

# GRAS 42AC

Pistonphone, high pressure, Class 1



Sound pressure level: 134 dB  
Frequency: 250 Hz  
ANSI: S1.40  
IEC: 60942

The GRAS 42AC Pistonphone, high pressure is a precision sound source for calibrating microphones. It is battery operated and produces a constant sound pressure level of 134 dB re. 20 $\mu$ Pa (equivalent to 100 Pa) at 250 Hz, or 125.4 dBA re. 20 $\mu$ Pa.

## Typical applications and use

- Reference sound source
- Precision microphone calibrations
- Microphone comparisons

## Design

With a microphone placed in the coupler of the pistonphone, the calibration level is:

- 134 dB 1 re. 20 Pa
- 125.4 dBA re. 20 Pa (with A-weighting applied)

At a static ambient pressure of 101.3 kPa, no further correction factors need to be applied.

The 42AC is an extremely stable laboratory standard sound source that can also be used for field calibrations – it retains its high accuracy even under hostile environmental conditions. The 42AC complies with all the requirements of IEC Standard 942 (1988) Sound Calibrators Class 1 when corrected with barometer ZC0003K (included). The 42AC is delivered with a ½" coupler (RA0048) for calibrating ½" microphones directly. The 42AC-S2 is a version of the 42AC that is delivered with a 1" coupler (RA0023) for calibrating 1" microphones directly.

The pistonphone works on the principle of four reciprocating pistons actuated by a precision machined cam with a sinusoidal profile. The rotation speed of the cam is controlled to within 0.5% via a tachometer signal in a feedback loop.

The 42AC has a dual-color LED above the ON/OFF switch to indicate both battery condition and stable operation. When the pistonphone is operating properly, the LED shows green, indicating that the speed of the cam is correctly locked to give 250 Hz. If it shows red while the pistonphone is switched on, the speed is incorrect; most likely because of low batteries.

The operating procedure is straightforward, simply fit the microphone into the coupler of the pistonphone and switch it on. The pistonphone will now produce a constant sound pressure level on the diaphragm of the microphone.

The Pistonphone 42AC is compatible with GRAS ½", ¼", and ⅛" microphones and all other microphones having the same standard diameters. Adapters are included for calibrating ¼" and ⅛" microphones. Where applicable, the coupler RA0023 is also available for calibrating 1" microphones.

Each pistonphone is factory calibrated with an accuracy of  $\pm 0.14$  dB re. 20 Pa and is supplied with an individual calibration certificate stating the exact value and test condition. The exact value is adjusted to be 134 dB within  $\pm 0.05$  dB under reference conditions. Since the output level of a pistonphone depends on the static ambient pressure, the 42AC is delivered with a barometer which shows directly on a printed scale what must be added or subtracted to the output level of the pistonphone. The barometric correction at a given altitude very seldom varies by more than  $\pm 0.2$  dB.

Adapters for the GRAS 41AL Environmental Microphone and Outdoor Microphone Systems 41AM and 41CN are available for use with Pistonphone 42AC fitted with a 1" microphone coupler RA0023. A two-port high-pressure calibration coupler for ½" microphones (RA0042) is available for making comparison calibrations with a reference microphone. This can also be used for measuring the P-I (Pressure-Intensity) index of intensity systems at 250 Hz.

Octopus couplers are also available for simultaneously calibrating up to 8 microphones.

Frequency	Hz	250
Sound pressure level	dB	134 re. 20 Pa
ANSI standard		S1.40
IEC standard		60942
Temperature range, operation	°C / °F	-10 to 55 / 14 to 131
Battery type		4 x AA alkaline (IEC LR 6)
Weight	g / oz	325 / 11.464

Calibration Accuracy at reference conditions:

1/2" microphone: ±0.14 dB

1" microphone: ±0.2 dB

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

## Included

<a href="#">GRAS RA0048</a>	Coupler for ½" microphones. Applies only for 42AC
<a href="#">GRAS RA0049</a>	Adapter for ¼" microphones
<a href="#">GRAS RA0069</a>	Adapter for ⅜" microphones
GRAS ZC0003K	Barometer
GRAS EL0001	Four LR6-AA alkaline batteries

## Optional

<a href="#">GRAS RA0023</a>	Adapter for ¼" microphones
<a href="#">GRAS RA0009</a>	Adapter for Outdoor Microphone System 41AM
<a href="#">GRAS RA0041</a>	Adapter for Outdoor Microphone System 41CN
GRAS RA0010	Adapter for Environmental Microphone 41AL
<a href="#">GRAS RA0048</a>	Pistonphone Coupler for 1/2" microphones
<a href="#">GRAS RA0168</a>	Digital precision barometer

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# GRAS Worldwide

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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 and related equipment for industries where acoustic measuring accuracy and repeatability are of the utmost importance. This includes applications and solutions for customers within the fields of aerospace, automotive, audiology, consumer electronics and other highly demanding industries. GRAS microphones are designed to live up to the high quality, durability and accuracy that our customers have come to expect, trust and require.

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](http://www.grasacoustics.com)

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