



# VSA

# 2050

digitally  
steerable  
sound  
column  
speaker

the rules of sound







VSA 2050  
IS A MULTI-AMPLIFIED  
VERTICAL  
STEERABLE ARRAY  
THAT REPRESENTS  
ONE OF THE LATEST  
RCF APPLICATIONS  
IN TERMS OF DIGITAL  
AUDIO TECHNOLOGY.

VSA2050

Thanks to powerful DSPs (Digital Signal Processor) it processes the audio signal sent to each speaker for controlling its vertical acoustic dispersion. It is the ideal speaker for the indoor installations where the critical acoustic environment is an issue and where moderate visual impact is required.



## Superb quality, control and reliability

VSA 2050 allows to address the audio signal exactly to the listening area, avoiding to send the acoustic energy to ceilings and empty floors, thus not introducing bad reflections that would affect speech intelligibility, mainly in critical environments with high reverberation time.



# Electroacoustic technology

State of the art transducers have been developed for the VSA, in order to offer the highest possible intelligibility and wider frequency response, according to RCF philosophy.

A 1,4 Tesla flux density has been foreseen by using a massive neodymium magnet to get an incredible mid frequency dynamic range. The use of a neodymium magnet results in very lightweight transducers and in very compact size of the overall system.



# Electronic technology

The powerful DSP circuit is directly connected in digital domain to the 20 50 W each Class-D technology power amplifiers, which are able to drive the 20 transducers with the optimal headroom. The amplification circuits include several protections and controls always to operate in safe mode.

Digital technology has been used also for the power supply which is regulated both in voltage and current and it is equipped with active protections against over-voltage and over-current. The power supply module is digitally interfaced with the DSP main board to communicate voltage, current and temperature status data. It operates in both 115/230 V AC modes and in 24 DC as a back-up power source.

During the development of the VSA 2050 high priority has been given to critical signal paths and self-monitoring components to provide easier installation, simpler maintenance and maximum safety for Voice alarm applications.

A remote switch-on facility is available to avoid to power ON and OFF the column through electric switches when the columns are not part of a voice-alarm system. By detecting the audio presence, the column is able to switch itself ON automatically, and then OFF after a period of time in which it is not used at all.

VSA 2050  
(230 V)  
p/n 130.00.200

VSA 2050  
(115 V)  
p/n 130.00.201



# Audio quality

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The target we aimed at when designing the VSA 2050 was to offer voice directivity and control over all the voice range, to give high intelligibility performance with wide frequency response and high dynamics and coherence at distance. We've been able to reach this goal thanks to the length of the column, the number and size of the speakers, the choice to use a dedicated amplifier for each loudspeaker and other innovative details.

Tilting and beaming are not to be affected by the steering and the horizontal coverage is very wide and not impaired by discontinuities.

Thanks to the column power, the accurate speaker design and the high efficiency of the digital technology the VSA 2050 is able to obtain a very long coverage, up to 30 meters preserving a smooth uniform horizontal coverage as well.

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## FEATURES

- > Twenty 3" 1/2 full-range speakers
  - > Twenty 50 W Class D power amplifiers
  - > 48 kHz 32 bit processing
  - > Horizontal dispersion 130°
  - > Vertical dispersion controlled up to 10° till 300 Hz
  - > Power Supply 115/230 Vac (600VA); 24 Vdc
  - > Extruded aluminium body
  - > Ceramic block terminals and thermal fuse on 0 dB balanced priority input
  - > Indicators and control for EN 60849 monitoring facility
- 



## Enclosure

A structure in extruded aluminium has been made to offer a product with very limited architectural impact, light weight and simple installing operations. Standard colour is RAL 9002, other colours are available on request depending on the size of the projects. The aluminium body allows a modular design approach and a uniform heat dissipation. The front grille is transparent to sound and has been designed to be elegant.

The installation is particularly simple thanks to the drilling template on the wooden package and to the weight of only 20 Kg. Additional brackets are available on request if the column has to be oriented horizontally by 30° or 45°.

# Connections



Signal input panel



Power panel

The audio connections are protected by a plastic cap/shield and are located on the bottom-end of the column. Two balanced inputs are available for independent wiring for main and priority audio sources. The priority one is available on ceramic terminal blocks with thermal fuse for voice alarm applications.

A fail-safe activation command supports the commutation between inputs. An output logic control allows remotely manage the over-all status of the VSA 2050, for instance when any fault must be addressed to a central system.

AC and DC Power supply connections are positioned on top of the column, protected by a plastic cover. Connectors are VDE type for AC and ceramic terminal block for DC.

## Status indicators

All basic status indications are provided through LEDs, visible on the bottom panel.

LEDs indicates the correct presence of AC and DC power supply and the monitoring of the feedback from amplifiers to DSP and from transducers to power supply.

The ability to detect high and low frequencies on the input allows to monitor the connection between the RCF main Voice Alarm system and the column itself.



# Configuration

I/R receiving diode is recessed and its directivity coverage has been narrowed to receive I/R commands just from a remote located in front of the column axis.

Thanks to this, in case two columns are one close to the other, there is no risk to drive two receivers at the same time.

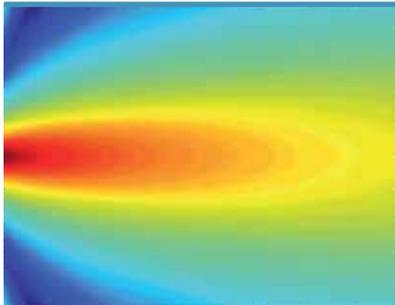
VSA REMOTE CONTROL  
p/n 133.60.124



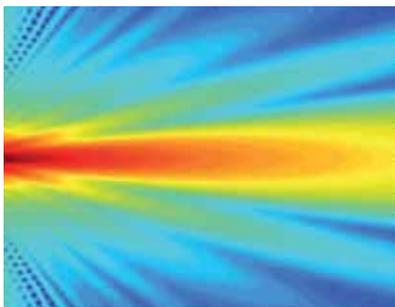
The following data are configurable on each VSA 2050 through the VSA-RC remote control:

- > Select the proper configuration
- > Delay in ms
- > Voice / Music optimization filters
- > Phase shift
- > Mute
- > Volume
- > Stand-By

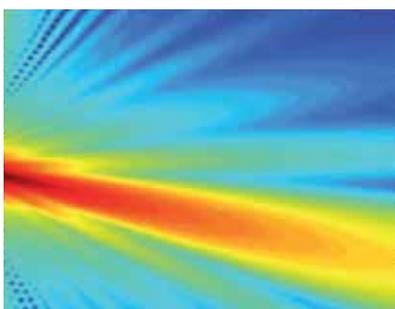
## Shaping the acoustic beam in a few steps



VERTICAL BEAM 30°  
VERTICAL TILT 0°



VERTICAL BEAM 10°  
VERTICAL TILT 0°



VERTICAL BEAM 10°  
VERTICAL TILT -30°

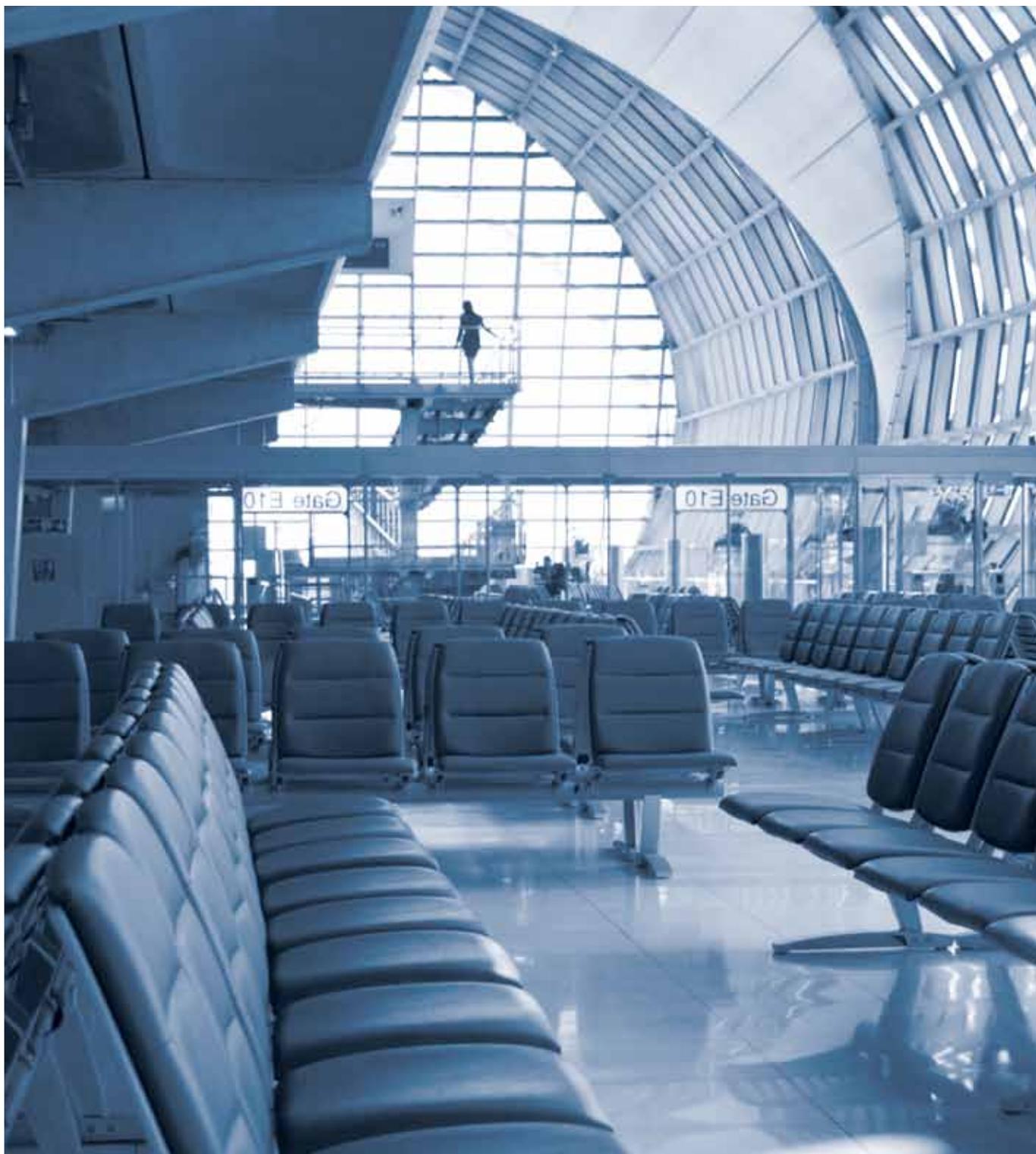
Through the remote control's user-friendly interface it is possible to select among three different presets that offer a remarkable easiness in the VSA 2050 configuration process.

The only parameters that the operator has to insert, in fact, are the installation height of the column and the area to cover.

**EASY FOCUS** With this series of configurations it is possible to obtain a uniform dispersion in the area between the column and a desired focus point, minimizing the amount of sound after it. By reducing the reflections outside the audience area, the Easy Focus mode is very useful in highly reverberant rooms.

**EASY BEAM** Allow to easily select the area that the column has to cover, combining different tilt and beam angles to several installation heights.

**FREE BEAM** These configurations allow to freely select tilt and beam angles from the presets, in order to make a custom set up.



## Main applications

Intelligible audio transmission in critical acoustical environments:  
TRANSPORTATION HALLS   SPORTS ARENAS   CONVENTION CENTRES  
CONFERENCE HALLS   AUDITORIUMS   HOUSES OF WORSHIP



# VSA 2050

- > Extended frequency response
- > Improved directivity control
- > Simple and quick set-up
- > High SPL and Dynamic
- > Standard installation accessories included
- > Compact and lightweight

## TECHNICAL SPECIFICATIONS

## VSA 2050

|                               |  |
|-------------------------------|--|
| FREQUENCY RESPONSE            | 100 Hz - 18 KHz  |
| MAX SPL                       | 94 dB (A-WEIGHTED AT 30 m)   |
| HORIZONTAL COVERAGE ANGLE     | 130°   |
| VERTICAL COVERAGE ANGLE       | SELECTABLE FROM 10° TO 30°   |
| VERTICAL STEERING ANGLE       | SELECTABLE FROM 0° TO - 40°  |
| DIRECTIVITY CONTROL FREQUENCY | FROM 150 Hz  |
| TRANSDUCERS                   | 20 X 3.5" FULL RANGE SPEAKERS  |
| INPUT SENSITIVITY             | 0 dBu, DIGITALLY CONTROLLED  |
| INPUT CONNECTORS              | BALANCED SCREW TERMINAL<br>BALANCED SCREW TERMINAL CERAMIC BLOCK   |
| INPUT CONTROL                 | REMOTE CONTROL DEDICATED IR INPUT<br>PRIORITY INPUT COMMAND<br>STATUS REMOTE MONITORING<br>STAND BY REMOTE COMMAND |
| INPUT LEDS                    | ACTIVE, COMMUNICATION, STATUS,<br>EMERGENCY  |
| PROCESSOR                     | TEXAS TMS320C6726 32 bit<br>FLOATING POINT DSP<br>SPARTAN3A FPGA<br>24 bit, 48 KHz AD CONVERTER                    |
| PROCESSOR OPERATIONS          | 20 CHANNEL PEQS, COMPRESSION,<br>BEAM-FORMING, SPEAKER LIMITER<br>AND PROTECTION                                   |
| AMPLIFIERS                    | 20 X CLASS D, 50 W AMPLIFIERS  |
| AMPLIFIERS PROTECTIONS        | SHORT CIRCUIT, THERMAL   |
| POWER SUPPLY                  | 500 W SWITCHING TYPE   |
| POWER SUPPLY & CONNECTORS     | 115/230 Vac-Vde CONNECTOR<br>24VDC BACK-UP<br>CERAMIC TERMINAL BLOCK   |
| HEIGHT                        | 2070 mm  |
| WIDTH                         | 125 mm   |
| DEPTH                         | 97 mm  |
| WEIGHT                        | 19 Kg  |
| CABINET                       | POWDER COATED<br>ALUMINIUM EXTRUSION   |
| HARDWARE                      | 2 X SPEAKER WALL MOUNTING FLANGE   |
| CONFIGURATION TOOL            | REMOTE CONTROL   |







the rules of sound

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