

microphones & acoustic systems - founded 1928 by Georg Neumann

KEM 975

Cardioid-Plane-Microphone

with non-rotatinal symmetrical directivity

User Manual







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Operating elements

KEM 975



Power supply N 975





Rackmount kit





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1 Technical specifications

Cardioid-Plane-Microphone KEM 975

horizontal	cardioid
vertical	club shaped
horizontal	120°
vertical	30°
	Pressure gradient
	transducer
	40 - 18,000 Hz
	775 mV/Pa
	40 Ω
CCIR 468-4	24 dB
DIN EN 60268-4	15 dB(A)
Gain 12 dB	104 dB
Gain 0 dB	116 dB
Gain -12 dB	128 dB
Gain -24 dB	140 dB
Gain -36 dB	152 dB
	Neutrik XLR-5M
	1.07 kg
	343 mm
Mesh	38 mm
Housing	25 mm
	satin nickel dark bronze
	horizontal vertical horizontal vertical CCIR 468-4 DIN EN 60268-4 Gain 12 dB Gain 0 dB Gain -12 dB Gain -12 dB Gain -36 dB Mesh Housing

Power supply N 975

Power supply voltage		230/115 V AC
		\pm 10%, 50/60 Hz
Connectors	KEM 975	XLR-5F
	Audio output	XLR-3M
Weight		1.6 kg
Width		221 mm
Depth		170 mm
Height		45 mm



2 Delivery

Cardioid-Plane-Microphone	KEM 975	
Microphone holder	MH 975	
Power supply	N 975	
Connection cable (10 m)	C 975.1	
IEC mains cable		
Rack mounting set		
Thread adaptor: 5%" male to 3%" & 1/2" female		
Tommy-screw 8 mm for MH 975		
8mm Allen key for MH 975		
Transit case 450 x 160 x 365 mm		
satin nickel		Order-No. 211180
dark bronze		Order-No. 211181

Prior to each use of the microphone make sure that all parts are in perfect condition.

We also recommend that the microphone is inspected for residual dust at appropriate intervals and to have Microtech Gefell GmbH examine it, if necessary.



3 Accessories

Microphone connection cable 10 m	C975.1	Order-No. 202224
Microphone connection cable 20 m	C975.2	Order-No. 202225
Microphone connection cable 30 m	C975.3	Order-No. 202226
Microphone connection cable with rt.angled plug 10m	C975.1 W	Order-No. 202227
Delta-Capsule	DM 21	
satin nickel		Order-No. 201246
dark bronze		Order-No. 201247
Anti-vibration mount for permanent fixing - 10cm Thread adaptor 5%" to M10	KH 975.03	
satin nickel		Order-No. 202374
dark bronze		Order-No. 202375
Anti-vibration mount for permanent fixing - 3cm Thread adaptor 5⁄8" to M10	KH 975.1	
satin nickel		Order-No. 202376
dark bronze		Order-No. 202377
Auditorium hanger	MA 975	
1x Microphone holder	MH 975	
2 x Thread adaptor 5⁄8" to M6 2 x Ring screw M6		
Tommy-screw and Allen key 8mm		
satin nickel		Order-No. 202380
dark bronze		Order-No. 202381

Prior to each use of the microphone make sure that all parts are in perfect condition.

We also recommend that the microphone is inspected for dust at appropriate intervals and to have Microtech Gefell GmbH examine it, if necessary.



4 About this manual

Please read this User Manual carefully before use to minimise the risk of physical injury or damage to property or to the equipment.

Keep this User Manual handy during installation and store it in a safe place in case it is needed by a user at a later date. If you are an installation company, please make sure this Manual is passed on to the customer on completion of the installation.

Please pass this User Manual on to any subsequent owners to ensure safe use of the product.

5 General Safety Instructions

5.1 Danger and information signs



Warns of life threatening injuries from an electric shock.

Warns of injuries.

Warns of damage to property.

INFORMATION

Gives additional information.

5.2 Normal Use

The KEM 975 is a line array microphone with the main sound input direction perpendicular to the front of the microphone. It is not a rotationally symmetric polar-pattern, but a cardioid pattern at rt.angles to the microphone and a narrow 30° angle in the other direction.



The microphone serves to capture one or more sound sources from a spatially extended area.

It is designed for indoor use and, with the corresponding accessories, for temporary outdoor use.

5.3 Unauthorised Use

This product should not be used by children or persons with impaired physical, sensory or mental abilities; nor by persons who have a lack of experience, unless they are being supervised.

5.4 Intended Use





Place the microphone and the power supply unit in such a way that they are protected from being trodden on or falling down.

Ensure that the cables are not strained through tension.

Do not use the microphone or power supply after they have been dropped.

Repairs should only be carried out by the Microtech Gefell GmbH Service Department.



Place the microphone and power supply unit in a way that they are protected from being trodden on or dropped.

6 Initial Steps

6.1 Setting up the equipment



Intense and/or permanent heat exposure will destroy the microphone. Therefore, do not place it in locations with direct sunlight or near radiators or spotlights.

6.1.1 Setting up the KEM 975

- 1. Loosen the adjustment screw on the MH975 microphone holder.
- 2. Align the threaded connector of the MH975 as desired.
- 3. Re-tighten the adjustment screw (after tightening, the lever can be lifted and turned so it does not obstruct).
- 4. Screw the microphone with the MH975 microphone holder on to the desired mount (see section 8: Use of accessories).

When using the adjustment screw as a clamping screw without the Tommy Bar, it must be loosened or tightened with an 8mm Allen Key.

6.1.1 Setting up the N 975 power supply

- 1. Install the power supply in a well-ventilated dry place.
- 2. Install it so that it is protected from being knocked or dropped.

6.2 Installing the rack

The dimensions of the N 975 correspond to the 19" rack mounting standard for mounting in a standard rack or a built-in cupboard. The N 975 is half-width, so it can be mounted in a half-width rack, or two can be mounted side-by-side in a standard rack with the supplied rack ears. If a single N 975 needs to be mounted in a standard 19" rack, use the supplied blanking panel in the place of the second N 975.



In case of an insufficient mounting depth of the rack, there is the risk that the connectors at the rear of the N 975 could be damaged or bent. For this reason pay close attention to the mounting depth and allow sufficient space for the connectors and cables.

If there are devices that get hot installed in the same rack or cupboard as the N 975, the N 975 is at risk of damage. Therefore sufficient ventilation must be provided to ensure a free airflow to keep the devices cool.

The front panel always includes 4 screws (matched to the rack or cabinet) and 4 washers.

6.2.1 Installing the N 975 into a half-19" Rack

1. Remove the screws on the left and right of the front panel of the N 975 (see diagram below).



2. Attach the left and right rack "ears" to the front panel of the N 975, they positively click into place, and screw them tightly in place.



3. Slide the pre-assembled power supply unit into the rack and screw it securely in place (if necessary, read the instructions supplied with the rack).



6.2.2 Installing the N 975 into a 19" Rack

1. Remove the screws on the left and right of the front panel of the N 975.



2. Attach one of the rack "ears" to one side of the N 975, it will positively click into place, and screw it tight.



3. Attach the other rack "ear" to the blank panel, it will positively click into place, and screw it tight (if mounting two N 975 together, substitute the second N 975 in place of the blank panel after removing the left and right screws as described in 1. above).



 Place the joining connector on the other end of the blank panel (or second N 975) and screw it tight.



5. Place the pre-assembled blank panel (or second N 975) with the joining connector to the desired side of the N 975 (the blank panel can be mounted either side) and screw it tight.

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6. Slide the pre-assembled power supply unit into the rack and screw it securely in place (if necessary, read the instructions supplied with the rack).

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6.3 Connecting the equipment

- 1. Plug the XLR-5F connector of the microphone cable into the XLR-5M connector of the microphone until the connector clicks audibly into place.
- Plug the XLR-5M connector at the other end of the microphone cable into the XLR-5F input connector of the N 975 power supply until it clicks audibly into place.
- 4. Plug the XLR-3F connector of the connection cable into the XLR-3M output connector of the N 975 power supply until it clicks audibly into place. Plug the XLR-3M connector at the other end of the connection cable into the XLR-3F input connector of the downstream equipment (eg: mixer, recorder, amplifier, etc.) until it clicks audibly into place.
- 5. Only after the above connections have been made, connect the power cable into the IEC mains connector of the N 975 and then into the mains power socket (switch on the power at this socket if it is a switched socket).
- 6. Switch on the N 975 power supply with the on/off power switch.

WARNING

It is important that the cables are installed safely and are not twisted nor crushed; also, they should be protected from being pulled or stretched if attached to moving parts.

) INFORMATION

The light on the power switch lights up when the power supply unit is powered up.

INFORMATION

The N 975 power supply unit and the KEM 975 can warm up to approx. 35° C, this corresponds to the normal operating temperature.

The device can be damaged or destroyed if connected to the incorrect mains voltage. Therefore please make sure that the N 975 power supply is set to the correct voltage for the country of use (see section 7.1: Setting the supply voltage).

If the amplification is set too high, there is the risk that the following equipment connected to the N 975 power supply unit will be destroyed. Therefore always set the rotary GAIN control to -36dB, before switching on the N 975.

6.4 Aligning the microphone

Behind the mesh of the KEM 975 is a green indicator LED.

- 1. Turn on the LED with the switch on the top cover of the KEM 975 microphone.
- 2. Aim the microphone so that the LED can be seen in the area to be covered. Best results are obtained when care is taken in the correct alignment of the microphone.
- 3. Turn off the LED (optionally, it can be left on if people to be recorded wish to be assured that they are in the pick-up area).



The microphone is now ready for use.

NB: When setting up, it is useful to be aware of the microphone's polar-pattern.

For instance, if it's being used to record a choir behind an orchestra, then the lower edge should pick up the front row of the choir and miss the back row of the orchestra – the top edge should pick up the back row of the choir and miss picking up any reflections from any wall behind the choir. Mounting higher and tilting down more may help in this case.

For use as a video conferencing microphone, be aware of any possible reflections from the table and/or ceiling and angle the microphone accordingly.

If used on the edge of a stage, tilting up slightly will improve the capture of the players and minimise foot noise on the stage.

Care taken in setting up will give the best results.

6.5 Disassembling and storing the microphone

6.5.1 Storage at the venue

1. Turn off the N 975 power supply with the on/off mains switch.

6.5.2 Storage in the transport case

- 1. Turn off the N 975 power supply with the on/off mains switch.
- 2. Remove the mains cable from the power socket and then from the N 975.
- Unlatch the XLR-3F connector of the connection cable and unplug it from the XLR-3M output connector of the N 975.
- 4. Unlatch the XLR-3M connector of the connection cable and unplug it from the XLR-3F connector of the downstream device.

- 5. Press the PUSH button on the XLR-5F connection of the N 975 power supply and pull the XLR-5M connector of the microphone cable out of the socket at the same time.
- 6. Press the release button of the XLR-5F connector of the microphone cable and pull it out of the attached XLR-5M connector of the microphone.
- 7. Place the microphone and power supply unit into the designated recesses of the transport case.
- If the installation was a temporary one, also store the cables in the cable area of the transport case – NB: take care in coiling the cables so they do not get twisted or damaged while being wound up.

Package the KEM 975, N 975 and accessories in the transport case they were supplied in – this protects them from shock and damage. Store the case in a dry and ventilated place.

7 Individual settings

7.1 Setting the supply voltage

The N 975 is delivered as standard, set for a mains supply voltage of 230V. The operating voltage can be seen by looking at the small window in the fuse module. The voltage setting will need to be changed if your country uses a different supply voltage. The voltage change switch is part of the fuse holder next to the IEC mains connector on the back of the N 975. You will need a flat-headed screwdriver to open the fuse holder.



Incorrect opening of the fuse holder / voltage change switch can cause damage, be very careful when opening it. It is important that you read the following instructions before you start. If any damage does occur to the N 975, send it to Microtech Gefell GmbH for repair (your local Microtech Gefell distributor can help you with this).

1. Carefully open the fuse holder cover with a screwdriver (see diagram).



2. Remove the module and the white plastic fuse holder.

At the back of the white plastic fuse holder are the voltage indicators (230V / 115V).

3. Turn the fuse holder over (see diagram) and re-insert it into the module so that the correct voltage is visible from outside, showing through the window of the module.



4. Re-insert the module carefully until it clicks into place.



The N 975 will now operate only on the new voltage.

7.2 Setting the level ranges

If the amplification is set too high, there is the risk that the following equipment connected to the N 975 power supply unit will be destroyed. Therefore always set the rotary GAIN control to -36dB, before switching on the N 975.

With the 5-stage rotary GAIN switch, the amplification can be adjusted in steps of 12dB between -36dB and +12dB.

- 1. Set the KEM 975 up and do a test recording. The sound pressure level at the microphone should correspond to the operating level of the event. Watch the peaks and leave enough headroom so you don't have to re-adjust levels during recording or transmission.
- 2. Set the rotary GAIN control on the N 975 so that the correct level is sent to the following equipment.

If the red LEDs of the N 975's level meter are flashing. The microphone is overmodulated and is sending a distorted signal to the output (OUTPUT). If this happens, reduce the GAIN setting of the N 975.

7.3 Setting grounding

The N 975 power supply is delivered as standard with pin-1 of the XLR-3M OUTPUT socket connected to GROUND. This means that the microphone ground (KEM 975 and N 975) is connected to the ground of the downstream device. Depending on the grounding of the following devices, so-called "ground loops" can develop. If this happens it is possible to disconnect the grounding between the N 975 and the following devices.



 Slide the earth lift switch (OUTPUT PIN 1) on the back of the N 975 to the FLOAT position. This disconnects pin-1 of the XLR-3M OUTPUT connector from system ground.

8 Use of the accessories

🚺 WARNING

Only use genuine Microtech Gefell GmbH accessories with the KEM 975 system.

8.1 Using the DM 21 Delta capsule

Below about 800Hz the KEM 975 cannot maintain its tight directivity in the vertical plane anymore, due to the length of the microphone, and more and more approaches a cardioid polar-pattern with lowering frequencies. The DM 21 Delta capsule, which forms an equilateral triangle together with the two outer capsules of the KEM 975, causes an increase in directivity below about 800Hz to compensate for this. With the DM 21 Delta capsule the KEM 975 maintains its vertical directivity at approx. 9dB with low frequencies to below 100Hz.

) INFORMATION

- The DM 21 Delta capsule is recognised immediately after plugging in and the signal processing for this is adjusted accordingly.
- With a connected Delta capsule, the sensitivity of the KEM 975 microphone is reduced by approx.. 1.0dB.



8.1.1 Installing the DM 21 Delta capsule

Incorrect mounting of the Delta capsule could damage the connectors and/or sockets. Please pay special attention to the following steps in order to avoid this.

- 1. Turn off the microphone by switching off the N 975 power supply (or install the Delta capsule before commencing the system installation).
- 2. Remove the protective screw caps from the rear sockets of the KEM 975 microphone and store them in a safe place.
- 3. Place the KEM 975 microphone and DM 21 Delta capsule in such a way that they are protected against being dropped. The 4-pin plug is the top end of the DM 21 Delta capsule and the guide socket (coloured red) is at the bottom, closest to the connector end of the KEM 975.
- 4. First, insert the guide pin half-way into the guide socket (coloured red) on the KEM 975.
- 5. Next, carefully slide the 4-pin connector into it's socket on the KEM 975.
- 6. Then, push the guide pin fully into the guide socket and screw it in tight.
- 7. Lastly, screw tight the 4-pin connector into its socket.

The KEM 975 with attached DM 21 Delta capsule is now ready for use.



8.1.2 Removing the DM 21 Delta capsule

Removing the DM 21 Delta capsule is done in the reverse order of assembly.

- 1. Turn off the microphone by switching off the N 975 power supply.
- 2. Unplug the XLR-5F microphone cable and remove the microphone assembly from its mount.
- 3. Unscrew the connectors of the DM 21 Delta capsule.
- 4. Firstly, unplug the 4-pin connector from the KEM 975 (this is the top connector of the Delta capsule) and, secondly, unplug the guide pin from its socket.
- 5. Replace the protective screw dust caps onto the empty sockets of the KEM 975.

8.2 Using a microphone stand

The KEM 975 is delivered with a stand mount that has a $\frac{5}{6}$ " US thread, together with an integral thread adaptor for the $\frac{1}{2}$ " and $\frac{3}{6}$ " international standards. The thread adaptor has a $\frac{1}{2}$ " thread one end and $\frac{3}{6}$ " at the other so, if required, just unscrew the adaptor and insert it the other way around for the other thread.

In Europe the $\frac{3}{8}$ " thread is the standard, though large stands often have the $\frac{1}{2}$ " thread. In the USA, the $\frac{5}{8}$ " thread is normally the one used.

Camera tripods normally have a small $\frac{1}{4}$ " thread and thread adaptors are commonly available to convert this small $\frac{1}{4}$ " thread to the standard $\frac{3}{8}$ " thread. However, we would not advise using a camera tripod for mounting the KEM 975.

8.3 Using the KH 975.1 or KH 975.03 antivibration mount

With these mounts you can attach the KEM 975 microphone to a wall or ceiling. These are elasticated to minimise the transmission of structure-born noise to the microphone.

For fitting, you will need a 14mm flat-headed screwdriver and the supplied 8mm Allen key.



8.3.1 Installing the KH 975.1 or KH 975.03 antivibration mount

- 1. Using the base of the KH 975.01 (.03) as a template, mark the wall or ceiling with the four mounting hole positions.
- Drill the mounting holes (suitable for the ø 5mm screws supplied) into the wall or ceiling – NB: make sure the surface is solid and will take the weight of the microphone and, if using wall plugs, make sure the correct ones are used and that the fixing will be firm and cannot be pulled out.
- 3. Remove the $\frac{5}{8}$ " to $\frac{1}{2}$ " & $\frac{3}{8}$ " thread adaptor that was supplied with the MH 975 microphone holder from it and replace it with the $\frac{5}{8}$ " to M10 thread adaptor that is supplied with the KH 975.1 (.03).
- 4. The microphone holder base sits inside the top of the cone screw it in tight from the bottom of the mount using the supplied 8mm Allen key.
- 5. Screw the KH 975.1 (.03) securely to the wall or ceiling using the supplied ø 5mm screws and make sure it is firm. As the microphone holder cannot be turned once installed, take care that it is aligned correctly before screwing the mount to the wall or ceiling.



 Lastly, insert the KEM 975 into the microphone holder, align it correctly and tighten the swivel with the lever on the MH 975. Once screwed tight, the lever can be lifted and turned so that it is out of the way.

8.3.2 Removing the KH 975.1 or KH 975.03 antivibration mount

- 1. Unplug the KEM 975 and remove it from the MH 975 microphone holder.
- 2. Unscrew the KH 975.1 (.03) from the wall or ceiling.
- Using the 8mm Allen key, unscrew the MH 975 microphone holder and remove it from the mount.
- 4. Remove the M10 thread adaptor from the microphone holder and screw it back into the KH 975.1 (.03).
- 5. Replace the original (½" & 3/8") thread adaptor back into the MH 975 microphone holder.
- 6. Do not lose the ø 5mm mounting screws in case the KH 971.1 (.03) needs to be used again.

8.4 Using the MA 975 auditorium hanger

The MA 975 auditorium hanger is designed exclusively for mounting the KEM 975, with or without the DM 21 Delta capsule attached, and can be used indoors or outdoors.

Please pay particular attention to the following warnings for the safe use of the MA 975 auditorium hanger.

• Only mount the microphone with the parts supplied by Microtech Gefell GmbH.



WARNING

- Only use properly tested and sufficiently dimensioned slings, ropes and chains.
- Observe the bearing capacity and the permissible gross bearing weight of the auditorium ceiling and make sure that the weight of the microphone and all mounting accessories, including cables, are within this weight limit; obeying any local regulations for the prevention of accidents.
- Secure the microphone and all suspension elements properly, making sure that they cannot fall and are supported with a safety chain.
- Make sure that all connections are fully tight and secure and cannot come loose.
- **Don't** use ropes from natural or synthetic fibres for the catenary.
- **Don't** use coated chains for the catenary.
- For load-bearing parts **don't** use rope connections with wire rope clamps.
- Inspect the mounting elements and accessories prior to each use and replace defective parts if necessary. For permanent installations the hanging system should be inspected on a regular basis – this is very important if the microphone is slung over an audience.
- Make sure that the catenary cannot become twisted or knotted.
- Lay the cables in such a way that there is no tripping risk and highlight any cables that are run across a walkway.
- Make sure that the microphone cable is installed so that it is **not** part of the loadbearing catenary and is not strained in any way (longer length microphone cables are available for this use).
- Use the auditorium hanger only with stages that are covered by a roof.



• If used outside and the wind speed rises to over 8 Bft (65-70 km/h or 40-45 mph), there is the risk of injury by falling debris. Get all people away from the danger zone and lower and dismantle the microphone suspension.



8.4.1 Installing the MA 975 auditorium hanger

- 1. Remove the thread adaptor from the MH 975 swivel mount that was supplied with the KEM 975 microphone.
- 2. Attach the additional MH 975 to the other end of the KEM 975, align the two mounts and tighten them firmly.
- 3. Screw the 5%" to M6 thread adaptors (supplied as part of the MA 975 auditorium hanger) into each of the two MH 975 mounts.
- 4. Screw the ring bolts into each microphone holder.

Fasten the catenary first to the holder at the XLR-5M end of the microphone and then to the second holder at the other end.

It is vital that these are screwed together properly and cannot come loose. For a permanent installation we would recommend the use of Loctite® or similar be applied to the thread adaptor and ring bolt threads to ensure a secure fixing. You can now attach the KEM 975 with attached MA 975 to the catenary.

8.4.2 Removing the MA 975 auditorium hanger from the KEM 975

- 1. Remove the KEM 975 with attached MA 975 from the catenary.
- 2. Unscrew the ring bolts from the mounts.
- 3. Remove the 5%" to M6 thread adaptor.
- 4. Remove the second MH 975 mount from the upper end of the microphone.
- 5. Store all MA 975 elements together in a safe place.

9 Cleaning and Maintenance

1.1 Cleaning

1. The KEM 975 and accessories should only be cleaned with a soft lint-free cloth.

Never use chemicals nor aggressive or abrasive cleaners on the KEM 975 system as these could scratch or damage the microphone.

Keep the microphone away from all forms of pollution that could damage the microphone.

If the microphone grill becomes damaged or blocked in any way please contact the Service Department at Microtech Gefell GmbH (your local Microtech Gefell Distributor can help you with this).



9.2 Maintenance

Before each use check the microphone and accessories to make sure that all parts are in perfect condition. For a permanent installation, the microphone and accessories should be checked on a regular basis to ensure that they are in proper condition and no mounting parts have become loose. For long term reliable use, Microtech Gefell GmbH recommends that the microphone be returned for checking and cleaning after an appropriate period of time.

10 Guarantee

Microtech Gefell GmbH guarantee products against manufacturing defects for a period of two years from first sale (or for one year in the case of a second-hand item that has been checked and serviced by Microtech Gefell's Service Department before re-sale). In each case, starting from the date of invoice to the end user. The Guarantee excludes any defects or damage caused by negligent or improper treatment or incorrect installation or noncompliance with the specifications given by Microtech Gefell GmbH or the technical specifications specified on the relevant data sheets, or the use of inappropriate accessories or any modification of the original parts by the customer or their contractor, or by any third parties not commissioned by Microtech Gefell GmbH. Regular wear and tear is also excluded from the Guarantee.



11 Disposal of old equipment

Protect the environment: To avoid risk to health or the environment, this product should not be disposed of with normal household waste. At the end of its life cycle it should be bought to a recycling point for the recycling of electrical and electronic devices. For more information please contact yout municipal authority or local government. This is an important contribution to recycling (EU directive 2002/96/EC).



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