

# DALI GARDIAN OW 6

TECHNOLOGY PAPER



IN ADMIRATION OF MUSIC



## DALI GARDIAN OW 6

DALI low-loss, high performance sound quality leaves the house and ventures outside with the GARDIAN OW 6 outdoor loudspeakers. By combining water and dust proof, high performance wide dispersion drivers with a stylish all-weather cabinet and tool-less, auto-connect, Click n' Connect pan and tilt mounting hardware, the GARDIAN OW 6 satisfies the most demanding, all weather, outdoor loudspeaker needs and achieves a class-leading IP67 (Ingress Protection) certification.

The GARDIAN OW 6 takes genuine DALI sound, in a stylish easy installation package, to the outdoors all year round. It sets a new standard for high performance outdoor audio, and the following paragraphs will describe its design, performance and use.



## DESIGN AND ENGINEERING

Designing a loudspeaker that takes high performance audio into the open air introduces a variety of engineering challenges that don't have relevance in the design of indoor loudspeakers. Perhaps the most obvious and significant example of this is that outdoor loudspeakers have to be waterproof so that rainwater, condensation, poorly directed hosepipes or exuberant swimming pool splashes

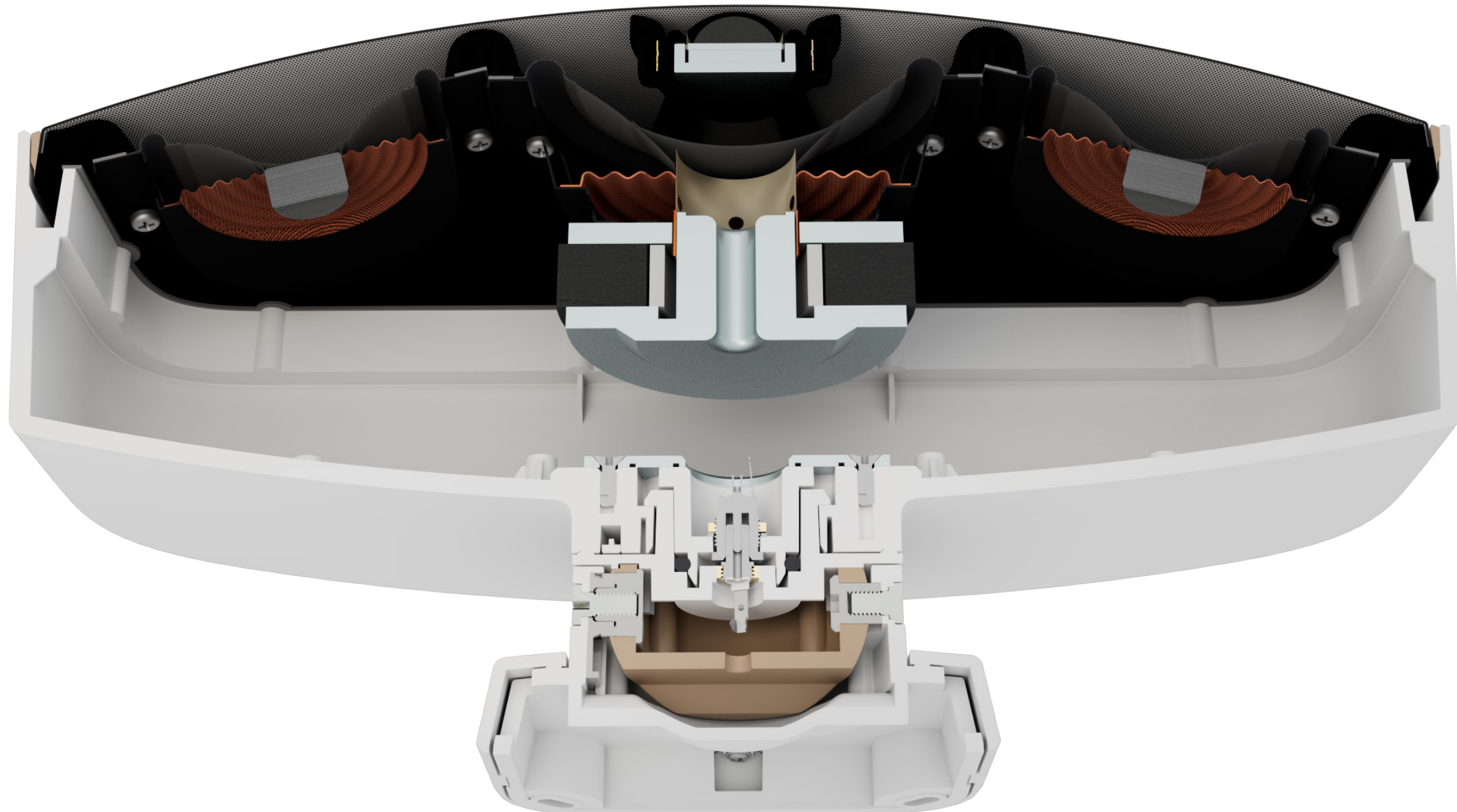
don't find their way inside to damage or corrode the sensitive electro-mechanical components.

However, water doesn't present the only challenge for outdoor loudspeakers. Wind-blown dust or even larger objects such as leaves or twigs can also potentially pose a risk. And enthusiastic outdoor games that might result in fast-moving balls must also

be considered. The IP67 rating of GARDIAN OW 6 not only defines its water resistance (it is effectively waterproof) but also defines it as fully resistant to dust ingress. And its rigid cabinet and aluminium grille provide genuine protection from physical impact.

The GARDIAN OW 6 can survive not just a splash and a blast of wind, but a big hit too.

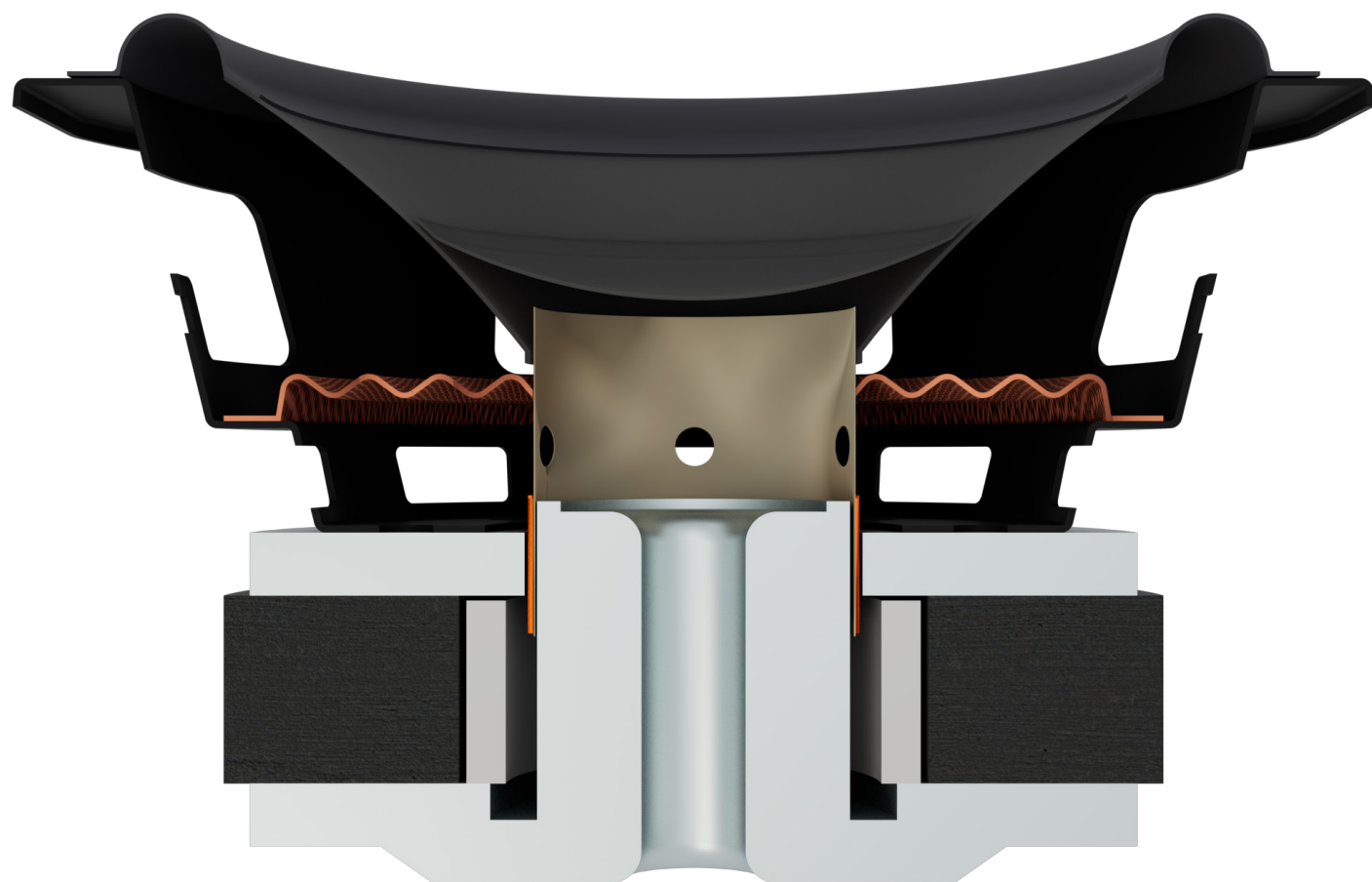
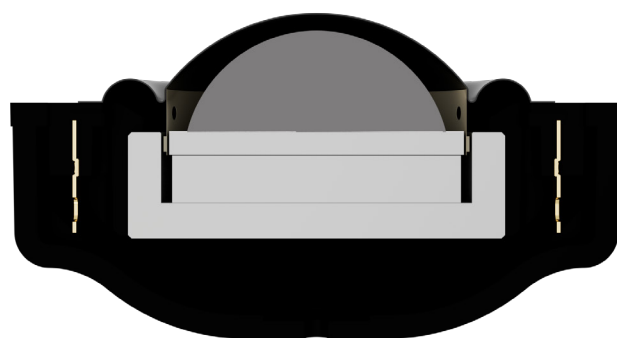
Outdoor loudspeakers must also be able to tolerate extreme temperatures at both ends of the scale and rapid temperature changes too. Therefore, the GARDIAN OW 6 is designed to withstand temperatures from -20°C to +70°C, making it suitable for both high summer applications in tropical climates and a mid-winter freeze in more temperate climates. It's a loudspeaker for all seasons and all locations.



## BASS/MIDRANGE DRIVER AND TWEETER

In addition to being designed for outdoor applications, the GARDIAN OW6 bass/midrange driver and tweeter are designed with DALI's low loss and low distortion principles very much to the fore. The bass/midrange driver is a DALI designed 5¼ inch unit that combines genuine DALI low loss sound quality with all-year-round outdoor performance. In addition to its water and dust proof polypropylene diaphragm, the driver features a high-power ferrite magnet motor system with a copper wire voice-coil wound on a low-loss kapton former. The driver provides high performance foundation for the GARDIAN OW 6's best-in-class sound quality.

The DALI designed and concentrically mounted 25 mm tweeter of the GARDIAN OW 6 features a lightweight, water and dust proof soft textile dome combined with a high performance neodymium-iron-boron magnet system. The tweeter provides explicit and detailed high frequency performance all the year round, whatever the weather.

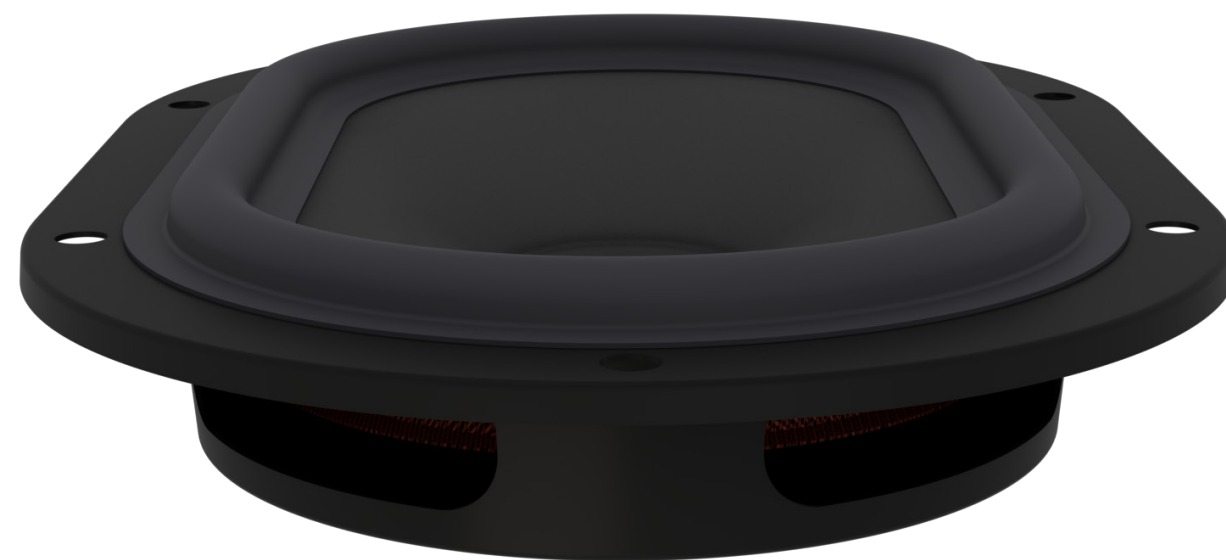


## AUXILIARY BASS RADIATORS

The most obvious potential route by which water might make its way inside a traditional loudspeaker is via the reflex port. So that is the first feature an outdoor loudspeaker must live without. However, especially when a loudspeaker is necessarily of compact dimensions, reflex loading provides a useful increase in power handling and bass bandwidth. So rather than use a port for reflex loading, the GARDIAN OW 6 employs twin 5 inch (130 mm) auxiliary bass radiators, one located each side of bass/midrange driver on the front panel. The Auxiliary bass radiator (ABR) is closely related to port based reflex loading in that it passively employs the low frequency rearward radiation of the bass/midrange to provide increased output over a narrow range of bass frequencies. Adjusting the mass of an ABR diaphragm enables its resonance frequency to

be tuned such that it generates bass just as the bass/midrange driver output begins to decay, while at the same time reducing the diaphragm movement of the bass/midrange driver. The result is extended bass and increased low frequency power handling from a compact enclosure.

The twin ABRs of the GARDIAN OW 6 are oval in profile in order to maximise their radiating area, and through employing polypropylene diaphragms with low-loss natural rubber surrounds, they are inherently waterproof. The ABRs are tuned to 52 Hz and this frequency broadly defines the class-leading bass roll-off of the GARDIAN OW 6. Low frequency roll-off specifications however don't tell the whole story because the real proof is in the listening. GARDIAN OW 6 bass sounds extended and precise, displaying the same kind of engaging and musical qualities that characterise every DALI loudspeaker.





## CLICK N' CONNECT BRACKET

A further aspect of loudspeaker design that demands specific engineering qualities in order to perform reliably in outdoor installations is electrical connection. The conventional loudspeaker connection technique of stripped wires or 4 mm (banana) plugs inserted into exposed spring or screw terminals is completely unsatisfactory outside the warm and dry indoor environment. Corrosion or short-circuits will quickly render connections unreliable and might even result in amplifier damage. Therefore, the GARDIAN OW 6 employs a connection solution that is not only fully reliable outdoors, it also helps make installation far easier than might otherwise be the case.

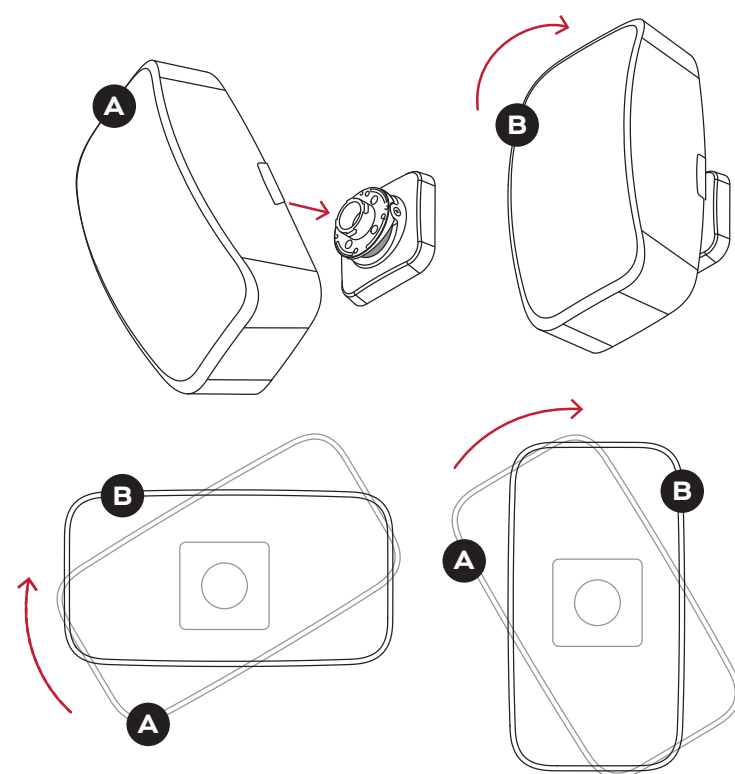
The GARDIAN OW 6 is supplied with a custom, adjustable 'Click n' Connect' mounting bracket and it is this, rather than the loudspeaker itself, that connects to the cables from the amplifier. Connection is achieved via conventional spring terminals that are hidden within the bracket behind a removable and weatherproof cover.

With a bracket secured to its mounting structure and connected to loudspeaker cables, the GARDIAN OW 6 itself then click-fits to the bracket with electrical connection between the two happening automatically. Not only does this technique ensure that all connection points are fully protected from the outdoor environment, it means that GARDIAN OW 6 loudspeakers can be easily removed or replaced, leaving the brackets in place, if so desired. In this case, an accessory rubber cap is optionally available that can be fitted over the exposed end of the bracket to protect the otherwise exposed connection components.

## ENGINEERING FOR THE OUTDOORS

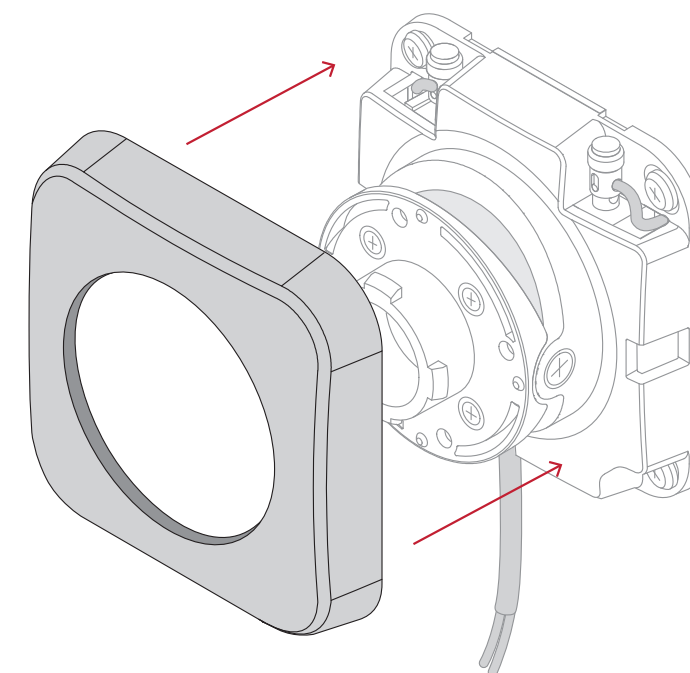
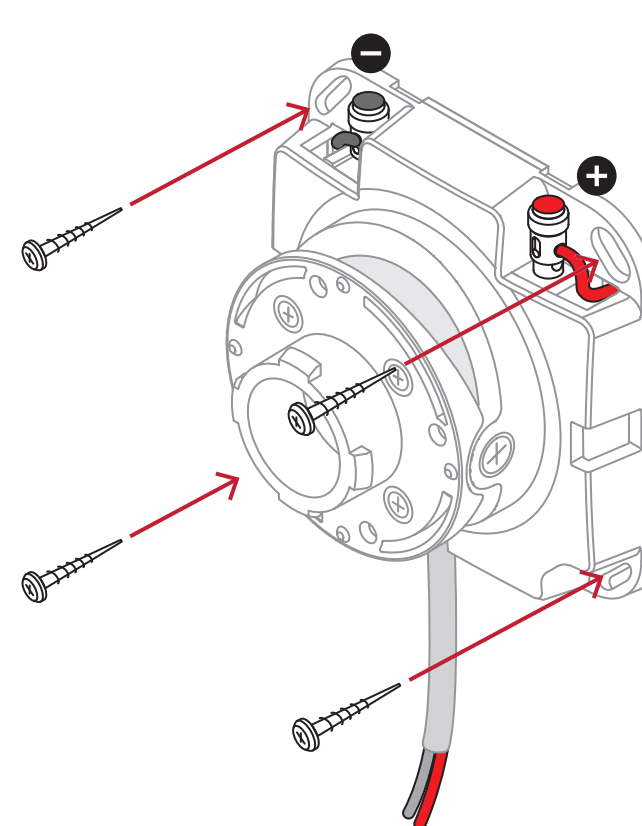
While the use of auxiliary bass radiators and hidden connectors are the most obvious elements of the GARDIAN OW 6 outdoor adaptation, it incorporates numerous further features that contribute to its performance. For example, in common with its auxiliary bass radiators, the GARDIAN OW 6 bass/mid driver diaphragm and surround are manufactured in polypropylene and natural rubber respectively to provide inherent waterproof qualities.

The GARDIAN OW 6 cabinet is moulded in rigid, foamed polypropylene that not only offers non-resonant acoustic characteristics but is also dimensionally stable over a very wide temperature and humidity range. Furthermore, foamed polypropylene also offers great strength, relatively light weight and is washable. The cabinet is created from a front and a rear injection moulded parts that are screwed together with a watertight seal integrated into the join. The GARDIAN OW 6 front panel is finished by a painted and corrosion-free perforated aluminium grille that provides a stylish aesthetic touch and high degree of driver protection. And finally, all GARDIAN OW 6 metal parts that are exposed to the outdoor environment, screws for example, are chemically plated to resist corrosion.



! To attach a loudspeaker, present it to the bracket at a rotational angle of approximately 20° (A) and insert the loudspeaker post into the wall bracket aperture. When the post is fully inserted, rotate the loudspeaker clockwise towards the perpendicular (B). The loudspeaker will Click n' Connect into place as it reaches the perpendicular.

! Cable routing to the terminals can be done from either side, from the bottom or from behind





# OUTDOOR ACOUSTICS

Installing loudspeakers outdoors presents a slightly different set of requirements in comparison to conventional indoor installation, and the GARDIAN OW 6 is specifically designed to offer a perfect set of features.

## INSTALLATION VERSATILITY

The context of conventional indoor loudspeaker installation is usually defined by predominantly rectilinear listening spaces with well established boundaries that define loudspeaker positioning and spacing. This is especially the case when loudspeaker positions

are driven by the needs of stereo or multi-channel reproduction. Outdoor loudspeaker installation however is more free-form, with loudspeaker locations driven by the availability of suitable mounting locations and the needs for broad audio coverage in areas where listeners require it. So, the key to successful outdoor loudspeaker installation is versatility, and the GARDIAN OW 6 is designed specifically to provide it.

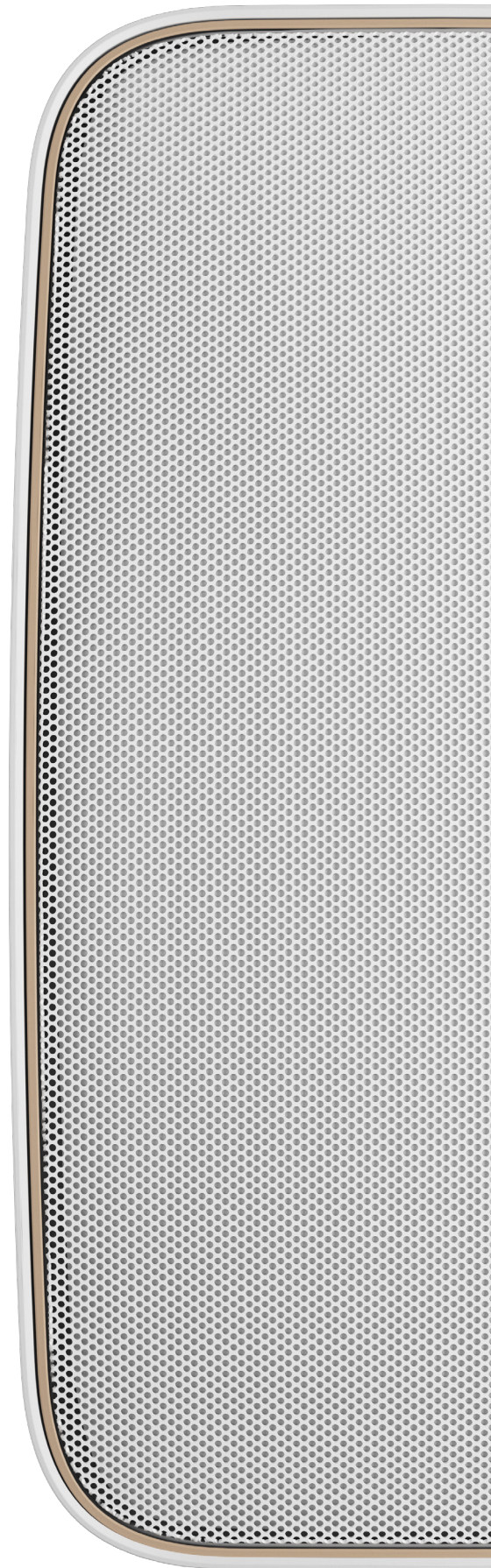
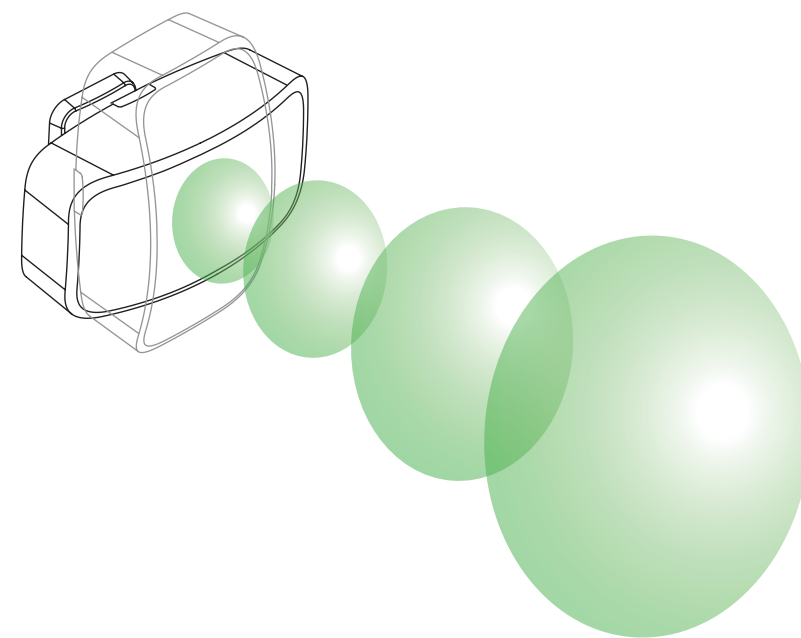
The GARDIAN OW 6 housing and grille can be painted to suit your installation surroundings.

! Painting should be executed by professionals only.



## SYMMETRICAL DISPERSION

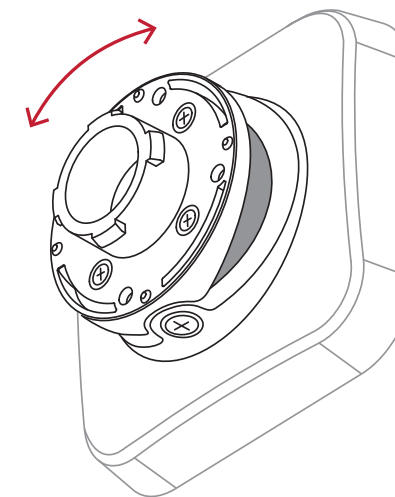
The GARDIAN OW 6 employs a coaxial driver array where the tweeter is mounted forward of the bass/midrange driver on a common central axis. This arrangement ensures that, rather than displaying the asymmetric acoustic dispersion characteristics of loudspeaker with spaced drivers, GARDIAN OW 6 dispersion is symmetrical. The great advantage of symmetrical dispersion in an outdoor installation context is that it ensures loudspeaker mid frequency radiation isn't biased either up or down (in portrait installation) or left or right (in landscape orientation). GARDIAN OW 6 dispersion is consistent in all orientations, and when loudspeaker locations are driven by structural or architectural constraints, this is an invaluable characteristic. Furthermore, the GARDIAN OW 6 is designed to offer dispersion and this again is invaluable in outdoor installations because it makes loudspeaker installation locations less critical in terms of their listening area coverage.



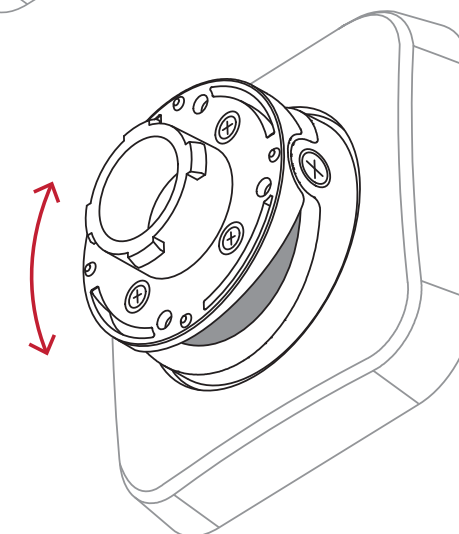


## PAN AND TILT ADJUSTMENT

The GARDIAN OW 6 Click 'n Connect bracket also offers pan and tilt adjustment that enables loudspeaker output to be directed as needed. This is particularly valuable in an outdoor loudspeaker installation context because outdoor acoustics tend to be less reverberant than indoor acoustics, and that means there will tend to be less uniformity of sound throughout a listening area. In technical terms, the reverberant field, where the sound heard by listeners is predominantly reflected from walls and ceilings, rather than direct from the loudspeakers, tends to be further away from the loudspeaker outdoors than it is indoors. A more distant reverberant field means that the ability to direct loudspeaker output towards the required listening area becomes more important, so the pan and tilt feature of GARDIAN OW 6 is hugely valuable.



Pan Orientation



Tilt Orientation





# OUTDOOR LOUDSPEAKER INSTALLATION

Outdoor loudspeaker installations can cover a wide variety of contexts. From general audio coverage in an outdoor deck area for example, to a pool area, around a barbecue, in a garage, or maybe even for multi-channel audio duties in a semi-enclosed home theatre. The GARDIAN OW 6 offers all the versatility required to mould itself to suit the mounting assets available and enable every outdoor installation to be optimised - even in the typical outdoor context of irregular and perhaps ill-suited mounting structures and surfaces. The following images and captions illustrate a few of the possibilities.

Even though the DALI GARDIAN is developed as an outdoor loudspeaker, its use in indoor installations is also quite extensive. Typical applications will include some form of exposure to water, such as indoor pool areas, spas or saunas. But also, because of the sleek and modern design, its use in hospitality applications such as hotel bars, restaurants, cafés or the like, will also be obvious use cases for the DALI GARDIAN.

## COMMON APPLICATIONS

### Residential - Indoor/Outdoor

- Pool areas
- Spa/Wellness areas
- Saunas (by the floor)
- Gym and Fitness
- Laundry rooms
- Garden areas
- Outdoor kitchen and dining areas
- Outdoor multichannel home-theatre
- Outdoor stereo/multizone music applications
- Surround / Immersive channels for surround

### Commercial installs - Indoor/Outdoor

- Pool areas
- Spa/Wellness areas
- Saunas (by the floor)
- Gym and Fitness
- Shower rooms
- Hotel bar / reception
- Restaurants
- Retail stores
- Theme parks
- Outdoor stereo/multizone music applications





# OUTDOORS IS THE NEW INDOORS

The GARDIAN OW 6 is the first DALI loudspeaker designed for all weather, all-year-round, outdoor use. Water and dust proof construction, combined with genuine DALI low-loss sound quality, and multiple features designed to ensure simple and versatile installation make the GARDIAN OW 6 the definitive best-in-class choice. It takes DALI loudspeaker quality out of the home and into the outside world. Outdoors is the new indoors.







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## TECHNICAL SPECIFICATIONS

GARDIAN	OW 6
Frequency range	47 - 25,000 Hz +/- 3dB
Sensitivity	84 dB @ 1 m for 2.83 V
Nominal impedance	6 ohm
Maximum SPL	103 dB
Crossover frequency	2,700 Hz
Crossover principle	2-way
Recommended amplifier power	50 - 200 Watt
High frequency driver	1 x 25 mm soft dome (Coaxially mounted)
High frequency diaphragm	Soft woven fabric
Low/Mid frequency driver	1 x 5 inch
Low/Mid frequency diaphragm	Polypropylene
Connection input	Single wire
Enclosure type	Tuned Mass Enclosure 2 x 5 inch (oval) passive radiators
Other features	Click n' Connect wall bracket
Installation location	On-Wall / On-Ceiling
Recommended placement	Ceiling / Front / Centre / Surround
IP rating	IP 67
Outer dimensions incl. grille (H x W x D)	200 x 372 x 206 mm 7.87 x 14.65 x 8.11 inches
Weight incl. grille	4.08 kg 9 lbs
Shipping weight (pair)	10.4 kg 22.92 lbs
Finish	White / Black
Included accessories	Wall Mounting Template
Optional accessories	Wall Bracket Cover

All technical specifications are subject to change without notice.

[dali-speakers.com/gardian](https://dali-speakers.com/gardian)