

RV-4 sensors

Type CRV4A...

Wheel vector sensors

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: Steer angle, 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
- Steer and camber angle adjustment
- Tire development
- Testing of driver assistance systems



Technical data

Performance specifications

Measurement range		
X-axis	mm	±150
Y-axis	mm	±150
Z-axis ¹⁾	mm	±200
Camber	°	±10
Steer angle	°	±45
Measurement accuracy		
X-axis	mm	±1
Y-axis	mm	±0.7
Z-axis	mm	±1
Camber	°	±0.2
Steer angle	°	±0.1
Reproducibility		
X-axis	mm	±0.5
Y-axis	mm	±0.5
Z-axis	mm	±0.5
Camber	°	±0.1
Steer angle	°	±0.05
Sampling rate	Hz	125

Signal outputs ²⁾

Analog (per RV-4)		
X-, y- z-axis	V	-10 ... 10
Default settings	mV/mm	60
Camber	V	-10 ... 10
Default settings	mV/°	1,000
Steer angle	V	-10 ... 10
Default settings	mV/°	200
DA converter resolution	16 bit	
(Default settings)	mm	<0.005
	°	<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 (ambient temperature)	°C	-20 ... 60
Storage	°C	-40 ... 85
Relative Humidity (non-condensing)	%	5 ... 80
Degree of protection (cable mounted)		
Sensor		IP67
Electronics		IP30
Dimensions (LxWxH)		
Sensor arm	mm	s. Fig. 1+2
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 wheel (approx.)	kg	2.5

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

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

Dimensions

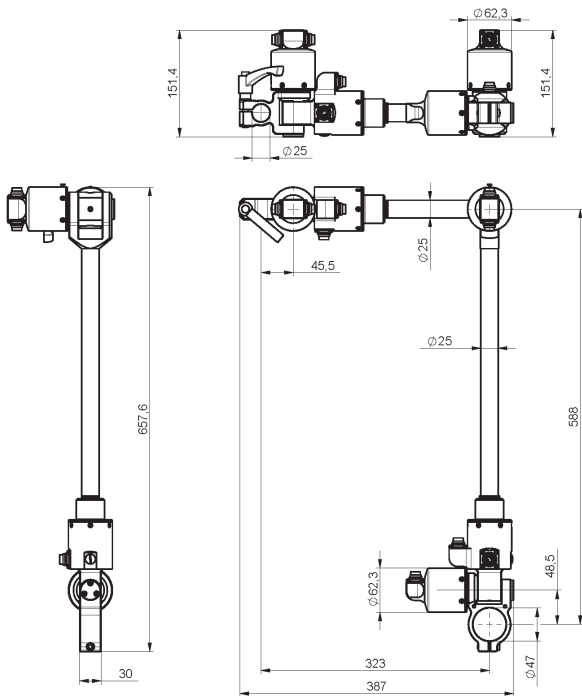


Fig. 1: RV-4 sensor dimensions, passenger car version

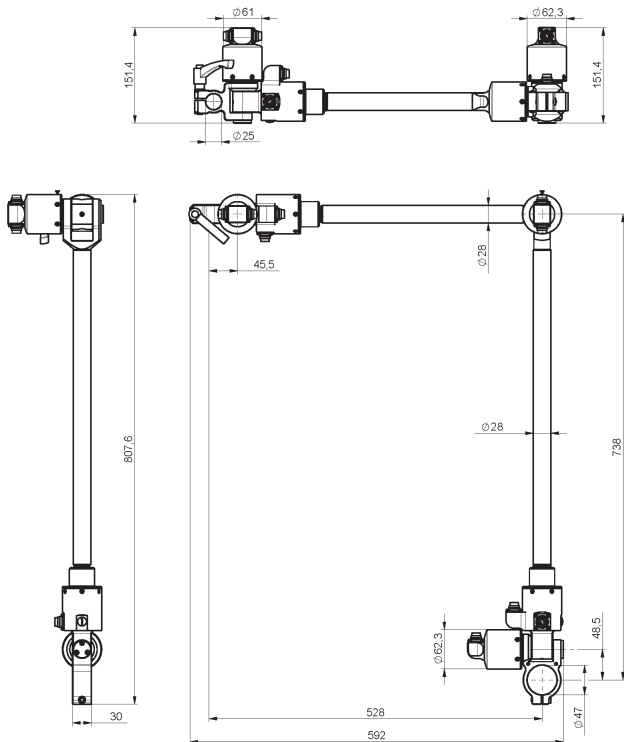


Fig. 2: RV-4 sensor dimensions, truck version

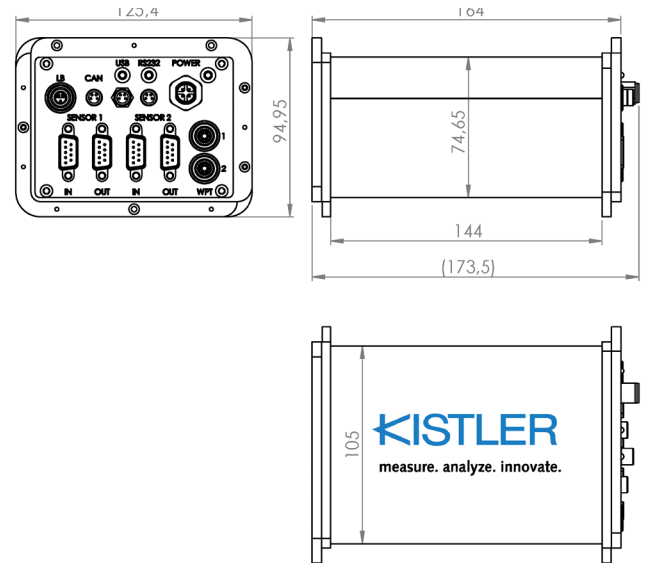


Fig. 3: RV-4 processor dimensions

Mounting of passenger car version

RV-4 sensors are mounted on the vehicle (car) 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. 4: RV-4 Sensor with optional WPT sensor, front wheel mounting

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Included accessories CRV4A10

	Type/art. no.
• Sensor cable, l = 5 m	18012992
• Distribution cable, l = 1 m	55064336
• Double-head open end wrench 10/13	55061923
• Hexagon wrench set, 6 kt, SW2-8	55061932
• Wheel mounting unit D180 (car)	55064168
• Collet 17 mm	22000263
• Collet 19 mm	22000264
• Collet 21 mm	22000265
• Hexagon screw driver with T-handle, 5x200	55061933
• Centering star, 5-hole, complete	18012422
• Centering star, 4-hole, complete	18012423
• Centering star, 3-hole, complete	18012424
• Transport case, complete	65020334

Included accessories CRV4A11

	Type/art. no.
• RV-4 processor (evaluation electronics)	55064170
• Sensor cable, l = 5 m	18012992
• Distribution cable, l = 1 m	55064336
• Connection cable RS-232C, l = 2 m	18012469
• Connection cable CAN, l = 2 m	18012482
• Connection cable USB, l = 2 m	18012483
• Power cable, B-coded, l = 2 m	18012367
• USB stick software + manuals	55158846
• Double-head open end wrench 10/13	55061923
• Hexagon wrench set, 6 kt, SW2-8	55061932
• Ls-Schr l-6rd M2, 5x8, ISO14583	55065321
• Hexagon wrench, Torx T8	55065078
• Wheel mounting unit D180	55064168
• Collet 17 mm	22000263
• Collet 19 mm	22000264
• Collet 21 mm	22000265
• Hexagon screw driver with T-handle, 5x200	55061933
• Centering star, 5-hole, complete	18012422
• Centering star, 4-hole, complete	18012423
• Centering star, 3-hole, complete	18012424
• Threaded bolt for centering star	55062277
• Transport case, complete	65020334

Optional accessories

	Type/art. no.
• 4-point suction holder for 1 x RV-4	18012520
• 8-point suction holder for 2 x RV-4	18012519
• Wheel mount WPT	18012541
• Wheel mount SF, HF	18012533
• Wheel mount SL	18012534

Ordering key

		Type CRV4A
		□ □
		↑ ↑
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



Accessories for Type CRV4A2x (truck) on request.