

Pistonphone Type 42AC

Product Data and Specifications

Typical applications

- Reference sound source
- Precision microphone calibrations
- Microphone comparisons
- Precision hydrophone calibrations

The G.R.A.S. Pistonphone Type 42AC (Fig. 1) is a battery-operated, precision sound source for accurate and reliable calibration of measurement microphones, sound level meters and other sound measuring equipment.

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

- 134 dB re. 20 μ Pa (± 0.08 dB) at 250 Hz
(note: 134 dB is equivalent to 100 Pa)
with A-weighting applied;
- 125.4 dBA re. 20 μ Pa (± 0.08 dB) at 250 Hz

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

The Type 42AC 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. It complies with all the requirements of IEC Standard 942 (1988) *Sound Calibrators Class 1* with an included barometer as well as Class 0 with a precision barometer (not included).

The Type 42AC is normally delivered for calibrating 1/2-inch microphones directly since these are most commonly used but can be delivered with a 1-inch coupler (RA0023) for calibrating 1-inch microphones directly if preferred. Please state preference when ordering.

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 tachom-



Fig. 1 Pistonphone Type 42AC: 134 dB at 250 Hz. Shown here with Adaptor GR0398 - for hydrophone couplers and Barometer ZC0003K - for applying corrections for ambient pressure

eter signal in a feed-back loop. The Type 42AC 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 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 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 Type 42AC is compatible with G.R.A.S. 1/2-inch, 1/4-inch and 1/8-inch microphones and all other microphones having the same standard diameters. Adapters are included for calibrating

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¼-inch and ⅛-inch microphones. Where applicable, the coupler RA0023 is also available for calibrating 1-inch microphones.

Each pistonphone is factory adjusted to give 134 dB ±0.08 dB re. 20 µPa and is supplied with an individual calibration certificate stating the exact value to within ±0.05 dB and the test conditions. Since the output level of a pistonphone depends on the static ambient pressure, the Type 42AC is delivered with a barometer (Fig. 1) which shows directly on a printed scale what must be added or subtracted to the output level of the pistonphone. For use as a Type 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.

The Type 42AC is also delivered with an Adaptor for hydrophone couplers (Fig. 1) which screws in

place of the microphone coupler and has an M 34 x 1 male thread for hydrophone couplers such as the RA0046 (available from G.R.A.S.).

Adapters for the G.R.A.S. Environmental Microphone Type 41AL and Outdoor Microphone Systems Types 41AM and 41CN are available for use with Pistonphone Type 42AC fitted with a 1-inch microphone coupler RA0023. A two-port high-pressure calibration coupler for ½-inch 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.

Specifications

Sound pressure level:		Accessories included:	
Nominal:	134 dB re. 20 µPa	Adapter for ½-inch microphones ¹ :	RA0048
Individually calibrated under the following reference conditions:-		Adapter for ¼-inch microphones:	RA0049
Ambient pressure:	101.3 kPa	Adapter for ⅛-inch microphones:	RA0069
Ambient temperature:	20 °C	Adapter for hydrophone couplers:	GR0398
Ambient humidity:	65 % RH	Barometer:	ZC0003K
Calibration accuracy:		Four LR6-AA alkaline cells:	EL0001
	±0.08 dB	Accessories available:	
Frequency:	250 Hz ±0.5 %	Adapter for Outdoor Microphone System ¹ :-	
Distortion:	Max. 2 %	Type 41AM: RA0009	
Nominal effective coupler volume:		Type 41CN: RA0041	
Including 0.05 cm ³ microphone load volume:		Adapter for Environmental Microphone ¹ :-	
12.45 cm ³		Type 41AL: RA0010	
Temperature range:		Coupler for Hydrophone:-	
Batteries permitting: -10 °C to +55 °C		Type 10CT: RA0043	
Batteries:		Type 10CC: RA0046	
Four standard LR6-AA alkaline cells		(to be used with the included Adapter GR0398)	
Dimensions:		Type 10CD: RA0078	
Length:	175 mm (6.89 in)	1-inch microphone coupler: RA0023	
Width:	35 mm (1.38 in)	Two-port calibration coupler: RA0042	
Height:	35 mm (1.38 in)	Octopus coupler (¼-inch mics.) ² : RA0025	
Weight:	325 g (0.7 lbs)	Octopus coupler (½-inch mics.): RA0072	
		¹ Applies only to pistonphones fitted with a 1-inch microphone coupler RA0023	
		² Also for the G.R.A.S. Array Microphone Type 40PR	

G.R.A.S. Sound & Vibration reserves the right to change specifications and accessories without notice

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