



# **STADIUM & ARENA**

## REFERENCES



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# YOUR HOME FIELD ADVANTAGE INCREASES WITH RCF

**RCF Stadium and Arena References** catalog presents a wide range of integrated audio systems to immerse a crowd into any player's performance. When music and voice are clear and intelligible, the audience is completely engaged and feels the emotions on the field. RCF draws on extensive technical expertise in solving complex acoustical problems found in large arenas with advanced audio systems. Our goal is to always improve and enhance the spectator experience in every seat.

All RCF products provide incredibly balanced SPL, consistent coverage, and maximum reliability to an extended market of professional installers and integrators. Discover RCF's long-throw speaker selection for added flexibility, perfect intelligibility, and reliable directivity factors.

Explore the convenience of RDNet, RCF's proprietary control and monitoring platform to manage all connected speakers and amplifiers on one single network. This catalog includes speaker systems designed to meet all pro audio contractors' requirements for sports facilities, and small to large indoor and outdoor venues.

## RCF SOUND CULTURE

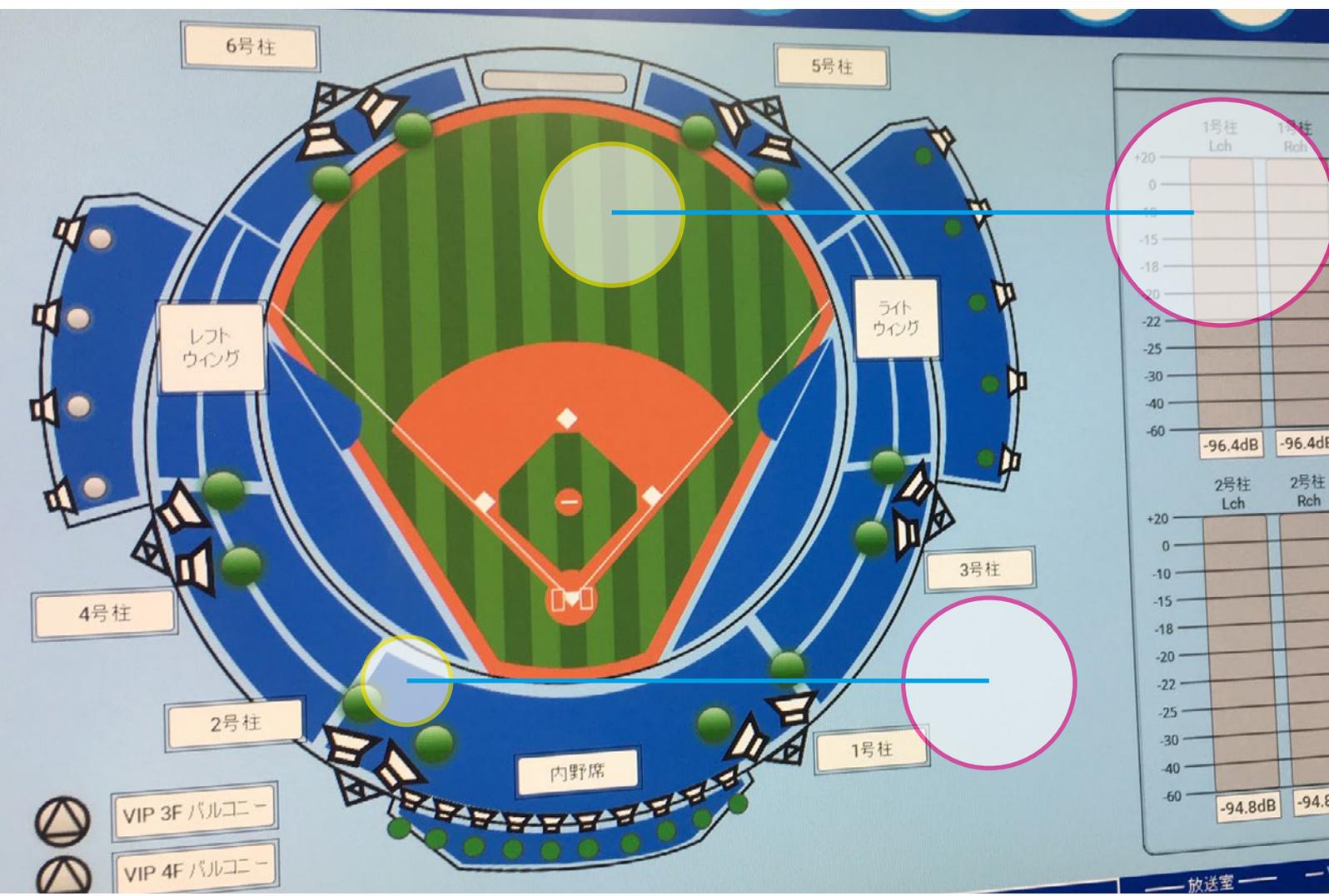
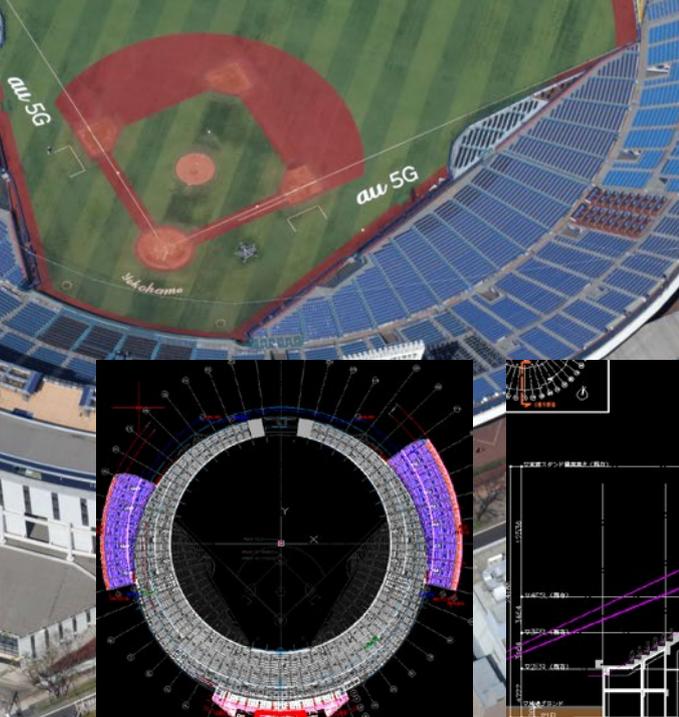
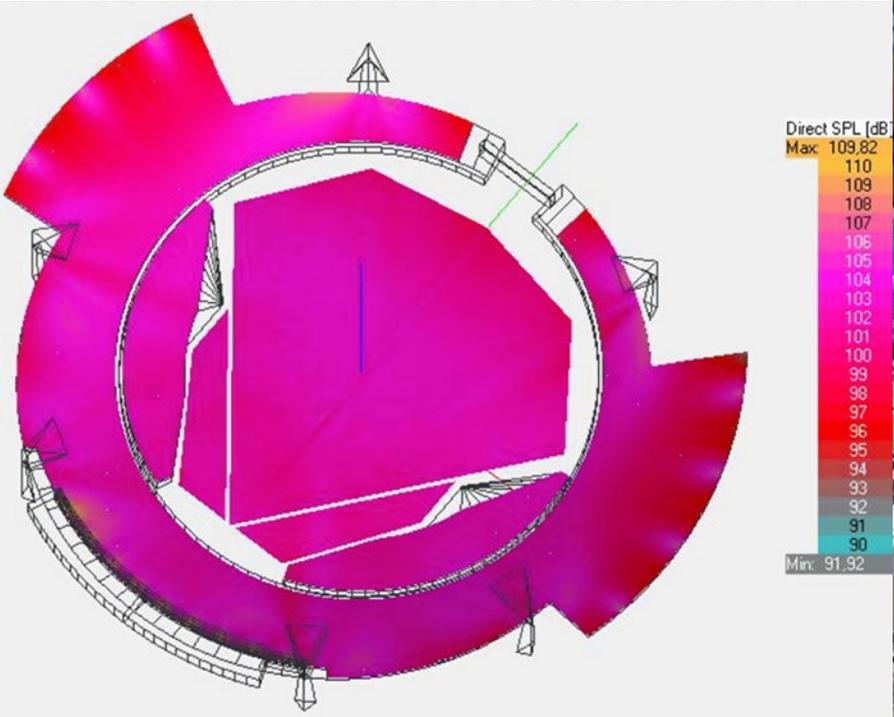
RCF is a leading technology brand of professional audio equipment, transducers, electronics, DSP, and custom solutions for any sound and any place. Established in Italy in 1949, RCF has been committed to the perfect reproduction and amplification of sound for events and concerts, recording, public address, broadcast, and portable audio. RCF has consistently transformed the pro-audio industry, developing components and products in-house to ensure maximum quality and reliability to the end-user.

## FOREFRONT TECHNOLOGY

Innovation comes first and foremost, thanks to the RCF R&D team, developers of many original products and technologies, such as the hyper-venting system, the inside/outside voice coil, the dual silicone spiders, and countless mechanical, digital, and leading-edge electronic solutions. RCF is one of the few loudspeaker companies worldwide that internally manufacture transducers, speaker systems, electronics, and software. All products feature RCF's exclusive designs and technologies.

## A REFERENCE IN INDUSTRY

RCF is always at the forefront of technologies and materials research, providing tools, documentation, technical support to help professionals deliver optimized sound to the listener. Training activities for all audio professionals and enthusiasts draw into 70 years of experience and knowledge of its engineers. The internal support engineering team is on hand to assist architects, system designers, or integrators during the design and customization of complex systems. Tangible technical expertise, modern Italian manufacturing facilities, and continuous technological refinement set RCF as an essential reference for all audio professionals and enthusiasts. RCF supports customers in its offices in the United States of America, France, Germany, Italy, Spain, the United Kingdom, and a network of more than hundreds of trusted distributors throughout the rest of the world.



# ENGINEERING SUPPORT GROUP

## CUSTOMIZATION WITHOUT BOUNDARIES

Our Engineering Support Group works side by side with the R&D Department to create tailor-made equipment based on the client's real needs – complete with rigging accessories, signal processing, or custom mechanics. We are not only suppliers of standard products but also a team of highly skilled engineers who develop personalized audio solutions. Contact the RCF team to learn more about customization and color options to suit your unique environment. Each project has important benchmarks and we will help you to get the job done.

## RCF EXPERIENCE AT YOUR SERVICE

The direct involvement in particularly complex projects Worldwide is continually raising the know-how and reputation of our team of specialists that is considered one of the best Engineering Support Groups in our industry. A system design must always consider the environment's acoustics, the architectural and installation constraints, the maintenance costs, and the user's requirements. According to cost and performance requirements, the extensive and complete range of RCF products enables the Engineering Support Group to submit multiple design solutions optimized for each project.

RCF is committed to providing complete support, helping our customers choose the most suitable solutions for their projects to achieve the best results. This support team is crucial to RCF's continual success. We continue to invest in our knowledge and skill by expanding our engineering team of product specialists and the latest equipment and software technologies.

- **DESIGN PROPOSAL**

Based on supplied venue details, including environmental acoustic simulation, product list, block diagram, and speaker coverage mapping.

- **DESIGN VALIDATION**

Based on the client's design, we guide the proper selection and placement of RCF products.

- **DESIGN OF ALTERNATIVE SOLUTIONS**

Based on existing specs, we provide advice and improved system configurations based upon RCF products to optimize the installation.

- **ACOUSTICAL CONSULTANCY**

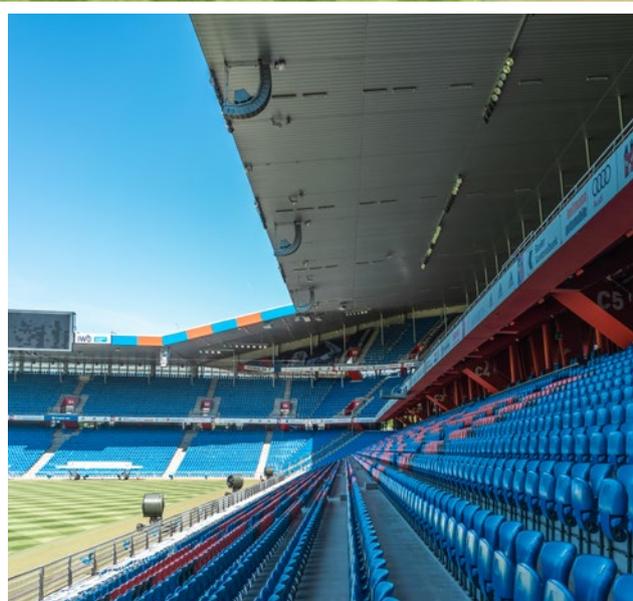
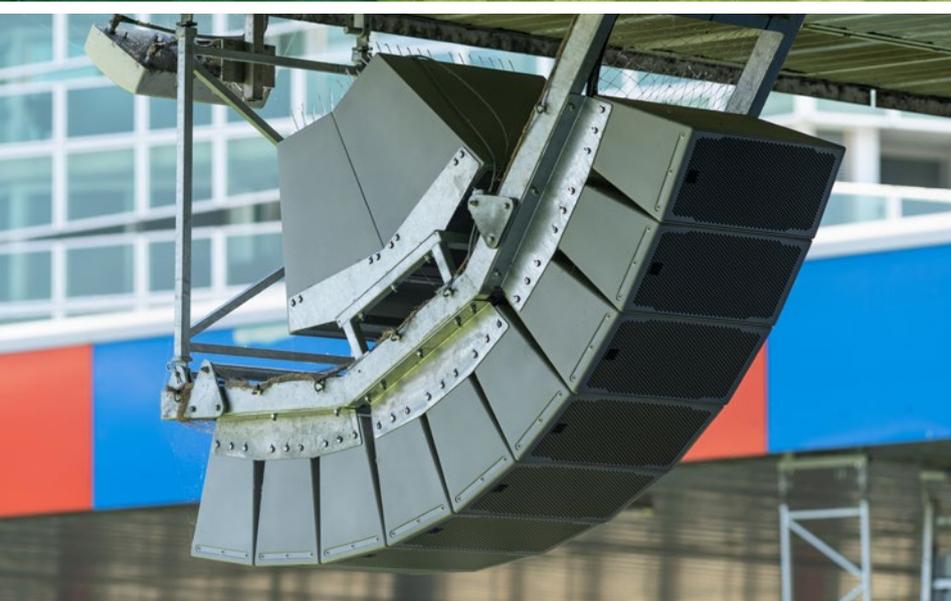
We help with the definition of the project's specifications in cooperation with architects and contractors.

- **ON SITE**

We provide system start-up and commissioning. RCF produces pre-wired racks on request, complete with connection diagrams and operation manuals.

## AUDIO ACADEMY TRAINING ACTIVITIES

Our training sessions are available in our worldwide educational program or can be customized according to the client's requirements. ESG members are involved in education and training activities where they can exchange information and ideas with consultants and contractors participating in the RCF Audio Academy program. RCF provides an extensive selection of courses and workshops covering several subjects such as new products, technologies, user cases, and in-depth professional training. Sessions are organized worldwide by our Instructors/Engineers and also in RCF Audio Academy facilities in Italy and Germany.



## ST Jakob Park - Basilea (Switzerland)

Basel, Switzerland - The St. Jakob Park, locally referred to as “Joggeli”, looks back on a long history. The largest stadium in Switzerland follows a new construction managed by the architects Herzog & de Meuron. After several extensions, St. Jakob Park is the first multifunctional venue in Switzerland with apartments, a shopping center, restaurants, department stores, and is also a UEFA Category 4 stadium. During the most recent modernization in 2020 and 2021, the owner, FC Basel 1893 renewed the entire sound system with RCF sound systems. The under-balcony PA system and the entire grandstand PA system have been upgraded with RCF loudspeakers. Power amplifiers and audio matrix systems have also been replaced. In particular, the client chose passive systems of the HL, HVL, and P series from the Italian manufacturer to renew and improve the sound experience.

Since the modernization took place during running games of the season, the team around Martin Reich (audioconsulting ag) implemented the renewal of the audio system in three phases. First, the amplifiers and the audio matrix were replaced, followed by the installation of the under-balcony fills, and as a final step, a completely new sound system for the grandstands.

Martin Reich, CEO of audioconsulting ag, draws a first positive conclusion: “After the first few games, we have received very positive feedback. The music reproduction and the coverage by the new RCF systems have become more homogeneous in comparison, and speech intelligibility has also improved distinctly. With the line array systems, we can make much finer adjustments in terms of quieter and louder sections than was ever possible with the previous point-source loudspeakers.”

Due to the high acoustic requirements of the UEFA directive for a stadium sound system, the excellent experience with RCF loudspeakers in several Bundesliga stadiums, the decision was made to install loudspeakers from the HL, HVL and P Series. In total, the grandstand PA system comprises 205 HL 40 line array elements, 30 HS 2200 high-performance subwoofers for the main PA, and ten HVL 15 loudspeakers for the corner PA. A total of 330 P 4228 loudspeakers, specially manufactured in Basel-Red color, are used to reinforce the under-balcony areas and the walkways.

The RCF systems fulfilled all benchmarks in the decision of FC Basel 1893 as operator of the St. Jakob Park stadium and audioconsulting ag as an installer. The most important criterion was the improvement in speech and music reproduction, which is largely achieved. The audio system is also used for safety-related announcements, so it must guarantee the requirements of the Swiss SES guideline SN EN 50849. Equally crucial was a seamless transition from the old to the new system and excellent weather resistance and reliability parameters during day-to-day operation. The system can be controlled and monitored remotely, virtually down to the smallest transducer

### Products installed



HVL 15-P



HVL 15-S



P 4228



P 3115T



P 6215



P 1108T



SUB 9007-AS



HL 2240



## Paul Brown Stadium - Cincinnati (USA)

For the last 20 years, the Cincinnati Bengals have been taking on NFL rivals at Paul Brown Stadium. This 65,515-seat gridiron arena has always placed a premium on the strength and quality of its audio systems. Equally known as the site of performances by artists ranging from Kenny Chesney to Guns N' Roses, PBS, as locals call it, subscribes to the notion that sound traveling throughout its concourses and seating areas should live up to concert-level expectations at all levels, whether it be on game day or for special events.

To that end, a three-phase project to re-energize the stadium's original, 20 year-old audio blueprint was just completed this fall, debuting on October 4th before a reduced crowd that watched as the Bengals beat the visiting Jacksonville Jaguars. Designed and implemented by Nashville, Tennessee-based Durrell Sports Audio Management, the new system is an amalgam of catalog products and custom speakers built in Italy expressly to meet the needs of this unique application by RCF.

"Paul Brown Stadium is unlike any other around the country when it comes to audio," Durrell's John Horrell explains. "Every aspect of its game-day production from simple announcements to music is as live as you can get. There is nothing here that even vaguely resembles a pre recorded TV show. That's why when we were chosen to upgrade the audio we felt it was essential to create a system that was capable of true, concert-level high performance."

The upgrade project was implemented in three phases, with the first kicking-off in 2018 and bringing, among other things, new delay loudspeakers from RCF to the upper deck and canopy level. Phase two added approximately 120 new RCF loudspeakers to the lower level and 70 more to the canopy level in 2019, along with eight dual 21-inch RCF subwoofers on each side of the canopy level. Phase three of the project was approved in January 2020, so by February the job was underway, with Durrell working hand-in-hand with Louisville, Kentucky's United Electric to turn the new vision into reality.

Critical to the audio heard within this space as well as sound traveling throughout the entire bowl, custom-built, hand-assembled loudspeakers from RCF figured prominently within the phase three additions. Wide horizontal coverage cabinets designated as model HVL 15-L1 and narrow coverage speakers bearing the model number HVL 15-P1 were provided by the Italian manufacturer as one-off custom units built to Durrell's specs just for PBS. In between these custom long-throw boxes, standard offerings from the RCF catalog including model P 4228, P 3115T, and P 6215 cabinets were interspersed as downfill in large number.

### Products installed



HVL 15-P



HVL 15-S



P 4228



P 3115T



P 6215



P 1108T

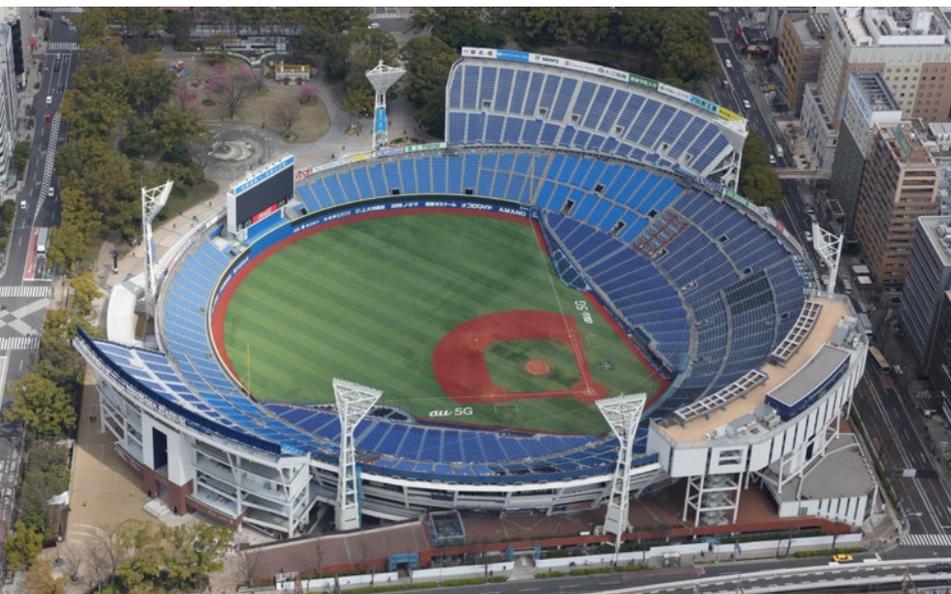


SUB 9007-AS



HL 2240





## Yokohama Stadium - Yokohama (Japan)

Yokohama (Japan) - Yokohama Stadium selects RCF as its sound reinforcement system for both sports and entertainment events. The stadium is one of the venues of the Summer Olympics and one of the most important sports facilities in Japan. It is, in fact, the largest venue in Kantō region of its kind, primarily used for baseball as the home field of the Yokohama DeNA BayStars. International artists also performed at the Stadium, such as Santana, David Bowie, Madonna, and Michael Jackson.

Yokohama Stadium started in 1876 as the common ground for cricket competitions. In 1929, it was reconstructed as a baseball stadium with 15,000 seats to host the country's most popular participatory and spectator sport. Then in 1978, Yokohama Stadium was rebuilt as the first multi-purpose Stadium in Japan, officially named Yokohama Stadium.

After a complete renovation started in 2018, Yokohama Stadium was selected as the venue for 2020 Tokyo Olympics and Paralympics, postponed to the following year to better manage the Covid-19 pandemic. Developers at Yokohama Stadium have added additional seating with the number of seats increased to just over 34,000. It is now known as the official venue of the baseball competitions for the 2021 Olympics. Baseball will be featured at the Summer Olympics in Tokyo for the first time since the Summer Olympics in 2008.

The RCF speaker system serves as a PAGA system (public address and general alarm system). The main systems, consisting of two arrays of four TTL 33-WP each, are placed on six light poles around the Stadium (total 48 speakers). Fly bars are fixed to custom built titanium brackets. Yokohama Stadium has expanded seating on each side, with 4 x P4228 placed on the top edge of the left wing and 5 units on the right wing. Additionally, 9 x P3108 and 1 x P4228 are placed under-balcony to cover the seats behind the plate. Lastly, 1 x P2110-T and 1 x P8015-S are installed to cover the dugout.

“In the renovation of Yokohama Stadium, our mission was to achieve both excellent quality for entertainment as a ballpark and clarity as a broadcasting facility.” says Taketoshi Kobayashi (Lead engineer of Onkyo Tokki). “TTL 33-WP and other RCF loudspeakers were essential to maintain clarity of the sound without losing the volume of the lower part of the spectrum, contrary to the situation where the volume in the low frequency is lost due to prioritizing clarity, which is often seen in outdoor facilities. I was impressed by RCF's intelligibility. The system is perfect for the size and shape of the facility with its skillful design, easy tuning of the speaker, orientation, and level balance. In particular, sound from the opposite side of the field is well controlled. Currently, there are lots of sports facilities with line arrays installed. Still, the sound is very well controlled here, and this also contributes to the improvement of clarity and sound quality.” He continues, “the support of the RCF team during the process was excellent. Quick response to changes in rigging points and model selection was an essential factor in the success of this project.”

### Products installed



TTL 33 WP



P 4228



P 2110T



P 3108



## Konya Torku Arena (Turkey)

When Konya was under consideration as one of the host cities for a future European Championship in Turkey, construction of a brand new UEFA-compliant stadium was proposed. While original plans set a capacity of around 33,000 seats, this was later upgraded to 42,276 seats — divided over two tiers, with an additional 50 VIP boxes — and the new facility, based in Selçuklu, will now provide the club Konyaspor KR with a ultramodern stadium for home matches.

Asimetrik, the Turkish-based distributors and AV system integrators, were awarded the contract to provide a network-based professional grandstand PA system, as well as broadcast infrastructure system, not only compatible with UEFA requirements, but also FIFA and IAFF. They also designed and supplied a PA/VA emergency evacuation system, C.I.S. infrastructure as well as full conference and visual presentation tools for conference, press and meeting rooms. All design, supply, installation and commissioning were undertaken by Asimetrik, who turned to RCF's H Series as their primary sound source.

To ensure such seamless acoustic design and installation, Asimetrik worked alongside main contractor, Sarıdaglar Construction Company and engineers from the Konya Municipality from the very beginning to design a seamless acoustic environment. Led by their project manager, Burak Bayrak, they designed a number of unique solutions, using EASE simulations to visualise the optimum distribution of sound to the seating areas, using the predictive software to set correct splay angles of the RCF loudspeakers and predict the performance with absolute precision.

Turker Baran, Asimetrik's Acoustical Design Engineer, and Burak Bayrak knew that the RCF solution was a proven model, having been inspired by the installation at Juventus Stadium in Turin. "The H Series is also a perfect fit for this stadium — in terms of both power and dispersion," says Mr. Bayrak. "RCF's technical project team partnered us to design the system for Konya. RCF is a unique and well-established brand with a very strong history, and as a partner for 14 years we are delighted to be their distributor."

RCF H 1315 WP loudspeakers were used for the network-based professional grandstand address system. Asimetrik specified 96 units of RCF H 1315 WP loudspeakers, a three-way full range loudspeaker that incorporates a 15in LF transducer, a 10in cone MF transducer and 1.4in exit titanium compression driver. These are mounted in double clusters across 48 rigging points, with a 12-metre distance between each cluster.

### Products installed



H 1315 WP





## Parken Stadium (Denmark)

Parken Stadium is Denmark's national football stadium and the current home of FC Copenhagen. Built between 1990-1992 it currently has a capacity of 38,065 (for football matches) although for other events the stadium can hold as many as 50,000 people with an end-stage set-up and 55,000 with a center-stage set-up.

Keeping pace with the club's recent success, Parken Stadium is equipped with a state of the art infrastructure, with a recently upgraded audio system.

"The new RCF speaker system at the Parken Stadium provides a perfect solution, and we have already received positive feedback from many people who say how impressed they are with the new sound," says Lars Bo Baadsgaard of Nordic Sales who delivered and installed the project. "This is due to the close collaboration with RCF and their project team. With their knowledge of stadia installations, we knew we could rely on their guidance when it came to designing the optimum speaker solution for the Parken Stadium."

To cover the site 42 units of RCF H 1315 WP were installed along with 18 RCF P 4228 and 12 RCF HD 6045EN fiberglass long-throw horns. Each cluster contains three units of the H 1315 WP, a three-way full range loudspeaker system that incorporates a 15" LF transducer, a 10" cone MF transducer and a 1.4" exit titanium compression driver.

In addition the RCF P 4228 speakers were installed to cover selected areas of the tribunes. This weatherproof, full range, wide-dispersion, two-way loudspeaker system offers substantial power and efficiency for a variety of professional indoor or outdoor applications. The HF section is a constant directivity CMD horn loaded with a 1.4" RCF Precision neodymium compression driver with a 2.5" diaphragm assembly for smooth, wide dispersion. The low-frequency transducer is a double 8" woofer with a 2.5" voice coil.

Finally the RCF HD 6045EN fiberglass horns are equally designed to withstand all weathers and offer high sound reproduction quality and sound pressure levels. These horns are used as a separate evacuation set-up, which can be automatically activated if special alert messages are required, or as a safety back up for the bigger H 1315 WP system.

Besides being the home base for FC Copenhagen and the national soccer team, Parken Stadium is also used for hosting big events, concerts and so on. In fact the new audio system has already proven its worth at several such events.

### Products installed



H 1315 WP



P 4228



HD 6045EN



## National Football Stadium - Belfast (United Kingdom)

The National Football Stadium at Windsor Park, Belfast, has been completely redeveloped, following £31m of funding from the Northern Ireland Executive. This included demolition and rebuild of the South and Railway (East) stands, and the subsequent demolition of the West stand, and complete renovation of the North stands by building contractors, O'Hare & McGovern.

This gives the National Stadium, where the Irish Football Association is headquartered, an all-covered seating capacity of 18,434.

Vital to the upgrade was a fully integrated PA and Voice Alarm system that was both EN54 compliant, with an impressive STI value, but at the same time incorporated a dynamic full range entertainment sound system to enhance the match day experience – both for the National team, and Linfield FC, whose home ground this is.

Belfast-based RCF partners, MGA Communication were the successful bidders, responding to a tender document originally drawn up by Arup. They were tasked with carrying out the implementation of commentary/broadcast systems, as well as disabled refuge, working under electrical contractors William Coates; their solution was based around an RCF DXT 7000 emergency evacuation system and Acustica P-series stadium speakers.

MGA managing director Aaron McKeown stated that the main requirement at Windsor Park was for the installation to be EN 54-16 compliant for the electronics, EN 54-24 for the speaker systems and the overall installation to be BS 5839 (Part 8) compliant. The system also needed to meet current FIFA requirements.

“On a normal match day, the crowd noise needs to be exceeded by 10dB,” he said. On being awarded the contract MGA contacted RCF for assistance with the design, derivation and implementation of the PA/VA solution, and soon Francesco Venturi from RCF's Engineering Support Group in Italy was preparing an acoustic model of the stadium using EASE 4.4.

“For us it was a no brainer to use RCF,” said McKeown. “We knew they would support it technically and having an existing working relationship was key,” he said.

A master control rack is stationed in the South stand, with further 42U satellite racks located in other three, linked via optical fiber for the entertainment PA system, and copper for the emergency mic to conform to EN54 norms. Each rack plays its own emergency announcement independently, at an SPL of 89dB(A). There is a fireman's mic in each of the stands on a local buss, and the entire signal path from fireman's microphone to loudspeaker lines is completely and automatically monitored against faults within the DXT 7000's 8 x 80W matrix. Included in the coverage are the pre-existing speakers in the administrative offices in the main stand.

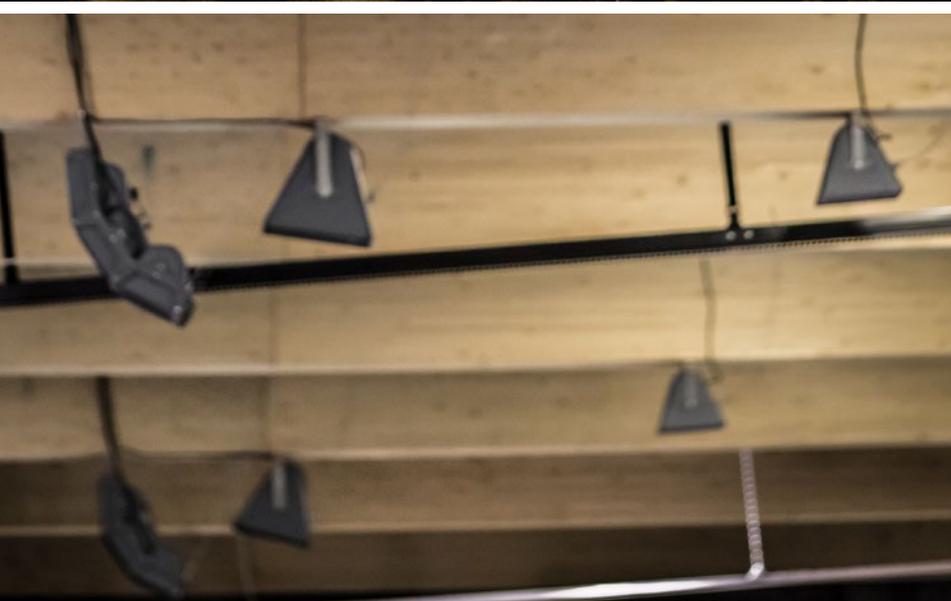
### Products installed



P 6215



HD 21EN



## Tondiraba Ice Arena - Tallinn (Estonia)

The city of Tallinn is carrying out a project of revitalization of its former Soviet residential neighborhoods. The stunning and innovative Tondiraba Ice Arena, was conceived and built with the aim of providing the Lasnamäe district with an avant-garde facility of great functional and architectural value.

Tondiraba's acoustic quality is outstanding – the whole ceiling is made of wooden beams and sound absorbing materials, thus creating very good environmental conditions. The sound system of this new multi-purpose sports arena, with an area of more than 20000 mq, 5840 permanent seats and 1780 additional chairs for concerts, was provided by the local company Event Center with RCF audio products.

The arena needed a complete array system able to reproduce both speech and music clearly even at high sound pressure levels and ensure excellent standards of weather resistance, because humidity inside the building can become quite severe. Simulations were arranged by the distributor using EASE software.

Event Center installed 10 clusters in the main hall, each consisting of three RCF P 4228 loudspeakers coupled with one P 8015S subwoofer. The clusters are directed towards the audience and used for broadcasting announcements and playing music, both from live mic input and playback. Eight additional P 2110T speakers ensure full coverage to the 30x60 metres playing field in the main hall.

Furthermore all practice rinks and the curling hall are equipped with 8 units of P 5228-L two-way speakers and 15 units of RCF TT 22-WP, a special weatherproof version that is adapted to open-air environments.

The distributor company designed the audio system of Tondiraba Ice Arena with the contribution of RCF Engineering Support Group. "We won the competitive tender called by Merko construction company with a bid based upon RCF products. Event Center met all criteria for sound coverage and resistance to humidity", said project manager Priit Hinnov. "The P Series is compact, light-weight and weatherproof. With its 110° horizontal and 60° vertical coverage angle, the P 4228 model guarantees perfect coverage of the whole area."

The system in the main arena is powered by 28 RCF HPS 2500 amplifiers installed in five racks, that allow a separate control of the various parts. "Being able to control independently the various zones where the audience is seated, and having a separate amplification for the playing areas, is extremely important in a venue where various activities are performed at the same time", Hinnov explains.

According to Hinnov, the building will become a major new facility for the country, not only for sports events, but also for concerts and conferences. This is one of the reasons why good intelligibility is a key feature of the chosen equipment.

### Products installed



P 2110T



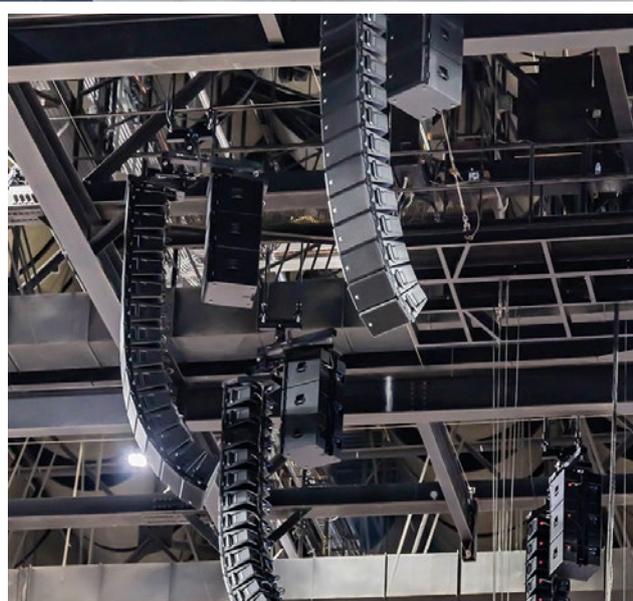
P 8015S



P 5228-L



P 4228



## Legacy Arena - Alabama (USA)

Birmingham, Alabama — In the heart of a thriving section of Birmingham, stands the Birmingham/Jefferson Convention Complex (BJCC) located in the Uptown Entertainment District. The multi-use complex boasts 220,000 square feet of flexible space which serves as a conference and entertainment destination for the city. Some areas of the complex include: one 3,000-seat concert hall, two theatres: one 1,000-seat, and one 274-seat. The largest venue, Legacy Arena with 19,000 seats, has recently undergone a complete audio system overhaul.

Originally build back in 1976, Legacy Arena may be the most impressive renovation of the \$300 million expansion of the Birmingham/Jefferson Convention Complex, which began in 2018. Some of music's biggest names performed at the arena — from Bob Dylan to Garth Brooks, Luciano Pavarotti to Prince, Led Zeppelin to Lynyrd Skynyrd, The Grateful Dead to Taylor Swift, JAY Z to ZZ Top, to name a few. It has hosted major sporting events as well, from basketball to hockey, to tennis matches, and attractions from tractor pulls to the Ringling Bros. and Barnum & Bailey Circus. And now, chosen venue for the Birmingham Squadron, DanceSport and Gymnastics events for the 2022 World Games.

When Populous, the project architects for the BJCC renovation, required audio design services they brought in top consultants Wrightson, Johnson, Haddon, Williams (WJHW) from Carrollton, Texas. Specializing in sound and video for many of the largest stadiums and arenas nationwide, WJHW Senior Consultant, Guillermo Wabi and his team were brought in to address the challenges and requirements for the arena and design a robust audio system for the installation.

“Imagine you have a venue with six unique areas — all having different sizes, elevations, and acoustic signature, while being open to each other, and having to be adaptable to multi-use scenarios.” explains Wabi. “To design a sound system for those areas, that sounds clear, intelligible, and balanced to everyone, along with providing performance and flexibility, and to be configurable for multiple scenarios by the venue staff, while also having limitations in maximum weight, size, and budget — it was quite a challenge. Often when you design a system for a project like this, there must be a minimum of three systems to choose from, especially when using government funds,” adds Wabi. “RCF became one of the three systems because of the variety of products and accessories in their portfolio that matched with the project needs and budget.”

While the physical and acoustic evaluations were reviewed and analyzed, the contractors hired ESB Group Inc. out of Springville Alabama, who's main bowl sound system package was consisted of the RCF solution. The RCF solution is comprised with [112] HDL 28-A full-range line array modules and [24] flyable HDL 36-A subwoofers for the center of the arena, as well as a wide selection of speakers [RCF MR- and C-Series speakers] for 40 zones.

An integrated support system covered areas throughout the arena, under-balcony, luxury suites, and corridors. “We installed various C-Series and MR speakers, filling in all areas under balconies, supplemental to the main system”. says Drew Breland, design engineer at ESB Group. “We're always impressed with RCF performance, and it's proven itself in this space,”. Control of all zones was key to its success. “RNET was deployed with this system to control the primary bowl system. All things considered, we felt the installation was very successful in space,” concluded Breland.

### Products installed



HDL 28-A



HDL 36-AS



C 5212-66



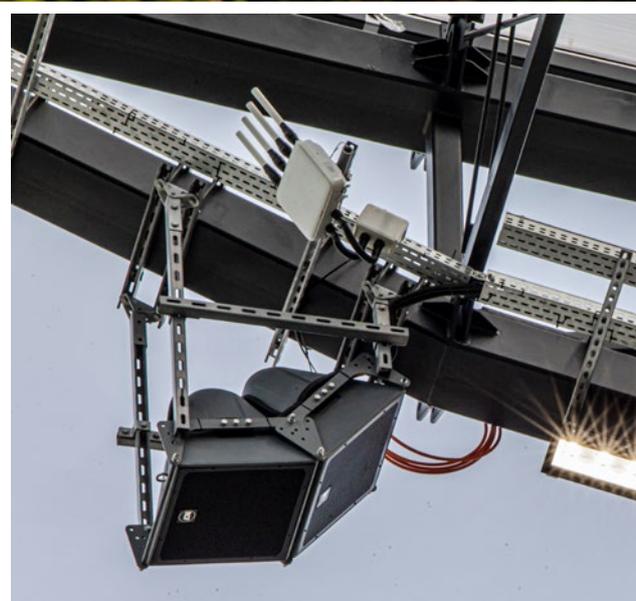
C 3108-126



H 1315



RNET CONTROL 8



## Florian Krygier Municipal Stadium - Szczecin (Poland)

The Florian Krygier Municipal Stadium has recently undergone a complete modernization which includes the installation of a new sound system based on RCF P Series speakers.

The Florian Krygier Municipal Stadium located in Szczecin, Poland, is a football stadium with a long history. It was built in 1925 with the name of Florian Krygier, named after a Polish football coach who was an instrumental figure in Pogoń Szczecin's history.

Since the 1950s club management was under MKS Pogoń Szczecin until 1989 when Szczecin City Commune transferred operations to the Municipal Sports, Recreation and Rehabilitation Centre (Polish: Miejski Ośrodek Sportu, Rekreacji i Rehabilitacji - MOSRiR). Until the beginning of 2007, it was the most prominent facility in the Polish Orange Ekstraklasa football league. It is currently used for football matches and is the home stadium of Pogoń Szczecin.

The stadium itself has recently undergone a complete modernization, so only part of the old stadium is still in place. A significant reconstruction started in 2019 with planned completion scheduled for 2022. The investment includes the Training Centre for Children and Youth (Centrum Szkolenia Dzieci i Młodzieży), remodeling and expanding the stadium, football fields, and associated infrastructure. The new stadium will reach 20,500 seat capacity and 22,000 square meters of covered area. It will transform into a "closed" stadium with four grandstands and roofed.

The first phase of modernization of the stadium within the west and south grandstands has been completed recently with a new sound system based on RCF P Series speakers. All P 6215 are suspended to the roof of the stadium coupled in vertical clusters, two speakers per cluster.

The sound experience provided by the new system confirms an improved change in sound quality. "We are going to hear a qualitative leap during football matches," confirms the stadium presenter /commentator Mr. Adam Wosik, who has taken part in testing the RCF system. "If we will build the new stadium with the quality of the sound system, then it is going to be a Champions League facility!"

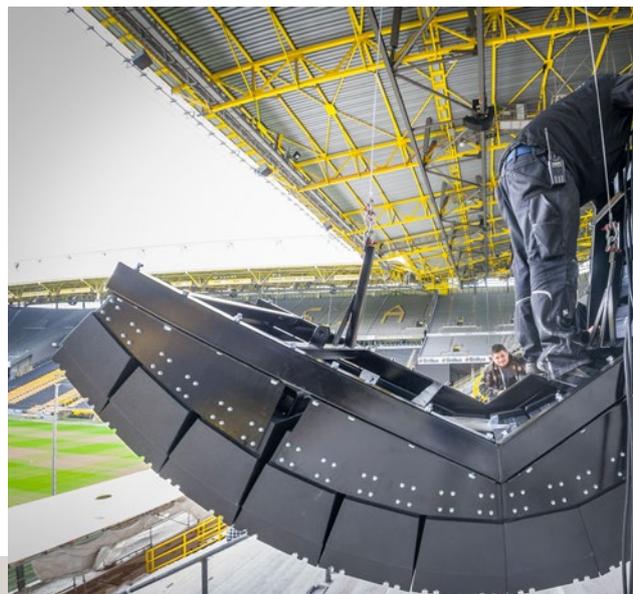
The sound system has been delivered and completed by TOMMEX company, official distributor of RCF install products in Poland, in cooperation with the Elektro - BUD Sp. z o.o. company, providing the electrical infrastructure for low voltage wiring of the sound system.

### Products installed



P 6215





## Borussia Dortmund (Germany)

The Signal Iduna Park stadium is considered one of the biggest and most comfortable stadiums in Europe with an international capacity of 65,000 people (seating only) that rise to over 80,000 for league matches (seating and standing). The last architectural renovation was in 2003 that brought the stadium to the actual look.

Nowadays, considering the increasing standards for the entertainment and for the emergency announcements required during the events, the ownership decided to upgrade the existing sound reinforcement system for the North, South, East and West stands. The existing system was built up during the years, by adding speakers following the expansion of the building.

The aim of this remake was to reach the state of the art in terms of integrated PA/VA, by ensuring not only intelligible voice-alarm announcements but also high quality entertainment music programs, including emotional audio effects able to transform a soccer match into a show experience.

Besides the acoustical requirements, that were the driving force for this project, there were a lot of technical aspects as well to take into consideration, such as the integration of the Fire Alarm System and the complete monitoring of the speakers and amplifiers according to the EN and DIN regulations.

All the activities have been carried out by RCF headquarters and RCF Germany subsidiary engineers, always in synergy with the contractor engineering and consulting company Michael Creydt, during a period of eight months.

RCF TTL 33-A WP STADIUM was suggested because of its ability to fulfill all the acoustical requirements. It was accepted as a possible solution, but some customization had to be done in order to allow safe rigging and hanging, also considering the unusual array shape. Furthermore a special weatherproof version was conceived to ensure durability in a permanent outdoor installation and withstand all seasons under the roof.

The integration of the 14 arrays with the voice alarm system required RCF's Engineering Support Group to report the general array fault-monitoring to the VA system and to monitor the presence of a tone signal generated by the VA system itself on each array module, in order to verify the whole critical audio path from the VA management system to the speakers. Then, for increased system reliability, the 14 modules of each array were split in two interleaved connection lines in order to get a connection diversity approach.

### Products installed

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TTL 33-A WP Stadium

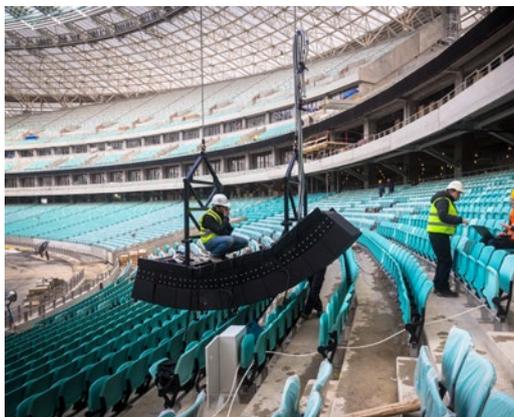
## Ferrara Stadium (Italy)



### Products installed



## Baku Olympic Stadium (Azerbaijan)



### Products installed



### Borussia Park Stadium (Germany)



#### Products installed



HL 20-WP



HL 2290

### The Władysław Król Municipal Stadium (Poland)

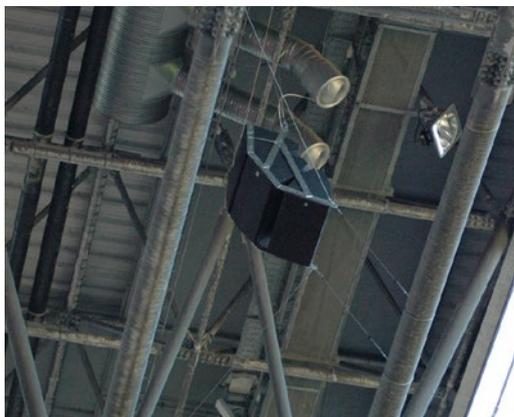


#### Products installed



P 6215

### Copenhagen Stadium - (Denmark)



#### Products installed



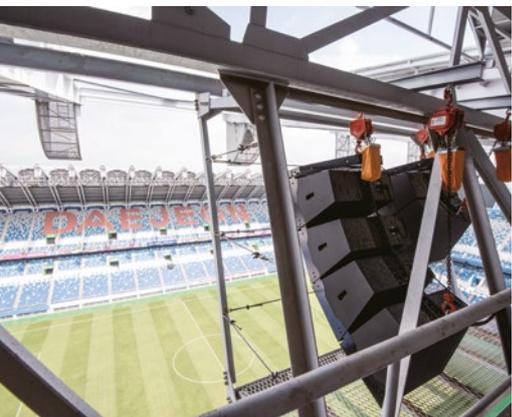
### San Marino Stadium (San Marino)



#### Products installed



### Daejeon World Cup Stadium (South Korea)



#### Products installed



HL 2290



HL 2260



HL 2240



HL 2200



P 3108

### Ilie Oana Stadium (Romania)



#### Products installed



P 6215



P 4228



DX 4008

### Kingspan Stadium - Belfast (United Kingdom)



#### Products installed



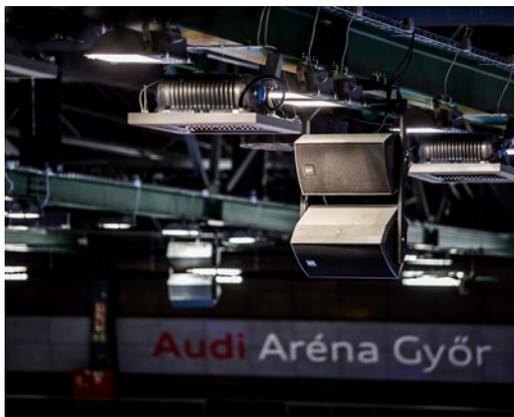
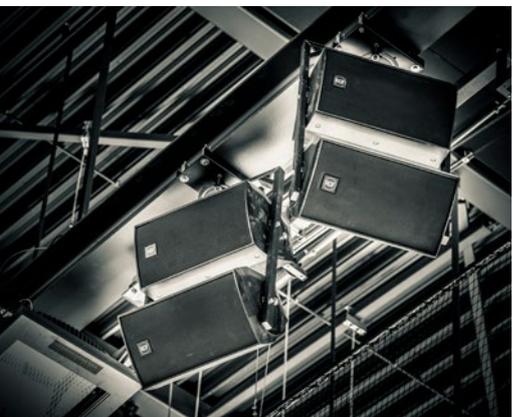
### Stadium Generała Kazimierz Sosnkowski - Warsaw (Poland)



#### Products installed



### Audi Arena Győr (Hungary)



#### Products installed



C 5212-96



IPS 3700



DX 4008



MQ 80P

### Hockeycomplex 'Oosterplas' - Hertogenbosch (Netherlands)



#### Products installed



P 3115T

# HL 6 & HL 35-S

## PASSIVE LINE ARRAY MODULES

Combined with robust rigging and a wide range of accessories, HL 6 and HL 35-S are perfect for installation, both in a corporate environment or music venue.

HL 6 is two-way full range system, ideal when line array performance is needed, and a fast and easy set-up is a must. The concept of this speaker derives from the touring industry, bringing in a compact cabinet all the experience of RCF professional sound. HL 6 features state-of-the-art RCF transducers, two powerful 6.0" woofers for a solid bass reproduction, plus a high powered 1.75" voice coil compression driver mounted on a precise 100° x 10°

waveguide to deliver vocal clarity with high definition and incredible dynamic. Due to its symmetrical design the HL 6 produces constant coverage without break up or attenuation, maintaining intelligibility, definition, and signal strength over distance. HL 6 comes in a structurally wooden reinforced composite polypropylene enclosure, and it is equipped with two rear handles for portability.

### PERFECT FOR INSTALLATION

The passive architecture makes the HL 6 one of the lightest line array modules on the market. Combined with flexible rigging options and a wide range of accessories, it's the ideal line array for installation both in corporate environments or music venues. HL 6 provides plenty of sound pressure and clarity that can replace antiquated, oversized sound systems with improved acoustic performance.

### LEGENDARY SUBWOOFERS

The RCF HL 6 features RCF transducers with neodymium magnets. RCF's experienced engineering teams have specially developed and matched each component. An entire set of protections preserve product life and reliability.



### HL 6

- 250 W RMS power handling
- 131 dB max SPL
- 65 ÷ 20000 Hz frequency range
- 100° x 10° coverage angles
- Fully equipped with neodymium transducers
- Horn Loaded symmetric design
- Wooden reinforced polypropylene enclosure
- Steel grille with clothing
- 2 x SPEAKON connectors

### CONSTANT DIRECTIVITY WAVEGUIDE

The custom-designed waveguide allows a precise coverage of 100° x 10°, while also delivering a completely linear high-frequency response. The constant directivity waveguide delivers consistent coverage from 900 Hz to the highest audible frequencies.



The HL 35-S is the ideal flyable bass complement for the HL 6 array system. It features a Baltic birch plywood cabinet housing one 4.0" voice coil, 15" neodymium woofer to handle frequencies from 40 Hz to 140 Hz with the maximum linearity and lowest distortion. The hardware is designed for an easy and fast setup,

completely compatible with the HL 6 rigging. The heavy-duty front grille is powder coated. A special transparent-to-sound foam backing inside helps to further protect the transducers from dust.

## DESIGNED FOR INSTALLATION

The passive architecture makes the HL 35-S one of the lightest 15" flyable bass modules on the market. Perfect for keeping the floor clear and maximizing the efficiency and coherence of the array. Combining it with robust rigging and a wide range of accessories, it's the perfect solution for installation in both sports arenas, corporate environments, and music venues. The HL 35-AS provides sound pressure and clarity that can replace antiquated, oversized sound systems with improved acoustic performance.

## CABINET & MECHANICS

The hardware is designed for an easy and fast setup, completely compatible with the HL 6 rigging. The heavy-duty front grille is powder coated. A special transparent-to-sound foam backing inside helps to further protect the transducers from dust. For weatherproof capabilities, a rain cover is available.

### HL 35-S

- 134 dB max SPL
- 40 ÷ 140 Hz frequency range
- x 15" high-power woofer
- Baltic birch plywood cabinet
- Steel front grille with clothing
- M20 standard pole mount in the top section of the cabinet
- 2 x SPEAKON connectors



# HL SERIES

## PASSIVE THREE-WAY SPEAKERS AND HORN LOADED ARRAY SYSTEMS

The RCF HL Series is designed to provide high sensitivity, high output and directivity as required for larger scale installations.

### AVAILABLE ON ORDER

Horn-loaded array systems can be easily converted from vertical installation mode to space saving horizontal placement. All speakers are equipped with RCF precision transducers and latest horn technology. The RCF H Series cabinets are constructed using the

highest quality Baltic birch plywood and finished with an extremely resistant epoxy paint. The cabinets have a multi-trapezoid shape that helps double coupling array configurations. Extensive fly-ware positions are provided for ease of installation.

### SUPERIOR INTELLIGIBILITY OVER DISTANCE

Thanks to its large format compression driver on a waveguide, HL 20-WP offers superior intelligibility over distance.

### SYMMETRICAL DESIGN

Due to its symmetrical design, HL 20-WP produces constant coverage without break or attenuation.

### MADE-TO-ORDER ACCESSORIES

An example of RCF's full customization: our team created to order a special cluster flybar for two units of H 1315 WP in the Juventus stadium.



#### HL 20-WP

- 135 dB SPL Max
- 700 W RMS Power
- 2800 W Peak Power
- Directivity Index Q: 16
- 55 ÷ 20000 Hz Freq. Range
- 100° x 15° coverage angle
- 3" C. Driver
- 2 x 10" Woofer
- Weatherproof treatment



#### H 1315 WP

- 136 dB SPL Max
- 900 W RMS Power
- 1800 W Peak Power
- Directivity Index Q: 12
- 50 ÷ 20000 Hz Freq. Range
- 3" neo C.Driver
- 10" neo Midrange
- 15" neo Woofer
- 60° x 40° coverage angle
- Weatherproof treatment



#### HS 2200

- 136 dB SPL Max
- 900 W RMS Power
- 3600 W Peak Power
- 30 ÷ 200 Hz Freq. Range
- 18" Woofer
- Weatherproof treatment

Horn loaded two-way full range array system designed for mid distance and long throw applications. Equipped with the latest generation of RCF precision transducers, this compact system provides very high output and

accurate voice and sound reproduction, both clustered for long throw applications or point source configuration for mid distance

### A WEATHERPROOF SOLUTION

Rated for direct-exposure outdoor installations, each cabinet is made of Baltic birch plywood with polyurea coating and includes a weatherproof barrier strip for connections. The grille is powder-coated heavy-duty steel with open-cell fibers and water repellent woven-fabric backing.

The HL SYSTEM is equipped with standard array fittings and IP 55 weather protection.

### PRECISION TRANSDUCERS

With in-house transducers' design and manufacturing for no-compromise performances, the HL Series excels in any comparison. All transducers feature state of the art neodymium magnetic circuits, radically new voice coil ventilation systems, titanium compression drivers, and ground-breaking voice coil assemblies.



#### HL 2290

- 141 dB SPL Max
- 1500 W RMS Power
- 6000 W Peak Power
- Directivity Index Q: 16
- 60 ÷ 20000 Hz Freq. Range
- 90° x 23° coverage angle
- 4" C. Driver
- 2 x 12" Woofer
- Weatherproof treatment



#### HL 2260

- 141 dB SPL Max
- 1500 W RMS Power
- 6000 W Peak Power
- Directivity Index Q: 14
- 60 ÷ 20000 Hz Freq. Range
- 60° x 23° coverage angle
- 4" C. Driver
- 2 x 12" Woofer
- Weatherproof treatment



#### HL 2240

- 141 dB SPL Max
- 1500 W RMS Power
- 6000 W Peak Power
- Directivity Index Q: 13
- 60 ÷ 20000 Hz Freq. Range
- 40° x 23° coverage angle
- 4" C. Driver
- 2 x 12" Woofer
- Weatherproof treatment

# HVL SERIES

## LONG THROW THREE-WAY SYSTEM

Focusing on stadiums and big arenas, HVL Series speakers are capable of true, concert-level high performance in arena-sized venues.

Featuring point source, line source, and subwoofers speakers, all modules embed RCF Precision Transducers, horns, and waveguides for optimal coverage and clarity. The cabinet's design with coplanar woofers and horns produces

identical left and right coverage, capable of delivering serious sonic horsepower within the stadium while maintaining intelligibility and even coverage at every seat.



### 4PATH WAVEGUIDE

The custom 4 PATH-designed waveguide allows precise coverage while also delivering an excellent, linear high-frequency response. The unique shape of the four ducts forming the guide creates an ideal isophasic load from the vocal range up to the highest audible frequencies.



### HVL 15-L

- 144 dB SPL Max
- 1900 W RMS Power
- 7600 W Peak Power
- Directivity Index Q: 12
- 43 ÷ 18000 Hz Freq. Range
- 90° x 30° coverage angle
- 4" neo C.Driver
- 2 x 10" neo Midrange
- 2 x 15" neo Woofer
- Weatherproof treatment

### HVL 15-P

- 144 dB SPL Max
- 1900 W RMS Power
- 7600 W Peak Power
- Directivity Index Q: 18
- 43 ÷ 18000 Hz Freq. Range
- 45° x 15° coverage angle
- 4" neo C.Driver
- 2 x 10" neo Midrange
- 2 x 15" neo Woofer
- Weatherproof treatment

### HVL 15-S

- 133 dB SPL Max
- 3000 W AES Power
- 6000 W Program Power
- 43 ÷ 180 Hz Freq. Range
- 2 x 15" neo Woofer
- Weatherproof treatment

## CONSISTENT ROBUSTNESS

Reduce the commissioning time on your new projects with HVL's modular array-ability, multiple directivity indexes (Q), and small footprint in comparison to its power. HVL can lower overall system costs by delivering full coverage with fewer modules precisely matching the audience area. Rated

for direct-exposure outdoor installations, each cabinet is made of Baltic birch plywood with polyurea coating and includes a weatherproof barrier strip for connections. The grille is powder-coated heavy-duty steel with open-cell fibers and water repellent woven-fabric backing.

## PRECISION TRANSDUCERS

With in-house transducers' design and manufacturing for no-compromise performances, the HVL Series excels in any comparison. All transducers feature state of the art neodymium magnetic circuits, radically new voice coil ventilation systems, and ground-breaking voice coil assemblies.

**LOW FREQUENCIES** 2 x 15" high-power woofer, 3,5" inside/outside voice coil, dual spider, hypervented, neodymium magnet.

**MID FREQUENCIES** 2 x 10" neodymium midrange, 3" voice coil, high performance sealed basket design.

**HIGH FREQUENCIES** 2 x 4" neodymium compression driver, titanium dome, 4 slot phase plug, copper inductance ring for extended response.



### HVL 15-L1

- 144 dB SPL Max
- 1900 W RMS Power
- 7600 W Peak Power
- Directivity Index Q: 12
- 43 ÷ 18000 Hz Freq. Range
- 90° x 30° coverage angle
- 4" neo C.Driver
- 2 x 10" neo Midrange
- 2 x 15" neo Woofer
- Weatherproof treatment

### HVL 15-P1

- 144 dB SPL Max
- 1900 W RMS Power
- 7600 W Peak Power
- Directivity Index Q: 15
- 43 ÷ 18000 Hz Freq. Range
- 60° x 30° coverage angle
- 4" neo C.Driver
- 2 x 10" neo Midrange
- 2 x 15" neo Woofer
- Weatherproof treatment

# Q 15 SERIES

## TWO-WAY POINT SOURCE MODULE

Q Series speakers are built upon RCF's premium concert-proven technologies for optimum power-to-size ratio able to cover large areas.

Q 15 is a two-way, bi-amp point source module for mid-distance and long-throw applications, combining a compact size with very high output and accurate speech and music reproduction.

### CONSTANT CURVATURE ADVANTAGE

Delivering extraordinary clarity and power handling, the Q Series modules feature best in class flexibility for multiple applications. Due to its sleek form factor, the speaker is unobtrusive and preferred when space is a constraint. Component positioning of the Q Series and the ability to rotate the cabinet in any position, ensure precise directivity and a detailed sound image, reducing spots of break up or attenuation. RCF developed the Q Series for fixed installations requiring remarkable coverage and coherence in a premium yet discrete look. Despite their dimensions, Q Series speakers are built upon RCF's premium concert-proven technologies for optimum power-to-size ratio able to cover large areas.

Q Series typical applications span from point-source configurations for mid-distance applications to clusters up to 8 modules for long-throw applications.

### CONSTANT RELIABILITY

The Q Series speaker is carefully engineered to pack maximum output and superb sound quality with minimum size. The cabinet is made of high-quality water-resistant Baltic birch plywood with internal structural metal bracings, rigid and resonance-free. A special polyurea paint creates a very thick coating of the cabinet, making the speaker highly resistant to scratches, bumps, sun, and extreme weather conditions. The heavy-duty front grille is powder coated. A transparent-to-sound foam backing on the inside of the grille helps to further protect the transducers from dust.



### Q 15

- 138 dB Max SPL
- 1500 W AES power handling
- 45 ÷ 20000 Hz
- 60° x 22.5° constant directivity coverage
- 1 x 15" neodymium woofer, 4.0" voice coil
- 4" neodymium compression driver
- Baltic birch plywood cabinet
- Steel front grille with clothing
- Integrated array mechanics
- Multi-pole Speakon connectors



## USE ANYWHERE ATTITUDE

Q Series speakers can be deployed either horizontally or vertically, with a coverage angle proportionally equal to the sum of the enclosures in the array ( $22.5^\circ \times n$ ). The cabinet features multiple M10 suspension points on both sides. Optional rigging accessories include two fly-bars for horizontal (up to 4) and vertical placement (up to 6 with a single flybar, or 8 with double flybar), stainless steel plates

for rigging, and  $-10$  degree spacing to decrease the coverage angle for long-throw applications. All rigging is made of high-strength structural steel with a high safety factor. The compactness and lightweight of the system, combined with top of class suspension system, guarantee a fast and secure hanging procedure.

## LEGENDARY TRANSDUCERS

The RCF Q Series features state-of-the-art RCF transducers with neodymium magnets. RCF's experienced engineering teams have developed and matched each component. A set of protections preserve product life and reliability.

### LOW FREQUENCIES

15" neodymium woofer, 4.0" v.c.  
Water-resistant fiber doped cone  
Polycotton M-roll surround  
Hypervented magnetic structure

### HIGH FREQUENCIES

The ND940 Compression Driver in pure Titanium with a 4 inches voice coil works from 600 Hz. This allows a better impulse response, fast decay, translating in perfect vocal clarity and enhanced quality in mid-frequency — leaving the woofer to manage the lower part of the spectrum. Lightweight and powerful, RCF neodymium drivers are a reference in performance and reliability. The speaker can only be powered by two amplifiers, one for each transducer (4 poles via NL4 connector).

### Q 15-P

- 138 dB Max SPL
- 1500 W AES power handling
- 45 ÷ 20000 Hz
- $40^\circ \times 22.5^\circ$  constant directivity coverage
- 1 x 15" neodymium woofer, 4.0" voice coil
- 4" neodymium compression driver
- Baltic birch plywood cabinet
- Steel front grille with clothing
- Integrated array mechanics
- Multi-pole Speakon connectors

### Q 15-L

- 138 dB Max SPL
- 1500 W AES power handling
- 45 ÷ 20000 Hz
- $90^\circ \times 22.5^\circ$  constant directivity coverage
- 1 x 15" neodymium woofer, 4.0" voice coil
- 4" neodymium compression driver
- Baltic birch plywood cabinet
- Steel front grille with clothing
- Integrated array mechanics
- Multi-pole Speakon connectors

# P SERIES

## PASSIVE COAXIAL SPEAKERS IN ROTO-MOLDED PLASTIC RESIN

Highly efficient coaxial designs offering excellent music and speech intelligibility in a compact, lightweight, and weatherproof enclosure.

The RCF P Series are highly efficient two-way designs offering excellent music and speech intelligibility in compact lightweight weatherproof design cabinets constructed with a heavy-duty roto-molded plastic resin UV-stabilized material. P Series speaker systems offer environmental protection up to the highest IP standard rating.

The design aesthetics of the P Series is suitable for outdoor applications as well as indoor installations in tough environments.

The front grille construction and included bracket are made of aluminum and stainless steel in all models.



### P 6215

- 134 dB SPL Max
- 600 W RMS Power
- 2400 W Peak Power
- Directivity Index Q: 13
- 75 ÷ 20000 Hz Freq. Range
- 60° x 60° coverage angle
- 2.5" C. Driver
- 15" Coaxial neo Woofer
- IP 55 Protection Grade



### P 3115T

- 129 dB SPL Max
- 300 W RMS Power
- 1200 W Peak Power
- Directivity Index Q: 13
- 75 ÷ 20000 Hz Freq. Range
- 90° x 60° coverage angle
- 1.5" C. Driver
- 15" Coaxial Woofer
- IP 55 Protection Grade



### P 2110T

- 124 dB SPL Max
- 200 W RMS Power
- 800 W Peak Power
- Directivity Index Q: 11
- 95 ÷ 20000 Hz Freq. Range
- 90° x 40° coverage angle
- 1.5" C. Driver
- 10" Coaxial Woofer
- IP 55 Protection Grade



### P 8015S

- 132 dB SPL Max
- 800 W RMS Power
- 3200 W Peak Power
- 50 ÷ 200 Hz Freq. Range
- 15" neo Woofer
- IP 55 Protection Grade



## ALL-WEATHER PERFORMANCE

The single-piece rotomolded cabinet is fully UV protected, equipped with multiple brass inserts and a corrosion-resistant 316P stainless steel U-bracket. Connections to the amplifier are made through a watertight multi-pole connector. The front aluminum grille is powder coated with water-repellent backing material, front logo is rotatable. All P series speakers meet IP55 standard requirements (International Protection Rating), suitable for indoor and outdoor applications.

## VERSATILITY FOR ANY APPLICATION

Focusing on outdoor and indoor large spaces, P Series speakers are capable of true, concert-level high performance in a compact enclosure, installed individually or coupled in array configurations. Featuring coaxial, line source, and subwoofers speakers, all modules embed RCF Precision Transducers, horns, and waveguides for optimal coverage and clarity. The cabinet's design with coaxial or coplanar woofers and horns produces identical left and right coverage, capable of delivering serious sonic horsepower within the stadium while maintaining intelligibility and even coverage at every seat.



### P 5228-L

- 131 dB SPL Max
- 500 W RMS Power
- 2000 W Peak Power
- Directivity Index Q: 11
- 80 ÷ 20000 Hz Freq. Range
- 90° x 20° coverage angle
- 1.75" C. Driver
- 2 x 8" neo Woofers
- IP 55 Protection Grade



### P 4228

- 129 dB SPL Max
- 400 W RMS Power
- 1600 W Peak Power
- Directivity Index Q: 9
- 80 ÷ 20000 Hz Freq. Range
- 110° x 60° coverage angle
- 2.5" C. Driver
- 2 x 8" Woofers
- IP 55 Protection Grade



### P 3108

- 129 dB SPL Max
- 300 W RMS Power
- 1200 W Peak Power
- Directivity Index Q: 11
- 80 ÷ 20000 Hz Freq. Range
- 90° x 60° coverage angle
- 2.5" C. Driver
- 8" Woofers
- IP 55 Protection Grade



### P 1108T

- 121 dB SPL Max
- 100 W RMS Power
- 400 W Peak Power
- Directivity Index Q: 11
- 80 ÷ 20000 Hz Freq. Range
- 90° x 60° coverage angle
- 1.5" C. Driver
- 8" Woofers
- IP 55 Protection Grade

# COMPACT SERIES

## TWO-WAY PROFESSIONAL SPEAKERS

Elegant design aesthetics and RCF signature sound quality that delivers a supreme audio experience in any application, from restaurants and retail shops to clubs, corporate spaces and venues.

Compact C Series is composed of two-way point source speakers for near and mid-distance applications, combining a compact size with very high output for accurate speech

and music reproduction. Combining high-quality birch plywood cabinets with neodymium transducers and a 100° x 50° rotatable constant directivity horn.

### CONSTANT DIRECTIVITY WAVEGUIDE

The special waveguide design allows the deployment of COMPACT C speakers with accurate control of the directional characteristics. In difficult acoustic environments, intelligibility is significantly increased. Using the optional HN-KIT COMPACT C 32 C 45 accessory, it is possible to replace the speaker horn with two different horns and change directivity to 100° x 25° or 60° x 25°.

### MULTIPURPOSE SOUND

Elegant design aesthetics and RCF signature sound quality that delivers a supreme audio experience in any application, from sports halls to clubs, corporate spaces, and live venues. Available in three sizes - starting from 12-inch to 15-inch woofers with excellent acoustic performance for both background and foreground music.



#### COMPACT C 45

- 700 W power handling (RMS)
- 138 dB max SPL
- 48 ÷ 20000 Hz frequency range
- 100° x 50° constant directivity coverage angle
- 1 x 15" high power neodymium woofer
- 1 x 4.0" v.c. neodymium compression driver
- Steel front grille with protective foam
- Installation points available on top, bottom, rear, and side panels
- 2 x SPEAKON in/out connectors



#### COMPACT C 32

- 600 W power handling (RMS)
- 137 dB max SPL
- 54 ÷ 20000 Hz frequency range
- 100° x 50° constant directivity coverage angle
- 1 x 12" high power neodymium woofer
- 1 x 3.0" v.c. neodymium compression driver
- Steel front grille with protective foam
- Installation points available on top, bottom, rear, and side panels
- 2 x SPEAKON in/out connectors



COMPACT A Series is a multipurpose two-way full-range professional speaker system, suitable for a wide range of applications, such as live sound reinforcement and stage monitoring as well as distributed sound systems for clubs or music venues. The combination of a 1.75" compression driver, from 15" to 10" woofer", and the constant directivity True Resistive Waveguide produces coherent 100° x 60°

coverage for the listening area with high SPL, distortion-free sound. The sleek and lightweight cabinet uses a special polypropylene composite material with an M-brace internal reinforcement, making it easy to carry and secure to install on a pole, flown-, wall-, or truss-mounted using the multiple rigging points and available accessories

### EASY TO HANDLE, FAST TO INSTALL

COMPACT A is flexible and makes it a smart choice for a wide range of applications. The cabinet is easy to carry, thanks to ergonomic handles on both sides and the top. The lower side includes a steel pole socket for mounting on a stand or subwoofer pole. Each model can also be

flown, wall- or truss-mounted using multiple M10 rigging points and special accessories. From molding to the final texture, COMPACT A offers maximum strength for fixed installation.



#### COMPACT A 15

- 450 W power handling
- Up to 130 dB Sound Pressure Level
- 50-20 kHz linear frequency response
- 1.75" Compression Driver
- 15" High Power Woofer
- Robust composite material cabinet
- Steel full front grille
- Optional mounting accessories
- 2 x SPEAKON connectors



#### COMPACT A 12

- 400 W power handling
- Up to 129 dB Sound Pressure Level
- 55-20 kHz linear frequency response
- 1.75" Compression Driver
- 12" High Power Woofer
- Robust composite material cabinet
- Steel full front grille
- Optional mounting accessories
- 2 x SPEAKON connectors



#### COMPACT A 10

- 350 W power handling
- Up to 128 dB Sound Pressure Level
- 60-20 kHz linear frequency response
- 1.75" Compression Driver
- 10" High Power Woofer
- Robust composite material cabinet
- Steel full front grille
- Optional mounting accessories
- 2 x SPEAKON connectors

# TT+ STADIUM PRODUCTS

## THREE-WAY LINEARRAY SYSTEM

The flagship RCF touring solution for first class sport events, speech reinforcement and high-end fixed installations.

The TT+ install range consists of true active and passive speaker models for vertical deployment with a top of the class sound performance and maximum scalability. TT+ Series are RCF's state-of-the-art loudspeakers, designed for large-scale applications. These excellent audio systems are adapted for outdoor environments, and sports arenas in particular, with the name of TT+ Stadium Series.

However, each project we develop is unique. TT+ Stadium active and passive models are only the starting point for creating tailor-made solutions for demanding environments. RCF's Engineering Support Group and R&D Department contribute to building a sound culture in continuous evolution, with more than 70 years of experience and a widely recognized know-how.

## ADVANCED ELECTRONICS

The high-powered TT+ Class-D amplifiers, tailored for each transducer, deploy pristine sound with efficient heat dissipation at the lowest possible distortion, along with low power consumption.

High-end AD/DA conversion up to 96 kHz - 32-bit floating-point, and onboard DSP for the best sound quality. Thanks

to the proprietary RDNet networked management and control, every TT+ speaker provides in-depth remote monitoring through multiple sensors. The system engineer has immediate feedback of transducer status, speaker module inclination, fan speed, temperature, VU meters, limiters and much more.



### TTL 55-A WP STADIUM

- 143 dB SPL Max
- 3500 W RMS Power
- 7000 W Peak Power
- 320 - 1300 Hz Crossover Freq.
- 90° x 7° coverage angle
- 3 X 2.5" neo C.Driver
- 10" neo Midrange
- 2 x 12" neo Woofer
- RDNet ON BOARD



### TTL 33-A II WP STADIUM

- 135 dB SPL Max
- 1250 W RMS Power
- 2500 W Peak Power
- 400 - 1800 Hz Crossover Freq.
- 100° x 15° coverage angle
- 3 X 1.5" neo C.Driver
- 8" neo Midrange
- 2 x 8" neo Woofer
- RDNet ON BOARD



### TTL 33 WP

- 133 dB SPL Max
- 600 W RMS Power
- 2400 W Peak Power
- 500 Hz Crossover Freq.
- 100° x 15° coverage angle
- 1.4" C.Driver
- 8" Midrange
- 2 x 8" Woofer
- IP 67 Connectors



## PRECISION TRANSDUCERS

We design our transducers to maximize the purity of sound, combining the absence of distortion and the ability to withstand long term high-power levels. RCF develops advanced transducer technology internally, being instrumental in technological inventions such as carbon fiber cone molding, double silicon spiders, inside/outside voice

coil windings to edge wound voice coil manufacturing, and pure titanium diaphragm forming. Our latest developments have resulted in designing state of the art neodymium magnetic circuits, radically new voice coil ventilation systems, and ground breaking direct drive voice coil assemblies.

## ROBUST AND DURABLE

The high-quality Baltic birch plywood cabinet features every layer glued by a water-resistant adhesive already before the painting process. The weatherproof polyurea paint forms a thick full coating of the cabinet, making it highly resistant to scratches and bumps. All the mechanical rigging is built-in high strength structural Swedish steel. After a quenching and tempering process, this special steel guarantees a

yielding strength almost four times higher compared to commercial-grade steel and maintains the mechanical properties down to  $-40^{\circ}\text{C}$ . Rigging has a high safety factor, with all the weight under control. TT cabinets feature die-cast aluminum handles with ergonomic rubber hand-grip.



Grille with double painting, foam and rain slim cover



Polyurea painting inside and outside



IP 67 connectors



Inox steel screws & mechanics with protective film



# NETWORKED SOUND SYSTEM MANAGER

RDNet is a robust management network and control platform for small, medium and large arena-sized sound systems, as well as complex and extended installations.

RDNet is the RCF management software suite for Sound System Engineers. A robust management network for RCF devices, a line-array design tool, a monitoring platform, and a complete audio analyzer in one package. RDNet provides intuitive management of every connected device/

object on the network. A network user can control all DSP settings inside any compatible device, including advanced subwoofer configurations, from a single object to a group of objects.

## TOOLBOX FOR SOUND SYSTEM DESIGN

RDNet is more than just a speaker management software - you can control parameters and internal routings of multiple RCF devices, such as digital matrixes or amplifiers, both in live or installed applications. Featuring an advanced measurement suite and the ability to save/recall presets on the cloud, RDNet is the all-in-one solution for both touring and installed sound systems.

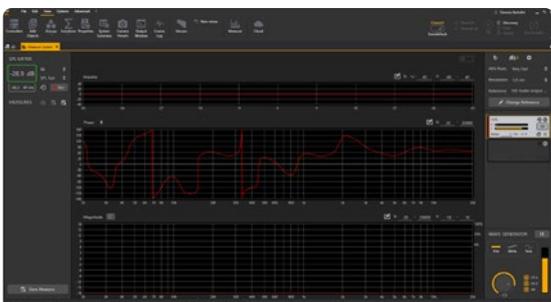
## STRAIGHT-FORWARD SOUND DESIGN

Shape Designer prediction software enables a two-dimensional acoustic simulation of the array configuration and suggest LF Corrections based on the cluster size. The system curvature angles and sound projection data are computed with maximum sound pressure levels for the given design. The software provides system curvature and weight, system rigging points, and cabinet angles.



## MONITOR AND MANAGE

The RDNet Scan function sequentially scans all audio devices, recognizes, assigns digital address labels, and adds devices as objects in the main window. The real-time monitoring features a multitude of parameters such as fan speed, temperature, the inclination of a single speaker, VU Meters, peak levels and more. RDNet takes direct control on the internal EQ and High-Pass filter on each cabinet.



## TAKE ALL APPROPRIATE MEASURES

RDNet Measure is a powerful 4-input Dual-Channel FFT Audio Analyzer able to measure Magnitude, Phase, RTA, Coherence, and Impulse response. Functions included spans from a delay finder, a multiple signal generator, and an integrated SPL meter/logger with calibration tools.



## NETWORKED SPEAKER CONTROL

When the RCF sound system is connected via CONTROL 2 or CONTROL 8 interfaces, the system engineer has complete control of time delay and equalization of all speakers, individually or grouped. With its built-in communication board and DSP, each device is an active part of the system, able to store presets, receive commands, and continuously send status information of single components or transducers. Comprehensive monitoring is standard in RDNet: VU metering, clip indicator, limiter intervention, device inclination, communication issues, and much more.

## EASY SUBWOOFER CONFIGURATION

Guided subwoofer configurations help the engineer to set up subwoofer Cardioids, Arcs, or EndFire configurations in one pass, while the Bass Shaper fine-tunes the desired timbre on low frequencies. With three slides and a few steps, it's easy to correct low-end behavior, while maintaining tonal balance across the entire system.



## GET THE MOST OF YOUR SYSTEM

RDNet gives the ability to control devices in Groups for easy supervision. Arrays customizable Group properties are Zones, Air Compensation, Cluster Size, FirPHASE Gain. When assigning Group Array objects in Zones: every Zone has its color for quick reference of set parameters. An incremental control shapes the Air Absorption Compensation, which can be very useful with changes in humidity or temperature (e.g., soundcheck on a sunny day, concert on a humid night). The line array's low-mid shaping is automatically calculated on the Cluster size to obtain the perfect linear frequency response from the entire system.



## TRAVEL LIGHT ON CLOUDS

You don't need your personal computer anymore. Simply connect any computer to the Internet, sign-in to your account, and you are ready to go with a complete set of audio tools for your RCF audio system. You can also save and recall your projects and measurements.

# XPS 16K AMPLIFIERS

RCF knows power amps, developing active speaker technology in many diverse solutions. Now we have unleashed our amplification and signal processing technology into a convenient 2U package for mobile touring and install applications.

## MODULAR POWER MANAGEMENT

XPS 16K provides extreme power density with 4 x 4000 W continuous power outputs in 2 RU space for both touring and installed sound systems. The unit features 4 analog and digital AES/EBU inputs/outputs, Dante Network (KD model), and a complete signal processing, tuning, and routing capability at 96 kHz. Redundancy and full scalability are granted by the advanced and modular design of the circuitry. A complete set of RCF speaker presets is available, with powerful signal processing for a complete system's tuning.

More than a power amplifier. XPS 16K supports the RCF philosophy with a power-agnostic approach, where the

Sound System Manager has complete freedom in choosing a powered or externally amplified modules for its system. XPS 16K offers balancing portability, weight, ease of installation, cabling, fast setup speed, and complete remote management of each connected device, via RDNet.

RCF's effort in assisting both installers and sound providers with the best audio technology and clear, powerful sound is at the core of the company's beliefs. Since 1949, providing both power amplifiers and transducers to the professional market, the RCF experience marks a new milestone with XPS 16K.

## TOTAL OPERATIONAL CONTROL

A large 4.3" TFT color capacitive touch panel provides full operational control of the amplifier. The user interface is clear and easy to use providing large touch buttons and a practical edit knob, with high contrast menus designed to avoid any ambiguity in very bright or sunny environments. Proprietary RDNet Over Ethernet Management Network and OSC protocol compatibility allow the Sound System Manager to have complete remote control of the amplifier.



## XPS 16K

- 16000 W Total Continuous Power
- 40-bit floating-point processing up to 96 kHz
- 32-bit fixed-point internal routing
- FIRPHASE, BMC, BASS Shaper
- RCF speakers' presets library
- RDNet Networked Management
- 4.3" TFT color touch screen
- Class-D modules with SMPs
- Dante Audio Network on XPS 16KD



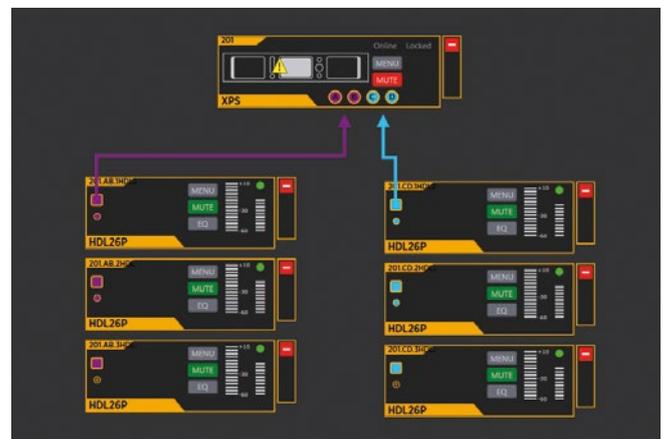
FOUR CHANNELS DSP AMPLIFIER



## POWER-AGNOSTIC RDNET MANAGEMENT

RDNet will manage XPS amplifiers as middlemen between the user and the speaker, so the speaker will always be at the center of the scene, maintaining the usual control paradigm of RDNet software. The extensive RCF loudspeaker preset database is available within the amplifier and recallable via RDNet. The software Synoptic

Table will show both passive devices and active ones as fully featured speakers, while the amplifier will be seen as a simple controller for signal routing and maintenance controls. The user can also group speakers and manage advanced settings in a mixed fashion making no distinction between active or passive architecture.



## FLEXIBLE SIGNAL PROCESSING

The comprehensive digital architecture of the amplifier features multiple inputs and outputs that can be easily routed to suit any project. Analog inputs 3 and 4 can be switched to 4 AES/EBU digital I/O ports. Each input can be routed to any of the four digital and power outputs. The advanced clocking management design provides low latency sample rate conversion with high-quality AD/DA converters up to 96 kHz. Each XPS 16K amplifier combines two 40-bit floating-point SHARC DSP chips at 96 kHz and two more 32-bit DSP chips to independently manage audio processing and signal routing for maximum sound quality and redundancy.

## FAULT-TOLERANT ARCHITECTURE

RCF amplifier blocks are fully self-protecting and designed on an 'audio-at-all-times' principle, with all fault protection features individually implemented for each amplifier channel and power supply. XPS 16K implements several safety strategies with fast and slow protections at both firmware and hardware levels. Scalability and Resilience concepts are interpenetrated in the so-called RDNet-OE converged network, which transports audio and control in a simple and safe way, with priority management.

## SCALABILITY

XPS is a scalable system: system expansion only requires standard ethernet equipment. RDNet will detect any new devices on the network, take immediate control, and provide monitoring from a remote computer.

## CONVERGENCE

XPS is a converged system: multiple interconnected devices don't need overabundant infrastructures. Dante and control networks converge to the same connector, simplifying cabling and reducing malfunction occurrences.

# PROFESSIONAL AMPLIFIERS

## SOLUTIONS FOR ALL PASSIVE LOUDSPEAKERS

RCF offers an entire line of professional high-current and extended dynamic power amplifiers, suitable for stadiums and sports arena installations.

### QPS SERIES

QPS Power Amplifiers boast 4 channel high-efficiency electronics delivering up to 4 x 1500 W continuous power @ 2 ohm. Both devices feature independent gain control, signal / clip and faults indicators, channels A and C XLR output link, mono and bridge mode, SPEAKON output

- (QPS 10K) 4 x 2500 W class HD power amplifier
- (QPS 6.0K) 4 x 1500 W class HD power amplifier
- 20 ÷ 25000 Hz frequency range
- Fast response and low distortion
- Mono and bridge modes
- Extensive protective circuits
- Variable speed cooling system
- Signal, clip, fault led indicators
- XLR input connectors
- SPEAKON output connectors
- Limiter on each channel

connectors. Moreover, it is protected against shorts and open circuits. Thanks to its large-size heat sinks and variable speed fans, QPS 6.0K can withstand the hardest heat conditions ensuring great reliability.



FOUR CHANNELS PROFESSIONAL POWER AMPLIFIER

### IPS SERIES

IPS Series is a range of 2-channel professional amplifiers that combines high-quality performance and reliability with the latest power-amp technology. Three compact 2-RU devices with remarkable sound quality for both install and touring applications. Each amplifier features independent gain control, signal / clip and fault indicators, stereo XLR

- (IPS 5.0K) 2 x 2600 W class H power amplifier
- (IPS 2.5K) 2 x 1250 W class H power amplifier
- (IPS 1.5K) 2 x 750 W class H power amplifier
- 20 ÷ 20000 Hz frequency range
- Fast response and low distortion
- Stereo, parallel, bridge modes
- Extensive protective circuits
- Variable speed cooling system
- Signal, clip, fault led indicators
- XLR input connectors
- SPEAKON and binding post output connectors
- Limiter on each channel

input and output link, mono / stereo / bridge switch, SPEAKON, and binding post output connectors. Moreover, it is protected against shorts and open circuits. Thanks to its high-efficiency heat sinks and variable-speed fans, IPS amplifiers can withstand the hardest heat conditions ensuring great reliability.



TWO CHANNELS PROFESSIONAL POWER AMPLIFIER



## DX 1616

DX 1616 AES-Dante remote software. This network-based software designed for Microsoft Windows and Mac OSX allows the management of the DX 1616 Matrix Sound Processor. -Pre-Amp configuration, selecting source types

like analog, AES/EBU, Dante -Designing Input groups for festival applications -Input source processing with EQ, delay and compressor -Powerful 16x16 router to assign processing tasks to flexible output patches.

- Hybrid architecture DSP
- 48 KHz sampling, 40 bit floating point engine
- 16 x 16 I/O matrix
- Dante enabled network audio transport
- 8 AES/EBU inputs - 8 AES/EBU outputs
- Ethernet connectivity and control
- Maximum latency 3 ms
- Easy to use software GUI



MATRIX AUDIO PROCESSOR

## DX 4008

The DX 4008 is a complete 4 input - 8 output digital loudspeaker management system designed for the touring or fixed sound installation markets. The absolute latest in available technology is utilized with 32-bit (40-bit

extended) floating point processor and high performance 24-bit Analog Converters. The high-bit DSP prevents noise and distortion induced by truncation errors of the commonly used 24-bit fixed-point devices.

- The DX 4008 is a complete 4 input - 8 output digital loudspeaker management system designed for the touring or fixed sound installation markets
- Sampling rate can be set to 96kHz
- Precise frequency control is achieved with its 1 Hz resolution
- Inputs and outputs can be routed in multiple configuration to meet any requirements
- The DX 4008 is shipped with a special PC Graphic User Interface (GUI) application - XLink
- XLink gives the user an option to control the DX 4008 unit from a remote PC via the RS232 serial communication link
- The GUI application makes much easier control and monitor the device, allowing the user to get the whole picture on one screen
- Programs can be recalled and stored from/to PC's hard drive, thus expanding the storage to become virtuality limitless



4 INPUT - 8 OUTPUT DIGITAL PROCESSOR

# EN 54 CERTIFIED

## FIRST-CLASS ELECTRO-ACOUSTIC EQUIPMENT FOR VOICE ALARM

RCF offers a full range of EN 54-certified products, for both systems and speakers. Our solutions are widely adopted by railway stations, airports, shopping centers, subways and large sports arenas.

EN 54 is progressively turning into the default standard for fire detection and alarm systems in many countries around the world, thus an increasing number of customers require certified electro-acoustic equipment for their evacuation systems. Typical applications in a stadium include hallways, toilets, entrances, exits, cafés and all highly trafficked areas. Our EN 54-certified products ensure a clear transmission

of alarm messages and signals, with full intelligibility of instructions given to avoid panic and provide guidance in case of emergency. RCF's supports all sports arenas needing to integrate a fine audio system for the spectators with a top-of-the-range evacuation system, with practical solutions that guarantee a safe and quick evacuation and are compliant with the sector's highest standards.

### DXT 7000

#### SMALL TO LARGE APPLICATIONS

DXT 7000 is a sound system conceived to completely control and manage background music and paging for emergency and evacuation purposes. The system has been designed to fulfill all requirements of EN 54-16 and EN 60849 standard, and it is entirely scalable, suitable for a wide range of applications: up to 32 MU 7100EN can be linked together in order to build an extended system,



including many paging stations and up to 256 loudspeaker lines / paging zones. The main unit can play all necessary evacuation and alarm messages previously stored into its built-in digital memory.

### DXT 3000

#### SCALABLE COMPACT SOLUTION

DXT 3000 is a wall-mounting intelligent evacuation system dedicated to small and medium size applications, where an EN 54-16 system is required. It includes a digital DSP-based master unit equipped with up to six RCF Class D+ power amplifiers, able to provide up to 500W on 100V or 70V speaker lines. A spare power amplifier with automatic replacement of a faulty unit is configurable too.

DXT 3000 hosts batteries and the necessary EN54-4 circuitry for the DC back-up. Furthermore it offers inputs, controls and pre-recorded messages to get a real plug & play solution.





The RCF range of products ensures the best acoustic efficiency on competitive EN54 compliant products. Furthermore, RCF loudspeakers are suitable for background music and public address, a role often

expected for products used for public spaces requiring EVAC. The speakers are suitable for indoor and/or outdoor installation.

### SCALABLE COMPACT SOLUTION

Fiberglass horn designed to withstand the most adverse weather conditions, offering high sound reproduction quality and sound pressure levels. A high level of efficiency and sound pressure can be obtained thanks to the use of four dynamic driver units for a total output power of 200W.



### HORN SPEAKER

Thanks to IP66 protection and its UV resistant ABS housing, it is suitable for both indoors and outdoors applications. It can be used for sound reinforcement and speech systems in medium and large spaces, for instance sports halls, swimming pools, theme parks, stations, undergrounds, etc. and also in all environments that need high efficiency loudspeakers grade.



### COLUMN SPEAKERS

Two-way speakers with very compact dimensions are the features of the extended-range speakers and a tweeter. This model utilizes a series of innovative technological solutions that guarantee highly intelligible reproduction of the vocal message. Usable in railway stations, subways, churches, factories, warehouses, PA systems in general.



### SOUND PROJECTORS

The speakers are certified weatherproof sound projectors. They are suitable for all installations where high intelligibility for alarm message broadcast and great sound reproduction quality are required. A modern and endearing design makes it the perfect product for environments where projectors are intended, as well as architectural elements, and contribute to improved global aesthetics.



### CEILING SPEAKERS

The ceiling speakers featuring a flameproof metal bottom are designed for recess installation in false ceilings or panels. They are especially suitable for broadcasting alarm messages thanks to highly intelligible sound reproduction and are resistant to the high temperatures reached during fires.



# SPORT COMPLEXES

## SOME REFERENCES

|                   |                           |  |
|-------------------|---------------------------|--|
| <b>AUSTRIA</b>    | Taraun                    | Eishalle                                   |
|                   | Feldkirch                 | Vorarlberghalle                            |
| <b>AUSTRALIA</b>  | Melbourne                 | Collingwood Football Club                  |
| <b>AZERBAIJAN</b> | Baku                      | Olympic Stadium                            |
| <b>CROATIA</b>    | Zadar                     | Visnjik Sports Arena                       |
| <b>DENMARK</b>    | Copenhagen                | Parken Stadium                             |
|                   | Herning                   | MCH Arena                                  |
| <b>ENGLAND</b>    | Newcastle                 | Kingston Park Stadium                      |
| <b>ESTONIA</b>    | Tallinn                   | Tondiraba Ice Arena                        |
| <b>FINLAND</b>    | Imatra                    | Imatra Stadium                             |
| <b>FRANCE</b>     | Angers                    | Stadium Raymond Kopa                       |
| <b>GERMANY</b>    | Bad Breisig               | Römer Therme                               |
|                   | Bietigheim                | Sportcenter                                |
|                   | Bünde                     | Sporthalle Bünde                           |
|                   | Crailsheim                | Hakro Arena                                |
|                   | Dortmund                  | Signal Iduna Park                          |
|                   | Dortmund                  | Helmut Körnig Halle                        |
|                   | Forst                     | Waldseehalle                               |
|                   | Füsen                     | Bundesstützpunkt für Eishockey und Curling |
|                   | Hardtwaldstadion SV       | Sandhausen                                 |
|                   | Hochseilshow              | Geschwister Weiheit                        |
|                   | Kiel                      | Sparkassenarena                            |
|                   | Koblenz                   | Stadion                                    |
|                   | Leer                      | Schwimmhalle                               |
|                   | Lübeck                    | Buniamshof                                 |
|                   | Luhe - Wildenau           | Golfplatz Schwanhof                        |
|                   | Mönchengladbach           | Borussia Park Stadium                      |
|                   | Mönchengladbach           | Borussia Park                              |
|                   | Mörfelden-Walldorf        | SV Rot-Weiss Walldorf e. V.                |
|                   | Oberhof                   | Ski Langlauf-Meisterschaften               |
|                   | Oldenburg                 | Marschwegstadion                           |
| Sandhausen        | Hardtwaldstadion          |  |
| Sandhausen        | Sandhausen Stadium        |  |
| Siegburg          | Sporthalle Anno-Gymnasium |  |
| Trier             | Mosel Stadium             |  |
| Wiehl             | Wiehler Wasser Welt       |  |
| Wilhelmshaven     | Jadestadion               |  |

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| <b>HUNGARY</b>     | Gyor                     | Aqua Sport Center  |
|                    | Győr                     | Audi Arena Győr  |
| <b>ITALY</b>       | Ancona                   | City Stadium   |
|                    | Brescia                  | Mario Rigamonti  |
|                    | Cagliari                 | Sardegna Arena   |
|                    | Carpi                    | Sandro Cabassi   |
|                    | Ferrara                  | Paolo Mazza  |
|                    | Florence                 | City Stadium   |
|                    | Massa Carrara            |  |
|                    | Napoli                   | Maradona Stadium   |
|                    | Assago (MI)              | Mediolanum Forum   |
|                    | Bergamo                  | Gewiss Arena   |
|                    | Ravenna                  | Ravenna Stadium  |
|                    | Reggio Emilia            | Mapei Stadium  |
|                    | Rome                     | Ostia Palasport  |
|                    | Teramo                   | City Stadium   |
|                    | Trapani                  | Stadio Polisportivo Provinciale                                      |
| Trento             | Ice Stadium Palasmeraldo |  |
| Trento             | Palasport                |  |
| <b>JAPAN</b>       | Yokohama                 | Yokohama Park Stadium  |
| <b>LITHUANIA</b>   | Vilnius                  | Elektrenai Sports Arena  |
|                    | Kėdainiai                | Kėdainiai Sports Arena   |
| <b>MALAYSIA</b>    | Kuala Lumpur             | Bukit Jalil (PA)   |
|                    | Kuala Lumpur             | Bukit Jalil (SRS)  |
|                    | Kuala Lumpur             | DBKL Stadium   |
|                    | Kuala Lumpur             | Kuala Lumpur Sports City (KLSC)/ Bukit Jalil National Sports Complex |
| <b>NETHERLANDS</b> | Alkmaar                  | JumpSkillz Hoofddorp   |
|                    | Purmerend                | JumpSkillz Hoofddorp   |
|                    | Hertogenbosch            | Hockeycomplex 'Oosterplas'   |
| <b>NORWAY</b>      | Oslo                     | Jarlsberg Travbane Horse Racetrack                                   |
|                    | Trondheim                | Granåsen World Cup stadium (ski jump)                                |
|                    | Trondheim                | Granåsen World Cup stadium (cross country)                           |
| <b>POLAND</b>      | Łódź                     | Władysław Król Municipal Stadium                                     |
|                    | Szczecin                 | Florian Krygier Municipal Stadium                                    |



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| <b>QATAR</b>        | Doha                | Al Gharafa Sports Complex                         |
| <b>ROMANIA</b>      | Ploiesti            | Ilie Oana Stadium                                 |
| <b>RUSSIA</b>       | Kaspijsk            | Ali Aliev Athletic Arena                          |
|                     | Moscow              | Luzhniki Olympic Sports Complex                   |
|                     | Nadym               | Ice Arena   |
|                     | Omsk                | Sports Arena                                      |
|                     | Shali               | Vainakh football stadium                          |
| <b>SAN MARINO</b>   | San Marino          | Sport Complex of San Marino                       |
| <b>SOUTH KOREA</b>  | Paju                | Paju Yongsan Camp                                 |
|                     | Suwon               | ROTC Indoor Military Training Ground              |
|                     | Daejeon             | Daejeon World Cup Stadium                         |
| <b>SOUTH AFRICA</b> | Johannesburg        | Coca Cola Ellis Park Stadium                      |
|                     | Nasrec              | Soccer City Stadium                               |
|                     | Nelspruit           | Mbombela Stadium                                  |
| <b>SWEDEN</b>       | Stockholm           | Solvalla Travbana Horse Racetrack                 |
|                     | Stockholm           | Stockholm Stadium                                 |
| <b>SWITZERLAND</b>  | Basel               | St. Jakob-Park                                    |
| <b>THAILAND</b>     | Bangkok             | Nongjok Futsal Stadium                            |
| <b>TURKEY</b>       | Konya               | Konya Torku Arena                                 |
|                     | Trabzon             | Trabzonspor Stadium                               |
|                     | Bursa               | Bursa Stadium                                     |
|                     | Antalya             | Antalya Stadium                                   |
|                     | Eskisemir           | Eskisemir Stadium                                 |
| <b>TURKMENISTAN</b> | Ashgabat            | Ashgabat Olympics Comple                          |
| <b>UK</b>           | Bangor              | Aurora Aquatic & Leisure Complex                  |
|                     | Belfast             | Ravenhill Ulster Rugby Stadium                    |
|                     | Belfast             | Windsor Park Stadium                              |
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| PRODUCT   | Colour | -        | 220-240V | 115V | Pag. |
|-----------|--------|----------|----------|------|------|
| P 6215    | Black  | 13000131 | -        | -    | 42   |
| P 6215 W  | White  | 13100083 | -        | -    | 42   |
| P 3115T   | Black  | 13000135 | -        | -    | 42   |
| P 3115T W | White  | 13100082 | -        | -    | 42   |
| P 2110T   | Black  | 13000125 | -        | -    | 42   |
| P 8015S   | Black  | 13000230 | -        | -    | 43   |
| P 5228-L  | Black  | 13000202 | -        | -    | 43   |
| P 4228    | Black  | 13000199 | -        | -    | 43   |

## P SERIES

| PRODUCT   | Colour | -        | 220-240V | 115V | Pag. |
|-----------|--------|----------|----------|------|------|
| P 4228 W  | White  | 13100081 | -        | -    | 43   |
| P 3108    | Black  | 13000198 | -        | -    | 43   |
| P 1108T   | Black  | 13000203 | -        | -    | 43   |
| P 1108T W | White  | 13100084 | -        | -    | 43   |

## COMPACT SERIES

| PRODUCT      | Colour | -        | 220-240V | 115V | Pag. |
|--------------|--------|----------|----------|------|------|
| COMPACT C 45 | Black  | 13000602 | -        | -    | 44   |
| COMPACT C 32 | Black  | 13000642 | -        | -    | 44   |
| COMPACT A 15 | Black  | 13000740 | -        | -    | 45   |
| COMPACT A 12 | Black  | 13000739 | -        | -    | 45   |
| COMPACT A 10 | Black  | 13000738 | -        | -    | 45   |

## TTL WP

| PRODUCT                   | Colour | -        | 220-240V | 115V | Pag. |
|---------------------------|--------|----------|----------|------|------|
| TTL 55-A WP<br>STADIUM    | Black  | -        | 13000424 | -    | -    |
| TTL 33-A II WP<br>STADIUM | Black  | -        | 13000402 | -    | -    |
| TTL 33 WP                 | Black  | 13000309 | -        | -    | -    |

## XPS 16K AMPLIFIERS

| PRODUCT  | Colour | EU       | US       | UK       | Page |
|----------|--------|----------|----------|----------|------|
| XPS 16K  | Black  | 12100037 | 12100074 | 12100076 | 50   |
| XPS 16KD | Black  | 12100064 | 12100075 | 12100077 | 50   |

## AMPLIFIERS

| PRODUCT  | Colour | 90-240V | 220-240V | 100-120 V | Pag. |
|----------|--------|---------|----------|-----------|------|
| QPS 10K  | Black  | -       | 12100057 | 12100058  | 52   |
| QPS 6.0K | Black  | -       | 12100055 | 12100056  | 52   |

## AMPLIFIERS

| PRODUCT  | Colour | 90-240V | 220-240V | 100-120 V | Pag. |
|----------|--------|---------|----------|-----------|------|
| IPS 5.0K | Black  | -       | 12135087 | 12135086  | 52   |
| IPS 2.5K | Black  | -       | 12100059 | 12100060  | 52   |
| IPS 1.5K | Black  | -       | 12100065 | 12100066  | 52   |

## PROCESSORS

| PRODUCT | Colour | -        | 220-240V | 100-120 V | Pag. |
|---------|--------|----------|----------|-----------|------|
| DX 1616 | Black  | 12399033 | -        | -         | 53   |
| DX 4008 | Black  | 12135033 | -        | -         | 53   |





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