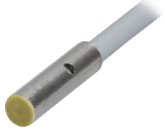








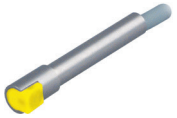




Inductive Barrel Sensor Selection Guide

Embeddable/Nonembeddable Barrels					
					
Housing	3 mm	4 mm	4 mm	4 mm	5 mm
Sensing Range	1 mm	1 mm	1 mm	1 mm	1 mm
Pages	B9	B9	B9	B11	B11
Features					
2-wire					
3/4-wire	•	•	•	•	•
2-wire AC/DC					

Embeddable/Nonembeddable Barrels				
				
Housing	5 mm	6.5 mm	6.5 mm	8 mm
Sensing Range	1 mm	1.5 - 6 mm	1.5 - 6 mm	1.5 - 2 mm
Pages	B11	B13 - 16	B13 - 16	B17
Features		Uprox	Uprox	
2-wire				
3/4-wire	•	•	•	•
2-wire AC/DC				

Embeddable/Nonembeddable Barrels				
				
Housing	8 mm	Side Sensing	Side Sensing	8 mm
Sensing Range	1.5 - 2 mm	1 - 1.5 mm	1.5 mm	1.5 - 6 mm
Pages	B17	B19	B19	B23 - 34
Features	Uprox			Uprox
2-wire				•
3/4-wire	•	•	•	•
2-wire AC/DC				

We reserve the right to make technical alterations without prior notice.

Inductive Barrel Sensor Part Number Key



Mounting

- B = embeddable
- N = nonembeddable

Principle of Operation

- I = inductive

Rated Operating Distance (mm)

Sensing Characteristics

- U = Uprox® sensor

Housing Material Modifier

- E = stainless steel

Housing Style

Barrel - Metal

- G = full threading, generally chrome plated brass
- GS = threaded side sensor
- H = smooth, chrome plated brass or stainless steel
- HS = smooth side sensor
- M = partial threading, chrome plated brass

Barrel - Plastic

- K = smooth
- P = full threading
- S = partial threading
- SK = side sensing/slot sensor, plastic housing

Primary Barrel Modifier

- T = PTFE coated

Housing Diameter or Height (mm)

Secondary Barrel Modifier

- CA = conduit adaptor
- E = extended barrel length
- EE = extra long barrel length
- F = stainless steel face
- FE = stainless steel face, extended barrel length
- H = Stoneface®
- K = short barrel length
- M = medium barrel length
- S = side sensing
- SE = extended length
- SK = right-angle terminal chamber
- SR = straight terminal chamber
- T = barb fitting at cable entry
- TC = terminal chamber
- WD = washdown IP68/IP69K

Number of LEDs

- (blank) = no LEDs
- X = 1 LED
- X2 = 2 LEDs

Voltage Range

AC/DC: (No SCP)**

- 3 = 20-250 VAC, 10-300 VDC
- 14 = 20-132 VAC, 10-140 VDC
- 31 = 20-250 VAC, 10-300 VDC, plastic barrel
- 33 = 35-250 VAC, grounded metal barrel

AC/DC: (Latched SCP)

- 30 = 20-250 VAC, 10-300 VDC
- 32 = 20-250 VAC, 10-300 VDC
- 40 = 20-140 VAC/DC, high off-state current

DC:

- 4 = 10-65 VDC, polarity protected, pulsed SCP**
- 6 = 10-30 VDC, polarity protected, pulsed SCP
- 7 = 10-30 VDC, TTL compatible
- 8 = 20-30 VDC, polarity protected, pulsed SCP
- 41 = 10-55 VDC, polarity protected, pulsed SCP
- 44 = 10-55 VDC
- 45 = 8.4-64 Volts

**SCP = short-circuit and overload protection

Output

- D = 2-wire DC (transistor output)
- DZ = 2-wire AC/DC, (power MOSFET output)
- G = 2-wire DC, low voltage drop
- N = NPN transistor (current sinking)
- P = PNP transistor (current sourcing)
- Z = 2-wire AC or 2-wire AC/DC

Output Function

- A = normally open (N.O.)
- DA = dynamic output (ring sensor), normally open
- F = connection programmable (N.O or N.C.)
- R = normally closed (N.C.)
- V = complementary outputs: one N.O., one N.C.
- Y0 = NAMUR output, requires switching amplifier
- Y1 = NAMUR output, requires switching amplifier, ATEX Approved

NOTE:

Part number keys are to assist in identification only. Verify new part numbers with factory; some configurations are not possible.

We reserve the right to make technical alterations without prior notice.

Inductive Barrel Sensors

Inductive Barrel Sensor Part Number Key

Wiring Options*

A. Connectorized Sensor

Bi2-M12-AN6X - H1 1 4 1

Connector Family

- B1 = Minifast®, 7/8"-16UN, metal, male
- B2 = Minifast®, 7/8"-16UN, plastic, male
- B3 = Microfast®, 1/2"-20UNF, metal, male
- H1 = Eurofast®, M12x1, metal or plastic, male
- V1 = Picofast®, snap and M8x1, metal, male (Q08 snap only)
- V2 = Picofast®, snap and M8x1, male (Q08 only)

Connector/Sensor Transition

- 1 = straight
- 3 = straight with adapter
- 4 = right-angle with adapter

Factory Code

Example:

- 0 = non-standard wiring
- 1 = standard wiring
- 3 = N.C. DC output on pin 4
- 4 = N.O. 2-wire DC output on pin 4

Number of Pins

B. Potted Cable

Bi2-G12-AN6X 7M

Cable Length

- (blank) = 2 meter cable
- 7M = 7 meter cable
- *M = custom cable lengths available

C. Potted Cable with Molded Connector

Bi2-G12-Y0X - 0.2M - RS 4.21T

Cable Length

examples:

- 0.2M = 0.2 meters (minimum)
- 2M = 2 meter cable
- 7M = 7 meter cable

Standard Cordset Connector

- AC: RSM 30 = Minifast, 7/8"-16UN, metal, male, 3-conductor
- SB 3T = Microfast, 1/2"-20UNF, metal, male, 30 conductor
- DC: RS 4T = Eurofast, M12x1, metal or plastic, male, 3-conductor
- RS 4.2T = Eurofast, M12x1, metal or plastic, male, 2-conductor
- RS 4.21T = Eurofast, M12x1, metal or plastic, male, NAMUR, 2-conductor
- RS 4.4T = Eurofast, M12x1, metal or plastic, male, 4-conductor
- RSM 40 = Minifast, 7/8"-16UN, metal, male, 4-conductor
- PSG 3 = Picofast, snap, plastic, male, 3-conductor
- PSG 3M = Picofast, M8x1, male, 3-conductor

Option Codes for Special or Custom-Built Sensors**

Bi 2-S12-AN7X /S100 or Bi10-M30-AN6X-H1141 /F2

examples:

- /S34 = weld field immune
- /S90 = TPU cable
- /S97 = -40 °C (-40 °F) operating temperature
- /S100 = +100 °C (+212 °F) operating temperature
- /S1589 = barrel sensors with Weldguard® laminate
- /S1610 = barrel sensors with tool steel sleeve and Weldguard® laminate

example:

- /F2 = alternate oscillator frequency

We reserve the right to make technical alterations without prior notice.

Inductive Barrel Sensors

Mounting

Turck inductive proximity sensors are manufactured with a shielded coil, designated by “Bi” in the part number, and a nonshielded coil, designated by “Ni” in the part number. Embeddable (shielded) units may be safely flush-mounted in metal. Nonembeddable (nonshielded) units require a metal free area around the sensing face. Because of possible interference of the electromagnetic fields generated by the oscillators, minimum spacing is required between adjacent or opposing sensors.

It is good engineering practice to mount sensors horizontally or with the sensing face looking down. Avoid sensors that look up wherever considered, especially if metal filings and chips are present.

Maximum Locknut Torque Specifications

The locknut torque should be considered for all threaded sensors to prevent the housing from being over stressed. The values below pertain to the locknut provided with each sensor. Liquid thread sealants of an anaerobic base, such as Loctite, are recommended if strong vibrations are likely.

Caution: Sensor barrels are typically brass. Consider break torque when selecting grade of thread sealant.

Barrel Size	Metal Barrel	Plastic Barrel
5 mm	5 Nm (3.7 ft-lb)	----
8 mm	5 Nm (3.7 ft-lb)	----
8 mm (M08 Ferrite)	7 Nm (5.2 ft-lb)	----
12 mm	10 Nm (7.4 ft-lb)	1 Nm (0.7 ft-lb)
18 mm	25 Nm (18 ft-lb)	2 Nm (1.4 ft-lb)
30 mm	75 Nm (55 ft-lb)	5 Nm (3.7 ft-lb)
47 mm	90 Nm (66 ft-lb)	----

Drill Hole Sizes for Metric Threads

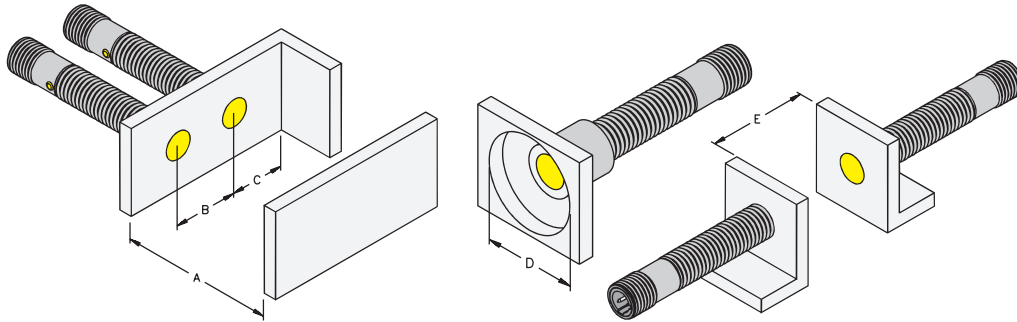
Thread Size	Pitch	Thru Hole (mm)	Tap Hole Dia. (mm)	Thru Hole (in)	Tap Hole Dia. (in)
M5 x 0.5	0.5	5.0	4.5	13/64	5/32
M8 x 1	1.0	8.0	7	21/64	1/4
M12 x 1	1.0	12.0	11	31/64	13/32
M18 x 1	1.0	18.0	17	23/32	41/64
M30 x 1.5	1.5	30.0	28	1-3/16	1-5/64
PG 9	1.41	15.2	14	5/8	1/2
PG 13.5	1.41	20.4	19	13/16	23/32
PG 36	1.59	47.0	45.5	1-7/8	1-47/64

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Inductive Barrel Sensors

Inductive Barrel Sensors

Embeddable Mounting Considerations



Flush Mountable

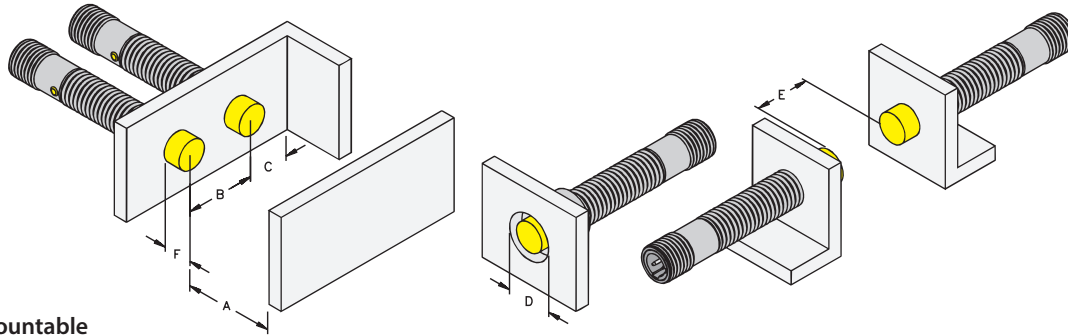
Sensor Type	Barrel Diameter	A	B	C	D	E
Bi1	3.00	3.00	6.00	4.50	9.00	9.00
Bi1U	4.00	3.00	8.00	6.00	12.00	6.00
Bi1	4.00	3.00	8.00	6.00	12.00	6.00
Bi1	5.00	3.00	10.00	8.00	15.00	6.00
Bi1U	5.00	3.00	10.00	7.50	15.00	6.00
Bi1.5U	6.50	5.00	13.00	10.00	20.00	9.00
Bi1.5	6.50	5.00	13.00	10.00	20.00	9.00
Bi2	6.50	6.00	13.00	10.00	20.00	12.00
Bi1.5U	8.00	5.00	16.00	12.00	24.00	9.00
Bi1.5	8.00	5.00	16.00	12.00	24.00	9.00
Bi2	8.00	6.00	16.00	12.00	24.00	12.00
Bi2U	8.00	6.00	16.00	12.00	24.00	12.00
Bi3U	8.00	9.00	16.00	12.00	24.00	18.00
Bi2	11.00	6.00	22.00	17.00	33.00	12.00
Bi2	12.00	6.00	24.00	18.00	36.00	12.00
Bi3U	12.00	9.00	24.00	18.00	36.00	18.00
Bi3	12.00	9.00	24.00	18.00	36.00	18.00
Bi4	12.00	12.00	24.00	18.00	36.00	24.00
Bi4U	12.00	12.00	24.00	18.00	36.00	24.00
Bi6U	12.00	18.00	24.00	18.00	36.00	36.00
Bi5U	18.00	15.00	36.00	27.00	54.00	30.00
Bi5	18.00	15.00	36.00	27.00	54.00	30.00
Bi7	18.00	21.00	36.00	27.00	54.00	42.00
Bi8U	18.00	24.00	36.00	27.00	54.00	48.00
Bi8	18.00	24.00	36.00	27.00	54.00	48.00
Bi10U	18.00	30.00	36.00	27.00	54.00	60.00
Bi10U	30.00	27.00	60.00	45.00	90.00	54.00
Bi10	30.00	30.00	60.00	45.00	90.00	60.00
Bi12	30.00	36.00	60.00	45.00	90.00	72.00
Bi15	30.00	45.00	60.00	45.00	90.00	90.00
Bi15U	30.00	45.00	60.00	45.00	90.00	90.00
Bi 20U	30.00	60.00	60.00	45.00	90.00	120.00
Bi 20	47.00	60.00	94.00	71.00	141.00	120.00
Bi 25	47.00	75.00	94.00	71.00	141.00	150.00

Dimensions are in mm.

We reserve the right to make technical alterations without prior notice.

Inductive Barrel Sensors

Nonembeddable Mounting Characteristics

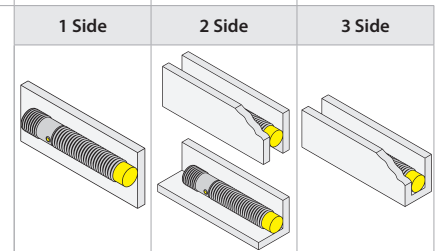


Non-Flush Mountable

Sensor Type	Barrel Diameter	A	B	C	D	E	F	1 Side	2 Side	3 Side
Ni3	6.50	9.00	20.00	10.00	20.00	18.00	6.00			
Ni3	8.00	9.00	24.00	12.00	24.00	18.00	6.00			
Ni4U	8.00	12.00	32.00	12.00	32.00	24.00	8.00			
Ni4	8.00	12.00	24.00	12.00	24.00	24.00	8.00			
Ni6U	8.00	18.00	32.00	12.00	36.00	36.00	12.00			
Ni5	11.00	15.00	33.00	17.00	33.00	30.00	10.00			
Ni4	12.00	12.00	36.00	18.00	36.00	24.00	8.00			
Ni5	12.00	15.00	36.00	18.00	36.00	30.00	10.00			
Ni8U	12.00	24.00	48.00	18.00	45.00	48.00	16.00	Sr=6 mm*		
Ni8	12.00	24.00	36.00	18.00	36.00	48.00	16.00			
Ni10U	12.00	30.00	48.00	18.00	36.00	60.00	20.00			
Ni8	18.00	24.00	54.00	27.00	54.00	48.00	16.00			
Ni10	18.00	30.00	54.00	27.00	54.00	60.00	20.00			
Ni12U	18.00	36.00	70.00	27.00	54.00	72.00	24.00			
Ni14	18.00	42.00	54.00	27.00	54.00	84.00	20.00			
Ni15U	18.00	45.00	70.00	27.00	54.00	90.00	30.00			
Ni10	20.00	30.00	60.00	30.00	60.00	60.00	20.00			
Ni15	30.00	45.00	90.00	45.00	90.00	90.00	20.00			
Ni20U	30.00	60.00	90.00	45.00	90.00	120.00	40.00	Sr=15 mm*	Sr=12 mm*	Sr=11 mm*
Ni20	30.00	60.00	90.00	45.00	90.00	120.00	20.00			
Ni30U	30.00	135.00	90.00	45.00	90.00	180.00	60.00			
Ni20	40.00	60.00	120.00	60.00	120.00	120.00	40.00			
Ni30	40.00	90.00	120.00	60.00	120.00	180.00	40.00			
Ni25	47.00	75.00	141.00	71.00	141.00	150.00	40.00			
Ni40	47.00	120.00	141.00	71.00	141.00	240.00	40.00			

Dimensions are in mm.

*The above Uprox Ni sensors with DC outputs and Stainless barrels can be flush mounted because the sensor automatically compensates for metal alongside its sensing face by decreasing the sensing range, preventing the output from locking on.


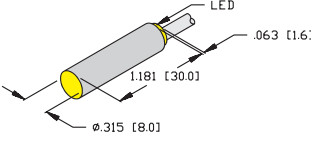
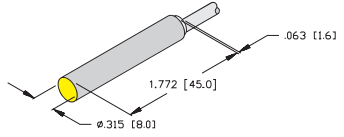
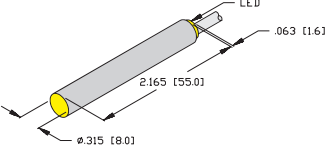
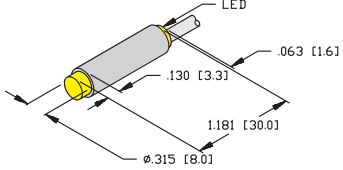
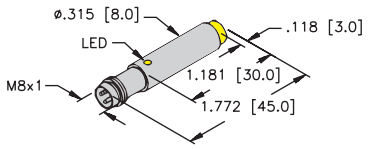
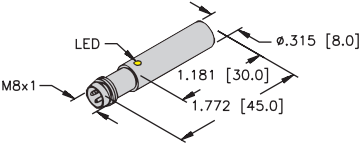


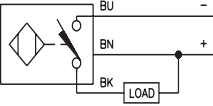
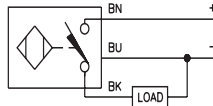
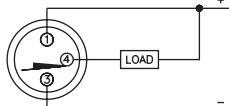
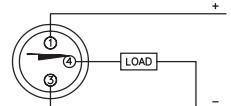
We reserve the right to make technical alterations without prior notice.

Inductive Barrel Sensors

Inductive Barrel Sensors | 8 mm

Embeddable and Nonembeddable Smooth Metal Barrels with DC Outputs

Housing Style	Dimension Drawings	
	<p>A</p>  <p>8 mm - Embeddable, Miniature Smooth Barrel, Potted-In Cable</p>	<p>B</p>  <p>8 mm - Embeddable, Miniature Smooth Barrel, Potted-In Cable</p>
<p>C</p>  <p>8 mm - Embeddable, Miniature Smooth Barrel, Potted-In Cable</p>	<p>D</p>  <p>8 mm - Nonembeddable, Miniature Smooth Barrel, Potted-In Cable</p>	<p>E</p>  <p>8 mm - Nonembeddable, Miniature Smooth, M8 Picofast Quick Disconnect</p>
<p>F</p>  <p>8 mm - Embeddable, Miniature Smooth, M8 Picofast Quick Disconnect</p>		

Wiring Diagrams/Mating Cordsets			
<p>1</p> 	<p>2</p> 	<p>3</p>  <p>Mating Cordset: PKG 3M-*</p>	<p>4</p>  <p>Mating Cordset: PKG 3M-*</p>

A4 3 and 4-wire DC - (AN, RN, AP, RP, VN, VP)	
<p>Ripple: $\leq 10\%$</p> <p>Differential Travel (Hysteresis): 3-15% (5% typical)</p> <p>Voltage Drop Across Conducting Sensor: $\leq 1.8\text{ V}$</p> <p>Trigger Current for Short Circuit Protection: $\geq 220\text{ mA}$ on 200 mA Load Current $\geq 170\text{ mA}$ on 150 mA Load Current $\geq 120\text{ mA}$ on 100 mA Load Current</p> <p>Off-State (Leakage) Current: $\leq 0.1\text{ mA}$</p> <p>No-Load Current: $\leq 15\text{ mA}$ (Ferrite, Uprox) $\leq 20\text{ mA}$ (Uprox+, Uprox3)</p>	<p>Time Delay Before Availability: $\leq 8\text{ ms}$</p> <p>Power-On Effect: Per IEC 947-5-2</p> <p>Reverse Polarity Protection: Incorporated</p> <p>Wire-Break Protection: Incorporated</p> <p>Transient Protection: Per EN 60947-5-2</p> <p>Temperature Drift: $\leq \pm 10\%$</p> <p>Shock: 30 g, 11 ms</p> <p>Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes</p> <p>Repeatability: $\leq 2\%$ of Rated Operating Distance</p>

We reserve the right to make technical alterations without prior notice.

Inductive Barrel Sensors | 8 mm

Embeddable and Nonembeddable Smooth Metal Barrels with DC Outputs

Part Number/ ID Number	Features	Sensing Range (mm)	Output	Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection	Housing	Face	Power LED	Output LED	Cable Length/Jacket	Dimension Drawings	Wiring Diagrams	Spec List
Bi1.5-H08K-AN6X 1604341	Short Barrel	1.5	3-wire DC NPN	10-30 VDC	3000	≤150	-25 to +70	IP67	SS	PA 12	N/A	YE	2M/TPU	A	1	A4
Bi1.5-H08K-AP6X 1604331	Short Barrel	1.5	3-wire DC PNP	10-30 VDC	3000	≤150	-25 to +70	IP67	SS	PA 12	N/A	YE	2M/TPU	A	2	A4
Bi1.5-H08M-AP6X 1604301		1.5	3-wire DC PNP	10-30 VDC	2000	≤150	-25 to +70	IP67	SS	PA 12	N/A	YE	2M/TPU	B	2	A4
Bi1.5-H08-AN6X 16143		1.5	3-wire DC NPN	10-30 VDC	2000	≤150	-25 to +70	IP67	SS	PA 12	N/A	YE	2M/TPU	C	1	A4
Bi1.5-H08-AP6X 16043		1.5	3-wire DC PNP	10-30 VDC	2000	≤150	-25 to +70	IP67	SS	PA 12	N/A	YE	2M/TPU	C	2	A4
Ni2-H08K-AN6X 16147	Short Barrel	2	3-wire DC NPN	10-30 VDC	3000	≤150	-25 to +70	IP67	SS	PA 12	N/A	YE	2M/TPU	D	1	A4
Ni2-H08K-AP6X 16047	Short Barrel	2	3-wire DC PNP	10-30 VDC	3000	≤150	-25 to +70	IP67	SS	PA 12	N/A	YE	2M/TPU	D	2	A4
Bi1.5-H08K-AN6X-V1131 1604340	Short Barrel	1.5	3-wire DC NPN	10-30 VDC	5000	≤150	-25 to +70	IP67	SS	PBT	N/A	YE	--	F	3	A4
Bi1.5-H08K-AP6X-V1131 1604330	Short Barrel	1.5	3-wire DC PNP	10-30 VDC	5000	≤150	-25 to +70	IP67	SS	PBT	N/A	YE	--	F	4	A4
Ni2-H08K-AN6X-V1131 16148	Short Barrel	2	3-wire DC NPN	10-30 VDC	5000	≤150	-25 to +70	IP67	SS	PA 12	N/A	YE	--	E	3	A4
Ni2-H08K-AP6X-V1131 16048	Short Barrel	2	3-wire DC PNP	10-30 VDC	5000	≤150	-25 to +70	IP67	SS	PA 12	N/A	YE	--	E	4	A4

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Inductive Barrel Sensors