Force sensor Nesthorn

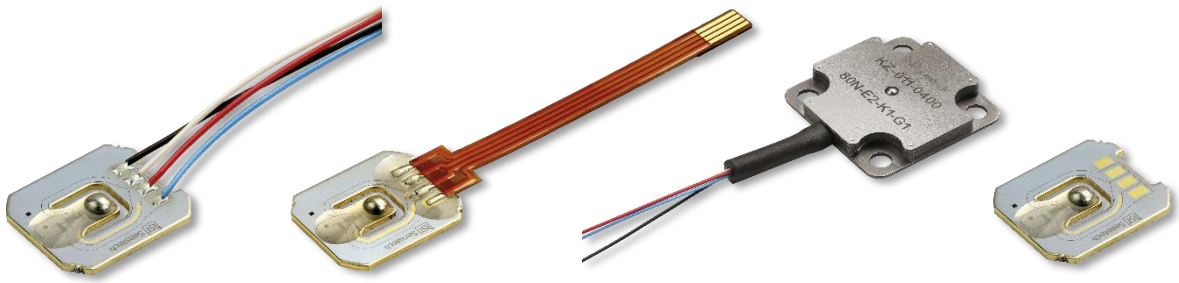
Datasheet KZ-011-0400

Force is applied through the center

Benefits & characteristics

- Measurement ranges: **0 – 18 N to 0 – 300 N**
- 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

Illustration



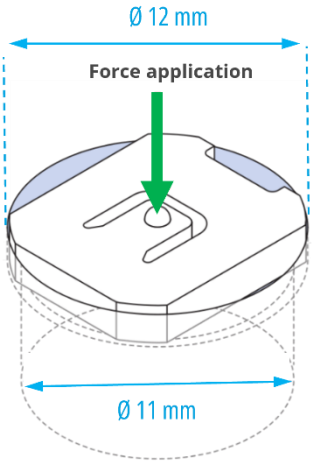
50N-E1-K1-G0 *50N-E1-K6-G0* *80N-E2-K1-G1* *50N-E1-K0-G0*

Applications

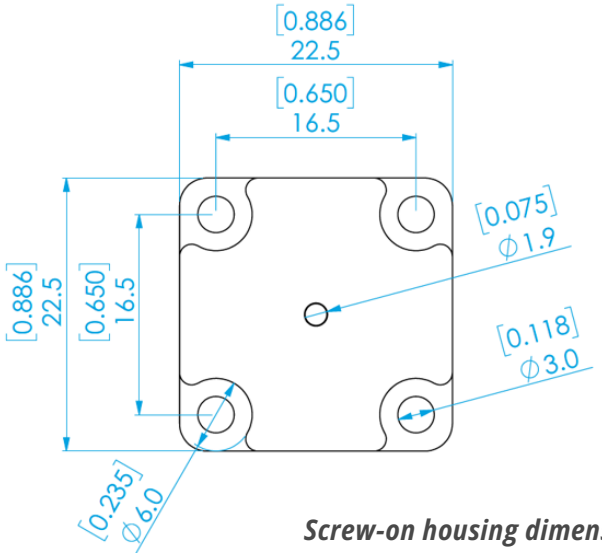
- Medical devices
- Measuring and testing equipment
- Robotics
- Watchmaking equipment

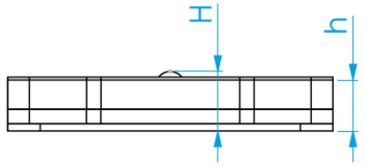
Dimensions and integration

All dimensions in millimeters / (inches)



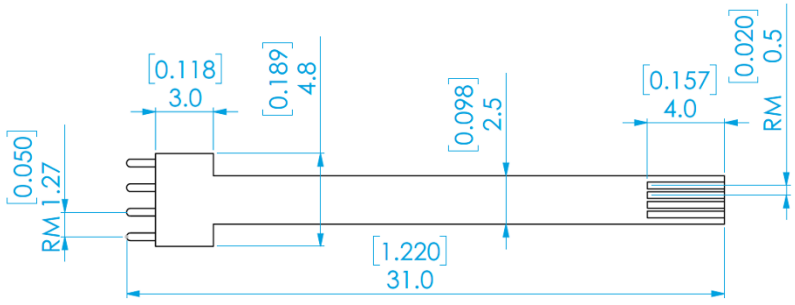
Integration and force application



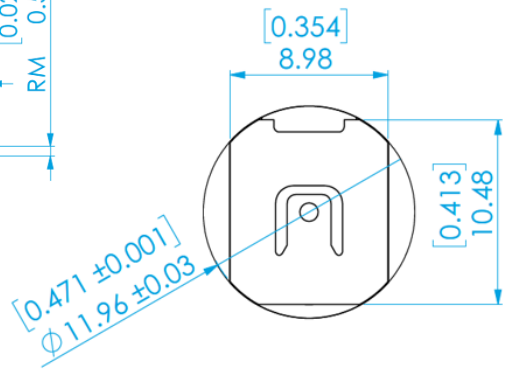


Code	h (mm)	H (mm)
18N	2.29	2.69
50N	2.60	2.98
80N	2.75	3.15
200N	3.34	3.74
300N	3.73	4.13

Screw-on housing dimensions (-G1 variant)



Flex ribbon dimensions (-K6 variant)



Sensor element dimensions

Technical specifications

Measurement principle	Thin film strain gauge (full Wheatstone bridge)
Measurement parameter	Force [N]
Measurement ranges	0 – 18 N to 0 – 300 N, see order information. Custom force ranges available on request
Electrical contacting	Solder points (-K0 variant), stranded wires (-K1 variant), or flex ribbon (-K6 variant) Color scheme for stranded wire (-K1 variant): Red: Supply voltage + (VCC) Black: Supply voltage – (GND) White: Signal voltage +/- Blue: Signal voltage -/+
Mounting	Designed for installation in Ø12 mm blind hole, see prior section
Application of force	On round-head rivet, sensor to be positioned in centrally in 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

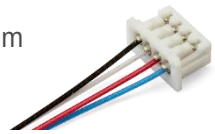
	Min	Typ	Max	Unit	Notes/Conditions
Operating temperature range	-20		+125	°C	
Storage temperature range	-40		+125	°C	
Ambient humidity	0		95	%RH	Non-condensing; at VCC ≥ 10 V
Ingress protection		IP44			Only valid for -G1 variant

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 (R_B)	4		6	kΩ	
Zero signal	-0.2		0.2	mV/V	Output of the unloaded sensor
Rated characteristic value (FS) tolerance	-15		15	%	See order information for rated characteristic value (Full scale FS)
Relative linearity error		±0.2		%FS	
Temperature effect on zero signal	-0.02		0.02	%FS/°C	
Temperature effect on characteristic value	0.02	0.025	0.03	%/°C	

Connector details

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

K6 variant: Compatible connector
Molex FFC & FPC Connector 4P (0.5 mm pitch)
Molex Art. No. 52745-0497

Order information

Force sensor Nesthorn

Basic sensor element

KZ-011-0400 = Force sensor Nesthorn

Force range

Code	Rated force	Rated characteristic value (FS)	Substrate thickness	Sensitivity	Force limit
18	18 N	2.84 mV/V	0.5 mm	158 µV/V/N	27 N
50	50 N	3.05 mV/V	0.8 mm	61 µV/V/N	75 N
80	80 N	2.96 mV/V	1.0 mm	37 µV/V/N	120 N
200	200 N	3.00 mV/V	1.6 mm	15 µV/V/N	300 N
300	300 N	3.00 mV/V	2.0 mm	10 µV/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 (only for E2-K1)	Screw-on metal housing

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

Senstech AG • Allmendstrasse 9 • 8320 Fehraltorf • Switzerland
+41 44 955 04 55 • info.senstech@ist-ag.com•www.ist-senstech.com

RoHS