



HELIX P One MK2 1-Channel High-Res Amplifier with Digital Signal Input User Manual

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HELIX P One MK2 1-Channel High-Res Amplifier with Digital Signal Input



Dear Customer,

Congratulations on your purchase of this innovative and high-quality HELIX product.

Thanks to more than 30 years of experience in research and development of audio products the HELIX P ONE MK2 sets new standards in the range of amplifiers

We wish you many hours of enjoyment with your new HELIX P ONE MK2.

Yours, AUDIOTEC FISCHER

General instructions

General installation instructions for HELIX components

- To prevent damage to the unit and possible injury, read this manual carefully and follow all installation instructions. This product has been checked for proper function prior to shipping and is guaranteed against manufacturing defects.
- Before starting your installation, disconnect the battery's negative terminal to prevent damage to the unit, fire, and/or risk of injury. For proper performance and to ensure full warranty coverage, we strongly recommend getting this product installed by an authorized HELIX dealer.
- Install your HELIX P ONE MK2 in a dry location with sufficient air circulation for proper cooling of the equipment. The amplifier should be secured to a solid mounting surface using proper mounting hardware. Before mounting, carefully examine the area around and behind the proposed installation location to insure that there are no electrical cables or components, hydraulic brake lines or any part of the fuel tank located behind the mounting surface. Failure to do so may result in unpredictable damage to these components and possibly costly repairs to the vehicle.

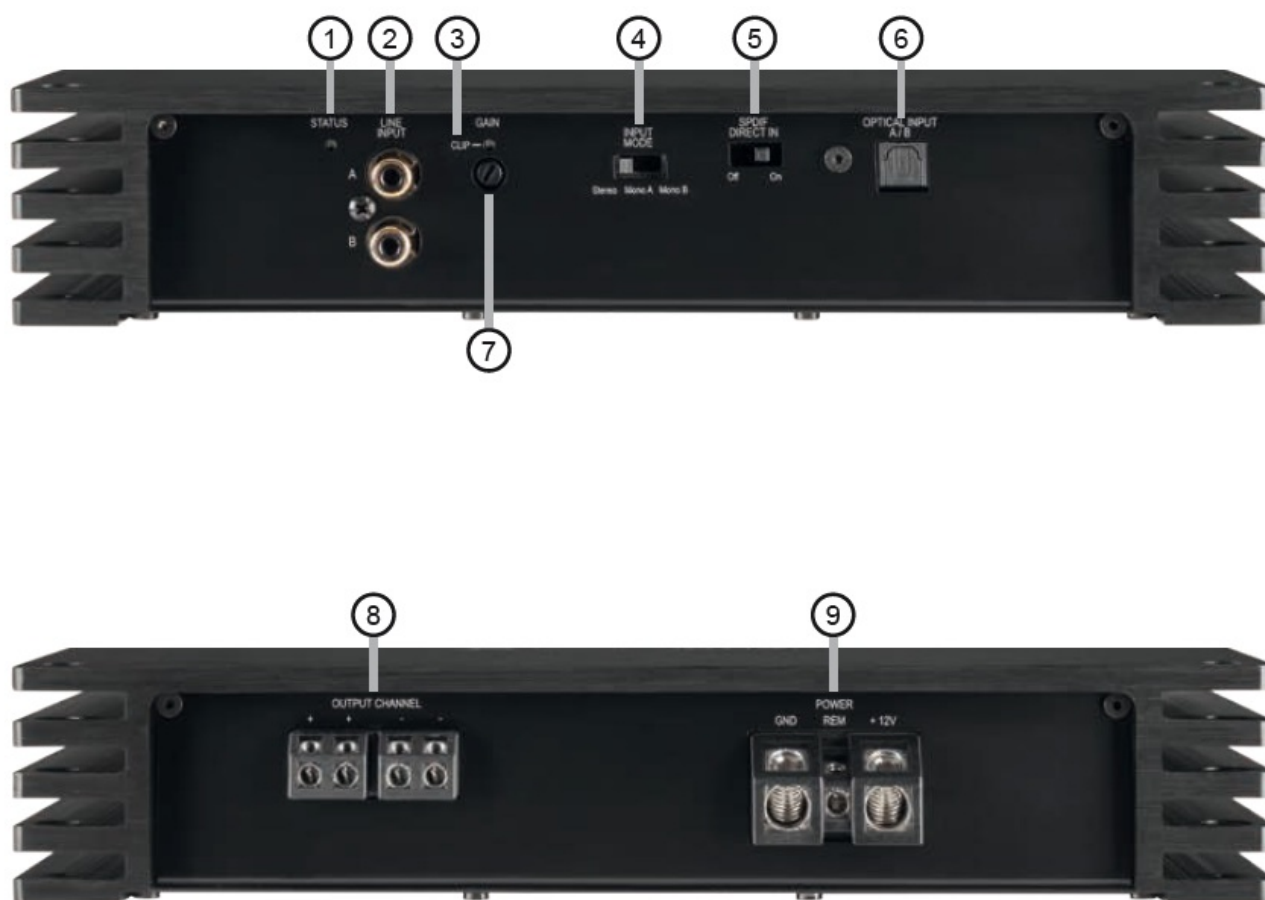
General instruction for connecting the HELIX P ONE MK2 amplifier

- The HELIX P ONE MK2 amplifier may only be installed in vehicles that have a 12 Volts negative terminal

connected to the chassis ground. Any other system could cause damage to the amplifier and the electrical system of the vehicle.

- The positive cable from the battery for the complete system should be provided with a main fuse at a distance of max. 30 cm from the battery. The value of the fuse is calculated from the maximum total current input of the car audio system.
- Use only suitable cables with sufficient cable cross-section for the connection of HELIX P ONE MK2. The fuses may only be replaced by identically rated fuses (4 x 30 A) to avoid damage of the amplifier.
- Prior to installation, plan the wire routing to avoid any possible damage to the wire harness. All cabling should be protected against possible crushing or pinching hazards.
- Also avoid routing cables close to potential noise sources such as electric motors, high-power accessories and other vehicle harnesses.

Connectors and control units



- Status LED
- Low level line inputs
- Clipping LED
- Input mode switch
- SPDIF DIRECT IN switch
- Optical digital input A / B
- Gain control
- Speaker output
- Power & Remote connector

Hardware configuration

Configure the HELIX P ONE MK2 as follows

Caution: Carrying out the following steps will require special tools and technical knowledge. In order to avoid connection mistakes and / or damage, ask your dealer for assistance if you have any questions and follow all instructions in this manual (see page 13). It is recommended that this unit will be installed by an authorized HELIX dealer.

1. Connecting the lowlevel line inputs These two lowlevel line inputs can be connected to signal sources such as head units / radios / DSPs / DSP amplifiers using appropriate cables. The input sensitivity for all channels can be optimally adapted to the signal source using the gain control (see page 16, point 6). It is not mandatory to use both lowlevel line inputs. If only one channel will be connected the input mode switch must be set to the appropriate input channel used (see page 15, point 3). Note: It is possible to use the optical input and the lowlevel line input at the same time if the SPDIF Direct In function is deactivated (see page 15, point 4).

2. Connecting a digital signal source in SPDIF format

If you have a signal source with an optical digital output you can connect it to the amplifier using the appropriate input. The sampling rate must be between 28 and 96 kHz. The input signal is automatically adapted to the internal sample rate.

It is not mandatory to use both input signals. If only one signal should be used, the input mode switch must be set to the appropriate input channel (see page 15, point 3).

1. **Important:** The signal of a digital audio source normally does not contain any information about the volume level. Keep in mind that this will lead to full level on the outputs of the HELIX P ONE MK2. This may cause severe damage to your speakers. We strongly recommend to only use volume-controlled audio sources! For example DSP devices with optical signal output like P SIX DSP ULTIMATE, BRAX DSP etc.
 2. **Note:** The HELIX P ONE MK2 can only handle uncompressed digital stereo signals in PCM format with a sample rate between 28 kHz and 96 kHz and no MP3- or Dolby-coded digital audio stream!
 3. **Note:** It is possible to use the optical input and the low-level line input at the same time if the SPDIF Direct In function is deactivated (see page 15, point 4).
3. Configuration of the amplifier's input mode After connecting the desired signal inputs, the amplifier must be adapted to the number of used inputs.
 1. **Mono A:** Select this switch setting if only the signal of channel A should be used as input signal. For example, if only a mono signal is provided for subwoofer applications.
 2. **Mono B:** Select this switch setting if only the signal of channel B should be used as input signal. For example, if only a mono signal is provided for subwoofer applications. **Stereo:** Select this switch setting if both input channels (A and B) are used. In this mode an optimized sum signal is generated by the input signals of the channels A and B.

Note: The setting of the switch affects both the lowlevel line inputs as well as the optical digital input.
 4. Configuration of the digital signal input For best possible sound performance, the SPDIF Direct In switch (page 14, point 5) can be used to bypass the input stages of the P ONE MK2 and to route the audio signal from the digital input (Optical Input A/B) directly and without any detours to the output stages of the amplifier.
 1. **On:** Activates direct signal routing for best sound performance.
 2. **Off:** Select this switch position if you need the gain control for adjusting the input sensitivity (by default).
 3. **Note:** The switch only affects the signal routing of the optical input. If the switch is set to "On", the low

level line inputs as well as the gain control are without function!

5. Connection to power supply & remote Make sure to disconnect the battery before installing the HELIX P ONE MK2!

Make sure of the correct polarity. + 12V: Connector for the positive cable. Connect the +12 V power cable to the positive terminal of the battery. The positive wire from the battery to the amplifier's power terminal needs to have an inline fuse at a distance of no more than 12 inches (30 cm) from the battery. The value of the fuse is calculated from the maximum total current input of the whole car audio system (P ONE MK2 = max. 120 A RMS at 12 V RMS power supply). If your power wires are short (less than 1 m / 40) then a wire gauge of 16 mm² / AWG 6 will be sufficient. In all other cases, we strongly recommend gauges of 25 – 35 mm² / AWG 4 “ 2! GND: Connector for the ground cable.

The ground wire should be connected to a common ground reference point (this is located where the negative terminal of the battery is grounded to the metal body of the vehicle), or to a prepared metal location on the vehicle chassis, i.e. an area that has been cleaned of all paint residues. The cable should have the same gauge as the +12 V wire. Inadequate grounding causes audible interference and malfunctions.

REM: The remote input is used to switch on and off the P ONE MK2. It is mandatory to connect this input to the remote output of the preconnected device that provides the input signal to the P ONE MK2. For example the remote output of a preconnected P SIX DSP ULTIMATE. We do not recommend controlling the remote input via the ignition switch to avoid pop noise during turn on / off.

6. Adjustment of the input sensitivity

ATTENTION: It is mandatory to prop-erly adapt the input sensitivity of the P ONE MK2 to the signal source in order to achieve the best possible signal quality and to avoid damage to the amplifier. The input sensitivity can be optimally adapted to the signal source using the gain control.

This is not a volume control, it's only for adjusting the amplifier gain. The setting of the control also affects the digital signal input if the SPDIF Direct In switch is set to “Off” position.

The gain control range is:

- **Line Input:** 0.5 – 8.0 Volts
- **Optical Input:** 0 – 24 dB

If the signal source doesn't provides enough output voltage, the input sensitivity can be smoothly increased via the gain control.

The Clipping LED (see page 14, point 3) serves as monitoring tool.

Note: Don't connect any loudspeakers to the outputs of the HELIX P ONE MK2 during this setup.

For adjustment please proceed as follows:

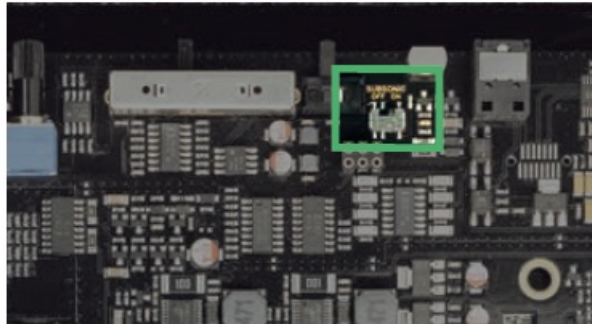
1. Turn on the amplifier.
2. Adjust the volume of your radio to approx. 90 % of the max. volume and playback an appropriate test tone, e.g. pink noise (0 dB).
3. If the Clipping LED already lights up, you have to reduce the input sensitivity via the gain control until the LED turns off.
4. Increase the input sensitivity by turning the gain control clockwise until the Clipping LED lights up. Now turn the control coun-terclockwise until the Clipping LED turns off again.

Connecting the loudspeaker outputs

The loudspeaker outputs can be connected directly to the wires of the loudspeakers. Never connect any of the loudspeaker cables with the chassis ground as this will damage your amplifier and your speakers. Ensure that the loudspeakers are correctly connected (in phase), i.e. plus to plus and minus to minus. Exchanging plus and minus causes a total loss of bass reproduction. The plus pole is indicated on most speakers. The impedance must not be lower than 1 Ohm, otherwise the amplifier protection will be activated. Examples for speaker configurations can be found on page 19 et sqq.

Optional: Activation/deactivation of the internal subsonic filter

The P ONE MK2 is equipped with a switch-able 21 Hz subsonic filter. The filter can be activated or deactivated inside the device.



- **On:** Subsonic filter activated (by default).
- **Off:** Subsonic filter deactivated. The subsonic filter should only be deactivated if the amplifier is driven by a digital signal processor (DSP) or DSP amplifier. In addition, a subsonic (highpass) filter with a cut-off frequency of min. 20 Hz and a slope of min. 36 dB/octave (Butterworth characteristic) must be provided in the signal path of the preconnected DSP / DSP amplifier.

Additional functions

Status LED

The Status LED indicates the operating mode of the amplifier.

Green: Amplifier is ready for operation. Yellow / green flashing: Overheat control is active. The overheat control dynamically limits the output power and allows to always achieve the maximum output power depending on the temperature.

Yellow: The amplifier is overheated. The internal temperature protection shuts down the device until it reaches a safe temperature level again.

Yellow flashing: The fuses inside the device are blown. Please check the fuses and, if necessary, replace them. They may only be replaced by identically rated fuses (4 x 30 Ampere) to avoid damage of the amplifier. Red: A malfunction has occurred that may have different root causes. The HELIX P ONE MK2 is equipped with protection circuits against over- and undervoltage, short-circuit on loudspeakers and reverse connection. Please check for connecting failures such as short-circuits or other wrong connections. If the amplifier does not turn on after that it is defective and has to be sent to your local authorized dealer for repair service.

Clipping LED

Normally the Clipping LED is off and only lights up if the input stage is overdriven.

- **On (red):** One of the signal inputs is overdriven. Reduce the input sensitivity using the gain control until the

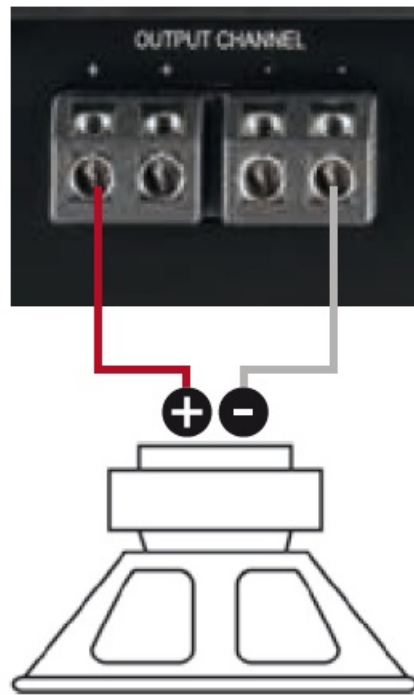
LED goes out. How to reduce the input sensitivity is described on page 16 point 6.

Configuration examples

Note: The crossover frequencies for the high- and lowpass must be set in the preconnected DSP / DSP amplifier.

Mono subwoofer application

Subwoofer with one voice coil (single voice coil)

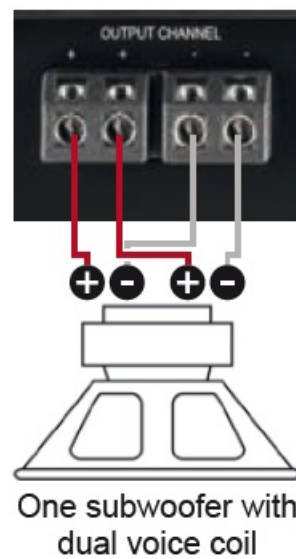
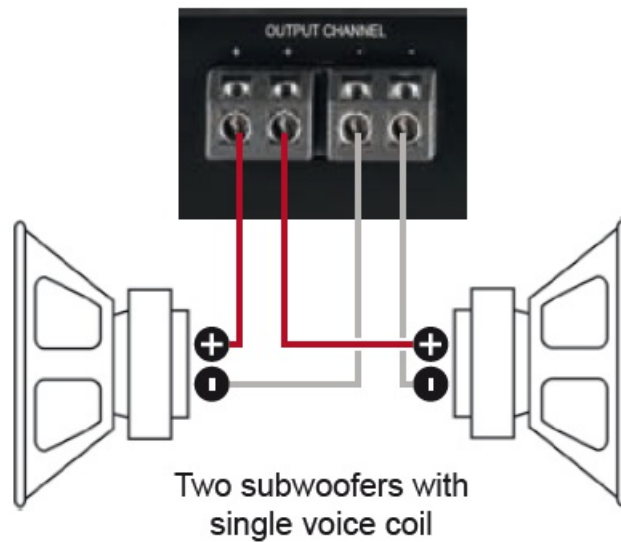


RMS output power \leq 1% THD+N:

- 1 x 4 Ohms: 500 Watts
- 1 x 2 Ohms: 880 Watts
- 1 x 1 Ohm: 1,500 Watts

Parallel operation

Two subwoofers with one voice coil (single voice coil) or one subwoofer with dual voice coil are connected in parallel. Note: The parallel connection of two voice coils will result in halving the impedance!

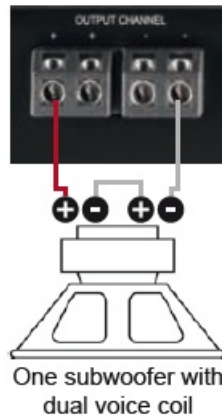
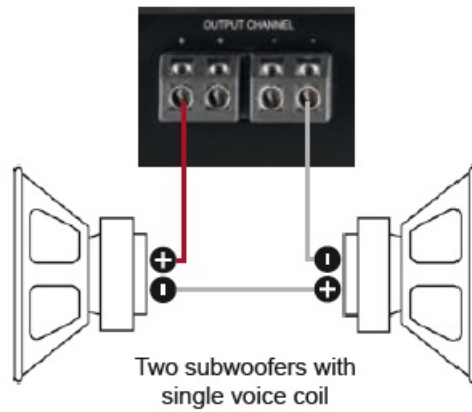


RMS output power \leq 1% THD+N:

- Two subwoofers with 1 x 4 Ohms correspond to a total impedance of 2 Ohms: 880 Watts
- One subwoofer with 2 x 4 Ohms also corresponds to a total impedance of 2 Ohms: 880 Watts
- Two subwoofers with 1 x 2 Ohms correspond to a total impedance of 1 Ohm: 1,500 Watts
- One subwoofer with 2 x 2 Ohms also corresponds to a total impedance of 1 Ohm: 1,500 Watts
- **Note:** The parallel connection of 1 Ohm voice coils will re-sult in shutdown of the amplifier.

Configuration examples

In series



Two subwoofers with one voice coil (single voice coil) or one subwoofer with dual voice coil are connected in series. Note: The connection of two voice coils in series will result in doubling the impedance!

RMS output power \leq 1% THD+N:

- Two subwoofers with 1 x 2 Ohms correspond to a total impedance of 4 Ohms: 500 Watts
- One Subwoofer with 2 x 2 Ohms also corresponds to a total impedance of 4 Ohms: 500 Watts
- Two subwoofers with 1 x 1 Ohm correspond to a total impedance of 2 Ohms: 880 / 1,760 Watts
- One subwoofer with 2 x 1 Ohm also correspond to a total impedance of 2 Ohms: 880 Watts

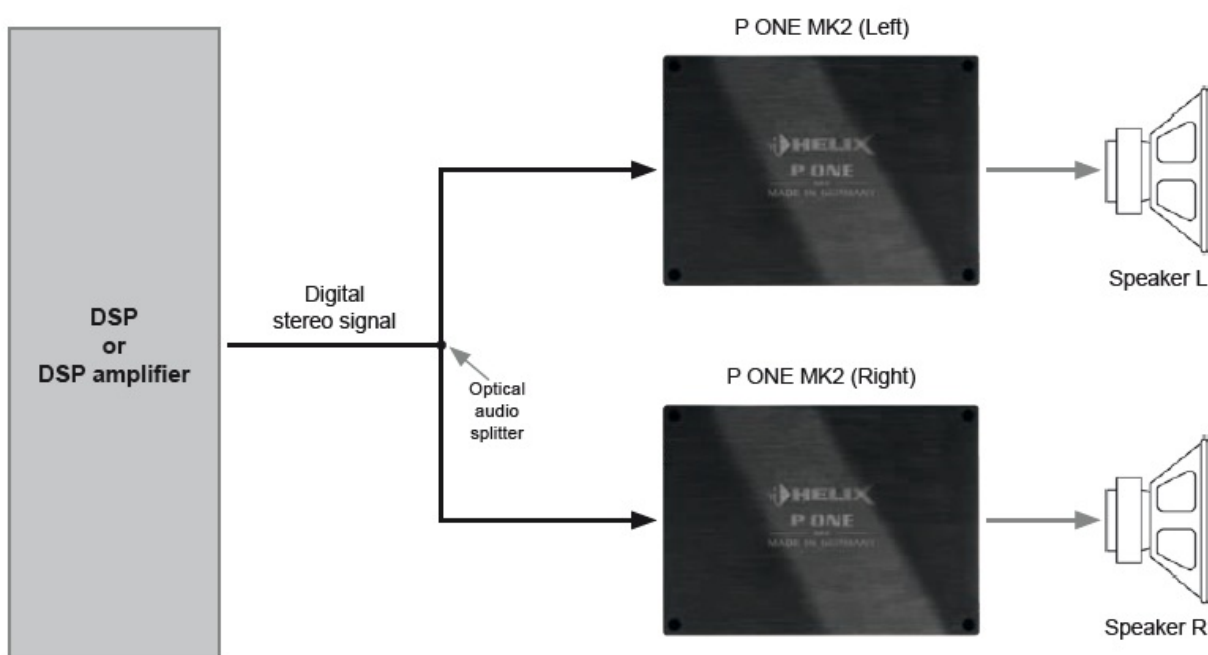
Note: The negative terminal of the first voice coil has to be connected to the positive terminal of the second voice coil by using a speaker wire with the same gauge as the other speaker.

Stereo application with two P ONE MK2 amplifiers and use of a digital signal

Configuration notes for the individual P ONE MK2 amplifiers:

Amplifier	Amplifier input	Input mode switch	SPDIF Direct In switch	Internal subsonic filter
P ONE MK2 (Left)	Optical Input A/B	Mono A	On	Off
P ONE MK2 (Right)	Optical Input A/B	Mono B	On	Off

IMPORTANT: The crossover frequencies for the high- and lowpass must be set in the preconnected DSP / DSP amplifier. We recommend a subsonic (highpass) filter with a cut-off frequency of min. 20 Hz and a slope of min. 36 dB per octave (Butterworth characteristic).



Technical Data

- **Power RMS \leq 1% THD+N**
 - @ 4 Ohms.....1 x 500 Watts
 - @ 2 Ohms.....1 x 880 Watts
 - @ 1 Ohm.....1 x 1.500 Watts
- Max. output power per channel*..... Up to 1,800 Watts RMS @ 1 Ohm
- Amplifier technology.....Class D
- Inputs..... 2 x RCA / Cinch 1 x Optical SPDIF (28 – 96 kHz) 1 x Remote In
- Input sensitivity..... RCA / Cinch: 0.5 V – 8 V
- Input impedance..... RCA / Cinch: 20 kOhms
- Outputs..... 1 x Speaker output
- Signal converter for the digital input.....BurrBrown 32 Bit DA converter
- Frequency range.....21 Hz – 40,000 Hz
- Subsonic filter.....21 Hz / Butterworth 48 dB/Okt.

- Signal-to-noise ratio (A-bewertet)..... Digital input: 110 dB Analog input: 110 dB
- Distortion (THD).....< 0.01 %
- Damping factor.....> 450
- Operating voltage.....10.5 – 17 Volts (max. 5 sec. down to 6 Volts)
- Idle current.....1500 mA
- Fuse.....4 x 30 A LP-Mini-fuse (APS)
- Power rating.....DC 12 V 160 A max.
- Ambient operating temperature range.....-40 °C to +70 °C
- Additional features..... Input mode switch, SPDIF Direct In switch,
- Start-Stop capability
- Dimensions (H x W x D).....50 x 260 x 190 mm / 1.97 x 10.24 x 7.48"

In typical applications as a subwoofer amplifier

Warranty Disclaimer

The warranty service is based on statutory regulations. Defects and damage caused by overload or improper handling are excluded from the warranty service. Any return can only take place following prior consultation, in the original packaging together with a detailed description of the error and a valid proof of purchase

Technical modifications, misprints and errors excepted!

We accept no liability for damage to the vehicle or device defects caused by the incorrect operation of the device. This product has been issued a CE marking. This means that the device is certified for use in vehicles within the European Union (EU)

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Documents / Resources

	<p>HELIX P One MK2 1-Channel High-Res Amplifier with Digital Signal Input [pdf] User Manual</p> <p>P One MK2 1-Channel High-Res Amplifier with Digital Signal Input, P One MK2, 1-Channel High-Res Amplifier with Digital Signal Input, 1-Channel High-Res Amplifier, High-Res Amplifier, Amplifier</p>
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References

- [A High-End Car Hifi & Audio - Made in Germany | Audiotec Fischer](#)