


High temperature pressure sensor for gas turbine- and thermoacoustics applications

Type 6021B...

Differential, acceleration compensated, piezoelectric pressure sensor for dynamic applications at highest temperatures up to 1 000°C.

- Operating temperature –55 ... 700°C
- Short time operating temperature –55 ... 1 000°C
- Internally case isolated
- Differential charge output
- Highest reliability
- Not pyroelectric
- Acceleration compensated
-  ATEX/IECEX certificated
- CE conform

Description

Core of the sensor is the single crystal PiezoStar measuring element, which has a temperature capability up to 1 000°C and is not pyroelectric. The sensor is designed for maximum longevity.

To reach highest resolution in harsh environment, the sensor is internally case isolated featuring two-wire technology with differential signal output. The integrated, mineral insulated hardline cable is available with different terminations.

Ex-approval (ATEX, IECEx) allows operation in hazardous areas.

Application

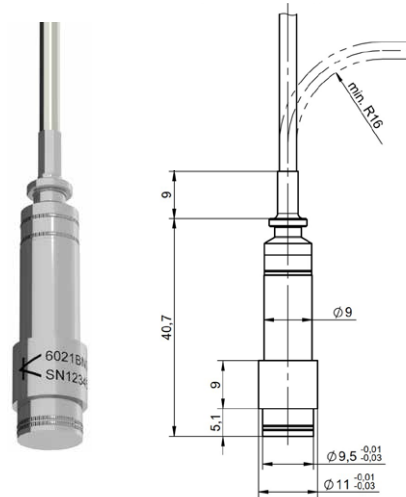
Main applications are protection of equipment and condition monitoring of gas turbines. In addition, the sensor is used for the development of combustion chambers of gas turbines.

General purpose and thermoacoustics applications, which require

- Temperature capability up to 1 000°C
- Measurements of smallest pressure fluctuations
- Explosive and/or EMC loaded environments in the acoustic range

Further applications

- Pressure pulsations on compressors, pumps, turbines, propellers, etc.
- Dynamic pressure measurements with high thermal shocks as for example gas and dust explosions (Ex testing), pyro-technical devices, closed vessel testing, energetic material testing, sloshing or small dynamic pressures as for example sound pressure, etc.



Technical data

Reference temperature for performance specifications is 25°C unless otherwise noted. For more information, see technical brochure 960-201e.

Electric

Power		none
Output signal		charge
Signal mode		2-wire, differential
Signal conditioning		diff. charge amplifier
Insulation resistance pin – pin		
@ 25°C	Ω	≥10 ¹¹
@ 700°C	Ω	≥10 ⁵
Insulation resistance pin – case		
@ 25°C	Ω	≥10 ¹⁰
@ 700°C	Ω	≥10 ⁵
Capacitance pin – pin	pF	≤20 + 60 pF/m cable length
Capacitance pin – case	pF	≤8 + 175 pF/m cable length

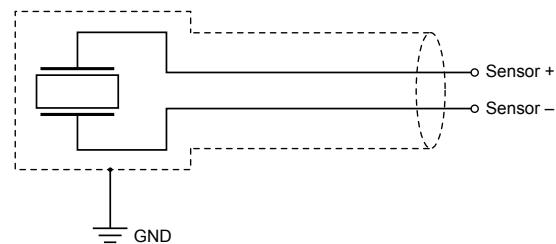


Fig. 1: Diagram, 2-wire, internally case isolated

6021B_003-590e-10.22

Technical data (continuation)

Operation

Pressure measuring range	bar/psi	0 ... 100 / 0 ... 1 450
Calibrated partial range	bar/psi	0 ... 20 / 0 ... 290
Overload	bar/psi	200 / 2 900
Sensitivity (nom. ±10 %)	pC/bar	62
Thermal sensitivity shift		see Fig. 2
Linearity, hysteresis and repeatability	%FSO	≤1
Acceleration sensitivity, typical	mbar/g	0.4
Natural frequency, longitudinal	kHz	ca. 50
Frequency range		
upper range (+10 %)	Hz	ca. 20 000
lower range (–3 dB)	Hz	0.5 ¹⁾

¹⁾ In combination with differential charge amplifier Types 5181, 5183, 5185.

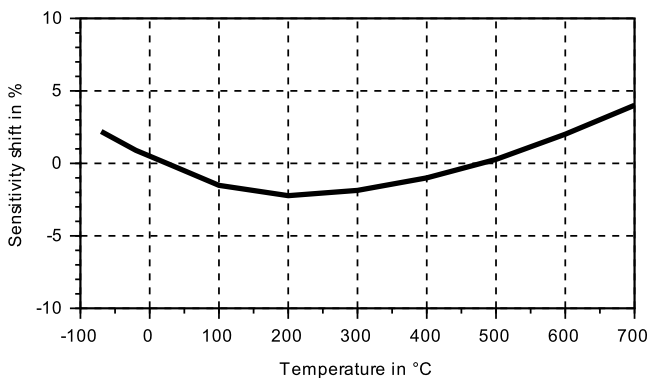


Fig. 2: Typical thermal sensitivity shift relative to room temperature

Physical

Weight sensor and cable	g	14 + 47 g/m cable length
Material		Nimonic alloy 90 INCONEL alloy 718
Cable jacket		INCONEL alloy 600
Wire		Nickel

Nimonic is a registered trade mark of Special Metals Wiggins Ltd.

INCONEL alloy 718 und INCONEL alloy 600 are registered trade marks of INCO family of companies.

Environment

Operating temperature range		
Continuous	°C	–55 ... 700
Extreme ³⁾	°C	1 000 ³⁾
Termination		
LEMO PCA.0S.302	°C	–55 ... 180
7/16"-27 UNS-2A	°C	–55 ... 180
Open leads		–55 ... 180
Shock	g	<1 000
Corrosion		see material
Humidity		
Housing with integr. cable		hermetically sealed
Connector		IP50

Explosive atmosphere

Explosion protection:

Protection class

Ex-nA	ATEX	⊕ II 3 G Ex nA IIC T6...T710 °C Gc SEV 18 ATEX 0208 X ²⁾
	IECEX	Ex nA IIC T6...T710 °C Gc IECEX SEV 18.0038X ²⁾
Ex-ia	ATEX	⊕ II 1 G Ex ia IIC T6...T710 °C Ga SEV 18 ATEX 0208 X ²⁾
	IECEX	Ex ia IIC T6...T710 °C Ga IECEX SEV 18.0038X ²⁾

Entity Parameter (intrinsic safety)

U _i	V	≤30
I _i	mA	≤130
P _i	W	≤0.8
C _i	pF	≤15 + 170 pF/m
L _i	μH	0

Entity Parameter (non-sparking)

U _i	V	≤30
I _i	mA	≤130

²⁾ Special conditions for safe use are described in the instruction manual

³⁾ For detailed information please contact the local Kistler sales office

6021B_003-590e-10.22

Connector Types

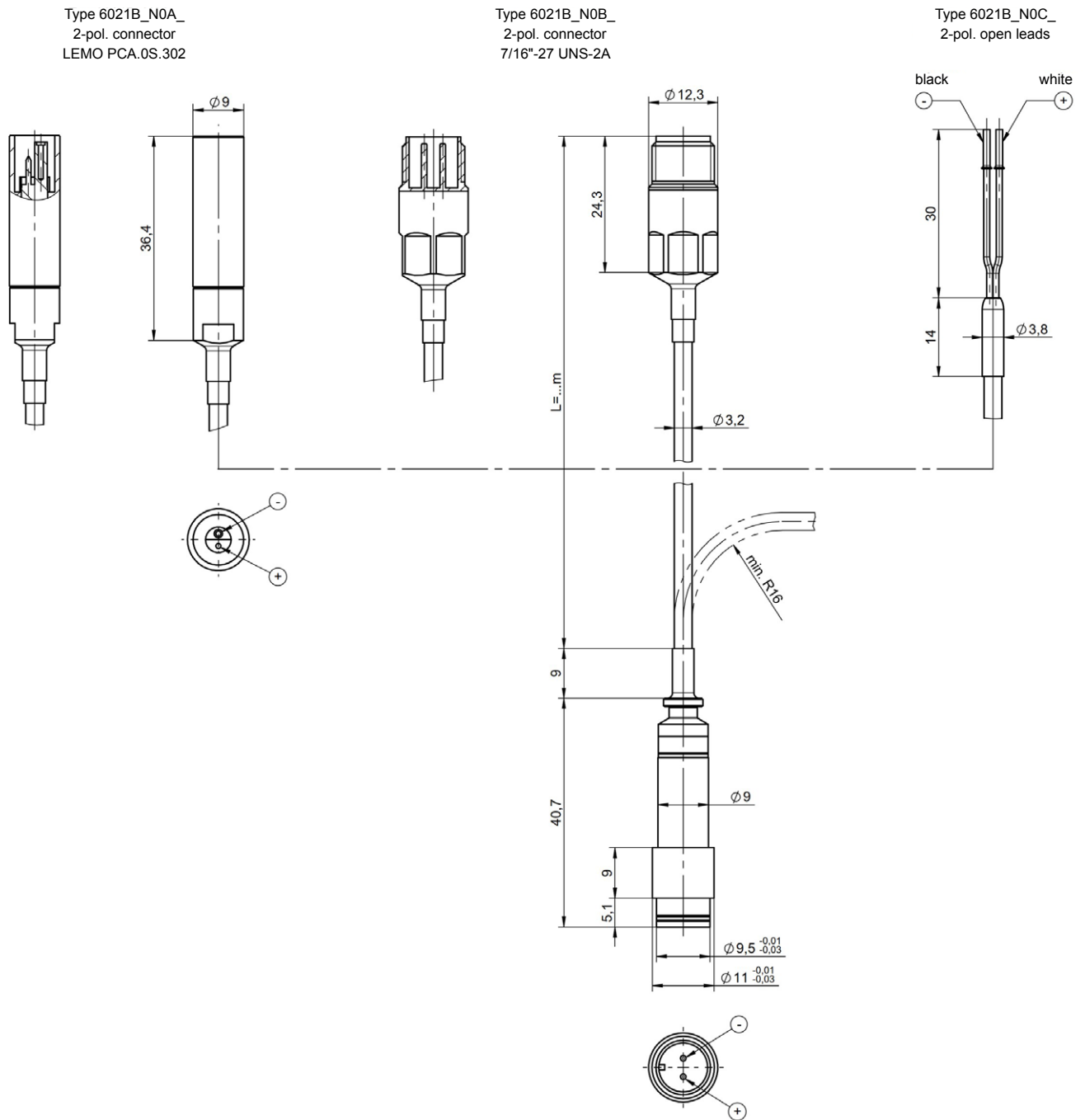


Fig. 3: Sensor dimensions Type 6021B... including cable terminations

6021B_003-590e-10.22

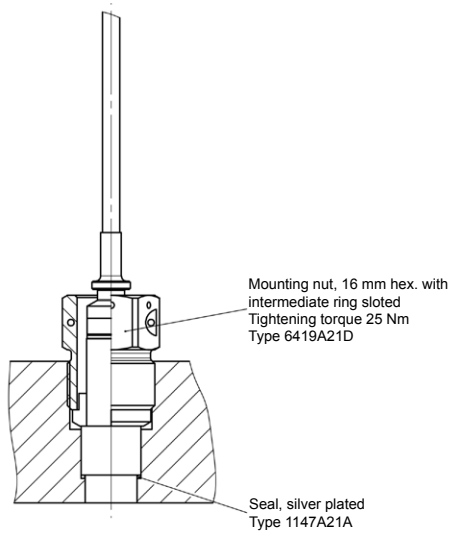


Fig. 9: Installation with mounting adapter Type 6419A21D and seal Type 1147A21A

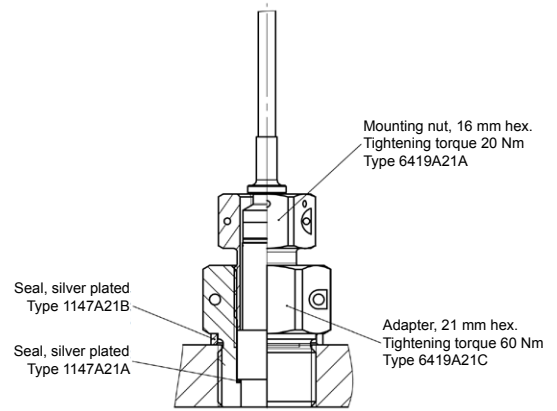


Fig. 10: Installation with adapter Type 6419A21C, mounting nut Type 6419A21A, and seal Type 1147A21A and 1147A21B

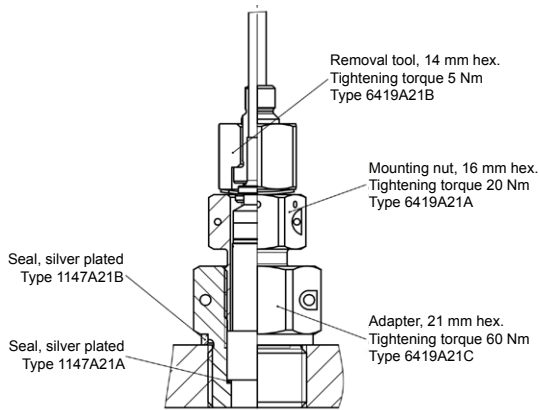


Fig. 11: Installation with adapter Type 6419A21C, mounting nut Type 6419A21A, removal tool Type 6419A21B, and seal Type 1147A21A and Type 1147A21B

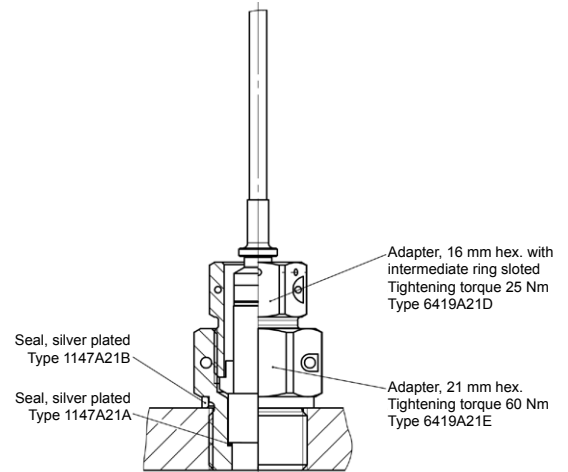


Fig. 12: Installation with adapter Type 6419A21E, adapter Type 6419A21D, and seal Type 1147A21A and Type 1147A21B

Accessories

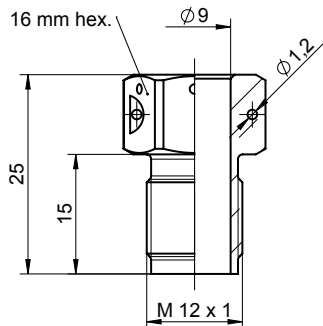


Fig. 13: Mounting nut M12x1, Type 6419A21A for sensor with Lemo connector and open leads

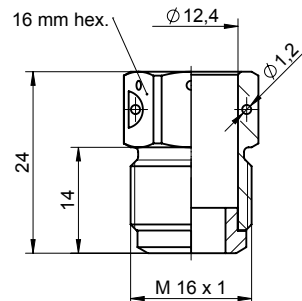


Fig. 14: Mounting nut M16x1, Type 6419A21D for Sensor with 7/16" connector

6021B_003-590e-10.22

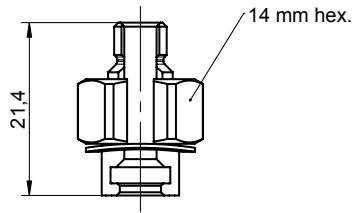


Fig. 15: Removal tool, Type 6419A21B on mounting nut Type 6419A21A

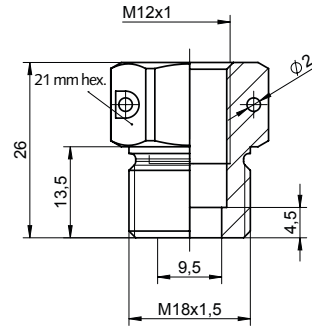


Fig. 16: Adapter M18x1,5, Type 6419A21C

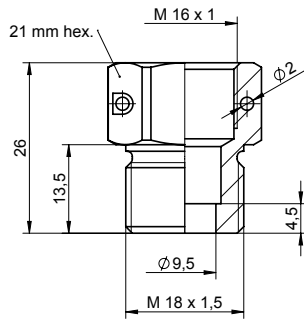


Fig. 17: Adapter M18x1,5, Type 6419A21E for sensor with 7/16" connector

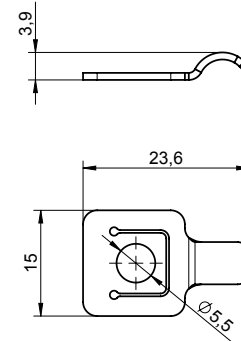


Fig. 18: Mounting bracket for hardline cable, Type 1423A1

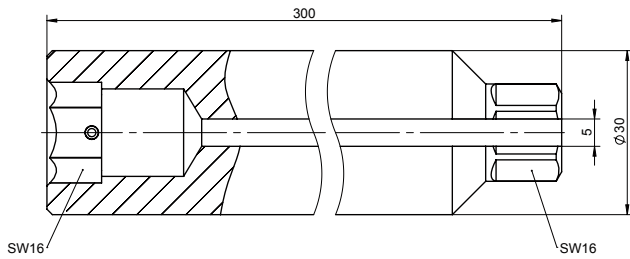


Fig. 19: Mounting tool, slotted, Type 1251A21A

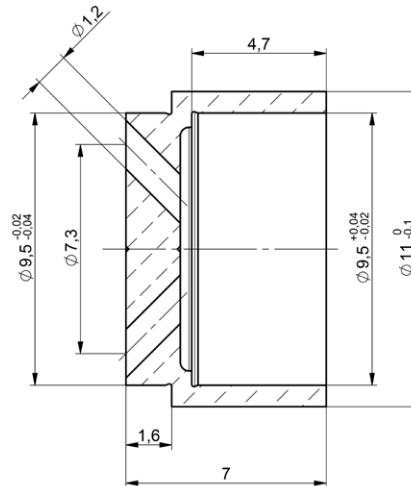


Fig. 20: Flame protection shield, Type Z21603A21F

6021B_003-590e-10.22

Included accessories

- Mounting nut
- Sealing ring, silver plated (5 pieces)

Optional accessories

- Sealing ring, silver plated (5 pieces)
- Sealing for intermediate adapter M18x1,5, silver plated
- Mounting nut
- Mounting nut
- Insertion/removal tool
- Adapter M18x1,5
- Adapter M18x1,5
- Mounting bracket for hardline cable
- Mounting tool, slotted
- High temperature thread paste
- Flame protection shield

Optional accessories

- Softline cable
- Differential charge amplifier
 - Standard version
 - Ex-iA version
 - Ex-nA version

Type/Mat. No.

6419A21A or
6419A21D
1147A21A

Type/Mat. No.

1147A21A
1147A21B

6419A21A

6419A21D

6419A21B

6419A21C

6419A21E

1423A1

1251A21A

1059

Z21603A21F

Type/Mat. No.

1652A...

5181A

5183A

5185A

Ordering key

Ex certification

Not Ex certificated	–
Ex certificated: "Ex-ia", Ex-nA"	E

Cable termination

Lemo 2 pole connector	A
7/16" 2 pole connector	B
Open leads	C

Cable length* 4)

1 m	01
3 m	03

* Customized lengths on request

4) Tolerance for cable lengths less than 1 m: +45 mm.
Tolerance for cable lengths between 1 m and 5 m: +75 mm.

Type 6021B NO

