

Your Global Automation Partner

TURCK

BI7C | BI20C | NI40C Carbon Fiber Detection Sensors



Detecting Carbon Fibers Inductively

Turck has developed the world's first inductive sensors for detecting carbon fibers. The sensor series detects both carbon fibers and pressed carbon parts. It is based on advanced uprox technology and therefore offers maximum switching distances and maximum installation flexibility – for manufacturers and suppliers of products such as carbon, cars, wind turbines or sporting equipment.

A comparison with the solutions used to date in this area demonstrates the advantages that the new sensors offer to users: They are less susceptible to contamination than optical or capacitive sensors while also being significantly more economical than ultrasonic sensors.

The sensors are now available in three initial designs: a threaded barrel version in M18 stainless steel housing with a rugged Duroplast front cap (BI7C) and as rectangular versions with a height of either 20 mm (BI20C) or 40 mm (NI40C). Protection class IP68 and the extended temperature range from 0 to 100 °C guarantee the long-term reliable use of the devices, which Turck offers as PNP changeover contacts with M12 connectors.

Your Benefits

- Reliable detection of all carbon fiber composites
- Wide application range from 0 to 100 °C
- Less susceptible to contamination than optical or capacitive sensors
- More cost-effective than ultrasonic sensors
- High resilience thanks to IP68 protection class

Inductive Sensors for Detecting Carbon Fiber Composites



- Protection class IP68
- Magnetic field immune
- Extended temperature range
- DC 4-wire, 10...30 VDC
- Changeover contact, PNP output
- M12 × 1 male connector

| Type | BI20C-QR20-VP6X2-H1141 | NI40C-CK40-VP6X2-H1141 | BI7C-EM18H-VP6X-H1141 |
|---|---|---|-------------------------------|
| Ident-No. | 100015717 | 100015716 | 100015715 |
| Rated switching distance | 20 mm* | 40 mm* | 7 mm* |
| Mounting condition | Flush | Non-flush | Flush |
| Secured operating distance | ≤ (0.81 × S _n) mm | | |
| Repeatability | ≤ 2 % full scale | | |
| Temperature drift | ≤ ± 10 % | | |
| Hysteresis | 3...15 % | | |
| Ambient temperature | 0...+100 °C | | |
| Operating voltage | 10...30 VDC | | |
| Residual ripple | ≤ 10 % U _{ss} | | |
| DC rated operational current | ≤ 100 mA | | |
| No-load current | ≤ 20 mA | | |
| Residual current | ≤ 0.1 mA | | |
| Isolation test voltage | ≤ 0.5 kV | | |
| Short-circuit protection | Yes/cyclic | | |
| Voltage drop at I _e | ≤ 1.8 V | | |
| Wire breakage/reverse polarity protection | Yes/complete | | |
| Output function | Four-wire, changeover contact, PNP | | |
| Switching frequency | 0.25 kHz | 0.25 kHz | 1.5 kHz |
| Design | Rectangular, QR20 | Rectangular, CK40 | M18 × 1 threaded barrel |
| Dimensions | 71.3 x 64 x 20 mm | 65 x 40 x 40 mm active face, variable orientation in 5 directions | 52 mm |
| Housing material | Plastic, Ultem | Plastic, PBT-GF20-V0, black | Stainless steel, V2A (1.4301) |
| Active face material | Plastic, Ultem | Plastic, PA12-GF30, yellow | Plastic, Duroplast |
| Max. tightening torque of housing nut | – | – | 25 Nm |
| Electrical connection | M12 × 1 male connector | | |
| Vibration resistance | 55 Hz (1 mm) | | |
| Shock resistance | 30 g (11 ms) | | |
| Protection class | IP68 | | |
| MTTF | 874 years acc. to SN 29500 (ed. 99) 40 °C | | |
| Operating voltage display | LED, green | 2x LEDs, green | – |
| Display switching status | LED, yellow | 2x LEDs, yellow | LED, yellow |
| Included in delivery | – | Mounting bracket BS4-CK40 | – |

*The rated switching distance refers to a standard steel target. The switching distance can vary depending on the composition of the CFRP material

