



G.R.A.S. 41AC Outdoor Kit
Serial No. 214062

G.R.A.S. 41AC-2 LEMO Outdoor Microphone with RemoteCheck for Community and Airport Noise

Standard: IEC 61672-1
Special features:
RemoteCheck
Configurable for 90 or 0 degrees of incidence
IP55 proof

The 41AC-2 is an outdoor microphone for unattended use for prolonged periods of time. It can be used for community noise applications or for monitoring of overhead aircraft noise. It has RemoteCheck for monitoring of the measurement chain.

Technology

Introduction

The 41AC-2 is a small precision outdoor microphone according to IEC 61672-1 for monitoring of community noise and the noise of overhead aircraft.

Typical Applications and Use

With state of the art weather protection and extensive use of high-grade stainless steel, the 41AC-2 is ideal for long-term unattended monitoring of community noise and noise from overhead aircraft.

It can easily be configured for measurement of noise with 90 degrees of incidence, typically community noise, or – with the proper correction data – for measurement of noise with 0 degrees of incidence, typically overhead aircraft. A USB flash drive with the necessary 1/12 octave correction data is part of the delivery.

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SOUND & VIBRATION

41AC-2 has built-in RemoteCheck technology that makes it possible to remotely check the measurement chain for changes.

Design

The 41AC-2 has been designed to meet the need for a precise and reliable outdoor microphone that can be part of a permanent installation. The 41AC-2 is waterproof and fulfils the requirements of IP-55. It is easy to configure and calibrate and comes with a RemoteCheck function that makes it easy to monitor the measurement chain and detect errors.

It uses a 40AF-S2 1/2" Ext. Polarized Free-Field Microphone, High Sensitivity and a 26AJ 1/2" RemoteCheck Preampifier with Integrated Connector.

Microphone and preampifier are mounted inside a high-grade stainless steel housing. The top cone – also made of stainless steel – has been perfected for best acoustical response with the 40AF-S2 microphone. In addition to its acoustical function, the top cone acts as a bird spike.

The 40AF-S2 microphone has been modified for optimal response with respect to the sound field and the top cone's internal cavity. The protection grid is a special design that offers added water protection.

The wind screen eliminates the effects of air flow and also serves as part of the 41AC-2's water protection. It is glued to a detachable tube that ensures correct positioning. A locking system eliminates the risk of accidental dislocation. It is designed to withstand a wide range of weather conditions and temperatures for a very long period, i.e. easily a year or longer.

It comes with an adapter for pipe mounting. An adapter for tripod mounting is also part of the delivery.

Compability

The 41AC-2 uses an externally polarized microphone with a LEMO type preampifier with RemoteCheck. It requires a cable with 7-pin LEMO connector and an input module that can provide a 200 V polarization voltage.

If you want to benefit from the built-in RemoteCheck technology, your analyzer must be able to provide a sinusoidal test signal of 5 V RMS or greater, applied to pin 1 of the LEMO connector.

System Verification

The built-in RemoteCheck functionality allows you to set up a monitoring routine that will detect changes to your measurement chain.

The RemoteCheck technology works by applying a precision AC signal to an RC network in the preampifier. The test signal is attenuated by about 40 dB by this network. Therefore, a test signal with an amplitude of about 5 V RMS will result in a response signal corresponding to about 94 dB SPL.

RemoteCheck verification is based on comparison of historical data from frequent RemoteCheck measurements. Depending on the background noise level, the expected accuracy of the verification signal will be within 0.15 dB to 0.5 dB. If the background noise is about 60 dB SPL, the accuracy will be about 0.15 dB, if it is 70 dB SPL it will be about 0.5 dB.

To get the best possible accuracy, you must therefore monitor the background noise and select your RemoteCheck measurement values from samples obtained in situations with low levels of background noise.

As the RemoteCheck does not generate a signal proportional to the microphone's sensitivity, it cannot replace a proper acoustical calibration. For proper sensitivity calibration, we recommend using a pistonphone like the G.R.A.S. 42AP Intelligent Pistonphone.

Calibration

Before leaving the factory, all G.R.A.S. products are calibrated in a controlled laboratory environment using traceable calibration equipment.

An individual test certificate stating the sensitivity and frequency response is included with each product.

Performance and Warranty

G.R.A.S. outdoor microphones 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 which guarantees a highly reliable connection, enables us to offer 5 years warranty against defective materials and workmanship. The windscreen comes with a 6-month warranty.

The warranty does not cover products that are damaged due to negligent use, an incorrect power supply, or an incorrect connection to the equipment.

Service and Repairs

All repairs are made at G.R.A.S. International Support Center located in Denmark. Our Support Center is equipped with the newest test equipment and staffed with dedicated and highly skilled engineers. Upon request, we make cost estimates based on fixed repair categories.

If a product covered by warranty is sent for service, it is repaired free of charge, unless the damage is the result of negligent use or other violations of the warranty. All repairs are delivered with a service report, as well as an updated calibration chart.

Specifications

Frequency range (± 1 dB)	Hz	5 to 10 k
Frequency range (± 2 dB)	Hz	3.15 to 20 k
Dynamic range lower limit (microphone thermal noise)	dB(A)	17
Dynamic range upper limit with G.R.A.S. preamplifier @ +28 V / ± 14 V power supply	dB	138
Dynamic range upper limit with G.R.A.S. preamplifier @ +120 V / ± 60 V power supply	dB	144
Set sensitivity @ 250 Hz (± 3 dB)	mV/Pa	50
Polarization voltage	V	200
Temperature range, operation	$^{\circ}\text{C}$ / $^{\circ}\text{F}$	-30 to 70 / -22 to 158
Temperature range, storage	$^{\circ}\text{C}$ / $^{\circ}\text{F}$	-40 to 85 / -40 to 185
Temperature coefficient @250 Hz	dB/ $^{\circ}\text{C}$ / dB/ $^{\circ}\text{F}$	-0.01 / - 0.006
Static pressure coefficient @250 Hz	dB/kPa	-0.014
Humidity range non condensing	% RH	0 to 100
Humidity coefficient @250 Hz	dB/% RH	-0.001
Influence of axial vibration @1 m/s ²	dB re 20 μPa	62
Connector type		7-pin LEMO (FGG.1B.307)
CE/RoHS compliant/WEEE registered		Yes/Yes/Yes

Dimensions

When mounted on a pipe: 343 mm/ 13 1/2 in above the top of the pipe.

Ordering info

Included items

G.R.A.S. 40AF-S2	1/2" Ext. Polarized Free-field Microphone, High Sensitivity
G.R.A.S. 26AJ	1/2" SysCheck Preamplifier with integrated connector and O-ring OR2038
SW0005	USB flash drive containing correction data (resolution: 1/12 octave)
AM0378	Wind Screen
GR1794	Release Tube for LEMO connector
RA0286	1" Pole Mount Adapter
GR1096	Tripod Adapter
SK0017	Tripod Thread Adapter

Optional items

AA0008	3 m LEMO 7-pin - LEMO 7-pin Cable
AA0009	10 m LEMO 7-pin - LEMO 7-pin Cable
AA0012	30 m LEMO 7-pin - LEMO 7-pin Cable
AA0014	100 m LEMO 7-pin - LEMO 7-pin Cable
AA0020-CLXXXX	Customized length LEMO 7-pin - LEMO 7-pin Cable, xxxx length in cm.
G.R.A.S. 12AK	1-Channel Power Module with gain, filters and SysCheck generator
G.R.A.S. 42AP	Intelligent Pistonphone, Class 0



We make Microphones

Tradition

Since the establishment in 1994, G.R.A.S. has been 100% dedicated to developing and manufacturing high-quality measurement microphones and related acoustic equipment. G.R.A.S. was 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

At G.R.A.S. we know that in order for you to trust your measurement results; signal quality, stability and robustness are essentials. And because we also know how you handle and use the microphones in your daily work, we design and build them to perform under real life conditions – and beyond.

When developing measurement microphones, our R&D team uses a series of highly accelerated life tests (HALT) to ensure that our microphones live up to the high quality and precision our customers have come to expect and trust. Thus to simulate the handling and use a microphone is exposed to when working outside the lab – in real life situations - we bake it, we humidify it, we shake it and we try to break it - all to make sure that you can trust your measurement results - every time.

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.