

Universal Femur Load Cell

Uniaxial, six-axial

 Type M56501A...,
 M56506A...

Type M5650xA... is designed to measure forces and moments in the femur of the crash test dummies Thor (TH) and WorldSID-50 % (WS).

- Uniaxial (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 are transmitted. The mechanical deformation element, applied with strain gage, serves for mechanical electrical deformation. 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 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	$F_z^{1)}$	M_x	M_y	M_z
Measuring range	kN	15	15	15			
	N·m				350	350	200
Bridge output voltage (typ.)	mV/V	1,86	1,86	1,06	2,0	2,0	2,7
Sensitivity (typ.)	$\mu\text{V}/\text{V}/\text{kN}$	130	130	70			
	$\mu\text{V}/\text{V}/\text{N}\cdot\text{m}$				6,0	6,0	9,0
Bridge resistance	Ω	700 ²⁾	700 ²⁾	700	350	350	350 ²⁾
Ultimate load, static	%	150	150	150	150	150	150

General data

Supply voltage ³⁾	VDC	2,5 ... 15
Insulation resistance ⁴⁾	G Ω	>10
Operating temperature range	$^{\circ}\text{C}$	-20 ... 80
Storage temperature range	$^{\circ}\text{C}$	-30 ... 90
Amplitude non-linearity (typ.)	%	<1
Hysteresis (typ.)	%	<1
Channel cross talk	%	<5
Bridge zero output (typ. / max.)	mV/V	0,02 / 0,03
Weight, without cable	grams	480

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

¹⁾ Uniaxial and six-axial version

²⁾ Up to serial number 000024 (up to year of construction 2015) the bridge resistance of the load cells is 350 Ω (F_x , F_y) resp. 700 Ω (M_z). Please mind the first calibration!

³⁾ With UPS module 9 ... 12 VDC

⁴⁾ All wires to load cell housing, measured with 500 VDC

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.

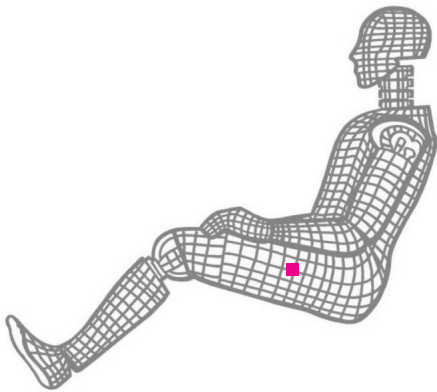


Fig. 1: Dummy application, location leg

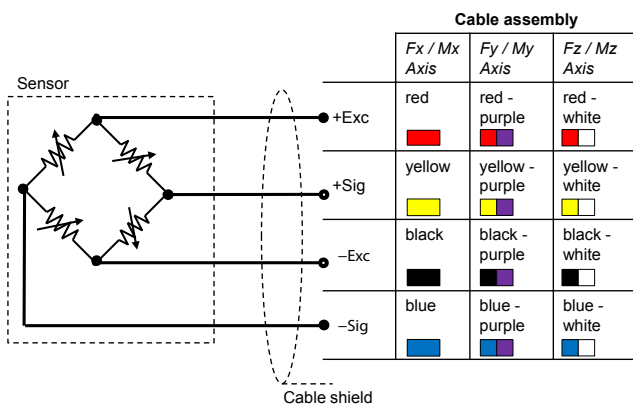


Fig. 2: Cable assembly

Included accessories

- None

Optional accessories

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

Art. No.

M015KABID
on request
M015KABID
on request

Ordering key

Type M5650

Design

Uniaxial	1ABM
Six-axial	6ABM

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	-#

M5650xA_000-977e-03.18

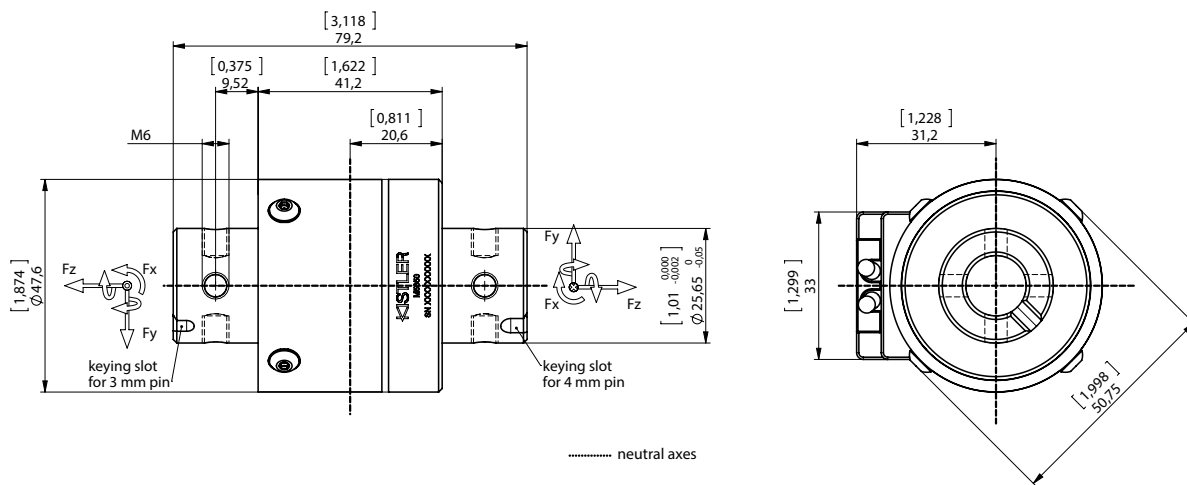


Fig. 3: Dimensions in mm

This information corresponds to the current state of knowledge. Kistler reserves the right to make technical changes. Liability for consequential damage resulting from the use of Kistler products is excluded.

©2011 ... 2018, Kistler Group, Eulachstrasse 22, 8408 Winterthur, Switzerland
Tel. +41 52 224 11 11, Fax +41 52 224 14 14, info@kistler.com, www.kistler.com
Kistler is a registered trademark of Kistler Holding AG.