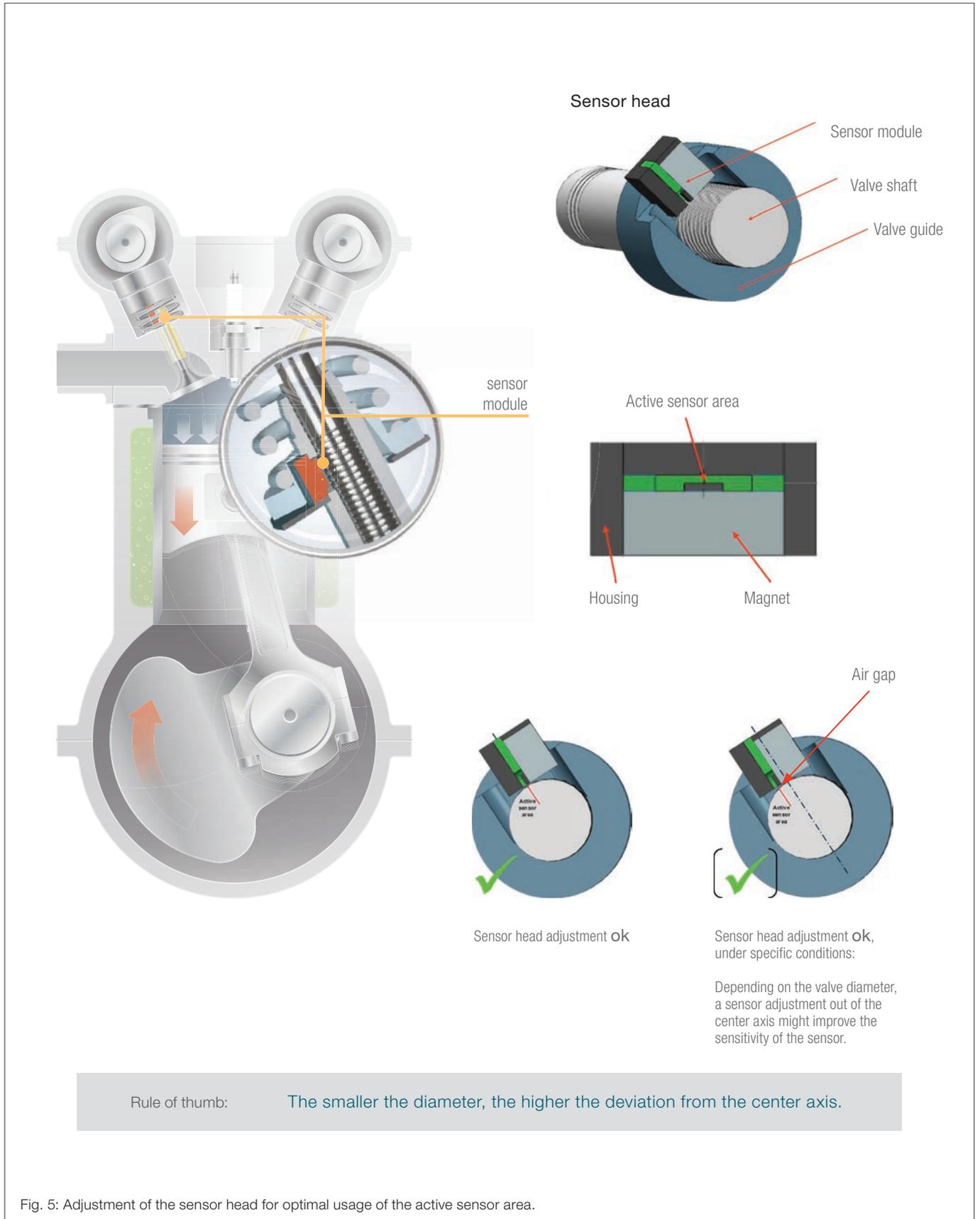


Fig. 5: Adjustment of the sensor head for optimal usage of the active sensor area.

Tooth Structures

The sensor modules can be used at most different toothed shapes. To get an optimal signal from the sensor module the toothed profiles should correspond to certain relations. In the following table you will find an overview of often used toothed profiles and their relations.

Recommended tooth pitches	h tooth height	w tooth top and width	g tooth gap	d air gap
	$\approx \frac{p}{4}$	$\sim \frac{p}{3}$	$\sim \frac{2p}{3}$	$\sim \frac{p}{5}$
	$\approx \frac{p}{4}$	$\sim \frac{p}{3}$	$\sim \frac{2p}{3}$	$\sim \frac{p}{5}$
	$\approx \frac{p}{4}$	$\sim \frac{p}{3}$	$\sim \frac{2p}{3}$	$\sim \frac{p}{5}$
	$\approx \frac{p}{3}$	—	—	$\sim \frac{p}{5}$

Fig. 6: Table with typical parameters for the design of the tooth structure.

General Information

Product Status

Article	Status
GLM711AVB-UA, sensor head	The product is in series production.
Note	The status of the product may have changed since this data sheet was published. The latest information is available on the internet at www.sensitec.com .

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Changelist

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GLM711AVB.DSE.00	Original (pp. 1-7)	02/2023

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