

# Crash Test Dummy Load Cells

## WorldSID

TECHNICAL DATA SHEETS



# Technical Data Sheet



## F1AGA11A



### Load Cell, 1-axial

Location: Universal Leg

Force direction

$F_z$

Application

WorldSID-5%

WorldSID-50%

Equivalent types

Measurement specification

Resistive

Strain gauges

Options

ID-Module integrated in sensor

Polarity according to SAE J211

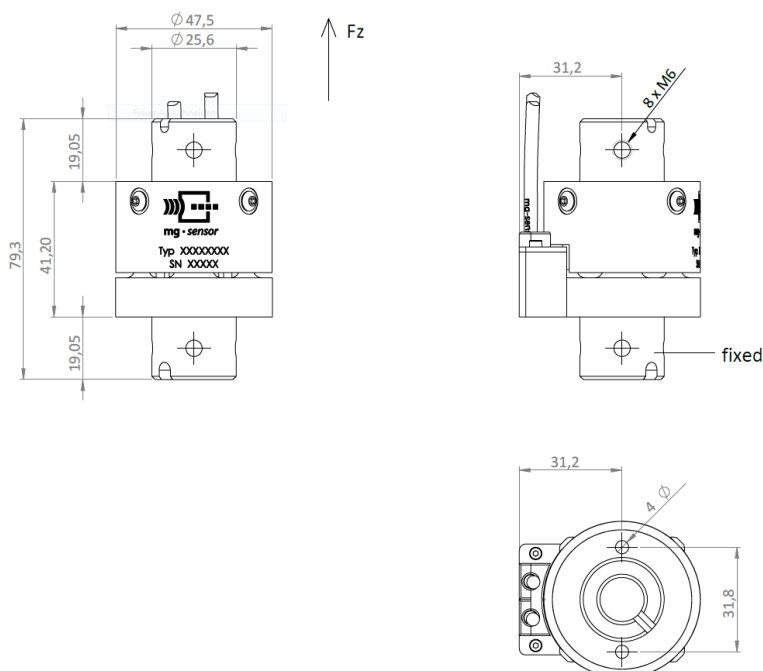


### Technical description

The applied force causes compression or strain of the base body. The deformation is measured using strain gauges. The wiring of multiple strain gauges for a full bridge circuit compensates for the temperature influence on the zero signal and the cross-influence from other force and torque application.



### Dimensions



# Technical Data Sheet



**mg · sensor**  
PURE PRECISION

## F1AGA11A



### Technical specification

|                                       | Unit               | Value       |
|---------------------------------------|--------------------|-------------|
|                                       |                    | $F_z$       |
| Measuring range                       | kN                 | 15          |
| Sensitivity <sup>1)</sup>             | $\mu\text{V/V/kN}$ | 73          |
| Output signal <sup>1), 2)</sup>       | mV/V               | 1.1         |
| Bridge resistance                     | $\Omega$           | 700         |
| Zero signal <sup>1)</sup>             | mV/V               | $\leq 0.05$ |
| Amplitude non-linearity <sup>3)</sup> | %                  | $\leq 1.0$  |
| Hysteresis <sup>3)</sup>              | %                  | $\leq 1.0$  |
| Channel crosstalk <sup>3)</sup>       | %                  | $\leq 5.0$  |
| Supply voltage                        | V                  | 2–15        |
| Ultimate load                         | %                  | 150         |
| Insulation resistance                 | M $\Omega$         | $> 100$     |
| Temperature range                     | $^{\circ}\text{C}$ | -30...+70   |
| Weight (approximate)                  | g                  | 480         |

All values measured at 10 V sensor supply voltage and at 23  $^{\circ}\text{C}$ .

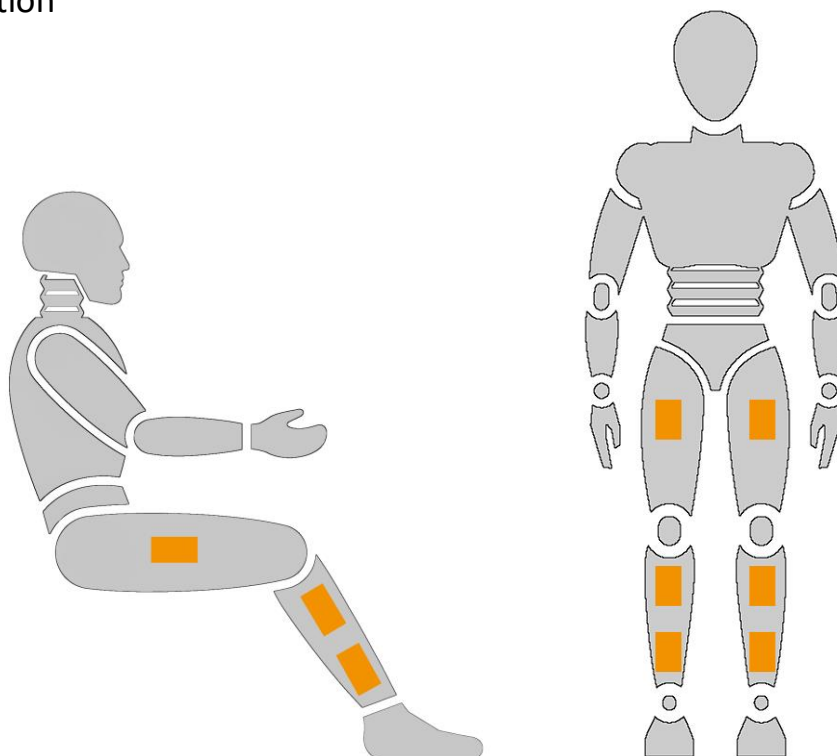
<sup>1)</sup> Typical value

<sup>2)</sup> At nominal load

<sup>3)</sup> Relative nominal range



### Dummy application



# Technical Data Sheet



## F1ANC11A



### Load Cell, 1-axial

Location: Pubic

Force direction

$F_y$

Application

WSID 50%

Equivalent types

FTSS: W50-71051

Measurement specification

Resistive

Strain gauges

Options

ID-Module integrated in sensor

Polarity according to SAE J211

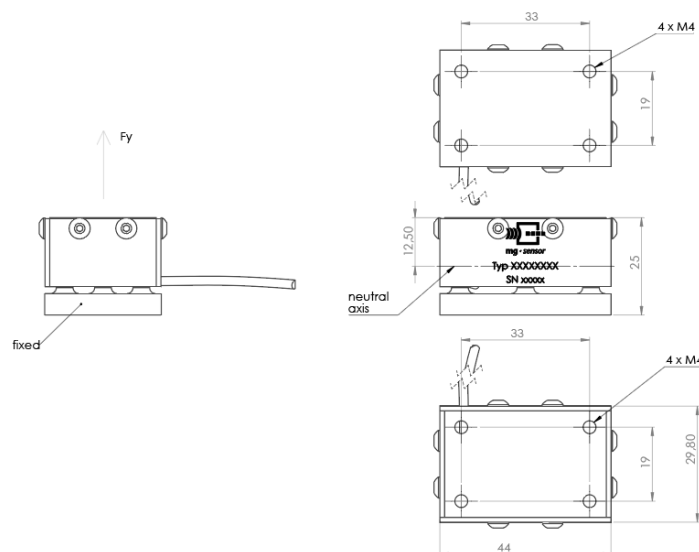


### Technical description

The applied force causes compression or strain of the base body. The deformation is measured using strain gauges. The wiring of multiple strain gauges for a full bridge circuit compensates for the temperature influence on the zero signal and the cross-influence from other force and torque application.



### Dimensions



# Technical Data Sheet



## F1ANC11A

### Technical specification

|                                       | Unit    | Value          |
|---------------------------------------|---------|----------------|
|                                       |         | F <sub>y</sub> |
| Measuring range                       | kN      | 12             |
| Sensitivity <sup>1)</sup>             | μV/V/kN | 200            |
| Output signal <sup>1), 2)</sup>       | mV/V    | 2.4            |
| Bridge resistance                     | Ω       | 700            |
| Zero signal <sup>1)</sup>             | mV/V    | ≤ 0.05         |
| Amplitude non-linearity <sup>3)</sup> | %       | ≤ 1.0          |
| Hysteresis <sup>3)</sup>              | %       | ≤ 1.0          |
| Channel cross talk <sup>3)</sup>      | %       | –              |
| Supply voltage                        | V       | 2–15           |
| Ultimate load                         | %       | 150            |
| Insulation resistance                 | MΩ      | > 100          |
| Temperature range                     | °C      | -30...+70      |
| Weight (approximate)                  | g       | 120            |

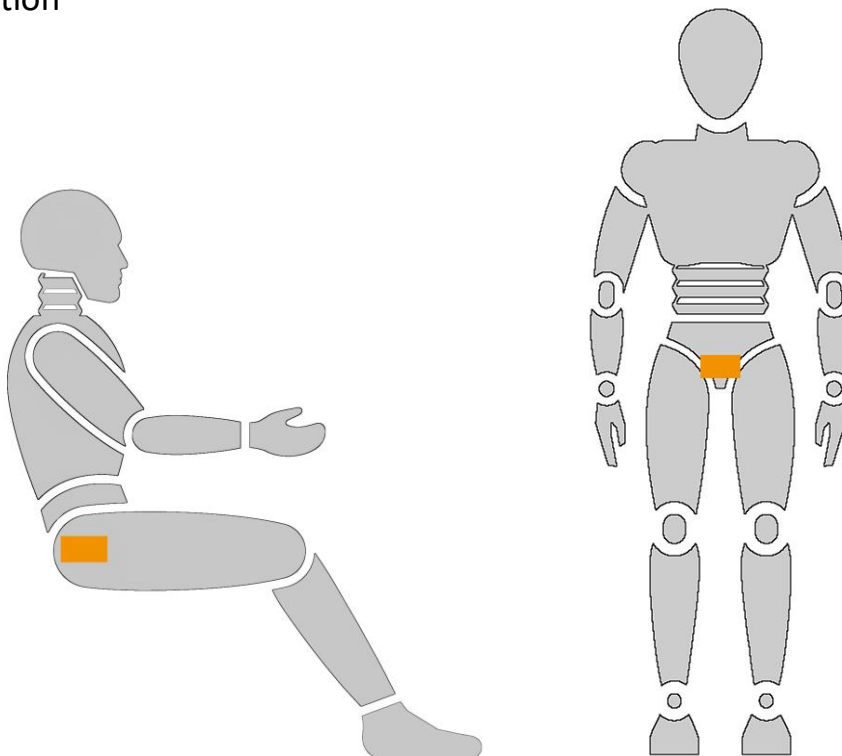
All values measured at 10 V sensor supply voltage and at 23 °C.

<sup>1)</sup> Typical value

<sup>2)</sup> At nominal load

<sup>3)</sup> Relative nominal range

### Dummy application



# Technical Data Sheet



## F3AJA11A



### Load Cell, 3-axial

Location: Femoral Neck right

Force direction

$F_x, F_y, F_z$

Application

WorldSID-50%

Equivalent types

FTSS: W50-71080

Measurement specification

Resistive

Strain gauges

Options

ID-Module integrated in sensor

Polarity according to SAE J211

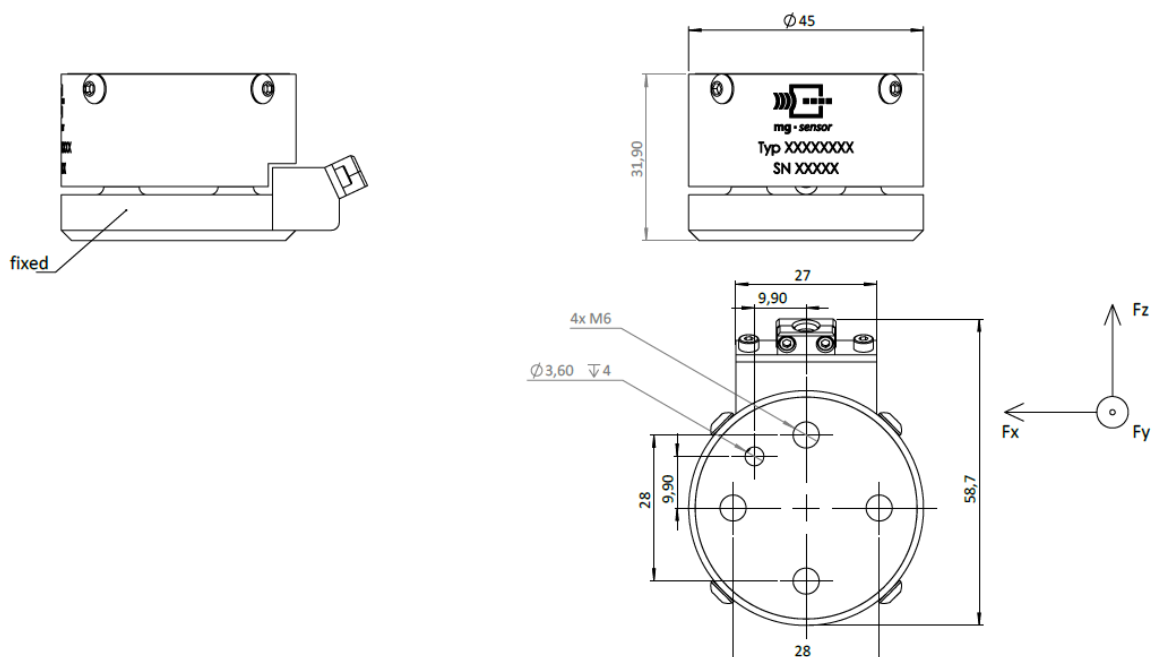


### Technical description

The applied force causes compression or strain of the base body. The deformation is measured using strain gauges. The wiring of multiple strain gauges for a full bridge circuit compensates for the temperature influence on the zero signal and the cross-influence from other force and torque application.



### Dimensions



# Technical Data Sheet



**mg · sensor**  
PURE PRECISION

## F3AJA11A



### Technical specification

|                                       | Unit    | Value          |                |                |
|---------------------------------------|---------|----------------|----------------|----------------|
|                                       |         | F <sub>x</sub> | F <sub>y</sub> | F <sub>z</sub> |
| Measuring range                       | kN      | 10             | 25             | 10             |
| Sensitivity <sup>1)</sup>             | μV/V/kN | 220            | 80             | 220            |
| Output signal <sup>1), 2)</sup>       | mV/V    | 2.2            | 2.0            | 2.2            |
| Bridge resistance                     | Ω       | 350            | 700            | 350            |
| Zero signal <sup>1)</sup>             | mV/V    | ≤ 0.05         |                |                |
| Amplitude non-linearity <sup>3)</sup> | %       | ≤ 1.0          |                |                |
| Hysteresis <sup>3)</sup>              | %       | ≤ 1.0          |                |                |
| Channel crosstalk <sup>3)</sup>       | %       | ≤ 5.0          |                |                |
| Supply voltage                        | V       | 2–15           |                |                |
| Ultimate load                         | %       | 150            |                |                |
| Insulation resistance                 | MΩ      | > 100          |                |                |
| Temperature range                     | °C      | -30...+70      |                |                |
| Weight (approximate)                  | g       | 200            |                |                |

All values measured at 10 V sensor supply voltage and at 23 °C.

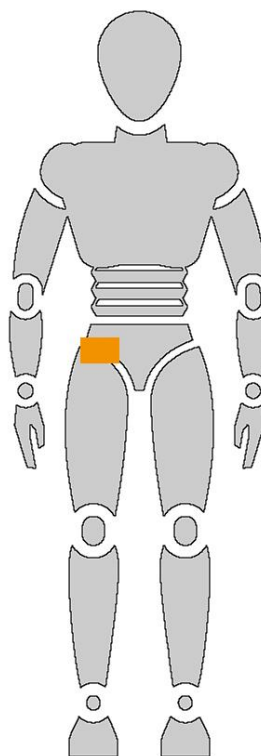
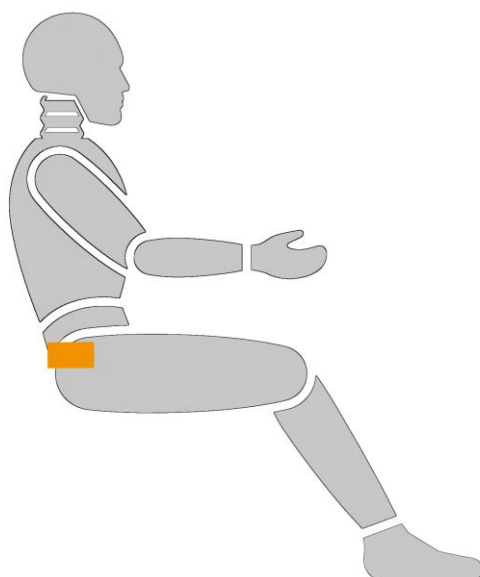
<sup>1)</sup> Typical value

<sup>2)</sup> At nominal load

<sup>3)</sup> Relative nominal range



### Dummy application



# Technical Data Sheet



**mg · sensor**  
PURE PRECISION

## F3AQC11A



### Load Cell, 3-axial Location: Shoulder, left

Force direction

$F_x, F_y, F_z$

Application

WSID 50%

WSID 5%

Equivalent types

FTSS: W50-71090

Measurement specification

Resistive

Strain gauges

Options

ID-Module integrated in sensor

Polarity according to SAE J211

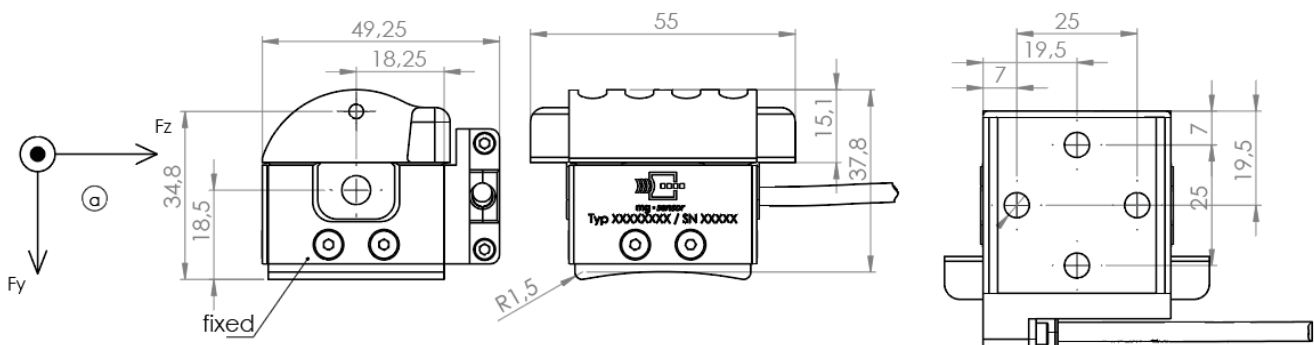


### Technical description

The applied force causes compression or strain of the base body. The deformation is measured using strain gauges. The wiring of multiple strain gauges for a full bridge circuit compensates for the temperature influence on the zero signal and the cross-influence from other force and torque application.



### Dimensions





# Technical Data Sheet



**mg · sensor**  
PURE PRECISION

## F3AQC11A



### Technical specification

|                                       | Unit    | Value          |                |                |
|---------------------------------------|---------|----------------|----------------|----------------|
|                                       |         | F <sub>x</sub> | F <sub>y</sub> | F <sub>z</sub> |
| Measuring range                       | kN      | 5.0            | 10.0           | 5.0            |
| Sensitivity <sup>1)</sup>             | μV/V/kN | 440            | 200            | 440            |
| Output signal <sup>1), 2)</sup>       | mV/V    | 2.2            | 2.0            | 2.2            |
| Bridge resistance                     | Ω       | 350            | 700            | 350            |
| Zero signal <sup>1)</sup>             | mV/V    | ≤ 0.05         |                |                |
| Amplitude non-linearity <sup>3)</sup> | %       | ≤ 1.0          |                |                |
| Hysteresis <sup>3)</sup>              | %       | ≤ 1.0          |                |                |
| Channel crosstalk <sup>3)</sup>       | %       | ≤ 5.0          |                |                |
| Supply voltage                        | V       | 2–15           |                |                |
| Ultimate load                         | %       | 150            |                |                |
| Insulation resistance                 | MΩ      | > 100          |                |                |
| Temperature range                     | °C      | -30...+70      |                |                |
| Weight (approximate)                  | g       | 100            |                |                |

All values measured at 10 V sensor supply voltage and at 23 °C.

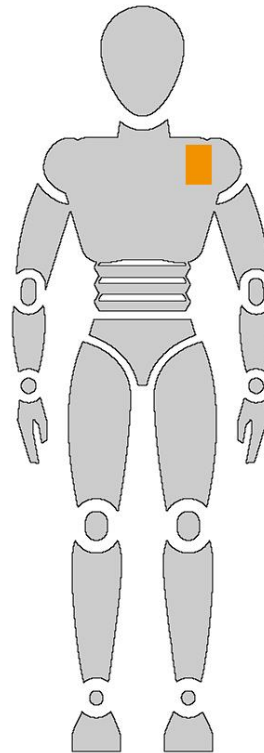
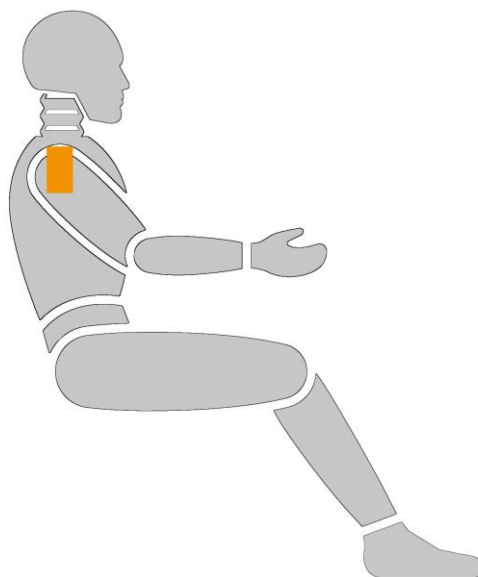
<sup>1)</sup> Typical value

<sup>2)</sup> At nominal load

<sup>3)</sup> Relative nominal range



### Dummy application



# Technical Data Sheet



## N6AGA11A



### Load Cell, 6-axial

Location: Universal Leg

Force direction

$F_x, F_y, F_z, M_x, M_y, M_z$

Application

WorldSID-5%

WorldSID-50%

Thor-50%

Equivalent types

Humanetics: W50-71010

Measurement specification

Resistive

Strain gauges

Options

ID-Module integrated in sensor

Polarity according to SAE J211

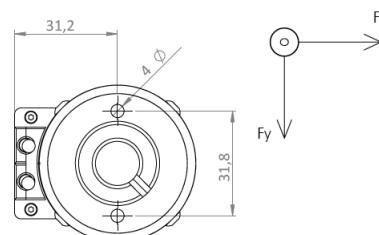
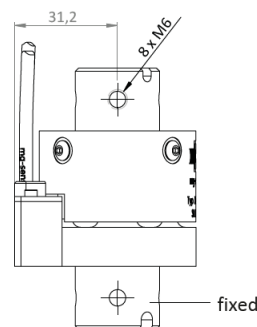
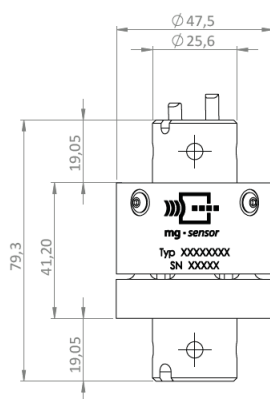


### Technical description

The applied force causes compression or strain of the base body. The deformation is measured using strain gauges. The wiring of multiple strain gauges for a full bridge circuit compensates for the temperature influence on the zero signal and the cross-influence from other force and torque application.



### Dimensions



# Technical Data Sheet



**mg · sensor**  
PURE PRECISION

## N6AGA11A



### Technical specification

|                                       | Unit     | Value          |                |                |                |                |                |
|---------------------------------------|----------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                       |          | F <sub>x</sub> | F <sub>y</sub> | F <sub>z</sub> | M <sub>x</sub> | M <sub>y</sub> | M <sub>z</sub> |
| Measuring range                       | kN<br>Nm | 15             | 15             | 15             | 350            | 350            | 200            |
| Sensitivity <sup>1)</sup>             | μV/V/kN  | 133            | 133            | 73             |                |                |                |
|                                       | μV/V/Nm  |                |                |                | 6.0            | 6.0            | 10.0           |
| Output signal <sup>1), 2)</sup>       | mV/V     | 2.0            | 2.0            | 1.1            | 2.1            | 2.1            | 2.0            |
| Bridge resistance                     | Ω        | 350            | 350            | 700            | 350            | 350            | 700            |
| Zero signal <sup>1)</sup>             | mV/V     | ≤ 0.05         |                |                |                |                |                |
| Amplitude non-linearity <sup>3)</sup> | %        | ≤ 1.0          |                |                |                |                |                |
| Hysteresis <sup>3)</sup>              | %        | ≤ 1.0          |                |                |                |                |                |
| Channel crosstalk <sup>3)</sup>       | %        | ≤ 5.0          |                |                |                |                |                |
| Supply voltage                        | V        | 2–15           |                |                |                |                |                |
| Ultimate load                         | %        | 150            |                |                |                |                |                |
| Insulation resistance                 | MΩ       | > 100          |                |                |                |                |                |
| Temperature range                     | °C       | -30...+70      |                |                |                |                |                |
| Weight (approximate)                  | g        | 500            |                |                |                |                |                |

All values measured at 10 V sensor supply voltage and at 23 °C.

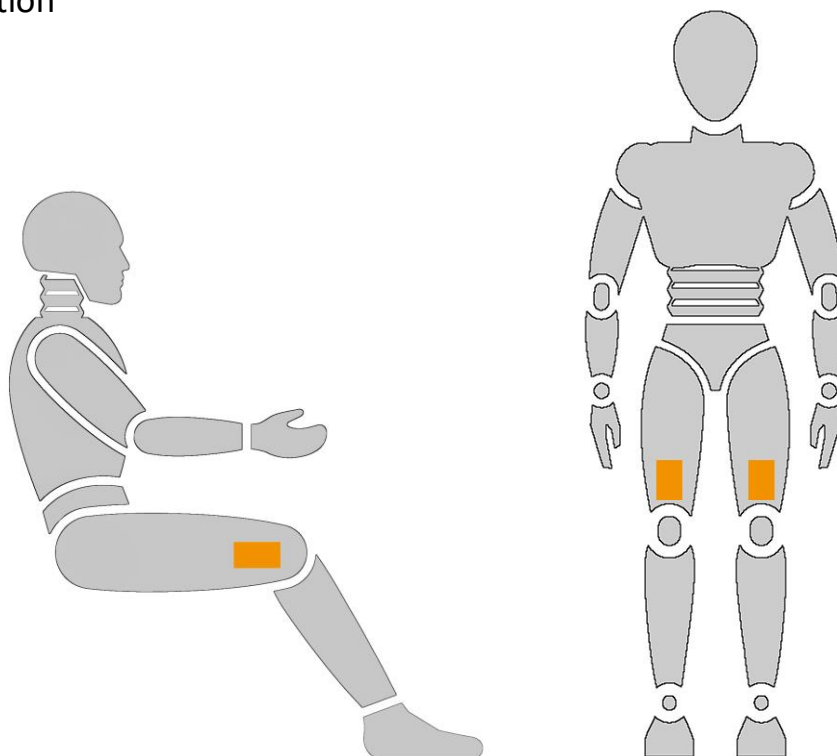
<sup>1)</sup> Typical value

<sup>2)</sup> At nominal load

<sup>3)</sup> Relative nominal range



### Dummy application



# Technical Data Sheet



## N6AID11A



### Load Cell, 6-axial

Location: Lumbar Spine

Force direction

$F_x, F_y, F_z, M_x, M_y, M_z$

Application

WorldSID-50%

Equivalent types

Humanetics: W50-71120

Measurement specification

Resistive

Strain gauges

Options

ID-Module integrated in sensor

Polarity according to SAE J211

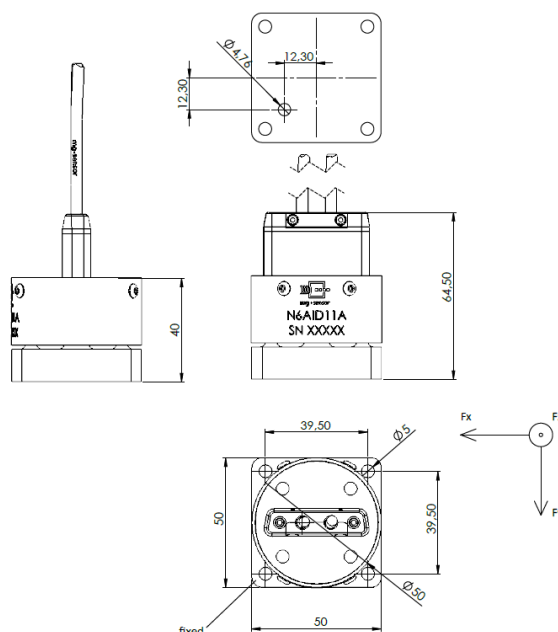


### Technical description

The applied force causes compression or strain of the base body. The deformation is measured using strain gauges. The wiring of multiple strain gauges for a full bridge circuit compensates for the temperature influence on the zero signal and the cross-influence from other force and torque application.



### Dimensions



# Technical Data Sheet



**mg · sensor**  
PURE PRECISION

## N6AID11A



### Technical specification

|                                       | Unit     | Value          |                |                |                |                |                |
|---------------------------------------|----------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                       |          | F <sub>x</sub> | F <sub>y</sub> | F <sub>z</sub> | M <sub>x</sub> | M <sub>y</sub> | M <sub>z</sub> |
| Measuring range                       | kN<br>Nm | 10             | 10             | 12             | 300            | 300            | 200            |
| Sensitivity <sup>1)</sup>             | μV/V/kN  | 180            | 180            | 92             |                |                |                |
|                                       | μV/V/Nm  |                |                |                | 7.0            | 7.0            | 10.5           |
| Output signal <sup>1), 2)</sup>       | mV/V     | 1.8            | 1.8            | 1.1            | 2.1            | 2.1            | 2.1            |
| Bridge resistance                     | Ω        | 350            | 350            | 700            | 350            | 350            | 700            |
| Zero signal <sup>1)</sup>             | mV/V     | ≤ 0.05         |                |                |                |                |                |
| Amplitude non-linearity <sup>3)</sup> | %        | ≤ 1.0          |                |                |                |                |                |
| Hysteresis <sup>3)</sup>              | %        | ≤ 1.0          |                |                |                |                |                |
| Channel crosstalk <sup>3)</sup>       | %        | ≤ 5.0          |                |                |                |                |                |
| Supply voltage                        | V        | 2–15           |                |                |                |                |                |
| Ultimate load                         | %        | 150            |                |                |                |                |                |
| Insulation resistance                 | MΩ       | > 100          |                |                |                |                |                |
| Temperature range                     | °C       | -30...+70      |                |                |                |                |                |
| Weight (approximate)                  | g        | 500            |                |                |                |                |                |

All values measured at 10 V sensor supply voltage and at 23 °C.

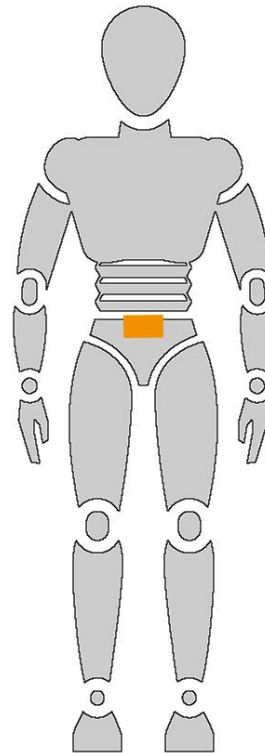
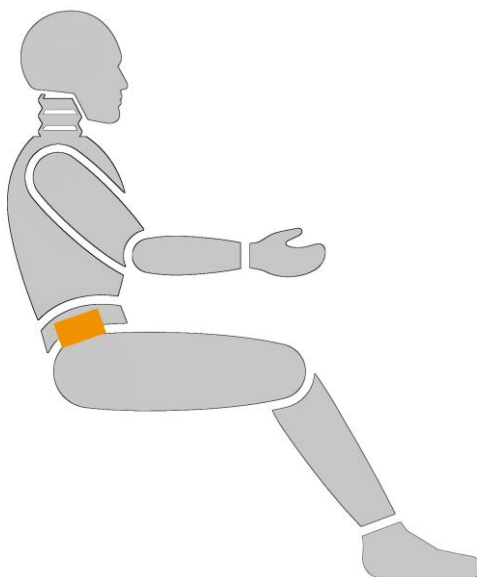
<sup>1)</sup> Typical value

<sup>2)</sup> At nominal load

<sup>3)</sup> Relative nominal range



### Dummy application



# Technical Data Sheet



## N6AJD11A



### Load Cell, 6-axial

Location: Neck, Upper/ Lower

Force direction

$F_x, F_y, F_z, M_x, M_y, M_z$

Application

WorldSID-5%

WorldSID-50%

Equivalent types

Humanetics: W50-71001/ W50-71005

Measurement specification

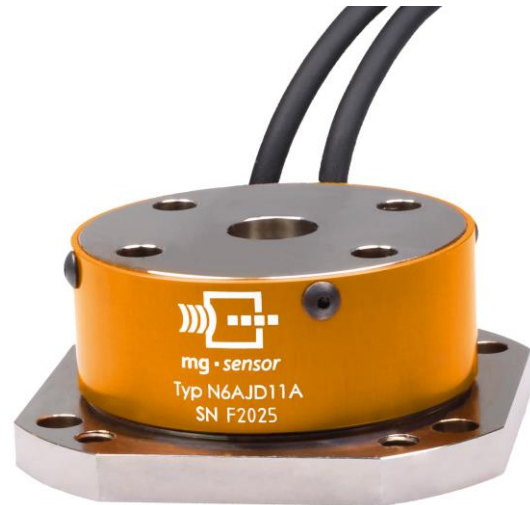
Resistive

Strain gauges

Options

ID-Module integrated in sensor

Polarity according to SAE J211

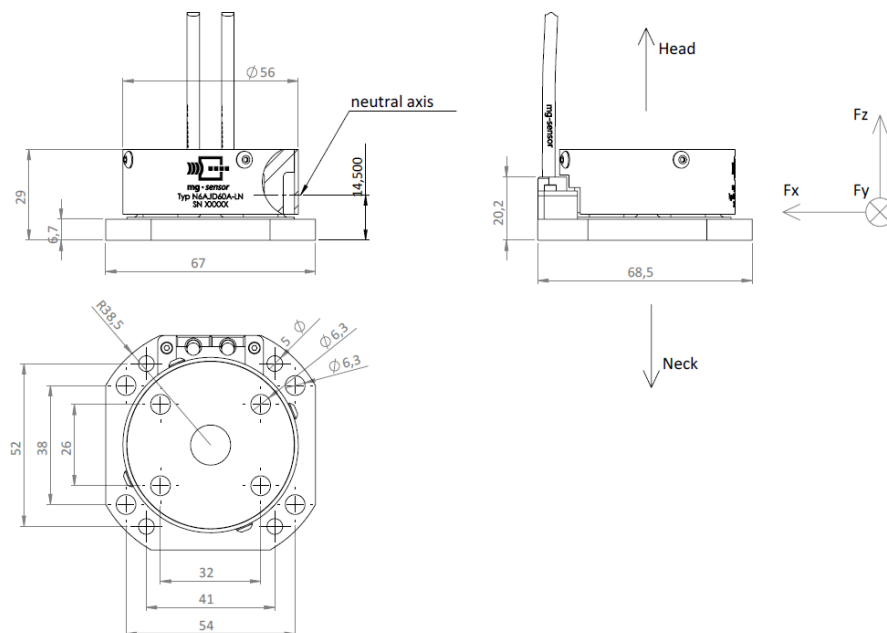


### Technical description

The applied force causes compression or strain of the base body. The deformation is measured using strain gauges. The wiring of multiple strain gauges for a full bridge circuit compensates for the temperature influence on the zero signal and the cross-influence from other force and torque application.



### Dimensions



# Technical Data Sheet



**mg · sensor**  
PURE PRECISION

## N6AJD11A



### Technical specification

|                                       | Unit     | Value          |                |                |                |                |                |
|---------------------------------------|----------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                       |          | F <sub>x</sub> | F <sub>y</sub> | F <sub>z</sub> | M <sub>x</sub> | M <sub>y</sub> | M <sub>z</sub> |
| Measuring range                       | kN<br>Nm | 10             | 10             | 12             | 300            | 300            | 200            |
| Sensitivity <sup>1)</sup>             | μV/V/kN  | 300            | 300            | 110            |                |                |                |
|                                       | μV/V/Nm  |                |                |                | 6.0            | 6.0            | 14             |
| Output signal <sup>1), 2)</sup>       | mV/V     | 3.0            | 3.0            | 1.1            | 1.8            | 1.8            | 2.8            |
| Bridge resistance                     | Ω        | 350            | 350            | 700            | 350            | 350            | 700            |
| Zero signal <sup>1)</sup>             | mV/V     | ≤ 0.05         |                |                |                |                |                |
| Amplitude non-linearity <sup>3)</sup> | %        | ≤ 1.0          |                |                |                |                |                |
| Hysteresis <sup>3)</sup>              | %        | ≤ 1.0          |                |                |                |                |                |
| Channel crosstalk <sup>3)</sup>       | %        | ≤ 5.0          |                |                |                |                |                |
| Supply voltage                        | V        | 2–15           |                |                |                |                |                |
| Ultimate load                         | %        | 150            |                |                |                |                |                |
| Insulation resistance                 | MΩ       | > 100          |                |                |                |                |                |
| Temperature range                     | °C       | -30...+70      |                |                |                |                |                |
| Weight (approximate)                  | g        | 360            |                |                |                |                |                |

All values measured at 10 V sensor supply voltage and at 23 °C.

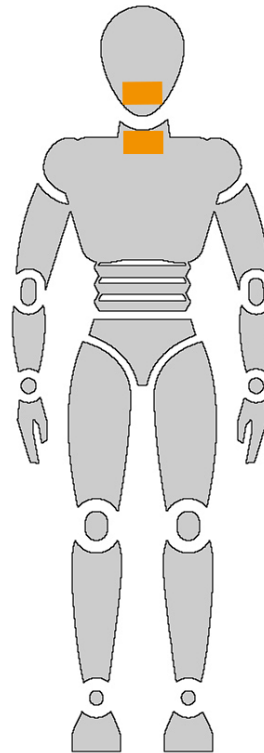
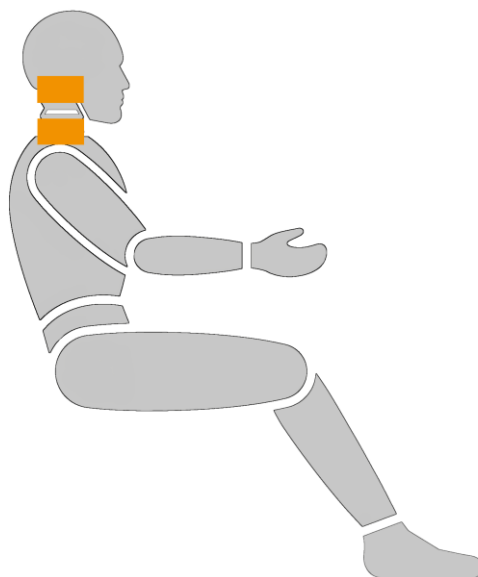
<sup>1)</sup> Typical value

<sup>2)</sup> At nominal load

<sup>3)</sup> Relative nominal range



### Dummy application



# Technical Data Sheet



## NCAPA11A



### Load Cell, 12-axial Location: Sacro-iliac

#### Force direction

$F_x, F_y, F_z, M_x, M_y, M_z$  (left & right)

#### Application

World-SID

#### Equivalent types

FTSS: W50-71130

#### Measurement specification

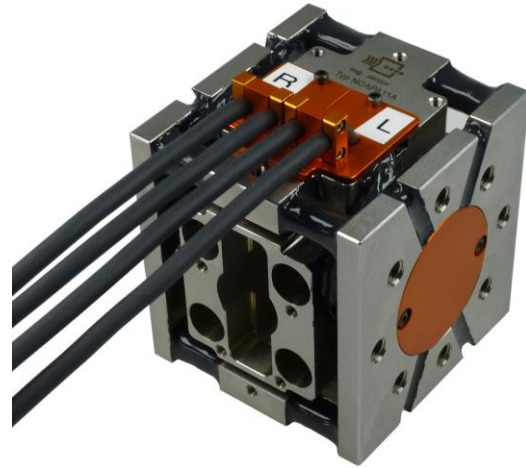
Resistive

Strain gauges

#### Options

ID-Modul integrated in sensor

Polarität according to SAE J211

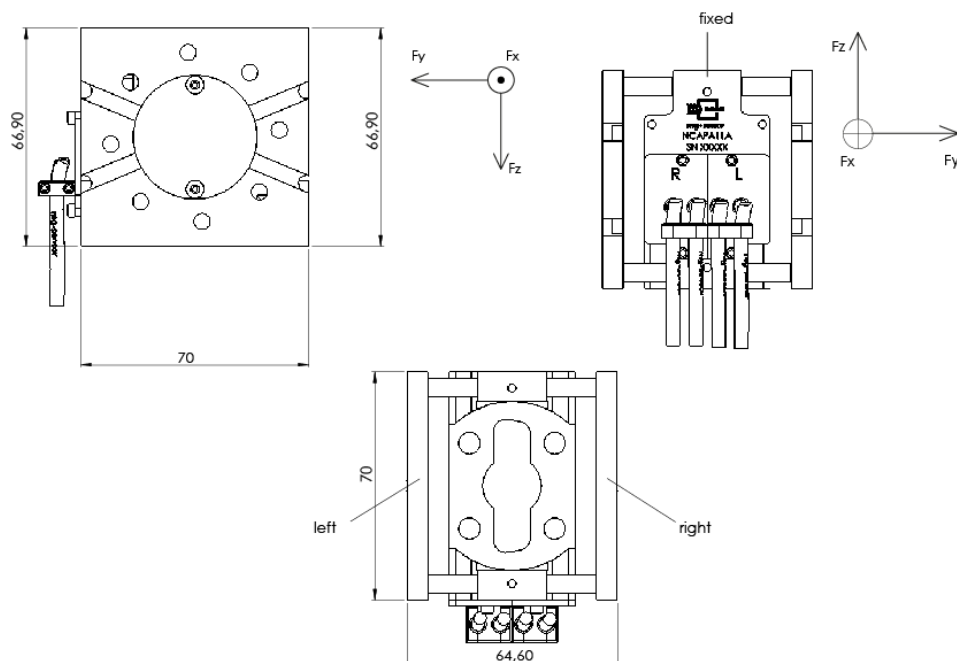


#### Technical description

The applied force causes compression or strain of the base body. The deformation is measured using strain gauges. The wiring of multiple strain gauges for a full bridge circuit compensates for the temperature influence on the zero signal and the cross-influence from other force and torque application.



### Dimensions





# Technical Data Sheet



**mg · sensor**  
PURE PRECISION

## NCAPA11A



### Technical specification

|                                       | Unit     | Value          |                |                |                |                |                |
|---------------------------------------|----------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                       |          | F <sub>x</sub> | F <sub>y</sub> | F <sub>z</sub> | M <sub>x</sub> | M <sub>y</sub> | M <sub>z</sub> |
| Measuring range                       | kN<br>Nm | 6.0            | 12.0           | 6.0            | 1000           | 400            | 400            |
| Sensitivity <sup>1)</sup>             | μV/V/kN  | 450            | 50             | 450            |                |                |                |
|                                       | μV/V/Nm  |                |                |                | 3.0            | 7.3            | 2.5            |
| Output signal <sup>1), 2)</sup>       | mV/V     | 2.7            | 0.6            | 2.7            | 3.0            | 2.9            | 1.0            |
| Bridge resistance                     | Ω        | 350            | 1400           | 350            | 700            | 350            | 700            |
| Zero signal <sup>1)</sup>             | mV/V     | ≤ 0.05         |                |                |                |                |                |
| Amplitude non-linearity <sup>3)</sup> | %        | ≤ 1.0          |                |                |                |                |                |
| Hysteresis <sup>3)</sup>              | %        | ≤ 1.0          |                |                |                |                |                |
| Channel cross talk <sup>3)</sup>      | %        | ≤ 5.0          |                |                |                |                |                |
| Supply voltage                        | V        | 2–15           |                |                |                |                |                |
| Ultimate load                         | %        | 150            |                |                |                |                |                |
| Insulation resistance                 | MΩ       | > 100          |                |                |                |                |                |
| Temperature range                     | °C       | -30...+70      |                |                |                |                |                |
| Weight (approximate)                  | g        | 920            |                |                |                |                |                |

All values measured at 10 V sensor supply voltage and at 23 °C.

<sup>1)</sup> Typical value

<sup>2)</sup> At nominal load

<sup>3)</sup> Relative nominal range



### Dummy application

