

# MU-4 EVO Tube Integrated Amplifier

## User Manual



Our mission is to make surrounding reality inspiring for eyes and for ears. We follow the idea of Open Eyes Economy where customer satisfied of high quality product and service is more important than pure financial profit for manufacturer. Our goal is to offer novel, luxury things – things with a bit of creator's soul. Using those special things shall be a pleasure for its owner.

So, relax and spend a while with us...

Jacek Siwiński & Wiesław Zawada



## MU-4 EVO Tube Integrated Amplifier

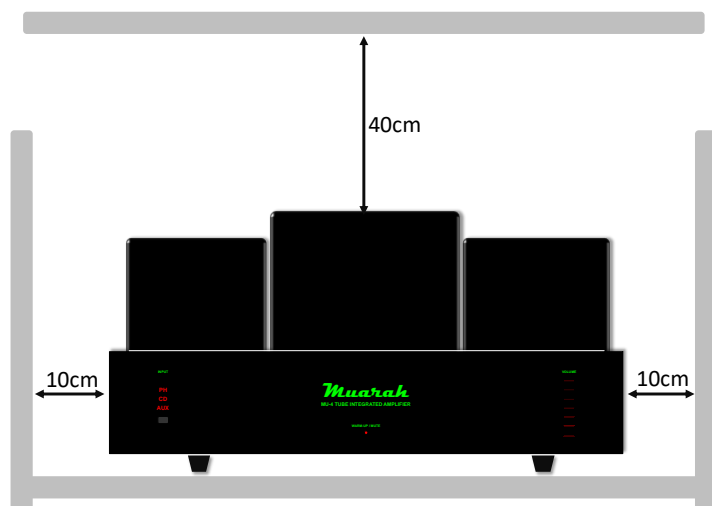
High end tube integrated amplifier MU-4 EVO thanks to several modern technical solutions delivers true „tube sound” with well controlled low frequencies region what is difficult to achieve in tube designs. Entire audio band is perfectly handled by MU-4 EVO. High output power, exclusive appearance, remote control and very simple maintenance gives a big pleasure of music listening for every MU-4 EVO owner.

## MU-4 EVO features

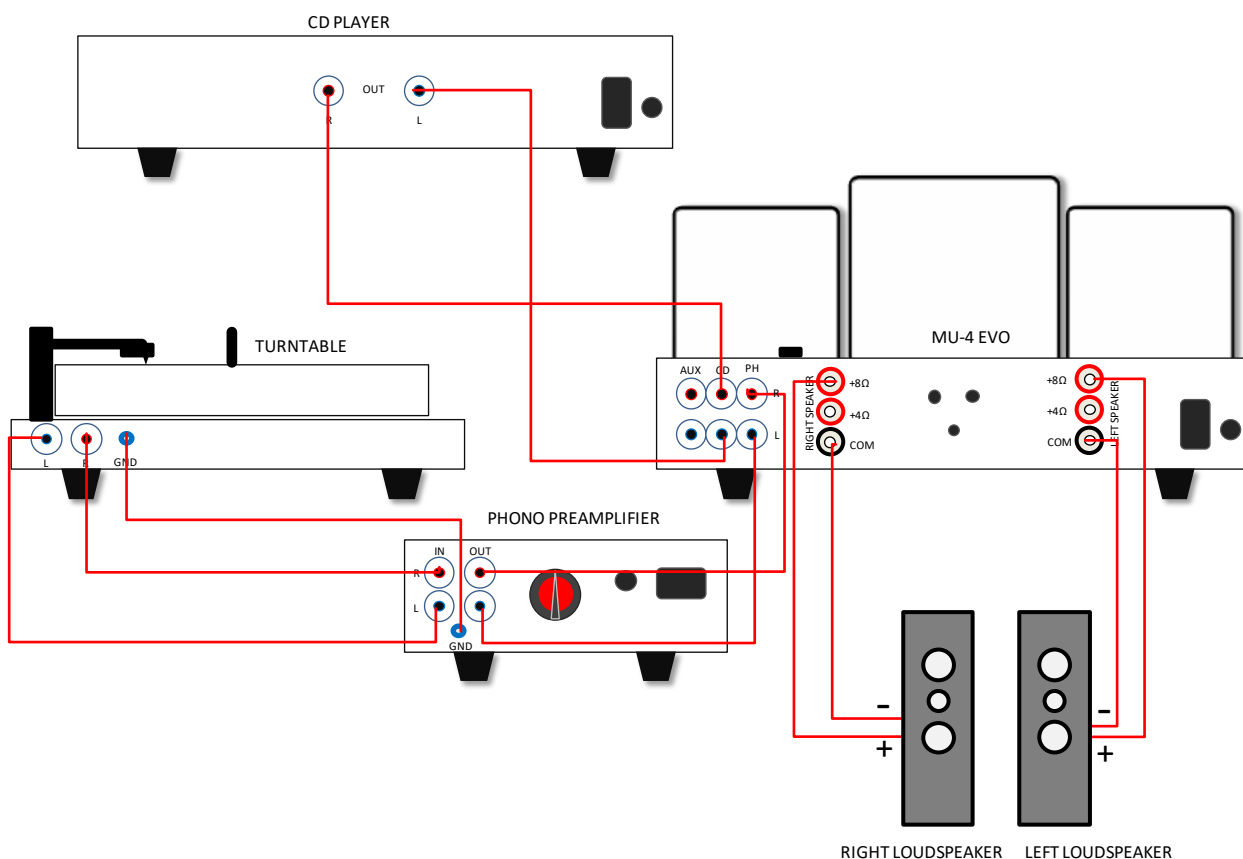
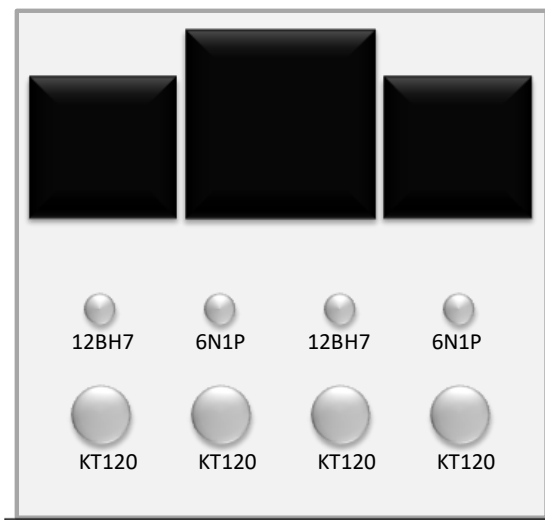
- Push-pull tube power amplifier working in AB class delivers continuous up to 70W power at 4Ω or 8Ω load.
- Low harmonic distortion thanks to Ultra Linear configuration of output transformers
- Precise output tube bias regulation with  $\pm 1\text{mA}$  accuracy
- Low hum and distortion due to automatic bias adjustment in power tube pairs.
- Postponed High Voltage switch on that extends power tubes lifetime.
- Warm up function. Signal is attached to outputs sockets with delay mandatory to stabilize tubes operating points.
- Immediate outputs detach when device is switched off or in case of AC mains is down.
- High quality resistors (1% tolerance) and capacitors (5% tolerance) in audio path for ideal channel symmetry and stability of operation.
- Headphones/subwoofer output.
- Remote controller with SWAROVSKI push buttons
- Microprocessor controlled circuit

## Connection

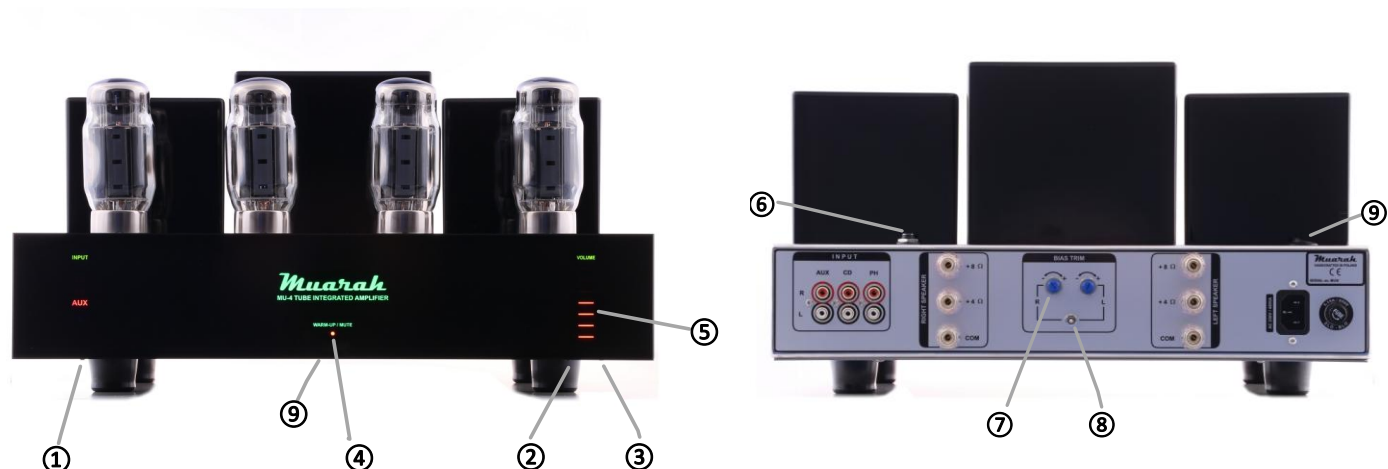
- 1) Carefully take MU-4 EVO out of the shipping carton and plastic bag. Use attached rubber coated gloves for better grip and to avoid fingerprints on stainless steel chassis. Do not hold glass front panel nor transformer cans by hand.
- 2) Place amplifier in proper distance (minimum 10cm) from other electrical equipment like phono preamplifier to avoid electromagnetic interferences. Take care about proper ventilation because amplifier generates heat.
- 3) If amplifier was taken from place with different temperature or humidity wait minimum one hour before next steps.



- 4) Using attached rubber coated gloves Install vacuum tubes in proper sockets (see picture below). Do not touch tube's glass with bare hands. Any fingerprints on tube glass should be wiped out using soft cotton cloth soaked with spirit.
- 5) Connect sources to RCA inputs of MU-4 EVO according to description on rear panel.
- 6) Connect loudspeakers to proper output sockets using spades, banana plugs or bare wires.
- 7) Connect AC main power. **WARNING!** Main AC Power going to MU-4 EVO should not be applied until all the system components are connected together. AC mains power cord has to be connected to MU-4 EVO first and then to AC outlet.



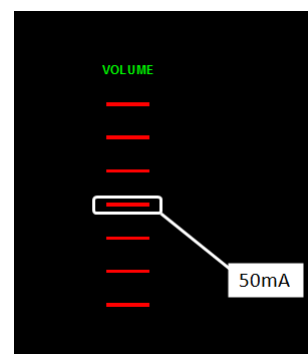
## Front and rear panel



- ① - INPUT selector button
- ② - VOLUME DOWN button
- ③ - VOLUME UP button
- ④ - POWER ON/ WARM-UP LED
- ⑤ - VOLUME level bar / Tube BIAS meter
- ⑥ - Headphone / Subwoofer output (depends on model)
- ⑦ - Tube BIAS trimming potentiometers
- ⑧ - Tube BIAS TRIM switch: Right channel measurement – OFF – Left channel measurement
- ⑨ - MU-4 EVO main power ON/OFF switch (placement depends on model)

## Operation

- 1) Set BIAS TRIM switch ⑧ in middle position before MU-4 EVO amplifier power on.
- 2) Bias potentiometers ⑦ shall be turned maximum in the „-“ (minus) direction (lowest current)
- 3) After power on by switch ⑨ amplifier starts warm up phase indicated by red POWER/WARM-UP diode ④ blinking.
- 4) Tubes warming up takes 30 seconds. After that High Voltage is applied to output tubes.
- 5) After following 15 seconds operating points of all elements becomes stabile and output relay connects audio signal to loudspeaker sockets. POWER/WARM-UP diode ④ stops blinking.
- 6) Before first listening session output tubes bias has to be adjusted separately for left and right channel. To do that BIAS TRIM switch ⑧ shall be toggled left or right according to description on rear amplifier panel. Adjust bias for left or right channel by turning appropriate bias



potentiometer ⑦. Proper bias level (50mA) is when red bar on the VOLUME indicator ⑤ reach middle position (see attached picture). When lower - bias is too low, when higher – too high. After regulation BIAS TRIM switch has to be set in the middle position again.

- 7) Now MU-4 EVO integrated amplifier is ready to use although full sound quality is achieved after c.a. 10 minutes. During this time loud listening shall be avoided.
- 8) Bias adjustment shall be repeated after 1h of first listening and then every 2 or 4 weeks depends on usage intensity.
- 9) Volume level and input selection can be operated by remote controller or using micro push buttons ①②③ located at the bottom of the amplifier. MUTE function is available only in remote controller. It detaches loudspeakers from amplifier outputs what is indicated by blinking POWER/WARM-UP diode ④.
- 10) Inserting headphones jack in headphones plug ⑥ doesn't detach loudspeakers so MUTE function should be used in that case.

## Tubes replacement

- 1) MU-4 EVO tubes have to be replaced every 1000 hours of operation. Assuming listening one vinyl record per day tubes have to be replaced after 3 years. High frequencies degradation in sound is clear notification that tubes have to be replaced as well as problems with proper bias adjustment.
- 2) **WARNING!** Before starting tube replacement procedure unplug AC mains power from MU-4 EVO and accompanying equipment and wait 15 minutes.
- 3) To avoid fingerprints on tubes glass use soft gloves during procedure. Attached rubber coated gloves can also be used.
- 4) Carefully remove tubes using two fingers. Pull each tube up moving gently sideways.
- 5) Install brand new tubes (matched in pair if possible) in sockets pushing them down and moving gently sideways. Properly installed tubes have their pins entirely stuck in sockets. Tubes should be in ideal vertical position. Any fingerprints on tube glass should be wiped out using soft cotton cloth soaked with spirit.
- 6) For a best performance electrically matched vacuum tube pairs (6N1P, 12BH7) and quartets (KT-120/KT-88/KT150) shall be used.
- 7) After tubes replacement bias trim regulation shall be repeated again as described in „Operation“ paragraph.
- 8) Typically new tubes don't require extra warming up procedure to reach nominal sound quality.

## Remote controller battery replacement

- 1) Remote controller battery (AA alkaline type) shall be replaced every 12 months. Do not allow the batteries are fully discharged. It can cause electrolyte leakage and remote controller damage.
- 2) To replace batteries unscrew two bolts at the rear part of remote controller and slide the battery holder out. Install new batteries as indicated on the holder. Screw the bolts back with moderate strength.
- 3) Only brand new batteries from the same production series have to be used.

## Maintenance

- 1) Stainless steel MU-4 EVO chassis and lacquered transformer cans should be regularly dusted off using soft cotton cloth. Gently wipe fingerprints from the surface by soft cotton cloth soaked with spirit. Front glass panel can be wiped using soft cotton cloth and glass cleaner.
- 2) Gently wipe fingerprints from the remote controller surface by soft dry cotton cloth.
- 3) When you plan not to use remote controller for a longer period of time (over 3 months) remove batteries from controller.

## Important safety instructions!

- 1) **WARNING!!!** During amplifier operation there is high voltage up to DC 500V existing inside MU-4 EVO that is dangerous to human's life. So **on no account should you insert anything into ventilation slots or into tube's sockets**. If it happens accidentally do not touch amplifier and disconnect AC mains plug from AC outlet as quick as possible. Then contact authorized service to remove foreign body and check amplifier circuits.
- 2) Vacuum tubes get hot over 100°C (210°F) during normal operation. Touching tubes can cause scorch so locate MU-4 EVO amplifier in place inaccessible for children and pets.
- 3) Amplifier can be connected to AC mains power only when all vacuum tubes are installed
- 4) On any account should you open MU-4 EVO amplifier bottom cover!

## Specification

- |  |  |
|--|--|
| • Power frequency response +0dB/-0,25dB            | 20Hz-20kHz @ 70W (KT-120)                      |
| • Frequency response +0dB/-3dB                     | 10Hz-70kHz                                     |
| • Nominal Power at THD=1%                          | 2x70W (KT-120) 2x60W (KT-88)                   |
| • Voltage gain @4/8Ω                               | 32/36dB  |
| • Noise A-weighted, input shorted @full power @4Ω  | -104dBV  |
| • THD+N @1W  | <0.05%   |
| • Damping factor @4Ω                               | 4.2  |
| • Speaker outputs                                  | 4 or 8 Ω                                       |
| • Headphones / subwoofer output (depends on model) | 6,3mm jack plug. Headphones 30-300 Ω           |
| • Inputs   | 3 x unbalanced RCA                             |
| • Tubes  | 2x6N1P, 2x12BH7, 4xKT-120 (or KT88,6550,KT150) |
| • Dimensions (width/length/height)                 | 43,5cm/43,5cm/23,5cm                           |
| • Weight   | 21kg   |
| • Power consumption                                | < 400VA  |