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# 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 patent-pending 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 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 <sub>n</sub> ) 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 <sub>ss</sub>		
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 <sub>e</sub>	≤ 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
<b>Design</b>	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		
<b>Operating voltage display</b>	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

