

Senstech KZ-011-0400

Centered Force Sensor

With this compact force sensor, the force is applied to a round-head rivet in the center. The sensor can be mounted very easily in a blind hole with a diameter of 12 mm and a clearance. Flexible contacting and housing options make this sensor suitable for a wide variety of applications.

Dimensions and Mounting Options

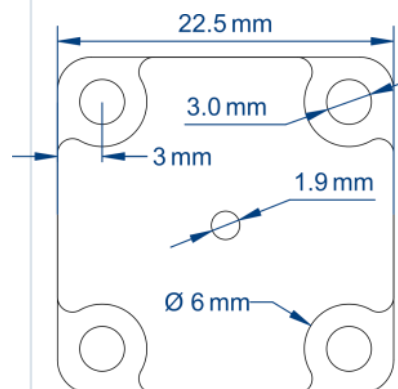
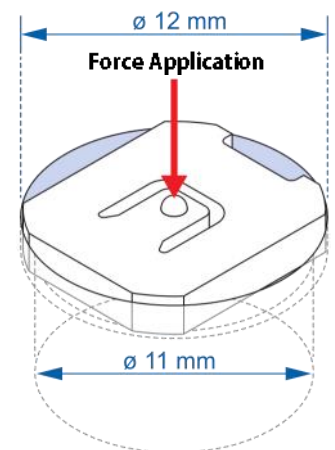
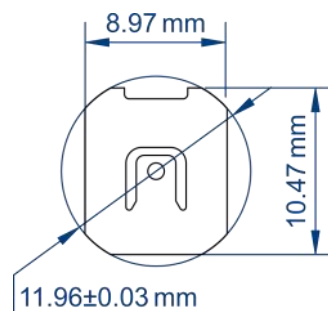


Features

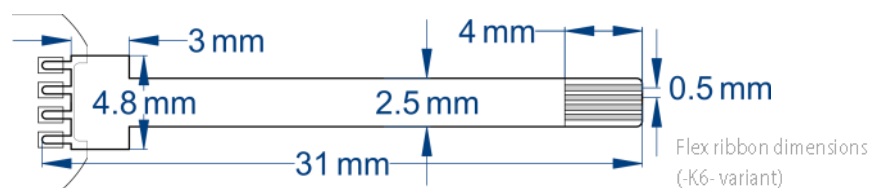
- Compact Design
- Easy Mounting in Blind Hole or with Optional Screw-On Enclosure
- 0-15V Supply Voltage Range
- Differential Analog Output
- Available in Several Force Ranges

Application Examples

- Watchmaking Equipment
- Medical Devices
- Measuring and Testing Equipment
- Robotics



Screw-on housing dimensions (G1 variant)



Flex ribbon dimensions (K6 variant)

General Specifications

Measuring principle	Thin film strain gauges
Measuring parameter	Force [N] or displacement [μm]
Electrical contacting	Solder points, stranded wires, or flex ribbon
Mounting	Fits into a blind hole of $D = 12 \text{ mm}$, with a clearance of $11 \text{ mm} > d > 6 \text{ mm}$ below sensor to allow for measuring path and protect against overload
Application of force	On round carbide rivet head, positioned in center of blind hole
Direction of force	Perpendicular on thin-film coated side or back side (see ordering information for details)
Shielding	Sensor substrate is connected to supply ground

Environmental Specifications

	Min	Typ	Max	Units	Notes/Conditions
Temperature range					
- Operation	-20		125	°C	
- Storage	-40		125	°C	
Ambient humidity	0		95	%RH	Non-condensing
Ingress protection		IP44			Only valid for variant with housing (-G1)

Operating Specifications

	Min	Typ	Max	Units	Notes/Conditions
Supply voltage	0		15	V	
Supply current	1.5		2.5	mA	at 10 V
Output signal span		0..3.0		mV/V	The output voltage is given by $V_{out} = V_{cc} \cdot F_{sensor} \cdot s$ where V_{out} Output Voltage [μ V] F_{sensor} Force Applied [N] V_{cc} Supply Voltage [V] s Sensitivity [μ V/V/N] - see Ordering Information section
Bridge resistance	4.0		6.0	k Ω	
Zero offset	-0.1		0.1	mV/V	Signal without load, variance between specimens
Zero repeatability	-0.02		0.02	%FS	Variance between measurements (FS = Full Scale)
Sensitivity tolerance	-10		10	%	Variance of sensitivity between specimens
Sensitivity repeatability	-0.3		0.3	%	Variance of sensitivity between measurements
Linearity error	-0.2		0.2	%FS	
Thermal shift for zero	-0.02		0.02	%FS/°C	
Thermal shift for sensitivity	0.02	0.025	0.03	%/°C	

Specifications can be customized in case of larger order quantities. The values listed here often do not represent the best achievable performance.

Variants and Ordering Information

KZ-011-0400-xxxN-Ex-Kx-Gx

Application of Force

Code	Force Application Aid
<u>E0</u>	None (hole only)
<u>E1</u>	Rivet on top side
<u>E2</u>	Rivet on bottom side

Contacting

Code	Contacting Variant
<u>K0</u>	Tinned solder pads only
<u>K1</u>	Stranded wires, 20 cm
<u>K6</u>	Flex ribbon «Antlia»

Housing

Code	Housing Variant
<u>G0</u>	None
<u>G1</u>	Screw-on metal housing

Force Range

Code	Full Scale Range	Allowable Overload	Substrate Thickness	Sensitivity
<u>50N</u>	0 N - 50 N	75 N	0.8mm	54 μ V/V/N
<u>80N</u>	0 N - 80 N	120 N	1.0mm	37 μ V/V/N
<u>200N</u>	0 N - 200 N	300 N	1.6mm	15 μ V/V/N
<u>300N</u>	0 N - 300 N	450 N	2.0mm	10 μ V/V/N

Wire Color Code

Color	Pin Assignment
Red	Supply Voltage
Black	Supply Ground
Blue	Output Signal +
White	Output Signal -