

Upper Tibia Load Cell

Four-axial, Five-axial

Type M55214A...,
M55214B...,
M55215A...,
M55215B...

Type M5521... is designed to measure forces and moments in the upper tibia of the crash test dummies H3-5 %, H3-50 %, H3-95 %, BioRID, BioSID and SID IIs. The sensor is available with four or five axes.

- Axes: four (F_x, F_z, M_x, M_y) or five (F_x, F_y, F_z, M_x, M_y)
- ID module available
- MICRODAU® available
- Low linearity errors and hysteresis errors
- Kistler system cabling
- Polarities according to SAE J211/1



Type M55214A...



Type M55214B...

Description

The load cell is made of elements on which forces and moments are trans-mitted. The mechanical deformation element, applied with strain gage, serves for mechanical electrical deformation.

Line-up of equivalent load cells:

	Four-axial	Five-axial
Kistler	M55214...	M55215...
FTSS	IF-820	IF-857
Denton	3115	3643

The forces and moments 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, either a UPS module (Universal Parameter Memory) or a Dallas module can be chosen for this functionality. These modules are 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	$F_y^{1)}$	F_z	M_x	M_y
Measuring range	kN	11	11	11		
	N·m				400	400
Bridge output voltage (typ.)	mV/V	2,0	2,0	1,0	2,8	2,8
Sensitivity (typ.)	$\mu V/V/kN$	180	180	90		
	$\mu V/V/N\cdot m$				7,0	7,0
Bridge resistance	Ω	350	350	700	350	350
Ultimate load, static	%	150	150	150	150	150

General Data

Supply voltage	without ID modules	VDC	5 ... 15
	with ID modules	VDC	9 ... 12
Insulation resistance ²⁾		M Ω	>90
Operating temperature range		$^{\circ}C$	-20 ... 80
Storage temperature range		$^{\circ}C$	-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	450

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

¹⁾ Only five-axial version

²⁾ All wires to screen (GND), measured with 10 VDC

M55214A_000-789e-06.12

Application

Type M5521... is designed to measure forces and moments in the upper tibia of the crash test dummies H3-5 %, H3-50 %, H3-95 %, BioRID, BioSID and SID IIs. The measuring location upper tibia is typically used together with the measuring location lower tibia (Type M55204...). If tibia load cells are mounted in a dummy both the tibia bone and the knee of the dummy must be replaced. The items are:

	Type
Tibia bone	M55000ASM00Q0001
Knee as bone	M55110AJM00Q0001
Knee as load cell	M55112AJM...

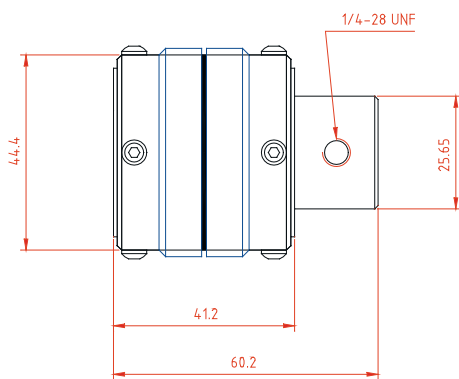


Fig. 1: Dimensions



Fig. 2: Instrumented leg

Included Accessories

- Mounting screws, imperial 1/4-28 UNF, 4 units

Type No.

on request

Optional Accessories

- Add. label, customized
- ID module
- Add. label with ID number at sensor
- Add. shunt

Type No.

M015KABID
on request
M015KABID
on request

Ordering Key

Design

Four axes:

Standard	4ASM
Mech. prepared for MICRODAU®	4BSM

Five axes:

Standard	5ASM
Mech. prepared for MICRODAU®	5BSM

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	-#

MICRODAU® is a registered trademark of Kistler Holding AG

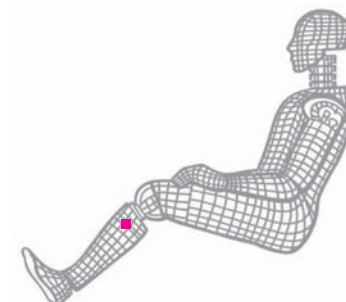
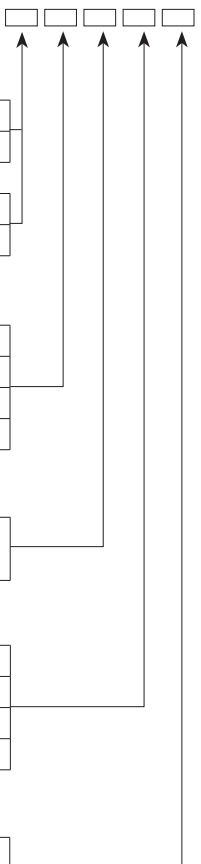


Fig. 3: Dummy application, location upper tibia

Type M5521



M55214A_000-789e-06.12