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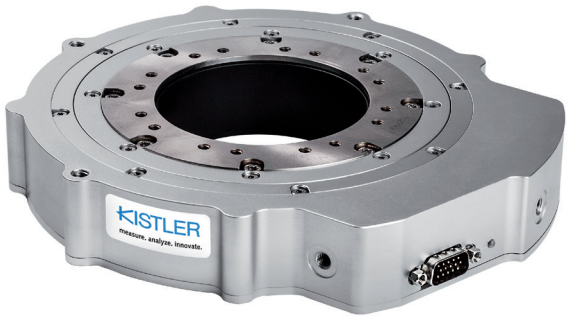
Kistler MSW Sensors

Type CMSWB...

Universal Measurement Steering Wheels

For non-contact measurement of steering moment, steering angle and steering speed.

- Non-contact, optical steering angle sensor
- 50 N·m version for passenger cars;
  250 N·m version for utility vehicles
- Reduced size
- Increased dynamics
- Preservation of airbag function
- Fast and easy installation



Description

Kistler MSW sensors are specifically designed to be used with modern steering wheels of passenger cars and utility vehicles.

The introduction of new driving assistance systems calls for testing equipment that performs even better. Kistler MSW sensors meet the growing demands of modern automotive engineering perfectly. Reduced in size and weight, they offer higher dynamics and increased resolution without impairing steering wheel functions (airbag) and control elements.

Kistler MSW sensors may be mounted in two different ways: normally the sensor is installed between the steering wheel and the steering shaft. To permit universal application, the sensors may be equipped quickly and easily with an interchangeable adapter to connect to the steering shaft gearing.
An optional steering angle stop improves the performance of special driving maneuvers.

Kistler MSW sensors are equipped with a switch-key to reset the steering moment and angle. The offset is stored and still available after voltage loss or restart. Via CAN bus, outputs can be set to zero at any point. Calibration data are stored in the sensor element, enabling the user to exchange sensor elements, if required.

Application

Universal measurement steering wheel for measurement of steering moment, steering angle and steering speed; for vehicle driving dynamics tests like ISO 4138, steady-state circular course drive.

Technical Data

Performance Specifications

Power supply	V	10 ... 28
Power consumption at 12 V	W	<20
Adjustable filter time	ms	2 ... 512 (or unfiltered)
Measurement frequency	Hz	1 000
Temperature ranges		
Nominal temperature range	°C	0 ... 70
Operating temperature range	°C	–20 ... 80
Degree of protection		
Sensor (cable mounted)		IP40
Electronics (cable mounted)		IP40
Mass moment of inertia	kg·cm²	80
Weight (without steering wheel and electronics)		
Passenger car version [1)]	kg	2,7
Commercial vehicle version [1)]	kg	2,8

Steering Moment

Measurement range			
Passenger car		N·m	±50
Commercial vehicle		N·m	±250
Overload			
Passenger car	torque	N·m	±100
	bending moment	N·m	±150
Commercial vehicle	torque	N·m	±500
	bending moment	N·m	±750

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Technical Data (Continuation)

Accuracy	%FSO	±0,15
Linearity deviation	%FSO	±0,15
Temperature influence		
On the zero signal	%FSO/10K	0,5
On the index value	%FSO/10K	0,5
Zero-point stability (above 24 h)	%FSO	0,05

Steering Angle

Measurement range (absolute principle)	°	≥±1 250
Steering speed	°/s	≤2 000
Resolution	°	0,015
Accuracy	°	±0,1

Steering Wheel Adaptation

Diameter of the hollow shaft	ø mm	75
Max. height of the measuring body	mm	33
Pitch circle for screw-on threads (M4/16 pcs)	ø mm	90

Signal Outputs [2]

Analog outputs		
DA converter resolution	Bit	16
Non-linearity	LSB	±16
Steering moment M1 (±50/250 N·m) [3]	V	–10 ... 10
Steering moment M2 (±10/50 N·m) [3]	V	–10 ... 10
Steering angle L1 (±1 250 °) [3]	V	–10 ... 10
Steering angle L2 (±200 °) [3]	V	–10 ... 10
Steering speed (±1 000 °/s) [3]	V	–10 ... 10
Digital outputs		
Steering moment TTL		ja
Steering angle TTL		ja
Steering speed TTL 0 °	pulses/rev	20 000
Steering speed TTL 90 °	pulses/rev	20 000

Interfaces

CAN (Motorola/Intel)	2.0B
USB (Full Speed)	1.1
Ethernet	yes

[1] with standard steering wheel flange, without steering wheel and steering shaft adapter

[2] all outputs are protected against overvoltage and short-circuit

[3] standard settings; can be individually adjusted via KiCenter

Dimensions of Sensor

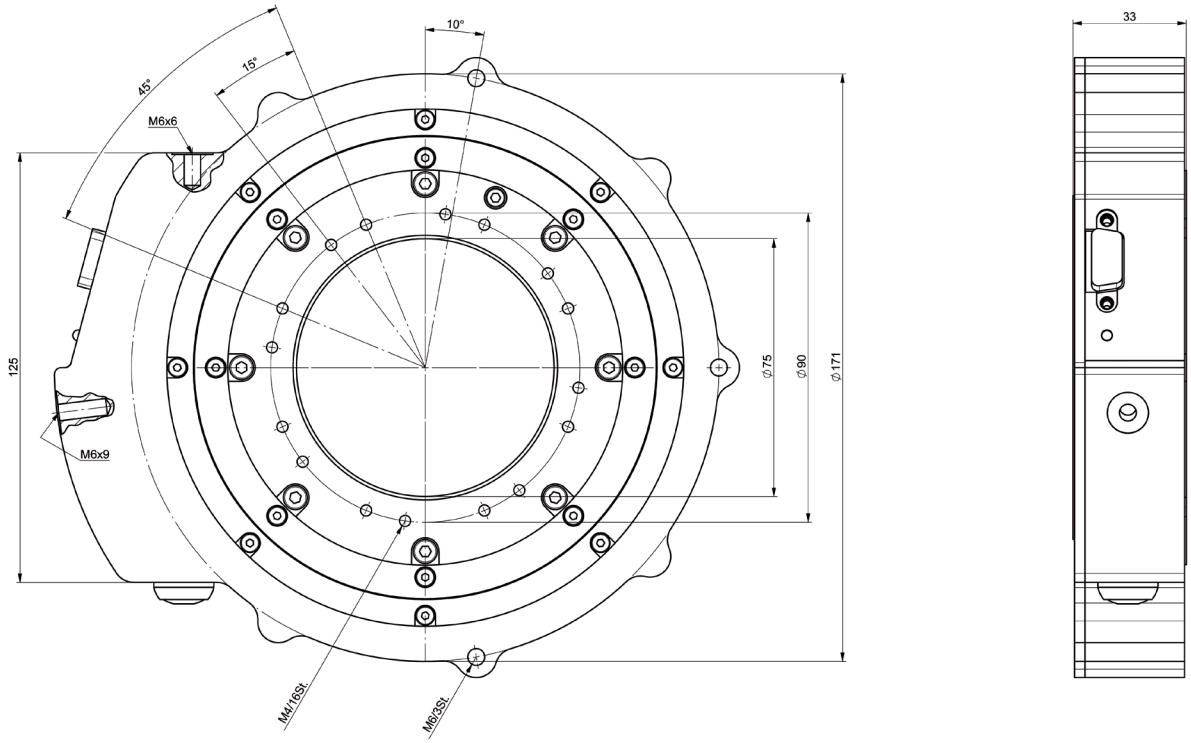


Fig. 1: Kistler MSW sensor element dimensions

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Sensor Electronics



Fig. 2: Kistler MSW sensor electronics

Steering Angle Stop (optional)

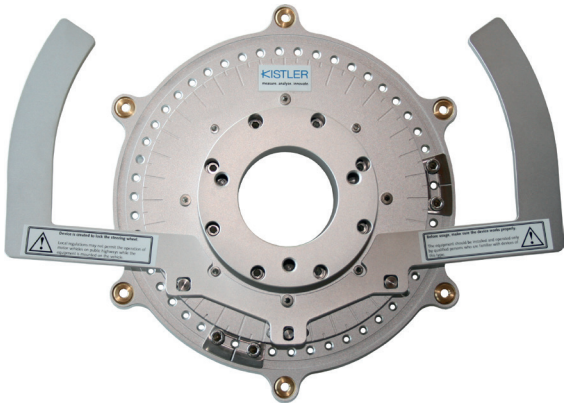


Fig. 4: Steering angle stop for Kistler MSW sensors

Dimensions of Sensor Electronics

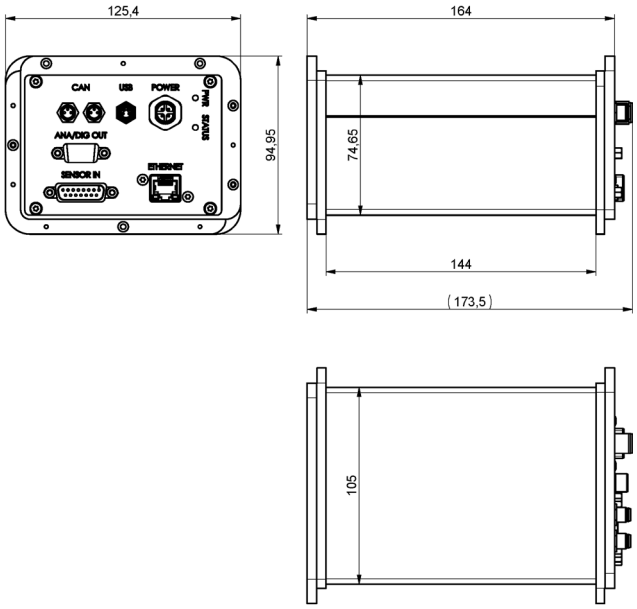


Fig. 3: Dimensions of the Kistler MSW sensor electronics

Features of the Steering Angle Stop

- Fixes the steering angle to a pin point
- Enables steering movement between two different steering angles
- Easy handling
- Use of existing steering shaft adapters is possible
- Unrivaled mechanical setup (size and height)

Typical Applications

- Sudden steering input
- Sinus steering
- Zero-point determination

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Included Accessories	Ordering No.
• Power cable, B-coded, l = 5 m	18012366
• Connection cable CAN, l = 2 m	18012482
• Connection cable USB, l = 2 m	18012483
• Distribution cable, HD-Sub 5xBNC, l = 1 m	55063742
• Distribution cable, HD-Sub 4xBNC, l = 1 m	55091476
• Adapter VGA connector/female 90°	55120394
• Multimedia CD incl. software & manual	55082182
• Transport case	diverse*

Optional Accessories	Ordering No.
• Steering wheel 450 mm	18012537
• Steering wheel adapter ø280 ... 420 mm	22001141
• Steering wheel adapter ø400 ... 560 mm	22001142
1-point suction holder for mounting at the windshield (car)	18025571
• Steering angle stop car (see Fig. 4)	18026445
• Steering angle stop truck	18026447
• Custom adaptations	on request

* dependent on type; transport cases for custom adaptations upon request

Ordering Key

Type CMSWB □ □ □ □

Sensor Element

50 N·m	1
250 N·m	2

Steering Wheel

Without steering wheel	1
360 mm for 50 N·m	2
390 mm for 250 N·m	3

Sensor Cable

5 m	1
10 m	2

Interface

±10 V	1

Ordering Example

Type CMSWB1111

Kistler MSW sensor element 50 N·m measurement range, without steering wheel, 5 m cable, with processor, ±10 V

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