

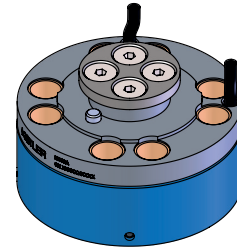
# Upper & Lower Neck Load Cell

Type M560A6A...

## Six-axial

Type M560A6A... is designed to measure forces and moments in the upper neck and/or in the lower neck of the HIII-3 year old (Y6) crash test dummy.

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



### Description

The load cell is made of elements on which forces and moments 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. If the load cell is used at the location 'lower neck', polarities of  $F_x$  and  $M_x$  must be changed in order to fulfil the SAE J211/1.

### Technical data

| Axial data                   |                     | $F_x$ | $F_y$ | $F_z$ | $M_x$ | $M_y$ | $M_z$             |
|------------------------------|---------------------|-------|-------|-------|-------|-------|-------------------|
| Measuring range              | kN                  | 4.45  | 4.45  | 6.7   |       |       |                   |
|                              | N·m                 |       |       |       | 170   | 170   | 113               |
| Bridge output voltage (typ.) | mV/V                | 1.7   | 1.7   | 1.1   | 1.5   | 1.5   | 1.5               |
| Sensitivity (typ.)           | $\mu\text{V/V/kN}$  | 385   | 385   | 170   |       |       |                   |
|                              | $\mu\text{V/V/N·m}$ |       |       |       | 8.6   | 8.6   | 13.7              |
| Bridge resistance            | $\Omega$            | 350   | 350   | 700   | 350   | 350   | 350 <sup>1)</sup> |
| Ultimate load, static        | %                   | 150   | 150   | 150   | 150   | 150   | 150               |

### General data

|                                     |                    |             |
|-------------------------------------|--------------------|-------------|
| Supply voltage <sup>2)</sup>        | VDC                | 2.5 ... 15  |
| Insulation resistance <sup>3)</sup> | G $\Omega$         | >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                 | 0.01 / 0.03 |
| Weight                              | grams              | 236         |

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

<sup>1)</sup> Up to serial number 0004648632 (up to year of construction 2015) the bridge resistance of the load cells is 700  $\Omega$  in  $M_z$ . Please mind the first calibration!

<sup>2)</sup> With UPS module 9 ... 12 VDC

<sup>3)</sup> All wires to screen (GND), measured with 500 VDC

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**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.

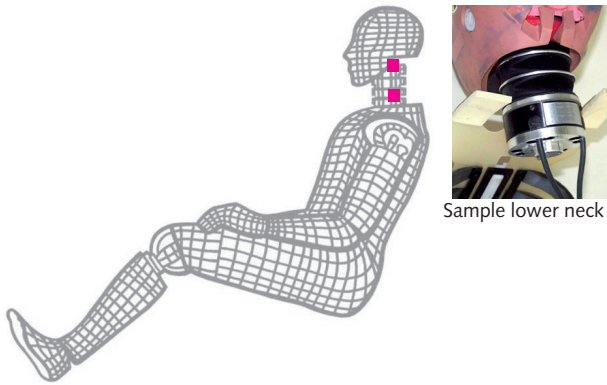


Fig. 1: Dummy application, location upper/lower Neck

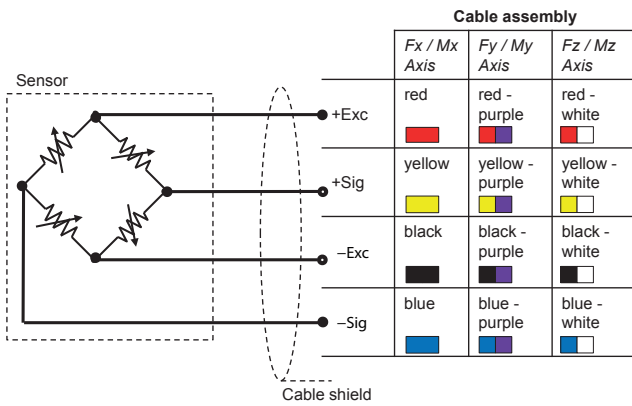


Fig. 2: Cable assembly

**Included accessories**

- None

**Optional accessories**

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

**Type No.**

M015KABID  
M015KABID  
on request  
on request

**Ordering key**

| Type M560A6A                           |  |    |
|--|--|----|
| <b>Design</b>                          | Standard   | UM |
| <b>Cable length before electronics</b> | 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# |
| <b>Additional electronics</b>          | Sensor detail, as per type declaration force-moment TP-650-2 | #  |
| <b>Cable length after electronics</b>  | 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# |
| <b>Connector</b>                       | Conn. type, as per TP-600                                    | #- |
|  | Conn. type assignment, as per TP-600                         | -# |

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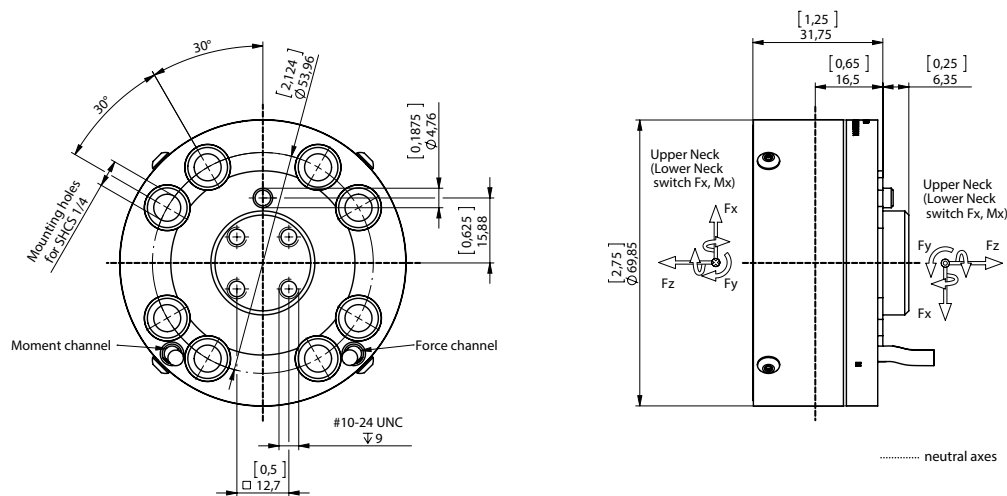


Fig. 3: Dimensions in mm

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.

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