



Force sensor Nesthorn



Datasheet KZ-011-0400

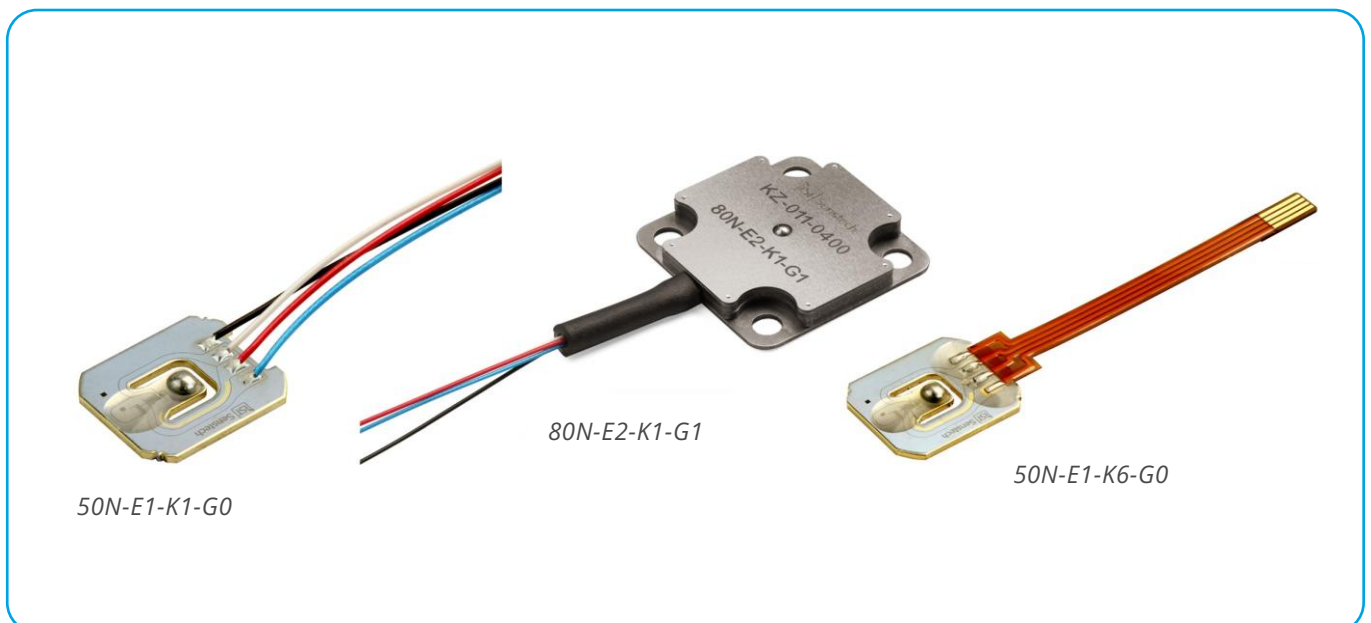
Force is applied through the center



Benefits & characteristics

- Force is applied to a round-head rivet
- Compact and robust design
- Easy mounting: The sensor can be mounted in a blind hole with a diameter of 12 mm
- Available in several force ranges and variants
- Optional stainless-steel housing
- Measuring range (full scale): 0 – 18 N to 0 – 300 N

Illustration

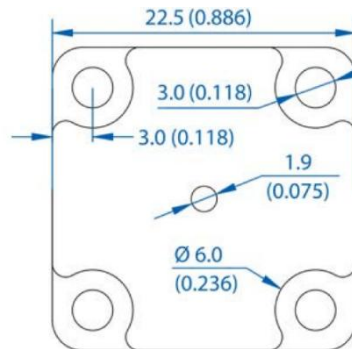
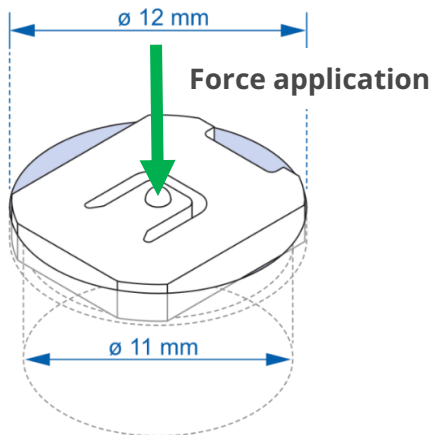


Applications

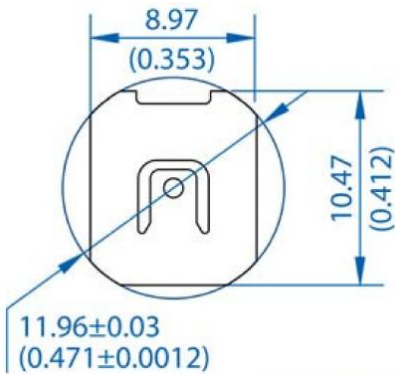
- Medical devices
- Measuring and testing equipment
- Robotics
- Watchmaking equipment

Dimensions and integration

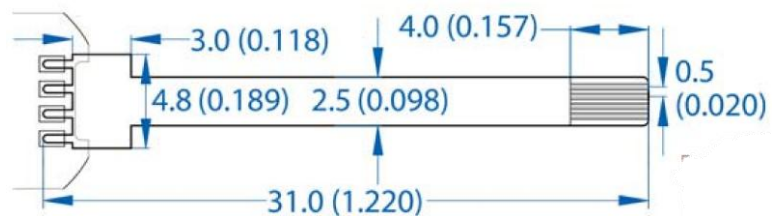
All dimensions in millimeters / (inches)



Screw-on housing dimensions
(-G1 variant)



Sensor dimensions



Flex ribbon dimensions
(-K6 variant)

Technical specifications

Measuring principle	Thin film strain gauge (full Wheatstone bridge)	
Measuring parameter	Force [N]	
Electrical contacting	Solder points, stranded wires, or flex ribbon	
	Color scheme for stranded wire (K1 variant):	Red: Supply voltage + (VCC) Black: Supply voltage - (GND) White: Signal voltage +/- * Blue: Signal voltage -/+ *
	*) depending on force direction and desired sign of signal value	
Mounting	Fits into a blind hole of $D = 12 \text{ mm}$, see integration	
Application of force	On round-head rivet, positioned in center of blind hole	
Direction of force	Perpendicular to sensor plane (see ordering information for variants)	
Shielding	Sensor substrate is connected to supply ground	
Substrate material	Stainless Steel 1.4542 / X5CrNiCuNb16-4 / 17-4 PH®	

Environmental specifications

	Min	Typ	Max	Unit	Notes/Conditions
Temperature range					
- Operational	-20		+125	°C	
- Storage	-40		+125	°C	
Ambient humidity	0		95	%RH	Non-condensing; at VCC ≥ 10 V
Ingress protection		IP44			Only valid for variant with housing (-G1)

Operating specifications

	Min	Typ	Max	Unit	Notes/Conditions
Supply voltage VCC	0		15	V	
Supply current	1.5		2.5	mA	At VCC = 10 V
Bridge resistance	4.0		6.0	kΩ	
Zero offset	-0.2		0.2	mV/V	Signal without load, variance between specimens
Zero repeatability		±0.02		%FS	Variance between measurements (FS = Full Scale)
Sensitivity tolerance	-10		10	%	Variance of sensitivity between specimens
Sensitivity repeatability		±0.3		%	Variance of sensitivity between measurements
Linearity error		±0.2		%FS	
Thermal shift for zero	-0.02		0.02	%FS/°C	
Thermal shift for sensitivity	0.02	0.025	0.03	%/°C	

Connector details

For K1 variant (see order information)

Molex PicoBlade 4P Female connector (1.25 mm pitch)

Mating connectors:

- Right-angle SMT header, Molex Art. No. 532610471
- Wire-to-Wire Male housing, Molex Art. No. 510470400



PicoBlade connector
(-K1 variants)

Order information

Force sensor Nesthorn

Basic sensor element

KZ-011-0400 = Force sensor Nesthorn

Force range

Code	Full scale range	Full scale signal	Substrate thickness	Sensitivity	Max. overload
18 N	0 N – 18 N	2.84 mV/V	0.5 mm	158 μ V/V/N	27 N
50 N	0 N – 50 N	3.05 mV/V	0.8 mm	61 μ V/V/N	75 N
80 N	0 N – 80 N	2.96 mV/V	1.0 mm	37 μ V/V/N	120 N
200 N	0 N – 200 N	3.00 mV/V	1.6 mm	15 μ V/V/N	300 N
300 N	0 N – 300 N	3.00 mV/V	2.0 mm	10 μ V/V/N	450 N

Application force

Code	Force application aid
E0	None (hole only)
E1	Rivet on top side
E2	Rivet on bottom side

Connection

Code	Variant
K0	Tinned solder pads only
K1	Stranded wires (20 cm) with PicoBlade connector
K6	Flex ribbon "Spirit"

Housing

Code	Variant
G0	None
G1	Screw-on metal housing

KZ-011-0400-

XXXN-

Ex-

Kx-

Gx

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