

Lumbar Spine Load Cell

Six-axial

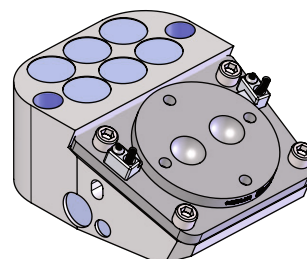
Type M56213A...
M56216A...

Type M5621xA... is used in the crash test dummy HIII-95 % (HM) and HIII-50 % (H3) to measure forces and moments¹⁾ in the lumbar spine.

- Triaxial (F_x , F_y , F_z), six-axial (F_x , F_y , F_z , M_x , M_y , M_z)
- UPS module available
- Low linearity errors and hysteresis
- Kistler system cabling
- Polarities according to SAE J211/1

Description

The load cell is made of elements on which forces and moments¹⁾ are transmitted. The mechanical deformation element, applied with strain gage, serves for mechanical electrical deformation. The forces and moments¹⁾ to be measured create mechanical stretches and buckling in the gaging member. In order to avoid linearity errors, the deformation paths are constructively held small (high rigidity). Thus a proportional behavior is realized.



The force proportional resistance variations are measured by a Wheatstone-type bridge circuit. The load cell is available with UPS module which is integrated in an external housing in the wiring or in the connector. Customized cable lengths and connectors with specific pin assignments are optionally available.

Technical data

Axial data		F_x	F_y	F_z	$M_x^{1)}$	$M_y^{1)}$	$M_z^{1)}$
Measuring range	kN	15	15	20			
	N·m				600	600	350
Bridge output voltage (typ.)	mV/V	1.9	1.9	1.1	1.8	1.8	1.6
Sensitivity (typ.)	$\mu\text{V/V/kN}$	127	127	55			
	$\mu\text{V/V/N·m}$				3.0	3.0	4.6
Bridge resistance	Ω	350	350	700	700	700	350
Ultimate load, static	%	150	150	150	150	150	150

General data

Supply voltage ²⁾	VDC	2.5 ... 15
Insulation resistance ³⁾	G Ω	>10
Operating temperature range	°C	-20 ... 80
Storage temperature range	°C	-30 ... 90
Amplitude non-linearity (typ.)	%	<1
Hysteresis (typ.)	%	<1
Channel cross talk	%	<5
Bridge zero output (typ. / max.)	mV/V	0.01 / 0.03
Weight, without cable	grams	7 200

All specifications are typical at 25 °C and rated at 10 V sensor supply, unless otherwise specified.

¹⁾ Only in six-axial version

²⁾ With UPS module 9 ... 12 VDC

³⁾ All wires to load cell housing, measured with 500 VDC

M56213A_000-837e-11.19

Application

The load cell is directly assembled at the designated location in the dummy and provides important information about the loads on the human body occurring during a crash test.

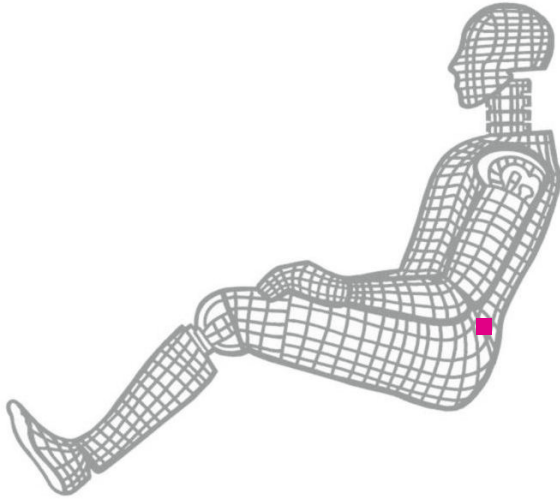


Fig. 1: Dummy application, location lumbar spine

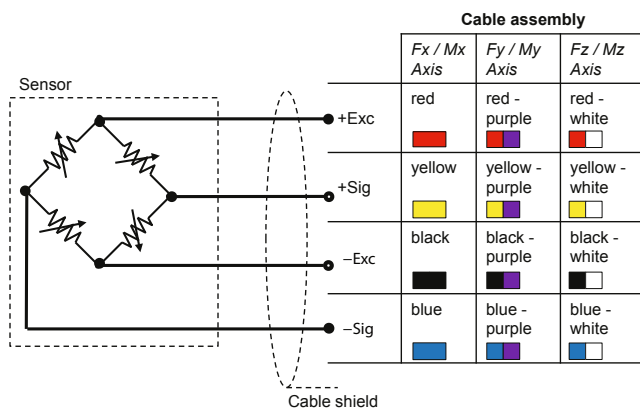


Fig. 2: Cable assembly

Included accessories

- None

Optional accessories

- UPS module
- Add. shunt

Art. no.

on request
on request

Ordering key

Type M5621

Number of axes, design

Triaxial, standard	3AIM
Six-axial, standard	6AIM

Cable length before electronics

0 cm	00
<10 cm (digit x 1 cm)	C#
10 cm ... 9.9 m (digit x 10 cm)	##
10 m ... 90 m (digit x 10 m)	D#

Additional electronics

Sensor detail, as per type declaration force-moment TP-650-2	#
---	---

Cable length after electronics

0 cm	00
<10 cm (digit x 1 cm)	C#
10 cm ... 9.9 m (digit x 10 cm)	##
10 m ... 90 m (digit x 10 m)	D#

Connector

Conn. type, as per TP-600	#-
Conn. assignment, as per. TP-600	-#

M56213A_000-837e-11.19

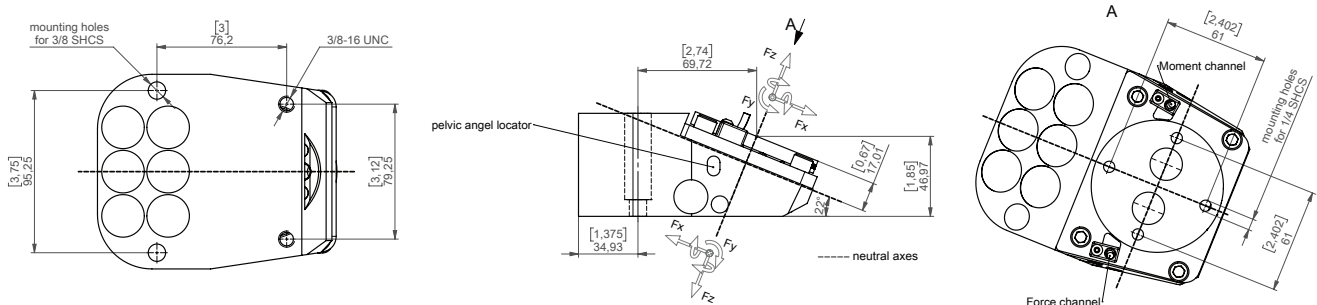


Fig. 3: Dimensions in mm