

# Low Noise Amplifiers

## Low Noise Amplifiers for 144 MHz to 2400 MHz

| Type              | Frequency Range<br>(MHz) | Noise Figure (dB) <sup>1)</sup> |         | Gain typ.<br>(dB) | Power Supply   |              | Connectors |           | Case Type<br>waterproof | Remarks                                     |
|-------------------|--------------------------|---------------------------------|---------|-------------------|----------------|--------------|------------|-----------|-------------------------|---|
|                   |                          | typical                         | maximum |                   | DC Voltage (V) | Current (mA) | Input      | Output    |                         |   |
| MKU LNA 144 A     | 144.3 (+/- 2)            | 0.35                            | 0.4     | min. 25           | 12 ... 14      | 60           | N, male    | N, female | milled alu, no          | High IP3, 4), 5)                            |
| MKU LNA 432 A     | 432.2 (+/- 2)            | 0.4                             | 0.45    | min. 20           | 12 ... 14      | 60           | N, male    | N, female | milled alu, no          | High IP3, 4), 5)                            |
| MKU LNA 132 A     | 1275 (+/- 10)            | 0.7                             |         | min. 35           | 9 ... 18       | 30           | N, male    | N, female | German Silver, no       | Including helical filter, 4)                |
| MKU LNA 132 A2    | 1275 (+/- 10)            | 0.7                             |         | min. 35           | 9 ... 18       | 30           | N, female  | F, female | German Silver, no       | Including helical filter, 2350 MHz notch    |
| MKU LNA 132 A2 TM | 1275 (+/- 10)            | 0.7                             |         | min. 35           | 9 ... 18       | 30           | N, female  | F, female | German Silver, yes      | Including helical filter, 2350 MHz notch    |
| MKU LNA 131 AH    | 1296 (+/- 50)            | 0.4                             | 0.45    | typ. 20           | 9 ... 15       | 15           | N, male    | N, female | milled alu, no          | Super low noise HEMT                        |
| MKU LNA 132 AH    | 1296 (+/- 50)            | 0.4                             | 0.45    | typ. 33           | 9 ... 15       | 80           | N, male    | N, female | milled alu, no          | Super low noise HEMT, high IP3              |
| MKU LNA 232 A2    | 2350 (+/- 30)            | 0.7                             |         | min. 35           | 9 ... 18       | 30           | N, male    | N, female | German Silver, no       | Including ceramic filter, 1250 MHz notch 4) |
| MKU LNA 232 A2 TM | 2350 (+/- 30)            | 0.7                             |         | min. 35           | 9 ... 18       | 30           | N, female  | N, female | German Silver, yes      | Including ceramic filter, 1250 MHz notch    |
| MKU LNA 231 AH    | 2304 ... 2320            | 0.4                             | 0.5     | typ. 16           | 9 ... 15       | 15           | N, male    | N, female | milled alu, no          | Super low noise HEMT, 4)                    |
| MKU LNA 232 AH    | 2304 ... 2320            | 0.5                             | 0.6     | typ. 30           | 9 ... 15       | 80           | N, male    | N, female | milled alu, no          | Super low noise HEMT, high IP3, 4)          |

1) Noise figure values at +18 °C.

Only for narrowband preamplifiers:  
noise figure is specified at center frequency.

2) Also see waveguide table.

3) N connectors available

4) SMA connectors available

5) Input connector 7/16

### Waveguide table

|       |       |       |
|-------|-------|-------|
| R 100 | WG 16 | WR 90 |
| R 120 | WG 17 | WR 75 |
| R 220 | WG 20 | WR 42 |
| R 500 | WG 24 | WR 19 |

### Important notes

- Low noise amplifiers are static sensitive devices. Handle with care!
- Maximum input power 1 mW (unless otherwise specified).
- The low noise amplifiers do not contain coaxial relays!
- In case of outdoor installation, protection against water and moisture is required!
- Other connectors or cases are available on request.

## Low Noise Amplifiers for 3 GHz to 47 GHz

| Type                   | Frequency Range<br>(MHz) | Noise Figure (dB) <sup>1)</sup> |         | Gain typ.<br>(dB) | Power Supply   |              | Connectors  |             | Case Type<br>waterproof | Remarks                            |
|------------------------|--------------------------|---------------------------------|---------|-------------------|----------------|--------------|-------------|-------------|-------------------------|------------------------------------|
|                        |                          | typical                         | maximum |                   | DC Voltage (V) | Current (mA) | Input       | Output      |                         |                                    |
| MKU LNA 341 AH         | 3400 ... 3460            | 0.5                             |         | typ. 14           | 9 ... 15       | 15           | N, male     | N, female   | milled alu, no          |                                    |
| MKU LNA 342 AH         | 3400 ... 3460            | 0.5                             |         | typ. 28           | 9 ... 15       | 90           | N, male     | N, female   | milled alu, no          |                                    |
| MKU LNA 571 A          | 5760 (+/- 50)            |                                 | 0.7     | min. 12           | 9 ... 15       | 15           | SMA, male   | SMA, female | milled alu, no          |                                    |
| MKU LNA 571 B          | 5760 (+/- 50)            |                                 | 0.7     | min. 12           | 9 ... 15       | 15           | SMA, female | SMA, female | milled alu, no          |                                    |
| MKU LNA 572 A          | 5760 (+/- 50)            |                                 | 0.7     | min. 25           | 9 ... 15       | 30           | SMA, male   | SMA, female | milled alu, no          |                                    |
| MKU LNA 572 AF         | 5760 (+/- 50)            |                                 | 0.7     | min. 25           | 9 ... 15       | 30           | SMA, male   | SMA, female | milled alu, no          | Including band pass filter         |
| MKU LNA 572 B          | 5760 (+/- 50)            |                                 | 0.7     | min. 25           | 9 ... 15       | 30           | SMA, female | SMA, female | milled alu, no          |                                    |
| MKU LNA 572 BF         | 5760 (+/- 50)            |                                 | 0.7     | min. 25           | 9 ... 15       | 30           | SMA, female | SMA, female | milled alu, no          | Including band pass filter         |
| MKU LNA 101 AS         | 10368 (+/- 50)           | 0.8                             |         | min. 12           | 9 ... 15       | 15           | SMA, male   | SMA, female | milled alu, no          |                                    |
| MKU LNA 101 BS         | 10368 (+/- 50)           | 0.8                             |         | min. 12           | 9 ... 15       | 15           | SMA, female | SMA, female | milled alu, no          |                                    |
| MKU LNA 102 A          | 10368 (+/- 50)           | 0.8                             |         | min. 22           | 9 ... 15       | 30           | SMA, male   | SMA, female | milled alu, no          |                                    |
| MKU LNA 102 B          | 10368 (+/- 50)           | 0.8                             |         | min. 22           | 9 ... 15       | 30           | SMA, female | SMA, female | milled alu, no          |                                    |
| MKU LNA 102 S-EME      | 10368 (+/- 50)           | 0.7                             |         | min. 23           | 9 ... 15       | 30           | R 100 (2)   | SMA, female | milled alu, no          | Input waveguide R100 / WG16 / WR90 |
| MKU LNA 102 S-EME R120 | 10368 (+/- 50)           | 0.7                             |         | min. 23           | 9 ... 15       | 30           | R 120 (2)   | SMA, female | milled alu, no          | Input waveguide R120 / WG17 / WR75 |
| MKU LNA 243 CS2        | 24000 ... 24250          |                                 | 2.0     | min. 24           | 9 ... 15       | 60           | SMA, male   | SMA, female | milled alu, no          | Output power typ. 10 mW            |
| MKU LNA 243 WS2        | 24000 ... 24250          |                                 | 1.5     | min. 26           | 9 ... 15       | 60           | R 220 (2)   | R 220 (2)   | milled alu, no          | Output power typ. 10 mW            |
| MKU LNA 243 RX2        | 24000 ... 24250          |                                 | 1.5     | min. 26           | 9 ... 15       | 60           | R 220 (2)   | SMA, female | milled alu, no          | Output power typ. 10 mW            |
| MKU LNA 245 HP         | 24000 ... 24250          |                                 | 2.5     | min. 30           | 10 ... 15      | 210          | SMA, male   | SMA, female | milled alu, no          | Saturation output power 80 mW      |
| MKU LNA 472 B          | 47000 ... 47250          |                                 | 5.0     | min. 27           | 10 ... 14      | 110          | R 500 (2)   | R 500 (2)   | milled alu, no          | Saturation output power 30 mW      |
| MKU LNA 473 A          | 47000 ... 47250          |                                 | 5.0     | min. 25           | 9 ... 13       | 400          | R 500 (2)   | R 500 (2)   | milled alu, no          | Saturation output power 150 mW     |

- 1) Noise figure values at +18 °C.  
 Only for narrowband preamplifiers:  
 noise figure is specified at center frequency.
- 2) Also see waveguide table.
- 3) N connectors available
- 4) SMA connectors available

### Waveguide table

|       |       |       |
|-------|-------|-------|
| R 100 | WG 16 | WR 90 |
| R 120 | WG 17 | WR 75 |
| R 220 | WG 20 | WR 42 |
| R 500 | WG 24 | WR 19 |

### Important notes

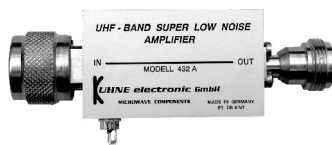
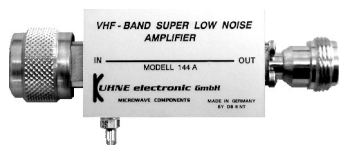
- Low noise amplifiers are static sensitive devices. Handle with care!
- Maximum input power 1 mW (unless otherwise specified).
- The low noise amplifiers do not contain coaxial relays!
- In case of outdoor installation, protection against water and moisture is required!
- Other connectors or cases are available on request.

# Selective Super Low Noise PHEMT Preamplifiers for 144 MHz and 432 MHz

## MKU LNA 144 A - MKU LNA 432 A

These selective super low noise preamplifiers use the latest PHEMT transistor technology from Agilent. Due to their high technical performance - low noise figure, high gain and very high IP3 - they are the ideal preamplifiers for contest operation as well as EME, Meteorscatter, Aurora and tropo DX.

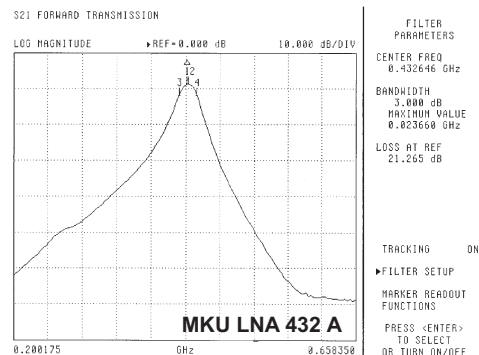
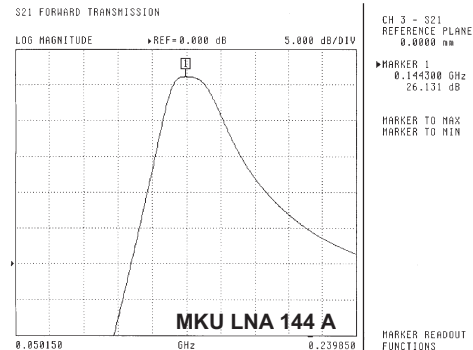
- Low noise figure and high gain
- LC filter (144 MHz) / Helical filter (432 MHz) for good selectivity
- High IP3 - ideal for contest operation
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Important note: The preamplifiers do not contain built-in coaxial relays!



### Specifications

| Type                 | MKU LNA 144 A      | MKU LNA 432 A      |
|----------------------|--------------------|--------------------|
| Center frequency     | 144.3 MHz +/-      | 432.2 MHz +/-      |
| Noise figure @ 18 °C | 0.35 dB +/- 0.05   | 0.4 dB +/- 0.05    |
| Gain                 | min. 25 dB         | typ. 20 dB         |
| Input return loss    | min. 3 dB          | typ. 5 dB          |
| Output return loss   | typ. 15 dB         | min. 15 dB         |
| Output IP3           | typ. +24 dBm       | typ. +27 dBm       |
| Supply voltage       | +12...14 V DC      | +12...14 V DC      |
| Current consumption  | typ. 60 mA         | typ. 60 mA         |
| Input connector      | N-male / 50 ohms   | N-male / 50 ohms   |
| Output connector     | N-female / 50 ohms | N-female / 50 ohms |
| Case                 | milled aluminium   | milled aluminium   |
| Dimensions (mm)      | 50 x 30 x 22       | 50 x 30 x 22       |
| Weight               | typ. 100 g         | typ. 100 g         |
| Options              | 7/16               | 7/16               |

**Option 7/16:**  
Input connector 7/16,  
Impedance 50 ohms



Amplifiers for other frequencies available on request.

# Super Low Noise Preamplifiers with Helical Filter / Ceramic Filter (23 cm, 13 cm)

## Preamplifiers with helical filter and notch filter:

### MKU LNA 132 A2 - MKU LNA 132 A2 TM

- Notch filter for 2350 MHz at input - for duplex operation on 1.3 GHz (RX) and 2.3 GHz (TX)
- Helical filter for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Built-in bias tee for remote power supply via coaxial cable
- Output connector F-female for direct connection to a TV satellite receiver
- Important note: The preamplifiers do not contain built-in coaxial relays!

## Preamplifiers with ceramic filter and notch filter:

### MKU LNA 232 A2 - MKU LNA 232 A2 TM

- Notch filter for 1250 MHz at input - for duplex operation on 1.3 GHz (TX) and 2.3 GHz (RX)
- Multilayer ceramic for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Built-in bias tee for remote power supply via coaxial cable
- **MKU LNA 232 A2:** additional solder pin for direct DC power supply
- Important note: The preamplifiers do not contain built-in coaxial relays!

## Preamplifiers with helical filter:

### MKU LNA 132 A

- Helical filter for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Solder pin for direct DC power supply (feed-through capacitor)
- Built-in bias tee for remote power supply via coaxial cable
- Important note: The preamplifiers do not contain built-in coaxial relays!

## Specifications

| Type                 | MKU LNA 132 A      | MKU LNA 132 A2     | MKU LNA 132 A2 TM                     | MKU LNA 232 A2     | MKU LNA 232 A2 TM                     |
|----------------------|--------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|
| Center frequency     | 1275 MHz +/-       | 1275 MHz +/-       | Installed into a water resistant case | 2350 MHz +/-       | Installed into a water resistant case |
| Noise figure @ 18 °C | typ. 0.7 dB        | typ. 0.7 dB        |                                       | typ. 0.7 dB        |                                       |
| Gain                 | min. 35 dB         | min. 35 dB         |                                       | min. 35 dB         |                                       |
| Supply voltage       | +9...18 V DC       | +9...18 V DC       |                                       | +9...18 V DC       |                                       |
| Current consumption  | 30 mA              | 30 mA              |                                       | 30 mA              |                                       |
| Input connector      | N-male / 50 ohms   | N-male / 50 ohms   |                                       | N-male / 50 ohms   |                                       |
| Output connector     | N-female / 50 ohms | F-female / 50 ohms |                                       | N-female / 50 ohms |                                       |
| Case                 | German silver      | German silver      |                                       | German silver      |                                       |
| Dimensions (mm)      | 74 x 38 x 30       | 74 x 38 x 30       | 109 x 60 x 80                         | 74 x 38 x 30       | 109 x 60 x 85 / typ.                  |
| Weight               | typ. 130 g         | typ. 100 g         | typ. 390 g                            | typ. 130 g         | 390 g                                 |

Amplifiers for other frequencies available on request.

# Super Low Noise HEMT Preamplifiers for DX and EME (23 cm, 13 cm)

## MKU LNA 131 AH - MKU LNA 132 AH - MKU LNA 231 AH - MKU LNA 232 AH

For many years, our super low noise microwave preamplifiers have been used very successful. Many results of Ham Radio Contests proof that! Due to a extremely low noise figure the preamplifiers are ideal for tropo DX, EME (earth moon earth operation) and for receiving satellites.

- Extremely low noise figure
- Good input return loss (low VSWR)
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Professional milled aluminium case
- Small mechanical dimensions
- Male connector at the input for direct connection to antenna or coaxial relay
- MKU LNA 132 AH and MKU LNA 232 AH: high IP3 for good large signal performance
- Important note: The preamplifiers do not contain built-in coaxial relays!



### Specifications

|                      | MKU LNA 131 AH     | MKU LNA 132 AH     | MKU LNA 231 AH     | MKU LNA 232 AH     |
|----------------------|--------------------|--------------------|--------------------|--------------------|
| Type                 | 1296 MHz +/-       | 1296 MHz +/-       | 2304...2320 MHz    | 2304...2320 MHz    |
| Center frequency     | 1296 MHz +/-       | 1296 MHz +/-       | 2304...2320 MHz    | 2304...2320 MHz    |
| Noise figure @ 18 °C | 0.4 dB +/- 0.05    | 0.4 dB +/- 0.05    | typ. 0.4 dB        | typ. 0.5 dB        |
| Gain                 | typ. 20 dB         | typ. 33 dB         | typ. 16 dB         | typ. 30 dB         |
| Output IP3           | -                  | typ. 27 dBm        | -                  | typ. 27 dBm        |
| Supply voltage       | +9...15 V DC       | +9...15 V DC       | + 9 ... 15 V DC    | + 9 ... 15 V DC    |
| Current consumption  | typ. 15 mA         | typ. 80 mA         | typ. 15 mA         | typ. 80 mA         |
| Input connector      | N-male / 50 ohms   | N-male / 50 ohms   | N-male / 50 ohms   | N-male / 50 ohms   |
| Output connector     | N-female / 50 ohms | N-female / 50 ohms | N-female / 50 ohms | N-female / 50 ohms |
| Case                 | milled aluminium   | milled aluminium   | milled aluminium   | milled aluminium   |
| Dimensions (mm)      | 50 x 30 x 22       | 70 x 30 x 22       | 50 x 30 x 22       | 73 x 30 x 22       |
| Weight               | typ. 100 g         | typ. 140 g         | typ. 110 g         | typ. 140 g         |

Options: Other connectors on request

Amplifiers for other frequencies available on request.

# Super Low Noise HEMT Preamplifiers for DX and EME

## MKU LNA 341 AH - MKU LNA 342 AH

### Features

- Extremely low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Male connector at the input for direct connection to antenna or coaxial relay
- Reverse polarity protection
- Professional design in milled aluminium case
- Small mechanical dimensions
- Solder pin for direct power supply
- High IP3 for good large signal performance (MKU LNA 342 AH)

### Applications

- Amateur radio
- Satellite reception
- Analog and digital operation modes (SSB, CW, WSJT)

### Options

- Remote power supply via output connector
- Other connectors are available on request

### Important note

- The preamplifiers do not contain built-in coaxial relays!



## Specifications

| Type                        | MKU LNA 341 AH     | MKU LNA 342 AH     |
|-----------------------------|--------------------|--------------------|
| Frequency range             | 3400 ... 3460 MHz  | 3400 ... 3460 MHz  |
| Noise figure @ 18 °C        | 0,5 dB +/- 0,05 dB | 0,5 dB +/- 0,05 dB |
| Input power                 | max. 1 mW          | max. 1 mW          |
| Gain                        | min. 14 dB         | typ. 28 dB         |
| Output IP3                  |                    | typ. 28 dBm        |
| Supply voltage              | +9 ... 15 V DC     | +9 ... 15 V DC     |
| Current consumption         | typ. 15 mA         | typ. 90 mA         |
| Maximum case temperature    | +55 °C             | +55 °C             |
| Input connector, impedance  | N-male, 50 Ohm     | N-male, 50 Ohm     |
| Output connector, impedance | N-female, 50 Ohm   | N-female, 50 Ohm   |
| Case                        | milled aluminium   | milled aluminium   |
| Dimensions (mm)             | 50 x 30 x 22       | 73 x 30 x 22       |
| Weight                      | typ. 110 g         | typ. 140 g         |

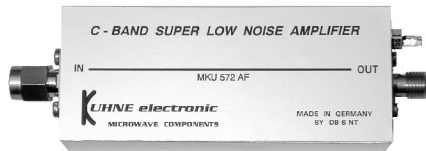
Amplifiers for other frequencies available on request.

# Super Low Noise HEMT Preamplifiers for the 6 cm Band

**MKU LNA 571 A - MKU LNA 571 B - MKU LNA 572 A - MKU LNA 572 B**

**With band pass filter: MKU LNA 572 AF - MKU LNA 572 BF**

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The preamplifiers do not contain built-in coaxial relays
- The preamplifiers MKU LNA 572 AF and MKU LNA 572 BF contain an internal band pass filter with good wideband selectivity
- Other connectors on request



## Specifications

|                               | <b>MKU LNA 571 A</b> | <b>MKU LNA 571 B</b> | <b>MKU LNA 572 A</b> | <b>MKU LNA 572 B</b> | <b>MKU LNA 572 AF</b> | <b>MKU LNA 572 BF</b> |
|-------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|
| <b>Type</b>                   | MKU LNA              | MKU LNA              | MKU LNA              | MKU LNA              | MKU LNA               | MKU LNA               |
| <b>Center frequency</b>       | 5760 MHz +/- 50      | 5760 MHz +/- 50      | 5760 MHz +/- 50      | 5760 MHz +/- 50      | 5760 MHz +/- 50       | 5760 MHz +/- 50       |
| <b>Noise figure @ 18 °C</b>   | max. 0.7 dB          | max. 0.7 dB          | max. 0.7 dB          | max. 0.7 dB          | max. 0.7 dB           | max. 0.7 dB           |
| <b>Gain</b>                   | min. 12 dB           | min. 12 dB           | min. 25 dB           | min. 25 dB           | min. 25 dB            | min. 25 dB            |
| <b>Supply voltage</b>         | +9...15 V DC         | +9...15 V DC         | +9...15 V DC         | +9...15 V DC         | +9...15 V DC          | +9...15 V DC          |
| <b>Current consumption</b>    | typ. 15 mA           | typ. 15 mA           | typ. 30 mA           | typ. 30 mA           | typ. 30 mA            | typ. 30 mA            |
| <b>Input connector</b>        | SMA-male             | SMA-female           | SMA-male             | SMA-female           | SMA-male              | SMA-female            |
| <b>Output connector</b>       | SMA-female           | SMA-female           | SMA-female           | SMA-female           | SMA-female            | SMA-female            |
| <b>Case</b>                   | milled aluminium     | milled aluminium     | milled aluminium     | milled aluminium     | milled aluminium      | milled aluminium      |
| <b>Dimensions (mm)</b>        | 50 x 30 x 17         | 50 x 30 x 17         | 74 x 30 x 20         | 74 x 30 x 20         | 74 x 30 x 20          | 74 x 30 x 20          |
| <b>Weight</b>                 | typ. 50 g            | typ. 50 g            | typ. 75 g            | typ. 75 g            | typ. 75 g             | typ. 75 g             |
| <b>Incl. band pass filter</b> | no                   | no                   | no                   | no                   | yes                   | yes                   |

**Amplifiers for other frequencies available on request.**

# Super Low Noise HEMT Preamplifiers for the 3 cm Band

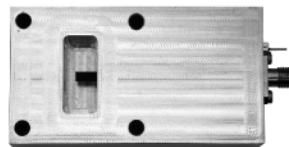
**One-stage preamplifiers: MKU LNA 101 AS - MKU LNA 101 BS**

**Two-stage preamplifiers: MKU LNA 102 A - MKU LNA 102 B**

**Two-stage preamplifiers with waveguide-input: MKU LNA 102 S-EME**

**MKU LNA 102 S-EME R120**

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The preamplifiers do not contain built-in coaxial relays



## Specifications

| Type MKU LNA                | MKU LNA 101 AS  | MKU LNA 101 BS      | MKU LNA 102 A       | MKU LNA 102 B       | MKU LNA 102 S-EME               | MKU LNA 102 S-EME R120          |
|-----------------------------|---|---------------------|---------------------|---------------------|---------------------------------|---------------------------------|
| <b>Center frequency</b>     | 10368 MHz +/- 50  | 10368 MHz +/- 50    | 10368 MHz +/- 50    | 10368 MHz +/- 50    | 10368 MHz +/- 50                | 10368 MHz +/- 50                |
| <b>Noise figure @ 18 °C</b> | typ. 0.8 dB   | typ. 0.8 dB         | typ. 0.8 dB         | typ. 0.8 dB         | typ. 0.7 dB                     | typ. 0.7 dB                     |
| <b>Gain</b>                 | min. 12 dB  | min. 12 dB          | min. 22 dB          | min. 22 dB          | min. 23 dB                      | min. 23 dB                      |
| <b>Supply voltage</b>       | +9...15 V DC  | +9...15 V DC        | +9...15 V DC        | +9...15 V DC        | +9...15 V DC                    | +9...15 V DC                    |
| <b>Current consumption</b>  | typ. 15 mA  | typ. 15 mA          | typ. 30 mA          | typ. 30 mA          | typ. 30 mA                      | typ. 30 mA                      |
| <b>Input connector</b>      | SMA-male  | SMA-female          | SMA-male            | SMA-female          | Waveguide<br>R100 / WG16 / WR90 | Waveguide<br>R120 / WG17 / WR75 |
| <b>Output connector</b>     | SMA-female  | SMA-female          | SMA-female          | SMA-female          | SMA-female                      | SMA-female                      |
| <b>Case</b>                 | milled<br>aluminium   | milled<br>aluminium | milled<br>aluminium | milled<br>aluminium | milled<br>aluminium             | milled<br>aluminium             |
| <b>Dimensions (mm)</b>      | 50 x 30 x 17  | 50 x 30 x 17        | 50 x 30 x 17        | 50 x 30 x 17        | 73 x 40 x 20                    | 73 x 40 x 20                    |
| <b>Weight</b>               | typ. 50 g   | typ. 50 g           | typ. 50 g           | typ. 50 g           | typ. 130 g                      | typ. 130 g                      |
| <b>Option "N"</b>           | Input connector N-male, output connector N-female, on request |                     |                     |                     |                                 |                                 |

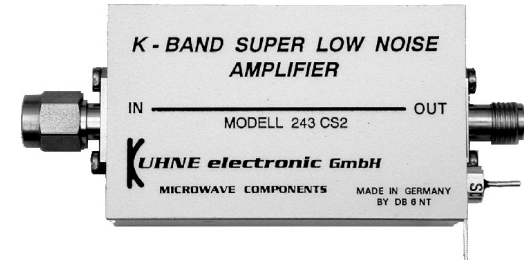
**Amplifiers for other frequencies available on request.**

# Super Low Noise HEMT Amplifiers for 24 GHz

## MKU LNA 243 WS2 - MKU LNA 243 CS2

The HEMT amplifiers for 24 GHz feature low noise figures and high output power. They can be used as preamplifiers and as driver or power amplifiers. The amplifiers are available with SMA or waveguide connectors.

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The preamplifiers do not contain built-in coaxial relays



### Specifications

| Type                    | MKU LNA 243 WS2              | MKU LNA 243 CS2       |
|-------------------------|------------------------------|-----------------------|
| Frequency range         | 24...24.25 GHz               | 24...24.25 GHz        |
| Noise figure @ 18 °C    | max. 1.5 dB                  | max. 2.0 dB           |
| Gain                    | min. 26 dB                   | min. 24 dB            |
| Saturation output power | typ. 10 mW                   | typ. 10 mW            |
| Supply voltage          | +9...15 V DC                 | +9...15 V DC          |
| Current consumption     | typ. 60 mA                   | typ. 60 mA            |
| Input connector         | Waveguide R220 / WR42 / WG20 | SMA-male / 50 ohms    |
| Output connector        | Waveguide R220 / WR42 / WG20 | SMA-female / 50 ohms  |
| Case                    | milled aluminium case        | milled aluminium case |
| Dimensions (mm)         | 55 x 30 x 27                 | 50 x 30 x 17          |
| Weight                  | typ. 85 g                    | typ. 40 g             |

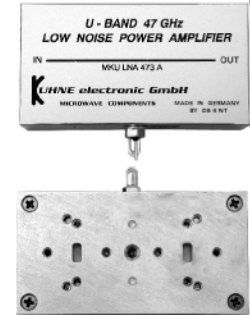
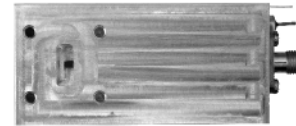
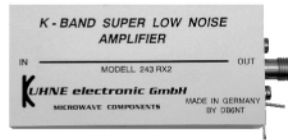
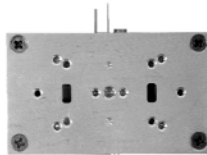
Amplifiers for other frequencies available on request.

# Super Low Noise HEMT Amplifiers for 24 GHz and 47 GHz

## MKU LNA 243 RX2 - MKU LNA 472 B - MKU LNA 473 A

Our amplifiers for 24 GHz and 47 GHz use the latest semiconductor technologies. They achieve low noise figures and a high output power. The waveguide input is directly coupled to the internal PCB for minimum losses. Due to their small mechanical dimensions, the modules can be used for building very compact receive or transmit systems.

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The preamplifiers do not contain built-in coaxial relays



### Specifications

| Type                    | MKU LNA 243 RX2              | MKU LNA 472 B                 | MKU LNA 473 A                                |
|-------------------------|------------------------------|-------------------------------|--|
| Center frequency        | 24048 MHz (24.0...24.25 GHz) | 47088 MHz (47.0...47.25 GHz)  | 47088 MHz (47.0...47.25 GHz)                 |
| Noise figure @ 18 °C    | max. 1.5 dB                  | max. 5.0 dB                   | max. 5.0 dB                                  |
| Gain                    | min. 26 dB                   | min. 27 dB                    | min. 25 dB                                   |
| Saturation output power | typ. 10 mW                   | typ. 30 mW                    | typ. 150 mW                                  |
| Supply voltage          | +9...15 V DC                 | +10...14 V DC                 | +9...13 V DC                                 |
| Current consumption     | typ. 60 mA                   | typ. 110 mA                   | typ. 400...900 mA                            |
| Input connector         | Waveguide R220 / WR42 / WG20 | Waveguide R500 / WR19 / WG24  | Waveguide R500 / WR19 / WG24 with M2 thread  |
| Output connector        | SMA-female / 50 ohms         | Waveguide R500 / WR 19 / WG24 | Waveguide R500 / WR 19 / WG24 with M2 thread |
| Case                    | milled aluminium             | milled aluminium              | milled aluminium                             |
| Dimensions (mm)         | 63 x 30 x 20                 | 50 x 30 x 20                  | 50 x 30 x 20                                 |
| Weight                  | typ. 75 g                    | typ. 100 g                    | typ. 110 g                                   |

Amplifiers for other frequencies available on request.

# Low Noise Amplifiers for Avionics, Radio Astronomy and Satellite Reception

| Low Noise Amplifiers for Avionics, Radio Astronomy and Satellite Reception |                          |                                 |         |                   |                |              |             |                 |                         |                                    |
|--|--------------------------|---------------------------------|---------|-------------------|----------------|--------------|-------------|-----------------|-------------------------|------------------------------------|
| Type   | Frequency Range<br>(MHz) | Noise Figure (dB) <sup>1)</sup> |         | Gain typ.<br>(dB) | Power Supply   |              | Connectors  |                 | Case Type<br>waterproof | Remarks                            |
|  |                          | typical                         | maximum |                   | DC Voltage (V) | Current (mA) | Input       | Output          |                         |                                    |
| KU LNA 1090 A  | 1070 ... 1110            | 0.5                             | 0.6     | > 30              | 8 ... 15       | typ. 130     | N, female   | BNC, female     | German silver, no       | Including band pass filter         |
| KU LNA 1090 A TM   | 1070 ... 1110            | 0.5                             | 0.6     | > 30              | 8 ... 15       | typ. 130     | N, female   | N, female       | German silver, yes      | Including band pass filter         |
| KU LNA 142 AH HEMT   | 1350 ... 1450            |                                 | 0.4     | 33                | 9 ... 15       | typ. 80      | N, male     | N, female       | milled alu, no          | Super low noise HEMT               |
| KU LNA 1575/4 SMA  | 1575 (+/- 10)            | 0.7                             |         | 17                | 12             | typ. 300     | SMA, female | 4 x SMA, female | German Silver, no       | Including helical filter, for GPS  |
| KU LNA 1575-50   | 1575 (+/- 10)            |                                 | 0.5     | 55                | 9 ... 18       | typ. 100     | N, female   | N, female       | milled alu, no          | Including helical filter, for GPS  |
| KU LNA 172 A   | 1695 (+/- 10)            | 0.7                             |         | > 35              | 9 ... 18       | min. 30      | N, male     | N, female       | German Silver, no       | Including helical filter           |
| KU LNA 8000 A  | 8000 ... 8450            | 0.7                             | 0.8     | > 22              | 9 ... 15       | min. 24      | R 100 (2)   | SMA, female     | milled alu, no          | Input waveguide R100 / WG16 / WR90 |
| KU LNA 8000 A-SMA  | 8000 ... 8450            | 0.7                             | 0.8     | > 22              | 12 ... 15      | min. 24      | SMA, female | SMA, female     | milled alu, no          |                                    |

- 1) Noise figure values at +18 °C.  
Only for narrowband preamplifiers:  
noise figure is specified at center frequency.
- 2) Also see waveguide table.
- 3) N connectors available
- 4) SMA connectors available

#### Waveguide table

|       |       |       |
|-------|-------|-------|
| R 100 | WG 16 | WR 90 |
| R 120 | WG 17 | WR 75 |
| R 220 | WG 20 | WR 42 |
| R 500 | WG 24 | WR 19 |

#### Important notes

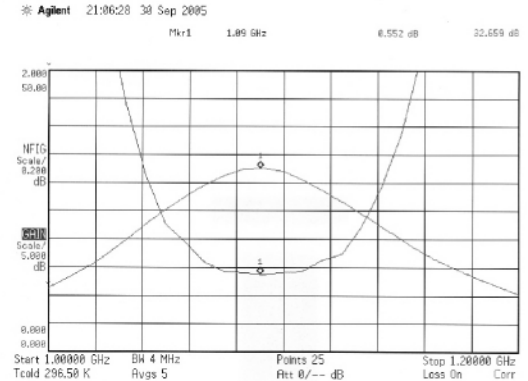
- Low noise amplifiers are static sensitive devices. Handle with care!
- Maximum input power 1 mW (unless otherwise specified).
- The low noise amplifiers do not contain coaxial relays!
- In case of outdoor installation, protection against water and moisture is required!
- Other connectors or cases are available on request.

# Super Low Noise Amplifiers for Avionics

## KU LNA 1090 A - KU LNA 1090 A TM

This high linear preamplifier was developed for applications in the IFF frequency range (Identification Friend or Foe) at 1090 MHz. The preamplifier has a two-pole band pass filter between the two amplifier stages for high suppression of out-of-band signals. This preamplifier features excellent large signal performance and a low noise figure.

- High IP3 for excellent large signal performance
- Low noise figure
- ESD protection at preamplifier input
- Built-in bias tee for remote power supply via coaxial cable
- Built-in band pass filter
- Important note: The preamplifiers do not contain built-in coaxial relays



### Specifications

| Type                 | KU LNA 1090 A            | KU LNA 1090 A TM                                     |
|----------------------|--------------------------|--|
| Frequency range      | 1070...1110 MHz          | 1070...1110 MHz                                      |
| Noise figure @ 18 °C | typ. 0.5 dB; max. 0.6 dB | typ. 0.5 dB; max. 0.6 dB                             |
| Gain                 | min. 30 dB               | min. 30 dB   |
| RF input power       | 1 mW                     | 1 mW   |
| Supply voltage       | +8 ...15 V DC            | +8...15 V DC   |
| Current consumption  | 130 mA                   | 130 mA   |
| Input connector      | N-female / 50 ohms       | N-female / 50 ohms                                   |
| Output connector     | BNC-female / 50 ohms     | N-female / 50 ohms                                   |
| Case                 | German silver case       | German silver, installed into a water resistant case |
| Dimensions (mm)      | 74 x 37 x 30             | 110 x 60 x 85  |
| Weight               | typ. 90 g                | typ. 330 g   |

Amplifiers for other frequencies available on request.

# Super Low Noise Amplifiers for Radio Astronomy

## KU LNA 142 AH

Our radio astronomy preamplifier for the 1400 MHz band provide extremely low noise figures. It is excellent for receiving weak signals from space. The preamplifier can be added to the receiving system without additional adaptors because of the male input connector and female output connector.

- Extremely low noise figure
- Good input return loss (low VSWR)
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The preamplifiers do not contain built-in coaxial relays

### Specifications

|                      |                              |
|----------------------|------------------------------|
| Type                 | KU LNA 142 AH                |
| Frequency range      | 1350...1450 MHz              |
| Noise figure @ 18° C | 0.4 dB +/- 0.05              |
| Gain                 | typ. 33 dB                   |
| Supply voltage       | +9...15 V DC                 |
| Current consumption  | typ. 80 mA                   |
| Input connector      | N-male / 50 ohms             |
| Output connector     | N-female / 50 ohms           |
| Case                 | milled aluminium             |
| Dimensions (mm)      | 73 x 30 x 22                 |
| Weight               | typ. 140 g                   |
| Options              | Other connectors on request! |



Amplifiers for other frequencies available on request.

# Super Low Noise Amplifiers for Satellite Reception

## Preamplifier with helical filter KU LNA 172 A - METEOSAT and weather satellites 1.7 GHz

### Features

- Helical filter for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillators in case of poor antenna match
- Solder pin for direct power supply (feed-through capacitor)
- Built-in bias-T for remote power supply via coaxial cable

### Important note

- The preamplifiers do not contain built-in coaxial relays!



### Specifications

|                      |                     |
|----------------------|---------------------|
| Type                 | <b>KU LNA 172 A</b> |
| Frequency range      | 1695 MHz +/-        |
| Noise figure @ 18 °C | typ. 0.7 dB         |
| Gain                 | min. 35 dB          |
| Supply voltage       | +9...18 V DC        |
| Current consumption  | 30 mA               |
| Input connector      | N-male / 50 ohms    |
| Output connector     | N-female / 50 ohms  |
| Case                 | German silver       |
| Dimensions (mm)      | 74 x 38 x 30        |
| Weight               | typ. 130 g          |

## Deep Space Communications KU LNA 8000 A KU LNA 8000 A-SMA

### Features

- Preamplifier for reception of space probes
- Super low noise figure due to the use of the latest HEMT FETs
- Unconditionally stable. No parasitic oscillations in case of poor antenna match.
- Input either waveguide R100 or SMA-female connector
- Milled aluminium case

### Important note

- The preamplifiers do not contain built-in coaxial relays!



### Specifications

|                      |                                 |                          |
|----------------------|---------------------------------|--------------------------|
| Type                 | <b>KU LNA 8000 A</b>            | <b>KU LNA 8000 A-SMA</b> |
| Frequency range      | 8000...8450 MHz                 | 8000...8450 MHz          |
| Noise figure @ 18 °C | typ. 0.7 dB                     | typ. 0.7 dB              |
| Gain                 | min. 24 dB                      | min. 24 dB               |
| Supply voltage       | +12...15 V DC                   | +12...15 V DC            |
| Current consumption  | typ. 30 mA                      | typ. 30 mA               |
| Input connector      | Waveguide<br>R100 / WG16 / WR90 | SMA-female / 50 ohms     |
| Output connector     | SMA-female / 50 ohms            | SMA-female / 50 ohms     |
| Case                 | milled aluminium                | milled aluminium         |
| Dimensions (mm)      | 73 x 40 x 20                    | 50 x 30 x 17             |
| Weight               | typ. 110 g                      | typ. 45 g                |

## Super Low Noise Amplifiers for GPS Reception

### KU LNA 1575-4 SMA

- Power supply (12 V) of an active antenna via the preamplifier's input connector is possible
- 4 separate output stages and output connectors
- Internal helical filter
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match

### KU LNA 1575-50

- Very low noise figure
- High gain
- Internal helical filter
- Unconditionally stable - no parasitic oscillations in case of poor antenna match



## Power Splitter for GPS

### KU DIV 1575

The KU DIV 1575 is a passive power splitter with one DC coupled path for power supply of active antennas. Two receivers can be connected to one common antenna. The receiver in the DC coupled path can be used to supply an active antenna.



### Specifications

| Type                 | KU LNA 1575-4 SMA       | KU LNA 1575-50      |
|----------------------|-------------------------|---------------------|
| Center frequency     | 1575 MHz +/- 10 MHz     | 1575 MHz +/- 10 MHz |
| Noise figure @ 18 °C | typ. 0,7 dB             | max. 0.5 dB         |
| Gain                 | typ. 47 dB +/- 3 dB     | typ. 55 dB          |
| Output power         |                         | min. 10 dBm (10 mW) |
| Output IP3           |                         | min. 20 dBm (100mW) |
| Supply voltage       | +12 V DC                | +9...18 V DC        |
| Current consumption  | typ. 300 mA             | typ. 100 mA         |
| Input connector      | SMA-female / 50 ohms    | N-female / 50 ohms  |
| Output connector     | 4x SMA-female / 50 ohms | N-female / 50 ohms  |
| Case                 | German silver           | milled aluminium    |
| Dimensions (mm)      | 111 x 55 x 30           | 102 x 45 x 29       |
| Weight               | typ. 150 g              | typ. 220 g          |

### Specifications

| Type               | KU DIV 1575               |
|--------------------|---------------------------|
| Center frequency   | 1575 MHz +/- 50 MHz       |
| Insertion loss     | typ. 3 dB                 |
| Isolation          | typ. 25 dB                |
| Impedance          | 50 ohms                   |
| DC path            | +0...24 V DC / max. 0.5 A |
| Input connector    | N-female / 50 ohms        |
| Output connector A | N-female / 50 ohms        |
| Output connector B | N-female / 50 ohms        |
| Case               | Tinplate                  |
| Dimensions (mm)    | 37 x 37 x 30              |
| Weight             | typ. 95 g                 |

Amplifiers for other frequencies available on request.

# Imprint

## **KUHNE electronic**

**MICROWAVE COMPONENTS**

**Innovative high quality products  
using advanced technology  
for microwave communications**

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<http://www.db6nt.de>**

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WEEE-Reg.-Nr. DE 341 866 65**



### **Post office account Nürnberg**

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For bank transfer from abroad you have to use:  
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SWIFT-Code: BYLADEM1HOF



Erfüllungsort ist / Place of performance and court of jurisdiction is Hof/Saale - Amtsgericht - HRB 3350  
Geschäftsführerin / Manager: Jutta Kuhne

# General Terms and Conditions of Business with Private Customers

Note: This is a translation of a German document into English language.

As we do business only under German Law, in cases of dispute only the German wording of the GTCs will apply.

## 1.Scope

The following general terms and conditions (GTCs) apply for all contracts, shipments, and other services between Kuhne electronic GmbH and private customers. Private customers in the sense of this document are natural persons which do or intend to do business with Kuhne electronic GmbH not practising a commercial or self-employed business thereby.

Kuhne electronic GmbH does not accept any conditions which are opposite to or deviating from these GTCs conflicting terms and conditions of a customer do not become valid unless the terms and conditions are explicitly and individually recognized in writing by Kuhne electronic GmbH.

## 2.Conclusion of Contract

The presentation of the products in the catalogue does not constitute a legally binding offer of Kuhne electronic GmbH but an invitation to order. By sending an order, customer enters into a legally binding offer for a respective contract. The contract will be concluded with our confirmation of the order within two weeks after dispatch of the order or by delivery of goods ordered.

## 3.Instruction on Right of Revocation

### Right of Revocation

*You may declare the revocation of your contractual statement in text form (e.g. letter, fax, email) or by returning the merchandise within a period of two weeks. The revocation does not have to contain any grounds. The revocation period commences upon receipt of this declaration of revocation in text form but not before receipt of merchandise (in cases of recurrent deliveries of uniform goods not before receipt of first instalment) and also not before fulfilment of our information obligation upon Art. 246 § 2 in conj. with §1 para 1 und 2 EGBGB as well as fulfilment of our obligations acc. To § 312 e para 1 BGB (German commercial Code) in conj. with Art. 246 § 3 EGBGB. The time-limit shall be deemed to be observed by the timely dispatch of the declaration of revocation or the return shipment.*

*The revocation is to be addressed to:  
Kuhne electronic GmbH, Scheibenacker 3, D-95180 Berg  
Telefax: + 49 (0)9293/800938  
Email: info@kuhne-electronic.de*

### Consequences of revocation

*In case of a valid revocation, all mutually received performances as well as emoluments (e.g. interest) taken, if applicable, are to be restituted by either side. If you are unable or partially unable to reconstitute the merchandise to us or can only reconstitute it in a deteriorated condition, then you have to insofar compensate for its value. This does not apply if the deterioration is exclusively due to examining the merchandise – as for instance in a retail store. For a deterioration exclusively due to intended use of merchandise no restitution has to be made.*

*Goods that can be shipped by parcel are to be returned on our risk. You are obliged to bear the costs of the return shipment if the merchandise delivered corresponds to the merchandise ordered, and if the price of merchandise to be sent back does not exceed an amount of 40 € or if, where the price is higher, you have at the date of the revocation not yet rendered consideration or given a part*

*payment. In all other cases, the return shipment for you is free of charge. Things that cannot be shipped by parcel will be picked up. All reimbursement obligations must be fulfilled within 30 days. For you, time limit starts with sending of the declaration of revocation or merchandise, for us with their receipt.*

### End of revocation instruction

## 4.Dispatch and Delivery

The delivery of goods ordered will be effected within one to three workdays. The compliance with our delivery obligation furthermore requires the due and orderly performance of the customer's obligations in due time. The defence of non-performance of the contract is reserved.

Delivery times for customized products and goods not in stock are not binding unless seller committed itself to a binding delivery date in written form.

In case we are not able to keep bidding delivery dates due to reasons we are not responsible for (impossibility of performance, e.g. because our suppliers fail to deliver) we shall inform the buyer without delay and determine a new delivery period which appears reasonable according to the circumstances.

If performance continues to be impossible also within the newly determined period, we shall be entitled to cancel the agreement completely or partly; we shall thereupon immediately reimburse any already provided counter-performance. Cases of impossibility of performance include cases of force majeure (e.g. strike, business interruptions/restraints, or transport difficulties).

## 5.Prices and Payment

The prices stated are EURO-prices (including VAT). Shipping cost are not included.

We offer delivery against payment in advance, against invoice, direct debit, or credit card. For delivery to new customers or customers from outside Germany, payment has to be effected in advance. In case of purchase on account (invoice), customer is obliged to settle invoice within 21 days after receipt of goods in full unless otherwise agreed. For payments with credit card or debit credit, collection takes place before the goods are dispatched.

The buyer shall not be entitled to offset payment against counterclaims unless such claims are undisputed or finally established by court. Further, buyer is only authorized to exercise the right of retention to the extent as his counter claim is based on the same contractual relationship.

If you use your right of revocation, you have to bear regular cost of return if the merchandise delivered corresponds to the merchandise ordered, and if the price of merchandise to be sent back does not exceed an amount of 40 € or if, where the price is higher, you have at the date of the revocation not yet rendered consideration or given a part payment. In all other cases, the return shipment for you is free of charge.

## 6.Warranty

Palpable defaults in material or production including transport damages should be notified to us in writing within two weeks upon receipt. Failure of timely complaint does not effect your legal claims.

Buyer has the choice if supplementary performance is to be executed by remedial action or substitute delivery. Whereas, we are authorized to refuse chosen alternative if this is only feasible under disproportional cost and the other alternative does not stay with any substantial disadvantages. During supplementary performance, a reduction of price or rescission of contract are

# General Terms and Conditions of Business with Private Customers

excluded. Supplementary performance deems to be failed when performed twice without success if from the mod of article or failure any other result can be drawn.

In addition, statutory provisions apply.

## **7.Retention of Title**

We reserve title of all goods delivered until complete settlement of all contractual receivables. Also, extended reservation of title applies.

Upon any levy of execution or other respective third party actions we have to be immediately informed to execute our rights under § 771 BGB.

## **8.Final Provisions**

All disputes resulting from this contractual relationship are solely governed by German law. If any regulation in these terms and conditions or within the scope of further agreements should become ineffective the effectiveness of all remaining regulations or agreements is not touched. The stipulation which is invalid in whole or in part shall be replaced by an arrangement which comes as closely as possible to the invalid stipulation in terms of its economic effect.

In case of any dispute of these GTCs, the German version of the GTCs will prevail over the English version.