

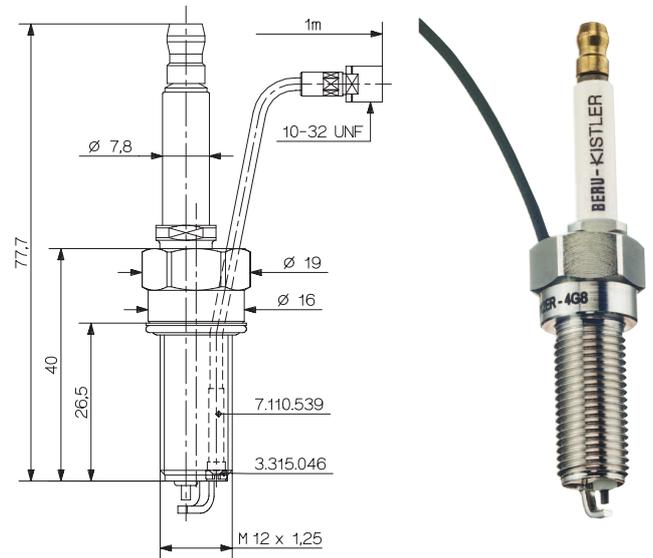
Measuring Spark Plug M12 x 1,25 with Integrated Cylinder Pressure Sensor

Type 6115A...

The measuring spark plug Type 6115A... allows cylinder pressure measurements to be made without the need for a separate measuring bore. The measuring spark plug M12 x 1,25 incorporates a miniature piezoelectric pressure sensor.

The sensor is flush-mounted in the combustion chamber; thus, its natural frequency is higher than 100 kHz. The Type 6115A... is therefore also suitable for providing readings at high engine speeds and for knock investigations.

- Exchangeable ignition ceramics
- Measurement without indicator bore in M12 spark-plug hole
- Highest natural frequency for high speeds
- Sensor front flush
- Various heat values and spark positions possible
- Suitable for knock investigations



Description

The space for incorporation of the sensor has been achieved by an eccentric electrode position of 1,7 mm. As a result of miniaturization, the sensor and cable form a single unit, which can only be dismantled by disconnecting the cable connector. The sensor is inserted from the underside of the plug and secured with a perforated screw, which also provides flame protection.

The ceramic part is screwed in position, allowing it to be easily exchanged in the event of damage.

Application

Cylinder pressure measurement with a measuring spark plug is used in those cases when a separate measuring bore is to be omitted, in order to keep the expenditure for sensor technology to a minimum. Front-flush sensor mounting achieves high signal quality without disturbing singing oscillations.

A typical application is adjustment of the knock limit for the electronic engine circuitry in production and racing engines.

Technical Data

Pressure range	bar	0 ... 200
Calibrated partial range	bar	0 ... 50
Overload	bar	250
Sensitivity at 200 °C	pC/bar	≈ -9,5
Natural frequency		
Spark plug with integrated sensor	kHz	>100
Linearity	% FSO	≤±0,8
Acceleration sensitivity		
axial and radial	bar/g	<0,005
Operating temperature range, sensor	°C	-50 ... 250
Operating temperature range, cable	°C	-50 ... 200
Sensitivity change 200 ±50 °C	%	<±1
Thermal shock		
at 1500 min ⁻¹ , 9 bar pmi		
Δp (short time drift)	bar	<±0,8
Δp _{mi}	%	<±4
Δp _{max}	%	<±2
Insulation resistance, sensor		
at 20 °C	Ω	>10 ¹³
at 200 °C	Ω	>10 ¹¹

Insulation resistance, plug at Ambient temperature between center electrode and plug body at 1000 V	MΩ	>100
Final electronic check of the plug spark discharge at		7 bar/20 kV
Dielectric strength	kV	<35
Tightening torque of the plug	Nm	20
Capacitance of the sensor with 1 m cable	pF	110
Weight	g	50

Mounting

The measuring spark plug is screwed into the spark plug hole with mounting key Type 1300A19. A spark plug hole of 20 mm diameter is necessary. The spark plug extension connector Type 1700B15 can be fitted onto the spark plug to protect the spark plug insulator. To prevent electrical interference, the cable should wherever possible be connected directly to the charge amplifier using the coupling Type 1721 (i.e. without an extension cable).

Note: Use lubricating grease Type 1067 when fitting the insulating extension connector. This will ensure good insulation and facilitate later removal.

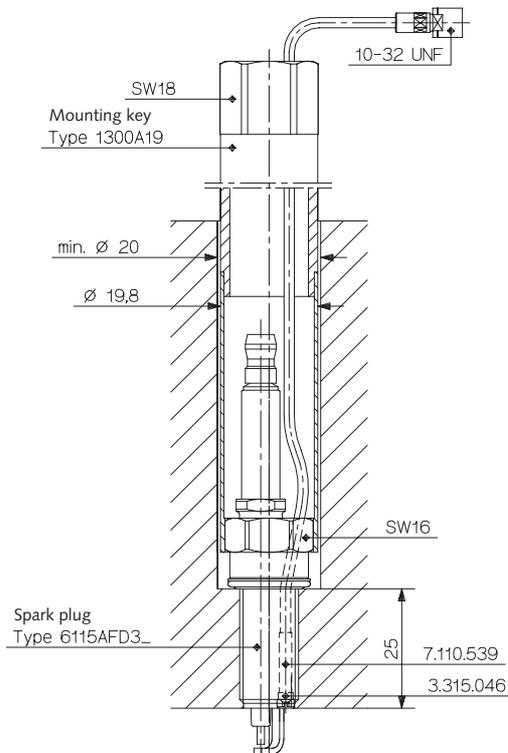


Fig. 1: Mounting of the measuring spark plug

Heat value (WW)

The heat value is a measure of the thermal loading capacity of the spark plug.

Kistler measuring spark plugs are classified according to the BERU/BOSCH heat value:

NEW	10	9	8	7	6	5	4	3	09	08	07
OLD	100	125	150	175	200	225	250	275	325	350	375
	Hot			↔	Medium			↔	Cold		

Since each manufacturer uses his own numbering system, cross-checking is possible only by means of a standard commercial reference book.

Wherever possible, the original heat value should be used. A plug **can always be exchanged** for a colder plug, but never for a hotter plug. For example, a plug with the heat value 6 can be exchanged for a plug with the heat value 5, but not the other way round.

Accessories Included

- Coupling 10-32 neg. – BNC pos. **Type** 1721
- Insulating extension connector **Type** 1700B15

Form

- Hexagon **Type** 16 mm
- Center electrode **Type** Cu/Ni
- Electrode spacing, nominal **Type** see Technical data
- Ground electrode **Type** Front electrode if not otherwise specified

Optional Accessories

- Mounting key for plug (SW16) **Type** 1300A19
- Torque wrench for plug **Type** 1300A11
- Fork wrench insert SW 18 for torque wrench **Type** 1300A11 **Type** 1300A15
- Lubricating grease for spark plug extension connector (high insulation) 5 ml. **Type** 1067
- Spark plug extension connector **Type** 1700B15
- Extension cable for measuring spark plug **Type** 6115A.. length 400 mm **Type** 1500A49
- Adapter for pressure generator **Type** 6904 **Type** 6593

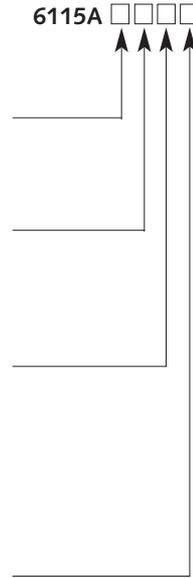
Spare parts

- Insulating extension connector **Type** 1700B15
- Coupling 10-32 neg. BNC pos. **Type** 1721

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Ordering Key

Seal		
Flat		F
Electrode		
Front		D
Surface-gap		G
Thread length		
Seal, flat	L = 19 mm	1
	L = 12,7 mm	2
	L = 26,5 mm	3
Heat value		
375		07
275		3
225		5
200		6
175		7
125		9



Available Versions of the Measuring Spark Plug M12 x 1,25

Type	AFD34Q01	AFD36	AFD36Q01
Thread length L	26,5 mm	26,5 mm	26,5 mm
Seal	flat	flat	flat
Heat value	4	6	6
Spark position A	5,9	9,4	3,5
Electrode spacing	0,8 ^{+0,1}	0,8 ^{+0,1}	0,8 ^{+0,1}
Wrench size SW	17 mm	16 mm	16 mm

Other types on request

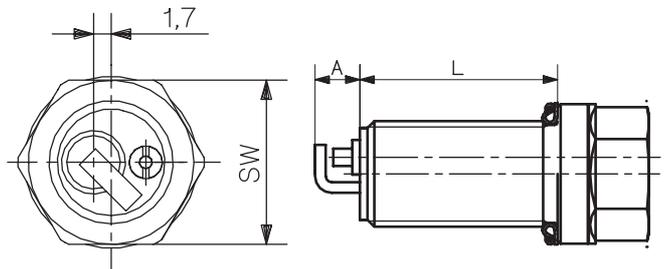


Fig. 2: Spark plug dimensions



Fig. 3: Torque wrench with insert

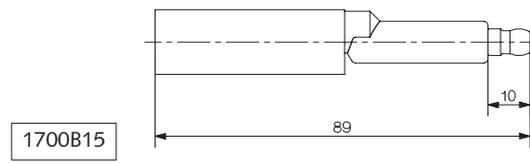


Fig. 5: Insulating extension connector

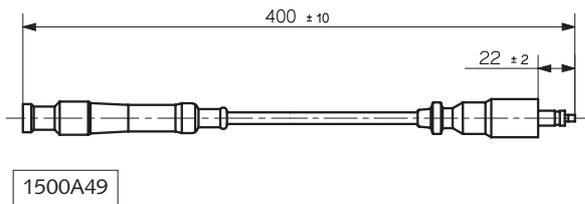


Fig. 4: Extension cable

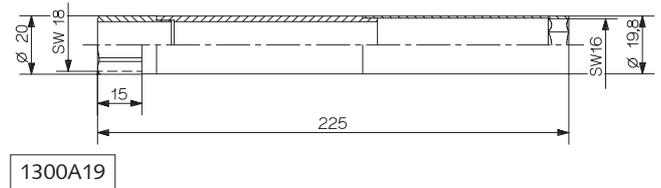


Fig. 6: Mounting key

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