

Sensors

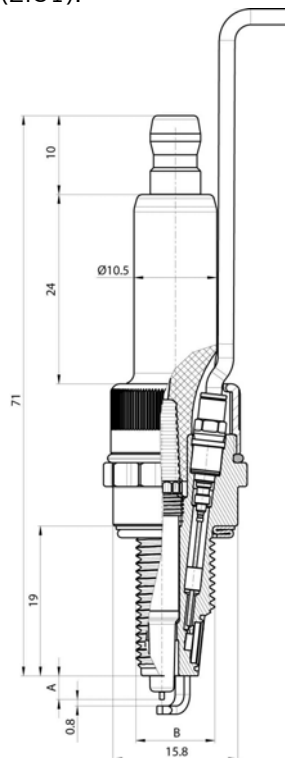


ZI21 / ZI31 Spark Plug Sensor of size M10 / M12

The combination of the spark function with the pressure measurement function in a small housing with minor eccentricity of the spark gap defines a new standard in the cylinder pressure measurement. The high sensitivity of the piezoelectric element integrated in the spark plug combined with the high stiffness of the spark plug body guarantees an excellent signal quality. The preparation time for indicating tasks of the engine is reduced by using the new spark plug sensor with the central insulator connector based on ISO standard (ISO 2704 for M10 and ISO 2705 for M12). A separate mounting of any pressure sensor in the spark plug adaptor is not necessary anymore.

With the introduction of the spark plug sensor a new insulator with a massive platinum electrode of the supplier BOSCH is applied.

The spark plug sensor ZI with the new platinum reinforced mass electrode is available in sizes M10 (ZI21) and M12 (ZI31).



Dimensions

A = Spark position of 1, 3 or 5 mm

B = Thread of M10x1 or M12x1,25

ZI21 and ZI 31

Standard specification	ZI21 (ZI31)
Measuring range	0...200 bar
Overload	250 bar
Lifetime	> 10 ⁸ load cycles
Sensitivity (nominal)	8 (12) pC/bar
Linearity	< ±0.5% FSO
Natural frequency	130 kHz
Acceleration sensitivity	< 0.001 bar/g
Shock resistance	> 2000 g
Operating temperature range	up to 350°C; Max. temp. of plug seat: 230°C permanent
Burn off resistance	1 kΩ ± 0.2 kΩ
Resistance of insulator	> 10 MΩ at 20°C
Eccentricity of insulator	1.7 (1.1) mm
Electric strength (permanent)	< 30 kV
Polarity	negativ
Thread length	19mm to 12.7mm by distance ring 26.5mm to 20.2mm
Thermal sensitivity change	< ±0.6% for 150...250°C
Insulation resistance	> 10 ¹³ Ω at 20°C
Capacitance	5 pF
Mass (without cable)	35 (38) grams
Mounting torque	10 (15) Nm...15 (25) Nm for spark plug 2 Nm for insulator

Thermodynamic specification

Cyclic temperature drift	< ±0.6 bar at 1300 rpm and 7 bar IMEP
Load change drift	
Max. zero-line gradient dp/dt	< 5 mbar/ms
Permanent zero-line deviation	10 bar
IMEP-stability	< 3%

ZI21 and ZI 31

Specification of the spark plug function

Type	Sealing	Thread length* [mm]	Heat range [Bosch]	Spark position [mm]	Electrode gap max. [mm]	Article	Spare Insulator
ZI21 U3CPRT	flat	12.7 - 19	3	1	0.8	TIGG0980A.01	B07350
ZI21 U5DPRT	flat	12.7 - 19	5	3	0.8	TIGG0981A.01	B07351
ZI21 U7DPRT	flat	12.7 - 19	7	3	0.8	TIGG0982A.01	B07352
ZI21 U7LPRT	flat	12.7 - 19	7	5	0.8	TIGG0983A.01	B07353
ZI31 Y3CPRT	flat	12.7 - 19	3	1	0.8	TIGG0984A.01	B07350
ZI31 Y5DPRT	flat	12.7 - 19	5	3	0.8	TIGG0985A.01	B07351
ZI31 Y7DPRT	flat	12.7 - 19	7	3	0.8	TIGG0986A.01	B07352
ZI31 Y7LPRT	flat	12.7 - 19	7	5	0.8	TIGG0987A.01	B07353
ZI31 Y3MPRT	flat	20,2 - 26,5	3	1	0.8	TIGG1028A.01	B07350
ZI31 Y5MPRT	flat	20,2 - 26,5	5	3	0.8	TIGG1029A.01	B07351
ZI31 Y7MPRT	flat	20,2 - 26,5	7	3	0.8	TIGG1030A.01	B07352
ZI31 Y7SPRT	flat	20,2 - 26,5	7	5	0.8	TIGG1031A.01	B07353

**) Shorter thread length than 19mm down to 12.7mm and 26.5 mm down to 20.2mm is realised by special distance rings on customer' request.*

Scope of supply

- 1 Spark plug sensor ZI21 (ZI31)
- 1 Piezo-Input cable CI31-1 plus coupling CC31, fitted
- 2 Spare O-rings for cable
- 1 Protection cap
- 1 Calibration sheet
- 1 Specification sheet
- 1 Brief description

ZI21 and ZI 31**Accessories**

Cable and coupling	CI31-1, CI31-2, CC31
Cable-mounting tool	TC31
Box spanner SW 4.5 for insulator	TT31
Mounting tool for insulator	TA31
Box nut with SW 16 standard and outer diameter of 20,2mm	TT24
Box nut with SW 16 for narrow spark plug shaft and outer diameter of 19mm	TT22
Torque wrench 1 Nm...6 Nm	TT02
Torque wrench 4 Nm...20 Nm	TT18
T handle	TT44
Elongation	TT43
Extra accessories (Mounting spray)	SF01