# GRAS 46AO-S2

1/2'' CCP Pressure Microphone Set,

Freq range: 3.15 Hz to 20 kHz
Dyn range: 25 dB(A) to 150 dB
Sensitivity: 12 mV/Pa

The 46AO-S2 is a 1/2" CCP microphone set for wide-frequency pressure measurements with very short preamplifier for confined spaces.

GRAS Sound & Vibration
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## Introduction

The 46AO-S2 is a high-precision microphone suitable for laboratory work.

## Design

The GRAS 46AO-S2 is a high-performance standard microphone set. In our clean-room environment the set is assembled and sealed with a label. However, the microphone set can be dismounted, if you wish to use the components separately.

Microphone
The microphone cartridge is the high-quality rear-vented IEC 61094 WS2P standardized GRAS 40AO 1/2" Prepolarized Pressure Microphone, designed for long-term reliability in multiple environments.

Preamplifier
The preamplifier is the very short GRAS 26CK Preamplifier which is inclusive TEDS and based on our well-known circuit board substrates. In the industry these are famous for their low self-noise, wide frequency and excellent slew rate performance.

## Compatibility

To perform as specified the GRAS 46AO-S2 microphone set requires a constant current input module that can deliver 4 mA and 24 V unloaded CCP voltage supply. If the constant current supply is lower, the capability of driving long cables is reduced and consequently the upper frequency is reduced. If the voltage supply is lower it will influence the upper dynamic range.

The microphone set is terminated with a Microdot 10/32 connector. Ready to use coax cable assemblies of various types and lengths are available in standard as well as customized lengths.

The 46AO-S2 is IEEE 1451.4 TEDS v. 1.0 compliant. If your measurement platform supports Transducer Electronic Data Sheets you will be able to read and write data like properties and calibration data.

## System verification

The functionality of TEDS is very useful to determine which microphone is connected to which input channel. However, it is not a check of whether the microphone is within specifications or not. For daily verification and check of your measurement setup, we therefore recommend using a sound source like the GRAS 42AG Sound Calibrator.

For proper sensitivity calibration we recommend using a reference sound source like the GRAS 42AP Intelligent Pistonphone.

## Service

Should you by mistake damage the diaphragm on a GRAS microphone we will in most cases be able to exchange it at a very reasonable cost and short turn-around time. This not only protects your investment but also meets your quality assurance department since you do not have to worry about new serial numbers etc.

## Calibration

When leaving the factory, all GRAS microphones have been calibrated in a controlled laboratory environment using traceable calibration equipment. Depending on the use, measurement environment and internal quality control programs we recommend that the microphone is recalibrated at least once a year.

We offer two kinds of calibration as an optional after-sales service: GRAS Traceable Calibration and GRAS Accredited Calibration.

GRAS Traceable Calibration is a traceable calibration

performed by trained personnel under controlled conditions according to established procedures and standards. This is identical to the rigorous calibration that all GRAS microphones are subjected to as an integral part of our quality assurance.

GRAS Accredited Calibration is performed by the GRAS Accredited Calibration Laboratory that has been accredited in accordance with ISO 17025 by DANAK, the Danish Accreditation Fund.

If you want a new microphone set delivered with an accredited calibration in stead of the default factory calibration, specify this when ordering.

Learn more at gras/calib.

## Quality and warranty

GRAS microphone sets are made of components from our proven standard portfolio and are all manufactured of high-quality material and branded parts that were chosen and processed to ensure life-long stability and robustness.

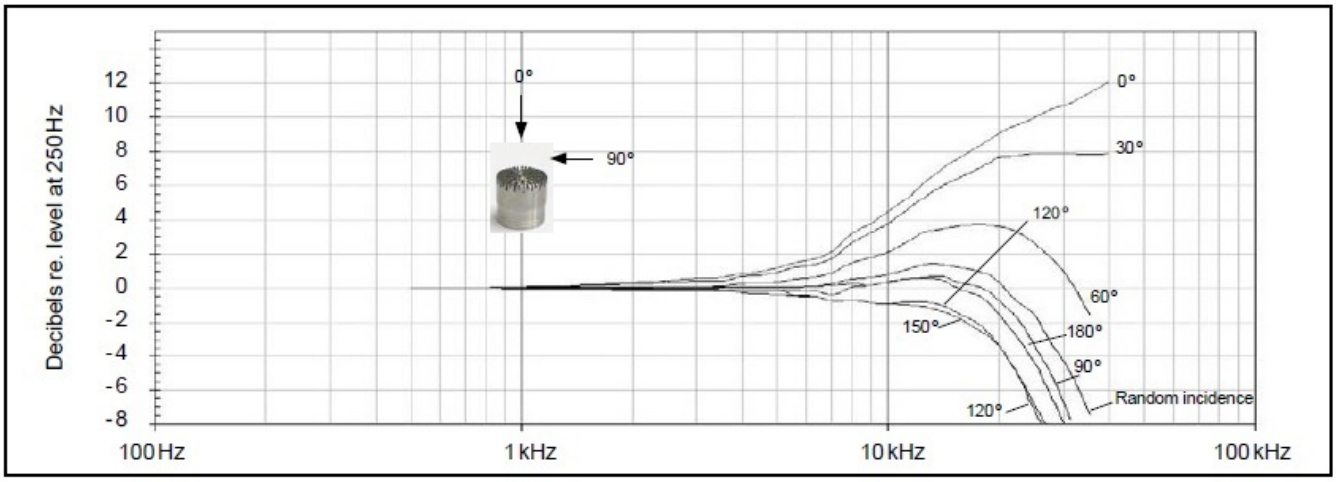
All parts are manufactured and assembled at the factory in Denmark by skilled and dedicated operators in a verified clean-room environment. The microphone diaphragm, body and unique protection grid are made of high-grade stainless steel and make the microphone set resistant to physical damage as well as corrosion caused by aggressive air or gasses.

This, together with the enforced gold-plated microphone terminal guarantees a highly reliable connection. Thanks to the high quality, our warranty against defective materials and workmanship is 5 years.

# Specifications

| | | |
|---|---|---|
| Polarization/Connection | | 0 V / CCP |
| Frequency range (±1 dB) | Hz | 5 to 12.5 k |
| Frequency range (±2 dB) | Hz | 3.15 to 20 k |
| Dynamic range lower limit with GRAS preamplifier | dB(A) | 25 |
| Dynamic range upper limit with GRAS preamplifier | dB | 150 |
| Set sensitivity @ 250 Hz (±3 dB) | mV/Pa | 12 |
| Set sensitivity @ 250 Hz (±3 dB) | dB re 1V/Pa | -38.5 |
| Output impedance | Ω | <50 |
| Output Voltage Swing, min. @ 24-28 V CCP voltage supply | Vp | 8 |
| Power supply min. to max. | mA | 2 to 20 |
| Power supply min. to max. (single/balanced) | V | N/A |
| DC bias voltage, typ. | V | 12 |
| Microphone venting | | Rear |
| IEC 61094-4 Designation | | WS2P |
| Temperature range, operation | °C / °F | -30 to 85 / -22 to 185 |
| Temperature range, storage | °C / °F | -40 to 85 / -40 to 185 |
| Temperature coefficient @250 Hz | dB/°C / dB/°F | -0.01 / -0.006 |
| Static pressure coefficient @250 Hz | dB/kPa | -0.007 |
| Humidity range non condensing | % RH | 0 to 90 |
| Humidity coefficient @250 Hz | dB/% RH | -0.001 |
| Influence of axial vibration @1 m/s² | dB re 20 µPa | 66 |
| TEDS (IEEE 1451.4) | | 27 v. 1.0 |
| Connector type | | Microdot 10/32 |
| CE/RoHS compliant/WEEE registered | | Yes/Yes/Yes |
| Weight | g / oz | 25 / 0.88 |

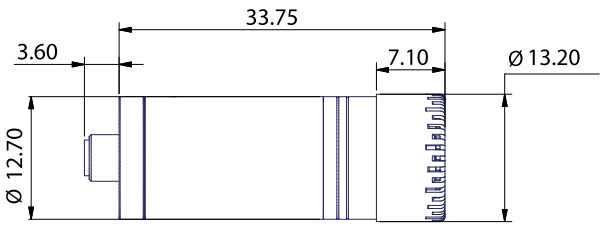
Typical pressure frequency response.

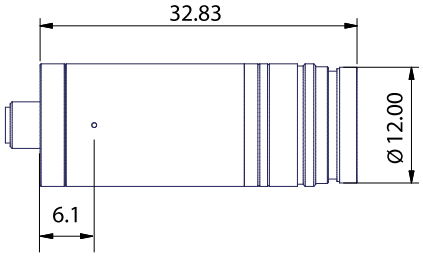



Free-field corrections for different angles of incidence

GRAS Sound & Vibration reserves the right to change specifications without notice.

# Dimensions



| | |
|---|---|
| 46AO-S2 | 1/2" CCP Pressure Microphone Set, prepolarized with very short preamplifier (2 pcs) |

## Optional items

| | |
|---|---|
| GRAS AA0027 | 3 m Microdot - BNC Cable |
| GRAS AL0008 | 1/2" Microphone Holder, POM |
| GRAS AL0012 | 1/2" Microphone Holder, Stainless Steel |
| GRAS AL0005 | Swivel head |
| GRAS AL0006 | Tripod |
| GRAS RA0020 | 1/2" Nosecone |
| GRAS AM0069 | Windscreen for 1/2" Microphones |
| GRAS RA0131 | 1/2" Rain protection cap |
| GRAS 12AL | 1-Channel CCP Power Module with A-weighting filter |
| GRAS 12AQ | 2-Channel Universal Power Module with signal conditioning and PC interface |
| GRAS 42AG | Multifunction Sound Calibrator, Class 1 |
| GRAS 42AP | Intelligent Pistonphone, Class 0 |
| GRAS CA0029 | Traceable Calibration of Microphone Set |
| GRAS CA2301 | Accredited Calibration of Microphone Set |

GRAS Sound & Vibration reserves the right to change accessories without notice.

# GRAS Worldwide

Subsidiaries and distributors in more than 40 countries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**About GRAS Sound & Vibration**

GRAS is a worldwide leader in the sound and vibration industry. We develop and manufacture state-of-the-art measurement microphones to industries where acoustic measuring accuracy and repeatability is of utmost importance in R&D, QA and production. This includes applications and solutions for customers within the fields of aerospace, automotive, audiology, and consumer electronics. GRAS microphones are designed to live up to the high quality, durability and accuracy that our customers have come to expect and trust.

GRAS Sound & Vibration is represented through subsidiaries and distributors in more than 40 countries and is part of Axiometrix Solutions, a leading test solutions provider comprised of globally recognized measurement brands. Read more at www.GRASacoustics.com

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