

## F3B3K10A



### Load Cell, 3-axial Location: Steering Column

Force direction

$F_x, F_y, F_z$

Application

Measurement of forces in the steering column

Equivalent types

Customized versions

Measurement specification

Resistive

Strain gauges

Options

Polarity according to customer specifications

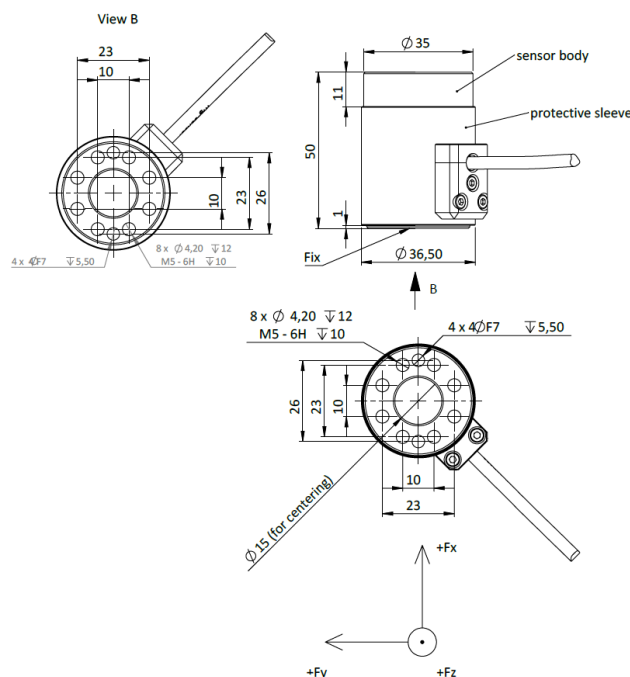


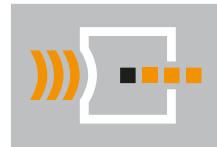
### Technical description

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





## F3B3K10A



### Technical specification

	Unit	Value		
		F <sub>x</sub>	F <sub>y</sub>	F <sub>z</sub>
Measuring range	kN	20	20	20
Sensitivity <sup>1)</sup>	μV/V/kN	120	120	55
Output signal <sup>1), 2)</sup>	mV/V	2.4	2.4	1.1
Bridge resistance	Ω	350	350	700
Zero signal <sup>1)</sup>	mV/V	≤ 0.05		
Amplitude non-linearity <sup>3)</sup>	%	≤ 1.0		
Hysteresis <sup>3)</sup>	%	≤ 2.0		
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	180		

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

## F3B3A10A

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Equivalent types

Customized version

Measurement specification

Resistive

Strain gauges

Options

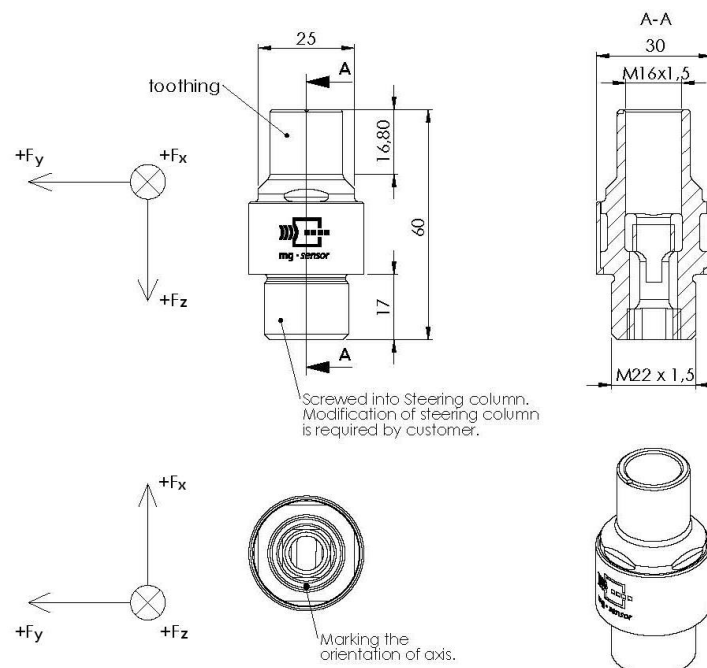
Polarity according to customer specifications



### 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



## F3B3A10A



### Technical specification

	Unit	Value		
		F <sub>x</sub>	F <sub>y</sub>	F <sub>z</sub>
Measuring range	kN	10	10	20
Sensitivity <sup>1)</sup>	μV/V/kN	220	220	88
Output signal <sup>1), 2)</sup>	mV/V	2.2	2.2	1.8
Bridge resistance	Ω	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	180		

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

## F3B3L11A



### Load Cell, 3-axial

Location: Steering Column

Force direction

$F_x, F_y, F_z$

Application

Measurement of forces in the steering column

Equivalent types

Customized versions

Measurement specification

Resistive

Strain gauges

Options

Polarity according to customer specifications

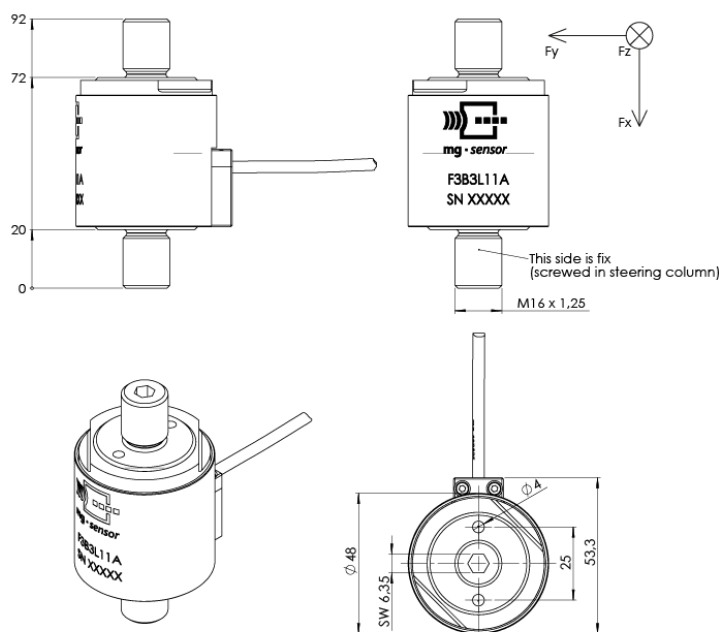


### Technical description

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



## F3B3L11A

### Technical specification

	Unit	Value		
		F <sub>x</sub>	F <sub>y</sub>	F <sub>z</sub>
Measuring range	kN	25	10	10
Sensitivity <sup>1)</sup>	μV/V/kN	44	140	140
Output signal <sup>1), 2)</sup>	mV/V	1.1	1.4	1.4
Bridge resistance	Ω	700	350	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	650 (incl. Adaptors)		

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

## N3B3A10A

### Load Cell, 3-axial Location: Steering Column

Force direction  
 $F_z, M_x, M_y$

Application  
Measurement of forces and moments in the steering column

Equivalent types  
Customized version

Measurement specification  
Resistive  
Strain gauges

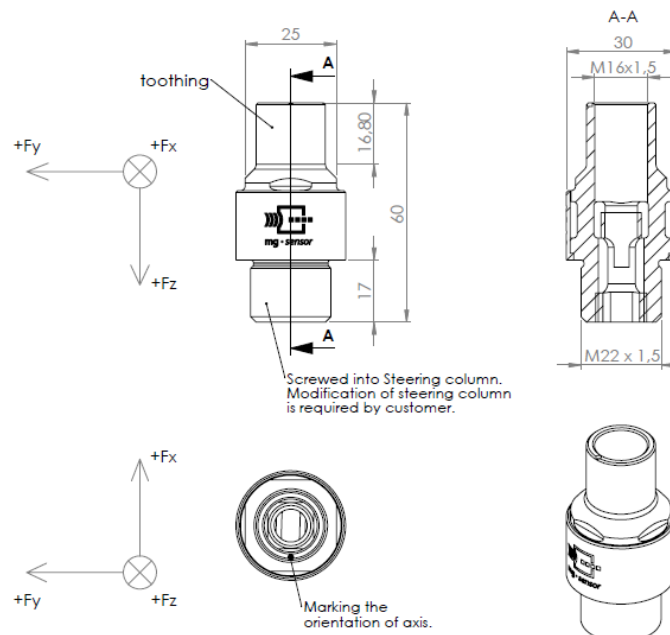
Options  
Polarity according to customer specifications



#### 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



## N3B3A10A

### Technical specification

	Unit	Value		
		F <sub>z</sub>	M <sub>x</sub>	M <sub>y</sub>
Measuring range	kN Nm	20	200	200
Sensitivity <sup>1)</sup>	μV/V/kN	88		
	μV/V/Nm		10	10
Output signal <sup>1), 2)</sup>	mV/V	1.8	2.0	2.0
Bridge resistance	Ω	700	350	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 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	180		

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



## N3B3E10A

### Load Cell, 3-axial Location: Steering Column

Force direction

$F_x, M_y, M_z$

Application

Measurement of forces and moments in the steering column

Equivalent types

Customized version

Measurement specification

Resistive

Strain gauges

Options

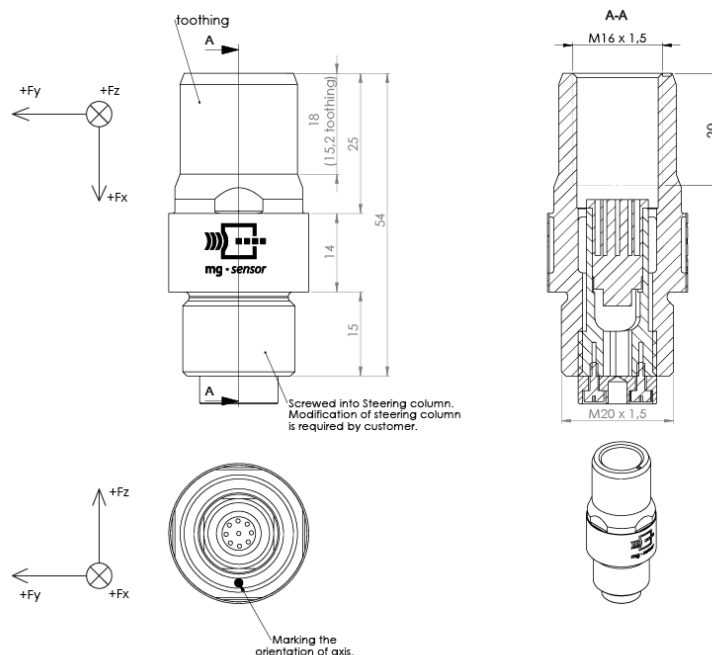
Polarity according to customer specifications



### 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



## N3B3E10A

### Technical specification

	Unit	Value		
		F <sub>x</sub>	M <sub>y</sub>	M <sub>z</sub>
Measuring range	kN Nm	20	150	150
Sensitivity <sup>1)</sup>	μV/V/kN μV/V/Nm	90	12.5	12.5
Output signal <sup>1), 2)</sup>	mV/V	1.8	1.9	1.9
Bridge resistance	Ω	700	350	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 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	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

## N3B3F10A



### Load Cell, 3-axial

Location: Steering Column

Force direction

$F_x, M_y, M_z$

Application

Measurement of forces and moments in the steering column

Equivalent types

Customized version

Measurement specification

Resistive

Strain gauges

Options

Polarity according to customer specifications

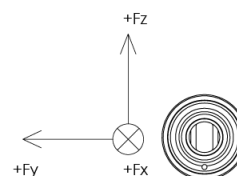
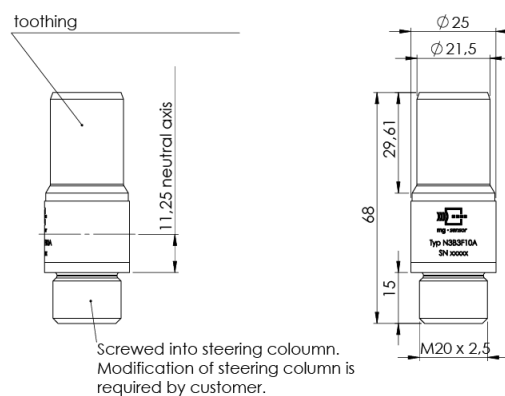


### Technical description

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



## N3B3F10A

### Technical specification

	Unit	Value		
		F <sub>x</sub>	M <sub>y</sub>	M <sub>z</sub>
Measuring range	kN Nm	20	150	150
Sensitivity <sup>1)</sup>	μV/V/kN	95		
	μV/V/Nm		13.3	13.3
Output signal <sup>1), 2)</sup>	mV/V	1.9	2.0	2.0
Bridge resistance	Ω	700	350	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 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	130		

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

# Technical Data Sheet



## N5B3H11A

### Load Cell, 5-axial Location: Steering Column

Force direction  
 $F_x, F_y, F_z, M_x, M_z$

Application  
Measurement of forces and moments in the steering column

Equivalent types  
Customized version

Measurement specification  
Resistive  
Strain gauges

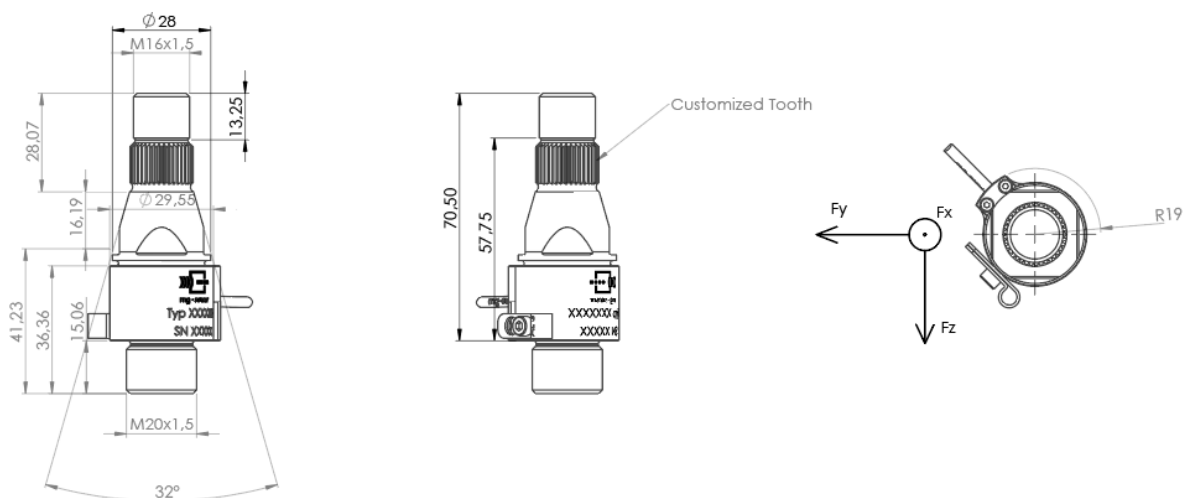
Options  
Polarity according to customer specifications



### 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



## N5B3H11A

### Technical specification

	Unit	Value				
		F <sub>x</sub>	F <sub>y</sub>	F <sub>z</sub>	M <sub>y</sub>	M <sub>z</sub>
Measuring range	kN Nm	20	10	10	200	200
Sensitivity <sup>1)</sup>	μV/V/kN μV/V/Nm	95	200	200	11.5	11.5
Output signal <sup>1), 2)</sup>	mV/V	1.9	2.0	2.0	2.3	2.3
Bridge resistance	Ω	700	350	350	350	350
Zero signal <sup>1)</sup>	mV/V	≤ 0.05				
Amplitude non-linearity <sup>3)</sup>	%	≤ 1.0				
Hysteresis <sup>3)</sup>	%	≤ 2.0				
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