

Lineas[®] Quartz Sensor for Weigh-In-Motion (WIM)

Type 9195G...

Patent No. US 5,461,924

The Lineas is a quartz sensor to measure the wheel and axle loads and to determine the vehicle gross weight under rolling traffic conditions. The sensor is installed in the road pavement and provides highly accurate measurement signals.

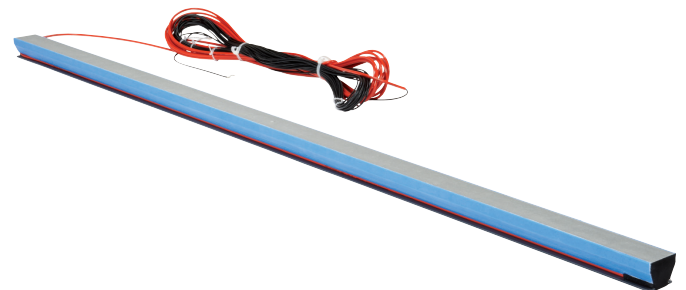
- Quartz technology
- High measurement accuracy and long term stability
- Compliant to OIML R134 (accuracy class 2)
- Robust sensor design for long term durability
- Wide measuring range
- Measures from low to high speeds
- Insensitive to temperature fluctuations
- Quick and easy installation into road pavement
- Conforms to **CE** and EMC standards

Description

The Lineas WIM sensor is a force sensor with quartz elements specially designed for measuring wheel and axle loads of road vehicles. The sensor is installed permanently into the road. When a force is applied to the sensor surface, the quartz elements yield an electrical charge signal proportional to the applied force. The sensor Type 9195GC... requires an external charge amplifier (Type 5163A...). The charge amplifier converts the electric charge into a proportional voltage signal which then can be further processed. The sensor Type 9195GV... has an integrated amplifier and must be connected to the external signal conditioner Type 5105A... .

Applications

The Lineas Type 9195GC... fulfills OIML requirements and therefore is intended for use in high accuracy applications such as direct weight enforcement and toll by weight. In combination with the charge amplifier Type 5163A... it measures accurately at any speeds, from 1 km/h up to over 250 km/h. The Lineas Type 9195GV... is intended for use in monitoring applications such as data collection and pre-selection of overloaded vehicles. Thanks to the integrated electronics the low impedance sensor cables are easy to handle. Due to a short time constant (40 s) in the signal conditioning unit, the sensor measures accurately starting at 10 km/h up to over 250 km/h. Note: The final system performance (weighing accuracy and speed range) will also depend on the type of WIM electronics used (type of data logger). Only those systems specifically developed for Lineas sensors will provide the best performance.



Technical Data

Electrical Data

Sensitivity	pC/N	-1,62 (±10 %)
Max sensitivity shift over sensor length ⁴⁾	%	<±2 ¹⁾ / ²⁾ <±4
Linearity	%FSO	<±1,0
Insulation resistance ¹⁾	Ω	>1·10 ¹⁰
Capacitance ¹⁾		
with 40 m cable	nF	8 ... 12
with 100 m cable	nF	14 ... 19
Bias voltage nom. ²⁾	V	9,5 ±0,5

General Data

Accuracy class (OIML R134) ³⁾		2
max. error ¹⁾	%	±1
Range wheel load	kN	0 ... 150
at a reference tire contact area	mm	200x320
(thread length x thread width)		
Load-bearing capacity on the sensor surface	N/mm ²	6
Operating temperature range	°C	-40 ... 80
Temperature coefficient (sensitivity)	%/°C	-0,02
Sensor length	m	1,50/1,75/2,00
Cable length	m	40/100
Weight (with 40 m/100 m cable)		
sensor length: 1,50 m	kg	7,4/8,3 ¹⁾ 6,2/7,1 ²⁾
sensor length: 1,75 m	kg	8,3/9,2 ¹⁾ 7,1/8,1 ²⁾
sensor length: 2,00 m	kg	9,2/10,1 ¹⁾ 8,0/9,0 ²⁾
Degree of protection (EN60529)		IP68

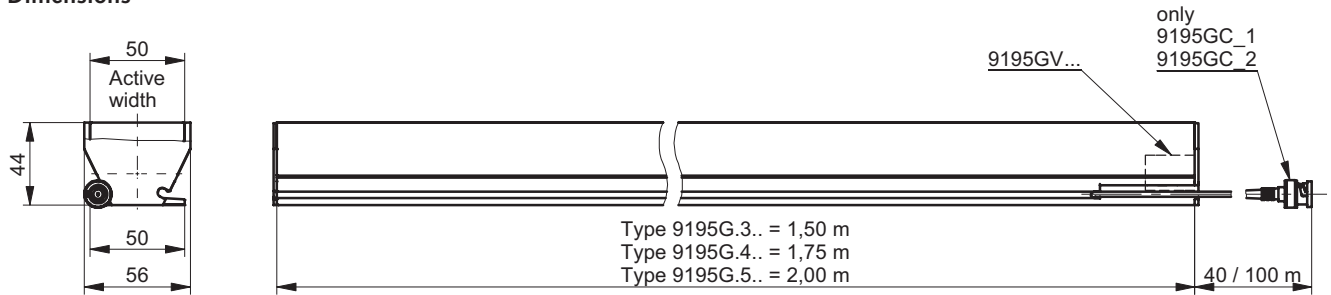
¹⁾ Applies for Type 9195GC... only

²⁾ Applies for Type 9195GV... only

³⁾ Compliant to OIML R134 laboratory tests (Certificate of Conformity No. 133-06800)

⁴⁾ Except first and last 10 cm

Dimensions

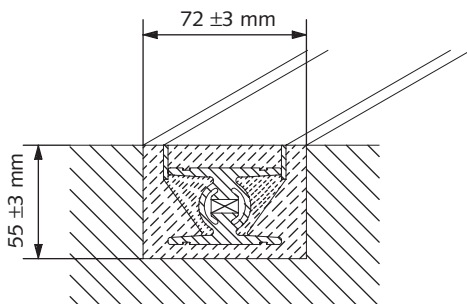


Installation

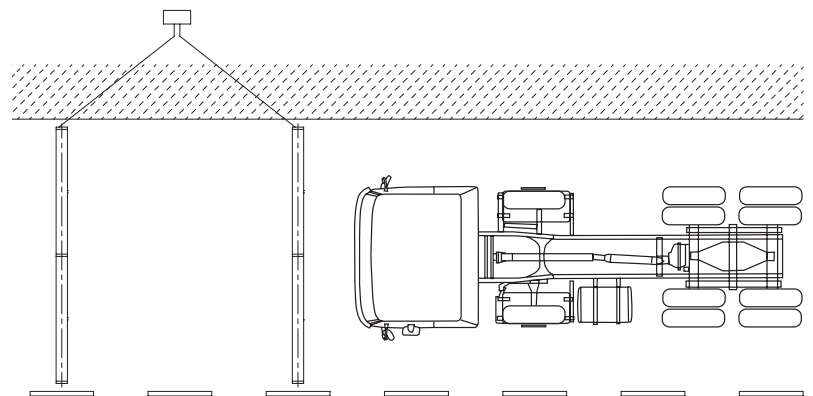
Lineas WIM sensors are easy to install. The Lineas WIM sensors are laid in self-hardening epoxy grout. This provides an optimum and consistent mounting into the pavement. The complete installation instructions for Type 9195G... (Doc.No. 9195G_002-466) describe all relevant steps.

The installation of Lineas sensors requires the supervision of a Kistler engineer or an engineer certified by Kistler.

Sensor Cross Section



Installation Layout



Included Accessories

- Mounting kit

Optional Accessories

- Lineas installation toolkit (contains required tools for the sensor installation)
 - for sensor Type 9195GC...
 - for sensor Type 9195GV...
- Set of grouting (sufficient for one sensor)
 - for temperatures >10 °C
 - for temperatures 1 ... 10°C
- Charge amplifier (for sensor Type 9195GC...)
- Signal conditioner (for sensor Type 9195GV...)

Type/Art. No.
55119954

Type/Art. No.
Z20015_GC
Z20015_GV

1000A1
1000A3
5163A...

5105A...

Ordering Key

Output Signal

Charge (for certified weighing)	C
Voltage (for monitoring applications)	V

Sensor Length

1,50 m	3
1,75 m	4
2,00 m	5

Cable Length

40 m	1
100 m	2

Type 9195G

