

**NOVOHALL  
Rotary Sensor  
Non-contacting**

**RSA-3200**

Voltage

**Mobile Applications**



**Special Features**

- Contactless hall technology
- Electrical range up to 360°
- High protection class IP67 rep. IP6K9K (housing side)
- Resolution up to 12 bit
- Temperature range -40°C to +125°C
- One and multi-channel versions
- Optimized for use in mobile applications
- For highest EMC requirements such as ISO pulses and interference fields according to ISO 11452 and ECE directive
- Suitable for safety-relevant applications according to DIN EN ISO 13849
- Suitable for linkage lever mounting
- Other configurations see separate data sheets

**Applications**

- Mobile working machines (industrial trucks, construction machinery, agricultural and forestry machinery)
- Marine applications

Mobile working machines or truck conveyors place very high demands on the sensor system due to the external application. The very compact angle sensor RSA-3200 offers reliable function under harsh operating conditions.

The sensor is optimized for mobile applications and is certified according to the highest EMC standards such as ISO pulses and interference fields according to ISO 11452.

Available are one and multi-channel versions which are suitable for use in safety-relevant applications. The stainless steel shaft is designed for assembling of lever arms.

**Description**

Material	Housing: high grade, temperature resistant plastic PBT-GF with stainless steel inserts Shaft: stainless steel, X10CrNiS18-9 1.4305 / AISI 303 Sealing: HNBR 70
Mounting	With 2 screws M4
Fastening torque of mounting	250 ± 50 Ncm
Bearing	Sintered bronze bushing
Sealing	Double O-ring seal, electronics completely encapsulated
Electrical connection	6-pin MQS-connector, code A, tinned contact according to drawing AMP-114-18063-126, Index A1 (Connector: AMP P/N 1-967616-1)

**Mechanical Data**

Dimensions	See dimension drawing
Mechanical travel	360° continuous
Permitted shaft load (static)	40 N (axial) / 50 N (radial)
Torque	Typ. 1.5 Ncm Depending on the environmental temperature and standstill time, the necessary force for the initial operating of the shaft may increase
Weight	approx. 45 g

## Ordering Specifications

### Ordering Specifications

Preferred types printed in bold

- Delivery time up to 25 pcs. within 10 working days EXW
- Best low-volume pricing

Supply voltage  $U_b$

3:  $U_b = 12/24$  VDC

Output signal

4: 0.5 ... 4.5 VDC

5: 0.25 ... 4.75 VDC

Output characteristic

1: Rising characteristic cw

2: Rising characteristic ccw

3: Crossed outputs, channel 1 rising cw (partly redundant)

4: Crossed outputs, channel 1 rising cw (fully redundant)

Other output characteristics on request

Electrical connection

521: Connector AMP MQS 6-pin, male

**R S A** - **3 2 0 1** - **6 3 6** - **3 5 1** - **5 2 1**

Series

Mechanical version

3201: Standard design

Measuring range

03: Angle  $0^\circ$  ...  $30^\circ$  min.

...

**06, 12, 18, 24, 36**

...

36: Angle  $0^\circ$  ...  $360^\circ$  max.

Other angles on request

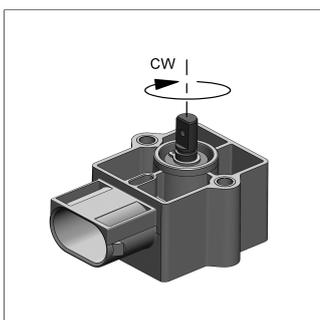
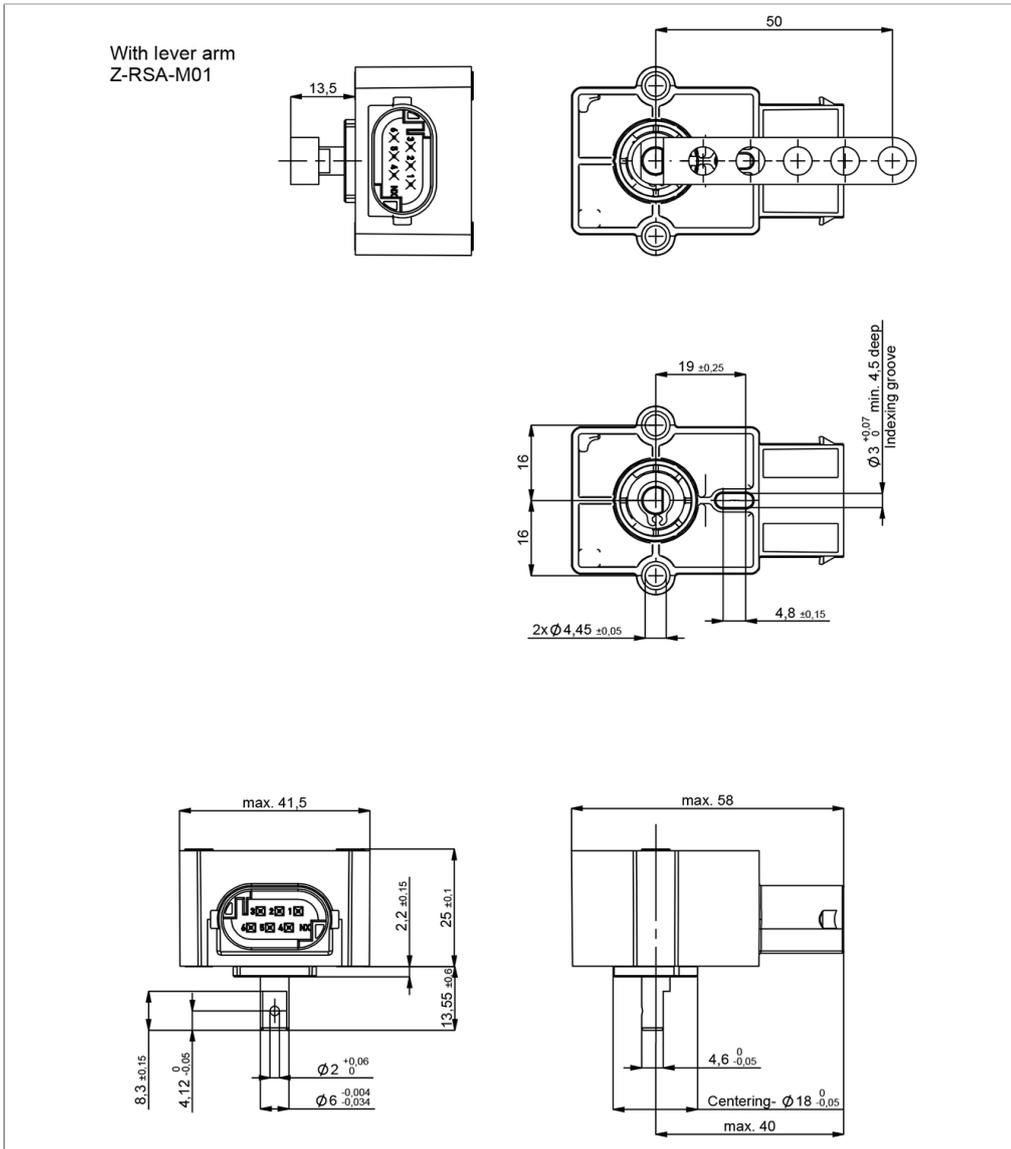
Number of channels

6: One-channel version (1x supply voltage  $U_b$ , 1x output)

7: Partly redundant version (1x supply voltage  $U_b$ , 2x output)

8: Fully redundant version (2x supply voltage  $U_b$ , 2x output)

**Drawing**



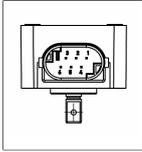
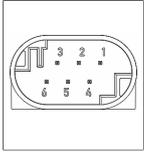
When the flattening of the shaft points towards the connector, the sensor is near the electrical center position.

## Technical Data

Type	RSA-32 _ _ _ _ -3 _ _ -521
Output signal	0.25 ... 4.75 V 0.5 ... 4.5 V
Load	≥ 10 kΩ
Number of channels	1 / 2
Diagnosis	activated (in case of error output signal is outside of the plausible signal range)
Update rate	typ. 3.4 kHz
Measuring range	0 ... 30° up to 0 ... 360° in 10°-steps
Absolute linearity at measuring range	360°: ≤ ±0.4 %FS, 240°: ≤ ±0.45 %FS, 180°: ≤ ±0.5 %FS, 120°: ≤ ±0.55 %FS, 60°: ≤ ±0.8 %FS, 30°: ≤ ±1.25 %FS
Resolution	12 bits
Repeatability	typ. ≤ ±0.1°
Hysteresis	typ. < ±0.1° Only measuring range 360°: typ. < 0.25° (lower hysteresis on request)
Temperature error	Measuring range < 180°: typ. ±1.0 %FS, Measuring range ≥ 180°: typ. ±0.5 %FS
Supply voltage Ub	12/24 VDC (8 ... 34 VDC)
Current consumption w/o load	typ. 12 mA per channel
Overvoltage protection	60 VDC (10 min.)
Polarity protection	yes (supply lines and outputs)
Short circuit protection	yes (vs. GND and supply voltage Ub)
Insulation resistance (500 VDC)	≥ 10 MΩ
<b>Environmental Data</b>	
Max. operational speed	120 rpm (temporary 800 rpm)
Vibration IEC 60068-2-6	20 g, 5 ... 2000 Hz, Amax = 0.75 mm
Shock IEC 60068-2-27	50 g, 6 ms
Protection class ISO 20653	IP67 resp. IP6K9K (housing side)
Operating temperature	-40 ... +125°C* * The max. operating temperature depends on supply voltage Ub (see temp.diagram)
Operating humidity	0 ... 98 % R.H. (no condensation)
Life	typ. 30 Mio. movements (when operated without lever)
Functional safety	Suitable for safety-relevant applications according to ISO 13849 after customer validation. Further safety data ( DCavg...) and support for functional safety are available on request.
MTTF (IEC 60050)	447 years (per channel)
MTTFd (EN ISO 13849-1 parts count method, w/o load)	894 years (per channel)
	MTTF certificate s. <a href="https://www.novotechnik.de/en/downloads/certificates/mttfid-certificates/">https://www.novotechnik.de/en/downloads/certificates/mttfid-certificates/</a>
<b>EMC Compatibility</b>	
ISO 10605 ESD (Handling/Component)	8 kV / 15 kV
ISO 11452-2 Radiated HF-fields	100 V/m
ISO 11452-5 Radiated HF-Fields, stripline	200 V/m
CISPR 25 Radiated emission	Level 5
ISO 7637-2 Pulses on supply lines	(1, 2a, 2b, 3a, 3b, 4, 5) Level 4
ISO 7637-2 Transient Emissions	Level 3
ISO 7637-3 Pulses on output lines	Level 4
EN 13309 Construction machinery	
Emission/Immunity E1	acc. to ECE-R10

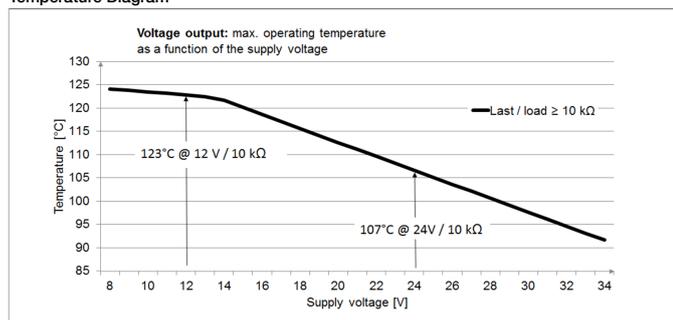
**Connection Assignment**

	One-channel	Partly redundant	Fully redundant
Supply voltage Ub 1	Pin 1	Pin 1	Pin 1
GND 1	Pin 2	Pin 2	Pin 2
Signal output 1	Pin 4	Pin 4	Pin 4
Signal output 2	Not assigned	Pin 3	Pin 3
Supply voltage Ub 2	Not assigned	Not assigned	Pin 6
GND 2	Not assigned	Not assigned	Pin 5

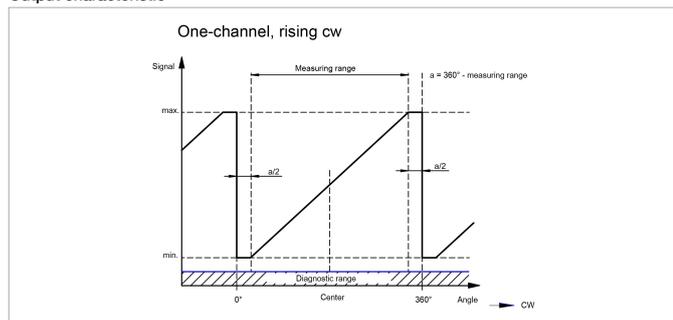


**Technical Data  
Output  
Characteristics**

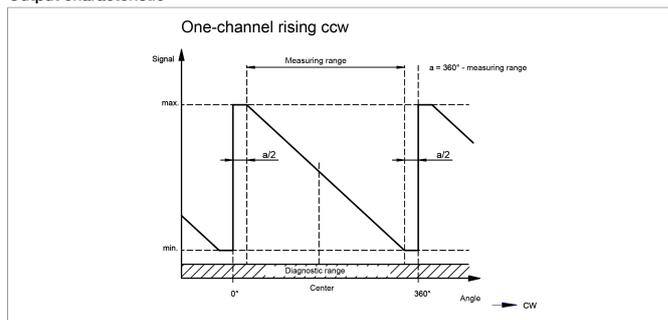
**Temperature Diagram**



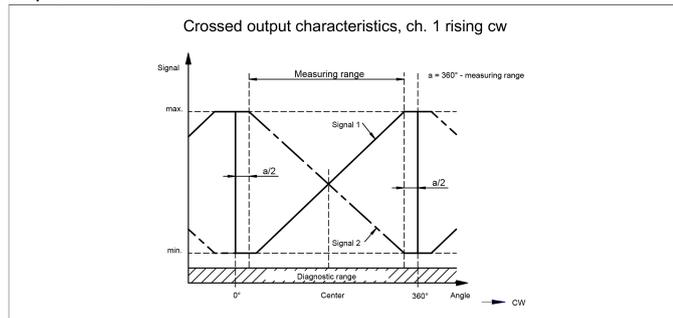
**Output characteristic**



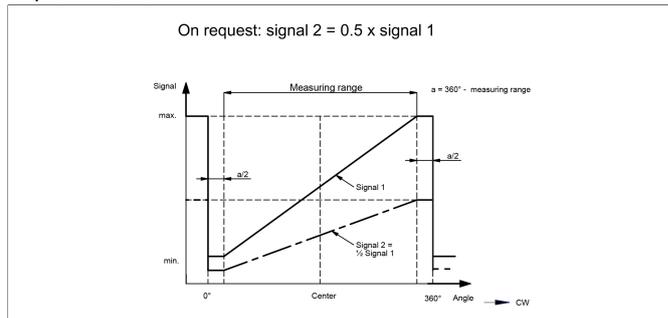
**Output characteristic**



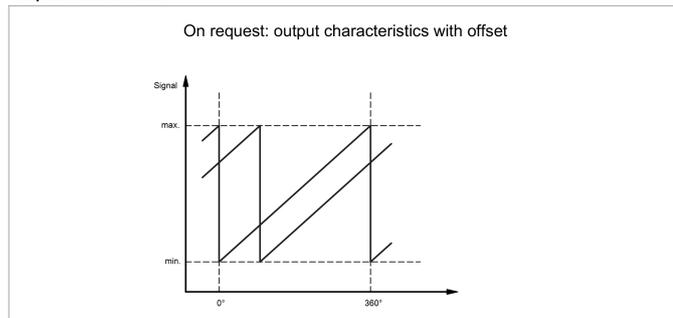
**Output characteristic**



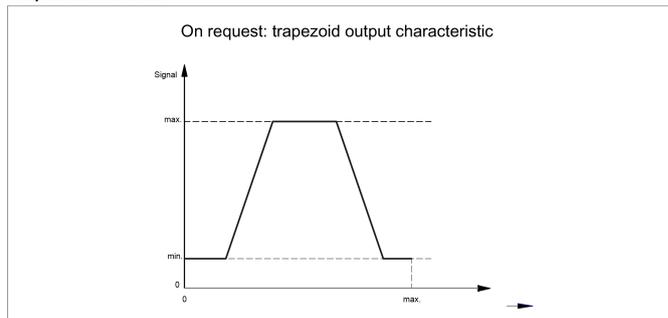
**Output characteristic**



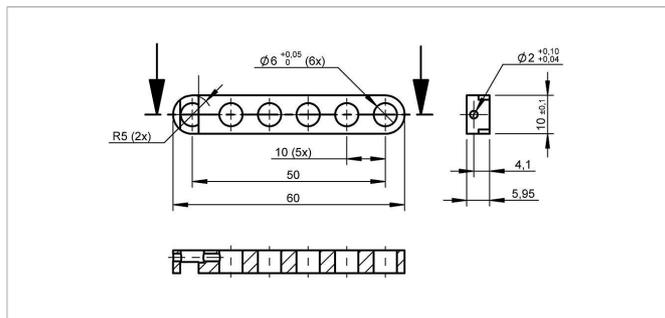
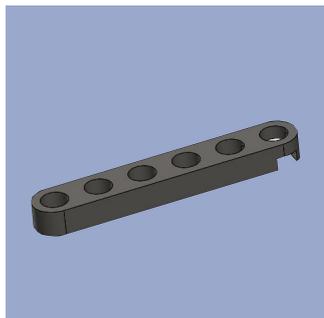
**Output characteristic**



**Output characteristic**



## Sensor Mounting



### Z-RSA-M01

Lever arm 50 mm for mounting at shaft with locking pin (included in delivery)

Material Aluminium, anodized

P/N **Type**

400105062 Z-RSA-M01

## Connector System MQS



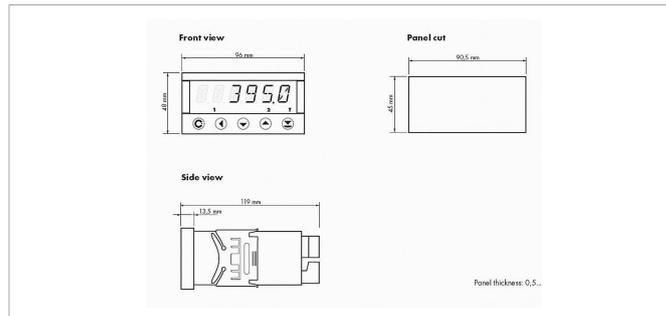
### MQS Micro Quadlok System

Connector kit including

- 1 plug socket (female), AMP P/N 1-967616-1
- 6 tinned contacts for cable cross-section area 0.3 ... 0.5 mm<sup>2</sup> (AWG 22), AMP-P/N 963727-1
- 6 single conductor sealings AMP P/N 967067-2

P/N	Type
400005666	EEM-33-34

## Signal Processing



### MAP-4000

Multifunctional measuring device with digital display for direct connection of potentiometric and normalized signals.

- Supply voltage 10...30 VDC, 80...250 VDC or AC
- High accuracy up to 0.1%
- Adjustable supply voltage for sensors 5...24 V
- Temperature coefficient 100 ppm/K
- Optional RS 232, RS 485, analog output, limited switch
- Complete data see separate data sheet

Novotechnik  
Messwertaufnehmer OHG  
P.O.Box 4220  
73745 Ostfildern (Germany)  
Horbstrasse 12  
73760 Ostfildern (Germany)  
Phone +49 711 4489-0  
Fax +49 711 4489-118  
info@novotechnik.de  
www.novotechnik.de



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