C 24
CONDENSER
STEREO MICROPHONE
CONDENSER STEREO MICROPHONE C 24

This microphone comprises two completely separate high-quality studio condenser microphone systems which are arranged one above the other and have the function of receiving sound from a given direction. This direction from which the systems receive sound can be adjusted by

- rotating one system with respect to the other (base angle)
- rotating the entire microphone assembly (XY, MS stereo techniques), and by
- selecting nine different directional characteristics for each system (cardioid, omni-directional, figure-eight, and intermediate positions).

APPLICATIONS

For highly critical stereo recordings of top studio quality:

Recording studios
Radio
Television
Phonograph record production

CONDENSER STEREO MICROPHONE C 24

STEREO PATTERN SELECTOR S 24

POWER SUPPLY UNIT N 24 A
The upper system (1) can be rotated by 180° with respect to the lower system (2). The desired stereo base angle can thus be set without difficulty.

Individual selection of the directional characteristic for each system permits excellent adaptation of the microphone to the given recording situation. Figure (1) shows a directional characteristic of two cardioids offset by 90°, a typical setting for the XY stereo technique. Figure (2) shows a directional characteristic of cardioid and figure eight at right angles to each other, a typical setting for the MS stereo technique. The cardioid, omni-directional and figure-eight characteristics along with six intermediate positions can be set from a separate control unit during operation for each individual system. This will not change the sensitivity of the microphones.

The microphone stand connector is designed to permit a rapid and accurate changeover from the MS stereo technique to the XY technique with the microphone permanently mounted on a studio boom. The connector receptacle (1) which holds the body of the microphone can be rotated by 45° after lifting it slightly. An indicator window (2) will show the position symbol MS (normal straight position of the microphone), or, after counter-clockwise rotation, the position symbol XY (offset by 45°).
The matte-finished metal cylinder (1) encloses and protects the built-in stereo preamplifier and prevents annoying light reflections. The amplifier tube 6072 (2) is a twin triode which has been given a special quality check and is interchangeably mounted on the printed circuit board of the preamplifier.

The two twin-condenser systems (3) and (4) of Mylar® foil with a vapor-deposited gold film are arranged one above the other; the upper system is rotatable. This diaphragm design has the advantages of great strength and ruggedness of the system as well as extremely high electro-acoustic sensitivity. The Mylar® foil is unaffected by moisture and prevents electrical shorting of the electrodes in case of high diaphragm amplitudes, protecting them from damage.

The double mesh cap (4) encloses the two diaphragm systems and protects them from dust and iron particles as well as from mechanical damage. The fine-mesh wire screen underneath the mesh cap does not affect the high sensitivity of the systems. The upper half of the mesh cap can be rotated in correspondence with the system.

The active side of the microphone is marked by a lighter color of the mesh cap. The lower end of the microphone body holds a 12-pin Tuchel connector T 3617 (5) which connects the microphone to the cable.

The condenser stereo microphone C 24 is plugged into the stand connector (1). By means of a knurled collar (2), the microphone body is rigidly connected to the stand connector. The electrical pins of the body have ample electrical contact with the socket (3) of the stand connector. The microphone can be easily disengaged from the stand connector by unscrewing the knurled collar.

The microphone cable (4) has a length of 20 m and is permanently connected to the stand connector. A 12-pin Tuchel connector T 3615 links the microphone cable with the power supply unit.

The electrical socket (3) is built into the stand connector to permit rotation by 45° (see Figure): The socket is lifted slightly, rotated counter-clockwise from the normal position MS into the position XY, and is let down again into the locked position. The respective position MS or XY can be read at an indicator window in the lower part of the stand connector. This feature serves to adapt the microphone for the various types of stereo recording when the microphone is permanently mounted on a studio boom.

The stand connector can be pivoted and fits the most common types of stands by means of a screwed-in thread reduction piece (thread gauges \(\frac{3}{8}\)", \(\frac{1}{2}\)" - 26, \(\frac{5}{6}\)" - 27).
POWER SUPPLY UNIT N 24 A

The power supply unit N 24 A provides the operating voltages for the condenser stereo microphone C 24. It furnishes the polarizing voltage for the condenser capsules and the filament voltage for the amplifier tube 6072.

The unit is turned on with the on-off switch ①. The neon control light ② indicates when the microphone is operative.

The rear panel of the N 24 A carries the power line connector ④. The line voltage selector 110/220 volts ③ is located above it. Two Tuchel 12-pin flanged sockets link the unit with the microphone (left socket ⑥) and with the directional control unit (right socket ⑦).

The N 24 A only weights 1.7 kg, has a convenient form, and can be suspended, placed on a surface, or mounted in a rack. Transportation is made easy by the carrying handle ③.

STEREO PATTERN SELECTOR S 24

For each system, nine different directional characteristics can be selected independent of the other system while the microphone is in operation (omni-directional, cardioid, figure-eight, and six intermediate positions). The various characteristics are equivalent in terms of phasing and sensitivity. The right selector switch ② controls the fixed system, while the left switch ① controls the rotatable system.

By changing the directional characteristics, it is not only possible to select the basic techniques of stereo recording (see schematic diagram, Figure 3); in addition, the recording technique can be ideally adapted to the room acoustics during the recording session. This also makes it unnecessary to rearrange the grouping of musicians or speakers since the desired effects are achieved by changing the directional characteristics.
Because of the difference in power line systems, the power supply unit is shipped with a power cord having a free cable end. The four-wire power cord has a length of 1.7 m. There are separate system and power line ground wires.

A 12-pin Tuchel flange socket is provided for connecting the microphone cable MK 24 to the power supply unit N 24 A.

The control cable RL 24 which links the power supply unit N 24 A with the directional control unit S 24 is connected to the power supply by way of a 12-pin Tuchel flange socket. The flange ring carries a red dot to distinguish it more clearly from the microphone input.

CONNECTIONS ON THE S 24

A 12-pin Tuchel flange male socket is built into one of the side panels of the directional control unit S 24 to connect the control cable RL 24.

The audio cable is connected to a 5-pin AKG flange socket located on the other side panel of the control unit.
The microphone is electrically connected to the power supply unit N 24 A by means of the microphone cable MK 24.

The control cable RL 24 links the power supply unit with the stereo pattern selector S 24.

The audio cable NF 24 connects the stereo pattern selector to the control console for the mixer amplifiers.

The power supply unit is connected to the line voltage of 220 volts, 50–60 Hz by a 4-wire power cord. A line voltage selector on the rear panel of the power supply unit permits conversion for 110-volt operation. Line voltage fluctuations of ± 10% are permissible; an excessive temperature rise will trigger a thermal fuse and turn off the unit automatically.

The power supply unit N 24 A furnishes the operating voltages for the twin triode 6072 built into the microphone, and for the two microphone systems. The microphone cable has a length of 20 m and can be extended to up to 700 m since the filament current is held constant by means of a zener diode transistor circuit.
The desired studio condenser stereo microphone should have two systems arranged axially one above the other. The upper system should be rotatable through 180°. Each of the two systems should have nine different directional characteristics (omni-directional, cardioid, figure-eight, and six intermediate positions) which should be available for selection from a directional control unit during operation, for each system independently.

The stand connector should be rotatable through 45° with a stop. This should permit effortless conversion from the MS stereo technique to the XY technique and vice versa, even when the microphone is permanently mounted on a studio boom. In addition, the stand connector should pivot through 180° by means of a swiveling joint.

The microphone body should have a matte nickel finish and should prevent annoying light reflections. The diameter of the microphone should not exceed 35 mm, and its maximum length including the stand connector should be no greater than 320 mm.

The microphone should be connected to the power supply unit by a 9-wire microphone cable having a length of 20 m. The front panel of the power supply unit should carry an on-off switch and a neon signal light; a line voltage selector (110 – 220 volts) should be provided on the rear panel. The weight of the power supply unit should be only 1.7 kg.

The power supply unit should be connected to the directional control unit by an 8-wire control cable having a length of 10 m. The directional control unit should be linked to the studio amplifier input with a four-wire audio cable with a free cable end and a length of 5 m. The interconnections between the microphone, the power supply unit, and the directional control unit should correspond to the circuit diagram shown opposite.

Each microphone system should have a smooth, horizontal frequency response with a deviation of no more than ±2.5 db; the frequency responses of the two systems should be practically identical. The frequency range should extend from 30 to 20 000 Hz. The front-to-back discrimination at 1000 Hz and 180° in the “cardioid” position, and at 90° in the “figure-eight” position, should exceed 25 db.

The microphone should have symmetrical output connections for each system. The electrical impedance should be 200 ohms per system, but should be convertible to 50 ohms by resoldering the connections. The maximum sound pressure for a harmonic distortion of 0.5% should exceed 150 µbars (117.5 db SPL). The residual noise level should be less than 22 db.

The studio condenser stereo microphone C 24 meets this description.
TECHNICAL DATA

FREQUENCY RESPONSE CURVES:

Guaranteed frequency response curve

Typical frequency response curve (1 m distance from the source of sound)  $0^\circ$

Typical frequency response curve (1 m distance from the source of sound)  $90^\circ$

Typical frequency response curve (1 m distance from the source of sound)  $180^\circ$
TECHNICAL DATA
SENSITIVITY, DIRECTIONAL CHARACTERISTICS:

Type: Pressure gradient receiver with low frequency circuit. For stereo recording (2 systems situated one above another)

Frequency Range: 30 to 20000 Hz

Sensitivity at 1000 Hz: 1 mv/µbar (-60 dbv) re. 1 v/dyne/cm²

Microphone Rating: GM = -132 db; -41 db re. 1 mw/10 dyne/cm²

Directional Characteristics: Cardioid, Omnidirectional, Figure-of-eight and 6 intermediate positions

Cancellation at 1000 Hz: 90° Figure-of-eight and 180° Cardioid: ≥ 25 db

Polar diagrams (photographs), taken from 1 m distance from the source of sound.
Directional characteristic: Position "Cardioid"

Polar diagrams (photographs), taken from 1 m distance from the source of sound.
Directional characteristic: Position between "Cardioid" and "Omnidirectional"
Polar diagrams (photographs), taken from 1 m distance from the source of sound. Directional characteristic: Position "Omnidirectional"

Polar diagrams (photographs), taken from 1 m distance from the source of sound. Directional characteristic: Position between "Cardiod" and "Figure-of-eight"

Polar diagrams (photographs), taken from 1 m distance from the source of sound. Directional characteristic: Position "Figure-of-eight"
TECHNICAL DATA

IMPEDANCE, VOLTAGES

Electrical Impedance at 1000 Hz: 200 ohms ± 15%, balanced, ground-free, convertible to 50 ohms ± 15%

Impedance Response: extremely flat over the entire frequency range

Min. Actual Load Impedance: ≥ 500 ohms (≥ 150 ohms)

Weighted Noise Level: 2.5 µveff (Filter CCIF 1954 DIN 45405)

Unweighted Noise Level: 8.0 µveff

Equivalent Noise Level: <22 db (Filter CCIF 1954 DIN 45405)

Sensitivity to Magnetic Stray Field:
  at 50 Hz: 0.06 v/µs/m² = 0.3 µv/50 m Gauss
  at 100 Hz: 0.5 v/µs/m² = 2.5 µv/50 m Gauss

Maximum Sound Pressure Level: at a harmonic distortion of 0.5%: 150 µbar (117.5 db SPL)

Tube: GE 6072

Plate Voltage: 120 v

Plate Current: 0.9 ma approx.

Filament Voltage: 12.6 v D.C.

Filament Current: 175 ma approx.

Power Supply: 220 v ± 10%, convertible to 110 v ± 10%, 50–60 Hz

IMPEDANCE RESPONSE

[Graph showing impedance levels across frequency range]
ACCESSORIES

Floor stand St 200
The professional, sturdy floor stand with swing-out tripod of 55 cm diameter, built-in mechanical noise filter, and pull-out tube (110 – 180 cm) is recommended as an accessory.
The following will be included with each C24 comb:

- 1 studio condenser stereo microphone C 24 in velvet-lined case: 650 grams
- 1 microphone stand connector with nine-wire shielded microphone cable MK 24 of 20 m in length, with Tuchel connector T 3615 (for connection with N 24): 1650 grams
- 1 power supply unit N 24 A with four-wire power cord of 1.7 m in length, without power line plug: 1700 grams
- Eight-wire shielded control cable RL 24 with Tuchel connectors T 3615 and T 3616, 10 m long: 800 grams
- 1 stereo pattern selector S 24: 1200 grams
- Four-wire shielded audio cable NF 24, 5 m long: 350 grams
- Original frequency response curves

Weight including individual packing cases: 8000 grams approx.
Weight of equipment and cables: 6800 grams

These items may also be ordered separately.