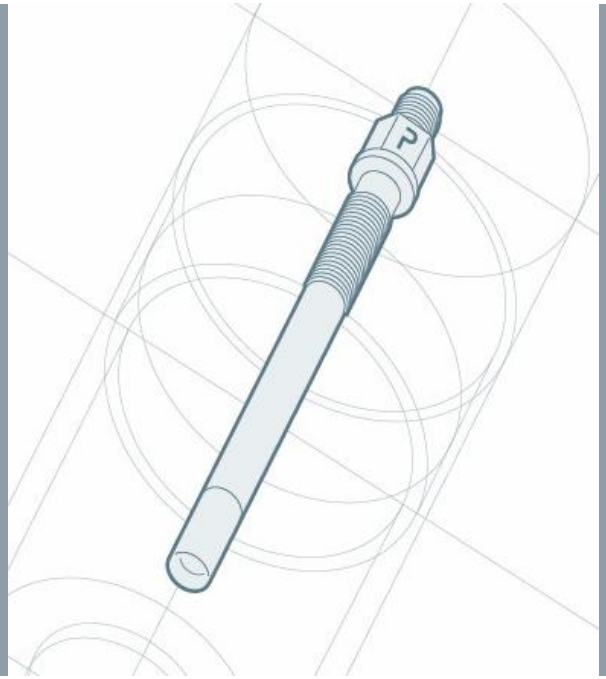
PIEZOCRYST
ADVANCED SENSORICS GMBH

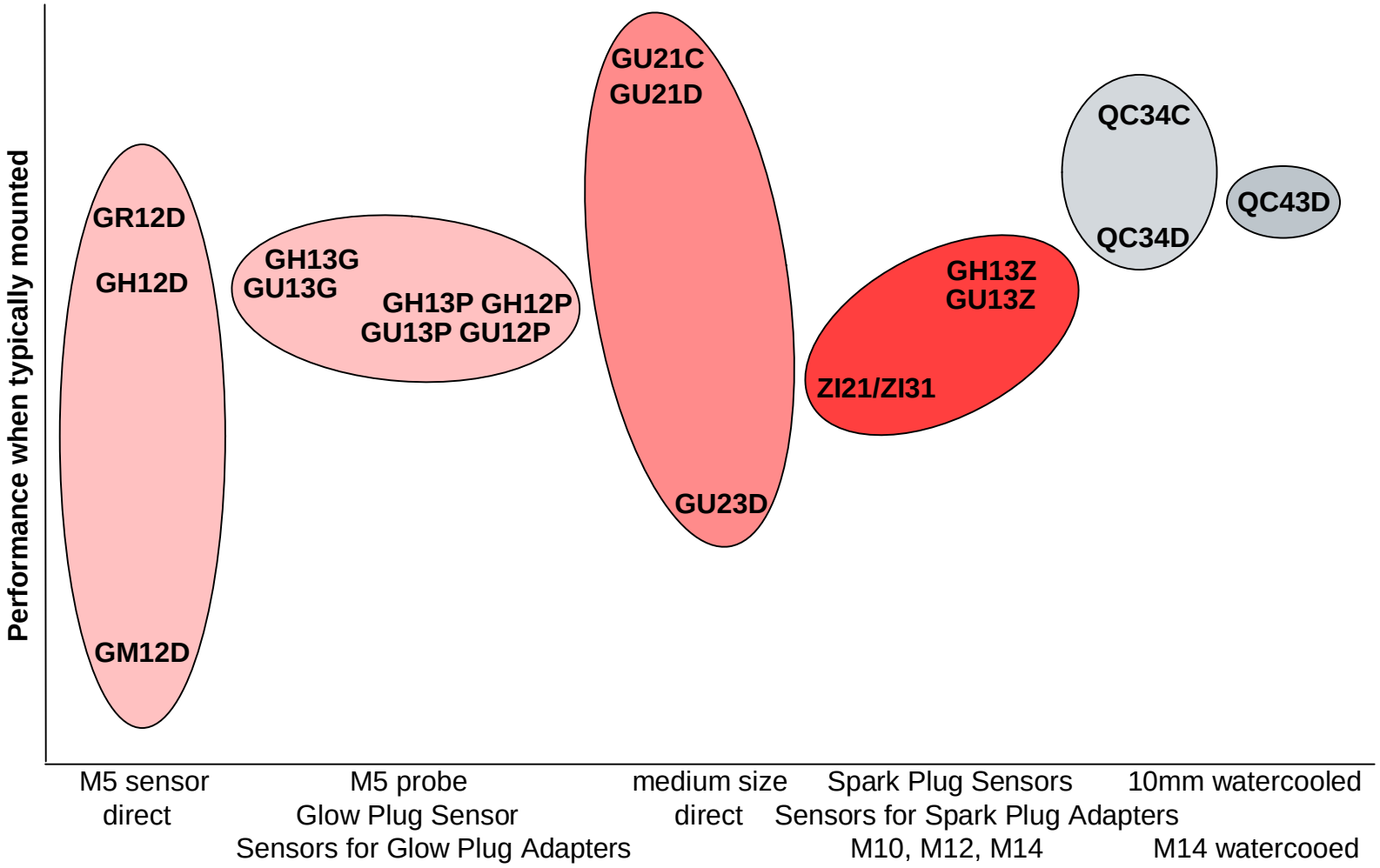
Graz, 2007

Product Portfolio
Combustion Analysis Sensors



Prepared for: www

Sensor Overview



GM12D

Uncooled M5 Frontsealing

Description

- Compact piezoelectric cylinder pressure sensor
- M5 mounting thread
- Designed for application on engines with limited space available
- Suitable for standard combustion analysis tasks

Measuring Range	200 bar
Sensitivity	16 pC/bar
Linearity	±0.3% FSO
Acceleration Sensitivity	< 0.001 bar/g axial – 0.0003 bar/g radial
Shock Resistance	> 2000 g
Operating Temperature Range	-40°C…400°C
Thermal Sensitivity Shift	20…400°C < 2%, 200…300°C < 0.5%
Cyclic Temperature Drift	< ±0.6 bar (@ 1300 rpm/7 bar IMEP)
Max. Load Change Drift Gradient	1.5 mbar/ms
Mounting Torque	1.5 Nm
Competitor´s solution	6052C – 100% mechanical compatible

Your Benefits

- suitable for most common measurement tasks
- compact design
- cost effective

GH12D

Uncooled M5 Frontsealing – High Performance

Description

- High Performance piezoelectric cylinder pressure sensor
- M5 mounting thread
- Designed for application on engines with limited space available
- Suitable for high demanding combustion analysis tasks as well as heavy duty applications

Measuring Range	250 bar
Sensitivity	16 pC/bar
Linearity	±0.3% FSO
Acceleration Sensitivity	< 0.001 bar/g axial – 0.0003 bar/g radial
Shock Resistance	> 2000 g
Operating Temperature Range	-40°C…400°C
Thermal Sensitivity Shift	20…400°C < 2%, 200…300°C < 0.5%
Cyclic Temperature Drift	< ±0.5 bar (@ 1300 rpm/7 bar IMEP)
Max. Load Change Drift Gradient	1.0 mbar/ms
Mounting Torque	1.5 Nm
Competitor´s solution	6052C – 100% mechanical compatible

Your Benefits

- suitable for high performance engines (IMEP)
- highest accuracy
- compact, robust design

GR12D

Uncooled M5 Frontsealing – acceleration compensated

Description

- Piezoelectric cylinder pressure sensor with active accelleration compensation
- M5 mounting thread
- Designed for F1 and other high performance engines
- Suitable for high demanding combustion analysis tasks

Measuring Range	250 bar
Sensitivity	16 pC/bar
Linearity	±0.3% FSO
Acceleration Sensitivity	< 0.0001 bar/g axial – 0.0003 bar/g radial
Shock Resistance	> 2000 g
Operating Temperature Range	-40°C…400°C
Thermal Sensitivity Shift	20…400°C < 2%, 200…300°C < 0.5%
Cyclic Temperature Drift	< ±0.5 bar (@ 1300 rpm/7 bar IMEP)
Max. Load Change Drift Gradient	1.0 mbar/ms
Mounting Torque	1.5 Nm
Competitor´s solution	6052C – 100% mechanical compatible

Your Benefits

- suitable for high performance engines (power output)
- minimized disturbing signal caused by axial acceleration
- highest accuracy
- compact, robust design

GM12D / GH12D / GR12D

Installation, Application, Measuring task

Hints for adaptation

Similar in size but designed for different applications due to different sensing properties

	GM12D	GH12D	GR12D
Installation principle	direct, adapter	direct, adapter	direct, adapter
Recommended application	Small engines to passenger car Diesel and Gasoline engines with moderate power output	Small engines to high performance passenger car engines, racing engines (high IMEP – e.g. WRC), Diesel engines up to medium speed; alternative fuel engines	High performance engines (high speed – e.g. motorbike, racing)
Alternative application	Light duty Diesel engines, High performance engines (high speed)	High performance engines (high speed – e.g. motorbike, racing)	high performance passenger car engines
Measurement task	Standard measurements like Peak pressure, IMEP etc. – no Knock analysis	Standard to high demanding measurements like Knock analysis, friction, Gas exchange analysis etc.	All measurement tasks at high performance engines

GU12P

Pressure Measuring Probe

Description

- Piezoelectric cylinder pressure measuring probe
- Suitable for combustion analysis of Diesel engines via the M10 Glow Plug bore
- Flush mounting in Glow Plug adapters

Measuring Range	0…200 bar (2900 psi), 20 MPa
Sensitivity	16 pC/bar, 160 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.001 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ±0.6 bar
Max. Load Change Drift Gradient	1.5 mbar/ms
Mounting Torque	1.5 Nm (for adapters refer to drawings)
Competitor´s solution	100% compatible 6056AU38 in M10 Glow Plugs (non standard sensor! … standard 6056A not compatible)

Your Benefits

- high accuracy for detailed combustion analysis
- flush mounting for high signal quality (no pipe oszillations)
- high signal quality (dp/dα) and thermodynamic investigations at same time possible

GU13P

Pressure Measuring Probe

Description

- Piezoelectric cylinder pressure probe
- Suitable for combustion analysis of Diesel engines via the M8 and M10 Glow Plug bore
- Flush mounting in Glow Plug adapters

Measuring Range	0…200 bar (2900 psi), 20 MPa
Sensitivity	16 pC/bar, 160 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.001 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ±0.6 bar
Max. Load Change Drift Gradient	1.5 mbar/ms
Mounting Torque	1.5 Nm (for adapters refer to drawings)
Competitor´s solution	100% compatible 6056AU38 (non standard sensor! … standard 6056A not compatible)

Your Benefits

- universal applicable for M8 and M10 Glow Plug adapters
- high accuracy for detailed combustion analysis
- high signal quality (dp/dα) and thermodynamic investigations at same time possible

GH12P

Pressure Measuring Probe

Description

- Suitable for combustion analysis of Diesel engines via the M10 Glow Plug bore
- High performance version of GU12P pressure measuring probe
- Improved accuracy and extended measuring range

Measuring Range	0…250 bar, 25 MPa
Sensitivity	16 pC/bar, 160 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.001 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ± 0.5 bar
Max. Load Change Drift Gradient	1 mbar/ms
Mounting Torque	1.5 Nm (for adapter 4.0 Nm)
Competitor´s solution	100% compatible 6056AU38 in M10 Glow Plugs (non standard sensor! … standard 6056A not compatible)

Your Benefits

- robust sensor for highest loads
- highest accuracy for detailed combustion analysis (Low Cyclic Drift)
- high signal quality (dp/dα) and thermodynamic investigations at same time possible

GH13P

Pressure Measuring Probe

Description

- Suitable for combustion analysis of Diesel engines via the M8 and M10 Glow Plug bore
- High performance version of GU13P pressure measuring probe
- Improved accuracy and extended measuring range

Measuring Range	0…250 bar (3625 psi), 25 MPa
Sensitivity	15 pC/bar (1.03 pC/psi), 150 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.001 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ± 0.5 bar
Max. Load Change Drift Gradient	1 mbar/ms
Mounting Torque	1.5 Nm (for adapter 4.0 Nm)
Competitor´s solution	100% compatible 6056AU38 (non standard sensor! … standard 6056A not compatible)

Your Benefits

- robust sensor for highest loads
- highest accuracy for detailed combustion analysis (Low Cyclic Drift)
- high signal quality (dp/dα) and thermodynamic investigations at same time possible

GU12P / GU13P / GH12P / GH13P

Installation, Application, Measuring task

Hints for adaptation

Pressure measuring probes with different cable connector and sensing properties

	GU12P/GU13P	GH12P/GH13P
Installation principle	Glow Plug Adapter M10 … GU12P M8 and M10 … GU13P	Glow Plug Adapter M10 … GH12P M8 and M10 … GH13P
Recommended application	At present nearly every Passenger car and Light Duty Diesel engine	high performace Diesel engines
Alternative application		All other Glow plug applications
Measurement task	Standard measurements like Peak pressure, IMEP, dp/dα etc.	Standard to high demanding measurements

GU13G
Glow Plug Sensor

Description

- Pressure sensor for combustion analysis via thin Glow Plug bores
- available with M8 and M10 mounting thread
- Geometry customised to mounting bore geometry
- Membrane close to combustion chamber

Measuring Range	0…200 bar, 20 MPa
Sensitivity	16 pC/bar, 160 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.001 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ± 0.6 bar
Max. Load Change Drift Gradient	1.5 mbar/ms
Mounting Torque	4 Nm
Competitor´s solution	No solution available

Your Benefits

- fits into Glow Plug Bore from diameter 4,3 to 5,0mm
- best signal quality
- high accuracy

GH13G
Glow Plug Sensor

Description

- High performance versions of GU13G cylinder pressure probes
- available with M8 and M10 mounting thread
- Geometry customised to mounting bore geometry
- Membrane close to combustion chamber

Measuring Range	0…250 bar (3625 psi), 25 MPa
Sensitivity	16 pC/bar, 160 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.001 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ± 0.5 bar
Max. Load Change Drift Gradient	1 mbar/ms
Mounting Torque	4 Nm
Competitor´s solution	No solution available

Your Benefits

- fits into Glow Plug Bore from diameter 4,3 to 5,0mm
- best signal quality
- improved accuracy

GU13G / GH13G

Installation, Application, Measuring task

Hints for adaptation

same look but slightly different sensing properties

	GU13G	GH13G
Installation principle	Direct via Glow Plug Bore	Direct via Glow Plug Bore
Recommended application	At present nearly every Passenger car and Light Duty Diesel engine	high performace Diesel engines
Alternative application		All other Diesel engines
Measurement task	Standard measurements like Peak pressure, IMEP, dp/dα etc.	Standard to high demanding measurements

GU13Z
Pressure Measuring Probe

Description

- sensors for installation in Spark Plug adapters ZF42 and ZF43
- GU13Z-24 for “short” adapters (19mm flat or 17,5mm conical seat)
- GU13Z-31 for “long” adapters (1” thread length)
- Suitable for all standard measuring tasks

Measuring Range	0…200 bar, 20 MPa
Sensitivity	16 pC/bar, 160 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.001 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ± 0.6 bar
Max. Load Change Drift Gradient	1.5 mbar/ms
Mounting Torque	1.5 Nm (for adapters refer to drawings)
Competitor´s solution	Spark Plug adapter 6117 with integrated sensor

Your Benefits

- universal applicable for adapters of same thread length
- exchange of cable by customer possible

GH13Z
Pressure Measuring Probe

Description

- High performance versions of GU13Z cylinder pressure probes
- sensors for installation in Spark Plug adapters ZF42 and ZF43
- GH13Z-24 for “short” adapters (19mm flat or 17,5mm conical seat)
- GH13Z-31 for “long” adapters (1” thread length)

Measuring Range	0…250 bar (3625 psi), 25 MPa
Sensitivity	16 pC/bar, 160 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.001 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ±0.5 bar
Max. Load Change Drift Gradient	1 mbar/ms
Mounting Torque	1.5 Nm (for adapter refer to drawings)
Competitor´s solution	Spark Plug adapter 6117 with integrated sensor

Your Benefits

- universal applicable for adapters of same thread length
- exchange of cable by customer possible
- suitable for high performance engines and high demanding measuring tasks

GU13Z / GH13Z

Installation, Application, Measuring task

Hints for adaptation

same look but slightly different sensing properties

	GU13Z	GH13Z
Installation principle	Spark Plug adapter ZF42 and ZF43	Spark Plug adapter ZF42 and ZF43
Recommended application	passenger car Gasoline engines with moderate power output	passenger car Gasoline engines with moderate power output as well as high performance engines
Alternative application		
Measurement task	Standard measurements like Peak pressure, IMEP etc. – no Knock analysis	Standard to high demanding measurements like Knock analysis, friction, Gas exchange analysis etc.

GU21C
Transducer Uncooled

Description

- Piezoelectric pressure sensor with popular 6.2 mm plug in design
- Accurate as the best water cooled transducers
- Suitable for thermodynamic investigations (IMEP, friction loss, burn rate etc.)
- Suitable for all other combustion analysis tasks

Measuring Range	0…250 bar, 25 MPa
Sensitivity	35 pC/bar, 350 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.002 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ±0.4 bar
Max. Load Change Drift Gradient	1.5 mbar/ms
Mounting Torque	10 Nm (for adapters refer to drawings)
Competitor´s solution	Ground insulated 6125B – not 100% mounting compatible

Your Benefits

- highest available signal quality
- no influence of mounting bore deformation
- suitable for highest thermal loads due to heat conducting element

GU21D
Transducer Uncooled

Description

- Combustion pressure sensor with M7 mounting thread – heat conducting element
- Special thread design for accuracy comparable to the best watercooled transducers
- Suitable for thermodynamic investigations (IMEP, friction loss, burn rate etc.)
- Suitable for all other combustion analysis tasks

Measuring Range	0…250 bar, 25 MPa
Sensitivity	35 pC/bar, 350 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.002 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ±0.4 bar
Max. Load Change Drift Gradient	1.5 mbar/ms
Mounting Torque	3 Nm (for adapters refer to drawings)
Competitor´s solution	No solution – comparable dimensions: M8 water cooled 6041

Your Benefits

- highest signal quality in combination with easy handling (mounting thread)
- no influence of mounting bore deformation
- suitable for highest thermal loads due to heat conducting element

GU23D

M8 Pressure Transducer Uncooled

Description

- M8 pressure sensor 100% compatible to 6041
- improved handling without coolding water supply
- accuracy higher than watercooled 6041

Measuring Range	0…250 bar, 25 MPa
Sensitivity	35 pC/bar, 350 pC/MPa
Linearity	< ±0.3% FSO
Acceleration Sensitivity	< 0.002 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 400°C
Thermal Sensitivity Shift	20…400°C < ±2%, 200…300°C < ±0.5%
Cyclic Temperature Drift	< ±0.4 bar
Max. Load Change Drift Gradient	< 2 mbar/ms
Mounting Torque	3 Nm
Competitor´s solution	6041

Your Benefits

- 1:1 replacement of Kistler 6041
- higher accuracy than 6041

GU21C / GU21D / GU23D

Installation, Application, Measuring task

Hints for adaptation

same sensitivity but different outer dimensions determine the sensing properties

	GU21C	GU21D	GU23D
Installation principle	direct, adapter	direct, adapter	direct, adapter
Recommended application	All engines with sufficient space for mounting	All engines with sufficient space for mounting	Direct replacement of Kistler 6041
Alternative application	High performance engines (high speed)	High performance engines (high speed)	
Measurement task	Standard to high demanding measurements like Knock analysis, friction, Gas exchange analysis etc.	Standard to high demanding measurements like Knock analysis, friction, Gas exchange analysis etc.	Measurement tasks covered by Kistler 6041

ZI21 / ZI31

M10 / M12 Spark Plug Sensor

Description

- Spark Plug with integrated Pressure sensor
- available with M10 and M12 mounting thread from 19mm to 26,5mm length
- Heat Values (Bosch) from 3 to 7

Measuring Range	0…200 bar
Sensitivity	8 (12) pC/bar
Linearity	< ±0.5% FSO
Acceleration Sensitivity	< 0.001 bar/g
Shock Resistance	> 2000 g
Operating Temperature Range	up to 350°C, max. temp. plug seat: 230°C
Thermal Sensitivity Shift	150…250°C < ±0.6%
Cyclic Temperature Drift	< ±0.6 bar at 1300 rpm and 7 bar IMEP
Max. Load Change Drift Gradient	< 5 mbar/ms
Mounting Torque	10 (15) Nm…15 (25) Nm for spark plug
Competitor´s solution	M12: 6115; M10 not officially available (?)

Your Benefits

- highest possible signal quality
- high signal output
- durable BOSCH ceramic insulator
- easy maintenance – exchange of cable and insulator by customer

ZI21 / ZI31
product range

Type	Sealing	Thread length*	Heat range	Spark position	Electrode gap max.	Article	Spare Insulator
		[mm]	[Bosch]	[mm]	[mm]		
ZI21 U3CPRT	flat	12.7 - 19	3	1	0.8	GG0980	BO7350
ZI21 U5DPRT	flat	12.7 - 19	5	3	0.8	GG0981	BO7351
ZI21 U7DPRT	flat	12.7 - 19	7	3	0.8	GG0982	BO7352
ZI21 U7LPRT	flat	12.7 - 19	7	5	0.8	GG0983	BO7353
ZI31 Y3CPRT	flat	12.7 - 19	3	1	0.8	GG0984	BO7350
ZI31 Y5DPRT	flat	12.7 - 19	5	3	0.8	GG0985	BO7351
ZI31 Y7DPRT	flat	12.7 – 19	7	3	0.8	GG0986	BO7352
ZI31 Y7LPRT	flat	12.7 – 19	7	5	0.8	GG0987	BO7353
ZI31 Y3MPRT	flat	20,2 - 26,5	3	1	0.8	GG1028	BO7350
ZI31 Y5MPRT	flat	20,2 - 26,5	5	3	0.8	GG1029	BO7351
ZI31 Y7MPRT	flat	20,2 - 26,5	7	3	0.8	GG1030	BO7352
ZI31 Y7SPRT	flat	20,2 - 26,5	7	5	0.8	GG1031	BO7353

**) 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.*

ZI21 / ZI31
Installation, Application, Measuring task

Hints for adaptation

Similar in size but designed for different applications these sensors should be chosen very carefully

	ZI21	ZI31
Installation principle	Direct via M10 Spark Plug bore	Direct via M12 Spark Plug bore
Recommended application	all naturally aspirated Gasoline engines	all naturally aspirated Gasoline engines
Alternative application	Turbo charged engines – reduced electrode gap	Turbo charged engines – reduced electrode gap
Measurement task	Standard measurements like Peak pressure, IMEP, Knock analysis (?) etc.	Standard measurements like Peak pressure, IMEP, Knock analysis (?) etc.

ZF43
M14 Spark Plug Adapter

Description

- Spark Plug adapter for installation of sensors GU/H13Z
- available with thread length 19mm to 26,5mm
- Heat Values (Bosch) from 3 to 7

Art. No.	Identification	Sealing	Thread length A	Heat range	Total length B	Spark position C	Electrode gap D	Spare Isolator
			[mm]	[Bosch]	[mm]	[mm]	[mm]	
GG0966	ZF43 F3CPRR	flat	19	3	70,5	1	0.8	B07350
GG0967	ZF43 F5DPRT	flat	19	5	70,5	3	0.8	B07351
GG0968	ZF43 F7DPRT	flat	19	7	70,5	3	0.8	B07352
GG0969	ZF43 F7LPRT	flat	19	7	70,5	5	0.8	B07353
GG0970	ZF43 F5MPRT	flat	26.5	5	78	3	0.8	B07351
GG0971	ZF43 F7MPRT	flat	26.5	7	78	3	0.8	B07352
GG0972	ZF43 F7SPRT	flat	26.5	7	78	5	0.8	B07353
GG0973	ZF43 H7DPRT	conical	17.5	7	70,5	3	0.8	B07352
GG0974	ZF43 H7LPRT	conical	17.5	7	70,5	5	0.8	B07353
GG0975	ZF43 H5MPRT	conical	25	5	78	3	0.8	B07351
GG0976	ZF43 H7MPRT	conical	25	7	78	3	0.8	B07352
GG0977	ZF43 H7SPRT	conical	25	7	78	5	0.8	B07353

Your Benefits

- front flush mounted transducer
- flexible application – sensor can be used in adapters of same thread length
- durable BOSCH ceramic insulator
- easy maintenance – exchange of sensor and insulator by customer

QC34C
Quartz Pressure Transducer

Description

- Watercooled combustion pressure sensor with 9.2 mm plug in type design
- highest performance in its class
- Suitable for thermodynamic investigations (IMEP, friction loss, burn rate etc.)

Measuring Range	0…250 bar, 25 MPa
Sensitivity	19 pC/bar, 190 pC/MPa
Linearity	< ±0.2% FSO
Acceleration Sensitivity	< 0.013 bar/g with cooling water
Shock Resistance	2000 g
Thermal Coefficient of Sensitivity	0.003%/°C at 20…80°C
Cyclic Temperature Drift	< ±0.3 bar
Max. Load Change Drift Gradient	5.5 mbar/ms
Mounting Torque	15 Nm (for adapters refer to drawing)
Competitor´s solution	6067

Your Benefits

- robust sensor (withstands failure of cooling water support)
- universal applicable – from passenger car engines to large engines
- no influence of mounting bore deformation
- suitable for all measuring tasks

QC34D
Quartz Pressure Transducer

Description

- Watercooled combustion pressure sensor with M10 mounting thread
- highest performance in its class
- Suitable for thermodynamic investigations (IMEP, friction loss, burn rate etc.)

Measuring Range	0…250 bar, 25 MPa
Sensitivity	19 pC/bar, 190 pC/MPa
Linearity	< ±0.2% FSO
Acceleration Sensitivity	< 0.013 bar/g with cooling water
Shock Resistance	2000 g
Thermal Coefficient of Sensitivity	0.003%/°C at 20…80°C
Cyclic Temperature Drift	< ±0.3 bar
Max. Load Change Drift Gradient	4.5 mbar/ms
Mounting Torque	10 Nm (for adapters refer to drawing)
Competitor´s solution	6061

Your Benefits

- robust sensor (withstands failure of cooling water support)
- universal applicable – from passenger car engines to large engines
- suitable for all measuring tasks

QC43D
Quartz Pressure Transducer

Description

- water cooled pressure sensor with M14 mounting thread
- suitable for high precision measurements

Measuring Range	0…200 bar, 20 MPa
Sensitivity	68 pC/bar, 680 pC/MPa
Linearity	< ±0.2% FSO
Acceleration Sensitivity	< 0.003 bar/g without cooling water
Shock Resistance	> 2000 g
Thermal Coefficient of Sensitivity	0.02%/°C at 20…80°C
Cyclic Temperature Drift	< ±0.35 bar
Max. Load Change Drift Gradient	4 mbar/ms
Mounting Torque	20 Nm (for adapters refer to drawing)
Competitor´s solution	7061B

Your Benefits

- high accuracy
- high signal output

QC34C / QC34D / QC43D

Installation, Application, Measuring task

Hints for adaptation

watercooled sensors for different applications

	QC34C	QC34D	QC43D
Installation principle	adapter	direct, adapter	direct, adapter
Recommended application	All engines with sufficient mounting space from passenger to large engines	All engines with sufficient mounting space from passenger to large engines	All engines with sufficient mounting space from passenger to large engines and moderate power output
Alternative application			
Measurement task	Standard to high demanding measurements like Knock analysis, friction, Gas exchange analysis etc.	Standard to high demanding measurements like Knock analysis, friction, Gas exchange analysis etc.	Standard to high demanding measurements but no Knock analysis