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SPEAKER SYSTEMS

USER MANUAL

ENGINEERED IN GERMANY

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 a proper performance and to ensure full warranty coverage, we strongly recommend to get 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 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

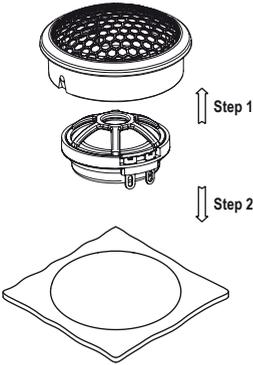
Go to www.audiotec-fischer.com/compose to explore the whole HELIX COMPOSE platform



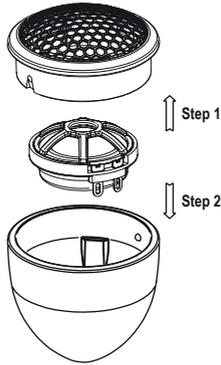
Installation

Mounting tweeter CB T20FM-S

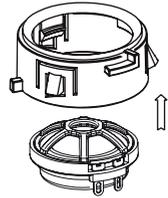
Option a:
Flush mount



Option b:
Angle mount

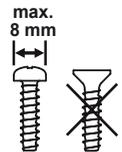
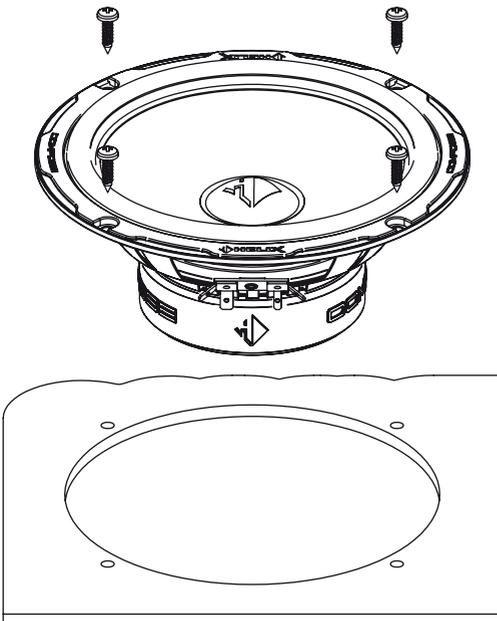


Option c:
Professional integration with optionally available **FlexMount 20** car-specific adaptor*



*Contact your retailer or visit www.audiotec-fischer.com/compose for an up-to-date overview of available **FlexMount 20** car-specific adaptors.

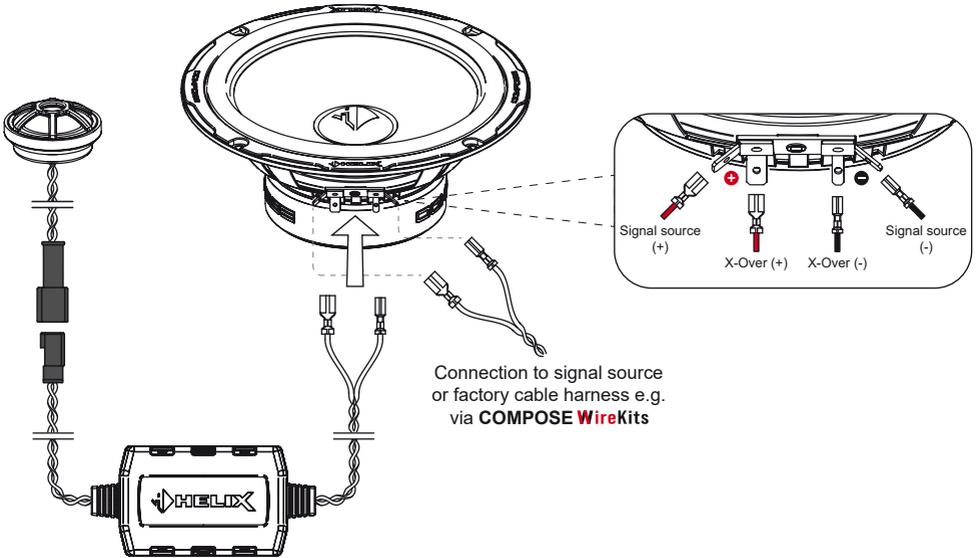
Mounting midrange & woofer & coaxial systems



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

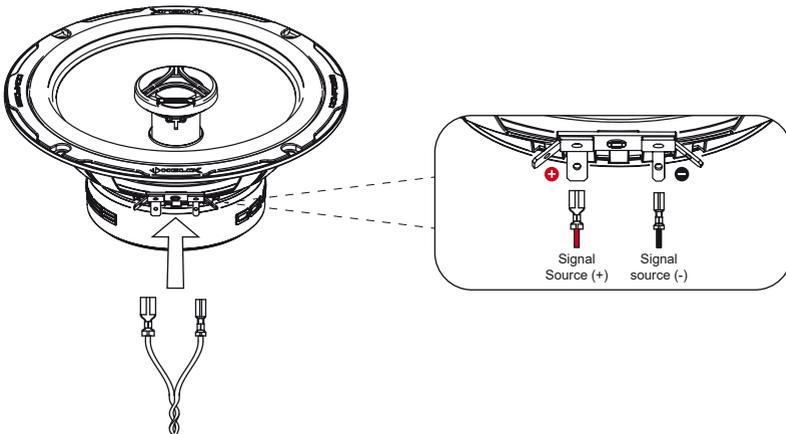
Installation

Wiring 2-way speaker kit



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

Wiring 2-way coaxial system

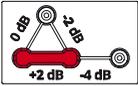


Tweeter level adjustment

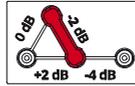


The crossover allows to optimize the level of the connected tweeter internally by repositioning the tweeter level jumper. Therefore open the crossover housing, pull the jumper straight upwards and reinsert it to the desired position.

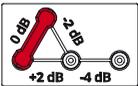
The correct tweeter level setting strongly depends on the location of the speakers. Then confirm the level by listening to the speakers and modify the jumper setting if needed.



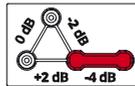
+2 dB: The level of the tweeter is increased by 2 dB.



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

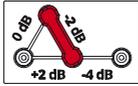
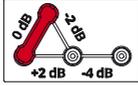
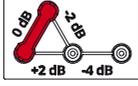


0 dB: The tweeter has the optimum level for most applications.



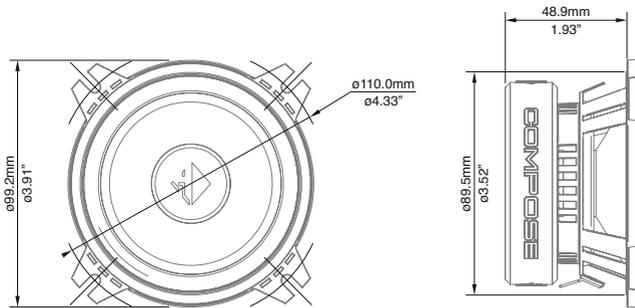
-4 dB: The level of the tweeter is reduced by 4 dB.

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

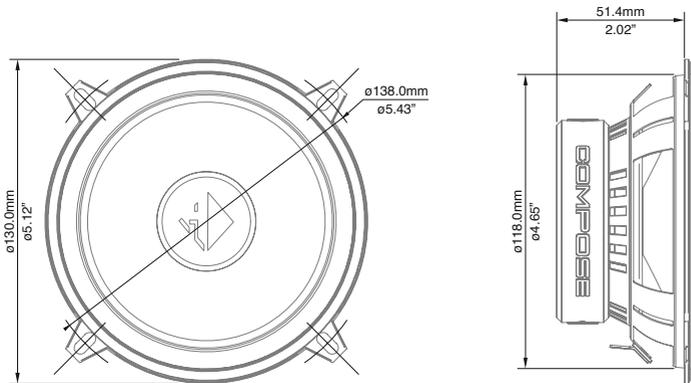
Speaker kit	Level	Jumper position
CB K100.2-S3	-2 dB	
CB K130.2-S3	0 dB	
CB K165.2-S3	0 dB	

Dimensions

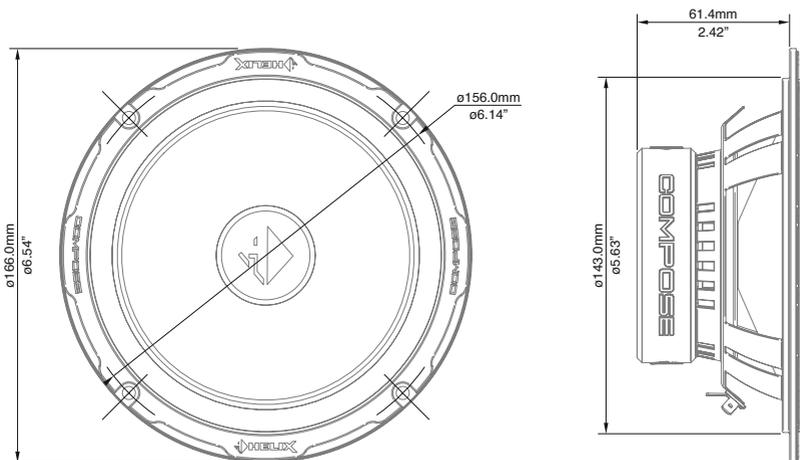
CB W100-S3



CB W130-S3

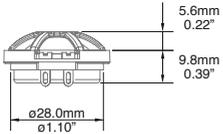
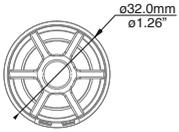


CB W165-S3

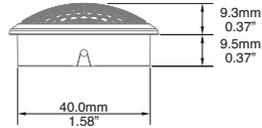
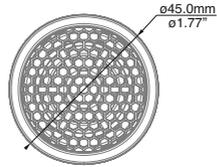


CB T20FM-S

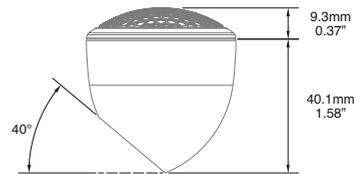
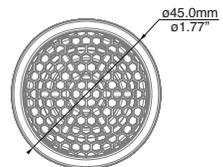
Without housing



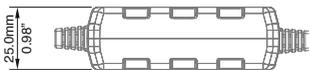
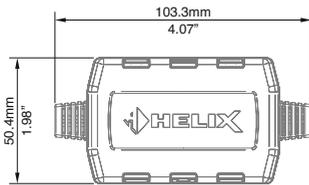
With housing for flush mount



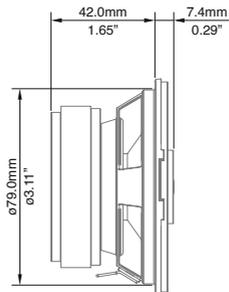
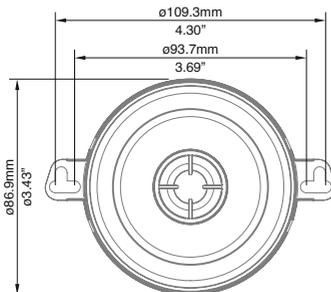
With housing for angle mount



CB FX.2

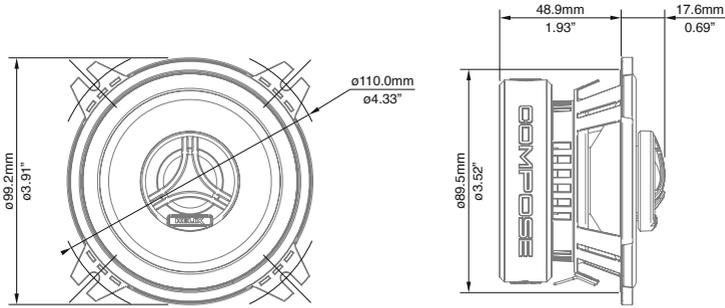


CB C87.2-S3

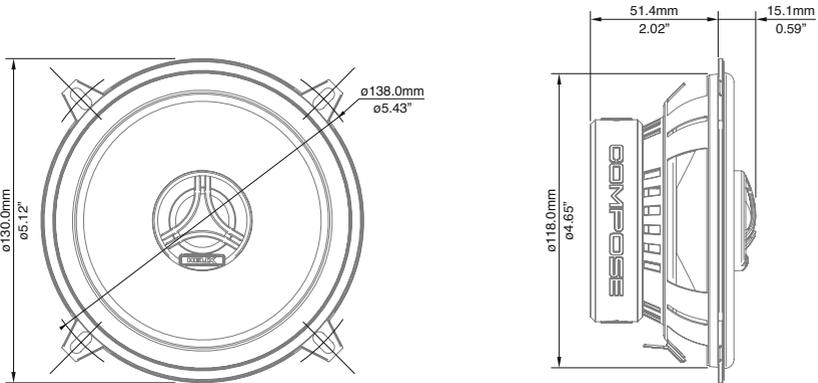


Dimensions

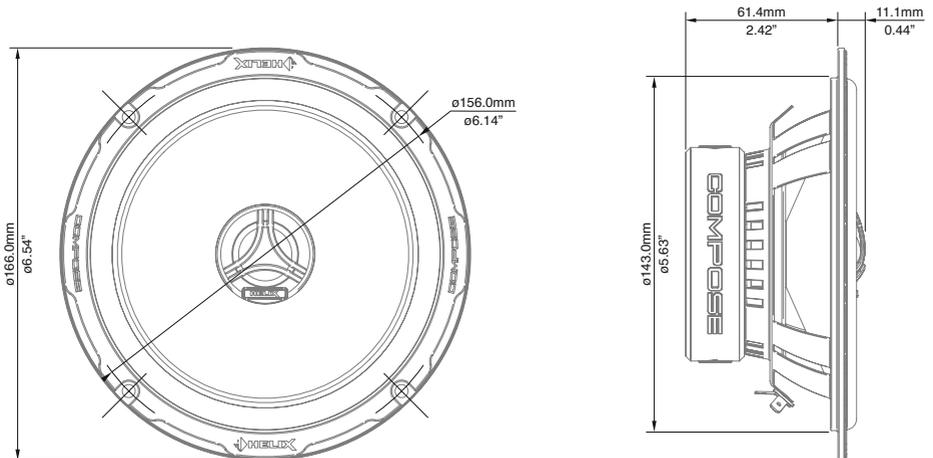
CB C100.2-S3



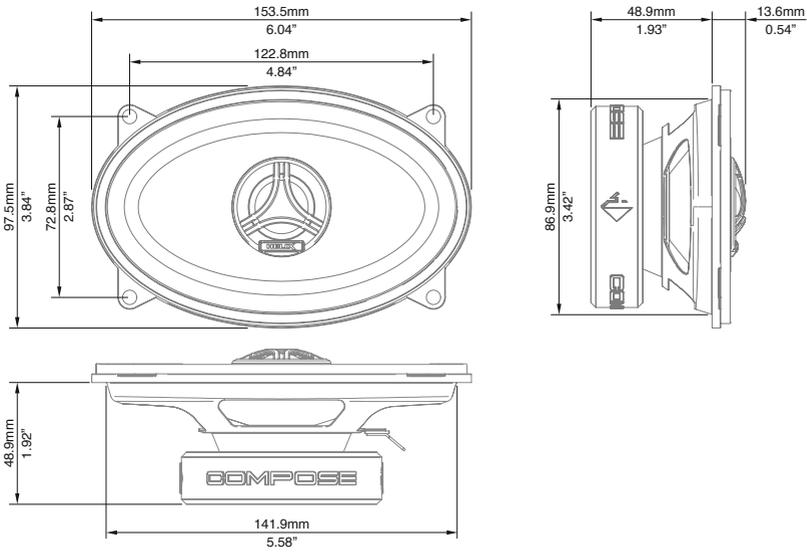
CB C130.2-S3



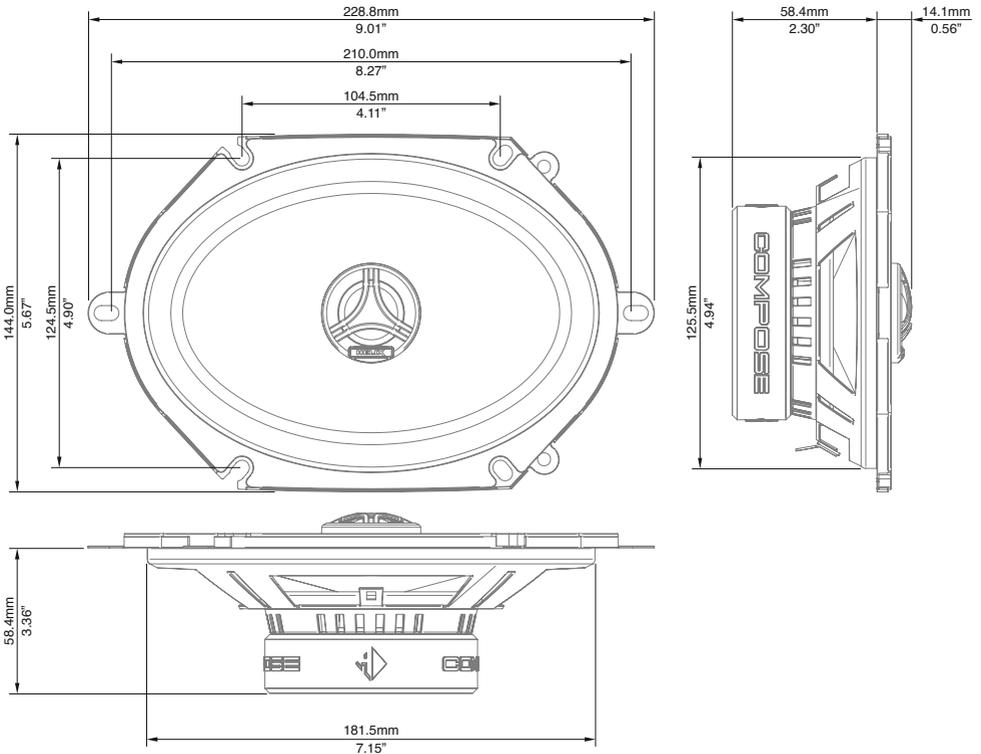
CB C165.2-S3



CB C460.2-S3

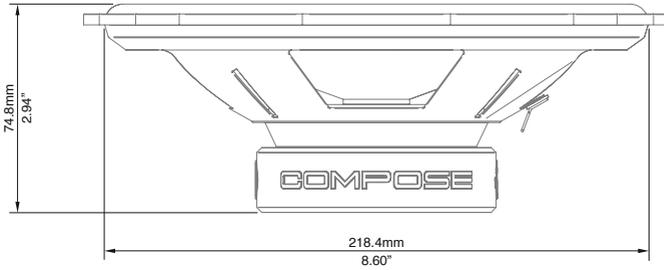
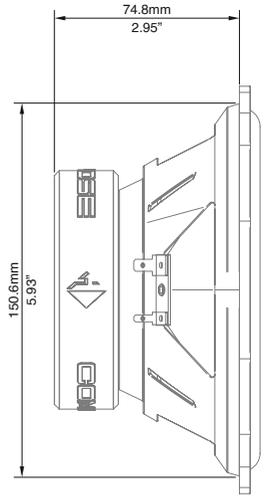
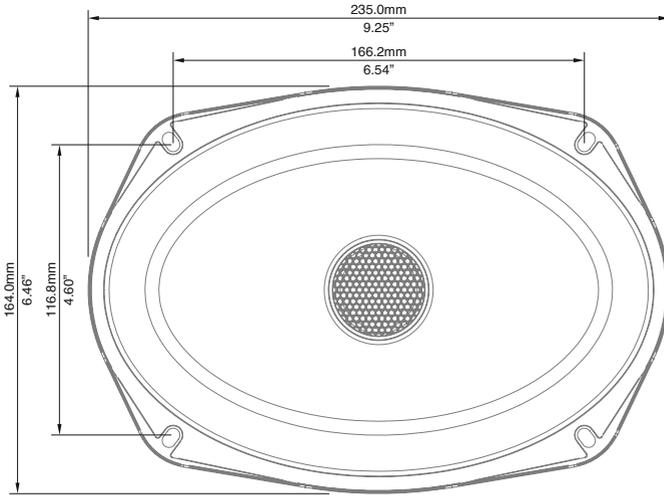


CB C570.2-S3



Dimensions

CB C690.2-S3



Technical data

Speaker kits

		CB K100.2-S3	CB K130.2-S3	CB K165.2-S3
Power RMS / Max.	<i>P</i>	60 / 90 Watts	70 / 105 Watts	80 / 120 Watts
Frequency response		100 Hz - 22,000 Hz	80 Hz - 22,000 Hz	60 Hz - 22,000 Hz
Impedance	<i>Z</i>	3 Ω	3 Ω	3 Ω
Sensitivity	<i>SPL</i>	88 dB @ 2.83V / 1m 84 dB @ 1W / 1m	90 dB @ 2.83V / 1m 86 dB @ 1W / 1m	92 dB @ 2.83V / 1m 88 dB @ 1W / 1m
Outer diameter (more data page 6 et sqq.)	∅	Tweeter: 32.0 mm / 1.26" Woofer: 99.2 mm / 3.91"	Tweeter: 32.0 mm / 1.26" Woofer: 130.0 mm / 5.12"	Tweeter: 32.0 mm / 1.26" Woofer: 166.0 mm / 6.54"
Installation diameter (more data page 6 et sqq.)	∅	Tweeter: 32.0 mm / 1.26" Woofer: 89.5 mm / 3.52"	Tweeter: 32.0 mm / 1.26" Woofer: 118.0 mm / 4.65"	Tweeter: 32.0 mm / 1.26" Woofer: 143.0 mm / 5.63"
Installation depth (more data page 6 et sqq.)		Tweeter: 9.8 mm / 0.39" Woofer: 48.9 mm / 1.93"	Tweeter: 9.8 mm / 0.39" Woofer: 51.4 mm / 2.02"	Tweeter: 9.8 mm / 0.39" Woofer: 61.4 mm / 2.42"
Dimensions crossover		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>	3.1 Ω	3.0 Ω	3.0 Ω
Resonance frequency	<i>Fs</i>	116 Hz	88 Hz	62 Hz
Mechanical Q factor	<i>Qms</i>	5.05	4.10	4.50
Electrical Q factor	<i>Qes</i>	0.97	1.12	0.90
Total Q factor	<i>Qts</i>	0.81	0.88	0.75
Compliance	<i>Cms</i>	250 μm/N	320 μm/N	520 μm/N
Equivalent air volume	<i>Vas</i>	0.9 L	4.2 L	14.5 L
Force factor	<i>B*l</i>	4.2 Tm	3.9 Tm	4.1 Tm
Cone area	<i>Sd</i>	50 cm ²	97 cm ²	141 cm ²
Moving mass	<i>Mms</i>	7.5 g	10.1 g	13.2 g
Mechanical resistance	<i>Rms</i>	1.09 kg/s	1.30 kg/s	1.10 kg/s
Voice coil diameter	∅	25 mm	25 mm	25 mm
Voice coil winding height		8.9 mm	8.9 mm	8.9 mm
Max. linear excursion	<i>Xmax</i>	+/- 2.5 mm	+/- 2.5 mm	+/- 2.5 mm

Tweeter

Impedance	<i>Z</i>	4 Ω	4 Ω	4 Ω
Resonance frequency	<i>Fs</i>	2000 Hz	2000 Hz	2000 Hz
Voice coil diameter	∅	20 mm	20 mm	20 mm

Features

Tweeter		Ultra compact, silk dome, neodymium magnet and FlexMount 20	Ultra compact, silk dome, neodymium magnet and FlexMount 20	Ultra compact, silk dome, neodymium magnet and FlexMount 20
Woofer		Injected polypropylene cone	Injected polypropylene cone	Injected polypropylene cone
Crossover		Tweeter: 12 dB highpass, protection and level adjustment	Tweeter: 12 dB highpass, protection and level adjustment	Tweeter: 12 dB highpass, protection and level adjustment

Technical data

Coaxial systems

		CB C87.2-S3	CB C100.2-S3	CB C130.2-S3	CB C165.2-S3
Power RMS / Max.	<i>P</i>	40 / 60 Watts	60 / 90 Watts	70 / 105 Watts	80 / 120 Watts
Frequency response		110 Hz - 22,000 Hz	100 Hz - 22,000 Hz	80 Hz - 22,000 Hz	60 Hz - 22,000 Hz
Impedance	<i>Z</i>	3 Ω	3 Ω	3 Ω	3 Ω
Sensitivity	<i>SPL</i>	88 dB @ 2.83V / 1m 84 dB @ 1W / 1m	86 dB @ 2.83V / 1m 82 dB @ 1W / 1m	90 dB @ 2.83V / 1m 86 dB @ 1W / 1m	92 dB @ 2.83V / 1m 88 dB @ 1W / 1m
Outer diameter (more data page 7 et sqq.)	∅	86.9 mm / 3.43"	99.2 mm / 3.91"	130.0 mm / 5.12"	166.0 mm / 6.54"
Installation diameter (more data page 7 et sqq.)	∅	79.0 mm / 3.11"	89.5 mm / 3.52"	118.0 mm / 4.65"	143.0 mm / 5.63"
Installation depth (more data page 7 et sqq.)		42.0 mm / 1.65"	48.9 mm / 1.93"	51.4 mm / 2.02"	61.4 mm / 2.42"

Woofers

Impedance	<i>Z</i>	3 Ω	3 Ω	3 Ω	3 Ω
DC resistance	<i>Re</i>	3.0 Ω	3.0 Ω	3.0 Ω	3.0 Ω
Resonance frequency	<i>Fs</i>	92 Hz	113 Hz	92 Hz	65 Hz
Mechanical Q factor	<i>Qms</i>	3.80	4.97	4.28	4.78
Electrical Q factor	<i>Qes</i>	0.74	1.05	1.18	0.93
Total Q factor	<i>Qts</i>	0.62	0.87	0.92	0.78
Compliance	<i>Cms</i>	820 μm/N	272 μm/N	303 μm/N	480 μm/N
Equivalent air volume	<i>Vas</i>	1.5 L	0.8 L	4.0 L	12.9 L
Force factor	<i>B*l</i>	2.9 Tm	3.9 Tm	3.8 Tm	4.1 Tm
Cone area	<i>Sd</i>	36 cm ²	45 cm ²	97 cm ²	139 cm ²
Moving mass	<i>Mms</i>	3.6 g	7.2 g	9.7 g	12.5 g
Mechanical resistance	<i>Rms</i>	0.52 kg/s	1.04 kg/s	1.33 kg/s	1.09 kg/s
Voice coil diameter	∅	25 mm	25 mm	25 mm	25 mm
Voice coil winding height		8.3 mm	8.9 mm	8.9 mm	8.9 mm
Max. linear excursion	<i>Xmax</i>	+/- 2.2 mm	+/- 2.5 mm	+/- 2.5 mm	+/- 2.5 mm

Tweeter

Voice coil diameter	∅	13 mm	20 mm	20 mm	20 mm
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Features

Tweeter		PEI dome and neodymium magnet	Silk dome and neodymium magnet	Silk dome and neodymium magnet	Silk dome and neodymium magnet
Woofers		Injected polypropylene cone	Injected polypropylene cone	Injected polypropylene cone	Injected polypropylene cone
Crossover		Integrated, 6 dB highpass	Integrated, 6 dB highpass	Integrated, 6 dB highpass	Integrated, 6 dB highpass

Coaxial systems

		CB C460.2-S3	CB C570.2-S3	CB C690.2-S3
Power RMS / Max.	<i>P</i>	50 / 75 Watts	70 / 105 Watts	100 / 150 Watts
Frequency response		90 Hz - 22,000 Hz	60 Hz - 22,000 Hz	50 Hz - 22,000 Hz
Impedance	<i>Z</i>	3 Ω	3 Ω	3 Ω
Sensitivity	<i>SPL</i>	90 dB @ 2.83V / 1m 86 dB @ 1W / 1m	92 dB @ 2.83V / 1m 88 dB @ 1W / 1m	94 dB @ 2.83V / 1m 90 dB @ 1W / 1m
Outer diameter (more data page 9 et sqq.)	∅	153.5 x 97.5 mm / 6.04 x 3.84"	228.8 x 144.0 mm / 9.01 x 5.67"	235.0 x 164.0 mm / 9.25 x 6.46"
Installation diameter (more data page 9 et sqq.)	∅	141.9 x 86.9 mm / 5.58 x 3.42"	181.5 x 125.5 mm / 7.15 x 4.94"	218.4 x 150.6 mm / 8.60 x 5.93"
Installation depth (more data page 9 et sqq.)		48.9 mm / 1.93"	58.4 mm / 2.30"	74.8 mm / 2.95"

Woofers

Impedance	<i>Z</i>	3 Ω	3 Ω	3 Ω
DC resistance	<i>Re</i>	3.1 Ω	3.0 Ω	3.1 Ω
Resonance frequency	<i>Fs</i>	120 Hz	67 Hz	56 Hz
Mechanical Q factor	<i>Qms</i>	6.18	3.64	3.73
Electrical Q factor	<i>Qes</i>	1.14	1.04	0.63
Total Q factor	<i>Qts</i>	0.96	0.81	0.54
Compliance	<i>Cms</i>	204 μm/N	399 μm/N	420 μm/N
Equivalent air volume	<i>Vas</i>	1.7 L	12.4 L	24.7 L
Force factor	<i>B*l</i>	4.2 Tm	4.2 Tm	5.7 Tm
Cone area	<i>Sd</i>	77 cm ²	149 cm ²	205 cm ²
Moving mass	<i>Mms</i>	8.7 g	14.3 g	19.1 g
Mechanical resistance	<i>Rms</i>	1.06 kg/s	1.64 kg/s	1.81 kg/s
Voice coil diameter	∅	25 mm	25 mm	25 mm
Voice coil winding height		8.9 mm	8.9 mm	9.0 mm
Max. linear excursion	<i>Xmax</i>	+/- 2.5 mm	+/- 2.5 mm	+/- 2.0 mm

Tweeter

Voice coil diameter	∅	20 mm	20 mm	25 mm
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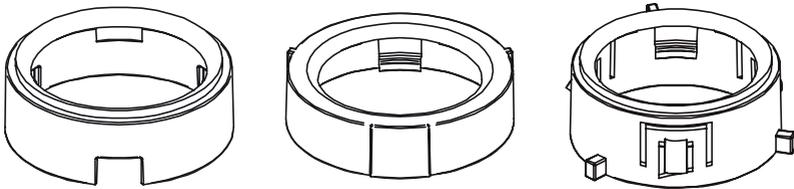
Features

Tweeter		Silk dome and neodymium magnet	Silk dome and neodymium magnet	Silk dome and neodymium magnet
Woofers		Injected polypropylene cone	Injected polypropylene cone	Injected polypropylene cone
Crossover		Integrated, 6 dB highpass	Integrated, 6 dB highpass	Integrated, 6 dB highpass

FlexMount car-specific adaptors

The optionally available **FlexMount 20** car-specific adaptor rings allow a tailored and acoustically optimized adaption of the HELIX COMPOSE tweeters to the vehicles original mounting location. Contact your retailer or visit www.audiotec-fischer.com/compose for an up-to-date overview of available adaptors.

FlexMount 20



Contact your retailer or visit
www.audiotec-fischer.com/compose for an up-to-date
overview of available **FlexMount 20** car-specific adaptors



Correct disposal of this product

(Applicable in the European Union and other countries with separate collection systems)

If you want to dispose this product, do not mix it with general household waste. There is a separate collection system for used electronic products in accordance with legislation that requires proper treatment, recovery and recycling. Contact your local government office for details in locating a recycle facility close to you. Proper recycling and waste disposal will help conserve resources and prevent detrimental effects on our health and the environment.

Warranty disclaimer

The warranty service is based on the 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! For damages on the vehicle and the device, caused by handling errors of the device, we can't assume liability. All HELIX speakers are tagged with a CE-Certification mark. Thereby these devices are certified for the use in vehicles within the European Community (EC).

AUDIOTEC
FISCHER

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Hünegräben 26
57392 Schmallenberg
Germany

Made in China
CE EAC UK CA 