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Correvit L-Motion

Non-contact optical sensors

Type 5335A... (standard), 5337A... (small)

Patent No. DE 43 13 497 C2

Correvit L-Motion sensors enable direct, slip-free measurement of longitudinal speed in vehicle driving dynamics tests. They are designed for application under extreme testing conditions, e.g., measuring longitudinal dynamics on snow and ice as well as wet surfaces.

- Correvit L-Motion with working range 350 ±100 mm, applicable from 0,1 ... 250 km/h (optional up to 400 km/h)
- Excellent distance measurement accuracy: ±0,1 %
- New technique reduces signal noise and enables a minimal signal delay of 6 ms
- Built-in GPS receiver (route mapping)
- Low adjustment effort at the vehicle, shorter setup time, no running-in procedure

Description

Correvit L-Motion sensors use the proven Correvit technology for non-contact speed measurement. They produce excellent accuracy on all standard testing surfaces - wet or dry.
L-Motion sensors adapt automatically to smooth, static water-covered surfaces, as well as to areas of moving or turbulent water, or sprayed surfaces.

A new algorithm significantly reduces the signal noise. This algorithm and the high measurement frequency of 500 Hz enable a minimal signal delay of 6 ms.
A built-in 5 Hz GPS receiver enables determination of position data and time. The external magnetic antenna allows flexible and quick mounting on the vehicle.

L-Motion sensors feature high-quality optical elements, the newest optoelectronic components and state-of-the-art high-performance signal processing based on DSP and FPGA's. Speed and distance information is updated at 500 Hz to track every highly dynamic maneuver.
The delivered KiCenter software allows easy configuration. Programmable, standardized signal outputs and interfaces provide direct connection to PC and virtually all data acquisition systems, making all measured values directly available.
In combination with the DTI-Logger and the KiCenter software, L-Motion sensors enable very easy measurement of braking distances.

Application

High-precision, slip-free measurement of distance, longitudinal speed and acceleration for vehicle dynamics testing, e.g., DIN 70028 braking distance measurement with straightforward ABS braking, ISO 14512 braking on one-sided slippery track surface when driving straight-ahead.

Kistler DTI technology

With the DTI technology, a single end-to-end bus wiring system is all that is required to take the measurement signals from every sensor to the data recorder. DTI converts each signal into a unique, time stamped digital output either directly in the Kistler DTI sensors, or via suitable DTI converters for use with any existing sensors. The sensor data is collected at the central DTI logger and is transmitted via Ethernet to your laptop for evaluation. A single cable is all that is needed to configure the sensors, to transmit and synchronize the measurement data and to supply power. The automated sensor detection simplifies the test setup. The installation position, calibration values and relevant physical parameters are detected automatically by the Kistler measuring software (KiCenter) and can be configured using the GUI.

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Technical data

Performance specifications		Type 5335A... (standard)	Type 5337A... (small)
Speed range [1]	km/h	±0,1 ... 250	
Distance resolution	mm	≤1,0	
Measurement accuracy [2]	%FSO	<±0,1	
Measurement frequency	Hz	500	
Working distance / range	mm	350 ±100	
Acceleration sensor			
Measuring range	g	±18	
Non-linearity	%FSO	±0,15	
Temp. compensation	°C	0 ... 70	
Angular rate sensor			
Measuring range	°/s	±300	
Non-linearity	%FSO	±0,15	
Temp. compensation	°C	0 ... 70	

Signal outputs			
Digital output Vel_x	pulses/m	1 ... 1 000/TTL	no
Analog output Vel_x	V	–10 ... 10	no
Analog output Pitch	V	–10 ... 10	no
Analog output Acc_x	V	–10 ... 10	no
Analog output $AngVel_y$	V	–10 ... 10	no

Signal inputs			
Trigger input		TTL	no
Digital input	kHz	0 ... 100	no
Analog input 1+2	V	–10 ... 10	no

Interfaces			
CAN (Motorola/Intel)		2.0B	no
USB (Full Speed)		2.0	
Ethernet		yes	
DTI		yes	

[1] Optional: calibrated up to 400 km/h
[2] Determined on test surface with distance >200 m

System specifications		Type 5335A... (standard)	Type 5337A... (small)
Power supply	V	10 ... 28	
Power consumption max. (at 12 V)	W	35	
Temperature range			
Operation	°C	–25 ... 50	
Storage	°C	–40 ... 85	
Relative humidity (non condensing)	%	5 ... 80	
Degree of protection (cable mounted)			
Sensor head		IP67	
Electronics		IP40	
Dimensions (LxWxH)			
Sensor head	mm	118x70x45	
Electronics	mm	175x125x95	175x125x65
Weight			
Sensor head	grams	600	
Electronics	grams	1 100	890
Shock	g	50 half-sine	
	ms	6	
Vibration	g	10	
	Hz	10 ... 150	
Illumination		halogen	

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Dimensions

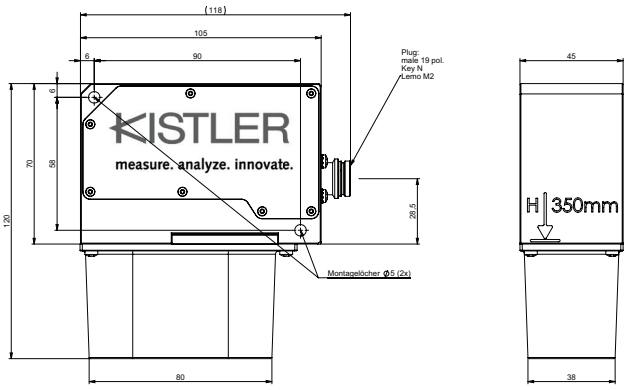


Fig. 1: Correvit L-Motion sensor dimensions

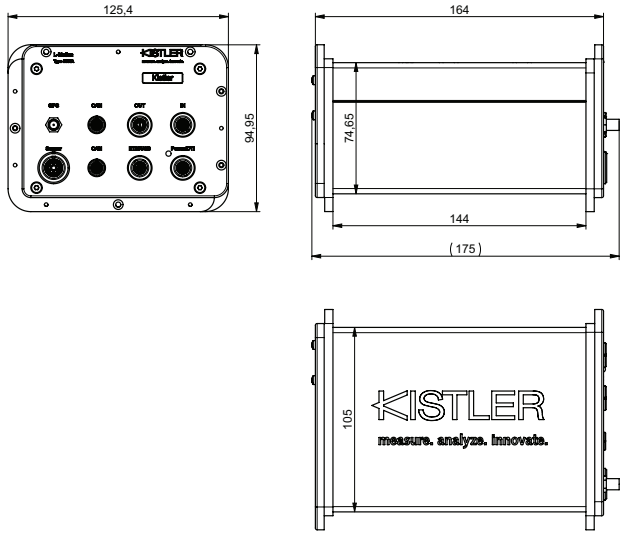


Fig. 2: Correvit L-Motion electronics (Standard), Type 5335A..., dimensions

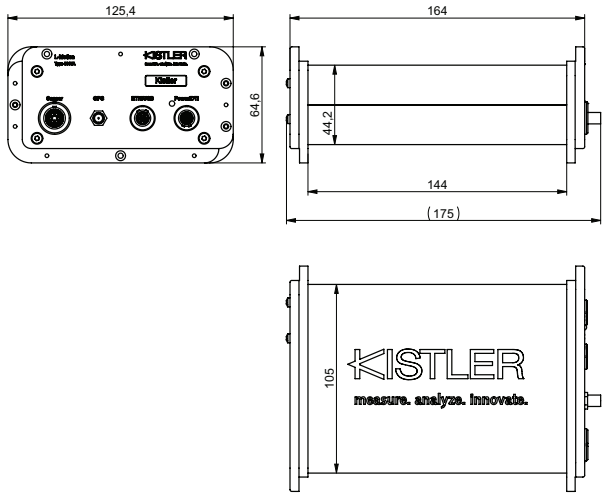
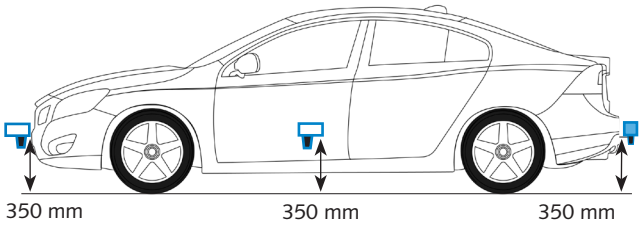


Fig. 3: Correvit L-Motion electronics Small, Type 5337A..., dimensions

Mounting

With Kistler mounting equipment (see optional accessories). When mounting the sensor at the vehicle, the mounting distance from the lower surface of the sensor body (not including the spray guard) to the road must be 350 ±100 mm.



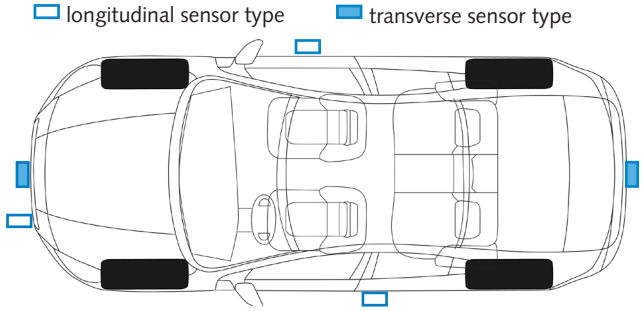


Fig. 4: Possible mounting options

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Included accessories Type 5335A... (standard)	Type/Art. No.
• Connecting cables	
USB, l = 1,8 m	55155609
CAN, l = 2 m	55155606
DTI, l = 0,5 m	55155607
ETH, l = 2 m	55155608
• Power cable DTI sensors, l = 2 m	55155612
• Distributor cables	
IN ANA/CNT, l = 1m	55159202
OUT ANA/DIG, l = 1m	55159205
• USB stick software + manual	55158846
• Halogen lamp, cold light	18012531
• Tool to exchange the sensor halogen lamp	55064735
• Cranked wrench key	55065040
• Hexagon wrench key, 6 kt	55063983
• Cranked wrench key	55065078
• Mini folding rule	55064207
• Screw set	55082183
• Transport case complete	55066876
• GPS antenna	55137560

Included accessories Type 5337A... (small)	
• Connecting cables	
USB, l = 1,8 m	55155609
DTI, l = 0,5 m	55155607
ETH, l = 2 m	55155608
• Power cable DTI sensors, l = 2 m	55155612
• USB-Stick software & manual	55158846
• Halogen lamp, cold light	18012531
• Tool to exchange the sensor halogen lamp	55064735
• Cranked wrench key	55065040
• Hexagon wrench key, 6 kt	55063983
• Cranked wrench key	55065078
• Mini folding rule	55064207
• Screw set	55082183
• Transport case complete	55066876
• GPS antenna	55137560

Optional accessories Type 5335A... / Type 5337A...	Type/Art. No.
• Connecting cable ETH, l = 5 m	55161139
• Connecting cable DTI, l = 1 m	55161140
• Connecting cable DTI, l = 2 m	55161141
• Suction holder	18012551
• Magnet holder	18012545

Ordering key

Art. No. 18033082 **Type 5335A** ☐☐☐☐☐☐☐

Art. No. 18032940 **Type 5337A** ☐☐☐ x[3] ☐ x[3] ☐

Sensor head

Halogen *	1

Sensor cable

5 m *	1
10 m	2
15 m	3

Electronics

250 km/h*	1
400 km/h	2

Interface outputs

±10 V *	1
0 ... 5 V	2

Mounting direction

Longitudinal *	1
Transverse	2

Interface inputs

±10 V *	1
0 ... 5 V	2

GPS

With GPS function *	1

Ordering example

Type 5335A1111111

L-Motion sensor, 5 m cable, standard electronics, ±10 V interface outputs, longitudinal mounting direction, ±10 V interface inputs, with GPS function

* Standard configuration

[3] Not configurable with Type 5337A...

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