



# HELIX COMPOSE Speaker Systems User Manual

[Home](#) » [Helix](#) » HELIX COMPOSE Speaker Systems User Manual 

## Contents

- [1 HELIX COMPOSE Speaker Systems](#)
- [2 Product Usage Instructions](#)
- [3 General instructions](#)
- [4 Installation](#)
  - [4.1 Mounting Ci3 T20FM-TI](#)
  - [4.2 Mounting Ci3 M100FM](#)
  - [4.3 Mounting Ci3 W130](#)
  - [4.4 Mounting Ci3 W165FM](#)
  - [4.5 Mounting Ci3 W200FM](#)
  - [4.6 Wiring 2-way component system Ci3 K100.2FM](#)
  - [4.7 Wiring 2-way coaxial system Ci3 C100.2FM](#)
  - [4.8 Wiring 2-way coaxial system Ci3 C130.2 / Ci3 C165.2FM](#)
  - [4.9 Tweeter level adjustment](#)
- [5 Dimensions](#)
  - [5.1 Ci3 W200FM](#)
  - [5.2 Ci3 C100.2FM](#)
  - [5.3 Ci3 C165.2FM](#)
- [6 Technical data](#)
- [7 FlexMount car-specific adaptors](#)
- [8 Documents / Resources](#)
  - [8.1 References](#)



**HELIX COMPOSE Speaker Systems**



## Product Information

- **Product Name:** HELIX COMPOSE Speaker Systems
- **Manufactured by:** AUDIOTEC FISCHER
- **Country of Origin:** Germany

## Highlights:

- High-quality product
- Excellent manufacturing
- State-of-the-art sound quality
- 30+ years of experience in audio product research and development
- Sets new standards in the car audio speaker market

## Product Usage Instructions

1. Read the entire user manual carefully before installation to prevent damage to the speakers and ensure personal safety.
2. If possible, have the product installed by an authorized HELIX dealer for proper performance and warranty coverage.
3. If performing your own installation, follow the precautions below:
  - Ensure the speaker fits into the intended mounting location and check for adequate depth for the magnet system.
  - Check for adequate space between the speaker and other items that may interfere with mounting.
  - Ensure correct polarity when connecting the loudspeakers. The positive leads are marked red.
  - Protect all speaker wiring from cutting or wear at sharp edges to prevent short circuits.
  - Ensure connection wires are long enough to avoid mechanical stress on the wires or connectors.
  - Properly mount all components and avoid mounting where water may splash on them. The quality of the installation greatly affects the overall performance of the speaker system. Pay attention to each installation step.
  - Avoid low-frequency cancellation caused by air leakage between the speaker basket and the mounting

surface.

- Consider mounting panel reinforcement for stability, and torsion-free installation. Consult an installation specialist for advice.
- Utilize the original speaker mounting locations whenever possible, or prepare a secure installation place if not available.

## **Congratulations!**

Dear Customer,

Congratulations on your purchase of this high-quality product.

HELIX COMPOSE highlights best quality, excellent manufacturing and state-of-the-art sound quality.

Thanks to more than 30 years of experience in research and development of audio products HELIX COMPOSE sets new standards in the car audio speaker market.

We wish you many hours of enjoyment with your new HELIX COMPOSE components.

Yours

AUDIOTEC FISCHER Team

## **General instructions**

### **General instructions for installing HELIX loudspeakers**

To prevent damage to the speakers 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.

For proper performance and to ensure full warranty coverage, we strongly recommend getting this product installed by an authorized HELIX dealer.

If you choose to perform your own installation read the following information and precautions carefully.

Failure to follow the stated precautions may result in personal injury and/or damage to the audio system or vehicle.

1. Always make sure that the speaker will fit into the intended mounting location and that there is adequate depth for the magnet system.
2. Check for adequate space between speaker and window, window crank, power window mechanism, seat, rear deck torsion bars, and other items which may interfere with the speaker's mounting. This is very important if any hole cutting is required. Detailed size information is indicated in the dimension section of this manual. Take care that the mounting surface is flat and free from all obstructions.
3. Ensure that the loudspeakers are correctly connected in polarity. Exchanging plus and minus may result in a significant loss of sound quality. The positive leads of the loudspeakers are marked red.
4. Make sure that all speaker wiring is fully protected from cutting or wear at sharp edges, which can lead to short circuits that may damage your head unit, amplifier and/or speaker system.
5. Verify that all connection wires are long enough in order to avoid any mechanical stress on the wires or the connectors.
6. Make sure that all components are mounted properly.
7. Do not mount the components where water may splash on them.
8. The quality of the installation has a significant effect on the overall performance of the speaker system. Treat each installation step with a high degree of attention.
9. Avoid low frequency cancellation caused by air leakage between the speaker basket and the mounting surface (e.g. mounted on a bended or uneven surface or mounted in an oversized hole).
10. Mounting panel reinforcement may be necessary in some cases in order to ensure a stable, torsion-free and

even surface. This can be achieved by mounting the speaker on a metal, plastic or wooden sub-baffle behind the body or door panel. Consult an installation specialist for further advices.

11. In most cases you can use the original speaker mounting locations in the doors, A-pillars, body panels or the rear deck. If these are not available you have to prepare your own secure installation place. Due to their structural integrity and accessibility the precut mounting holes should be used whenever possible. Information on a proper mounting can be found in the section "Installation" of this manual.

**IMPORTANT:** Never cut any metal that is an integral part of an automobile's safety or structural car body. We strongly recommend that you operate the complete audio system at low volume before final installation. So you can check whether each speaker is working before securing the loudspeakers into their mounting locations.

### Find your composition

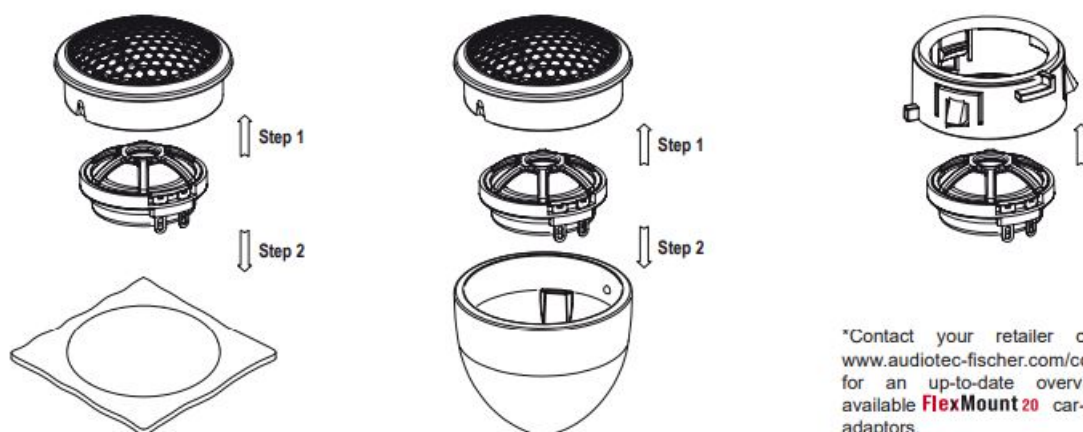
Go to [www.audiotec-fischer.com/compose](http://www.audiotec-fischer.com/compose) to explore the whole HELIX COMPOSE platform



## Installation

### Mounting Ci3 T20FM-TI

- **Option a:**  
Flush mount
- **Option b:**  
Angle mount
- **Option c:**  
Professional integration with optionally available Flex Mount 20 car-specific adaptor\*



### Mounting Ci3 M100FM

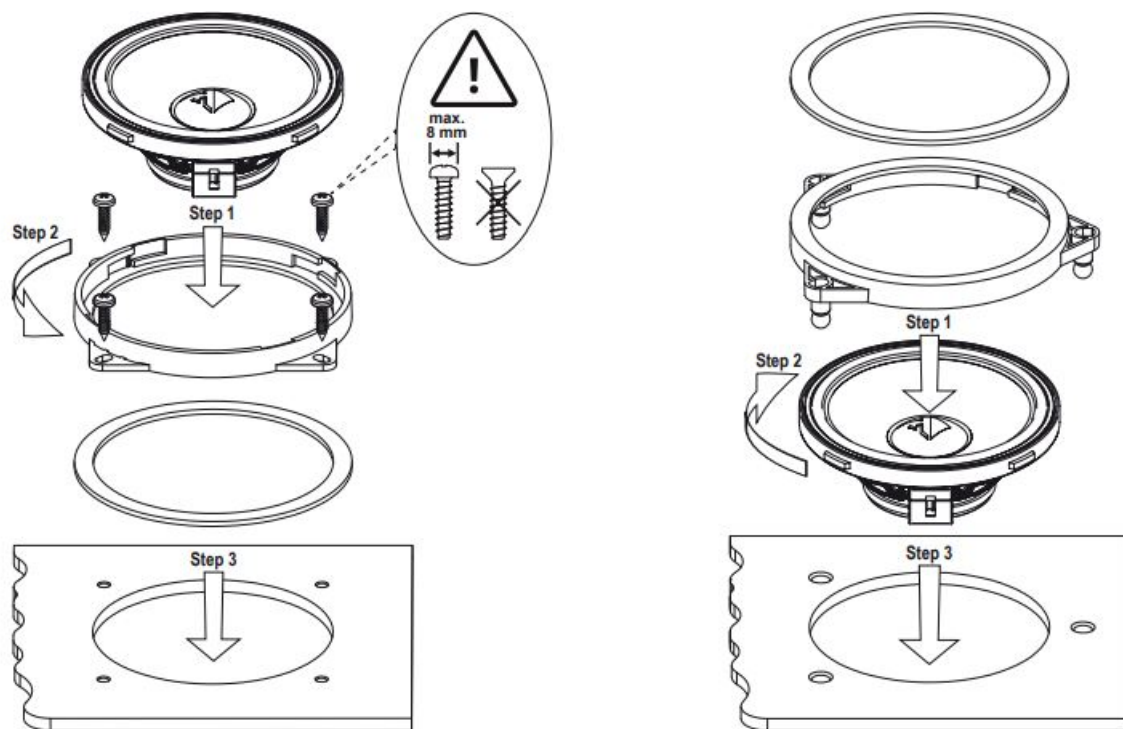
Note: the Flex Mount 100 adaptor rings can be mounted in two directions. Make sure to use the appropriate mounting option for your vehicle.

- **Option a:**

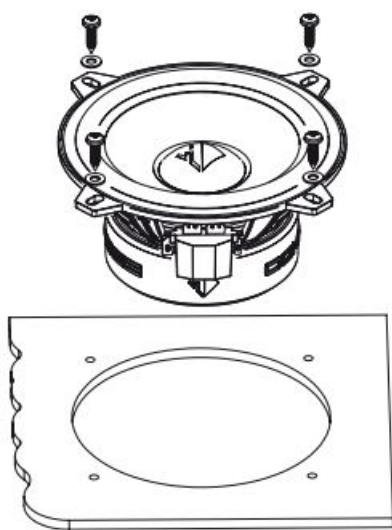
Mounting with the enclosed universal adaptor rings

- **Option b:**

Professional integration with optionally available car-specific adaptor\*



### Mounting Ci3 W130



**Attention:** To avoid damage to the speakers, do not use countersunk screws and do not overtighten the screws!

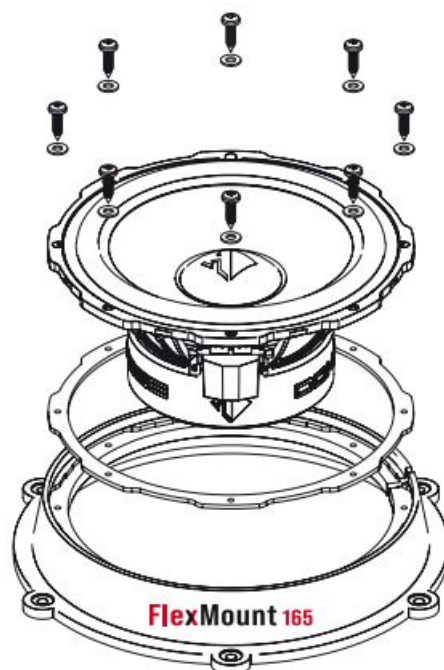
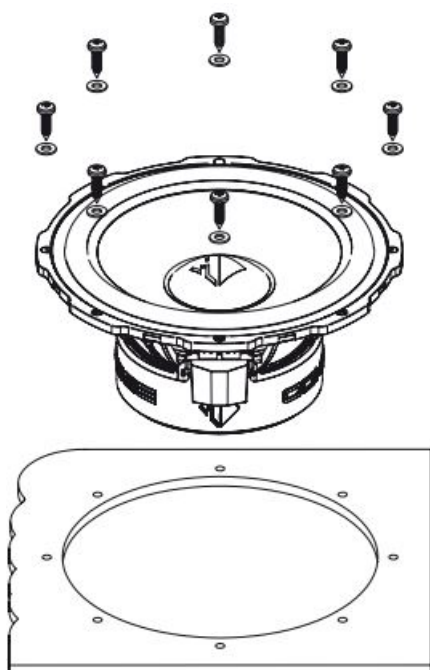
### Mounting Ci3 W165FM

- **Option a:**

Universal mounting

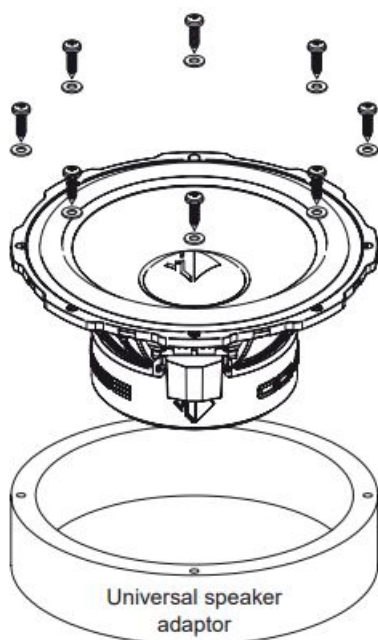
- **Option b:**

Professional integration with optionally available **Flex Mount 165** car-specific adaptor\*

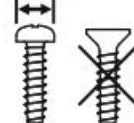


- **Option c:**

Mounting with universal mounting adaptor



max.  
8 mm



**Attention:** To avoid damage to the speakers, do not use countersunk screws and do not overtighten the screws!

\*Contact your retailer or visit [www.audiotec-fischer.com/compose](http://www.audiotec-fischer.com/compose) for an up-to-date overview of available adaptors.

## Mounting Ci3 W200FM

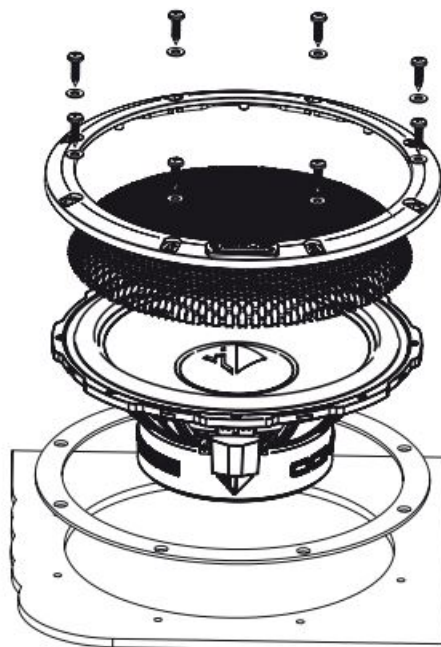
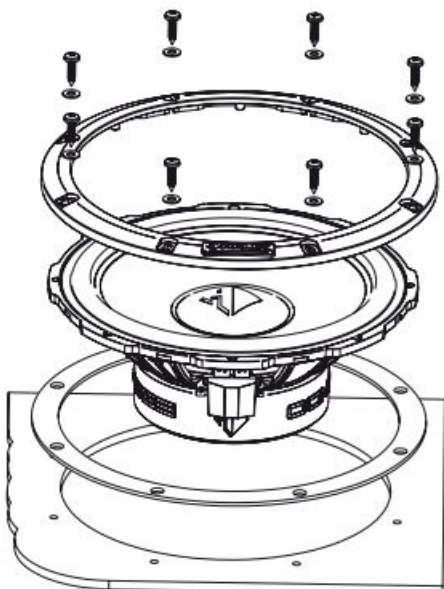
- **Option a:**

Universal mounting without grille

- **Option b:**

Universal mounting with grille



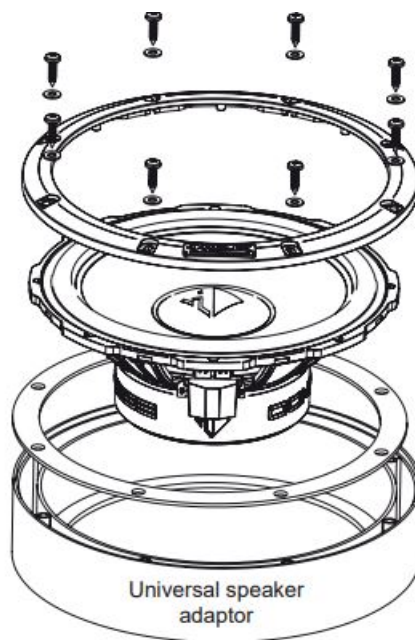
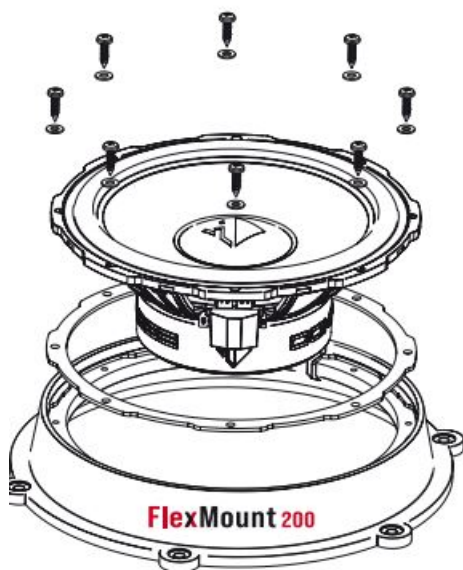


- **Option c:**

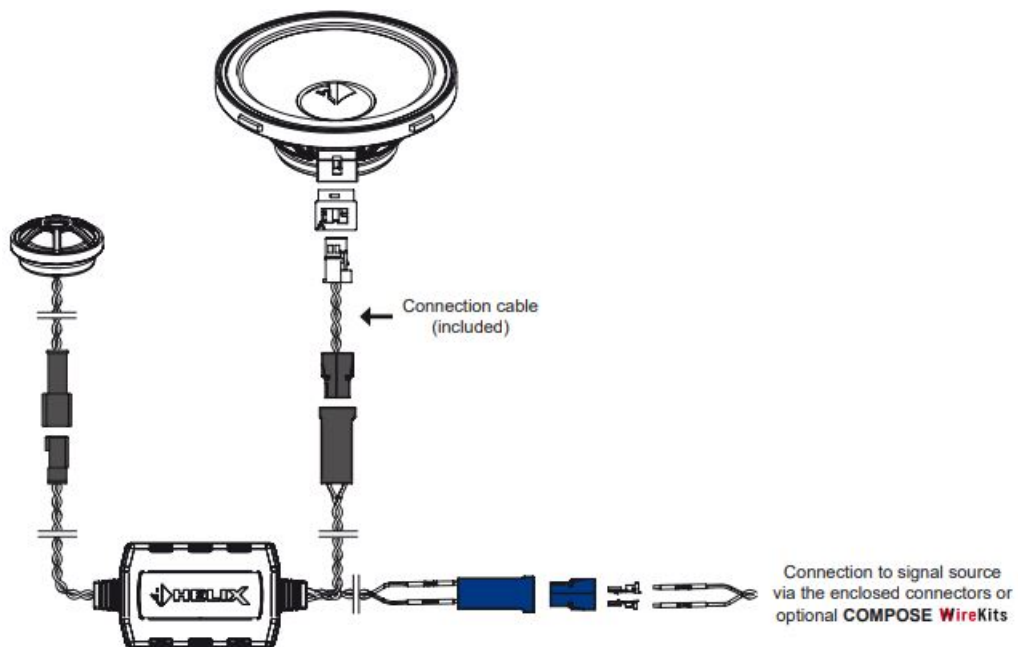
Professional integration with optionally available **Flex Mount 200** car-specific adaptor\*

- **Option d:**

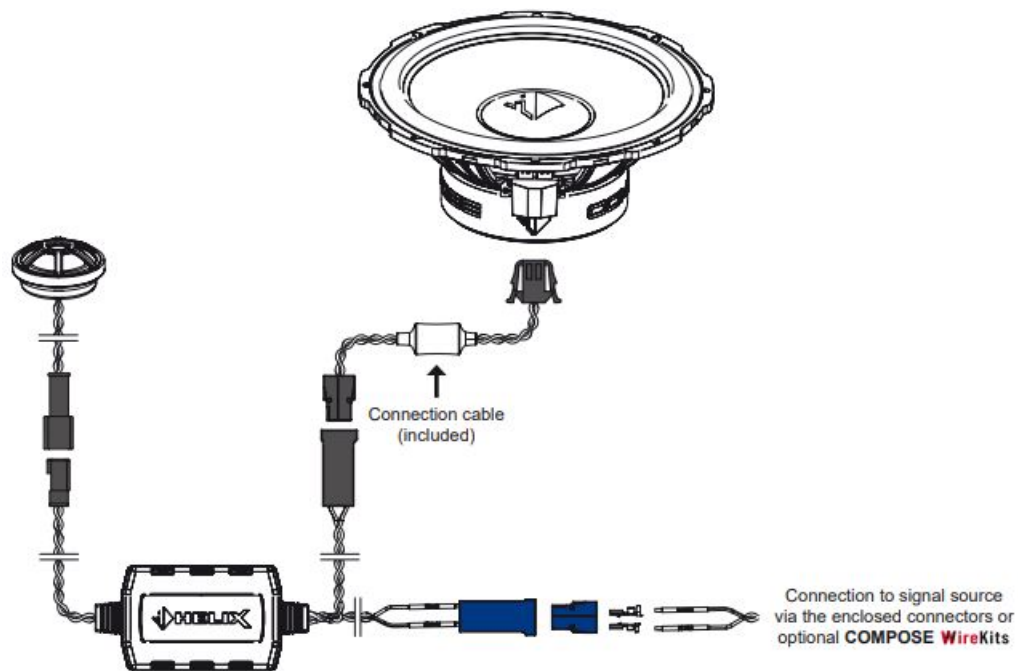
Mounting with universal mounting adaptor



Wiring 2-way component system Ci3 K100.2FM



### Wiring 2-way component system Ci3 K130.2 / Ci3 K165.2FM / Ci3 K200.2FM



Ensure that all components are correctly connected (phase), i.e. plus to plus and minus to minus.

### Wiring 2-way coaxial system Ci3 C100.2FM

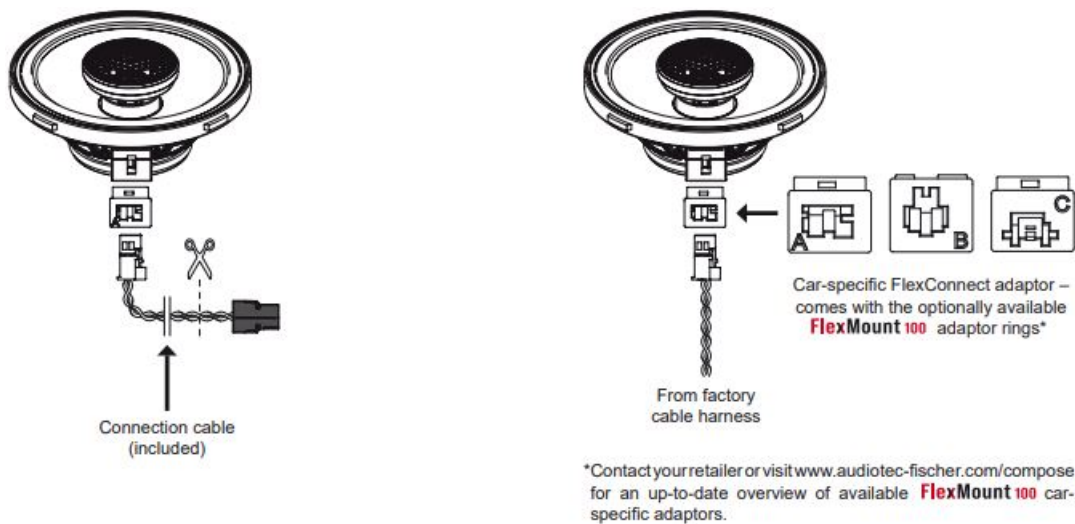
- **Option a: Universal connection**

Cut off the plug of the enclosed connection cable and connect it to the signal source

- **Option b: Direct connection**

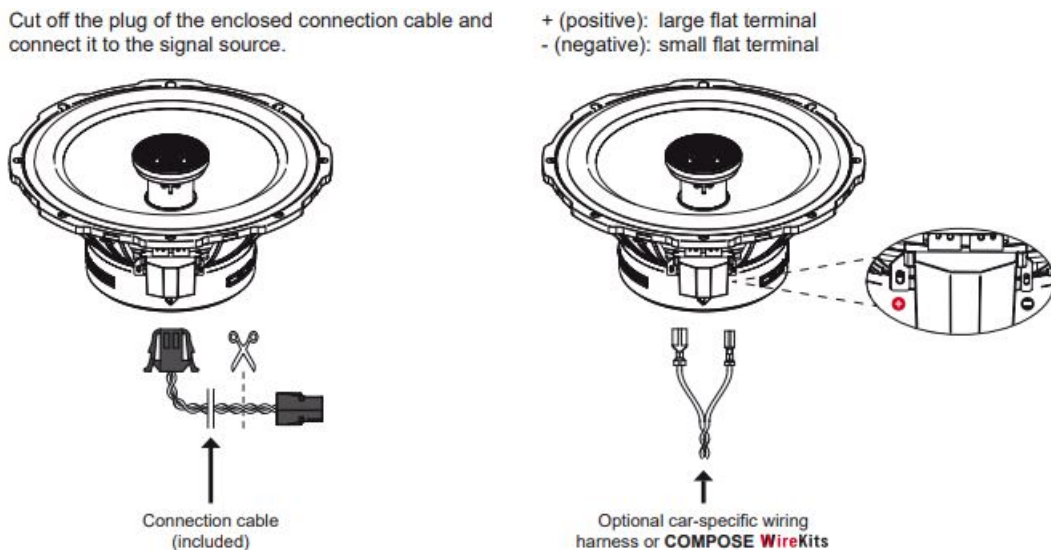
to OEM connector with optionally available car-specific adaptor





### Wiring 2-way coaxial system Ci3 C130.2 / Ci3 C165.2FM

- Option a: Universal connection with enclosed connection cable
- Option b: Universal connection to the blade terminals via optional car-specific harness or **COMPOSE Wire Kit**



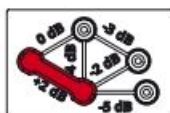
Ensure that all components are correctly connected (phase), i.e. plus to plus and minus to minus.

### Tweeter level adjustment

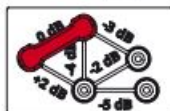


The crossover allows to optimize the level of the connected tweeter internally by repositioning the tweeter level jumper. Therefore open the crossover housing, pull the jumper straight upwards and reinsert it to the desired position.

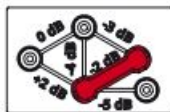
The correct tweeter level setting strongly depends on the location of the speakers. Then confirm the level by listening to the speakers and modify the jumper setting if needed.



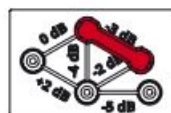
**+2 dB:** The level of the tweeter is increased by 2 dB.



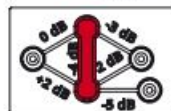
**0 dB:** The tweeter has the optimum level for most applications.



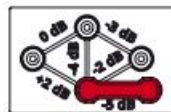
**-2 dB:** The level of the tweeter is reduced by 2 dB.



**-3 dB:** The level of the tweeter is reduced by 3 dB.



**-4 dB:** The level of the tweeter is reduced by 4 dB.



**-5 dB:** The level of the tweeter is reduced by 5 dB.

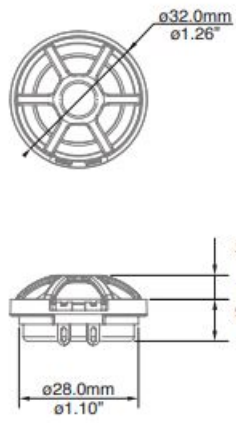
We recommend to use the settings in the table below as starting point:

Speaker kit	Level	Jumper position
Ci3 K100.2FM-S3	0 dB	
Ci3 K130.2-S3	-2 dB	
Ci3 K165.2FM-S3	0 dB	
Ci3 K165.2FM-S2	+2 dB	
Ci3 K200.2FM-S3	0 dB	
Ci3 K200.2FM-S2	+2 dB	

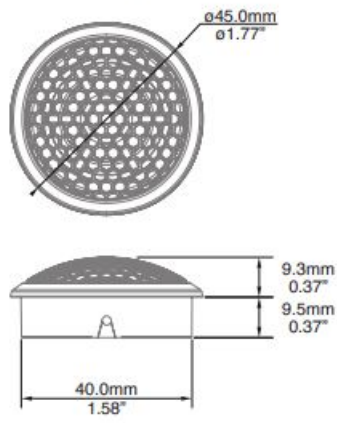
## Dimensions

### Ci3 T20FM-TI

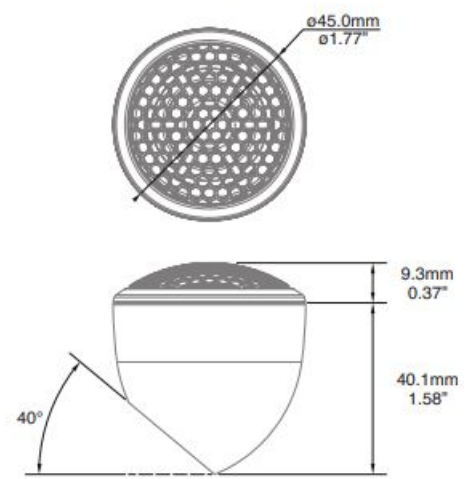
Without housing



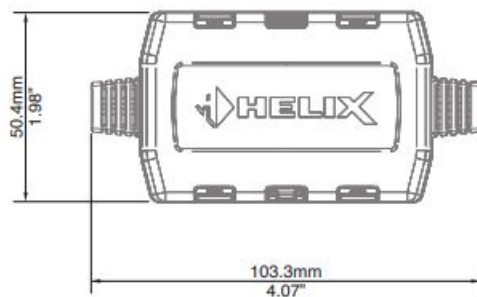
With housing for flush mount



With housing for angle mount

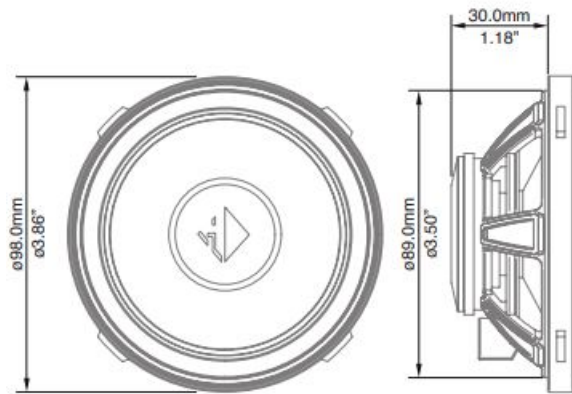


## **Ci3 FX-UNI.2**

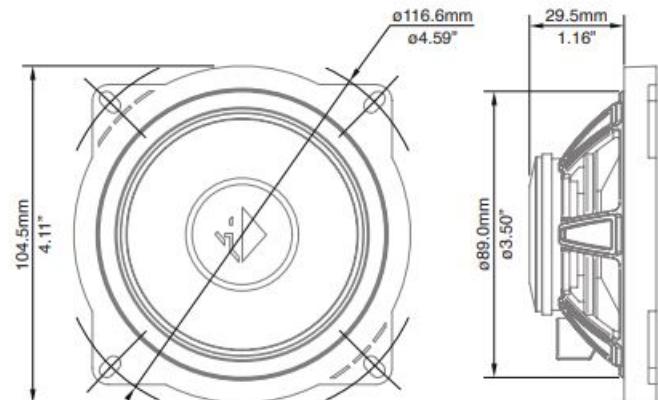


## **Ci3 M100FM**

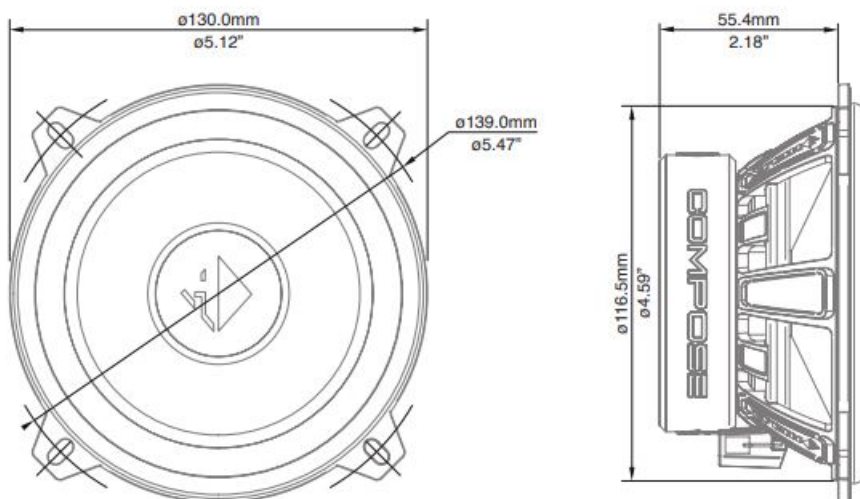
Speaker without **FlexMount 100**



Speaker with assembled universal **FlexMount 100**

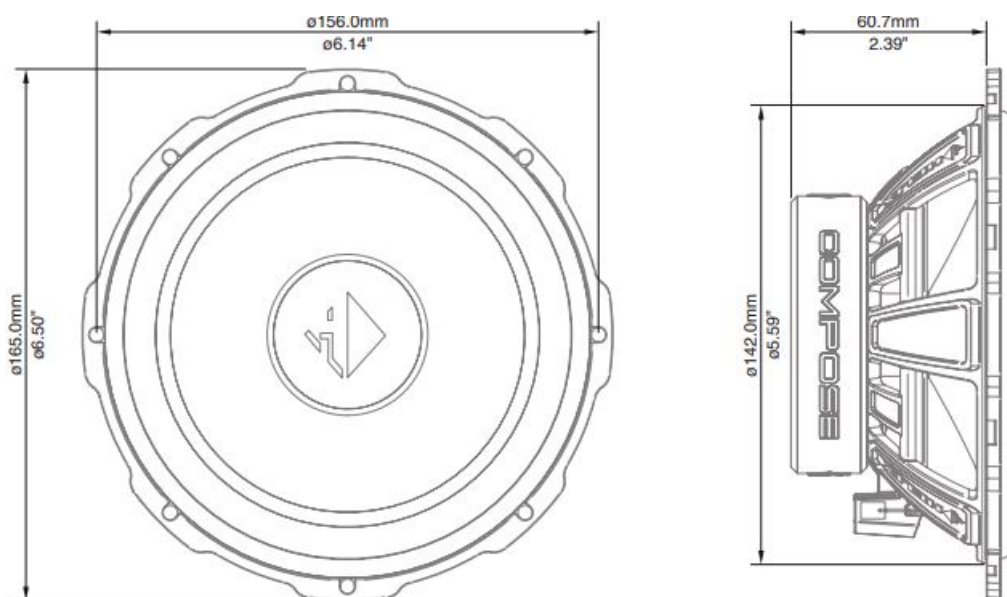


### **Ci3 W130**

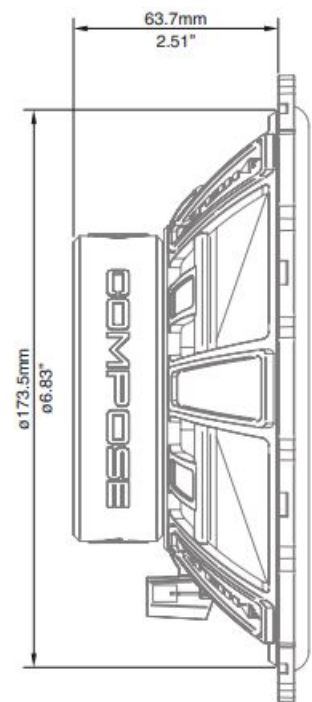
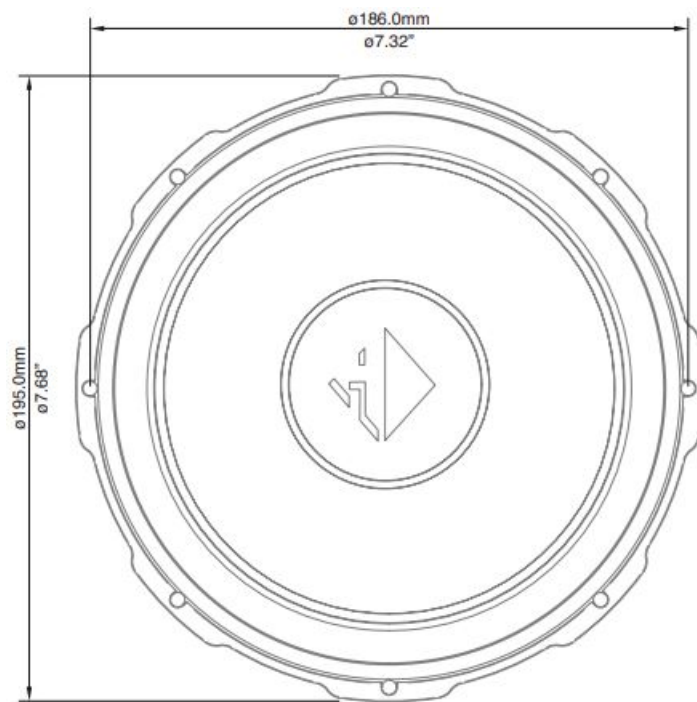


### **Ci3 W200FM**

Speaker without adaptor ring

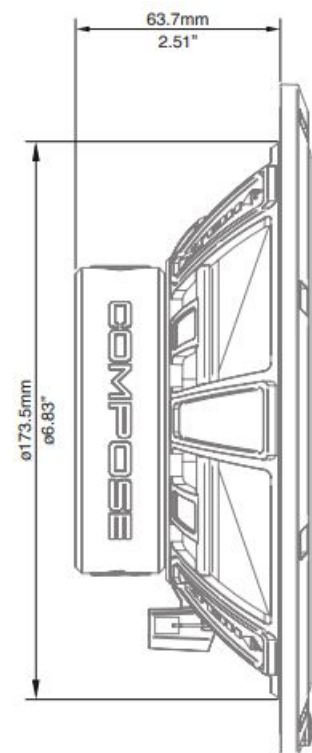
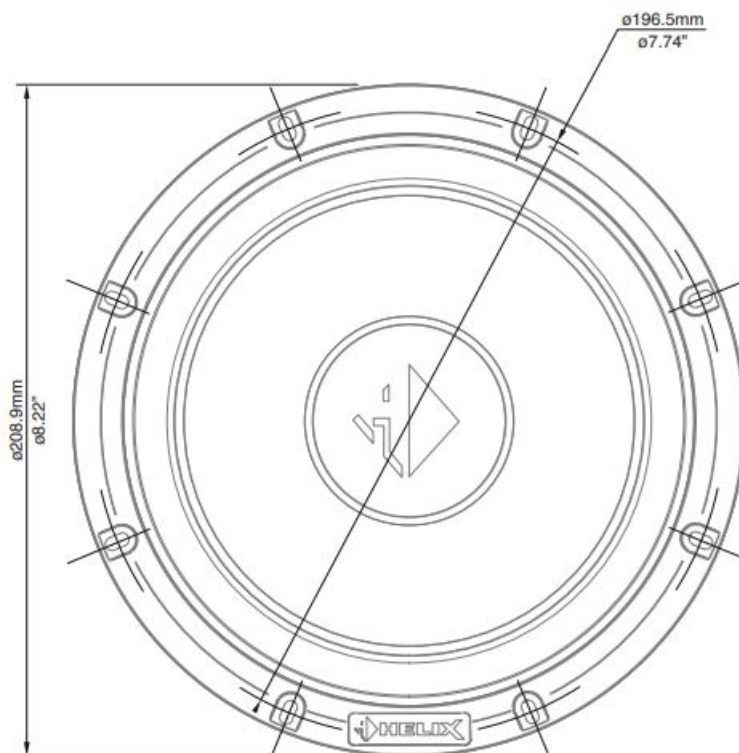


Woofer with assembled universal mounting ring



### Ci3 W200FM

Woofer with assembled universal mounting ring and grille

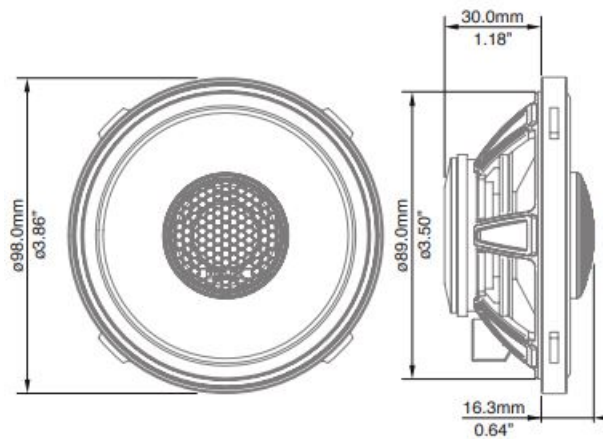


### Ci3 C100.2FM

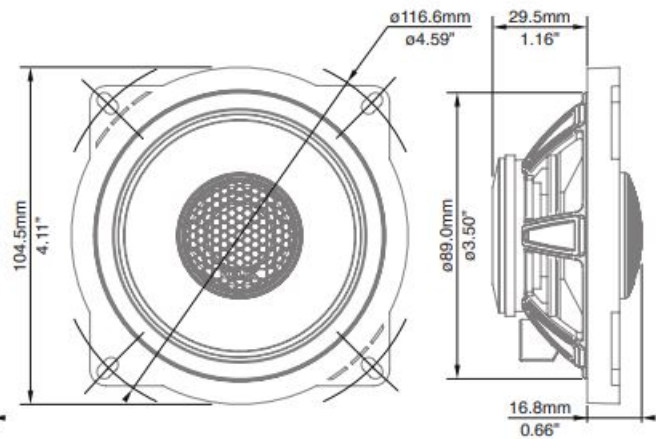
- Speaker without Flex Mount 100
- Speaker with assembled universal Flex Mount 100



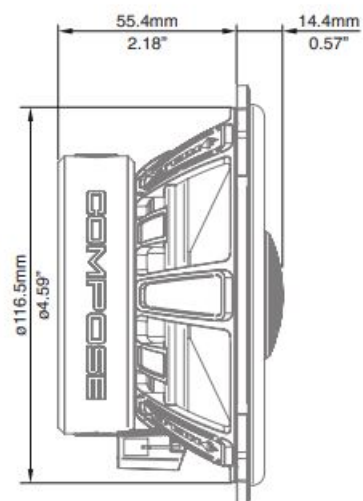
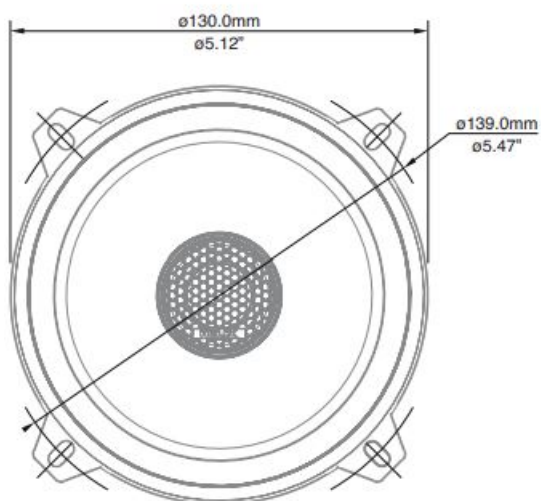
Speaker without **FlexMount 100**



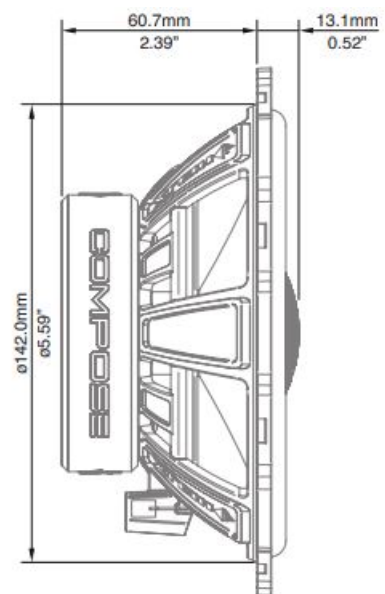
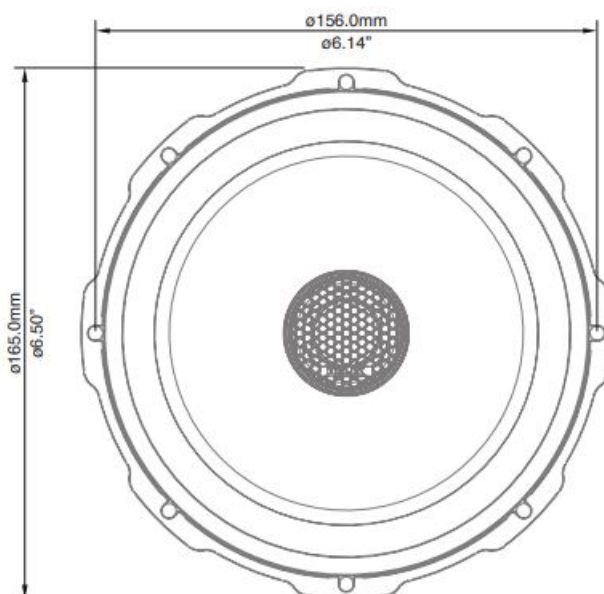
Speaker with assembled universal **FlexMount 100**



### **Ci3 C130.2**



### **Ci3 C165.2FM**



## **Technical data**

### **Speaker kits**

Speaker kits	Ci3 K100.2FM-S3	Ci3 K130.2-S3	Ci3 K165.2FM-S3
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<b>Power RMS / Max.</b>	<i>P</i>	80 / 120 Watts	90 / 135 Watts	100 / 150 Watts
<b>Frequency response</b>		120 Hz – 25,000 Hz	80 Hz – 25,000 Hz	60 Hz – 25,000 Hz
<b>Impedance</b>	<i>Z</i>	3 Ω	3 Ω	3 Ω
<b>Sensitivity</b>	<i>SPL</i>	91 dB @ 2.83V / 1m 87 dB @ 1W / 1m	91 dB @ 2.83V / 1m 87 dB @ 1W / 1m	92 dB @ 2.83V / 1m 88 dB @ 1W / 1m
<b>Outer diameter</b> (more data page 11 et sqq.)	Ø	Tweeter: 32.0 mm / 1.26" Woofer: 98.0 mm / 3.86"	Tweeter: 32.0 mm / 1.26" Woofer: 130.0 mm / 5.12"	Tweeter: 32.0 mm / 1.26" Woofer: 165.0 mm / 6.50"
<b>Installation diameter</b> (more data page 11 et sqq.)	Ø	Tweeter: 32.0 mm / 1.26" Woofer: 89.0 mm / 3.50"	Tweeter: 32.0 mm / 1.26" Woofer: 116.5 mm / 4.59"	Tweeter: 32.0 mm / 1.26" Woofer: 142.0 mm / 5.59"
<b>Installation depth</b> (more data page 11 et sqq.)		Tweeter: 9.8 mm / 0.39" Woofer: 30.0 mm / 1.18"	Tweeter: 9.8 mm / 0.39" Woofer: 55.4 mm / 2.18"	Tweeter: 9.8 mm / 0.39" Woofer: 60.7 mm / 2.39"
<b>Dimensions cross-over</b>		103.3 x 50.4 x 25.0 mm / 4.07 x 1.98 x 0.98"	103.3 x 50.4 x 25.0 mm / 4.07 x 1.98 x 0.98"	103.3 x 50.4 x 25.0 mm / 4.07 x 1.98 x 0.98"

## Woofer

Impedance	<i>Z</i>	3 Ω	3 Ω	3 Ω
DC resistance	<i>Re</i>	3.0 Ω	3.1 Ω	3.0 Ω
Resonance frequency	<i>Fs</i>	146 Hz	89 Hz	70 Hz
Mechanical Q factor	<i>Qms</i>	4.49	3.11	4.17
Electrical Q factor	<i>Qes</i>	1.02	0.97	1.05
Total Q factor	<i>Qts</i>	0.83	0.74	0.84
Compliance	<i>Cms</i>	280 µm/N	350 µm/N	454 µm/N
Equivalent air volume	<i>Vas</i>	1.1 L	4.6 L	11.2 L
Force factor	<i>B*I</i>	3.4 Tm	4.0 Tm	4.0 Tm
Cone area	<i>Sd</i>	53 cm <sup>2</sup>	98 cm <sup>2</sup>	133 cm <sup>2</sup>
Moving mass	<i>Mms</i>	4.3 g	9.1 g	11.3 g
Mechanical resistance	<i>Rms</i>	0.87 kg/s	1.65 kg/s	1.18 kg/s

Voice coil diameter	$\varnothing$	25 mm	25 mm	25 mm
Voice coil winding height		4.8 mm	10.5 mm	10.5 mm
Max. linear excursion	$X_{max}$	+/- 2.0 mm	+/- 3.2 mm	+/- 3.2 mm
<b>Tweeter</b>				
Impedance	$Z$	4 $\Omega$	4 $\Omega$	4 $\Omega$
Resonance frequency	$F_s$	1800 Hz	1800 Hz	1800 Hz
Voice coil diameter	$\varnothing$	20 mm	20 mm	20 mm
<b>Features</b>				
Tweeter		Ultra compact, titanium dome, neodymium magnet and	Ultra compact, titanium dome, neodymium magnet and	Ultra compact, titanium dome, neodymium magnet and
Woofer		Paper with Cenosphere coating, terminal, neodymium magnet and	Paper with Cenosphere coating and terminal	Paper with Cenosphere coating, terminal and
Crossover		Tweeter: 12 dB highpass , protection and level adjustment	Tweeter: 12 dB highpass , protection and level adjustment Woofer: 6 dB lowpass	Tweeter: 12 dB highpass , protection and level adjustment Woofer: 6 dB lowpass

Speaker kits		Ci3 K165.2FM-S2	Ci3 K200.2FM-S3	Ci3 K200FM.2-S2
Power RMS / Max.	$P$	100 / 150 Watts	100 / 150 Watts	100 / 150 Watts
Frequency response		60 Hz – 25,000 Hz	50 Hz – 25,000 Hz	50 Hz – 25,000 Hz
Impedance	$Z$	2 $\Omega$	3 $\Omega$	2 $\Omega$
Sensitivity	$SPL$	94 dB @ 2.83V / 1m 88 dB @ 1W / 1m	94 dB @ 2.83V / 1m 90 dB @ 1W / 1m	96 dB @ 2.83V / 1m 90 dB @ 1W / 1m

<b>Outer diameter</b> (more data page 11 et sqq.)	Ø	Tweeter: 32.0 mm / 1.26 ”  Woofer: 165.0 mm / 6.5 0”	Tweeter: 32.0 mm / 1.26 ”  Woofer: 195.0 mm / 7.6 8”	Tweeter: 32.0 mm / 1.26 ”  Woofer: 195.0 mm / 7.6 8”
<b>Installation diameter</b> (more data page 11 et sqq.)	Ø	Tweeter: 32.0 mm / 1.26 ”  Woofer: 142.0 mm / 5.5 9”	Tweeter: 32.0 mm / 1.26 ”  Woofer: 173.5 mm / 6.8 3”	Tweeter: 32.0 mm / 1.26 ”  Woofer: 173.5 mm / 6.8 3”
<b>Installation depth</b> (more data page 11 et sqq.)		Tweeter: 9.8 mm / 0.39”  Woofer: 60.7 mm / 2.3 9”	Tweeter: 9.8 mm / 0.39 ”  Woofer: 63.7 mm / 2.5 1”	Tweeter: 9.8 mm / 0.39 ”  Woofer: 63.7 mm / 2.5 1”
<b>Dimensions cross- over</b>		103.3 x 50.4 x 25.0 mm / 4.07 x 1.98 x 0.98”	103.3 x 50.4 x 25.0 mm / 4.07 x 1.98 x 0.98”	103.3 x 50.4 x 25.0 mm / 4.07 x 1.98 x 0.98”
<b>Woofer</b>				
Impedance	$Z$	2 Ω	3 Ω	2 Ω
DC resistance	$R_e$	1.8 Ω	3.0 Ω	1.8 Ω
Resonance frequency	$F_s$	74 Hz	67 Hz	72 Hz
Mechanical Q factor	$Q_{ms}$	3.92	4.25	4.56
Electrical Q factor	$Q_{es}$	0.92	0.93	1.09
Total Q factor	$Q_{ts}$	0.74	0.76	0.88
Compliance	$C_{ms}$	370 μm/N	300 μm/N	230 μm/N
Equivalent air volume	$V_{as}$	8.8 L	19.0 L	14.5 L
Force factor	$B \cdot l$	3.4 Tm	5.1 Tm	4.0 Tm
Cone area	$S_d$	133 cm <sup>2</sup>	214 cm <sup>2</sup>	214 cm <sup>2</sup>
Moving mass	$M_{ms}$	12.5 g	18.8 g	20.8 g
Mechanical resistance	$R_{ms}$	1.48 kg/s	1.87 kg/s	2.07 kg/s
Voice coil diameter	Ø	25 mm	25 mm	25 mm
Voice coil winding height		11.3 mm	11.6 mm	11.9 mm
Max. linear excursion	$X_{max}$	+/- 3.7 mm	+/- 3.8 mm	+/- 4.0 mm

<b>Tweeter</b>				
Impedance	$Z$	4 $\Omega$	4 $\Omega$	4 $\Omega$
Resonance frequency	$F_s$	1800 Hz	1800 Hz	1800 Hz
Voice coil diameter	$\varnothing$	20 mm	20 mm	20 mm
<b>Features</b>				
Tweeter		Ultra compact, titanium dome, neodymium magnet and	Ultra compact, titanium dome, neodymium magnet and	Ultra compact, titanium dome, neodymium magnet and
Woofers		Paper with Cenosphere coating, terminal and grille	Paper with Cenosphere coating, terminal, and grille	Paper with Cenosphere coating, terminal, and grille
Crossover		Tweeter: 12 dB highpass, protection and level adjustment Woofers: 6 dB lowpass	Tweeter: 12 dB highpass, protection and level adjustment	Tweeter: 12 dB highpass, protection and level adjustment

## Coaxial systems

Coaxial systems		Ci3 C100.2FM-S3	Ci3 C130.2-S3	Ci3 C165.2FM-S3
<b>Power RMS / Max.</b>	$P$	80 / 120 Watts	90 / 135 Watts	100 / 150 Watts
<b>Frequency response</b>		100 Hz – 25,000 Hz	80 Hz – 25,000 Hz	60 Hz – 25,000 Hz
<b>Impedance</b>	$Z$	3 $\Omega$	3 $\Omega$	3 $\Omega$
<b>Sensitivity</b>	$SPL$	91 dB @ 2.83V / 1m 87 dB @ 1W / 1m	92 dB @ 2.83V / 1m 88 dB @ 1W / 1m	92 dB @ 2.83V / 1m 88 dB @ 1W / 1m
<b>Outer diameter</b> (more data page 15 et sqq.)	$\varnothing$	98.0 mm / 3.86"	130.0 mm / 5.12"	165.0 mm / 6.50"

<b>Installation diameter</b> (more data page 15 et sqq.)	Ø	89.0 mm / 3.50"	116.5 mm / 4.59"	142.0 mm / 5.59"
<b>Installation depth</b> (more data page 15 et sqq.)		30.0 mm / 1.18"	55.4 mm / 2.18"	60.7 mm / 2.39"
<b>Woofer</b>				
Impedance	$Z$	3 Ω	3 Ω	3 Ω
DC resistance	$R_e$	3.0 Ω	3.0 Ω	3.1 Ω
Resonance frequency	$F_s$	137 Hz	92 Hz	72 Hz
Mechanical Q factor	$Q_{ms}$	4.37	2.76	4.02
Electrical Q factor	$Q_{es}$	0.78	0.90	1.04
Total Q factor	$Q_{ts}$	0.66	0.68	0.82
Compliance	$C_{ms}$	456 µm/N	374 µm/N	466 µm/N
Equivalent air volume	$V_{as}$	2.1 L	4.9 L	11.5 L
Force factor	$B^*l$	3.2 Tm	3.8 Tm	3.8 Tm
Cone area	$S_d$	57 cm <sup>2</sup>	97 cm <sup>2</sup>	133 cm <sup>2</sup>
Moving mass	$M_{ms}$	3.0 g	7.6 g	10.4 g
Mechanical resistance	$R_{ms}$	0.58 kg/s	1.60 kg/s	1.17 kg/s
Voice coil diameter	Ø	25 mm	25 mm	25 mm
Voice coil winding height		4.8 mm	10.5 mm	10.5 mm
Max. linear excursion	$X_{max}$	+/- 2.0 mm	+/- 3.2 mm	+/- 3.2 mm
<b>Tweeter</b>				
Voice coil diameter	Ø	20 mm	20 mm	20 mm
<b>Features</b>				
Tweeter		Titanium dome and neodymium magnet	Titanium dome and neodymium magnet	Titanium dome and neodymium magnet

Woofer		Paper with Cenosphere coating, terminal, neodymium magnet and	Paper with Cenosphere coating and terminal	Paper with Cenosphere coating, terminal and
Crossover		Integrated, 6 dB highpasses	Integrated, 6 dB highpasses	Integrated, 6 dB highpasses

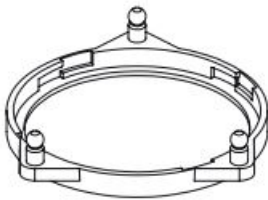
**FlexMount car-specific adaptors**

The optionally available **Flex Mount** car-specific adaptor rings allow a tailored and acoustically optimized adaption of the HELIX COMPOSE speakers Ci3 T20FM-TI, Ci3 M100FM, Ci3 W165FM, Ci3 W200FM, Ci3 C100.2FM-S3 and Ci3 C165.2FM-S3 to the vehicles original mounting location. Contact your retailer or visit [www.audiotec-fischer.com/compose](http://www.audiotec-fischer.com/compose) for an up-to-date overview of available adaptors.

**FlexMount 20**



**FlexMount 100**



**FlexMount 165**  
**FlexMount 200**



Contact your retailer or visit [www.audiotec-fischer.com/compose](http://www.audiotec-fischer.com/compose) for an up-to-date overview of available car-specific adaptors







[HELIX COMPOSE Speaker Systems](#) [pdf] User Manual  
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## References

- [A HELIX COMPOSE Speaker | Car-Hifi Components](#)