

KIR-TRACC

Deformation measuring for Q6

Type Q6-0362-1K

Single-axis length measuring sensors for use in anthropomorphic test devices (ATD) of Type Q6.

The KIR-TRACC (Kistler Infra Red – Telescoping Rod for Assessment of Chest Compression) is a length measuring sensor for the determination of the thorax rib compression for use in the Q6 (Child of 6 years old). The sensor can **only** be used in the Q6 in combination with a corresponding mechanical apparatus matched to the measuring position and other measuring sensors.

The measurement of the thorax rib deformation within the scope of a frontal or lateral impact accident simulation is performed for the purpose of evaluating the occupant safety of vehicles during the entire product development, legally required tests, new vehicle assessment programs and consumer tests.

The sensor Type 55244654 is characterized by:

- Q6 "ready"
- Stress-free length measurement at up to 50 m/s
- Compact size and long-lasting design
- Tight production tolerances for low lateral sensitivity
- Output signal: polynomial of the third degree
- Standardized receiver for simple calibration and installation
- DTI "ready"

Description

The operating principle of the Kistler IR-TRACC is based on a photo-optical procedure that is described in GM research paper RND-8832, June 4, 1998. Light in the infrared range is emitted by an infrared (IR) LED with high luminance and radiation intensity, received by an opposing photodiode with high luminance sensitivity and congruent spectral sensitivity. The radiant power measured by the photodiode is electrically converted to current, which is inversely proportional to the square of the distance from the LED to the photodiode.



The current thereby produced is further processed such that the signal at the output of the sensor can be converted by means of a polynomial approximation to the change of distance and, thus, to the change in length in the torso deformation zone.

Both the transmitter LED as well as the photodiode are installed in a telescoping rod that can be pushed together longitudinally.

Application

The Q6 child ATD is equipped with a total of one KIRTRACC in the thorax region. For this purpose, the sensor is mounted to the measuring position. The KIR-TRACC's own length measurement measures the torso deformation, thereby making the injury parameters determinable.

With the longitudinal displacement of the KIR-TRACC the deformation behavior can be clearly determined in one direction via the position of the front part of the measuring system.

Technical data

Length measuring		55244654
Specification		Thorax
Measuring range	mm	90
Retraction/withdrawal speed, max.	m/s	50
Power supply U _b	V	5
Current consumption, max. (typ.)	mA	35 (26)
Operating temperature range	°C	15 ... 40
Sensor output, max. (typ.)	mV	350 (300)
Output format		Cubic polynomial
Approximation deviation, max.	%	1
Shock resistance, max.	g	200
Cable length (open cable ends)	m	6
Mass	Grams	125
Sensitivity of telescopic displacement ¹⁾		
Deviation @ 120 mm (typ.)	%F.S.	–
Deviation @ 90 mm (typ.)	%F.S.	0.2
Deviation @ 75 mm (typ.)	%F.S.	0.2
Deviation @ 60 mm (typ.)	%F.S.	0.1
Deviation @ 30 mm (typ.)	%F.S.	0.1
Deviation (max. %F.S.)	%	1
Sensitivity of telescopic deflection ²⁾		
Deviation @ 120 mm (typ.)	%F.S.	–
Deviation @ 90 mm (typ.)	%F.S.	0.6
Deviation @ 75 mm (typ.)	%F.S.	0.3
Deviation @ 60 mm (typ.)	%F.S.	0.2
Deviation @ 30 mm (typ.)	%F.S.	0.2
Deviation (max. %F.S.)	%	1.5

1) Description:

- Rigid suspension at both fastening points
- Pos. 1: Telescopic elements for displacement at the narrower end
- Pos. 2: Telescopic elements for displacement at the wider end
- Sensitivity results from the signal difference during telescopic displacement

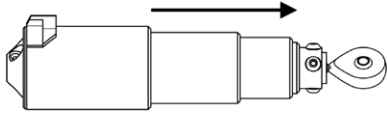


Fig. 1: Pos. 1

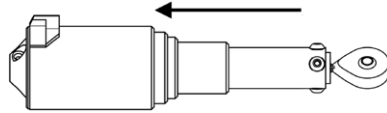


Fig. 2: Pos. 2

2) Description

- Rigid suspension at both fastening points
- Telescopic deflection through a weight acting at the middle (450 gram)
- Sensitivity results from the signal difference during telescopic deflection

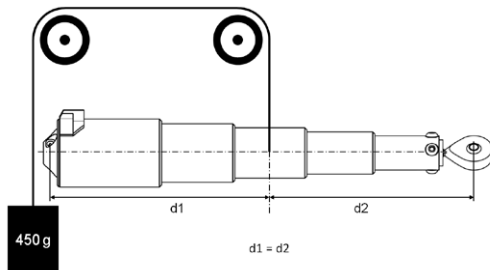


Fig. 3: Diagram of measurement setup for telescopic deflection

Ordering key

Single sensor

Mat. No.

Single sensor in telescoping rod, Thorax Deformation
KIR-TRACC, 1-dim. length measurement (infrared),
90 mm

55244654

Q6 assembly, position

Thorax 2D - DTII ³⁾	Type Q6-	0362-1K
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³⁾ DTI-ready, no DiMOD included, calibration included