

RV-4 Sensors

Wheel Vector Sensors

Type CRV4A...

For simultaneous measurement of all wheel positions and orientations in 5 axes.

- Complete acquisition of the wheel movements
- Robust design
- Easy and quick mounting
- Easy to extend with option for slip angle measurement
- Resistant to splash water, engine oil, and anti-freeze

Description

RV-4 sensors are mechanical systems which are designed for measuring space and direction coordinates of the vehicle wheel. The sensors carry out all movements with the wheel, except for the rotation about the wheel axis. Provided an adequate sampling rate of the articulation positions, it is possible to simulate wheel movements of a complete test drive.

RV-4 sensors consist of five absolutely measuring high precision angle transducers. Together, these measure the space coordinates in a vehicle-related coordinate system: Wheel deflection, camber, x-movement, y-movement, and z-movement (spring travel).

By using the RV-4 sensors with a wheel force transducer the forces and torques of a vehicle wheel can additionally be measured. An optional wheel pulse transducer can be used to determine wheel speed.

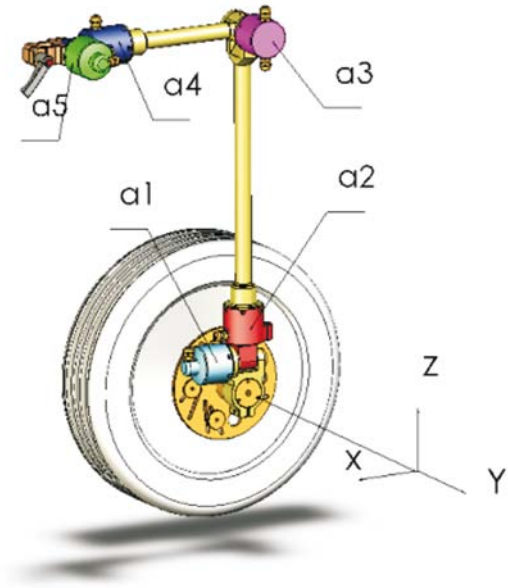
Application

RV-4 sensors are designed for various vehicle tests like e.g.:

- Weight shift and spring travel when braking
- Changes in camber angle when cornering
- Dynamic self-steering properties
- Tire strain
- Changes in wheel position, when braking or accelerating
- Rear-wheel tracking
- Recording of test and race tracks for simulators

Measurement results of the above tests provide the basis for tasks such as:

- Wheel-well clearance measurement and design
- Chassis development and refinement
- Spring and shock absorber development
- Wheel toe and camber angle adjustment
- Tire development
- Testing of driver assistance systems



Technical Data

Performance Specifications

Measuring range		
X-axis	mm	±150
Y-axis	mm	±150
Z-axis ¹⁾	mm	±200
Camber	°	±10
Steer	°	±60
Measurement accuracy		
X-axis	mm	±1
Y-axis	mm	±1
Z-axis	mm	±1
Camber	°	±0,2
Steer	°	±0,1
Reproducibility		
X-axis	mm	±0,5
Y-axis	mm	±0,5
Z-axis	mm	±0,5
Camber	°	±0,1
Steer	°	±0,05

¹⁾ If the entire measuring range of the z-axis (±200 mm) is utilized, the maximum measuring ranges of the y- and x-axis will be restricted.

Technical Data (Continuation)

Signal Outputs ²⁾

Analogue (per RV-4)		
X-, y-, z-axis	V	-10 ... 10
Default settings	mV/mm	60
Camber	V	-10 ... 10
Default settings	mV/°	1 000
Steering angle	V	-10 ... 10
Default settings	mV/°	200
DA converter resolution 16 bit	mm	<0,005
(Default settings)	°	<0,002
Adjustable filter time		unfiltered
or	ms	16 ... 1 024

Interfaces

CAN (Motorola/Intel)		2.0B
USB (Full Speed)		2.0
RS-232C		yes

System Specifications

Power supply	V	10 ... 28
Power consumption at 12 V		
if 1 sensor is connected	W	8
if 2 sensors are connected	W	11
Temperature range		
Operation (environmental temp.)	°C	-20 ... 60
Storage	°C	-40 ... 85
Relative humidity	%	5 ... 80
(non-condensing)		
Protection standard		
Sensor		IP67
Processor		IP30
Dimensions (LxWxH)		
Sensor arm	mm	s. Fig. 1
Electronics	mm	180x125x95
Weight		
1 x sensor + 1 x wheel mount	kg	12
+ 4-point suction holder (approx.)		
2 x Sensor + 2 x wheel mount	kg	20
+ 8-point suction holder (approx.)		
Moving mass at the sensor	kg	2,5

²⁾ All inputs and outputs are protected against overvoltage and short circuit

Dimensions

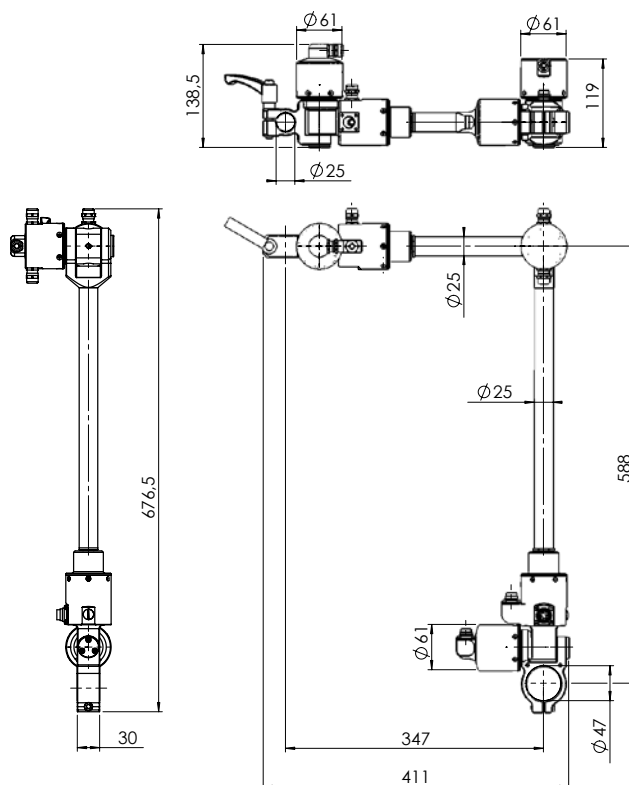


Fig. 1: Dimensions RV-4 sensor

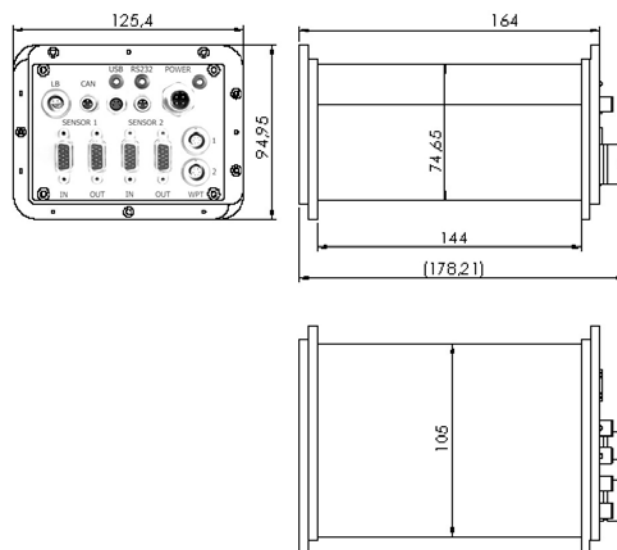


Fig. 2: Dimensions RV-4 processor

Mounting

RV-4 sensors are mounted on the vehicle by using the delivered wheel mounting units and collets (see "Included Accessories"). Fastening to the car body may be effected with the optional suction holders (see "Optional Accessories").



Fig. 3: RV-4 sensor, front wheel mounting with 4-point suction holder

Included Accessories

- Power cable, l = 5 m
- Distribution cable, l = 1 m
- Centering star, 5-hole
- Centering star, 4-hole
- Centering star, 3-hole
- Plastic handle for centering stars, 6 pcs
- Collets 17 mm, 5 pcs
- Collets 19 mm, 5 pcs
- Collets 21 mm, 5 pcs
- Screw driver 5x200 T-handle
- Double-head open end wrench 10-13
- Hexagon wrench SW2-8
- Wheel mounting unit passenger car
- Transport case complete

Type/Art. No.

KCD14941
KCD14824
KCD11296
KCD11297
KCD11298
KCD11860
KCD10070
KCD10071
KCD10072
KCD11291
KCD11281
KCD11290
KCD14582

Additional for RV-4 with processor

- RV-4 processor
- Power cable, l = 2 m
- Connection cable CAN, l = 2 m
- Connection cable RS-232C, l = 2 m
- Connection cable USB, l = 2 m
- Distribution cable, l = 1 m
- Multimedia-CD incl. software & manuals

KCD14584
KCD11343
KCD13946
KCD13425
KCD13947
KCD10523
KCD11343

Optional Accessories

- 4-point suction holder for 1 x RV-4
- 8-point suction holder for 2 x RV-4
- Wheel mount WPT
- Wheel mount SF, HF
- Wheel mount SL

Type/Art. No.

KCD14732
KCD14731
KCD15103
KCD14905
KCD14906

Ordering Key

		Type CRV4A <input type="checkbox"/> <input type="checkbox"/>	
Sensor Size			
Passenger car	1	↑	↑
Truck	2		
Processor			
Without processor	0	↑	↑
With processor*	1		

Ordering Example

For measurements on one wheel

RV-4 sensor, passenger car, processor

Type CRV4A11

For measurements on one axle = two wheels

RV-4 sensor, passenger car version, processor

Type CRV4A11

plus RV-4 sensor, passenger car, without processor

Type CRV4A10

* Standard configuration