Harsh Duty Sensors

- Washdown
- Submersible
- Load Dump
- High / Low Temperature
- Pressure Resistant
- Capacitive Noise Immune
Choose TURCK Harsh Duty Sensors to Solve Any Number of Sensor Problems . . .

✓ When excessive heat, cold or pressure bring about equipment breakdowns

✓ When electro static discharge and RFI/EMI make equipment inoperable

✓ When water and chemical damage produces corrosion and malfunction

✓ When conventional sensors are not built strong enough for harsh environments, leading to equipment failure
Important Reasons to Choose TURCK's Harsh Duty Sensors and Cordsets:

✓ More cost effective compared to other comparable sensors
✓ Ensures continuous and reliable operation
✓ Reduces maintenance downtime
✓ Simplifies field installations
✓ Environmentally tested and approved
✓ Variety of innovative, unique sensors and connection solutions for many harsh applications

Harsh Duty Products are Immediately Available to Solve Any of Your Sensing Problems... Even the Most Rigorous:

✓ Washdown Sensors
  - PVDF front cap is impervious to harsh chemicals
  - Viton O-ring provides a quality seal, impervious to harsh chemicals
  - Stainless steel housings provide corrosion resistance
  - 4-way LED provides visible output indication from any direction
  - IP 68/69K seal ratings withstand submersion and high pressure spray in a washdown environment
  - Extended sensing range picks up targets at longer distances
  - Water tight clear Teflon® shrink sleeve over LEDs and label for added protection

Typical applications - Car washes, bottling and food processing applications
✓ Submersible Sensors
  • Functional underwater to a depth of 500 meters in oil, water, and sea water
  • Plastic (polypropylene) is highly resistant to shock, vibration, and caustic chemicals

Typical applications - Oil rigs, offshore drilling, dams, dikes (locks), ship and sewage tanks

✓ Load Dump Sensors
  • ESD protection against static discharge prevents sensor damage; up to 30 kV airborne, 8 kV direct
  • RFI protection against radio frequency interference insures no false signals
  • High transient protection
  • Voltage spike protection protects against sensor burnout
  • Surge protection protects sensors against lightening strikes
  • Stainless steel barrels ensure physical durability
  • 3rd party tested to meet SAE J1113-11, IEC 61000-4-3 and IEC 61000-4-6
    (Immunity to conducted transients on power leads)

Typical applications - Battery operated vehicles, utility trucks, military vehicles, fire/garbage/cement trucks

✓ High and Low Temperature Sensors
  • High and low temperature sensors available with a wide range of uses (-40°C, +100°C, +120°C and +160°C)
  • -40°C - plastic barrel
  • +100°C - plastic, plus new metal barrels in chrome plated brass for added durability
  • +120°C - Stainless Steel barrels with Teflon front cap and cable to resist higher temperatures
  • +160°C - stainless steel barrels with Teflon front cap and cable for additional durability in resisting higher temperatures
  • Approved - CE, UL, CSA

Typical applications - ovens, freezers, bakeries, curing, semi-conductor, glass and steel mills
✓ **High Pressure Sensors**
  - O-ring in middle of housing to create a tight fit in pressure applications
  - Styles available for up to 500 bar (7250 PSI)
  - Stainless steel barrel for durability
  - DC output only
  - High pressure hydraulics

Typical applications - hydraulic cylinders on front loaders, hydraulic power units, tool and die, clamping, punch press, stamping plants

✓ **Capacitive Noise Immune Sensors**
  - ESD protection-static discharge protection against sensor damage; up to 30 kV airborne, 8 kV direct
  - RFI protection-no radio frequency interference
  - Fast Transient protection
  - Line Coupled Noise, immune from 150 KHz - 230 MHz
  - Surge protection-protects against lightening strikes

Typical applications - plastic pellet hoppers, molding machines, or any level detection application
Cable Solutions to Fit Your Harsh Duty Needs

TURCK also provides a wide variety of quality, rugged and durable cordsets that will withstand harsh environments such as cutting fluids, weld slag, abrasion or chemical wash downs.

- eurofast® molded cordsets are designed with a standard M12 thread.
- minifast® molded cordsets are made with an industry standard 7/8-16 UN thread.
- microfast® molded cordsets have a 1/2-20 UNF thread.
- All styles above meet the IP 68 seal rated standard and 1200 PSI washdown rating.

All TURCK cordsets provide a fast, reliable, and easy installation solution that reduce machine downtime and increase productivity. Cordsets are available in straight and right angle configurations with custom cable materials and lengths.

Also available are cable features such as:

- Plastic, nickel-plated brass, or stainless steel coupling nuts.
- Option of molding a connector to sensors with potted-in cable.
- PVC jacket offers an excellent resistance to UV, acids, alkalis, alcohols, most solvents, oils, gasoline, grease and waxes.
- "/S90" PUR is a polyurethane jacket that provides high resistance to oils, cutting oils, and transmission fluids. Superior cut and abrasion resistance.
- "/S101" is a high-flex jacket made of TPR or PUR. Excellent for robotics or any continuous motion applications. Withstands over 10 million bend and torsion flex cycles.
- "/S529" is a double-jacketed cable with a PUR outer jacket and a braided mechanical shield for superior strength and high flexibility. Excellent for applications where cable abrasion or cutting are common.
- "/S600" is a thermoset CPE jacket that is excellent for use where a high resistance to acids, alkalis, gasoline, degreaser solvents, and weld slag are required.
- "/S1587" is a TPR (thermoplastic rubber) that resists many chemicals and oils. Retains its aesthetic appearance, remains flexible, has a high tear strength and is recyclable.

Don't wait for equipment to malfunction or harsh conditions to prevail, choose TURCK Heavy Duty sensor and connection products. If you don't have these features with your current system, you may want to read more about ours in the information that follows. For first class application support to find exactly what you need, please contact us at:

Toll free: 800-544-PROX (7769)
Website: www.turck.com

At TURCK, we look forward to hearing from you!
<table>
<thead>
<tr>
<th>Category</th>
<th>Pages</th>
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<tr>
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<td>Submersible Sensors</td>
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<tr>
<td>Load Dump Sensors</td>
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<tr>
<td>High / Low Temperature Sensors</td>
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<td>Pressure Resistant Sensors</td>
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<tr>
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</tr>
<tr>
<td>Index</td>
<td>71</td>
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</table>
TURCK
Harsh Duty - Sensors

Sensors for Washdown Environments (IEC 529)

IP 67
• Temporary immersion in water, constant temperature
• 1 meter depth
• 30 minute duration

IP 68
• Commonly stands for a higher degree of sealing and is used for reinforced marketing of a product
• Continuous submersion in water, according to customer agreement

TURCK's IP 68 Definition
• IP 67 Plus
• 24 hours at 70°C
• 24 hours at -25°C
• 7 days at 1 meter under water at a constant temperature
• 10 cycles +70°C and -25°C, minimum of 1 hour @ each temperature

TURCK's IP 69K Definition
• IP 67 Plus IP 68 (as defined by TURCK) Plus
• Hot steam jet cleaning per EN 60529 (IP enclosure ratings) and DIN 40050-9

DIN 40050-9
A test sample is placed in a permanent position between 4 and 6 inches from the water jet nozzle. The sample rotates around the axis parallel to the length of the sensor five times per minute. Water temp is 80±5°C. The spray is then directed at 1250 to 1500 PSI directly on the sensor in 30° angle increments for 30 seconds at each point (4 points altogether) for a total of 120 seconds (2 minutes).

Other Testing Procedures:
All wash down sensors were also tested according to the following procedures:
• Sensors are stored for 3 days in fluid - then test for operation
• Heat sensors to +85°C and place in fluid - then test for operation
• Cool sensors to -10°C and place in fluid - then test for operation

Fluids Tested

Detergents
• Soda Lye (caustic) 3%
• KSM 93 R 4% with Ph value of 9.2
• Perchlorethylene (PERC)

Grinding Oil
• Megacut S (Made by Daw Aerocit)

Cutting Oil
• Megacut 22 (Made by Daw Aerocit)

Coolants
• Klarol with Ph value of 9.1
• Aerolan 2400 with Ph value of 9.0
TURCK has developed the new "Load Dump" sensor to solve application problems in large vehicles that use battery operated systems such as lift equipment, garbage trucks, military vehicles, etc. These applications caused problems due to high voltage transients and engineers had to come up with a solution. There were some solutions available, but they were not always the most reliable and economic solutions. TURCK chose to develop this sensor and test it with an outside testing laboratory to meet existing specifications to ensure the sensor will perform as required given the needed protection in this unique application.

The technical name for this type of sensor is "Immunity to Conducted Transients On Power Leads". They have been tested and meet the SAE-J1113-11 specs, described as the following:

- Tests were conducted primarily, but not exclusively, on ignition and battery operated systems of mobile and stationary vehicle systems.
- The tests for SAE-J1113-11 were developed to provide measurable and repeatable test measurements to determine the susceptibility of electrical transients, particularly along battery feed and switched ignition, generated in those systems.

Switching devices such as relays, intermittent alternator/generator switching or battery to load switching can cause very high transients up to 600 volts for durations of up to ½ a second. The energy in these transients is often enough to damage unprotected semiconductor devices (like proximity sensors). The tests were established for both 12 and 24 volt systems. Results also meet IEC 61000-4-3 and 61000-4-6 specs for radiated and injected noise.

There are five basic pulses in these tests of which Pulse 1 and Pulse 5A are the most severe. TURCK passed the tests in both cases. For further data, a copy of the SAE specifications can be obtained from SAE (this is a proprietary document and cannot be copied) or contact TURCK Application Support.
**Noise Immune Capacitive Sensors**

TURCK has developed a completely new circuit for its capacitive sensors. These new "BCF" sensors incorporate a unique filter principle, making them immune to most industrial noise. This principle involves a fixed oscillator frequency combined with a rectifier filter providing superior noise immunity over the competition.

TURCK's fixed oscillator allows the sensor to maintain a constant frequency regardless of sensitivity adjustment. This fixed frequency is high enough to ignore most of the "standard" noise levels seen on plant floors.

Electrical noise is mostly symmetrical which makes it easier to identify and separate from the sensor's input signal. The TURCK rectifier filter is able to block this noise allowing only the "useful" input signal, which is in phase with the oscillator frequency, to pass.

These two innovative electrical techniques give TURCK the best defense against industrial noise. The list of specifications and test results below demonstrates how TURCK meets or exceeds all of the rigid standards established by CE. In fact, the criteria set forth by CE is so stringent that most capacitive sensors offered on the market today cannot pass any or all of these testing requirements. If you have a capacitive sensor application located in a "noisy" environment choose the new "BCF" sensors from TURCK to ensure your process operates smoothly.

TURCK BCF capacitive sensors have been tested to a higher standard than required, exceeding most of the specifications listed by CE.

<table>
<thead>
<tr>
<th>Test Type</th>
<th>CE “Product” Standard</th>
<th>CE “Generic” Standard</th>
<th>TURCK “BCF” Noise Immune Capacitive Sensors</th>
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<tbody>
<tr>
<td>Immunity to Electrostatic Discharge (ESD)</td>
<td>IEC 1000-4-2, EN 61000-4-2</td>
<td>4 kV Direct Contact 8 kV Airborne</td>
<td>8 kV Direct Contact 30 kV Airborne</td>
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<tr>
<td>Immunity to Radiated Electromagnetic Fields, Radio Frequency Interference (RFI)</td>
<td>IEC 1000-4-3, EN 61000-4-3</td>
<td>3 V/M 80-1000 MHz</td>
<td>15 V/M 80-1000 MHz</td>
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<td>Immunity to Electrical Fast Transients (Burst-High Voltage)</td>
<td>IEC 1000-4-4, EN 1000-4-4</td>
<td>2000 V</td>
<td>3000 V</td>
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<td>Immunity to Conducted R.F. Voltage (Line coupled Noise)</td>
<td>IEC 61000-4-6, EN 61000-4-6</td>
<td>Undefined</td>
<td>10 V 150 kHz-80 MHz</td>
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<td>Immunity to Surges (lightning strike)</td>
<td>IEC 60255-5</td>
<td>1KV, 500Ω DC</td>
<td>1 kV, 500Ω DC 5 kV, 500Ω AC</td>
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</tbody>
</table>
Barrel Sensors, Metal, Washdown Environments - *Amphibian*™

**Quick Disconnect**

3-Wire DC

10-30 VDC, Short-Circuit and Overload Protected

Normally Open, NPN (Sinking) or PNP (Sourcing)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
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</table>

**Material**

- Connector: Stainless Steel
- Housing: Stainless Steel
- Front Cap: PVDF

**Accessories**

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

- Ripple: ≤10%
- Differential Travel (Hysteresis): 3-15% (5% typical)
- Voltage Drop Across Conducting Sensor: ≤1.8 V at 200 mA
- Trigger Current for Overload Protection: ≥220 mA
- Continuous Load Current: ≤200 mA
- Off-State (Leakage) Current: <1 mA
- No-Load Current: ≤15 mA
- Time Delay Before Availability: ≤8 ms
- Power-On Effect: Per IEC 947-5-2
- Reverse Polarity Protection: Incorporated
- Wire-Break Protection: Incorporated
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: -0°C to +85°C (-32°F to +185°F)
- Enclosure: Meets NEMA 1,3,4,6,13 and IEC IP 67, 68, and IP 69
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance

Dimensions

1

2

3

4

5

6

Wiring Diagrams
### Barrel Sensors, Metal, Washdown Environments - Amphibian™

**Potted-In Cable**

3-Wire DC

10-30 VDC, Short-Circuit and Overload Protected

Normally Open, NPN (Sinking) or PNP (Sourcing)

### Sensor Selection

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<tr>
<th>Part Number</th>
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<th>Barrel Diameter (mm)</th>
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<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
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<td></td>
<td>2 meter cable, PUR jacket</td>
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</tbody>
</table>

### Cable/Conductor

- **Cable**: PUR jacket; 2 meter standard length
- **Copper Conductor**: 22 AWG

### Material

- **Connector**: Stainless Steel
- **Housing**: Stainless Steel
- **Front Cap**: PVDF

### Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

Ripple .............................................. ≤10%
Differential Travel (Hysteresis) ... 3-15% (5% typical)
Voltage Drop Across Conducting Sensor ... ≤1.8 V at 200 mA
Trigger Current for Overload Protection ... ≥220 mA
Continuous Load Current .......... ≤200 mA
Off-State (Leakage) Current .......... <1 mA
No-Load Current .................. ≤15 mA
Time Delay Before Availability .......... ≤8 ms
Power-On Effect .................. Per IEC 947-5-2
Reverse Polarity Protection .......... Incorporated
Wire-Break Protection .......... Incorporated
Transient Protection .......... Per EN 60947-5-2
Operating Temperature .......... -0°C to +85°C (-32°F to +185°F)
Enclosure .................. Meets NEMA 1,3,4,6,13 and IEC IP 67, 68, and IP 69
Shock .................. 30 g, 11 ms
Vibration .................. 55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability .................. ≤2% of Rated Operating Distance
LED On .................. Output Energized

Dimensions

Wiring Diagrams

A  NPN (Sinking)

B  PNP (Sourcing)
B1 5-P18-AN6/S139-S90

Part Number | Embeddable | Rated Operating Distance (mm) | Barrel Diameter (mm) | NPN (Sinking) | PNP (Sourcing) | Drawing # | Wiring Diagram # of LEDs | Switching Frequency (Hz) | ID Number | Connection
---|---|---|---|---|---|---|---|---|---|---
B1 5-P18-AP6/S139-S90

This sensor will operate at 725 PSI and is resistant to oil and sea water at 500 meters (1641 feet). It is also highly resistant to shock, vibration and caustic chemicals.

### Material

**Barrel:** POM Plastic

**End Cap:** PA 6.6-GF Plastic

**Locknuts:** PA 6-GF30 Plastic

### Accessories

Accessories and mounting devices can be found in 'Sensors' catalog.

### Cable/Conductor

**Cable:** PUR jacket; 2 meter standard length

**Copper Conductor:** 24 AWG

---

TURCK Inductive Sensors

3-Wire DC

Submersible Sensor

3-Wire DC

10-30 VDC, Short-Circuit and Overload Protected

Normally Open, NPN (Sinking) or PNP (Sourcing)
Specifications

- Ripple: ≤10%
- Differential Travel (Hysteresis): 3-15% (5% typical)
- Voltage Drop Across Conducting Sensor: ≤1.8 V at 200 mA
- Trigger Current for Overload Protection: ≥220 mA
- Continuous Load Current: ≤200 mA
- Off-State (Leakage) Current: <10 µA
- No-Load Current: 5.5-9.5 mA
- Time Delay Before Availability: ≤8 ms
- Power-On Effect: Per IEC 947-5-2
- Reverse Polarity Protection: Incorporated
- Wire-Break Protection: Incorporated
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: -25°C to +70°C (-13°F to +158°F)
- Enclosure: Meets NEMA 1,3,4,4x,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance

Dimensions

- 2.362 [60.01] M18 x 1

Wiring Diagrams

A  NPN (Sinking)

B  PNP (Sourcing)
## TURCK Inductive Sensors

### 2-Wire AC Submersible Sensor

**2-Wire AC**
20-250 VAC
Normally Open (AZ3X)

---

### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Normally Open</th>
<th>Normally Closed</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 5-P18-AZ3/S139-S90</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>0</td>
<td>20</td>
<td>M1384300</td>
<td>2 meter cable, PUR jacket</td>
</tr>
</tbody>
</table>

This sensor will operate at 725 PSI and is resistant to oil and sea water at 500 meters (1641 feet). It is also highly resistant to shock, vibration and caustic chemicals.

---

### Cable/Conductor

- **Cable:** PUR Jacket; 2 meter standard
- **Copper Conductor:** 24 AWG

---

### Material

- **Barrel:** POM Plastic
- **End Cap:** PA 6.6-GF Plastic
- **Locknuts:** PA 6-GF30 Plastic

---

### Accessories

Accessories and mounting devices can be found in 'Sensors' catalog.
Specifications

- **Line Frequency**: 40-60 Hz
- **Differential Travel (Hysteresis)**: 3-15% (5% typical)
- **Voltage Drop Across Conducting Sensor**: ≤7.0 V at 500 mA
- **Continuous Load Current**: ≤500 mA
- **Off-State (Leakage) Current**: ≤1.7 mA
- **Minimum Load Current**: ≥5.0 mA
- **Inrush Current**: ≤8.0 A (≤10 ms, 5% Duty Cycle)
- **Time Delay Before Availability**: ≤25 ms
- **Power-On Effect**: Per IEC 947-5-2
- **Transient Protection**: Per EN 60947-5-2
- **Operating Temperature**: -25°C to +70°C (-13°F to +158°F)
- **Enclosure**: Meets NEMA 4, 4X, 6, 6P, 13 and IEC IP 68
- **Shock**: 30 g, 11 ms
- **Vibration**: 55 Hz, 1 mm Amplitude in all 3 Planes
- **Repeatability**: ≤2% of Rated Operating Distance

Dimensions

```
1  
```

```
2.362 (60.01)
```

Wiring Diagram

```
A

BN L1

BU

LDAB

L2
```
Barrel, Metal with Potted-In Cable, Load Dump

Partial Threading

3-Wire DC
10-30 VDC, Short-circuit and Overload Protected
Transient Noise per SAE J 1113/11
Normally Open, NPN (Sinking) or PNP (Sourcing)

Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Reed Optocoupling Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 5-EM18-AN6XLD</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>2000</td>
<td>T4614605</td>
<td>2 meter cable, PVC jacket</td>
</tr>
<tr>
<td>B110-EM30-AN6XLD</td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>•</td>
<td>2</td>
<td>A</td>
<td>1</td>
<td>500</td>
<td>T4617109</td>
<td></td>
</tr>
<tr>
<td>Bi 5-EM18-AP6XLD</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>•</td>
<td>1</td>
<td>B</td>
<td>1</td>
<td>2000</td>
<td>T4614505</td>
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</tr>
<tr>
<td>B110-EM30-AP6XLD</td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>•</td>
<td>2</td>
<td>B</td>
<td>1</td>
<td>500</td>
<td>T4617003</td>
<td></td>
</tr>
</tbody>
</table>

Cable/Conductor

- Cable: PVC Jacket, 2 meter standard length
- Copper Conductor: 18 AWG (PVC insulated)

Material

- Barrel/Locknuts: Stainless Steel
- Sensing Face: PA 12-GF30 Plastic
- End Cap: PUR Plastic

Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
### Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ripple</td>
<td>≤10%</td>
</tr>
<tr>
<td>Differential Travel (Hysteresis)</td>
<td>3-15% (5% typical)</td>
</tr>
<tr>
<td>Voltage Drop Across Conducting Sensor</td>
<td>≤1.8 V at 200 mA</td>
</tr>
<tr>
<td>Trigger Current for Overload Protection</td>
<td>≥220 mA</td>
</tr>
<tr>
<td>Continuous Load Current</td>
<td>≤200 mA</td>
</tr>
<tr>
<td>Off-State (Leakage) Current</td>
<td>&lt;10 µA</td>
</tr>
<tr>
<td>No-Load Current</td>
<td>4.0-9.5 mA</td>
</tr>
<tr>
<td>Time Delay Before Availability</td>
<td>≤8 ms</td>
</tr>
<tr>
<td>Power-On Effect</td>
<td>Per IEC 947-5-2</td>
</tr>
<tr>
<td>Reverse Polarity Protection</td>
<td>Incorporated</td>
</tr>
<tr>
<td>Wire-Break Protection</td>
<td>Incorporated</td>
</tr>
<tr>
<td>Transient Protection</td>
<td></td>
</tr>
<tr>
<td>Vehicle Transients 12-24VDC</td>
<td>Per SAE J 1113/11</td>
</tr>
<tr>
<td>Load Dump 12-24VDC</td>
<td>Per SAE J 1113/11</td>
</tr>
<tr>
<td>Protection Against Transients</td>
<td>2kV, 1ms, 1k</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-25°C to +70°C (-13°F to +158°F)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Meets NEMA 1,3,4,6,13 and IEC IP 67</td>
</tr>
<tr>
<td>Shock</td>
<td>30 g, 11 ms</td>
</tr>
<tr>
<td>Vibration</td>
<td>55 Hz, 1 mm Amplitude in all 3 Planes</td>
</tr>
<tr>
<td>Repeatability</td>
<td>≤2% of Rated Operating Distance</td>
</tr>
<tr>
<td>LED On</td>
<td>Output Energized</td>
</tr>
</tbody>
</table>

### Wiring Diagrams

**A** NPN (Sinking)

```
BU ---- BN
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LOAD</td>
</tr>
</tbody>
</table>

**B** PNP (Sourcing)

```

BU ---- BN

### Dimensions

![1](dimensions1.png)

![2](dimensions2.png)
**P Barrel**

**High Temperature Sensors**

*Plastic Barrel, Full Threading, Quick Disconnect*

3-Wire DC

10-30 VDC, Short-Circuit and Overload Protected

Normally Open, NPN (Sinking) or PNP (Sourcing)

---

### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 5-P18-AN6X-B2341/S100</td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>1000</td>
<td>M1677100</td>
<td>M4697421</td>
</tr>
<tr>
<td>Bi10-P30-AN6X-B2141/S100</td>
<td>•</td>
<td>18</td>
<td>30</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>500</td>
<td>M4697521</td>
<td></td>
</tr>
<tr>
<td>Bi 5-P18-AP6X-B2341/S100</td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>•</td>
<td>2</td>
<td>B</td>
<td>1</td>
<td>1000</td>
<td>M4697321</td>
<td></td>
</tr>
<tr>
<td>Bi10-P30-AP6X-B2141/S100</td>
<td>•</td>
<td>18</td>
<td>30</td>
<td>•</td>
<td>2</td>
<td>B</td>
<td>1</td>
<td>500</td>
<td>M4697521</td>
<td></td>
</tr>
</tbody>
</table>

*\(^{1/}S100^\) - These sensors will operate up to 100°C (212°F)*

---

### Material

- **Barrel:** PA 12-GF30 Plastic
- **Connector:** Polyamide Plastic

### Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

- Ripple: \( \leq 10\% \)
- Differential Travel (Hysteresis): 3-15\% (5\% typical)
- Voltage Drop Across Conducting Sensor: \( \leq 1.8 \) V at 200 mA
- Trigger Current for Overload Protection: \( \geq 220 \) mA
- Continuous Load Current: \( \leq 200 \) mA
- Off-State (Leakage) Current: \( < 10 \) \( \mu \)A
- No-Load Current: \( 5.5-9.5 \) mA
- Time Delay Before Availability: \( \leq 8 \) ms
- Power-On Effect: Per IEC 947-5-2
- Reverse Polarity Protection: Incorporated
- Wire-Break Protection: Incorporated
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: \(-25°C \) to \(+100°C \) (-13°F to +212°F)
- Enclosure: Meets NEMA 1,3,4,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: \( \leq 2\% \) of Rated Operating Distance
- LED On: Output Energized

Dimensions

Wiring Diagrams

A NPN (Sinking)

B PNP (Sourcing)
## High Temperature Sensors

**Plastic Barrel, Partial Threading, Potted-In Cable**

3-Wire DC  
10-30 VDC, Short-Circuit and Overload Protected  
Normally Open, NPN (Sinking)

### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ni15-S30-AN6X/S100</td>
<td>15</td>
<td>30</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>500</td>
<td>M4659321</td>
<td>2 meter cable, PVC jacket</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*S100* - These sensors will operate up to 100°C (212°F)

### Cable/Conductor

- **Cable:** PVC Jacket; 2 meter standard  
- **Copper Conductor:** (PVC insulated) 21 AWG

### Material

- **Barrel:** PA 12-GF30 Plastic  
- **End Cap:** PUR Plastic

### Accessories

Accessories and mounting devices can be found in 'Sensors' catalog.
Specifications

- Ripple: \( \leq 10\% \)
- Differential Travel (Hysteresis): \( 3-15\% \) (5% typical)
- Voltage Drop Across Conducting Sensor: \( \leq 1.8 \) V at 200 mA
- Trigger Current for Overload Protection: \( \geq 220 \) mA
- Continuous Load Current: \( \leq 200 \) mA
- Off-State (Leakage) Current: \( < 10 \) \( \mu \)A
- No-Load Current: \( 5.5-9.5 \) mA
- Time Delay Before Availability: \( \leq 8 \) ms
- Power-On Effect: Per IEC 947-5-2
- Reverse Polarity Protection: Incorporated
- Wire-Break Protection: Incorporated
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: \(-25^\circ C \) to \(+100^\circ C \) (\(-13^\circ F \) to \(+212^\circ F \))
- Enclosure: Meets NEMA 1,3,4,4x,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: \( \leq 2\% \) of Rated Operating Distance
- LED On: Output Energized

Dimensions

![Dimensions Diagram](image-url)
# TURCK Inductive Sensors

## 3-Wire DC

### High Temperature: 100°C

**S Barrel**

**High Temperature Sensors**

*Plastic Barrel, Partial Threading, Potted-In Cable*

3-Wire DC

10-30 VDC, TTL Compatible

Normally Open, NPN (Sinking) or PNP (Sourcing)

---

## Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 2-S12-AN7X/S100</td>
<td>•</td>
<td>2</td>
<td>12</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>2000</td>
<td>M1773100</td>
<td>2 meter cable, PVC jacket</td>
</tr>
<tr>
<td>Bi 5-S18-AN7X/S100</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>•</td>
<td>2</td>
<td>A</td>
<td>1</td>
<td>1000</td>
<td>M1773400</td>
<td></td>
</tr>
<tr>
<td>B110-S30-AN7X/S100</td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>•</td>
<td>3</td>
<td>A</td>
<td>1</td>
<td>500</td>
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</tr>
<tr>
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<td>A</td>
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<td></td>
</tr>
<tr>
<td>Ni 8-S18-AN7X/S100</td>
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<td>18</td>
<td>•</td>
<td>2</td>
<td>A</td>
<td>1</td>
<td>1000</td>
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<td></td>
</tr>
<tr>
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<td>•</td>
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</table>

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 2-S12-AP7X/S100</td>
<td>•</td>
<td>2</td>
<td>12</td>
<td>•</td>
<td>1</td>
<td>B</td>
<td>1</td>
<td>2000</td>
<td>M1755500</td>
</tr>
<tr>
<td>Bi 5-S18-AP7X/S100</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>•</td>
<td>2</td>
<td>B</td>
<td>1</td>
<td>1000</td>
<td>M1754200</td>
</tr>
<tr>
<td>B110-S30-AP7X/S100</td>
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<td>10</td>
<td>30</td>
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<td>3</td>
<td>B</td>
<td>1</td>
<td>500</td>
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<tr>
<td>Ni 4-S12-AP7X/S100</td>
<td>4</td>
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<td>B</td>
<td>1</td>
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</tr>
<tr>
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<td>B</td>
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<td>1000</td>
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</tr>
<tr>
<td>Ni15-S30-AP7X/S100</td>
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<td>•</td>
<td>3</td>
<td>B</td>
<td>1</td>
<td>500</td>
<td>M1768501</td>
<td></td>
</tr>
</tbody>
</table>

'S100' - These sensors will operate up to 100°C (212°F)

---

## Cable/Conductor

| Cable: | PVC Jacket; 2 meter standard |
| Copper Conductor: | S12: 24 AWG |
| (PVC insulated) | S18/S30 and all S100 sensors: 21 AWG |

## Material

| Barrel: | PA 12-CF30 Plastic |
| End Cap: | PUR Plastic |

## Accessories

Accessories and mounting devices can be found in 'Sensors' catalog.
### Specifications

- **Ripple**: ≤10%
- **Differential Travel (Hysteresis)**: 3-15% (5% typical)
- **Voltage Drop Across Conducting Sensor**: ≤0.7 V at 150 mA (0.3 V typical)
- **Continuous Load Current**: ≤150 mA
- **Off-State (Leakage) Current**: <10 µA
- **No-Load Current**: 5.5-9.5 mA
- **Time Delay Before Availability**: ≤8 ms
- **Power-On Effect**: Per IEC 947-5-2
- **Reverse Polarity Protection**: Incorporated
- **Wire-Break Protection**: Incorporated
- **Transient Protection**: Per EN 60947-5-2
- **Operating Temperature**: -25°C to +100°C (-13°F to +212°F)
- **Enclosure**: Meets NEMA 1,3,4,4x,6,13 and IEC IP 67
- **Shock**: 30 g, 11 ms
- **Vibration**: 55 Hz, 1 mm Amplitude in all 3 Planes
- **Repeatability**: ≤2% of Rated Operating Distance
- **LED On**: Output Energized

### Dimensions

#### 1

- **LED**: 157 [4.0]
- **M12x1**: 1.575 [40.0]
- **2.362 [60.0]

#### 2

- **LED**: 157 [4.0]
- **M18x1**: 1.969 [50.0]
- **2.362 [60.0]

#### 3

- **LED**: 157 [4.0]
- **M36x1.5**: 1.969 [50.0]
- **2.362 [63.0]

### Wiring Diagrams

#### A NPN (Sinking)

```
BU -
BN +
BK LOAD
```

#### B PNP (Sourcing)

```
BN +
BU -
BK LOAD
```
### High Temperature Sensors

**M Barrel**

*Metal Barrel, Partial Threading, Potted-In Cable*

#### 3-Wire DC

- 10-30 VDC, Short-Circuit and Overload Protected
- Normally Open, PNP (Sourcing)

#### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 2-M12-AP6X/S100</td>
<td>1</td>
<td>2</td>
<td>12</td>
<td>A</td>
<td>1</td>
<td>2000</td>
<td>A</td>
<td>1</td>
<td>2000 M4605003</td>
<td></td>
<td>2 meter cable, PVC jacket</td>
</tr>
<tr>
<td>B1 5-M18-AP6X/S100</td>
<td>1</td>
<td>5</td>
<td>18</td>
<td>A</td>
<td>1</td>
<td>1000</td>
<td>A</td>
<td>1</td>
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<td>B110-M30-AP6X/S100</td>
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<td>10</td>
<td>30</td>
<td>A</td>
<td>1</td>
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<td>A</td>
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<td>500 M4611004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N1 4-M12-AP6X/S100</td>
<td>1</td>
<td>4</td>
<td>12</td>
<td>A</td>
<td>1</td>
<td>2000</td>
<td>A</td>
<td>1</td>
<td>2000 M4611201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N1 8-M18-AP6X/S100</td>
<td>1</td>
<td>8</td>
<td>18</td>
<td>A</td>
<td>1</td>
<td>1000</td>
<td>A</td>
<td>1</td>
<td>1000 M4617004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N115-M30-AP6X/S100</td>
<td>1</td>
<td>15</td>
<td>30</td>
<td>A</td>
<td>1</td>
<td>500</td>
<td>A</td>
<td>1</td>
<td>500 M4617200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1/S100* - These sensors will operate up to 100°C (212°F)

### Cable/Conductor

- **Cable:** PVC Jacket; 2 meter standard
- **Copper Conductor:** 21 AWG (PVC insulated)

### Material

- **Barrel:** Chrome Plated Brass
- **Connector:** Polyamide Plastic

### Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

- Ripple: ≤10%
- Differential Travel (Hysteresis): 3-15% (5% typical)
- Voltage Drop Across Conducting Sensor: ≤1.8 V at 200 mA
- Trigger Current for Overload Protection: ≥220 mA
- Continuous Load Current: ≤200 mA
- Off-State (Leakage) Current: <10 μA
- No-Load Current: 5.5-9.5 mA
- Time Delay Before Availability: ≤8 ms
- Power-On Effect: Per IEC 947-5-2
- Reverse Polarity Protection: Incorporated
- Wire-Break Protection: Incorporated
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: -25°C to +100°C (-13°F to +212°F)
- Enclosure: Meets NEMA 1,3,4,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance
- LED On: Output Energized

Dimensions

Wiring Diagram

A PNP (Sourcing)
### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 5-S18-VP4X/S100</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>500</td>
<td>M1513402</td>
<td>2 meter cable, PVC jacket</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*S100* - These sensors will operate up to 100°C (212°F)

### Cable/Conductor

- **Cable:** PVC Jacket; 2 meter standard
- **Copper Conductor:** 21 AWG (PVC insulated)

### Material

- **Barrel:** PA 12-CF30 Plastic
- **End Cap:** PUR Plastic

### Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

- Ripple: ≤10%
- Differential Travel (Hysteresis): 3-15% (5% typical)
- Voltage Drop Across Conducting Sensor: ≤1.8 V at 200 mA
- Trigger Current for Overload Protection: ≥220 mA
- Continuous Load Current: ≤200 mA
- Off-State (Leakage) Current: <10 µA
- No-Load Current: 4.0-9.5 mA
- Time Delay Before Availability: ≤8 ms
- Power-On Effect: Per IEC 947-5-2
- Reverse Polarity Protection: Incorporated
- Wire-Break Protection: Incorporated
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: -25°C to +100°C (-13°F to +212°F)
- Enclosure: Meets NEMA 1,3,4,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance
- LED On: Output Energized

Dimensions

![Dimensions Diagram](image_url)
4-Wire DC
10-65 VDC, Short-Circuit and Overload Protected
Complementary Outputs: One N.O., One N.C. (SPDT)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Housing Square (mm)</th>
<th>NPN (sinking)</th>
<th>PNP (sourcing)</th>
<th>Wiring #</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi15-CP40-VN4X2/S100</td>
<td>•</td>
<td>15</td>
<td>40</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>2</td>
<td>150</td>
<td>M1514400</td>
<td>See Quick Disconnect Options below</td>
</tr>
<tr>
<td>Ni20-CP40-VN4X2/S100</td>
<td>•</td>
<td>20</td>
<td>40</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>2</td>
<td>150</td>
<td>M1527200</td>
<td></td>
</tr>
<tr>
<td>Bi15-CP40-VP4X2/S100</td>
<td>•</td>
<td>15</td>
<td>40</td>
<td>•</td>
<td>1</td>
<td>B</td>
<td>2</td>
<td>150</td>
<td>M1501900</td>
<td></td>
</tr>
<tr>
<td>Ni20-CP40-VP4X2/S100</td>
<td>•</td>
<td>20</td>
<td>40</td>
<td>•</td>
<td>1</td>
<td>B</td>
<td>2</td>
<td>150</td>
<td>M1502000</td>
<td></td>
</tr>
</tbody>
</table>

*S100" - These sensors will operate up to 100°C (212°F)

Quick Disconnect Options

For **minifast** connector: Add "-B1141" suffix to part number.
Suggested cordset: RKM 40-2M.
For **eurofast** connector: Add "-H1141" suffix to part number.

Material

| Housing: | PBT-GF30-VO Plastic |
| Sensing: | PBT-GF30-VO Plastic |

Accessories

Accessories and mounting devices can be found in 'Sensors' catalog.
Specifications

- Ripple ≤10%
- Differential Travel (Hysteresis) 3-15% (5% typical)
- Voltage Drop Across Conducting Sensor ≤1.8 V at 200 mA
- Trigger Current for Overload Protection ≥220 mA
- Continuous Load Current ≤200 mA
- Off-State (Leakage) Current <10 µA
- No-Load Current 4.0-9.5 mA
- Time Delay Before Availability ≤8 ms
- Power-On Effect Per IEC 947-5-2
- Reverse Polarity Protection Incorporated
- Wire-Break Protection Incorporated
- Transient Protection Per EN 60947-5-2
- Operating Temperature -25°C to +100°C (-13°F to +212°F)
- Enclosure Meets NEMA 1,3,4,6,13 and IEC IP 67
- Shock 30 g, 11 ms
- Vibration 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability ≤2% of Rated Operating Distance
- LED On Output Energized

Dimensions

Wiring Diagrams

A  NPN (Sinking)

B  PNP (Sourcing)
# Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Normally Open (AZ3X)</th>
<th>Normally Closed (RZ3X)</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Mating Cordsets</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi5-P18-AZ3X-B2331/S100</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>M4374801</td>
<td>RK 30-2M (2 meter)</td>
<td>Consult &quot;Cordsets&quot; catalog</td>
</tr>
<tr>
<td>Bi10-P30-AZ3X-B2131/S100</td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>3</td>
<td>A</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>M1352600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bi110-P18-AZ3X-B2331/S100</td>
<td>10</td>
<td>18</td>
<td></td>
<td>2</td>
<td>A</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>M4375201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bi5-P18-RZ3X-B2331/S100</td>
<td>5</td>
<td>18</td>
<td></td>
<td>1</td>
<td>B</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>M4375001</td>
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<td></td>
</tr>
<tr>
<td>Bi10-P30-RZ3X-B2131/S100</td>
<td>10</td>
<td>30</td>
<td></td>
<td>3</td>
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<td>1</td>
<td>1</td>
<td>20</td>
<td>M1352601</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"S100" - These sensors will operate up to 100°C (212°F)

## Material

- **Barrel:** PA 12-CF30 Plastic
- **Connector:** Polyamide Plastic

## Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
### Specifications

- **Line Frequency**: 40-60 Hz
- **Differential Travel (Hysteresis)**: 3-15% (5% typical)
- **Voltage Drop Across Conducting Sensor**: 100 mA
- **Continuous Load Current**: ≤100 mA
- **Off-State (Leakage) Current**: ≤1.7 mA
- **Minimum Load Current**: ≥5.0 mA
- **Inrush Current**: ≤8.0 A (≤10 ms, 5% Duty Cycle)
- **Time Delay Before Availability**: ≤25 ms
- **Power-On Effect**: Per IEC 947-5-2
- **Transient Protection**: Per EN 60947-5-2
- **Operating Temperature**: -25°C to +100°C (-13°F to +212°F)
- **Enclosure**: Meets NEMA 1,3,4,6,13 and IEC IP 67
- **Shock**: 30 g, 11 ms
- **Vibration**: 55 Hz, 1 mm Amplitude in all 3 Planes
- **Repeatability**: ≤2% of Rated Operating Distance
- **LED On**: Output Energized

### Dimensions

1. **LED**: 0.984 [25.0]
   - 7/8-16UN
   - M18x1
   - L: 5.969 [150.0]
   - 3.220 [82.0]

2. **LED**: 1.003 [27.5]
   - 7/8-16UN
   - M30x1.5
   - L: 2.362 [60.0]
   - 3.150 [80.0]
## High Temperature Sensor

*Plastic Barrel, Partial Threading, Potted-In Cable*

- **2-Wire AC**
- **20-250 VAC**
- Normally Open (AZ3X) or Normally closed (RZ3X)

### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Normally Open</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bi 5-S18-AZ3X/S100</strong></td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>20</td>
<td>M1373400</td>
<td>2 meter cable, PVC jacket</td>
</tr>
<tr>
<td><strong>Bi10-S30-AZ3X/S100</strong></td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>2</td>
<td>A</td>
<td>1</td>
<td>20</td>
<td>M1371900</td>
<td></td>
</tr>
<tr>
<td><strong>N110-S18-AZ3X/S100</strong></td>
<td>•</td>
<td>10</td>
<td>18</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>20</td>
<td>M1371800</td>
<td></td>
</tr>
<tr>
<td><strong>N115-S30-AZ3X/S100</strong></td>
<td>•</td>
<td>15</td>
<td>30</td>
<td>2</td>
<td>A</td>
<td>1</td>
<td>20</td>
<td>M1375800</td>
<td></td>
</tr>
<tr>
<td><strong>Bi 5-S18-RZ3X/S100</strong></td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>1</td>
<td>B</td>
<td>1</td>
<td>20</td>
<td>M1376000</td>
<td></td>
</tr>
<tr>
<td><strong>Bi10-S30-RZ3X/S100</strong></td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>2</td>
<td>B</td>
<td>1</td>
<td>20</td>
<td>M1371300</td>
<td></td>
</tr>
</tbody>
</table>

*"S100" - These sensors will operate up to 100°C (212°F)*

### Cable/Conductor

- **Cable:** PVC Jacket; 2 meter standard
- **Copper Conductor:** 21 AWG

### Material

- **Barrel:** PA 12-GF30 Plastic
- **End Cap:** PUR Plastic

### Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

- **Line Frequency**: 40-60 Hz
- **Differential Travel (Hysteresis)**: 3-15% (5% typical)
- **Voltage Drop Across Conducting Sensor**: 100 mA
- **Continuous Load Current**: ≤100 mA
- **Off-State (Leakage) Current**: ≤1.7 mA
- **Minimum Load Current**: ≥5.0 mA
- **Inrush Current**: ≤8.0 A (≤10 ms, 5% Duty Cycle)
- **Time Delay Before Availability**: ≤25 ms
- **Power-On Effect**: Per IEC 947-5-2
- **Transient Protection**: Per EN 60947-5-2
- **Operating Temperature**: -25°C to +100°C (-13°F to +212°F)
- **Enclosure**: Meets NEMA 1,3,4,6,13 and IEC IP 67
- **Shock**: 30 g, 11 ms
- **Vibration**: 55 Hz, 1 mm Amplitude in all 3 Planes
- **Repeatability**: ≤2% of Rated Operating Distance
- **LED On**: Output Energized

Dimensions

1. **Dimension 1**
   - M10 x 1
   - 1969 (50.01)
   - 2.362 (60.0)
   - 1.57 (4.0)

2. **Dimension 2**
   - M30 x 1.5
   - 1969 (50.01)
   - 2.362 (60.0)
   - 1.57 (4.0)
TURCK Inductive Sensors - Harsh Duty

High Temperature: 100°C

2-Wire AC

20-250 VAC

Connection Programmable; Normally Open or Normally closed

Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Housing Square (mm)</th>
<th>Normally Open</th>
<th>Normally Closed</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>B115-CP40-FZ3X2/S100</td>
<td>•</td>
<td>15</td>
<td>40</td>
<td>•</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>20</td>
<td>M1377600</td>
<td>See Quick Disconnect Options below</td>
</tr>
<tr>
<td>N120-CP40-FZ3X2/S100</td>
<td>20</td>
<td>40</td>
<td></td>
<td>•</td>
<td>•</td>
<td>1</td>
<td>B</td>
<td>1</td>
<td>20</td>
<td>M1377500</td>
<td></td>
</tr>
</tbody>
</table>

*/S100* - These sensors will operate up to 100°C (212°F)

Caution

An electrical shock hazard exists inside of terminal chamber style sensors whenever power is applied. Remove all power to the sensor whenever sensor wiring is exposed.

Quick Disconnect Options

For *minifast* connector: Add "-B1131" suffix to part number. RKM 30-2M.

For *microfast* connector: Add "-B3131" suffix to part number. KB 3T-2.

Material

<table>
<thead>
<tr>
<th>Housing:</th>
<th>PBT-GF30-VO Plastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing Face:</td>
<td>PBT-GF30-VO Plastic</td>
</tr>
</tbody>
</table>

Accessories

Mounting bracket LSAP-2 and other accessories can be found in "Sensors" catalog.
Specifications

- **Line Frequency**: 40-60 Hz
- **Differential Travel (Hysteresis)**: 3-15% (5% typical)
- **Voltage Drop Across Conducting Sensor**: ≤7.0 V at 100 mA
- **Continuous Load Current**: ≤100 mA
- **Off-State (Leakage) Current**: ≤1.7 mA
- **Minimum Load Current**: ≥5.0 mA
- **Inrush Current**: ≤8.0 A (≤10 ms, 5% Duty Cycle)
- **Time Delay Before Availability**: ≤80 ms
- **Power-On Effect**: Per IEC 947-5-2
- **Transient Protection**: Per EN 60947-5-2
- **Operating Temperature**: -25°C to +100°C (-13°F to +212°F)
- **Enclosure**: Meets NEMA 1,3,4,6,13 and IEC IP 67
- **Shock**: 30 g, 11 ms
- **Vibration**: 55 Hz, 1 mm Amplitude in all 3 Planes
- **Repeatability**: ≤2% of Rated Operating Distance
- **LED On (Red)**: Output Energized
- **LED On (Green)**: Power On

Dimensions

- **1**: 287 (7.32x)
  - 209 (5.32x)
  - 1575 (40.0)
  - 1772 (45.0)
  - 2362 (60.0)
  - 4480 (114.0)
  - 1181 (36.0)
  - 1/2-14NPT
TURCK Inductive Sensors - Harsh Duty
2-Wire DC High Temperature: 100°C

High Temperature Sensors
Plastic Barrel, Full Threading, Potted-In Cable

2-Wire DC, Requires Remote Amplifier
5-30 VDC
Variable Resistance Output, NAMUR (EN 50227)

Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>PM Approved Division 1**</th>
<th>Time Delay Before Availability (ms)</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 2-P12-Y0/S100</td>
<td>•</td>
<td>2</td>
<td>12</td>
<td>1</td>
<td>A</td>
<td>0</td>
<td>•</td>
<td>1</td>
<td>5000</td>
<td>M1030200</td>
<td>2 meter cable, PVC jacket</td>
</tr>
<tr>
<td>Bi 5-P18-Y0/S100</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>2</td>
<td>A</td>
<td>0</td>
<td>•</td>
<td>2</td>
<td>1000</td>
<td>M1024500</td>
<td>2 meter cable, PVC jacket</td>
</tr>
<tr>
<td>Bi10-P30-Y0/S100</td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>3</td>
<td>A</td>
<td>0</td>
<td>•</td>
<td>2</td>
<td>500</td>
<td>M1023300</td>
<td>2 meter cable, PVC jacket</td>
</tr>
<tr>
<td>Ni 5-P12-Y0/S100</td>
<td>5</td>
<td>12</td>
<td>1</td>
<td>A</td>
<td>0</td>
<td>•</td>
<td>1</td>
<td>5000</td>
<td>M1024200</td>
<td>2 meter cable, PVC jacket</td>
<td></td>
</tr>
<tr>
<td>Ni10-P18-Y0/S100</td>
<td>10</td>
<td>18</td>
<td>2</td>
<td>A</td>
<td>0</td>
<td>•</td>
<td>2</td>
<td>1000</td>
<td>M1031700</td>
<td>2 meter cable, PVC jacket</td>
<td></td>
</tr>
<tr>
<td>Ni15-P30-Y0/S100</td>
<td>15</td>
<td>30</td>
<td>3</td>
<td>A</td>
<td>0</td>
<td>•</td>
<td>2</td>
<td>500</td>
<td>M1022700</td>
<td>2 meter cable, PVC jacket</td>
<td></td>
</tr>
</tbody>
</table>

*S100* - These sensors will operate up to 100°C (212°F)

** Factory Mutual approval applies only when used with Factory Mutual approved switching amplifiers.

Note: Y0 and Y1 have identical electrical properties. See Sensors Catalog for differences in European approvals.

Cable/Conductor

| Cable: | PVC Jacket; 2 meter standard length |
| Copper Conductor: | 21 AWG |

Material

| Barrel: | PA 12-GF30 Plastic |
| End Cap: | PUR Plastic |

Accessories

Accessories and mounting devices can be found in "Sensors" catalog. Remote Amplifier required. Consult TURCK Isolated Barriers and Amplifiers catalog.
Specifications

- Differential Travel (Hysteresis): 1-10% (5% typical)
- Nominal Voltage: 8.2 VDC (EN 50227)
- Resistance Change from Nonactivated to Activated: 1.0 kΩ to >8.0 kΩ
- Resulting Current Change: ≥2.2 mA to ≤1.0 mA
- Recommended Switching Point for Remote Amplifier: 1.55 mA
- Power-On Effect: Realized in Amplifier
- Reverse Polarity Protection: Incorporated
- Wire-Break Protection: Realized in Amplifier
- Transient Protection: Realized in Amplifier
- Operating Temperature: -25°C to +100°C (-13°F to +212°F)
- Enclosure: Meets NEMA 1,3,4,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance

Dimensions

1

2

3

Wiring Diagram

A NAMUR Output
TURCK Inductive Sensors - Harsh Duty

2-Wire DC  High Temperature: 100°C

CP80

High Temperature Sensors
Modular Construction

2-Wire DC, Requires Remote Amplifier
5-30 VDC
Variable Resistance Output, NAMUR (EN 50227)

Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Housing Diameter (mm)</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>FM Approved</th>
<th>Division 1 **</th>
<th>Time Delay Before Availability (ms)</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>N40-CP80-Y0/S100</td>
<td>40</td>
<td>80</td>
<td>1</td>
<td>A</td>
<td>0</td>
<td>•</td>
<td>8</td>
<td>100</td>
<td>M1040300</td>
<td>See Quick Disconnect Options below</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

'S100' - These sensors will operate up to 100°C (212°F)

** Factory Mutual approval applies only when used with Factory Mutual approved switching amplifiers.

Note: Y0 and Y1 have identical electrical properties. See Sensors Catalog for differences in European approvals.

Quick Disconnect Options

For minifast connector:
Add "-B1141" suffix to part number.
Suggested cordset: RKM 40-2M

For eurofast connector:
Add "-H1141" suffix to part number.
Suggested cordset: RK 4.21T-2

Material

Housing: PBT-GF30-VO Plastic
Terminal Chamber Cover: Trogamid T

Accessories

Accessories and mounting devices can be found in 'Sensors' catalog. Remote Amplifier required. Consult TURCK Isolated Barriers and Amplifiers catalog.
Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differential Travel (Hysteresis)</td>
<td>1-10% (5% typical)</td>
</tr>
<tr>
<td>Nominal Voltage</td>
<td>8.2 VDC (EN 50227)</td>
</tr>
<tr>
<td>Resistance Change from Nonactivated to Activated</td>
<td>1.0 k to &gt;8.0 k</td>
</tr>
<tr>
<td>Resulting Current Change</td>
<td>≥2.2 mA to ≤1.0 mA</td>
</tr>
<tr>
<td>Remote Amplifier</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Power-On Effect</td>
<td>Realized in Amplifier</td>
</tr>
<tr>
<td>Reverse Polarity Protection</td>
<td>Incorporated</td>
</tr>
<tr>
<td>Wire-Break Protection</td>
<td>Realized in Amplifier</td>
</tr>
<tr>
<td>Transient Protection</td>
<td>Realized in Amplifier</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-25°C to +100°C (-13°F to +212°F)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Meets NEMA 1,3,4,6,13 and IEC IP 67</td>
</tr>
<tr>
<td>Shock</td>
<td>30 g, 11 ms</td>
</tr>
<tr>
<td>Vibration</td>
<td>55 Hz, 1 mm Amplitude in all 3 Planes</td>
</tr>
<tr>
<td>Repeatability</td>
<td>≤2% of Rated Operating Distance</td>
</tr>
</tbody>
</table>

Dimensions

Wiring Diagram

A NAMUR Output

---

TURCK Inc. 3000 Campus Drive Minneapolis, MN 55441 Application Support: 1-800-544-PROX Fax: (763) 553-0708 www.turck.com
## TURCK Inductive Sensors

**3-Wire DC High Temperature: 120°C**

### EM Barrel

**High Temperature Sensors**

*Metal Barrel, Partial Threading, Potted-In Cable*

3-Wire DC

10-30 VDC, Short-Circuit and Overload Protected

Normally Open, PNP (Sourcing)

### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Wiring Diagram #</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 2-EM12D-AP6/S120</td>
<td>•</td>
<td>2</td>
<td>12</td>
<td>1</td>
<td>A</td>
<td>1000</td>
<td>1000</td>
<td>M4614512</td>
<td>2 meter cable, PTFE jacket</td>
</tr>
<tr>
<td>Bi 5-EM18D-AP6X/S120</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>3</td>
<td>A 1</td>
<td>1000</td>
<td>M4614510</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B110-EM30D-AP6X/S120</td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>5</td>
<td>A 1</td>
<td>1000</td>
<td>M4617030</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N1 4-EM12D-AP6/120</td>
<td>•</td>
<td>4</td>
<td>12</td>
<td>2</td>
<td>A</td>
<td>1000</td>
<td>M1633110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N1 7-EM18D-AP6X/S120</td>
<td>•</td>
<td>7</td>
<td>18</td>
<td>4</td>
<td>A 1</td>
<td>1000</td>
<td>M4632000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N115-EM30D-AP6X/S120</td>
<td>•</td>
<td>15</td>
<td>30</td>
<td>6</td>
<td>A 1</td>
<td>1000</td>
<td>M4617400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*S120* - These sensors will operate up to 120°C (248°F)

### Cable/Conductor

<table>
<thead>
<tr>
<th>Cable:</th>
<th>PTFE Jacket; 2 meter standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper Conductor:</td>
<td>EM12: 24 AWG</td>
</tr>
<tr>
<td></td>
<td>EM18/EM30 22 AWG</td>
</tr>
</tbody>
</table>

### Material

<table>
<thead>
<tr>
<th>Barrel:</th>
<th>Stainless Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front Cap:</td>
<td>PTFE</td>
</tr>
</tbody>
</table>

### Accessories

Accessories and mounting devices can be found in 'Sensors' catalog.
Specifications

Ripple .............................................. ≤10%
Differential Travel (Hysteresis) ....... 3-15% (5% typical)
Voltage Drop Across Conducting Sensor ... ≤0.7 V at 150 mA (0.3 V typical)
Continuous Load Current ................. ≤150 mA
Off-State (Leakage) Current .............. <10 µA
No-Load Current ................................. 5.5-9.5 mA
Time Delay Before Availability .......... ≤8 ms
Power-On Effect ............................... Per IEC 947-5-2
Reverse Polarity Protection .............. Incorporated
Wire-Break Protection ....................... Incorporated
Transient Protection ....................... Per EN 60947-5-2
Operating Temperature .................... -25°C to +120°C (-13°F to +248°F)
Enclosure ........................................... Meets NEMA 1,3,4,4x,6,13 and IEC IP 67
Shock ..................................................... 30 g, 11 ms
Vibration ............................................ 55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability .................................... ≤2% of Rated Operating Distance
LED On .............................................. Output Energized

Dimensions

Wiring Diagram

A PNP (Sourcing)

Specifications Wiring Diagram

Dimensions

1

2

3

4

5

6
**TURCK Inductive Sensors**

**3-Wire DC High Temperature: 160°C**

**EM Barrel**

**3-Wire DC**

10-30 VDC, Short-Circuit and Overload Protected

Normally Open, PNP (Sourcing)

---

**High Temperature Sensors**

**Metal Barrel, Partial Threading, Potted-In Cable**

---

**Sensor Selection**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 5-EM18-AP6/S907</td>
<td>• 5 18</td>
<td>• 1 A</td>
<td>2000</td>
<td>M4617425</td>
<td>2 meter cable, PTFE jacket</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bi10-EM30-AP6/S907</td>
<td>• 10 30</td>
<td>• 2 A</td>
<td>2000</td>
<td>M4614513</td>
<td>2 meter cable, PTFE jacket</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*/S907* - These sensors will operate up to 160°C (320°F)

---

**Cable/Conductor**

- **Cable:** PTFE Jacket; 2 meter standard
- **Copper Conductor:** 24 AWG

---

**Material**

- **Barrel:** Stainless Steel
- **Connector:** Polyamide Plastic
- **Front Face:** PTFE

---

**Accessories**

Accessories and mounting devices can be found in *Sensors* catalog.
Specifications

- Ripple: ≤10%
- Differential Travel (Hysteresis): 3-15% (5% typical)
- Voltage Drop Across Conducting Sensor: ≤0.7 V at 150 mA (0.3 V typical)
- Continuous Load Current: ≤150 mA
- Off-State (Leakage) Current: <10 µA
- No-Load Current: 5.5-9.5 mA
- Time Delay Before Availability: ≤8 ms
- Power-On Effect: Per IEC 947-5-2
- Reverse Polarity Protection: Incorporated
- Wire-Break Protection: Incorporated
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: -25°C to +160°C (-13°F to +320°F)
- Enclosure: Meets NEMA 1,3,4,4x,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance
- LED On: Output Energized

Dimensions

Wiring Diagram
### S Barrel

**Low Temperature Sensors**  
*Plastic Barrel, Partial Threading, Potted-In Cable*

3-Wire DC  
10-30 VDC, Short-Circuit and Overload Protected  
Normally Open, PNP (Sourcing)

#### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Sinking</th>
<th>Sourcing</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 2-S12-AP6X/S97</td>
<td>•</td>
<td>2</td>
<td>12</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>2000</td>
<td>M1664500</td>
<td>2 meter cable, Silicon jacket</td>
</tr>
<tr>
<td>Bi 5-S18-AP6X/S97</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>•</td>
<td>2</td>
<td>A</td>
<td>1</td>
<td>1000</td>
<td>M4656025</td>
<td></td>
</tr>
<tr>
<td>Bi10-S30-AP6X/S97</td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>•</td>
<td>3</td>
<td>A</td>
<td>1</td>
<td>500</td>
<td>M4659003</td>
<td></td>
</tr>
<tr>
<td>Ni 4-S12-AP6X/S97</td>
<td>4</td>
<td>12</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>2000</td>
<td>M4653221</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ni 8-S18-AP6X/S97</td>
<td>8</td>
<td>18</td>
<td>•</td>
<td>2</td>
<td>A</td>
<td>1</td>
<td>1000</td>
<td>T4656201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N115-S30-AP6X/S97</td>
<td>15</td>
<td>30</td>
<td>•</td>
<td>3</td>
<td>A</td>
<td>1</td>
<td>500</td>
<td>M4658202</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"/S97" - These sensors will operate down to -40°C (-40°F)

#### Cable/Conductor

- **Cable:** Silicon Jacket; 2 meter standard  
- **Copper Conductor:** 21 AWG

#### Material

- **Barrel:** PA 12-CF30 Plastic  
- **Connector:** Polyamide Plastic

#### Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

- Ripple: ≤10%
- Differential Travel (Hysteresis): 3-15% (5% typical)
- Voltage Drop Across Conducting Sensor: ≤1.8 V at 200 mA
- Trigger Current for Overload Protection: ≥220 mA
- Continuous Load Current: ≤200 mA
- Off-State (Leakage) Current: <10 µA
- No-Load Current: 5.5-9.5 mA
- Time Delay Before Availability: ≤8 ms
- Power-On Effect: Per IEC 947-5-2
- Reverse Polarity Protection: Incorporated
- Wire-Break Protection: Incorporated
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: -40°C to +70°C (-40°F to +158°F)
- Enclosure: Meets NEMA 1,3,4,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance
- LED On: Output Energized

Dimensions

Wiring Diagram
**S Barrel**

**Low Temperature Sensors**

*Plastic Barrel, Partial Threading, Potted-In Cable*

4-Wire DC

10-65 VDC, Short-Circuit and Overload Protected

Normally Open, PNP (Sourcing)

---

**Sensor Selection**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Sinking</th>
<th>Sourcing</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 5-S18-VP4X/S97</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>•</td>
<td>1 A</td>
<td>1000</td>
<td>M1513420</td>
<td>M1512221</td>
<td>2 meter cable, Silicon jacket</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B110-S30-VP4X/S97</td>
<td>•</td>
<td>10</td>
<td>30</td>
<td>•</td>
<td>2 A</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N1 8-S18-VP4X/S97</td>
<td></td>
<td>8</td>
<td>18</td>
<td>•</td>
<td>1 A</td>
<td>1000</td>
<td>M1513512</td>
<td>M1514110</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N115-S30-VP4X/S97</td>
<td></td>
<td>15</td>
<td>30</td>
<td>•</td>
<td>2 A</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*S97* - These sensors will operate down to -40°C (-40°F)

---

**Cable/Conductor**

- **Cable:** Silicon Jacket; 2 meter standard
- **Copper Conductor:** 21 AWG

---

**Material**

- **Barrel:** PA 12-GF30 Plastic
- **Connector:** Polyamide Plastic

---

**Accessories**

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

- Ripple: ≤10%
- Differential Travel (Hysteresis): 3-15% (5% typical)
- Voltage Drop Across Conducting Sensor: ≤1.8 V at 200 mA
- Trigger Current for Overload Protection: ≥220 mA
- Continuous Load Current: ≤200 mA
- Off-State (Leakage) Current: <10 µA
- No-Load Current: 4.0-9.5 mA
- Time Delay Before Availability: ≤8 ms
- Power-On Effect: Per IEC 947-5-2
- Reverse Polarity Protection: Incorporated
- Wire-Break Protection: Incorporated
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: -40°C to +70°C (-40°F to +158°F)
- Enclosure: Meets NEMA 1,3,4,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance
- LED On: Output Energized

Dimensions

Wiring Diagram

A PNP (Sourcing)

[Diagram of wiring diagram]
TURCK Inductive Sensors

4-Wire DC

Low Temperature: -40°C

CP40

Low Temperature Sensors
Limit Switch and Long Range Style

4-Wire DC
10-65 VDC, Short-Circuit and Overload Protected
Complementary Outputs: One N.O., One N.C. (SPDT)

CP80

Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Sinking</th>
<th>Switching</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>B115-CP40-VP4X2/S97</td>
<td>•</td>
<td>15</td>
<td>40</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>2</td>
<td>150</td>
<td>M1505800</td>
<td>See Quick Disconnect Options below</td>
</tr>
<tr>
<td>N120-CP40-VP4X2/S97</td>
<td>•</td>
<td>20</td>
<td>40</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>2</td>
<td>150</td>
<td>M1569101</td>
<td></td>
</tr>
<tr>
<td>N140-CP80-VP4X2/S97</td>
<td></td>
<td>20</td>
<td>80</td>
<td>•</td>
<td>2</td>
<td>A</td>
<td>2</td>
<td>100</td>
<td>M1569522</td>
<td></td>
</tr>
</tbody>
</table>

*/S97* - These sensors will operate down to -40°C (-40°F)

Quick Disconnect Options

For minifast connector: Add “-B1141” suffix to part number.
Suggested cordset: R0M 40-2M
For eurofast connector: Add “-H1141” suffix to part number.
Suggested cordset: RK 4.4T-2

Material

Housing: PBT-GF30-VO Plastic
Sensing: CP40: PBT-GF30-VO Plastic
Terminal Chamber Cover: CP80: Trogamid T

Accessories

Accessories and mounting devices can be found in 'Sensors' catalog.
Specifications

Ripple ........................................... ≤10%
Differential Travel (Hysteresis) ............ 3-15% (5% typical)
Voltage Drop Across Conducting Sensor ... ≤1.8 V at 200 mA
Trigger Current for Overload Protection ... ≥220 mA
Continuous Load Current ................. ≤200 mA
Off-State (Leakage) Current .............. <10 µA
No-Load Current .............................. 4.0-9.5 mA
Time Delay Before Availability .............. ≤8 ms
Power-On Effect .......................... Per IEC 947-5-2
Reverse Polarity Protection ................. Incorporated
Wire-Break Protection .................. Incorporated
Transient Protection .................. Per EN 60947-5-2
Operating Temperature ................... -40°C to +70°C (-40°F to +158°F)
Enclosure ................................. Meets NEMA 1,3,4,6,13 and IEC IP 67
Shock ........................................... 30 g, 11 ms
Vibration ..................................... 55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability ........................ ≤2% of Rated Operating Distance
LED On ....................................... Output Energized

Dimensions

1

2

Wiring Diagram

A  PNP (Sourcing)

Specifications Wiring Diagram

Dimensions

TURCK Inc. 3000 Campus Drive Minneapolis, MN 55441 Application Support: 1-800-544-PROX Fax: (763) 553-0708 www.turck.com
TURCK Inductive Sensors
2-Wire AC
Low Temperature: -40°C

S Barrel

Low Temperature Sensors
Plastic Barrel, Partial Threading, Potted-In Cable

2-Wire AC
20-250 VAC
Normally Open

Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Normally Open</th>
<th>Normally Closed</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 2-S12-AZ31X/S97</td>
<td>•</td>
<td>2</td>
<td>12</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>2</td>
<td>20</td>
<td>M1302002</td>
<td>2 meter cable, Silicon jacket</td>
</tr>
<tr>
<td>N1 4-S12-AZ31X/S97</td>
<td>4</td>
<td>12</td>
<td>•</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>M1302202</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*/S97*: These sensors will operate down to -40°C (-40°F)

Cable/Conductor

- Cable: Silicon Jacket; 2 meter standard
- Copper Conductor: 21 AWG

Material

- Barrel: PA 12-CF30 Plastic
- Connector: Polyamide Plastic

Accessories

Accessories and mounting devices can be found in 'Sensors' catalog.
Specifications

- Line Frequency: 40-60 Hz
- Differential Travel (Hysteresis): 3-15% (5% typical)
- Voltage Drop Across Conducting Sensor: ≤11.0 V at 200 mA
- Trigger Current for Overload Protection: ≥220 mA
- Continuous Load Current: ≤200 mA
- Off-State (Leakage) Current: ≤1.7 mA
- Minimum Load Current: ≥5.0 mA
- Inrush Current: ≤1.0 A (≤10 ms, 5% Duty Cycle)
- Time Delay Before Availability: ≤8 ms
- Power-On Effect: Per IEC 947-5-2
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: -40°C to +70°C (-40°F to +158°F)
- Enclosure: Meets NEMA 1,3,4,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance
- LED On: Output Energized

Dimensions

- M12 x 1
- 157 (40.0)
- 1575 (40.0)
- 2.362 (60.0)
TURCK Inductive Sensors

2-Wire AC Low Temperature: -40°C

---

### CP40

**Low Temperature Sensors**

*Limit Switch and Long Range Style*

2-Wire AC

20-250 VAC

Connection Programmable; Normally Open or Normally Closed

---

### CP80

---

#### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Normally Open</th>
<th>Normally Closed</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>B115-CP40-FZ3X2/S97</td>
<td>✔</td>
<td>15</td>
<td>40</td>
<td>✔</td>
<td>✔</td>
<td>A</td>
<td>2</td>
<td>20</td>
<td>M1341015</td>
<td>See Quick Disconnect Options below.</td>
</tr>
<tr>
<td>N120-CP40-FZ3X2/S97</td>
<td></td>
<td>20</td>
<td>40</td>
<td>✔</td>
<td>✔</td>
<td>A</td>
<td>2</td>
<td>20</td>
<td>M1340123</td>
<td></td>
</tr>
<tr>
<td>N140-CP80-FZ3X2/S97</td>
<td></td>
<td>40</td>
<td>80</td>
<td>✔</td>
<td>✔</td>
<td>A</td>
<td>2</td>
<td>20</td>
<td>M1340510</td>
<td></td>
</tr>
</tbody>
</table>

*“/S97” - These sensors will operate down to -40°C (-40°F)*

---

#### Caution

An electrical shock hazard exists inside of terminal chamber style sensors whenever power is applied. Remove all power to the sensor whenever sensor wiring is exposed.

---

#### Quick Disconnect Options

For **minifast** connector: Add “-81131” suffix to part number.

Suggested cordset: RKM 30-2M

For **eurofast** connector: Add “-85131” suffix to part number.

Suggested cordset: KB 3T-2.

---

#### Material

- **Housing:** PBT-GF30-VO Plastic
- **Sensing:** CP40: PBT-GF30-VO Plastic
- **Terminal Chamber Cover:** CP80: Trogamid T

---

#### Accessories

Accessories and mounting devices can be found in 'Sensors' catalog.
Specifications

- Line Frequency: 40-60 Hz
- Differential Travel (Hysteresis): 3-15% (5% typical)
- Voltage Drop Across Conducting Sensor: ≤11.0 V at 200 mA
- Trigger Current for Overload Protection: ≥220 mA
- Continuous Load Current: ≤200 mA
- Off-State (Leakage) Current: ≤1.7 mA
- Minimum Load Current: >5.0 mA
- Inrush Current: ≤1.0 A (10 ms, 5% Duty Cycle)
- Time Delay Before Availability: ≤8 ms
- Power-On Effect: Per IEC 947-5-2
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: -40°C to +70°C (-40°F to +160°F)
- Enclosure: Meets NEMA 1,3,4,6,13 and IEC IP 67
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance
- LED On: Output Energized

Dimensions

Wiring Diagram
### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th>FM Approved Division 1 Hz</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi 2-P12-Y1X/S97</td>
<td>•</td>
<td>2</td>
<td>12</td>
<td>1</td>
<td>A</td>
<td>•</td>
<td>5000</td>
<td>M4030021</td>
<td>2 meter cable, Silicon jacket</td>
</tr>
<tr>
<td>Bi 5-P18-Y1X/S97</td>
<td>•</td>
<td>5</td>
<td>18</td>
<td>2</td>
<td>A</td>
<td>•</td>
<td>1000</td>
<td>M1024504</td>
<td></td>
</tr>
<tr>
<td>Ni 5-P12-Y1X/S97</td>
<td>5</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>A</td>
<td>•</td>
<td>2000</td>
<td>M1009402</td>
<td></td>
</tr>
<tr>
<td>Ni10-P18-Y1X/S97</td>
<td>10</td>
<td>18</td>
<td>2</td>
<td>1</td>
<td>A</td>
<td>•</td>
<td>500</td>
<td>M4035121</td>
<td></td>
</tr>
</tbody>
</table>

*“S97” - These sensors will operate down to -40°C (-40°F)*

** Factory Mutual approval applies only when used with Factory Mutual approved switching amplifiers.

** Note:** Y0 and Y1 have identical electrical properties. See Sensors Catalog for differences in European approvals.

### Cable/Conductor

- **Cable:** Silicon Jacket; 2 meter standard length
- **Copper Conductor:**
  - P12: 24 AWG
  - P18: 21 AWG

### Material

- **Barrel:** PA 12-GF30 Plastic
- **End Cap:** PUR Plastic

### Accessories

Accessories and mounting devices can be found in "Sensors" catalog. Remote Amplifier required. Consult **TURCK Isolated Barriers & Amplifiers** catalog.
### Specifications

- **Differential Travel (Hysteresis)**: 1-10% (5% typical)
- **Nominal Voltage**: 8.2 VDC (EN 50227)
- **Resistance Change from Nonactivated to Activated**: 1.0 kΩ to >8.0 kΩ
- **Resulting Current Change**: ≥2.2 mA to ≤1.0 mA
- **Recommended Switching Point for Remote Amplifier**: 1.55 mA
- **Power-On Effect**: Realized in Amplifier
- **Reverse Polarity Protection**: Incorporated
- **Wire-Break Protection**: Realized in Amplifier
- **Transient Protection**: Realized in Amplifier
- **Operating Temperature**: -40°C to +70°C (-40°F to +158°F)
- **Enclosure**: Meets NEMA 1,3,4,6,13 and IEC IP 67
- **Shock**: 30 g, 11 ms
- **Vibration**: 55 Hz, 1 mm Amplitude in all 3 Planes
- **Repeatability**: ≤2% of Rated Operating Distance
- **LED On**: Output Energized

### Dimensions

1. 1.181 [30.0] M12x1
2. 1.181 [30.0] M8x1
TURCK Inductive Sensors

2-Wire DC  Low Temperature: -40°C

CP40

Low Temperature Sensors
Rectangular Style

2-Wire DC, Requires Remote Amplifier
5-30 VDC
Variable Resistance Output, NAMUR (EN 50227)

CP80

Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Housing Diameter (mm)</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>FM Approved Division 1 **</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>B115-CP40-Y0X/S97</td>
<td>*</td>
<td>15</td>
<td>40</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>150</td>
<td>M1039701</td>
<td>See Quick Disconnect Options below</td>
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<tr>
<td>N120-CP40-Y0X/S97</td>
<td></td>
<td>20</td>
<td>40</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>150</td>
<td>M1043200</td>
<td></td>
</tr>
<tr>
<td>N140-CP80-Y0/S97</td>
<td></td>
<td>40</td>
<td>80</td>
<td>2</td>
<td>A</td>
<td>0</td>
<td>100</td>
<td>M1040010</td>
<td></td>
</tr>
</tbody>
</table>

*/S97* - These sensors will operate down to -40°C (-40°F)

** Factory Mutual approval applies only when used with Factory Mutual approved switching amplifiers.

Note: Y0 and Y1 have identical electrical properties. See Sensors Catalog for differences in European approvals.

Quick Disconnect Options

For minifast connector: Add "B1141" suffix to part number.
Suggested cordset: R00 40-2M

For eurofast connector: Add "H1141" suffix to part number.
Suggested cordset: RK 4.21T

Material

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing:</td>
<td>PBT-GF30-VO Plastic</td>
</tr>
<tr>
<td>Sensing:</td>
<td>CP40: PBT-GF30-VO Plastic</td>
</tr>
<tr>
<td>Terminal Chamber Cover:</td>
<td>CP80: Trogamid T</td>
</tr>
</tbody>
</table>

Accessories

Accessories and mounting devices can be found in 'Sensors' catalog. Remote Amplifier required. Consult TURCK Isolated Barriers & Amplifiers catalog.
### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differential Travel (Hysteresis)</td>
<td>1-10% (5% typical)</td>
</tr>
<tr>
<td>Nominal Voltage</td>
<td>8.2 VDC (EN 50227)</td>
</tr>
<tr>
<td>Resistance Change from</td>
<td></td>
</tr>
<tr>
<td>Nonactivated to Activated</td>
<td>1.0 k to &gt;8.0 k</td>
</tr>
<tr>
<td>Resulting Current Change</td>
<td>≥2.2 mA to ≤1.0 mA</td>
</tr>
<tr>
<td>Recommended Switching Point for</td>
<td></td>
</tr>
<tr>
<td>Remote Amplifier</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Power-On Effect</td>
<td>Realized in Amplifier</td>
</tr>
<tr>
<td>Reverse Polarity Protection</td>
<td>Incorporated</td>
</tr>
<tr>
<td>Wire-Break Protection</td>
<td>Realized in Amplifier</td>
</tr>
<tr>
<td>Transient Protection</td>
<td>Realized in Amplifier</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to +70°C (+4°F to +158°F)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Meets NEMA 1,3,4,6,13 and IEC IP 67</td>
</tr>
<tr>
<td>Shock</td>
<td>30 g, 11 ms</td>
</tr>
<tr>
<td>Vibration</td>
<td>55 Hz, 1 mm Amplitude in all 3 Planes</td>
</tr>
<tr>
<td>Repeatability</td>
<td>≤2% of Rated Operating Distance</td>
</tr>
<tr>
<td>LED On</td>
<td>Output Energized</td>
</tr>
</tbody>
</table>

### Dimensions

![Diagram](image)

**1**

- 4.438 [45.0]
- 2.362 [60.0]
- 1.81 [45.0]
- 1/2-14NPT
- 209 [53.3]

**2**

- 1.772 [45.0]
- 1.579 [40.0]
- 4.217 [107.0]
# TURCK Inductive Sensors

## 3-Wire DC  
### Pressure Resistant

**G Barrel**

**Pressure Resistant Barrel Sensors, Metal**  
*Potted-In Cable and Quick Disconnect*

3-Wire DC  
10-30 VDC, Short-Circuit and Overload Protected  
Normally Open, NPN (Sinking) or PNP (Sourcing)

## Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>BID2-G180-AN6/S220</td>
<td>•</td>
<td>2</td>
<td>18</td>
<td>•</td>
<td>1 A 0</td>
<td>2000</td>
<td></td>
<td></td>
<td>M1688051</td>
<td>2 meter cable, PVC Jacket</td>
</tr>
<tr>
<td>BID2-G180-AP6/S220</td>
<td>•</td>
<td>2</td>
<td>18</td>
<td>•</td>
<td>1 B 0</td>
<td>2000</td>
<td></td>
<td></td>
<td>M1688000</td>
<td></td>
</tr>
<tr>
<td>BID2-G180-AP6-H1141/S220</td>
<td>•</td>
<td>2</td>
<td>18</td>
<td>•</td>
<td>2 C 0</td>
<td>2000</td>
<td></td>
<td></td>
<td>M1688501</td>
<td></td>
</tr>
</tbody>
</table>

*"S220" - Potted oscillator head

**Cable/Conductor**

- **Cable:** PVC jacket; 2 meter standard length
- **Copper Conductor:** 24 AWG

**Material**

- **Barrel:** Stainless Steel  
  **End Cap:** PA 12-GF30 Plastic

**Accessories**

Accessories and mounting devices can be found in "Sensors" catalog.
### Specifications

- **Ripple**: ≤10%
- **Differential Travel (Hysteresis)**: 3-15% (5% typical)
- **Voltage Drop Across Conducting Sensor**: ≤1.8 V at 200 mA
- **Continuous Load Current**: ≤200 mA
- **Off-State (Leakage) Current**: <10 µA
- **No-Load Current**: 5.5-9.5 mA
- **Pressure Static (.../S212)**: ≤500 bar
- **Pressure Dynamic (.../S212)**: ≤350
- **Pressure Dynamic (.../S220)**: ≤60
- **Power-On Effect**: Per IEC 947-5-2
- **Reverse Polarity Protection**: Incorporated
- **Wire-Break Protection**: Incorporated
- **Transient Protection**: Per EN 60947-5-2
- **Operating Temperature (.../S212)**: -10°C to +70°C (14°F to +158°F)
- **Operating Temperature (.../S220)**: -25°C to +70°C (-13°F to +158°F)
- **Enclosure**: Meets NEMA 1,3,4,4x,6,13 and IEC IP 67
- **Shock**: 30 g, 11 ms
- **Vibration**: 55 Hz, 1 mm Amplitude in all 3 Planes
- **Repeatability**: ≤2% of Rated Operating Distance

### Dimensions

![Dimensions](image_url)

1. M18x1
   - Ø.551 [14.0]
   - 0.630 [16.0]
   - 0-RING [15.0]
   - 1.772 [45.0]
   - 2.343 [59.5]

2. M12x1
   - M18x1
   - 0-RING [15.0]
   - 1.772 [45.0]
   - 2.283 [58.0]
   - 0.630 [16.0]
   - 0.315 [8.0]
TURCK Inductive Sensors
2-Wire DC  Pressure Resistant

Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1D2-G180-Y1/S212</td>
<td>•</td>
<td>2</td>
<td>18</td>
<td>A</td>
<td>0</td>
<td>2000</td>
<td>M1088003</td>
<td>2 meter cable, PVC jacket</td>
</tr>
<tr>
<td>B1D2-G180-Y1/S220</td>
<td>•</td>
<td>2</td>
<td>18</td>
<td>A</td>
<td>0</td>
<td>2000</td>
<td>M1088000</td>
<td></td>
</tr>
</tbody>
</table>

*S212* - New manufacturing technology (core and coil potted differently)
*S220* - Potted oscillator head

Sensor Selection

2-Wire DC, Requires Remote Amplifier
5-30 VDC
Variable Resistance Output, NAMUR (EN 50227)

Cable/Conductor

- **Cable:** PVC Jacket; 2 meter standard length
- **Copper Conductor:**

Material

- **Barrel:** PA 12-CF30 Plastic
- **End Cap:** PUR Plastic

Accessories

Accessories and mounting devices can be found in 'Sensors' catalog. Remote Amplifier required. Consult TURCK Isolated Barriers & Amplifiers catalog.
### Specifications

- **Differential Travel (Hysteresis)**: 1-10% (5% typical)
- **Nominal Voltage**: 8.2 VDC (EN 50227)
- **Resistance Change from Nonactivated to Activated**: 1.0 kΩ to >8.0 kΩ
- **Resulting Current Change**: ≥2.2 mA to ≤1.0 mA
- **Recommended Switching Point for Remote Amplifier**: 1.55 mA
- **Pressure Static (.../S212)**: ≤500
- **Pressure Dynamic (.../S212)**: ≤350
- **Power-On Effect**: Realized in Amplifier
- **Reverse Polarity Protection**: Incorporated
- **Wire-Break Protection**: Realized in Amplifier
- **Operating Temperature (.../S212)**: -10°C to +70°C (-14°F to +158°F)
- **Enclosure**: Meets NEMA 1,3,4,6,13 and IEC IP 67
- **Shock**: 30 g, 11 ms
- **Vibration**: 55 Hz, 1 mm Amplitude in all 3 Planes
- **Repeatability**: ≤2% of Rated Operating Distance
- **LED On**: Output Energized

### Dimensions

![Dimensions Diagram]

- Ø.591 [15.0]
- .551 [14.0]
- M18x1
- O-RING
- 1.772 [45.0]
- .315 [8.0]
- .630 [16.0]
- 2.343 [59.5]
### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Non Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCF 5-S18-AN4X</td>
<td>• 7 5 18 • 1 A 1 100</td>
<td>M2503012</td>
<td>2 meter cable, PVC Jacket</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCF 5-S18-AP4X</td>
<td>• 7 5 18 • 1 B 1 100</td>
<td>M2503011</td>
<td>2 meter cable, PVC Jacket</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cable/Conductor

- **Cable:** PVC jacket; 2 meter standard length
- **Copper Conductor:** 22 AWG, PVC insulated

### Material

- **Barrel:** PA 12-GF30 Plastic
- **Sensing Face:** PA 12-GF30 Plastic
- **End Cap:** PUR Plastic

### Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

- Ripple: ≤10%
- Differential Travel (Hysteresis): 2-20% (5% typical)
- Voltage Drop Across Conducting Sensor: ≤1.8 V at 200 mA
- Trigger Current for Overload Protection: ≥220 mA
- Continuous Load Current: ≤200 mA
- Off-State (Leakage) Current: <100 µA
- No-Load Current: 6.0-12.0 mA
- Time Delay Before Availability: ≤25 ms
- Power-On Effect: Per IEC 947-5-2
- Reverse Polarity Protection: Yes
- Wire-Break Protection: Yes
- Transient Protection: Per EN 60947-5-2
- Operating Temperature: -25°C to +70°C (-13°F to +158°F)
- Enclosure: Meets NEMA 1, 3, 12 and 13
- Shock: 30 g, 11 ms
- Vibration: 55 Hz, 1 mm Amplitude in all 3 Planes
- Repeatability: ≤2% of Rated Operating Distance
- Temperature Drift: ≤±20% of Rated Operating Distance
- LED On: Output Energized
- Immunity to ESD: 8 kV Direct/ 30 kV Airborne
- Immunity to RFI: 15 V/M, 80-1000 MHz
- Immunity to Electrical Fast Transients: 3000 V
- Immunity to Line Coupled Noise: >10 V, 150 kHz-230 MHz
- Immunity to Surges: 1 kv, 500 Ω DC

Wiring Diagrams

A NPN (Sinking)

B PNP (Sourcing)

Dimensions

1
TURCK Capacitive Sensors

4-Wire DC  
Noise Immune

S Barrel

Noise Immune Capacitive Sensors, Plastic

Barrel, Partial Threading, Potted-In Cable

4-Wire DC
10-65 VDC, Short-Circuit and Overload Protected
Complementary Outputs: One N.O., One N.C. (SPDT)

Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>NON Embeddable</th>
<th>Range (mm)</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>NPN (Sinking)</th>
<th>PNP (Sourcing)</th>
<th>Drawing #</th>
<th>Wiring Diagram</th>
<th># of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCF10-S30-VN4X</td>
<td>•</td>
<td>15</td>
<td>10</td>
<td>30</td>
<td>•</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>100</td>
<td>M2506011</td>
<td>2 meter cable, PVC jacket</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCF10-S30-VP4X</td>
<td>•</td>
<td>15</td>
<td>10</td>
<td>30</td>
<td>•</td>
<td>1</td>
<td>B</td>
<td>1</td>
<td>100</td>
<td>M2506111</td>
<td>2 meter cable, PVC jacket</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cable/Conductor

Cable: PVC jacket; 2 meter standard length
Copper Conductor: 22 AWG, PVC insulated

Material

Barrel: PA 12-GF30 Plastic
Sensing Face: PA 12-GF30 Plastic
End Cap: PA 66-GF25-VO

Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

Ripple ........................................... ≤10%
Differential Travel (Hysteresis) ............. 2-20% (5% typical)
Voltage Drop Across Conducting Sensor .... ≤1.8 V at 200 mA
Trigger Current for Overload Protection .... ≥220 mA
Continuous Load Current ......................... ≤200 mA
Off-State (Leakage) Current ................. <100 µA
No-Load Current ................................ ≤12.0 mA
Time Delay Before Availability ............. ≤25 ms
Power-On Effect ................................ Per IEC 947-5-2
Reverse Polarity Protection .................... Yes
Wire-Break Protection ......................... Yes
Transient Protection ......................... Per EN 60947-5-2
Operating Temperature ...................... -25°C to +70°C (-13°F to +158°F)
Enclosure ........................................ Meets NEMA 1, 3, 12 and 13
Shock ........................................... 30 g, 11 ms
Vibration ........................................ 55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability ................................... ≤2% of Rated Operating Distance
Temperature Drift .......................... <±20% of Rated Operating Distance
LED On ........................................ Output Energized
Immunity to ESD .............................. 8 kV Direct/ 30 kV Airborne
Immunity to RFI ............................... 15 V/M, 80-1000 MHz
Immunity to Electrical Fast Transients ....... 3000 V
Immunity to Line Coupled Noise ........... >10 V, 150 kHz-230 MHz
Immunity to Surges .......................... 1 kv, 500 Ω DC

Wiring Diagrams

A NPN (Sinking)

B PNP (Sourcing)

Dimensions

1

LED

POTENTIOMETER

M30x1.5

1.569 (50.0)
2.362 (60.0)
# TURCK Capacitive Sensors

## 2-Wire AC Noise Immune

### S Barrel

Noise Immune Capacitive Sensors, Plastic

*Barrel, Partial Threading, Potted-In Cable and Quick Disconnect*

2-Wire AC  
20-250 VAC  
Normally Open (AZ3X) or Normally Closed (RZ3X)

### Sensor Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Embeddable</th>
<th>Non Embeddable</th>
<th>Rated Operating Distance (mm)</th>
<th>Barrel Diameter (mm)</th>
<th>Normally Open</th>
<th>Normally Closed</th>
<th>Drawing #</th>
<th>Wiring Diagram # of LEDs</th>
<th>Switching Frequency (Hz)</th>
<th>ID Number</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCF10-S30-AZ3X</td>
<td>•</td>
<td>15</td>
<td>10</td>
<td>30</td>
<td>1</td>
<td>A</td>
<td>1</td>
<td>20</td>
<td>M2506015</td>
<td></td>
<td>2 meter cable, PVC jacket</td>
</tr>
<tr>
<td>BCF10-S30-RZ3X</td>
<td>•</td>
<td>15</td>
<td>10</td>
<td>30</td>
<td>1</td>
<td>B</td>
<td>1</td>
<td>20</td>
<td>M2506013</td>
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<tr>
<td>BCF10-S30-AZ3X-B3131</td>
<td>•</td>
<td>15</td>
<td>10</td>
<td>30</td>
<td>2</td>
<td>C</td>
<td>1</td>
<td>20</td>
<td>M2506012</td>
<td></td>
<td>Mating Cordsets KB 3T-2 (2 meter) For other styles see “Cordsets” catalog</td>
</tr>
<tr>
<td>BCF10-S30-RZ3X-B3131</td>
<td>•</td>
<td>15</td>
<td>10</td>
<td>30</td>
<td>2</td>
<td>D</td>
<td>1</td>
<td>20</td>
<td>M2506014</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cable/Conductor

- **Cable:** PVC jacket; 2 meter standard length
- **Copper Conductor:** 22 AWG, PVC insulated

### Material

- **Barrel:** PA 12-GF30 Plastic
- **Sensing Face:** PA 12-GF30 Plastic
- **End Cap:** PA 66-GF25-VO

### Accessories

Accessories and mounting devices can be found in "Sensors" catalog.
Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value/Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Frequency</td>
<td>40-60 Hz</td>
</tr>
<tr>
<td>Hysteresis (Differential Travel)</td>
<td>2-20% (5% typical)</td>
</tr>
<tr>
<td>Voltage Drop Across Conducting Sensor</td>
<td>≤7.0 V at 500 mA</td>
</tr>
<tr>
<td>Continuous Load Current</td>
<td>≤500 mA</td>
</tr>
<tr>
<td>Off-State (Leakage) Current</td>
<td>≤1.7 mA</td>
</tr>
<tr>
<td>Minimum Load Current</td>
<td>≥5.0 mA</td>
</tr>
<tr>
<td>Inrush Current</td>
<td>≤8.0 A (≤10 ms, 5% Duty Cycle)</td>
</tr>
<tr>
<td>Time Delay Before Availability</td>
<td>≤60 ms</td>
</tr>
<tr>
<td>Power-On Effect</td>
<td>Per IEC 947-5-2</td>
</tr>
<tr>
<td>Transient Protection</td>
<td>Per EN 60947-5-2</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-25°C to +70°C (-13°F to +158°F)</td>
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<td>55 Hz, 1 mm Amplitude in all 3 Planes</td>
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<tr>
<td>Repeatability</td>
<td>≤2% of Rated Operating Distance</td>
</tr>
<tr>
<td>Temperature Drift</td>
<td>&lt;±10% of Rated Operating Distance</td>
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<tr>
<td>LED On</td>
<td>Output Energized</td>
</tr>
<tr>
<td>Immunity to ESD</td>
<td>8 kV Direct/30 kV Airborne</td>
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<tr>
<td>Immunity to Electrical Fast Transients</td>
<td>3000 V</td>
</tr>
<tr>
<td>Immunity to Line Coupled Noise</td>
<td>&gt;10 V, 150 kHz-230 MHz</td>
</tr>
<tr>
<td>Immunity to Surges</td>
<td>5 kV, 500 ΩAC</td>
</tr>
</tbody>
</table>

Dimensions

1

![Dimensions Diagram 1](image1)

2

![Dimensions Diagram 2](image2)
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<th>Index</th>
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<td>BCF 5-S18-AP4X ............ 65</td>
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<td>BCF10-S30-AZ3X ............ 69</td>
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<td>BCF10-S30-AZ3X-B3131 ...... 69</td>
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<td>BCF10-S30-RZ3X ............ 69</td>
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<td>BCF10-S30-VN4X ............ 67</td>
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<tr>
<td>BCF10-S30-VP4X ............ 67</td>
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<tr>
<td>Ni 2-EM12D-AP6/S120 ...... 43</td>
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<tr>
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<tr>
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<tr>
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</tbody>
</table>
Notes:
TURCK Inc. sells its products through Authorized Distributors. These distributors provide our customers with technical support, service and local stock. TURCK distributors are located nationwide - including all major metropolitan marketing areas.

For Application Assistance or for the location of your nearest TURCK distributor, call:

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Literature and Media questions or concerns?
Contact Marketing Services TURCK USA - media@turck.com
The Industry Leader in Proximity Sensing, Cordsets and Interface Technology

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Cordset Division - cordset@turck.com
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