GRAS 42AA

Pistonphone, Class 1



Sound pressure level: 114 dB
Frequency: 250 Hz
IEC: 60942

The GRAS Pistonphone 42AA is a battery-operated, precision sound source for accurate and reliable calibration of measurement microphones, sound level meters, and other sound measuring equipment.

GRAS Sound & Vibration
Skovlytoften 33, 2840 Holte, Denmark
www.grasacoustics.com

Typical applications and use

- Reference calibration source
- Precision microphone calibrations
- Microphone comparisons
- P-I index measurement at 250 Hz

Design

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

- 114 dB 1 re. 20 Pa
- 105.4 dBA re. 20 Pa (with A-weighting applied)

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

The 42AA is an extremely stable laboratory standard sound source which can also be used for field calibrations – it retains its high accuracy even under hostile environmental conditions.

The 42AA complies with all the requirements of IEC Standard 942 (1988) Sound Calibrators Class 1, when corrected with barometer ZC0002K as well as Class 0, when corrected with barometer GRAS RA0168. The 42AA includes ZC0002K.

The pistonphone works on the principle of two 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 feed-back loop. The 42AA has a dual-colour LED above the ON/OFF switch to indicate both battery condition and stable operation.

When the pistonphone is operating properly, the LED is green, indicating that the speed of the cam is correctly locked to give 250 Hz. If it is red, while the pistonphone is switched on, the speed is incorrect and most likely because of low batteries.

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

The Pistonphone 42AA is compatible with GRAS ½", ¼", and ⅛" microphones and all other microphones having the same standard diameters. Adapters are included for calibrating ¼" and⅛" microphones. Where applicable, the coupler RA0023 is also available for calibrating 1" microphones.

Each pistonphone is factory calibrated with an accuracy of ±0.09 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 114 dB within ±0.05 dB under reference conditions. Since the output level of a pistonphone depends on the static ambient pressure, the 42AA 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.

For use as a Class 0 calibrator, a precision barometer (not included) with an accuracy of ± 1 hPa or better should be used. The barometric correction at a given altitude very seldom varies by more than ± 0.2 dB.

Adapters for the GRAS 41AL Environmental Microphone and Outdoor Microphone Systems 41AM and 41CN are available for use with Pistonphone 42AA fitted with a 1" microphone coupler RA0023.

A two-port calibration coupler for ½" microphones (RA0024) 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.

Specifications

Frequency	Hz	250
Sound pressure level	dB	114 re. 20 Pa
Gain	dB	1.5
ANSI standard		S1.10
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	325.00 / 11.464

Calibration Accuracy at reference conditions:
1/2" microphone: ±0.09 dB
1" microphone: ±0.2 dB

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

Included

GRAS RA0049	Adapter for ¼" microphones
GRAS RA0069	Adapter for ⅛" microphones
GRAS ZC0002K	Barometer
GRAS RA0048	Coupler for ½" microphones
GRAS EL0001	Four LR6-AA alkaline batteries

Optional

GRAS RA0009	Adapter for Outdoor Microphone System 41AM
GRAS RA0041	Adapter for Outdoor Microphone System 41CN
GRAS RA0010	Adapter for Environmental Microphone 41AL
GRAS RA0157	Pistonphone adapter 1/2" for KEMAR pinna
GRAS RA0024	Two-port calibration coupler
GRAS RA0023	Adapter for 1" microphones
GRAS RA0090	94 dB Pistonphone coupler
GRAS RA0168	Digital precision barometer

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

GRAS Worldwide

Subsidiaries and distributors in more than 40 countries

HEAD OFFICE, DENMARK
GRAS SOUND & VIBRATION
Skovlytoften 33
2840 Holte
Denmark
Tel: +45 4566 4046
www.GRASacoustics.com
gras@grasacoustics.com

USA
GRAS SOUND & VIBRATION
9290 SW Nimbus Avenue
Beaverton, OR 97008
Tel: 503-627-0832
Toll Free: 800-231-7350
www.GRASacoustics.com
sales-usa@grasacoustics.com

UK
GRAS SOUND & VIBRATION
Unit 115, Gibson House,
Ermine Business Park, Huntingdon,
Cambridgeshire, PE29 6XU
Tel: +44 (0) 7762 584 202
www.GRASacoustics.com
sales-uk@grasacoustics.com

CHINA
GRAS SOUND & VIBRATION
Room 315, RuiBo Center(T1)
Lane683, Shenhong Rd,
Minhang District,
Shanghai, China, 201107
Tel: +86 21 64203370
www.GRASacoustics.cn
cnsales@grasacoustics.com



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

grasacoustics.com

GRAS
An Axiometrix Solutions Brand