Inductive Gauging Sensors

EX-200 Series

Features

- Linearity of ± 1% of F.S.
- High response speed of up to 18 kHz
- Resolution of 0.04% of F.S.
- Sensor head housing IP-67 rated

Measuring Distance

Cylindrical – 0 to 1 mm (0.04")

Threaded – 0 to 2 mm (0.08")

Cylindrical/Threaded – 0 to 10 mm (0.39")
0 to 5 mm (0.20")

CE

For More Info & Data
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Description

Accurate analog output of minute displacement

The EX-200 Series measures target displacement with a resolution of 0.04% F.S. (0.4 µm 0.02 Mil with the EX-305 sensor head). The dual analog outputs (voltage/current) enable connection to external equipment.

Linearity of ± 1% of F.S.

Using the built-in linearizer circuit, the EX-200 Series accurately outputs absolute displacement values.

High response speed

The EX-200 Series offers a response frequency of up to 18 kHz (with the EX-305), allowing measurement of rapidly vibrating targets.

Auto-zero key

Pressing the auto-zero (ZERO) key sets the present voltage output to 0 V (current output to 4 mA). Zero-point adjustment with a reference target can be completed simply by pressing the ZERO key.

Alarm functions

- If the sensor head is damaged or the cable is disconnected, the ALARM LED indicator lights and an alarm signal is output.
- If the target is out of the measuring range, the OVER LED indicator lights. Operators can easily adjust sensor position using the OVER indicator.

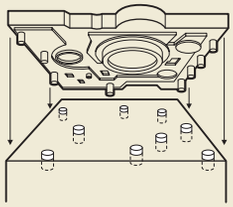
Sensor head housing IP-67 rated

Four sensor head models are available, including compact and long-range types.

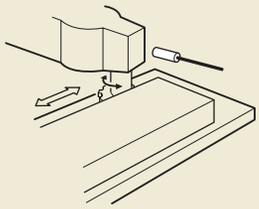
DIN-rail mountable compact amplifier

The DIN-rail or screw-mountable amplifier can be installed anywhere.

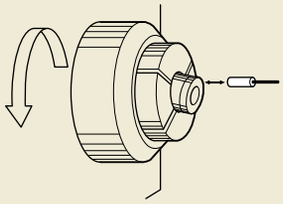
Applications



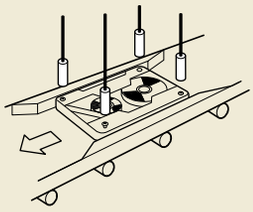
Height and parallelism measurement



Origin detection



Runout and eccentricity measurement



Insertion detection

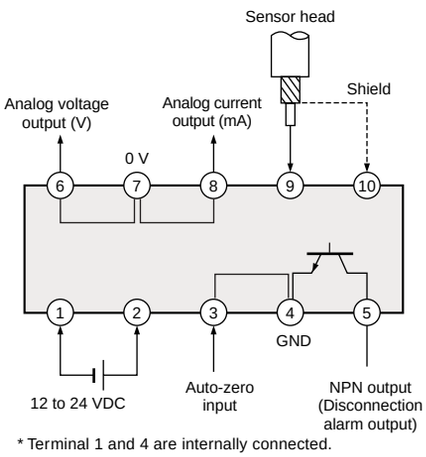
Specifications

Type			Cylindrical	Threaded	Cylindrical/Threaded	
			ø5.4	M10	ø14.5/M16	ø22/M12
Model	Sensor head		EX-305	EX-110	EX-416	EX-422
	Controller		EX-201	EX-202	EX-205	EX-210
Measuring range			0 to 1 mm 0.04"	0 to 2 mm 0.08"	0 to 5 mm 0.20"	0 to 10 mm 0.39"
Analog output	Output voltage		0 to 5 V (Output impedance 100 Ω)			
	Output current		4 to 20 mA (Applicable load: 0 to 350 Ω)			
	Resolution		0.04% of F.S. (Response frequency: LOW)			
	Linearity		±1% of F.S.			
	Response frequency	HIGH	18 kHz (-3 dB)	15 kHz (-3 dB)	13 kHz (-3 dB)	8 kHz (-3 dB)
		LOW	1.3 kHz (-3 dB)			
Disconnection alarm output [2.]			NPN: 100 mA (40 V) max., Residual voltage: 1 V max. (N.C.)			
Functions			Auto-zero function/Response frequency selecting function			
Temperature fluctuation	Sensor head [1.]		0.03% of F.S./°C			
	Controller [1.]		0.04% of F.S./°C			
Power supply voltage			12 to 24 VDC ±10%			
Current consumption			240 mA max.			
Ambient temperature	Sensor head		-10 to +60°C (14 to 140°F), No freezing			
	Controller		0 to +50°C (32 to 122°F), No freezing			
Relative humidity			35 to 85%, No condensation			
Enclosure rating			Sensor head: IP-67			
Weight	Sensor head		Approx. 45 g	Approx. 55 g	Approx. 75 g	Approx. 200 g
	Controller		Approx. 285 g			

The above data was obtained using a steel target (S45C, SS41, t=1 mm 0.04").
When measuring aluminum, copper, or stainless steel targets, refer to the linear characteristics for these materials.

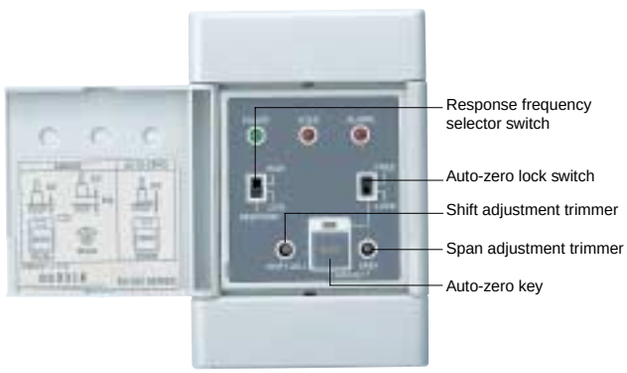
1. When the distance between the sensor head and the target is within 50% of the measuring range.
2. NPN output can easily be converted to PNP output by connecting the optional OP-5148 PNP output converter.

Connections



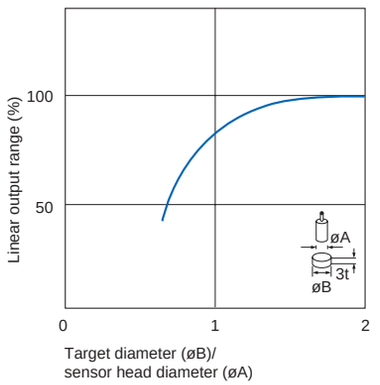
* Terminal 1 and 4 are internally connected.

Part Names and Functions

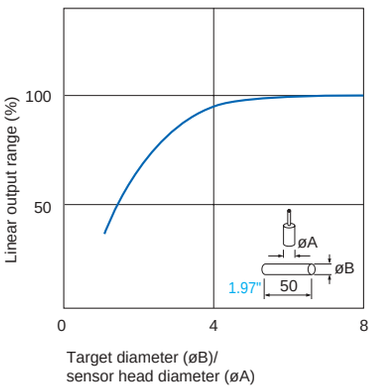


Characteristics

Output characteristics for disc target diameter measurement (Typical)

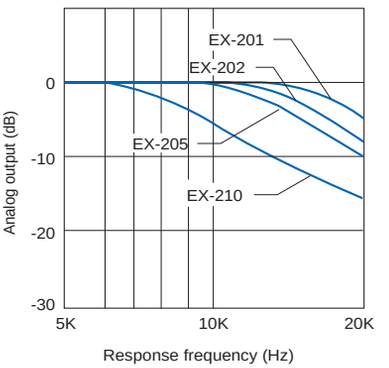


Output characteristics for cylindrical target diameter measurement (Typical)



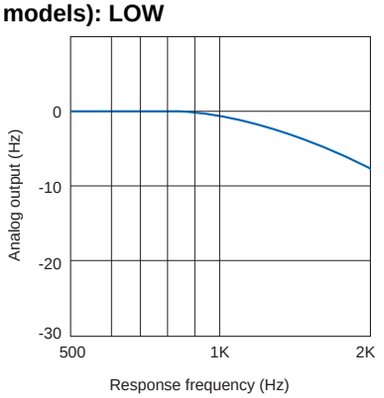
Response frequency vs. output characteristics (Typical)

Response frequency: HIGH



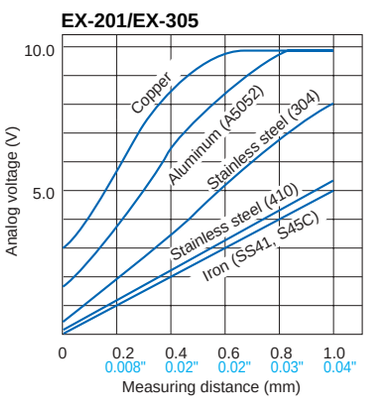
Response frequency vs. output characteristics (Typical)

Response frequency (all EX-200 models): LOW

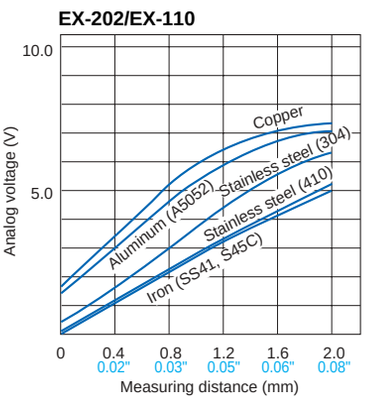


Output characteristics for nonferrous metal measurement (Typical)

EX-201/EX-305

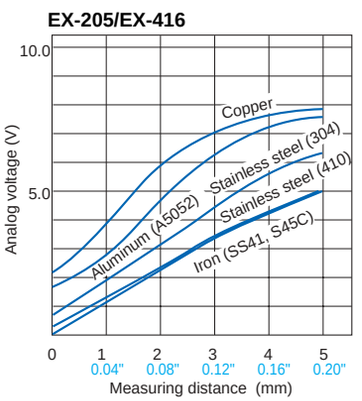


EX-202/EX-110

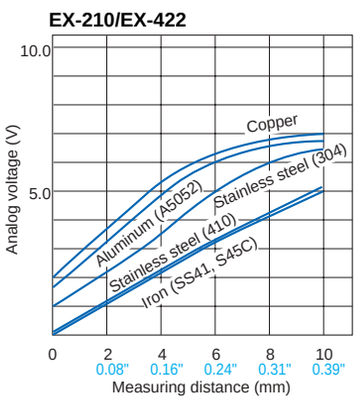


Output characteristics for nonferrous metal measurement (Typical)

EX-205/EX-416



EX-210/EX-422



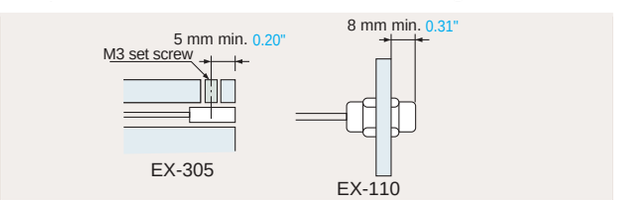
Hints on Correct Use

Compatibility

Since the controller and sensor head are f actor y-calibrated as a pair, check that they have the same serial number. If the y do not ha ve the same serial number, their characteristics may v ary significantly .

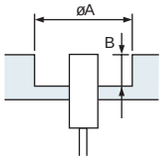
Mounting

Tighten the EX-305 set scre w and EX-110 nut away from the tip of the sensor head as sho wn in the figure .



Flush-mounting

The diagram and table below shows the dimensions to use when flush-mounting a sensor head onto a metal plate.



Model \ Distance	øA (mm)	B (mm)
EX-305	12 0.47"	9 0.35"
EX-110	12 0.47"	9 0.35"
EX-416	35 1.38"	10 0.39"
EX-422	55 2.17"	20 0.79"

Mutual interference

When one or more sensor head of the same model are installed side by side, the sensor may not output the correct voltage due to mutual interference. Make sure that the distance between adjacent sensor heads is larger than the values shown below.

Model \ Distance	Parallel Installation (mm) (Distance)
EX-305	36 1.42"
EX-110	80 3.15"
EX-416	116 4.57"
EX-422	142 5.59"

Sensor head cable

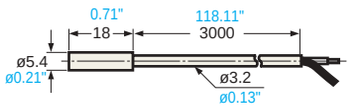
The sensor head cable length should be 3 m 9.8'. If you extend or cut the cable, its characteristics will change.

Dimensions

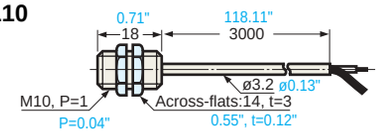
▶For CAD Data Download >>> http://www.keyence.com/cadg

Sensor heads

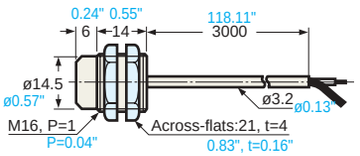
EX-305



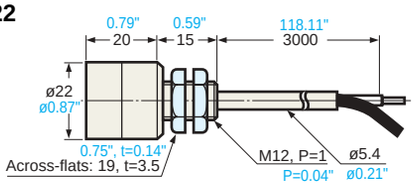
EX-110



EX-416



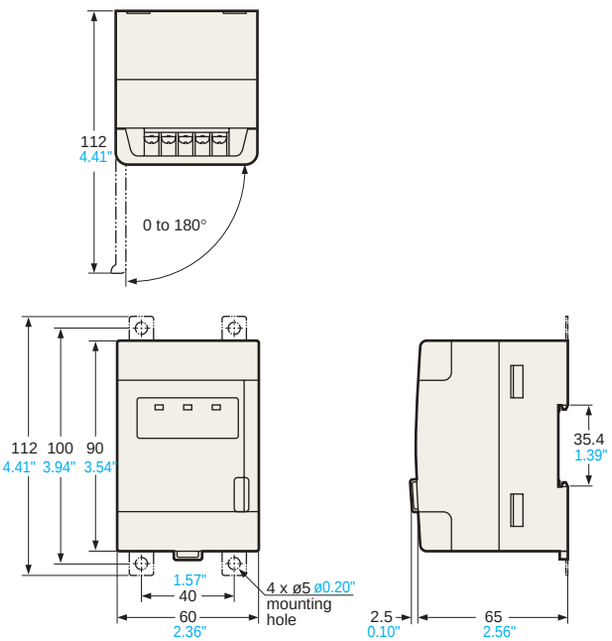
EX-422



Controller

Unit: mm Inch

EX-201/202/205/210



Options

RD Series Analog Sensor Controller

The RD Series processes analog input signals from sensors. It can easily perform various arithmetic operations such as tolerance limit differentiation and peak-to-peak hold.
For details on the RD Series, see the RD Series descriptions.