

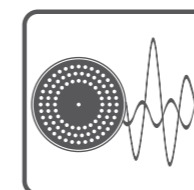
**MICROTECH GEFELL**



microphones & acoustic systems - founded 1928 by Georg Neumann

We reserve the right to make changes to this product and its accessories without prior notice.

Measurement. all in all



Test & Measurement

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# The Tradition

so far - so good

**1928** Georg Neumann and Erich Rickmann establish the limited partnership Georg Neumann & Co. The idea behind this new company lies in manufacturing microphones following the capacitive transducer concept. An aim they manage to achieve for the first time in serial production with the condenser microphone CMV 3.



*Georg Neumann*



Erprobung des ersten Erzeugnisses

**1933** participation at the „Große Deutsche Funkausstellung“ leads to a massive rise of sales within Germany and of exports. During this time, representations are set up in England, France, the USA and India.

**1936** the Olympic Games in Berlin provide the first live test for the classic M 7 electrode in a tube set-up as developed by Georg Neumann. It is still manufactured to this day. The so-called „Neumann bottle“ can already be equipped with different capsules in order to change patterns. The path that the company has chosen since its founding proves to be the right one. Extensive practical experience leads to a continuous improvement of products.

**1943** during the Second World War, the principal laboratory on Michaelkirchstraße in Berlin undergoes damage both by fire and bombs. To avoid further bombings, the entire company and the principal laboratory are transferred to Gefell.

**1945/46** Germany is divided into four sectors after the surrender. Thuringia, initially occupied by the Americans is exchanged for a part of Berlin (Potsdam Treaty) and handed over to the Soviet Union, which changes the situation in Gefell completely.

**1947** employees returning from Gefell establish a small workshop in Berlin (West) mainly for repair of microphones. This workshop becomes Georg Neumann GmbH, the second Neumann company, now owned by Sennheiser.



**1950** New condenser measurement microphones are developed and become part of the serial production.

**1956** the centralist regime of the GDR forces private companies to accept state co-ownership. Like thousands of other companies, Georg Neumann & Co. becomes a so-called BSB („Betrieb mit staatlicher Beteiligung“ – company under state participation).



During the **1950s**, radio stations in Berlin are rebuilt and production in Gefell continues, both of the known microphone types and of new ones: Tube microphone preamplifier CMV 563 With the microphone capsules M 55 (omni), M 7 (cardioid), M 8 (figure eight) and M 9 (omni) as well as M 7 S, M 8 S and M 9 S with short handles Tube condenser microphone UM 57, switchable patterns, omni-cardioid-figure eight.



During the three decades from the **1960s** to the **1980s**, production in the studio sector is mainly carried out according to the demands of radio applications. In close cooperation with „Rundfunk und Fernsehtechnisches Zentralamt RFZ“ (central radio and television council) the following microphones are developed and produced until 1989: ZUM 64, M 582, MV 690, MV 691, MV 692, PM 750 and PM 860.

**1961** the building of the Berlin Wall sets a seal on the division of the city. The socialist GDR also cuts off all communication that has existed to this point between Georg Neumann & Co. in Gefell and Georg Neumann GmbH in Berlin.

**1972** the limited partnership Georg Neumann & Co. in Gefell is expropriated and renamed VEB Mikrofontechnik Gefell. Further use of the Neumann trademark is prohibited by the GDR. Instead, products are now marked with the brand RFT.



**1989** the Berlin Wall comes down. The Treuhandanstalt takes charge of the company in Gefell with the aim of reprivatizing it. The expropriated limited partnership Georg Neumann & Co. files for restitution of its company.



**1993** the company Microtech Gefell GmbH is returned to the limited partnership Georg Neumann & Co.– now Georg Neumann KG. After more than twenty years of state imposed the company now produces under the new registered trademark.



# The Business

microphones & acoustic systems



Microtech Gefell designs, manufactures and supplies microphones and acoustic systems. A customer oriented approach is practiced to achieve the optimal usability of our products in their daily use. The products themselves should be regarded as special tools having particular properties appropriate for their intended applications, and perform at the highest quality level. Every single product is assembled entirely by hand by our specialists, then tested and calibrated. The experience amassed is applied to ensure that product quality is maintained or bettered. A complete company approach results in the acoustics, electronic and mechanical development, design, product management, production, marketing and sales, as well as technical service and support, all coming together under one roof in Gefell. Even the complete manufacturing process is, as far as possible, carried out in-house, and ranges from fabricating the membranes, the microphone capsules and the electronic circuitry right through to the housings and virtually every mechanical piece-part. A dedicated team at our headquarters in Gefell takes care of sales and customer support, and a global network of distribution and sales partners provide their customers with the best possible connection to our company. Microtech Gefell products have earned a worldwide reputation amongst professional users as precise and reliable tools in fields spanning from acoustic measurement, recording studios and radio and television, to mobile sound reinforcement and fixed installations in parliaments and conference venues.

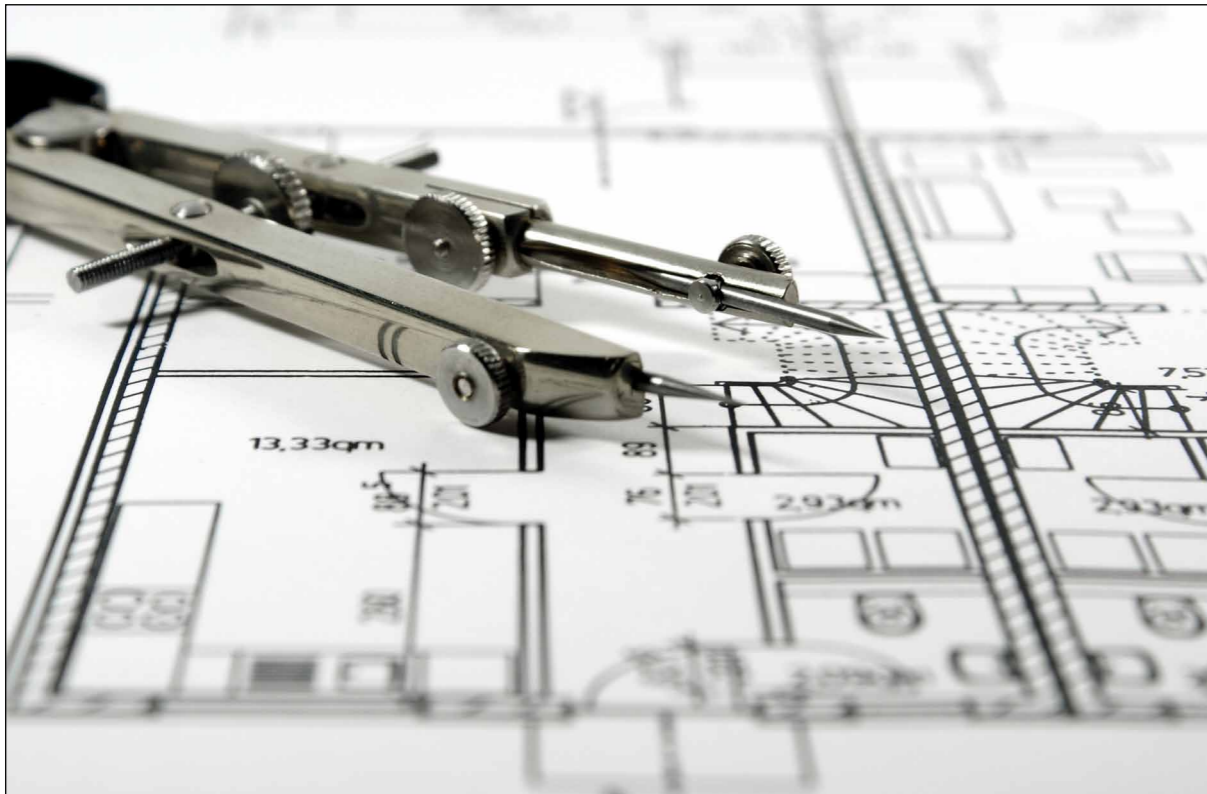
# The Support

before - during - after



A product possessing the highest level of quality is not always sufficient in itself to ensure an optimum outcome in every situation. The function of a microphone in a proposed acoustic environment must often be considered in conjunction with the electrical and mechanical parameters pertaining, as well as the layout and operation of complex installations. To achieve this, and to guarantee the best benefits possible to the user, Microtech Gefell provides not only a comprehensive range of accessories, but also extensive pre-sales technical assistance and excellent after-sales support. This includes customer and application-specific custom designed products, expert technical guidance, planning for test facilities, measurement installations and audio systems, design of room acoustics for studio and presentation theatres, as well as measurement and calibration services at the location. Tools used for these services also include computer room simulations, for example to ensure optimum relationships between microphones and loudspeakers in relation to the relevant sound sources and listeners. The service department at Microtech Gefell is constantly on hand should a fault occur, or servicing or calibration is required. All the company's microphones, including the older models, will be repaired or restored using original parts. Older power supply versions can be modified to 48V phantom powering, and previous connector types can be replaced with the modern XLR types. All this guarantees the user that, besides owning a top quality product, their valued investment is safeguarded.

# Application engineering



Answering the demands of the modern market, our service spectrum also includes application engineering, consultation services and the development & construction of special devices in the scientific-technical field.

Here our extensive experience comes into play, which we have gained with the construction of test benches for vehicles on the one hand and in the recording studio and sound system installation on the other hand. Our team of engineers will solve your device-specific or room-acoustic problems.

As a mechanical-electronic manufacturing company of high flexibility we are also able – in addition to planning – to build complex systems and produce their individual components.

We can offer you a consultation appointment for your special project on request.

Please contact us if you are interested in co-operation.

# Production on demand



For many years Microtech Gefell has produced mechanical and electro-technical electronic components for very different partners from various branches of industry. Our technologies in small serial microphone production allow unique solutions in the mechanical production of the highest precision and of the surface finishing.

You may say we have gained our manufacturing experiences “at the limits of physics”. So we are able to produce milling and rotary parts in series with units of measurement in the one-digit micrometre range. Our speciality is the production of polymer and metallic membranes in these dimensions. In the same way we can produce the finest nickel surfaces in the colours: ‘satin nickel’ and ‘dark bronze’.

If you are interested in co-operation in this field, please contact us.

# Measurement microphones

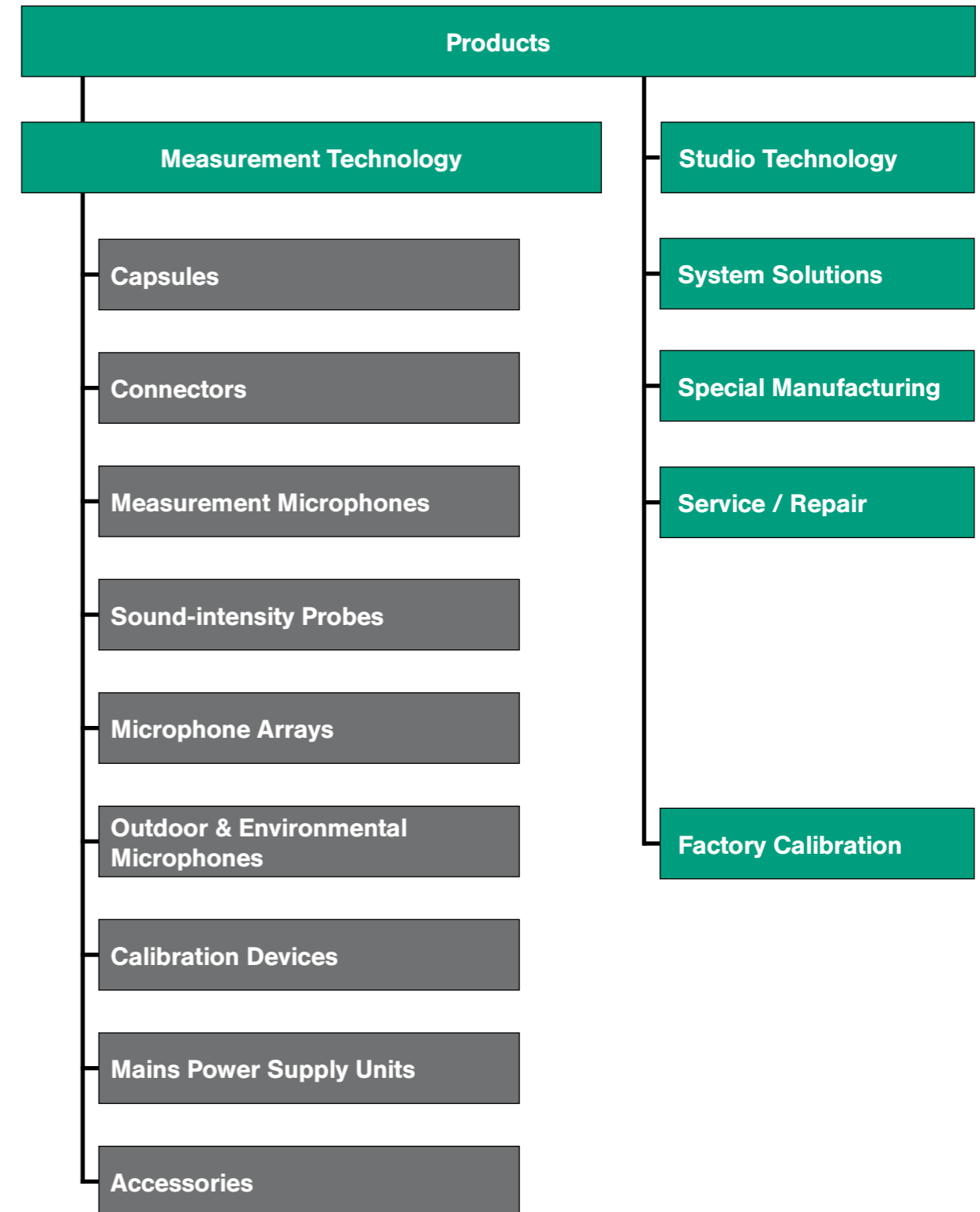
all in all



The product range of Microtech Gefell comprises microphones for applications in audio technology as well as in measurement, factory calibration, application-specific system solutions and special manufacturing in the areas of acoustic, electronic, mechanical and service & repair. This overview contains all products of the measurement technology. The focus of development and production is in the sector of sound sensing.

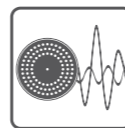
Microtech Gefell has a tradition-rich manufacturing department for precision measurement microphones. In this regard, all components of the capsule are produced in-house, even down to the membranes. Combined with a high-quality preamplifier technique they form complete microphone units. In many cases they are certified for official verification in combination with noise measurement devices of other manufactures. To round out the portfolio, there are also comprehensive accessories and special microphones; for example the sound intensity probe and weather-proof microphone unit.

# The Products





# Capsules



The measurement microphone production of Microtech Gefell can look back on over 80 years experience. Based on proprietary galvanic membrane production technology the microphone membranes can be produced with a thickness of just a few micrometres. This process is followed by an artificial ageing process to reach a stable mechanical state of stress. This guarantees an extremely accurate metrological stability of the microphone. This characteristic gives the microphone advanced technical properties. The typical feature of the measurement microphones is the protection grid with hole pattern. Furthermore, one version contains a highly-resistant part that can be used for the calibration of the frequency response and sensitivity with an electrostatic actuator.

There are 1", 1/2" and 1/4" capsules in the range that differ with regard to frequency range, sensitivity and dynamic range. The product range includes microphones with frequency responses optimised for free-field, diffuse-field and pressure-field. Thus, matching microphones for every application can be found.

## 1" Measurement Microphone Capsules



	MK 102.1	MK 103.1	MK 112
<b>Frequency Type</b>	Free field	Free field	Diffuse field
<b>Frequency Range (<math>\pm 2</math> dB) / (Hz ... kHz)</b>	10 ... 18	10 ... 18	5 ... 8
<b>Sensitivity / mV/Pa</b>	50	50	50
<b>Dynamic Range* / dB A (max. SPL for 3% THD)</b>	11 ... 146	11 ... 146	11 ... 146
<b>Polarisation voltage / V</b>	200	200	200
<b>Operating Temperature Range / °C</b>	-50 ... +100	-50 ... +100	-50 ... +100

## 1/2" Measurement Microphone Capsules



	MK 201   E; MK 202   E	MK 221; MK 223; MK 250   B	MK 222   E   B   BE
<b>Frequency Type</b>	Free field	Free field	Free field
<b>Frequency Range (<math>\pm 2</math> dB) / (Hz ... kHz)</b>	10 ... 40	3,5 ... 20	0,5 ... 20
<b>Sensitivity / mV/Pa</b>	14	50	50
<b>Dynamic Range* / dB A (max. SPL for 3% THD)</b>	22 ... 158	15 ... 146	15 ... 146
<b>Polarisation voltage / V</b>	0   200	200; 200; 0   0	200   0   200   0
<b>Operating Temperature Range / °C</b>	-50 ... +100	-50 ... +100	-50 ... +100

	MK 231   B   E   BE (MK 233   B   BE)**	MK 255; (= MKS 221 E)	MK 290   E
<b>Frequency Type</b>	Diffuse field	Free field	Free field
<b>Frequency Range (Hz ... kHz)</b>	( $\pm 2$ dB) 3,5 ... 8	( $\pm 2$ dB) 3,5 ... 20	(pair) 35 ... 5
<b>Sensitivity / mV/Pa</b>	50	50	50
<b>Dynamic Range* / dB A (max. SPL for 3% THD)</b>	11 ... 146	11 ... 146	11 ... 146
<b>Polarisation voltage / V</b>	200   200   0   0	0	200   0
<b>Operating Temperature Range / °C</b>	-50 ... +100	-50 ... +100	-50 ... +100

## 1/4" Measurement Microphone Capsules

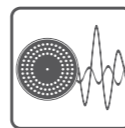


	MK 301   E	MK 302	MK 390   E
<b>Frequency Type</b>	Free field	Free field	Free field
<b>Frequency Range (Hz ... kHz)</b>	( $\pm 2$ dB) 5 ... 100	( $\pm 2$ dB) 5 ... 60	(pair) 1 ... 12
<b>Sensitivity / mV/Pa</b>	5	3	5
<b>Dynamic Range* / dB A (max. SPL for 3% THD)</b>	35 ... 168	39 ... 172	35 ... 168
<b>Polarisation voltage / V</b>	200   0	200	200   0
<b>Operating Temperature Range / °C</b>	-50 ... +100	-50 ... +100	-50 ... +100

\* The maximum level range which are specified for the measurement capsules are only valid in application of a LEMO® preamplifier at a full polarisation voltage of 130 V or  $\pm 65$  V.

\*\* Spare parts for WME 960 H | WME 965 H | WME 970 H

# Preamplifiers



For the connection of high-quality measurement microphone capsules, Microtech Gefell produces suitable measurement microphone preamplifiers. This impedance converter allows the connection of the very high-impedance capsule to the measurement equipment. Particular attention is given to connection condition standards and interference-free signal transmission. Based on the classical/conventional interfaces with LEMO® connectors for standard measuring equipment nowadays there are suitable preamplifiers for every applied form of measurement inputs. These are, on the one hand, the current driven IEPE (ICP® DELTATRON®...) connections which are compatible with DELTATRON® and similar systems with BNC connectors; P 48 phantom powered inputs with symmetrical signal transmission and XLR connectors and, on the other hand, digital interfaces such as AES-42 (XLR), SPDIF or USB. The comprehensive range of accessories allows the connection of all possible capsules with the suitable preamplifier, whereby even permanently polarised capsule systems are compatible such as capsules from other companies.

## Preamplifiers. Interfaces with LEMO® connectors

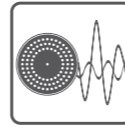


**MV 203;  
MV 204**      **MV 203.3;  
MV 204.3**      **MV 205**      **MV 206**      **MV 302;  
MV 302.1**

<b>Application</b>	universal	universal	for WME 940 with heating regulation	for insert voltage calibration	universal; for intensity probes
<b>Capsule polarisation voltage</b>	by power supply; none	by power supply; none	by power supply;	by power supply;	by power supply;
<b>Operating voltage / V</b>	28 ... 130	28 ... 130	28 ... 130	28 ... 130	28 ... 130
<b>Power consumption / mA</b>	≤ 2,3	≤ 2,3	≤ 2,3	≤ 2,3	≤ 1 ... 2,5
<b>Amplification / dB, at 1 kHz</b>	0 ± 0,05 at C <sub>e</sub> = 22 pF	0 ± 0,05 at C <sub>e</sub> = 22 pF	0 ± 0,05 at C <sub>e</sub> = 22 pF	0 ± 0,05 at C <sub>e</sub> = 22 pF	0 ± 0,05 at C <sub>e</sub> = 5,6 pF
<b>Frequency Range / Hz ... MHz</b>	0,5 ... 4,5	0,5 ... 4,5	0,5 ... 4,5	0,5 ... 4,5	0,5 ... 4,5
<b>Max. Output voltage / V<sub>eff</sub> at 1 kHz and R<sub>L</sub> = 100 kΩ</b>	7 (at 28 V) 33 (at 130 V) at C <sub>e</sub> = 22 pF	7 (at 28 V) 33 (at 130 V) at C <sub>e</sub> = 22 pF	7 (at 28 V) 33 (at 130 V) at C <sub>e</sub> = 22 pF	7 (at 28 V) 33 (at 130 V) at C <sub>e</sub> = 22 pF	7 (at 28 V) 33 (at 130 V) at C <sub>e</sub> = 5,6 pF
<b>Operating Temperature Range / °C</b>	-10 ... +50	-10 ... +50	-10 ... +50	-10 ... +50	-10 ... +50
<b>Heating</b>	Yes	none	Yes	none	none
<b>Connector</b>	7-pin LEMO® FGG 1 B 307 CLAD 62 ZN	7-pin LEMO® FGG 1 B 307 CLAD	7-pin LEMO® FGG 1 B 307 CLAD 62 ZN	7-pin LEMO® FGG 1 B 307 CLAD 62 ZN	7-pin LEMO® FGG 1 B 307 CLAD 35 ZN



# Preamplifiers



Preamplifiers.  
IEPE (ICP<sup>®</sup> - Microdot, SMB, BNC)



**MV 210**



**MV 310**

<b>Application</b>	universal	universal
<b>Capsule polarisation voltage</b>	none	none
<b>Operating voltage / V</b>	24 ... 30	24 ... 30
<b>Power consumption / mA</b>	2 ... 10 (constant)	2 ... 10 (constant)
<b>Amplification / dB, at 1 kHz</b>	-0,55 at $C_e = 22 \text{ pF}$	-2,0* at $C_e = 5,6 \text{ pF}$
<b>Frequency Range / (Hz ... kHz)</b>	1 ... 1	1 ... 1
<b>Max. Output voltage / <math>V_{\text{eff}}</math> at 1 kHz and <math>R_L = 100 \text{ k}\Omega</math></b>	6,5 at $C_e = 22 \text{ pF}$	8,2 at $C_e = 5,6 \text{ pF}$
<b>Operating Temperature Range / °C</b>	-25 ... +70	
<b>Heating</b>	none	none
<b>Connector</b>	BNC	MALCO-Microdot, 10-32 UNF-2A

for a different Capsule amplifier combination - see data sheet

note:

These measurement preamplifiers reduce the respective maximum level ranges specified on page 3 according to the maximum polarisation voltage range of the power supply.

Preamplifiers.  
Phantom P 48 V XLR



**MV 220**



**MV 220 S**



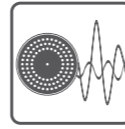
**MV 225**

<b>Application</b>	universal	universal	universal
<b>Capsule polarisation voltage</b>	none	none	200 (generated internally)
<b>Operating voltage / V</b>	48	48	48
<b>Power consumption / mA</b>	4	4	5,5
<b>Amplification / dB, at 1 kHz</b>	-1,0 at $C_e = 22 \text{ pF}$	-1,07 at $C_e = 22 \text{ pF}$	-0,1 at $C_e = 22 \text{ pF}$
<b>Frequency Range / (Hz ... kHz)</b>	20 ... 100	20 ... 100	20 ... 100
<b>Max. Output voltage / <math>V_{\text{eff}}</math> at 1 kHz and <math>R_L = 100 \text{ k}\Omega</math></b>	5,0 at $C_e = 22 \text{ pF}$	5,0 at $C_e = 22 \text{ pF}$	7,5 at $C_e = 22 \text{ pF}$
<b>Operating Temperature Range / °C</b>	-10 ... +50	-10 ... +50	-10 ... +50
<b>Heating</b>	none	none	none
<b>Connector</b>	XLR 3M	XLR 3M	XLR 3M

note:

These measurement preamplifiers reduce the respective maximum level ranges specified on page 3 according to the maximum polarisation voltage range of the power supply.

# Complete Microphones



In order to ease the search for the right combination of measurement microphone capsule and preamplifier there are factory-provided compositions of complete microphones available. The most common versions are shown here, the components are also available separately. Additionally Microtech Gefell GmbH also offers a microphone family with a fixed capsule to take account of the budget limit for multichannel measurement systems. There are complete microphones for classical/conventional LEMO connectors, current powered IEPE (ICP® or DELTATRON®) connectors with BNC connectors, phantom powered symmetrical signal inputs with XLR connectors and digital interfaces.



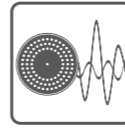
	MM 203	MM 302	MM 210   MM 215	MM 310	MM 225
<b>Consisting of:</b>	Capsule MK 221 Preamplifier MV 203	Capsule MK 301 Preamplifier MV 302	Capsule MK 250 I MK 255 (= MKS 221 E) Preamplifier MV 210	Capsule MK 301 E Preamplifier MV 310	Capsule MK 221 Preamplifier MV 225
<b>Connector</b>	LEMO®	LEMO®	BNC	Microdot	XLR



	M 370	M 371	M 372	M 373
<b>Supply</b>	current-fed/powered	supplied with voltage	supplied with voltage	phantom powering
<b>Plug connector</b>	Microdot	4-pin LEMO®	Microdot with 3,5 mm Jack cable	3-pin XLR

In addition to the basic choice introduced here, there are also many other capsule/preamplifier combinations available.

# Sound intensity probes



**SIS 90**

**SIS 92**

**SIS 93**

SIS 90 1/2"  
 Pair of capsules 1/2" MK 290  
 Preampifier 1/4" MV 302.1  
 Spacer 1/2" 12 and 50 mm

SIS 92 1/2"  
 Pair of capsules 1/2" MK 290  
 Preampifier 1/4" MV 302  
 Spacer 1/2" 12 and 50 mm

SIS 93 1/2"  
 like  
 SIS 92 1/2"

SIS 90 1/4"  
 Pair of capsules 1/4" MK 390  
 Preampifier 1/4" MV 302.1  
 Spacer 1/4" 6 and 12 mm

SIS 92 1/4"  
 Pair of capsules 1/4" MK 390  
 Preampifier 1/4" MV 302  
 Spacer 1/4" 6 and 12 mm

SIS 93 1/4"  
 like  
 SIS 92 1/4"

Since the introduction of computerised measurement systems the sound intensity measurement process, for example for sound field mapping or sound power measurement, has become very significant. Microtech Gefell offers selected precision microphone pairs in this area that are integrated in different mechanical constructions. Following customer requests, the different mechanical structures are originated in order to optimise the use of the intensity probes. With 1/2" and 1/4" microphone capsule pairs, a large frequency range is covered. Using the remote control, the user is able to work in stand-alone operation and control the measurement from the measurement location.

**Pair of capsules**

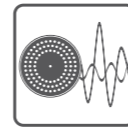
**Spacer**

**Measuring range**

1/2"	50 mm 12 mm	35 Hz ... 1,5 kHz 70 Hz ... 5 kHz
1/4"	12 mm 6 mm	1 kHz ... 6 kHz 1 kHz ... 12 kHz



# Sound intensity probes



## IEPE powered sound intensity probes (ICP®)



**SIS 190 - IEPE (ICP®)**

**SIS 192 - IEPE (ICP®)**

**SIS 193 - IEPE (ICP®)**

SIS 190 1/2"  
 Pair of capsules 1/2" MK 290 E  
 Preampifier 1/4" MV 310  
 Spacer 1/2" 12 and 50 mm

SIS 192 1/2"  
 like  
 SIS 190 1/2"

SIS 193 1/2"  
 like  
 SIS 190 1/2"

SIS 190 1/4"  
 Pair of capsules 1/4" MK 390 E  
 Preampifier 1/4" MV 310  
 Spacer 1/4" 6 and 12 mm

SIS 192 1/4"  
 like  
 SIS 190 1/4"

SIS 193 1/4"  
 like  
 SIS 190 1/4"

**Pair of capsules**

**Spacer**

**Measuring range**

1/2"

50 mm  
 12 mm

35 Hz ... 1,5 kHz  
 70 Hz ... 5 kHz

1/4"

12 mm  
 6 mm

1 kHz ... 6 kHz  
 1 kHz ... 12 kHz

## Sound intensity probe 194 3D, IEPE (ICP®)



**SIS 194 3D 1/2" - IEPE (ICP®)**

**SIS 194 3D 1/4" - IEPE (ICP®)**

SIS 194 3D 1/2"  
 6 Preampifiers 1/4" MV 310  
 3 Pairs of capsules 1/2" MK 290 E  
 Spacer 1/2" 50 mm

SIS 194 3D 1/4"  
 6 Preampifiers 1/4" MV 310  
 3 Pairs of capsules 1/4" MK 390 E  
 Spacer 1/4" 7 and 12 mm

**Pair of capsules**

**Spacer**

**Measuring range**

1/2" MK 290 E

50 mm

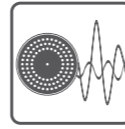
35 Hz ... 1,5 kHz

1/4" MK 390 E

12 mm  
 7 mm

1 kHz ... 6 kHz  
 1 kHz ... 10 kHz

# Outdoor/Environmental



## Outdoor and Environmental microphones



In today's world of a high degree of environmental awareness, accurate noise measurement is of decisive importance. In this area a series of precision measuring microphones with weather protection for temporarily and long-term installations is offered by Microtech Gefell. Most microphones are certified for official verification and can be used for legally binding measurements. Microtech Gefell produces microphones for aircraft noise monitoring systems for sound incidence from above as well as, for example, for noise monitoring like traffic noise with sound incidence from the side relating to the microphone axis. Some models are equipped with a remote calibration system. There are different installation and connection systems for mast mounting and various cable adaptors available. Thereby the microphones are compatible to all standard monitoring systems in the measurement area.

				
21.31 94.91	21.31 95.103			
<b>WME 940</b>	<b>WME 950; WME 952; WME 953</b>	<b>WME 960 H   V WME 965 H   V</b>	<b>WME 970 H   V digital</b>	<b>WS 1</b>
remotely calibrated	not remotely calibrated	remotely calibrated	remotely calibrated	not remotely calibrated
Reference sound incident direction: vertical	Reference sound incident direction: vertical	Reference sound incident direction: horizontal   vertical	Reference sound incident direction: horizontal   vertical	Reference sound incident direction: horizontal
Capsule MK 223, Preamplifier MV 205, U <sub>pol</sub> 200 V	Capsule MK 223, Preamplifier MV 203, U <sub>pol</sub> 200 V, 5 m cable, 7-pin LEMO®  <b>WME 952</b> Capsule MK 250 Preamplifier MV 210, U <sub>pol</sub> 0 V, 5 m cable, BNC  <b>WME 953 P 48 V</b> Capsule MK 250 Preamplifier MV 220, U <sub>pol</sub> 0 V, 5 m cable, 3-pin XLR	<b>WME 960 H   V</b> Supply module incl. VM 960 calibration generator Capsule MK 233 B   Capsule MK 223 B Preamplifier MV 203.3, U <sub>pol</sub> 200 V, 10 m cable, LEMO®  <b>WME 965 H   V</b> Supply module incl. VM 960 calibration generator Capsule MK 233 BE   Capsule MK 250 B   Capsule MK 255 Preamplifier MV 210 IEPE, 10 m cable, LEMO®	<b>WME 970 H   V digital</b> Supply module incl. VM 960 calibration generator, USB-Audio-Interface for MV 230 digital Capsule MK 233 B   Capsule MK 223 B Preamplifier MV 230 digital, U <sub>pol</sub> 200 V, 5 m cable, LEMO®	for freefield microphone types Capsule MK 221, MK 222, MK 223, with Preamplifier MV 203, MV 203.3 Capsule MK 250, MK 255 with Preamplifier MV 204, MV 204.3, MV 210, MV 220 Supplied with: Dehumidifier TA 202 cable for MV 203.3, MV 204.3: 7-pin LEMO® cable for MV 210: BNC

# Calibration equipment



PDB  $\frac{21.51}{00.03}$

**Sound pressure calibrator 4000 KI. 1**

**Pistonphone 5002**

<b>Generated SPL / dB</b>	114.0 ± 0.2	124 ± 0.3 plus static air pressure correction
<b>Frequency / Hz</b>	1 k ± 0.2 %	250 ≤ 0,1%
<b>For microphone types</b>	1", 1/2", 1/4"	1", 1/2", 1/4"



**EMK 1**

**Measuring chamber for electrostatic actuator measurement**

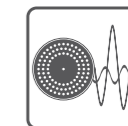
for 1", 1/2", 1/4" MTG-Measurement capsules

1" Measurement capsule with additional devices adaptor A 63.1

1/4" Measurement capsule with additional devices actuator RA 0014, optional adaptor 1/2" Ø

Measurement adaptor MK 1 for supply of measuring voltage

# Power supplies



**MN 921 / A 92**

Measuring amplifier with power supply, 1-cannel, 7-pin LEMO® / adaptor A 92

**Frequency Range** 0,5 Hz ... 4,5 MHz

**Gain switchable** 81 dB (9 x 9 dB)

**Adaptor A 92** for constant current powered microphones with IEPE-connection (ICP®)



**MN 940**

Measurement microphone power supply for WME 940, 1-cannel, 7-pin LEMO®



**MN 960-8 / MN 960-4**

Measurement microphone power supply, 8- / 4-cannel, 7-pin LEMO®

**Frequency Range** 0,5 Hz ... 4,5 MHz

**Gain** 0 dB and 40 dB



**M 28\***



**M 32\***

IEPE (ICP®) Conditioning modules, BNC-connector

**Frequency Range** 0,1 Hz ... 100 kHz

0,1 Hz ... 30 kHz  
(depending on low pass filter modul)

**Gain** 0 dB 0 dB and 20 dB and 40 dB

\* including AC Adaptor PS 500 or PS 1000 depending from number of units for supply.