

Steering Column Load Cell

Type M59303A...

Miniature Design

Type M59303A... was developed to measure forces in the steering column of vehicles.

- Triaxial miniature load cell
- Linearity error and hysteresis <1 %
- Measuring bridges 700 Ω

Description

The load cell is made of elements on which forces are transmitted. The mechanical deformation element, applied with strain gages, serves for mechanical electrical deformation. The effectiveness of the load cell resembles the behavior of a flexible spring.

The forces to be measured create mechanical strains 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 proportional resistance variations are measured by a Wheatstone-type bridge circuit.

Technical Data

Axes		F_x	F_y	F_z
Measuring range, at nominal load	kN	10	10	20
Bridge output voltage, at nominal load	mV/V	2,1	2,1	1,8
Sensitivity	$\mu\text{V}/\text{V}/\text{kN}$	210	210	90
Bridge resistance	Ω	700 ¹⁾	700 ¹⁾	700
Ultimate load, relating to nominal load	%	150	150	150
Supply voltage	VDC	5 ... 15		
Current consumption (Ex = 10 V supply)	mA	70		
Insulation resistance	G Ω	>10		
Operating temperature range	$^{\circ}\text{C}$	-20 ... 80		
Storage temperature range	$^{\circ}\text{C}$	-30 ... 90		
Amplitude non-linearity, relating to nominal value	%	<1		
Hysteresis, relating to nominal value	%	<1		
Channel cross talk, relating to nominal load	%	<5		
Weight (without cable)	grams	180		

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

¹⁾ Up to serial number 0004731687 (up to year of construction 2015) the bridge resistance of the load cells is 350 Ω (F_x , F_y). Please mind the first calibration!



Application

Type M59303A... is directly assembled at the designated location in the steering column and provides important information about the loads during a crash test.



Fig. 1: Application sample

Included Accessories

- Adapter cable

Type No.

M816AIMSA10A002A

Optional Accessories

- Extension cable with customized pin assignment (standard cable)

Type No.

M821AGF2B60A008x

Ordering Key

Type M59303A

Variants

Forces F_x , F_y , F_z

AM00A00SB

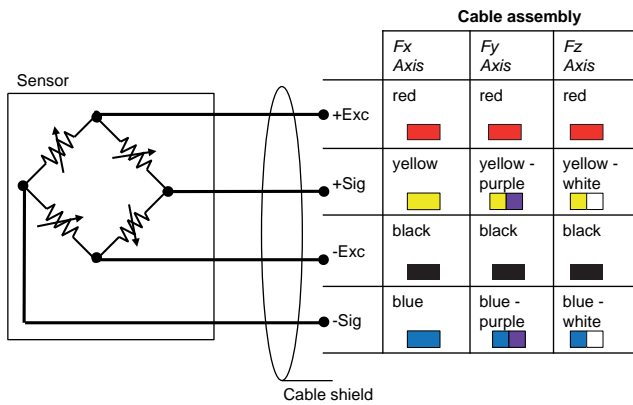


Fig. 2: Cable assembly

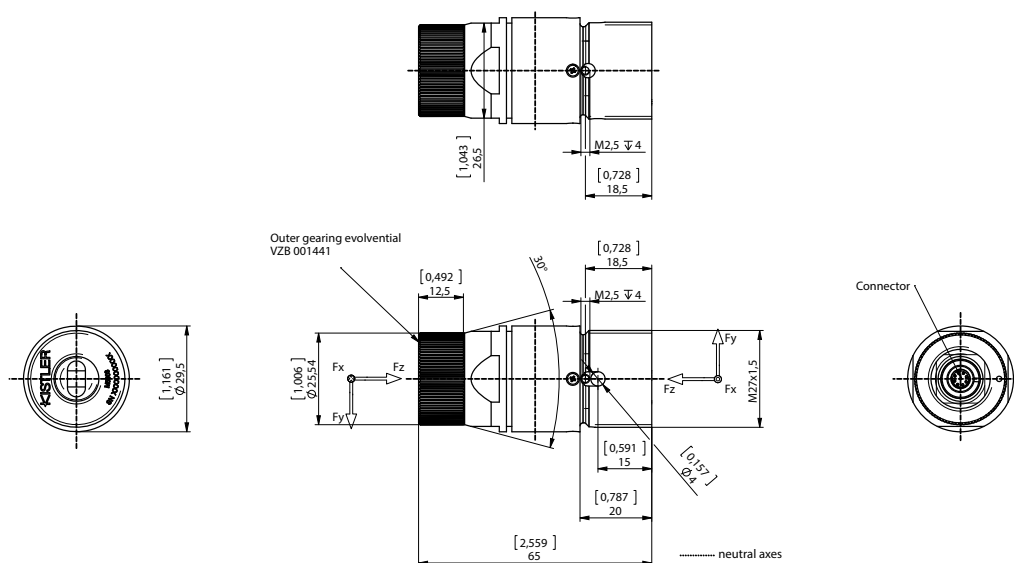


Fig. 3: Dimensions in mm