



# More Precision

**eddyNCDT** // Inductive sensors based on eddy currents





- Speed range from 200 to 400,000 rpm
- Miniature sensor  $\varnothing 3$  mm
- Measuring aluminum and titanium
- Large distances up to 2.2 mm
- No modification of the compressor wheel
- Ideal for test bench and road test
- Highest immunity to interference and accuracy even in harsh test conditions
- Sensor operating temperature up to 285 °C

#### Measuring principle

A coil is integrated in a sensor housing and energized by a high-frequency alternating current. The electromagnetic field from the coil generates eddy currents in the turbocharger blade, while every blade generates a pulse. The controller identifies the speed (analog 0–5V) by considering the number of blades.

#### Robust miniature controller

As the entire electronics is in a sealed miniature housing and designed for ambient temperatures up to 115 °C, the controller is easy to integrate into the engine compartment. turboSPEED DZ140 offers excellent EMC immunity in test cells and road tests.

#### Engine compartment application

The DZ140 eddy current measuring system is resistant to oil and dirt. This is a key advantage especially compared to optical speed measuring systems, as this immunity helps to achieve high precision measurements on a continuous basis.

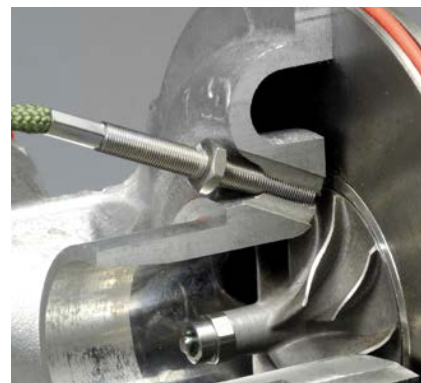
#### Ease of use

A tri-color 'status' LED on the controller indicates when the sensor has reached the ideal distance from the turbocharger blades. This simple feature enables greatly reduced installation time. As the sensor is connected with the electronics via a special BNC connector, it is therefore downward compatible with all previous sensor models. An industrial push-pull connector guarantees a reliable connection between the electronics and the power supply as well as the analog outputs.

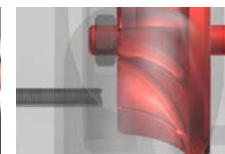
#### Measuring aluminum and titanium blades

The DZ140 measures both aluminum and titanium blades. The sensors can be mounted at a relatively large distance from the blade. The maximum distance of 2.2 mm enables reliable operation.

Extremely compact design



Large measuring distances both at aluminum and titanium



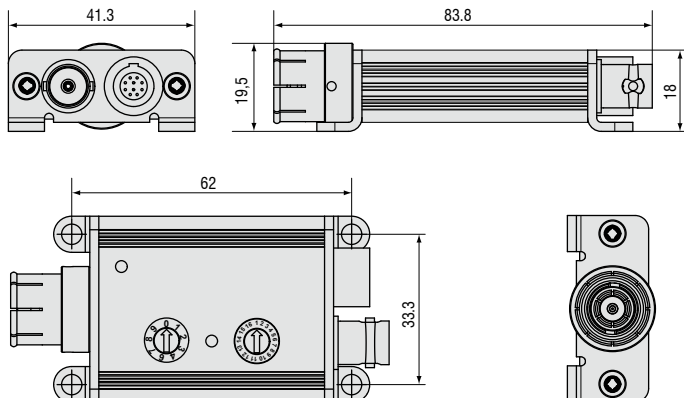
Axial installation

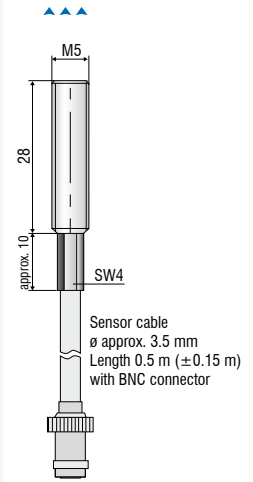
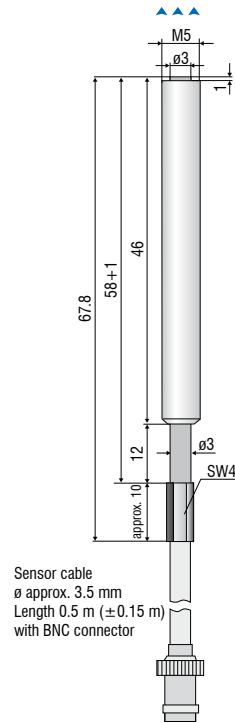
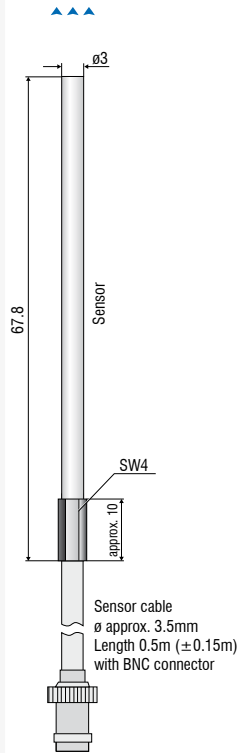
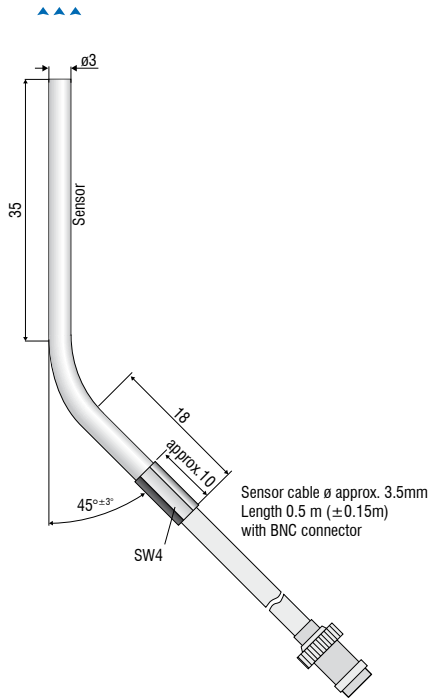


Radial installation

Model	DZ140 (Controller)							
Sensors	DS 05(03)	DS 05(04)	DS 05(07)	DS 05(14)	DS 05(15)	DS 1	DS 1(04)	DS 1/T
Target (blade material)	aluminum or titanium							
Speed range (measuring range)	200 ... 400,000 rpm							
Operating temperature	Controller	-20 ... +115 °C						
	Sensor	-40 ... +235°C (short-term +285 °C)						
Distance sensor to blade (wall thickness 0.35 mm)	Aluminum	radial 0.6 mm / axial 1.1 mm				radial 1.3 mm / axial 1.6 mm		
	Titanium	radial 0.6 mm / axial 1.0 mm				radial 1.2 mm / axial 1.6 mm		
	adjustment with three-state LED							
Integral sensor cable	0.5 m ± 0.15 m				0.75 m ± 0.15 m		0.8 m ± 0.15 m	
No. of blades	adjustable, accessible from outside via rotary switch for 1 to 16 blades							
Output (digital)	1 pulse / blade (TTL-level, variable pulse duration) or 1 pulse / revolution (TTL-level, pulse duration 100 µs)							
Output (analog)	0 ... 5 V (200 ... 200,000 rpm) 0 ... 5 V (200 ... 400,000 rpm) adjustable, mode rotary switch accessible from outside							
	Linearity	± 0.2 % FSO						
	Resolution	0.1 % FSO						
	test pulse generation to control the measurement chain; load resistance > 5 kOhm, load capacitance max. 1nF							
RAW output (via BNC socket)	for easy sensor installation via oscilloscope							
Power supply	9 V ... 30 VDC / max. 50 mA (short-term up to 36 VDC)							
Cables	PC140-3 supply and signal cable, 3 m							
	PC140-6 supply and signal cable, 6 m							
Weight	controller DZ140: approx. 85 g							
Protection class	controller DZ140: IP 65							

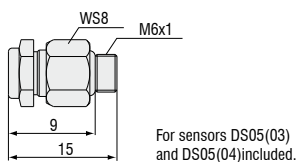
FSO = Full Scale Output

**Controller DZ140**

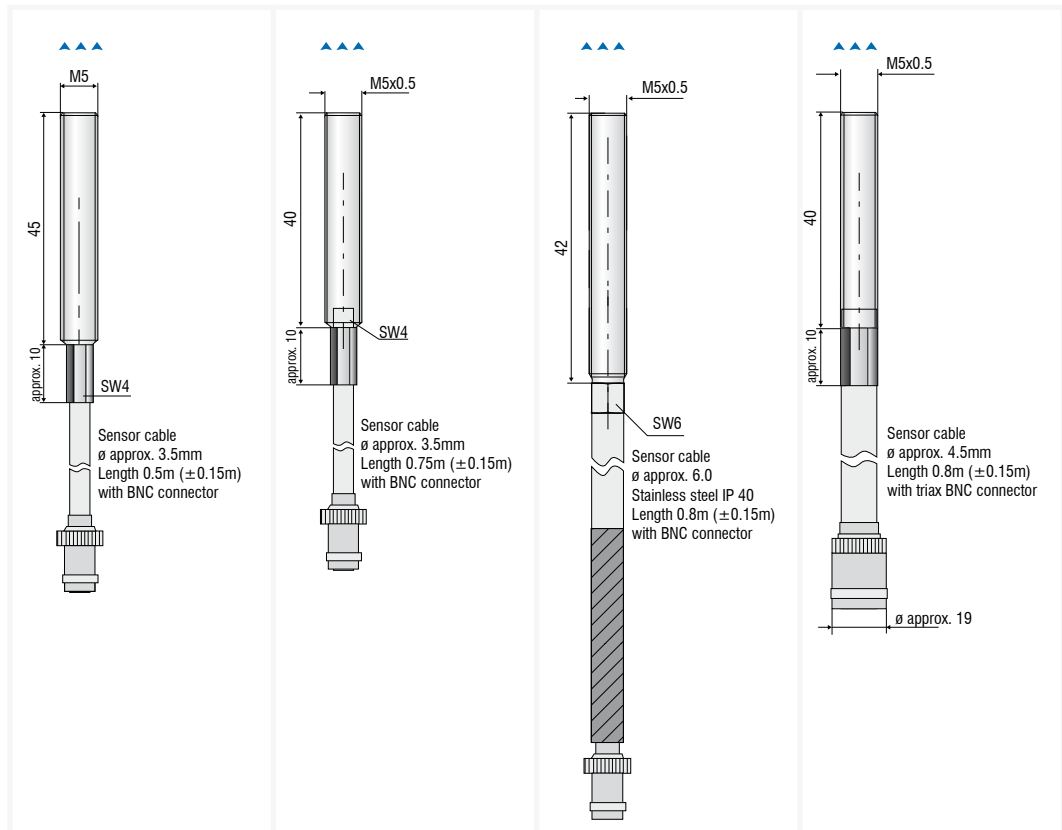


Sensor type	DS 05(03)	DS 05(04)	DS 05(07)	DS 05(14)
Measuring range	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Thread length	-	-	45 mm	28 mm
Thread	-	-	M5 x 0.8	M5 x 0.8
Integrated cable/length	0.5 m	0.5 m	0.5 m	0.5 m
Special feature	curved housing	-	-	length of housing 42.5 mm

Mounting adapter MA135



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Measurement direction



Sensor type	DS 05(15)	DS 1	DS 1(04)	DS 1/T
Measuring range	0.5 mm	1 mm	1 mm	1 mm
Thread length	45 mm	40 mm	40 mm	40 mm
Thread	M5 x 0.8	M5 x 0.5	M5 x 0.5	M5 x 0.5
Integrated cable/length	0.5 m	0.75 m	0.8 m	0.8 m
Special feature	-	-	stainless steel protection hose	-

## High performance sensors made by Micro-Epsilon



Sensors and systems for displacement and position



Sensors and measurement devices for non-contact temperature measurement



2D/3D profile sensors (laser scanner)



Optical micrometers, fiber optic sensors and fiber optics



Color recognition sensors, LED analyzers and color online spectrometer



Measurement and inspection systems