

DEUTA Sensors

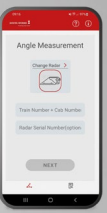
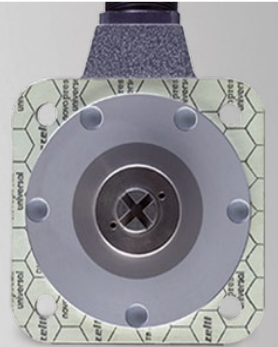
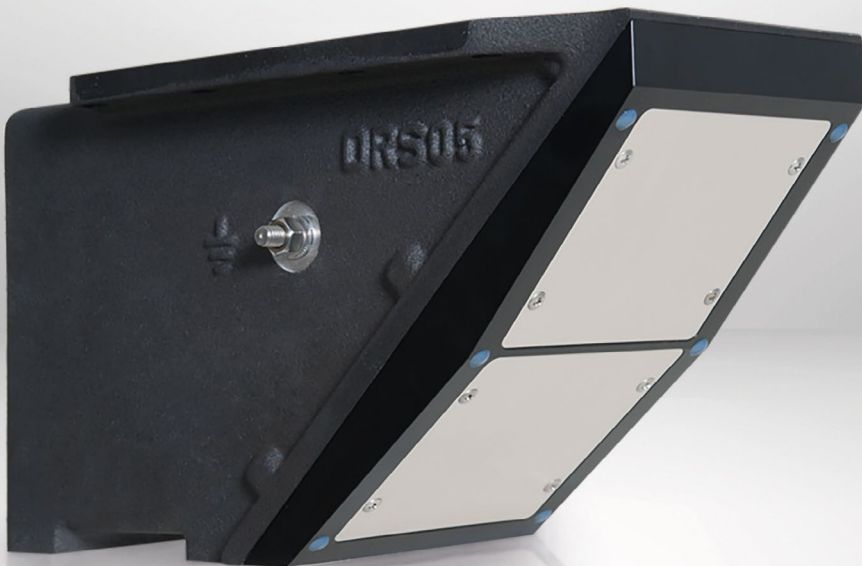




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»DEUTA Sensors -

Robustness, self-diagnosis and reliability!«

- **Robustness:** to extreme temperature/wear/impact of stones
- **Contactless:** Doppler radar sensors with innovative evaluation algorithm
- **Self-diagnosis:** Information about operating mode and condition of the sensor
- **Long-lasting:** Low-wear thanks to non-contact measurements
- **Captive property:** Mechanical defined number of pulses per revolution as captive property of the axle-mounted sensors.

Sensors for your safety!

For an entire system to be safe and precise, quality and robustness, self-diagnosis and reliability of the sensors are the decisive factors. Due to the different forms of output signals, DEUTA sensors transport information reliably and can be integrated and used flexibly in different environments.

Longevity

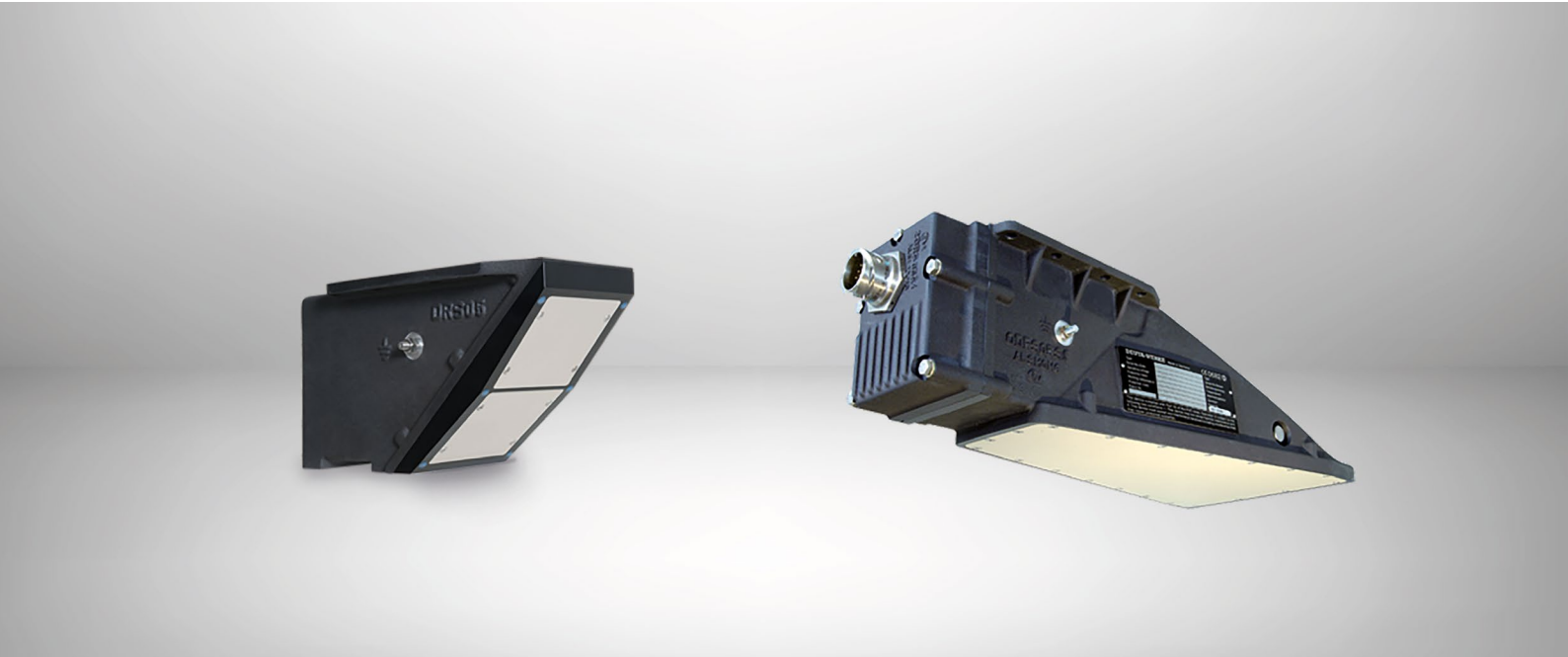
Reliability

Robustness

Self-diagnosis

Quality





»DEUTA Doppler Radar Sensors –

Speed not affected by slip and spin!«

- DRS05/3S1 with integrated protective cover against impact of stones
- Suitable for ETCS, CBTC, high-speed trains and metro vehicles
- Supports traction control functions

Minimal Life-Cycle Costs (LCC)

These radar sensors are designed with no moving parts, ensuring zero mechanical wear and delivering precise measurement data throughout their entire service life. Their low maintenance and servicing requirements result in an unrivalled cost-benefit ratio over the whole life cycle.

Unlimited deployment options

DRS05 radar sensors can be deployed worldwide. Declarations of conformity are available, for example, for Europe, the UK, Canada, the USA, Japan and Australia.

Exceptionally robust to cope with the harshest of conditions

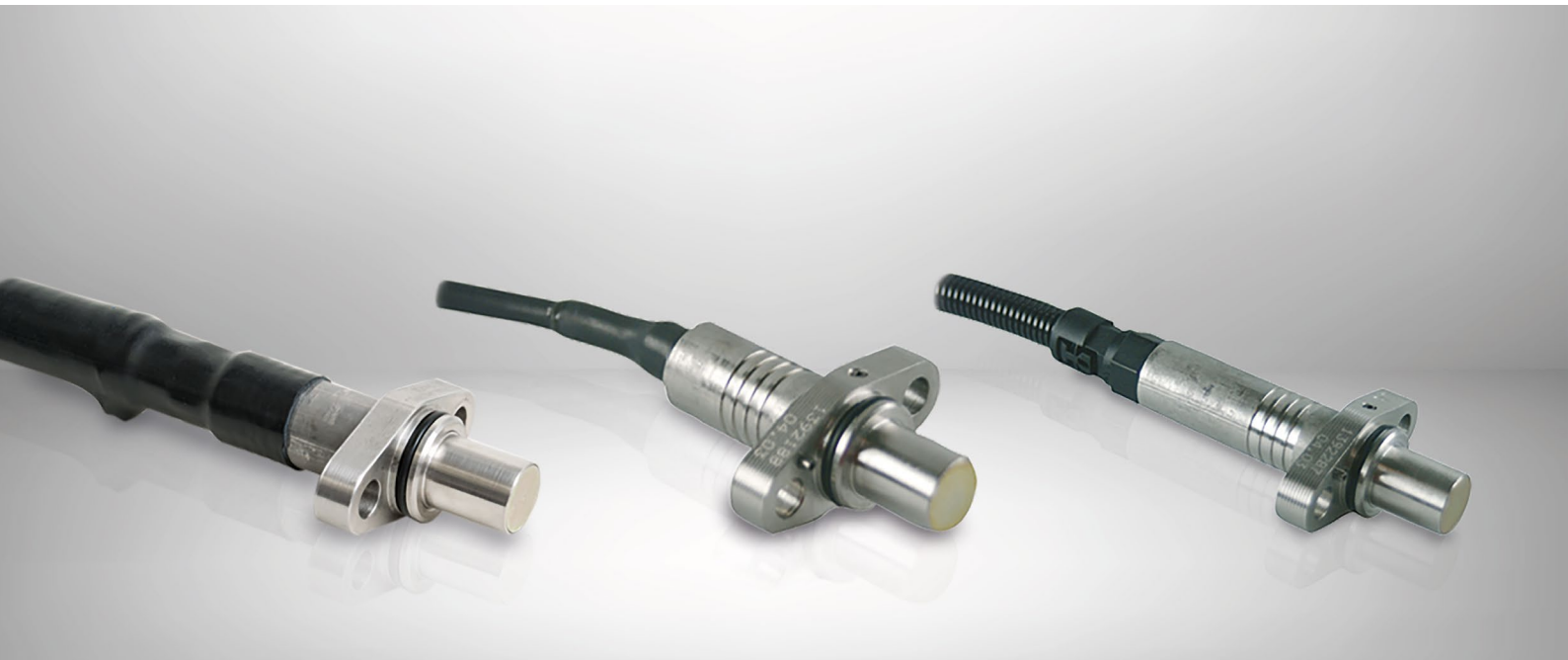
The DRS05/3S1 features an integrated protective cover that extends the service life of the radar sensors by preventing stone damage. It also increases system availability in winter conditions. Such a housing is particularly recommended for high-speed trains.

Special applications

Beyond their proven performance on conventional rail vehicles, these radar sensors are ideal for unconventional transport systems such as magnetic-levitation trains and monorail systems. DEUTA's experienced engineers are ready to support you from the earliest stages of your project, offering expert guidance on radar sensors, speed measurement, and seamless integration with your odometry systems.

DEUTA radar sensors

Feature/Specification	DRS05/3S0a#	DRS05/3S1a#	DRS05/3S1h#
Working principle	Dual-channel speed sensor	Dual-channel speed sensor	Dual-channel speed sensor with heated radome
Recordable speed range	0.2 km/h to max. 600 km/h	0.2 km/h to max. 600 km/h	0.2 km/h to max. 600 km/h
Measurement noise (standard deviation) (1σ)	<0.4 km/h (v <100 km/h) <0.4% (v >100 km/h)	<0.4 km/h (v <100 km/h) <0.4% (v >100 km/h)	<0.4 km/h (v <100 km/h) <0.4% (v >100 km/h)
Error due to variation of the trackbed	<1% typical	<1% typical	<1% typical
Distance measurement reproducibility (1σ)	<0.1% from 1000 m distance	<0.1% from 1000 m distance	<0.1% from 1000 m distance
Supply voltage	15 to 150 V DC, extended-range power, galvanically isolated, battery potential permitted	15 to 150 V DC, extended-range power, galvanically isolated, battery potential permitted	15 to 150 VDC, extended-range power, galvanically isolated, battery potential permitted
Power consumption	max. 10 W	max. 10 W	max. 10 W
Standard interfaces	1. Digital RS485, 2-wire bus, unidirectional, serial 2. Analogue: Pulse output (open collector)	1. Digital RS485, 2-wire bus, unidirectional, serial 2. Analogue: Pulse output (open collector)	1. Digital RS485, 2-wire bus, unidirectional, serial 2. Analogue: Pulse output (open collector)
Forward/backward detection	yes	yes	yes
Reverse polarity protection/short-circuit-proof	yes/yes	yes/yes	yes/yes
Radome heater power consumption	-	-	120 W
Operating temperature	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C
Dimensions	Approx. 244 mm × 134 mm × 140 mm (L×W×H, excluding plug and cable)	Approx. 481 mm × 214 mm × 140 mm (L×W×H, excluding plug and cable)	Approx. 481 mm × 214 mm × 140 mm (L×W×H, excluding plug and cable)
Distance to the reflection surface	Approx. 200 mm to 1000 mm, depending on the application	Approx. 200 mm to 1000 mm, depending on the application	Approx. 200 mm to 1000 mm, depending on the application
Housing material	Die-cast aluminium, anodised, cover PEEK	Die-cast aluminium, anodised, cover PEEK	Die-cast aluminium, anodised, cover PEEK
Protection category	IP66/IP67/IP69 (with plug and cable)	IP66/IP67/IP69 (with plug and cable)	IP66/IP67/IP69 (with plug and cable)
Weight	Approx. 2.6 kg (without plug and cable)	Approx. 4.7 kg (without plug and cable)	Approx. 4.7 kg (without plug and cable)



»DEUTA Pick-up Sensors - extremely high longevity!«

- almost wear-free due to contactless measuring

DEUTA pick-up sensors

Pick-up sensors from DEUTA have an extraordinary durability, as they operate contact-free and therefore wear-free. The measurement takes place by scanning a gear or magnet wheels, in the process the sensor is mounted in a defined distance over the wheel.

Pulse generator with hall sensor- determines speed and direction of rotation

They use the hall effect to measure the rotational speed. Within the HS22 two hall elements are geometrically arranged in such a way that even the direction of rotation is identified. The output gauge of both signals receivable separated galvanically from each other is prepared for a wide area of power supply.

The HS24 is used when, for example, the functionality of a second HS22 is required for an additional application or redundant evaluation, but no additional installation space is available. Thanks to identical installation dimensions and mounting hole patterns, an existing HS22 can be replaced with an HS24 at a later stage without any mechanical modifications.

There are many variations with different output stages.

DEUTA Pick-up Sensors

Feature/Specification	HS22/HS24
Working principle	HS22: 2-channel system HS24: 4-channel system
Frequency range	0 to max. 20 kHz, depending on cable length and ext. load
Operating distance, air gap	0.5 to 2.0 mm
Operating temperature	-40° C to +120° C ¹⁾
Storage temperature	-40° C to +85° C
Protection class	IP66/IP67/IP69
Pulse duty factor	50 % ±10 %
Overlap safety	at least 30°
Short-circuit-proof	yes
Reverse polarity protection	yes
Power supply U _B	+5.5 VDC to +30 VDC ²⁾
Insulation voltage	500 V _{EFF} / 50 Hz / 1 min
Power consumption per channel	<20 mA ²⁾
EMC	EN 50155, EN 50121-3-2, EN 61000-6-x
Permitted mechanical load	EN 61373, category 3
Weight	approx. 280 - 720 g ²⁾ with 1 m cable and open cable end
MTBF	>1.500.000 bis 4.600.000 h, ground mobile ²⁾
Indication medium	ferromagnet. gear wheel, module 2 ³⁾ involute toothing acc. DIN 867 - 80 teeth
Gear wheel material	steel, demagnetised St37, St50 or 10-10 DIN EN 10025, grade FE430A

¹⁾ without cable protection or protective tube and plug

²⁾ depending on the output stage and design

³⁾ optimisation to other modules on request



HS22/24...



HS22/24...ca



HS22/24...hc



»DEUTA Axle-mounted Sensors -
The number of pulses per revolution are mechanically defined
and therefore a solid basis for reliable measurement!«

- extremely high durability thanks to their predominantly wear-free operation
- insensitivity to dirt and vibration

Proven impulse sensors

Axle-mounted sensors from DEUTA are driven by a mechanical coupling on the axle of the vehicle. Impervious to dirt and vibration, they are virtually maintenance-free and achieve high resolution even at low rotational speeds.

The traditional AC generator generates a voltage and frequency that is proportional to the rotational speed, which can be fed directly to a converter or indicator via a cable, without the need for an additional power supply.

Impulse sensors in different variants

The electronic pulse generators (incremental encoders) operate based on an optoelectronic measuring principle.

All axle-mounted sensors can be supplied as multi-channel units. They can be customised to a certain extent with regard to the number of pulses, the phase relationships, and the output circuits.

DEUTA Axle-mounted Sensors

Feature/Specification	DF16/1 a, ac, ad, af, nf	DF17/1 a, ac, ad, b
Working principle	1- to 6-channel pulse generator	1- to 4-channel pulse generator
Speed range	0 to 2,000 min ⁻¹	0 to 2,000 min ⁻¹
Pulse per revolution per channel	1 to max. 230	1 to max.140
Operating temperature	-40° C to +70° C	-40° C to +70° C
Storage temperature	-40° C to +70° C	-40° C to +70° C
Protection class	IP66/IP67 housing/ IP54 drive side	IP66/IP67 housing/ IP54 drive side
Pulse duty factor	50% ±20%	50% ±20%
Short-circuit-proof	at least 18°	at least 18°
Short-circuit-proof	yes	yes
Reverse polarity protection	yes	yes
Power supply UB	10 VDC to 30 VDC ¹⁾	10 VDC to 30 VDC ¹⁾
Insulation channel/housing	<1500 V _{EFF} / 50 Hz / 1 min	1500 V _{EFF} / 50 Hz / 1 min
Power consumption per channel	<35 mA	<35 mA
EMC	EN 50155, EN 50121-3-2, EN 61000-6-x	EN 50155, EN 50121-3-2, EN 61000-6-x
Permitted mechanical load	EN 61373, category 3	EN 61373, category 3
Weight without plug and drive	approx. 2.3 kg	approx. 1.7 kg
MTBF	>148,000 to 335,000 h ¹⁾ , ground mobile	>205,000 to 335,000 h ¹⁾ , ground mobile
Design drive	a: cross slot ac: fork drive ad: tongue 20 x 7 af: drive disk nf: flat shaft	a: cross slot ac: fork drive ad: tongue 20 x 7 b: tongue 14 x 5

¹⁾depending on the output stage and design



DF16/1 a, ac, ad, af, nf



DF17/1 a, ac, ad, b

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