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Shoulder Load Cell

Type M53643A...

Triaxial

Type M53643A... is designed to measure forces in the shoulder of the crash test dummy WorldSID-50 % (WS).

- Triaxial (F_x, F_y, F_z)
- UPS module available
- Low linearity error and hysteresis error
- Kistler system cabling
- Polarities according to SAE J211/1

Description

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 rigidity). 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 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**
Measuring range	kN	5	10	5
Bridge output voltage (typ.)	mV/V	1,85	2,0	1,85
Sensitivity (typ.)	µV/V/kN	370	200	370
Bridge resistance	Ω	350	700	350
Ultimate load, static	%	150	150	150
Supply voltage[1)]	VDC	2,5 ... 15		
Insulation resistance[2)]	GΩ	>10		
Operating temperature range	°C	–20 ... 80		
Storage temperature range	°C	–30 ... 90		
Amplitude non-linearity (typ.)	%	<1		
Hysteresis (typ.)	%	<1		
Channel crosstalk	%	<5		
Bridge zero output (typ. / max.)	mV/V	0,01 / 0,03		
Weight (without cable)	grams	177		

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

1) With UPS module 9 ... 12 VDC
2) All wires to load cell housing, measured with 500 VDC

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Application

Type M53643A... 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.

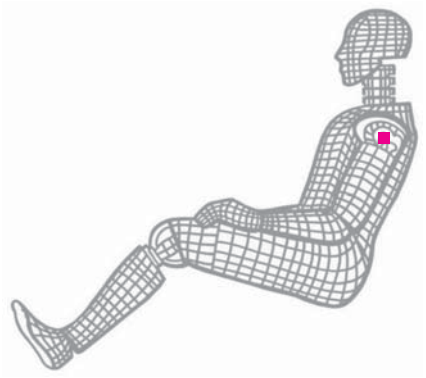

Fig. 1: Dummy application, location shoulder

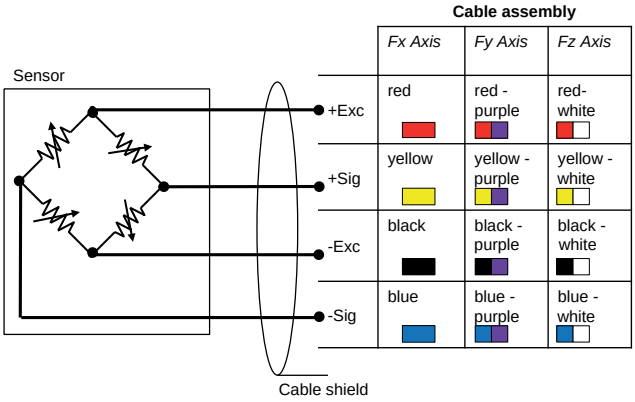

Fig. 2: Cable assembly

Included Accessories

- None

Optional Accessories	Type No.
• Add. label with serial number, plug side	M015KABID
• UPS module	on request
• Add. label with ID number at sensor	M015KABID
• Add. shunt	on request

Ordering Key

Type M53643A ☐☐☐☐☐☐

Design

Left shoulder	**4M**
Right shoulder	**5M**

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 Lengths 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. type assignment, as per TP-600	**-#**

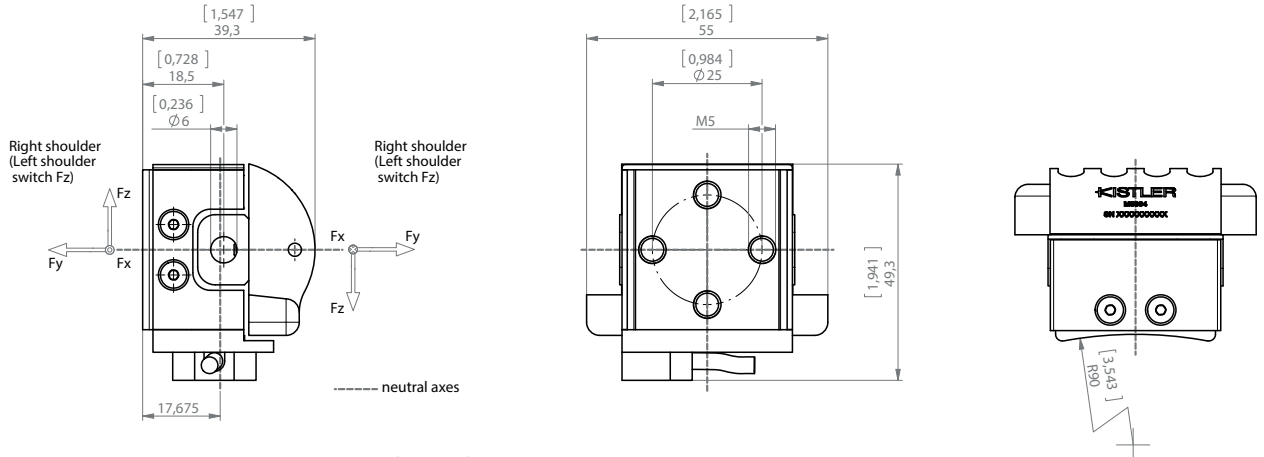

Fig. 3: Dimensions in mm and direction of action for right design (F_z is rotated for left design)

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