



G.R.A.S. 67TS-1-CL Turbulence Screen Kit with Flush-mount Microphone

Turb. att.: Up to 25 dB*
Turb. speed: Up to Mach 0.2
Turb. suppr. freq. range: 500 Hz - 10 kHz*
Acoustic att.: Less than 3 dB
Directivity: ± 60 Deg
Freq. range (acoustic) 100 Hz - 70 kHz
Dyn.range 44 dB(A) - 166 dB
*Depending on flow-speed

The G.R.A.S. 67TS-1-CL Turbulence Screen Kit is designed for aeroacoustic testing in solid-walled wind tunnels. The hydrodynamic component of turbulence is attenuated up to 25 dB. Thereby the acoustic signals of interest can be identified and diagnosed with a reliable resolution.

Technology

Introduction

The G.R.A.S. 67TS-1-CL Turbulence Screen Kit is designed for aeroacoustic testing in solid-walled wind tunnels. By attenuating the hydrodynamic component of turbulence up to as much as 25 dB, the acoustic signals of interest can be identified and diagnosed with a much more reliable resolution. The flush-mount turbulence screen integrates the flush-mount and recessed mounting techniques with a special wire mesh into a single unit, and allows for adaptation of several mounting options.

The included G.R.A.S. 47BX-CL 1/4" CCP Flush-mount Microphone Set can be attached to the assembly either with a "rubber band" (O-ring) or a holder plate of POM-material. The parts necessary for both methods are included. The microphone set has an integrated, customized length cable terminated with a Microdot connector. An

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adapter to BNC is included. When ordering, please specify the required length in cm.

As "default" the complete assembly will fit in a flat wall with 4 mm thickness. A hole with diameter 44 mm must be provided. It is possible to attach the assembly using glue. For mounting with screws, the 67TS is provided with 4 unthreaded holes with diameter 3.1 mm. You are always welcome to contact G.R.A.S. for advice or regarding customization.

As a downloadable spread-sheet, we have published the frequency/incident angle dependent correction factors and the resulting graphs. See under Downloads/Other.

Compatibility

To perform as specified the G.R.A.S. 47BX 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 cable of the microphone set is terminated with a 10/32 UNC microdot male connector. An adapter that converts to BNC male is included. Suitable coax cables of various types and lengths are available in standard as well as customized lengths.

The 47BX 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

For proper sensitivity calibration, we recommend using a pistonphone like G.R.A.S. 42AP Intelligent Pistonphone.

Performance and warranty

All G.R.A.S. microphone sets are made of high-quality materials that will ensure life-long stability and robustness. The microphone sets are all assembled in verified clean-room environments by skilled and dedicated operators with many years of expertise in this field. The microphone diaphragm, body, and improved protection grid are made of high-grade stainless steel, which makes the microphone resistant to physical damage, as well as corrosion caused by aggressive air or gasses. This, combined with the reinforced gold-plated microphone terminal which guarantees a highly reliable connection, enables G.R.A.S. to offer 5 years warranty against defective materials and workmanship.

Service

If you accidentally damage the diaphragm on a G.R.A.S. microphone, we can - in most cases - replace it at a very reasonable cost and with a short turn-around time. This not only protects your investment, but also pleases your quality assurance department because you don't have to worry about new serial numbers, etc.

Calibration

Before leaving the factory, all G.R.A.S. microphone sets are calibrated as a unit in a controlled laboratory environment using traceable calibration equipment. The sets are delivered with calibration charts including

sensitivity values and frequency response graphs for the complete set. You can use the sensitivity value directly in your system setup. Depending on the use, measurement environment, and internal quality control programs, we recommend recalibrating the microphone set at least every second year.

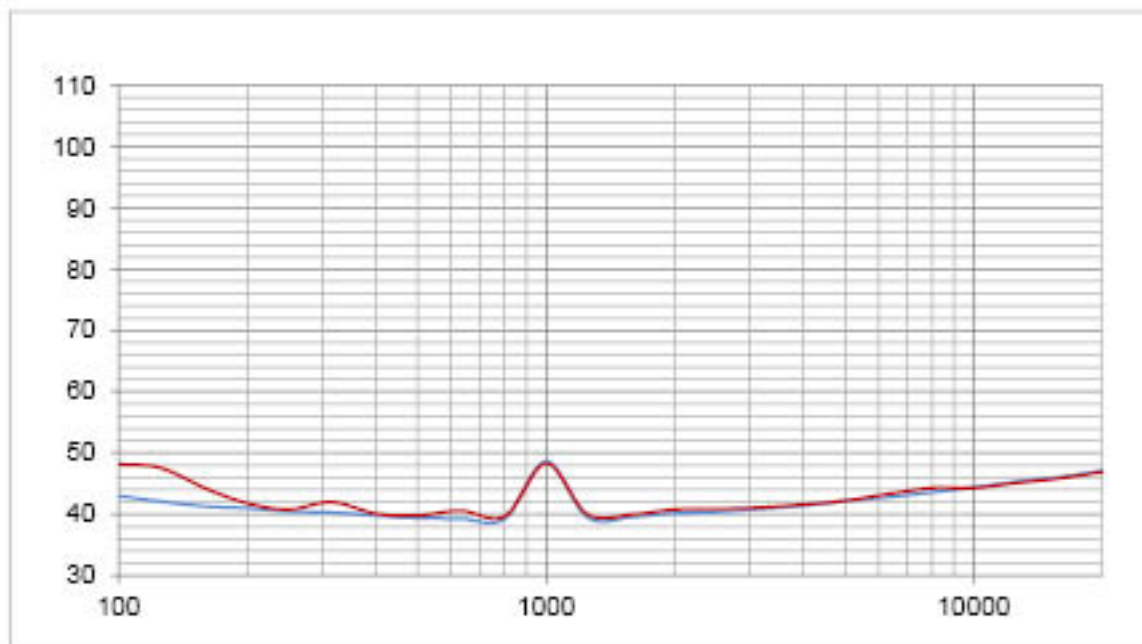
Specifications

Dynamic range lower limit (microphone thermal noise)	dB(A)	44
Dynamic range upper limit with G.R.A.S. CCP preamplifier	dB	166
Set sensitivity @ 250 Hz (± 2 dB)	mV/Pa	1.6
Power supply (Constant Current Power)	mA	2 to 10
Microphone venting		Front
Output impedance	Ω	< 50
Temperature range, operation	°C / °F	-30 to 70 / -22 to 158
Temperature range, storage	°C / °F	-40 to 85 / -40 to 185
Static pressure coefficient @250 Hz	dB/kPa	-0.008
Humidity range non condensing	% RH	0 to 100
Humidity coefficient @250 Hz	dB/% RH	< 0.1
Influence of axial vibration @1 m/s ²	dB re 20 μ Pa	66
TEDS UTID (IEEE 1451.4)		27 v. 1.0
Connector type		Microdot 10/32
CE/RoHS compliant/WEEE registered		Yes/Yes/Yes
Weight	g / oz	40 / 1.411

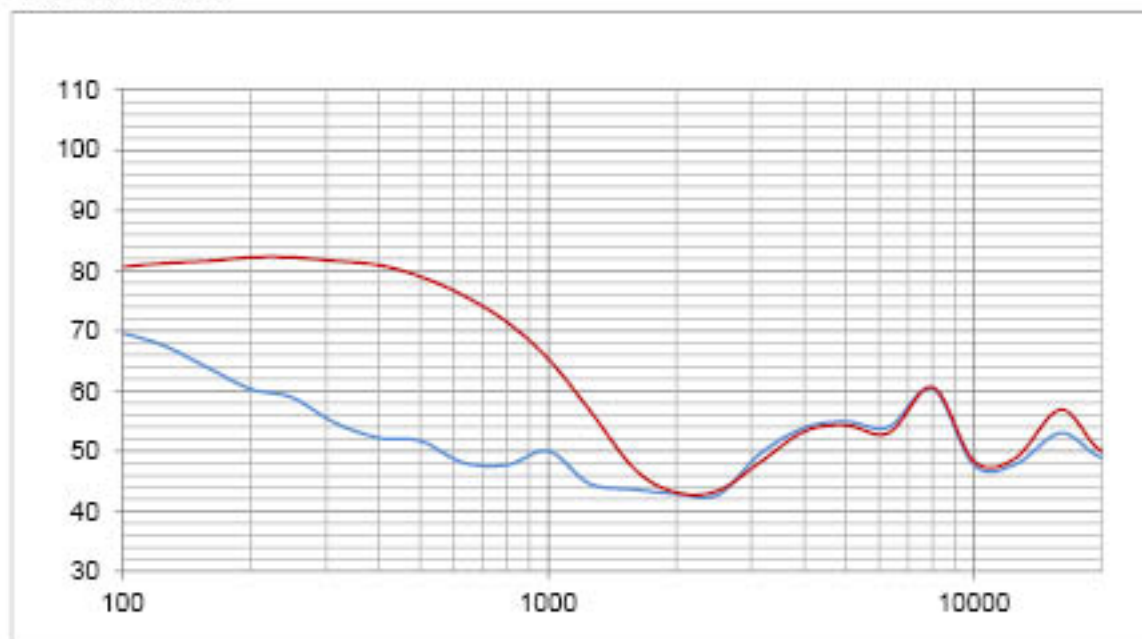
The graphs illustrate the effect of the G.R.A.S. 67TS Turbulence Screen on boundary layer turbulence measured at different laminar flow speeds. Y-axis is the turbulence level in dB SPL and the X-axis is the frequency in Hz. The red line is the result without turbulence screen, the blue line is the result with turbulence screen. The turbulence level is up to 25 dB lower with the turbulence screen (depending on the wind speed).

The measurements have been made in G.R.A.S.'s wind tunnel with a G.R.A.S. 47BX-CL Flush-mount microphone.

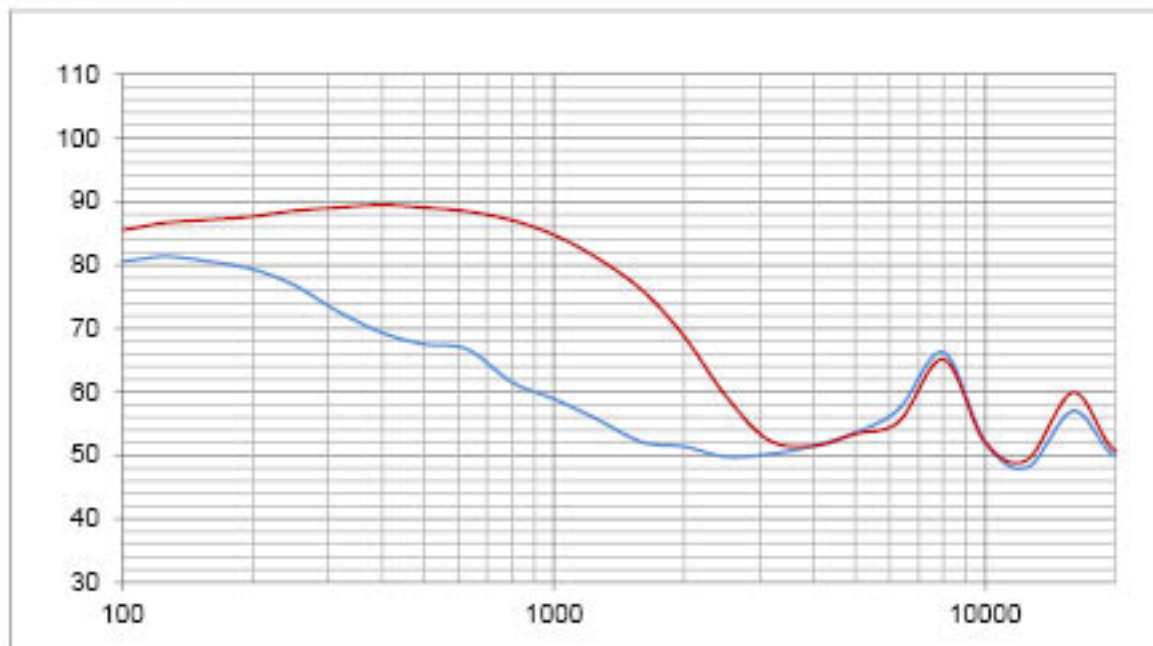
0 m/s laminar flow



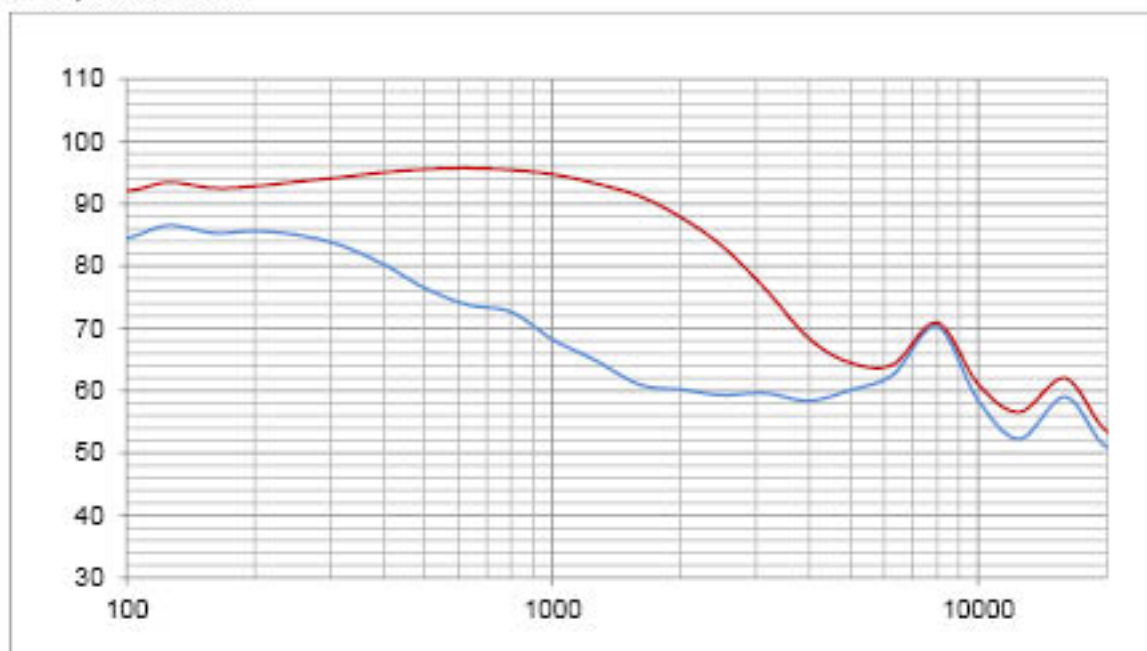
5 m/s laminar flow



10 m/s laminar flow



15 m/s laminar flow



Ordering info

Included items

G.R.A.S. 47BX-CL	1/4" CCP Flush-mount Microphone Set (adapted for the turbulence screen mechanics)
-	Turbulence Screen Assembly, parts for mounting, USB flash-drive with calibration data, drawings etc.

Optional items

G.R.A.S. 12AL	1-Channel CCP Power Module with A-weighting filter
G.R.A.S. 12AQ	2-Channel Universal Power Module with signal conditioning and PC interface
G.R.A.S. 42AP	Intelligent pistonphone
G.R.A.S. OP0023	Kit for Sensitivity Calibration of Flush-mount Microphone Sets
G.R.A.S. OP0024	Kit for Frequency Calibration of Flush-mount Microphone Sets
G.R.A.S. AE0074	BNC - BNC Adapter
G.R.A.S. AA0035	3 m BNC - BNC Cable
G.R.A.S. AA0037	10 m BNC - BNC Cable
G.R.A.S. AA0039-CL	Customized length BNC - BNC Cable



We make Microphones

Tradition

Since the establishment in 1994, G.R.A.S. have been 100% dedicated to developing and manufacturing high-quality measurement microphones and related acoustic equipment. Founded by the Danish acoustics pioneer Gunnar Rasmussen who for more than 60 years has contributed to the world of sound and vibration with his unique ideas and designs. From the first reproducible 1" condenser measurement microphone that enabled quality measurements and instrumentation for acoustic calibration, Mr. Rasmussen's ingenuity and foresight led to the world's most popular acoustic sensor: The 1/2" measurement microphone. Then the 1/4" and 1/8" microphones followed with outstanding dynamic and high-frequency capability that brought higher definition and transparency into impulse noise diagnostics. Many variants have been made available over the years; all based on Gunnar Rasmussen's original 1" pressure microphone design.

Innovation

At G.R.A.S., we and our customers benefit daily from Mr. Rasmussen's exceptional understanding of acoustics, physics, electronics and measurement needs. Not only in R&D but throughout the organisation, we are proud to develop, produce and offer the broadest range of high-quality measurement microphones and accessories in the industry. And as a family company, now owned and managed by the two sons, Per Rasmussen and Peter Wulf-Andersen, we safeguard our heritage and knowledge to help create new opportunities with our customers. We work with everybody with an interest in sound or noise within the fields of aerospace, automotive, audiology, consumer electronics, noise monitoring, building acoustics and telecommunications, metrology, education, consultancy, legislation and system integration.

Quality

All our microphones are solely produced in stainless steel and in a quality that allows for a 5 year warranty. Should you by mistake damage the diaphragm on a G.R.A.S. microphone, our special technique enables repair at very reasonable price.

Partners

G.R.A.S. is represented worldwide in more than 40 countries by subsidiaries and distributors. Whether you are searching for a multi-channel solution or just a replacement microphone for your sound level meter G.R.A.S. will help solve your needs. Visit gras.dk for your local G.R.A.S. partner.