

# Lumbar Spine Load Cell

Type M53764A...

## Four-axial

Type M53764A... is designed to measure forces and moments in the lumbar spine of the crash test dummies E1 and E2.

- Four-axial ( $F_x$ ,  $F_y$ ,  $M_x$ ,  $M_y$ )
- ID module integrable
- Low linearity error and hysteresis error
- Kistler system cabling
- Polarities according to SAE J211/1



### Description

When using the load cell in the dummy E1, additional modifications of the abdominal drum and lumbar spine are necessary.

Line-up of equivalent load cells:

	Type
Kistler	M53764A...
FTSS	IF-420
Denton	4284

The load cell is made of elements on which forces are transmitted. The mechanical deformation element, applied with strain gage, serves for mechanical electrical deformation. The effectiveness of the load cell resembles the behavior of a spiral spring. The forces 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 stiffness). Thus a proportional behavior is realized. The force and moment proportional resistance variations are measured by a Wheatstone-type bridge circuit.

The load cell is available with ID modules. Customized cable lengths and connectors with specific pin assignments are optionally available.

### Technical Data

Axial Data		$F_x$	$F_y$	$M_x$	$M_y$
Measuring range	kN	14	14		
	N·m			1 000	1 000
Bridge output voltage	mV/V	1,5	1,5	1,9	1,9
Sensitivity	$\mu\text{V/V/kN}$	107	107		
	$\mu\text{V/V/N}\cdot\text{m}$			1,9	1,9
Bridge resistance	$\Omega$	350	350	700	700
Ultimate load	%	150	150	150	150
Supply voltage	without ID module	VDC 5 ... 15			
	with ID module	VDC 9 ... 12			
Insulation resistance <sup>1)</sup>	M $\Omega$	>90			
Operating temperature range	$^{\circ}\text{C}$	-20 ... 80			
Storage temperature range	$^{\circ}\text{C}$	-30 ... 90			
Amplitude non-linearity	%	<1			
Hysteresis	%	<1			
Channel cross talk	%	<5			
Weight (without cable)	grams	500			

All specifications are typical at 25  $^{\circ}\text{C}$  and rated at 10 V sensor supply voltage, unless otherwise specified.

<sup>1)</sup> All wires to screen (GND), measured with 10 VDC

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**Application**

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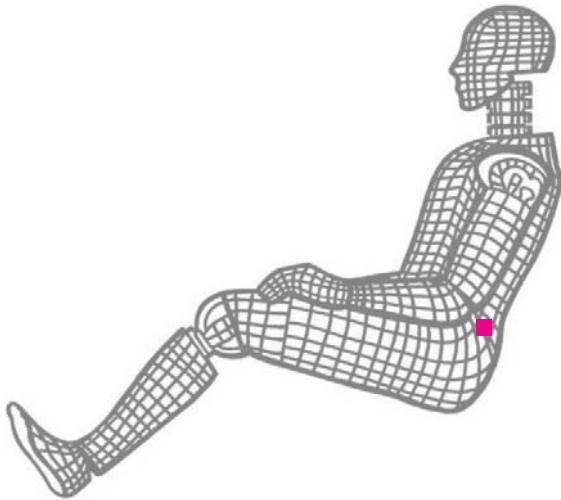


Fig. 1: Dummy application, location lumbar spine

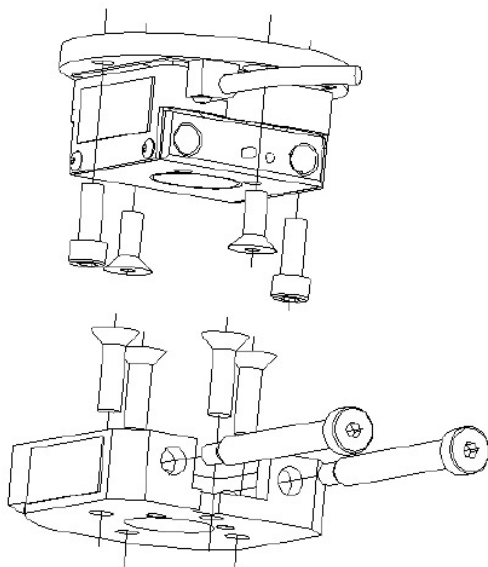


Fig. 2: Sketch

**Included Accessories**

- None

**Optional Accessories**

- Add. label with serial number, plug side
- ID module
- Add. label with ID number at sensor
- Add. shunt

**Type No.**

M015KABID  
on request  
M015KABID  
on request

**Ordering Key**

Type M53764A

**Design**

Standard	IM
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**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	#
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**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	-#

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