

KD-2446

Non-Contact High-Precision Proximity Measuring System

- Measurement range 0 ... 0.5 mm to 0 ... 15 mm
- Accuracy see sensor specification
- Output [supply voltage]:
 - 0 ... 10 V [12 VDC]
 - 0 ... 22 V [24 VDC]



General

The KD-2446 is a non-contact proximity measuring system. This low-cost, easy-to-use system makes precision static and dynamic measurements of metal targets

More Features

- Outstanding precision: static resolution to 12 microinches (approx. 0.3 μm)
- Low cost
- Excellent performance with ferrous targets
- Compact rugged electronics, sensors
- Adjustable gain for up to 22 V output (with 24 VDC input)
- High speed level adjustable switched output for process control
- Temperature tolerant sensors (to 204 °C)
- Very low switching hysteresis, <1 % on ferrous targets
- RoHS compliant

Theory of Operation

The KD-2446 system operates on a traditional Colpitts oscillator circuit where the sensor acts as the resonating coil for the oscillator. The proximity of the target to the sensor face pulls the oscillator, changing its frequency and amplitude of modulation, and controlling a variable gain oscillator section within the electronic circuit.

The signal is half-wave rectified and filtered to obtain an analog voltage proportional to the target position or displacement. The analog voltage output can be varied by adjustment of the gain. The input power is diode protected and regulated to provide a clean low-noise signal. The output is short-circuit current protected.

Application

The KD-2446 may be used in a variety of applications using target materials such as ferrous, stainless steel or aluminum. Applications include displacement, vibration, sorting and event capture. With its excellent sensitivity to small targets and high-speed switching, the KD-2446 is ideal for RPM sending in harsh environments. The opto-isolated switched output makes the KD-2446 ideal for interfacing to PLC inputs, counters, timers or alarm circuits.

KD-2446 System

The KD-2446 system consists of two sub-assemblies: the sensor, with integral cable, and the signal conditioning or electronics module. The KD-2446 electronics is housed in a DIN rail mount enclosure with terminal connections for +12 VDC to +24 VDC input power and the variable voltage and switched outputs. Power supplies are available optional. The system comes standard with one of two production sensor configurations — the 9C or the 5CM. Both of these sensors are rated for continuous operation up to 400 °F (204 °C).

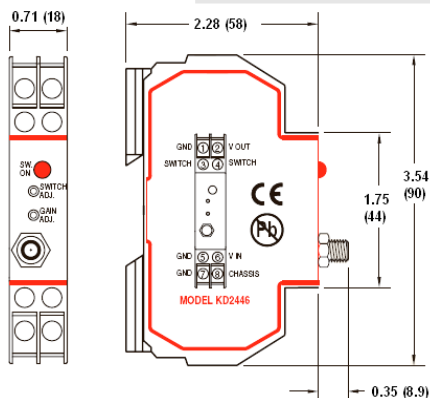
In addition to the standard sensors a series of sensors with a diameter from 2 to 51 mm is available!

EMC Performance

The KD-2446 conforms with the applicable standards of Council Directive for *Generic for Light Industrial and Commercial Use*. Under some EMI environments, at specific frequencies, the KD-2446 unit may experience a change in output voltage. In general, when exposed to those environments covered by the EMC directive, the user can expect less than 5 % deviation of output. As always, contact us for specific data.

Specifications

Input:	Supply voltage	12 ... 24 VDC, regulated Fuse limit input current from power source to 11 mA, 0.28 W maximum at full load.	
	Analog output:	Voltage	0 ... 22 V with 24 VDC supply voltage 0 ... 10 V with 12 VDC supply voltage The 0 ... 22 VDC and 0 ... 10 VDC are maximum voltages with the defined supply voltage.
	Current (full load), max.	4.2 mA	
	Impedance	50 Ω	
	Frequency response (±3 dB)	0 ... 10 kHz	
Switched output:	Load current	100 mA max. DC or AC	
	Load voltage	30 V _{rms} , 42,4 V _p or 60 VDC	
	On resistance	min. 30 Ω, max. 50 Ω	
	Switch point hysteresis	0.56 % of full scale for 9C sensor 0.97% of full scale for 5CM sensor using 24 VDC supply on 4130 steel	
	Frequency response	3.3 kHz	
Resolution:	Resolution	Less than 0.008 % of measuring range using a 5CM sensor on a 4130 steel target at mid scale, mid gain, and 12 VDC supply	
	Environmental:	Operating temperature range	Sensor and cable
		Electronics	+32 ... +150 °F (0 ... +66 °C)
Storage temperature range		Sensor and cable	-60 ... +400 °F (-51 ... +204 °C)
	Electronics	+58 ... +212 °F (-50 ... +100 °C)	
	Thermal drift	<0.22 % per °C of full scale for sensor, electronics or system	
	IP rating	Sensor	IP67
		Electronics	IP40

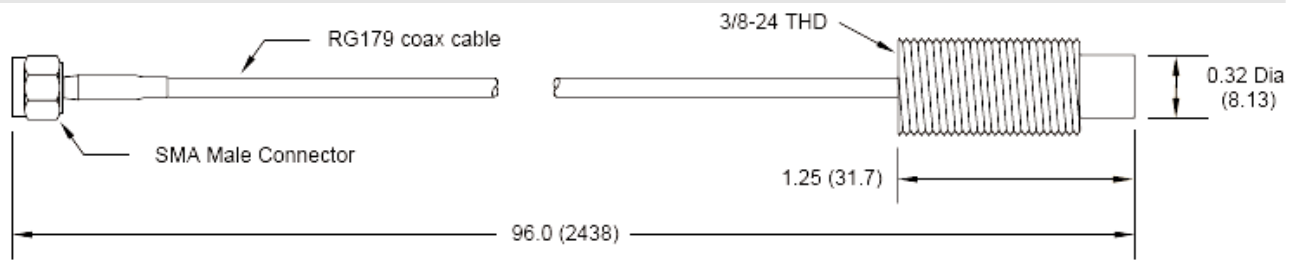


Dimensions in „inches“, values in brackets in “mm“, approx. values

These drawings are for information only and not intended for construction purpose. Please contact us for detailed drawings.

■ Sensor Specifications, Dimensions and Ordering Information

9C Sensor



Model	Description	Part number
KD-2446-9C	Complete system, sensor and electronics	855776-9CMT
	Sensor only	851166-008
	Electronics only	855765-001G

Target material

Non-ferrous (aluminium)

Non-magnetic steels (304 stainless)

Magnetic steels (4130)

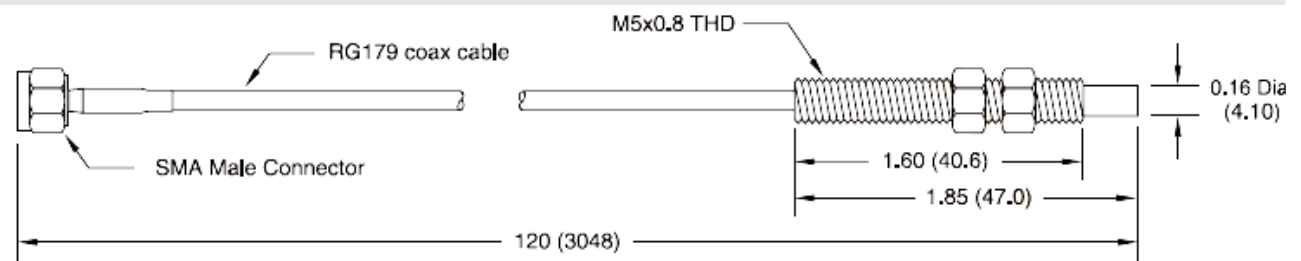
9C sensor measuring range

0 ... 0.175 inch (0 ... 4.45 mm)

0.025 ... 0.200 inch (0.64 ... 5.08 mm)

0.040 ... 0.275 inch (1.02 ... 6.99 mm)

5CM-Sensor



Model	Description	Part number
KD-2446-5CM	Complete system, sensor and electronics	855776-5CM
	Sensor only	851520-004
	Electronics only	855765-001G

Target material

Non-ferrous (aluminium)

Non-magnetic steels (304 stainless)

Magnetic steels (4130)

5CM sensor measuring range

0 ... 0.100 inch (0 ... 2.54 mm)

0.010 ... 0.125 inch (0.254 ... 3.18 mm)

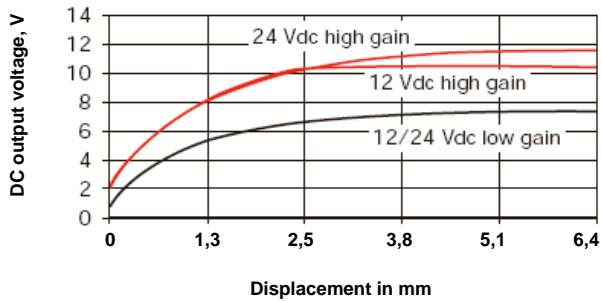
0.015 ... 0.150 inch (0.38 ... 3.81 mm)

Dimensions in „inches“, values in brackets in “mm“, approx. values

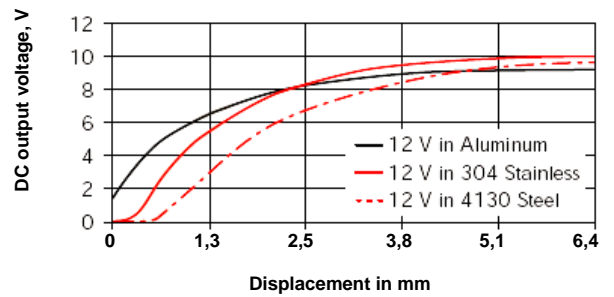
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■ 9C Sensor Response Data

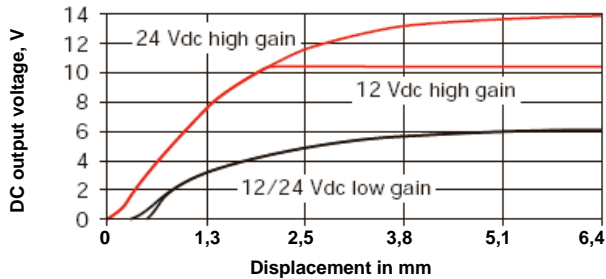
Aluminium output for 12 V and 24 V inputs



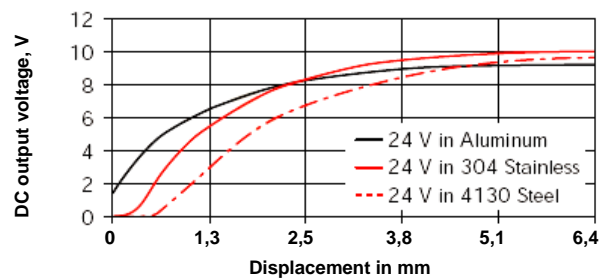
Output at medium gain and 12 V input



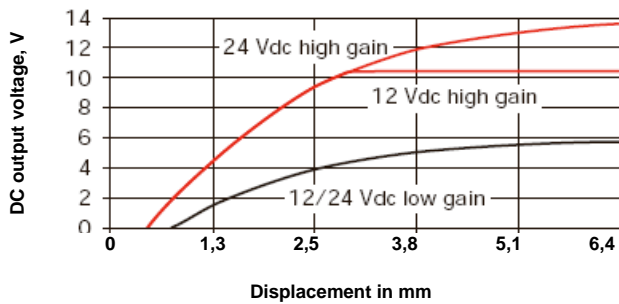
304 SS output for 12 V and 24 V inputs



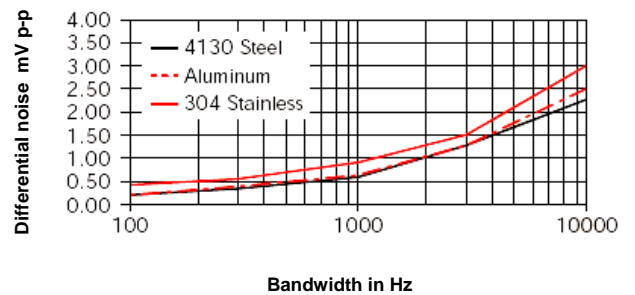
Outputs at medium gain and 24 V input



4130 steel output for 12 V and 24 V inputs

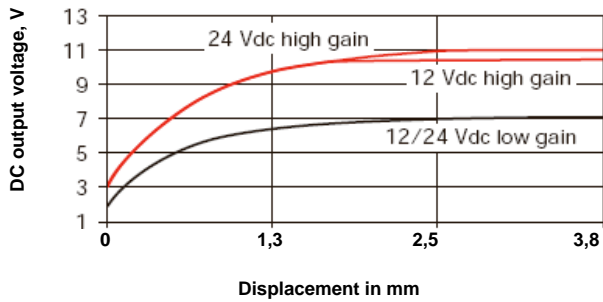


Example output noise @ 12 VDC input, mid gain, medium displacement

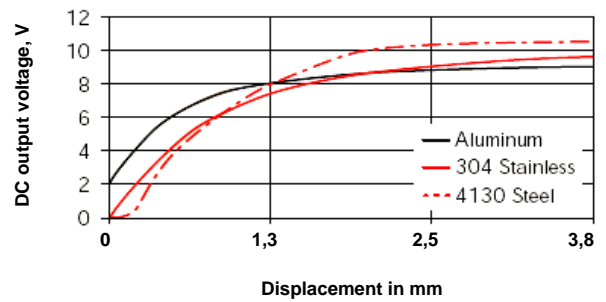


■ 5CM Sensor Response Data

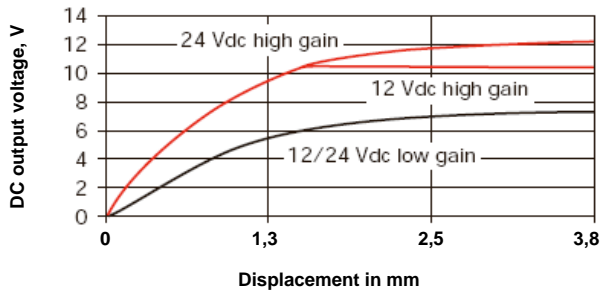
Aluminum output for 12 V and 24 V inputs



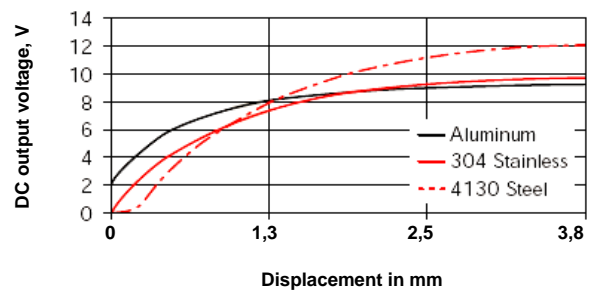
Outputs at medium gain and 12 V input



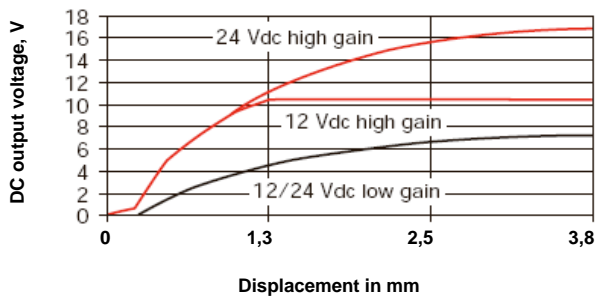
304 SS output for 12 V and 24 V inputs



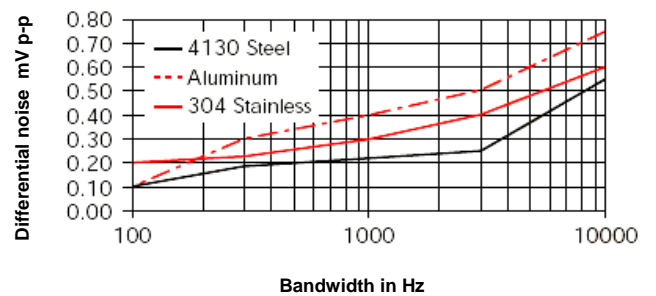
Outputs at medium gain and 24 V input



4130 steel output for 12 V and 24 V inputs



Example output noise @ 12 VDC input, mid gain, medium displacement

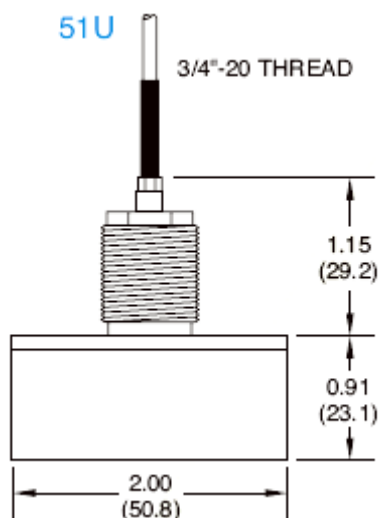
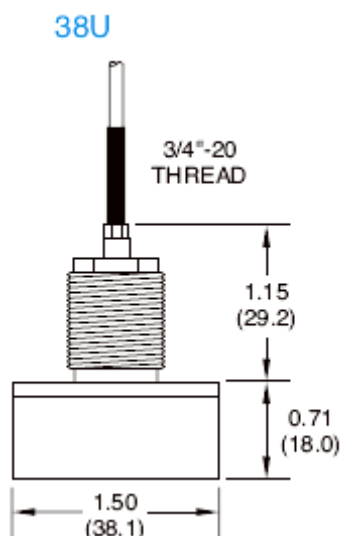
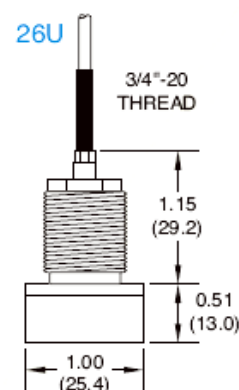
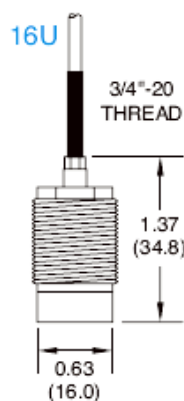
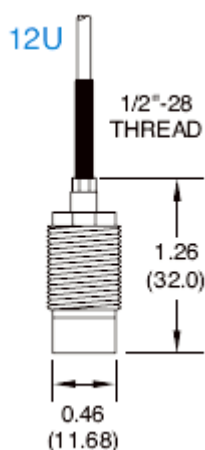
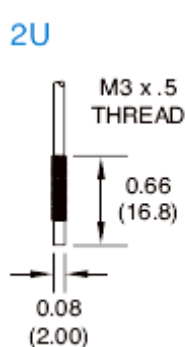


■ Non-standard Sensors

For applications where size and/or measuring range of the standard sensors is not suitable, more non-standard sensors are available.

Detailed parameters and output characteristics are available on request.

Sensor type	Range, typical	Diameter, approx.
-2U	0.5 mm	2 mm
-12U	4 mm	12 mm
-16U	5 mm	16 mm
-26U	8.1 mm	25 mm
-38U	12.7 mm	38 mm
-51U	15 mm	51 mm



Dimensions in „inches“, values in brackets in “mm“, approx. values

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Our policy is to improve specification of our products continuously, so technical and production details can be changed without any notice.