

sound without compromise



SOUND & COMMUNICATION



Preface

Dear Sir or Madam,

If you are holding our catalogue in your hand for the first time, you may be surprised by the extensive variety of our products. TOA has continuously advanced throughout the years and is now representing 3 big business areas:

- "Security & Safety" – security and surveillance technologies from evacuation systems to Intercom systems
- "Information & Communication" – from public address systems for various applications to network audio adaptors and all kinds of conference sites
- "Professional Audio" – for the perfect audio transmission in a variety of venues from theatres to soccer stadiums

Within this catalogue we are presenting an extensive variety of products for each of our 3 business areas. TOA sets itself the standard to always find the perfect acoustic solution for every application.

Additionally you will find a fourth part named "Acoustics" which makes our catalogue much more useful to you. This part contains all important and beneficial facts about public address – basic principles, formulas and precise planning tools.

Above all TOA thrives for the most perfect transmission of information and music. Our new products show how close we get in meeting this ultimate aim:

- New range of EN 54 certified products
- New range of infrared microphones
- Extensive line up of Intercom products
- Comprehensive range of loudspeakers with over 20 new models

We would like to surprise you and appreciate our catalogue being in your hands. If anything remains unclear, your specialist dealer and TOA will be glad to give you any further advice.

Toshio Sakata
Managing Director
TOA Europe

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Information & Communication

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Security & Safety



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TOA: More than 70 years in the field of communication

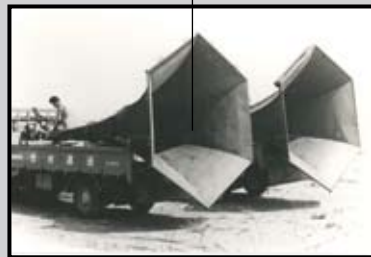


1954

Influenced elections in Japan: The first ever electric Megaphone in the world

To be heard over 12 km.
After the transmission test with 6 m long horns

1962



1976

The birth of Intercom: TOA developed a 2-Way Speech System

The first cameras - later

1983





CCTV
only 3 years
colour CCTV



1992

Caused a sensation among the specialists: The first full Digital Mixing Console

For really big rooms –
our Line Array Loudspeakers.

2005



Tomorrow

Safety in the future. The first Network Audio Adapter that has got the „IPv6 ready“ Logo

As Tsunetaro Nakatani founded TOA in 1934 and started to produce microphones, he did this with Japanese pioneering spirit. It just didn't interest him to record sounds, he wanted to go to the roots of acoustics and to understand it. It was his target to transmit every kind of music and information as precise and natural as possible.

Around 70 years later his target has almost been reached. TOA's researchers have had a big hand in this. From the first electric megaphone (1954) to the first complete building Audio-Emergency-System (1969), from CCTV Cameras (1983) to Audio Network Technology we have always set new standards.

You will find our systems in thousands of different places, such as schools, concert halls, shopping malls, skyscrapers, airports and sport stadiums. They are not only there to serve the security and surveillance but also for perfect transmission of concerts and music.

Today TOA is a world wide operating company with approximately 300 Mio. Dollar turnover.

Our pride is not only based on these turnover figures, but more on the fact that we can use this knowledge to create acoustic sound fields for millions of people to make their lives safer and more pleasant.



**Our Vision:
Advancing the Realms of Reassurance, Reliability and Emotion**





At TOA we've built our business on matching close observation of the changing times and trends with product after successful product, reinforced by proactive development that constantly will open doors to new possibilities.



So far and into the future: TOA takes an active role in meeting social responsibilities

Since its founding, TOA has pursued its business based upon a solid Management Philosophy—at the core of which are the “Three Confidences”—and now more than ever it is these important basic foundations that will carry the company into an even brighter and more prosperous future.

Basic Management Policy (Three Confidences)

<Total confidence>

There is nothing in the world that lasts forever except the heavens and earth. Death is inevitable for everything that lives. “Every tide hath its ebb.”

Even business enterprises must obey this very fundamental rule of life, for isn't a business enterprise a living thing, comprised of its employees who are living? Every enterprise is destined to grow, for the very nature of the business enterprise is to continue to grow. At some point, however, because of events outside the control of its employees, the business enterprise will begin to shrink, even to disappear.

Some enterprises die on their own, as in bankruptcy.

Others are swallowed up by larger or more successful business and just as surely end their existence.

But TOA must be protected by the EFFORTS of its employees, we must strive with every action to preserve TOA and protect it from this final outcome. And our TOTAL CONFIDENCE comes from these EFFORTS to PRESERVE and PROTECT.

No confidence can be obtained without dedicating ourselves to hard work.

When we as employees face difficult situations, we must make every effort to succeed.

In this way we will experience and communicate TOTAL CONFIDENCE.

Thus will we earn peace and tranquility for our company and ourselves.

Total confidence
of our customers in
the use of all
products.

Total confidence
of our associates in
all business transac-
tions.

Total confidence
of our employees in
all their efforts.

TOA strives every day to uphold the trust and hopes of customers, shareholders, business associates, employees and all others holding stakes in our company.



Based on the letter T,
the TOA logo symbolizes
our four corporate objectives:

PROGRESSIVE	To continuously incorporate the latest technology and pursue a high degree of specialization.
MODERN	To respond appropriately and quickly to rapid changes occurring in society.
INTERNATIONAL	To make a global contribution in the field of communication through sound.
DYNAMIC	To make an effort as individuals to create products of the highest quality and value.



People-Friendly, Planet-Friendly Quality Assurance and Environmental Policies



TOA's efforts to ensure product quality and support environmentally friendly corporate activity are recognized worldwide.

World-Renowned TOA Quality ISO 9001 and ISO 14001 Certification

TOA has earned certification under ISO 9001, an international standard recognizing effective quality assurance efforts. From product planning and development to production, installation and service, our total quality management activities ensure that we earn the trust the world has placed in us. Further, regarding environmental preservation as another important operational issue, we work to pursue technological and product development in an environmentally friendly manner, as evidenced by the fact that TOA has also earned certification under ISO 14001, the international standard recognizing effective, sustainable environmental management systems.



JMI-0020



JQA-EM1400



"Total Assembly"-Based Production System Ensures High Efficiency and Superior Quality

TOA has adopted a unique production system based on the concept of "Total Assembly." Each work station is staffed by several workers who together are responsible for the entire process of assembling each individual product, starting with ordering the necessary parts and ending with shipping the finished product. This system ensures the high quality and good production efficiency, and also allows us to quickly deliver only the required quantities of required products to the market.



RoHS
Compliant 



Takarazuka Headquarters Environmental Policies

- At our Takarazuka headquarters TOA pursues the development and design of technologies and products, and throughout these activities we endeavor always to correctly assess their environmental impact. At the same time, we also set further environmental objectives and targets within the parameters of our technical and economic capacities, implement these in a planned manner, and remain committed to continual improvement of our environmental protection efforts in general.
- TOA actively considers any and all measures that might be taken to not only minimize the environmental impact of our products at all stages of their life cycles – including design, technology and product development, manufacturing processes, product distribution, actual use, and final disposal – but also to reduce the use of hazardous chemical substances in all these areas.
- TOA establishes an environmental protection system designed to promote environmental protection and improvement and prevention of pollution activities that are economical, effective, and permanent.
- As a member of the communities in each of the regions where we do business, TOA actively cooperates in efforts to save resources and energy and reduce industrial waste.
- TOA endeavors to preserve the environment both through compliance with established environmental laws, regulations and other agreements, and by voluntarily establishing our own in-house environment-related regulations as needed.
- TOA pursues environment-related educational and promotional activities and endeavors to ensure that all members of the TOA staff have a clear and constantly improving understanding of the "TOA Fundamental Environmental Philosophy" and the "Takarazuka Office Environmental Policy."
- Information on environmental technologies and products and environmental management implementation are made public as necessary.

TOA's Environmental Principles

TOA recognizes preservation of the Earth's environment as an important aspect of doing business in the world today. Our staff as a whole remains actively committed to pursuing all corporate activities in ways that give strong consideration to environmental protection.

CONSTANTLY INFORMED

Public places – from hotels to airports – the general public need to be supplied with more and more information. TOA ensures that every message reaches the right person at the right time, through public address systems that can be steered to areas where it is needed. Wireless systems that are uncomplicated and very reliable. Network technology through Internet is more flexible than ever before. For a world where human life is more pleasant and easier than ever before.





Wired Microphone

Lecture Microphones



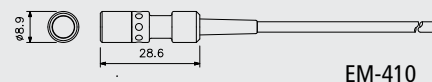
EM-410



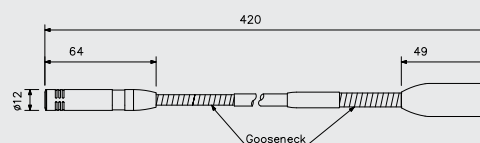
EM-410 capsule



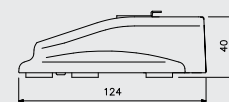
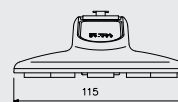
ST-800



EM-410



EM-800



ST-800

Features

EM-800: Gooseneck microphone

- Electret condenser element with cardioid pickup pattern and good off-axis rejection to minimise feedback
- Wide frequency range for well-balanced sound with clarity and a satisfying tonal response
- New gooseneck design with two adjustment points for flexible mic setting angles
- Colour : Black

Options:

- Microphone stand: ST-800

EM-410: Lavalier Microphone

- Clean and accurate reproduction of voice and maximum intelligibility
- Compact electret condenser element with hyper cardioid pickup pattern and good off-axis rejection to minimise feedback
- Provides the best performance when attached to the chest such as a shirt front
- Minimises noise pickup from clothes rustling and cables
- Capsule freely rotates to allow the best voice pickup even if the EM-410 is attached to the user's lapel
- Colour : Black

Applications

EM-800: Designed for places of worship, court-rooms and retail stores

EM-410: For lectures, religious services and any voice-oriented application

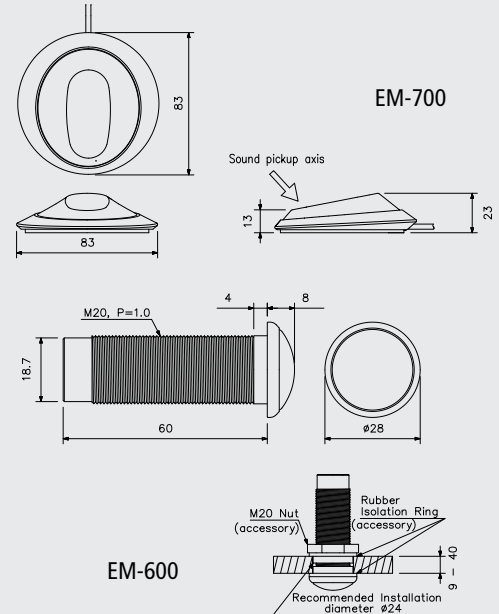
Specifications

	EM-800	EM-410
Application	Conference	Speech, vocal
Element	Electret condenser	Electret condenser
Polar Pattern	Cardioid	Hypercardioid
Rated Impedance	100 Ohm, balanced	100 Ohm, balanced
Phantom Power	9 – 52 V DC	9 – 52 V DC
Frequency Response	60 ... 20000 Hz	100... 15000 Hz
Sensitivity	-37 dB (0 dB = 1 V/1 Pa, 1 kHz)	-45 dB (0 dB = 1 V/1 Pa, 1 kHz)
Connector	XLR-3-12 or equivalent	Phone plug Cable length: 5.0 m
Weight	135 g	100 g
Dimension	ø12 x 420 mm	ø8.9 x 28.6 mm

Wired Electret Microphone



Boundary Microphones



Features

EM-700: Boundary Microphone

- High sound quality for sound reinforcement, professional recording, conferencing
- Frequency response extends over the full range of audible sound and ensures accurate reproduction
- Low-cut filter switch cuts low-frequency ambient noise around the desk
- Cardioid pickup pattern rejects off-axis sound to achieve very high gain until feedback starts
- Small diameter mic capsule positioned close to the mic housing boundary to minimise phase interference

- Design optimised for use on a desk
- Slim, stylish design suits interior decor
- Colour : Black

EM-600: Flush-Mount Boundary Microphone

- Unobtrusive design for flush-mounting
- Omnidirectional pickup pattern
- Wide frequency range from 30Hz to 20kHz
- Minimised picking up low frequency sounds that degrade audio performance
- Rubber isolation rings to resist vibrations which also affect audio quality
- Colour : White

Applications

Conference room recording, A/V conferences as well as use in monitoring for security purposes

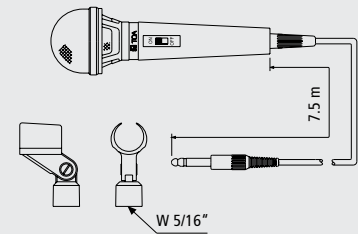
Specifications

	EM-700	EM-600
Application	Conference	Conference, security monitoring
Element	Electret condenser	Electret condenser
Polar Pattern	Cardioid	Hypercardioid
Rated Impedance	100 Ohm, balanced	100 Ohm, balanced
Phantom Power	9 – 52 V DC	9 – 52V DC
Frequency Response	35 ... 20000 Hz	30 ... 20000 Hz
Sensitivity	-32 dB (0 dB = 1 V/1 Pa, 1 kHz)	-39 dB (0 dB = 1 V/1 Pa, 1 kHz)
Connector	XLR-3-12 or equivalent Cable length: 7.5 m	XLR-3-12 or equivalent
Weight	300 g	85 g
Dimension	83 x 23 x 83 mm	∅ 28 x 68 mm



Handheld Dynamic Microphone

Universal Microphones



Features

- Handheld microphone for general use
- Short type slide On/Off switch for minimising switching noise
- Robust die-cast aluminium microphone body reduces handling noise
- Adapter for stand mount is provided
- DM-1100 has 7.5 m cable with phone plug
- DM-1300 with (balanced) XLR-connector has 10 m cable with (unbalanced) phone plug

Options

- ST-65A: Low Desk Stand
- ST-66A: High Desk Stand

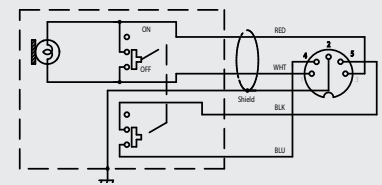
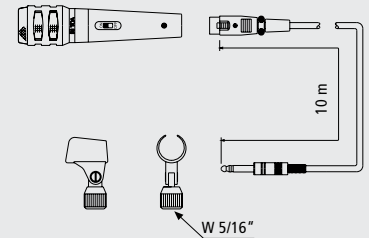
Specifications

	DM-1100	DM-1300
Application	Paging	Speech, vocal
Microphone Capsule	Dynamic	Dynamic
Directivity	Unidirectional	Unidirectional
Output Impedance	600 Ohm	600 Ohm
Signal Transmission	Unbalanced	Balanced
Frequency Range	100...12000 Hz	70...15000 Hz
Output Level (0 dB=1 V/Pa)	-55 dB	-54 dB
Cables	7.5 m, phone plug	10 m, phone plug
Microphone holder	W 5/16"	W 5/16"
Dimensions (W x H x D)	55 ø x 178 mm	51 ø x 170 mm

Handheld Dynamic Microphone



Dynamic Allround Microphones for Daily Use



Features

- Microphone for speech use
- Robust die-cast zinc microphone body
- Short type slide On/Off switch reduces handling noise
- XLR-connector and a 10 m cable with phone plug
- Adapter for stand mounting is provided
- DM-1200D comes with a remote control function to activate amplifiers power or chime unit and with a 5 m cable with 5-pin DIN plug

Options

- ST-65A: Low Desk Stand
- ST-66A: High Desk Stand

Applications

DM-1200: For daily use for presentation, performance or paging
 DM-1200D: For PA-System and paging (e.g. with pre-announcement gong)

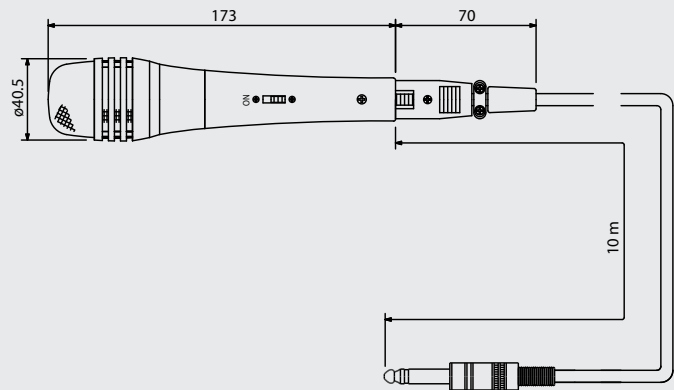
Specifications

	DM-1200	DM-1200D
Application	Paging, speech	Paging, speech
Directivity	Unidirectional	Unidirectional
Microphone Capsule	Dynamic	Dynamic
Output Impedance	600 Ohm	600 Ohm
Signal	Balanced	Balanced
Frequency Range	50...12000 Hz	50...12000 Hz
Output Level (0 dB=1 V/Pa)	-55 dB	-55 dB
Cables	10 m, phone plug	5 m, 5-pin DIN plug
Microphone Holder	W 5/16"	W 5/16"
Dimensions (W x H x D)	40 ø x 163 mm	40 ø x 163 mm



High Quality Microphones

Microphones for Vocal Use



Features

- DM-1500: Suitable for vocal and speech application
- Robust die-cast microphone body
- Short type slide On/Off switch reduces handling noise
- XLR-connector (balanced) and 10 m cable with phone plug
- Adapter for stand mount is provided

Options

- ST-65A (Low Desk Stand) ST-66A (High Desk Stand), ST-321B and ST-322B Stands

Applications

- DM-1500: For vocal and stage use
- EM-400: For speech, presentation and performance

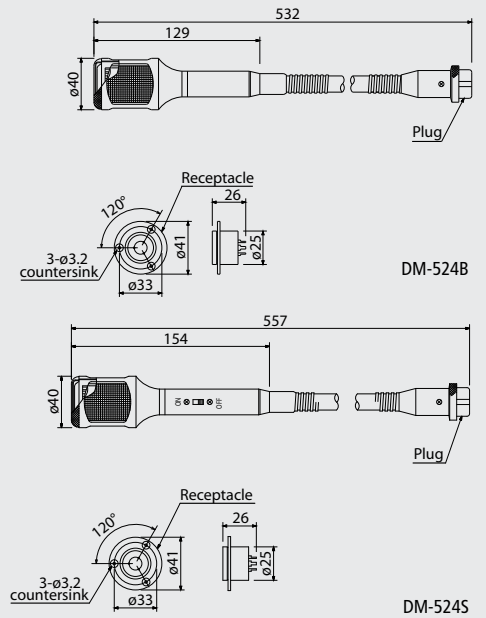
Specifications

	DM-1500
Application	Speech, vocals
Directivity	Cardioid
Microphone Capsule	Dynamic
Output Impedance	600 Ohm
Signal	Balanced
Input SPL	
S/N Ratio	
Frequency Range	70...15000 Hz
Output level (0 dB=1 V/Pa)	-56 dB
Cables, Connectors	10 m, phone plug
Mounting	W 5/16"
Dimensions	40.5 ø x 173 mm

Gooseneck Microphones



Stand-Mount Microphones for Lecture



Features

- Flexible gooseneck
- Suppresses handling noise
- DM-524S has a built-in On/Off switch
- 600 Ohm impedance (balanced)
- 3-pin connector
- Microphone can be used in conjunction with ST-73A Stand

Options

- ST-73A: Desk Stand

Applications

- For lecture desk or for paging

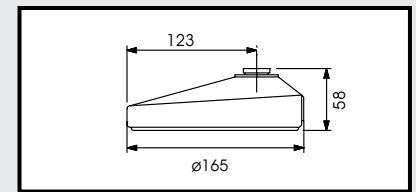
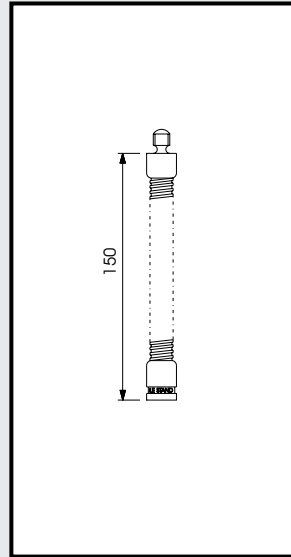
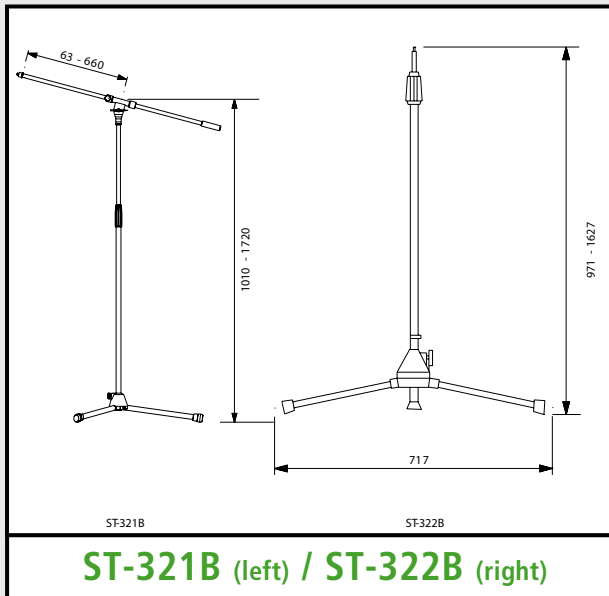
Specifications

	DM-524B	DM-524S
Application	Paging, speech, lecture	Paging, speech, lecture
Directivity	Cardioid	Cardioid
Microphone Capsule	Dynamic	Dynamic
Output Impedance	600 Ohm	600 Ohm
Signal	Balanced	Balanced
Frequency Range	100...10000 Hz	100...10000 Hz
Output Level	-56 dB (0.16 mV)	-56 dB (0.16 mV)
Cables	3-pin connector ø 21	3-pin connector ø 21
Dimensions	40 ø x 532 mm	40 ø x 557 mm



Accessories

Stands and Goosenecks



Features

- **ST-65A:** Desk Stand, low
- Height 120 ... 175 mm
- 5/16" stand adaptor and 5/8" inner pipe thread
- With microphone holder
- **ST-66A:** Desk Stand, high
- Height 220 ... 347 mm
- 5/16" stand adaptor and 5/8" inner pipe thread
- With microphone holder

Features

- **ST-321B:** Floor Stand with boom
- Height 1010 ... 1720 mm
- Boom 53 ... 660 mm
- U5/16 adaptor and NS5/8 thread
- **ST-322B:** Floor Stand
- Height 971 ... 1627 mm
- U5/16 adaptor and NS5/8 thread
- **ST-73A:** Desk Stand for DM-524B / DM-524S
- Height 58.5 mm

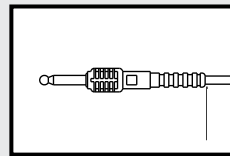
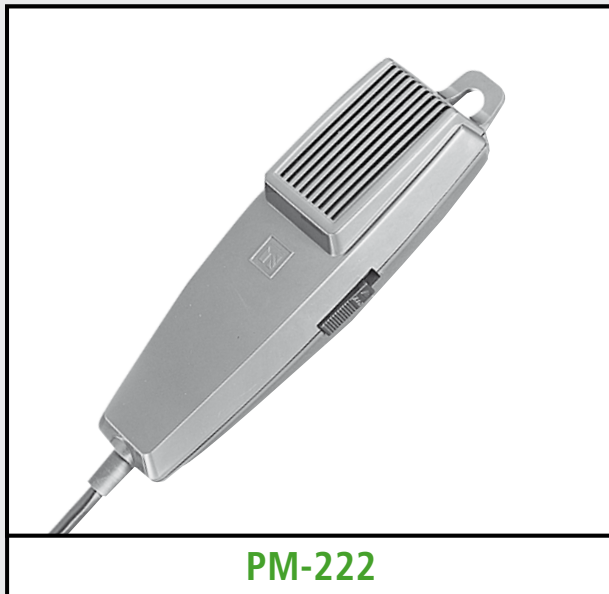
Features

- **YM-121:** Gooseneck for ST-73A
- Height 367 mm, connector XLR-3-11C
- Non-RoHS product
- **ST-506:** Gooseneck, short
- Height 150 mm, 5/16" thread
- Non-RoHS product
- **ST-507:** Gooseneck, long
- Height 300 mm, 5/16" thread
- Non-RoHS product

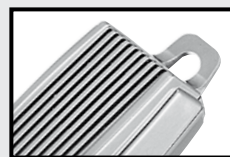
Paging Microphone



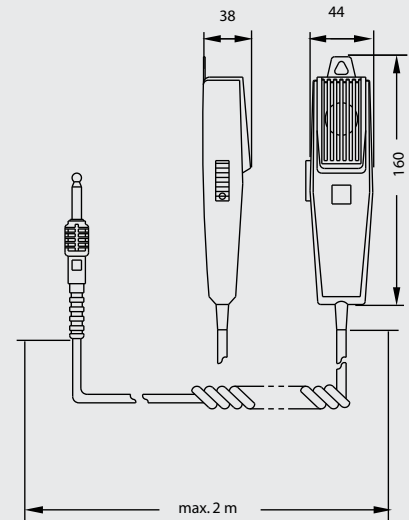
Rugged Microphone with Phone Plug



Phone Plug



Microphone Holder



Features

- For announcements in areas with high ambient noise
- Push-to-talk switch with lock
- Heavy duty metallic body
- Colour: grey
- PM-222 with phone plug and 2 m cable
- PM-222D with remote switch and DIN-plug
- PM-222U has no plug
- Output impedance is 600 Ohm, unbalanced

Applications

Paging

Specifications

	PM-222
Application	Paging
Directivity	Unidirectional
Microphone Capsule	Dynamic
Output Impedance	600 Ohm
Signal	Unbalanced
Frequency range	100...10000 Hz
Output level	-47 dB
Cables	1 core shielded cable, phone plug
Dimensions (W x H x D)	44 x 160 x 38 mm



Microphones for Speech

Heavy Duty Paging Microphones

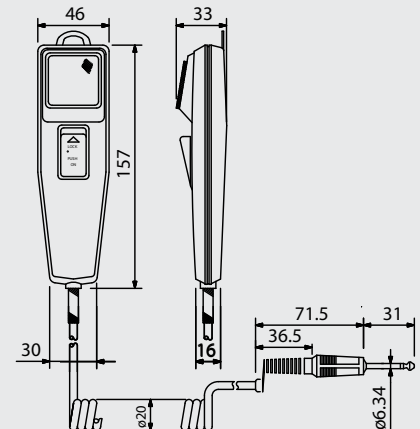


PM-120

Features

- Wide frequency response effective in high ambient noise areas
- Push-to-talk switch with lock
- 250 Ohm impedance, unbalanced
- 2.5 m coiled cable with phone plug
- Unidirectional polar pattern

Dimensions



PM-306D

Features

- Heavy duty microphone
- Metallic body suppresses background and handling noise for high intelligibility
- Push-to-talk-switch
- Coiled cable with 5-pin DIN plug (unbalanced)
- 500 Ohm impedance
- Allows priority overriding when used together with V-1051B

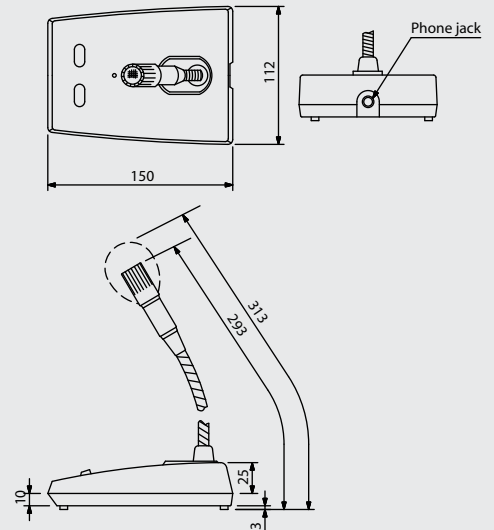
Specifications

	PM-306D	PM-120
Application	Paging	Paging
Directivity	Omnidirectional	Unidirectional
Microphone Capsule	Dynamic	Dynamic
Output Impedance	500 Ohm	250 Ohm
Signal	Unbalanced	Unbalanced
Frequency range	80...16000 Hz	50...12000 Hz
Output level	-47 dB	-56 dB \pm 3 dB (0 dB = 1 mV /Pa)
Cables	2 m, coiled cable, 5-pin DIN plug	2.5 m coiled cable, phone plug
Dimensions (W x H x D)	40 ϕ x 134 mm	46 ϕ x 157 mm

Desk Top Microphone for Paging



Chime Microphone



Features

- Unidirectional dynamic microphone
- Built-in electronic chime unit generates 2 series of 4 notes – from low to high and vice versa
- 2 push-buttons for easy operation
- 600 Ohm impedance, unbalanced

Applications

Reception, cashier station, counter

Specifications

	EC-100M
Type	Desk top microphone for paging
Power Requirements	3 V DC (2x 1.5 V battery) / 2 mA
Directivity	Unidirectional
Microphone Capsule	Dynamic
Output Impedance	600 Ohm
Signal	Unbalanced
Output Level	-53 dB (Mic), -45 dBV chime
Chime	4-note chime
Controls	On / off switch
Cables	2 m, phone plug
Dimensions (W x H x D)	112 x 293 x 150 mm



Remote Microphones

Universal Use Paging Microphone



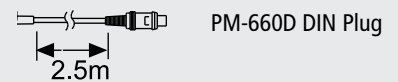
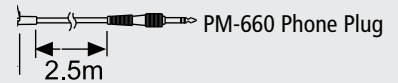
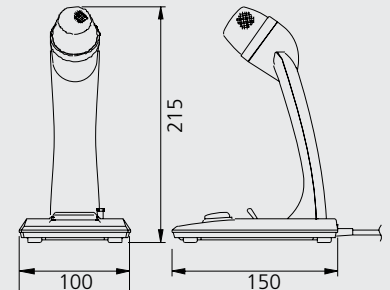
Talk-Switch



Dynamic Capsule



RU-2001 / 2002



Features

- Elegant desktop microphone
- Short-off talk switch with locking lever or open-off type switch contact
- Low handling noise
- 600 Ohm impedance
- 2,5 m cable with phone plug (PM-660) or 5-pin DIN-plug (PM-660D) or 2 m without plug (PM-660U)
- Talk-switch with contact for remote control (PM-660D)

Applications

Paging and announcements at the counter or in the cashier area (e.g. in supermarkets)

Options

- RU-2001, RU-2002: Microphone Amplifier Control Unit

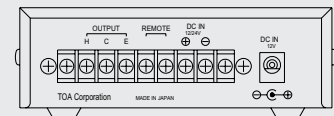
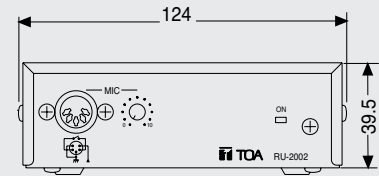
Specifications

	PM-660	PM-660D	PM-660U
Polar Pattern	Cardioid	Cardioid	Cardioid
Microphone Capsule Type	Dynamic	Dynamic	Dynamic
Output Impedance	600 Ohm	600 Ohm	600 Ohm
Signal	unbalanced	balanced	balanced
Frequency Range	100...10000 Hz	100...10000 Hz	100...10000 Hz
Output Level	-58 dB (1 kHz, 0 dB = 1 V / Pa)	-58 dB (1 kHz, 0 dB = 1 V / Pa)	-58 dB (1 kHz, 0 dB = 1 V / Pa)
Chime	–	from RU-2002	–
Controls	Push-to-talk-switch, locking lever	Push-to-talk-switch, locking lever	Push-to-talk-switch, locking lever
Cables	2.5 m with phone plug	2.5 m with 5-pin DIN plug	2.5 m cable, no plug
Dimensions (W x H x D)	100 x 215 x 150 mm	100 x 215 x 150 mm	100 x 215 x 150 mm

Amplifier Control Units



For Microphones with DIN Plug (for remote power control)



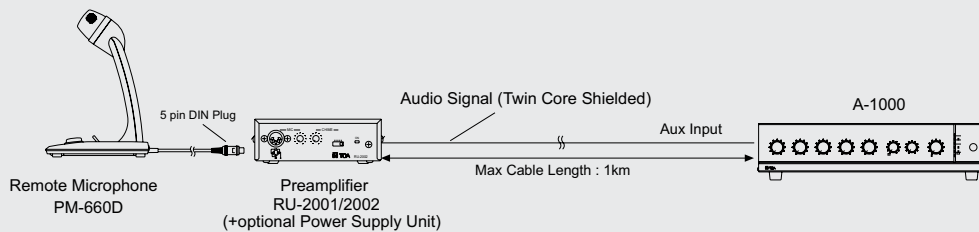
Features

- For remote power control of main amplifier and for initiating all-call
- Microphone volume control, talk indicator
- Power supply via AC adaptor
- Mounting brackets for wall-mounting are included
- RU-2002 activates 4, 2 or single tone chime plus gong when talk switch is pressed
- Colour: black

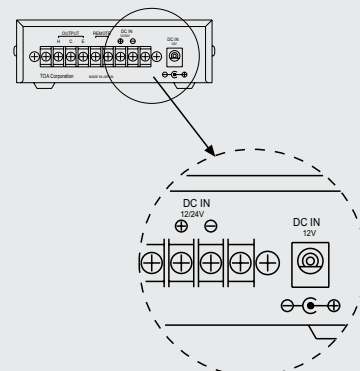
Options

- PM-660D: Remote Microphone

Application Example



Connection



	RU-2001	RU-2002
Power Supply	12...24 V DC, external or 12 V AC adaptor	12...24 V DC, external or 12 V AC adaptor
Power Consumption	60 mA	60 mA
Microphone Input	-62 dBV, 600 Ohm, unbalanced	-62 dBV, 600 Ohm, unbalanced
Output	0 dBV, 600 Ohm, balanced	0 dBV, 600 Ohm, balanced
Chime	—	4, 2 or single tone chime, gong
Dimensions (W x H x D)	124 x 42.5 x 159 mm	124 x 42.5 x 159 mm
Weight	0.7 kg	0.7 kg
Finish	black	black
Accessories	Mounting bracket	Mounting bracket



Infrared System

Microphones



IR-200M

Features

- Handheld microphone
- Capsule optimised for speech & vocal
- Stable voice transmission
- Intelligent positioning of the emitter avoids drop-outs through user's handling
- Electret condenser microphone unit
- Lightweight
- Infrared light emission adjustable
- 2 channels
- Antibacterial treatment
- Low-battery indicator



Tie Clip Microphone



Headset Microphone



Battery Charger



Ni-MH Battery



IR-300M

Features

- Body transmitter microphone
- Ready-to-wear design with neck strap
- Intelligent positioning of the emitter avoids drop-outs through user's handling
- Built-in electret condenser microphone
- Connection of optional external microphone possible
- Infrared light emission adjustable
- 2 channels
- Antibacterial treatment
- Low battery indicator

Options

- YP-M101: Tie Clip Microphone
- YP-M301: Headset Microphone
- IR-200BC: Battery Charger
- IR-200BT-2: Ni-MH Battery, 2 pcs./ rechargeable

Specifications

	IR-200M	IR-300M
Current Consumption	Typ. 250 mA (2.4 V, power selector switch: N) / typ. 340 mA (2.4 V, power selector switch: H)	
Battery	IR-200BT-2 rechargeable battery for the infrared wireless microphone (2 pieces) or AA alkaline dry cell battery (2 pieces)	
Infrared Emitter	870 nm (AM: Brightness modulation) Frequency modulation Channel A: 3.100 MHz/Channel B: 3.350 MHz Approx. 20 m (Power selector switch: H; in an unobstructed space.)/Approx. 15 m (Power selector switch: N; in an unobstructed space.)	
Modulation Sensitivity	±4.8 kHz (1 kHz, when SPL of 84 dB is input)	
Maximum Input Sound Pressure	120 dB SPL	
Input Sensitivity Adjustment	—	Adjustment range: -9 dB to 0 dB (factory-preset: 0 dB)
Microphone	Unidirectional electret condenser microphone	
Frequency Response	100 Hz – 12 kHz	
Preemphasis	300 μs	
Input	—	External microphone input (ø3.5 monaural mini jack)
Battery Operation Time	Approx. 8 hours (when the IR-200BT-2 rechargeable battery for the infrared wireless microphone is used; power selector switch: N) / Approx. 6 hours (when the alkaline battery is used; power selector switch: N)	
Environment Conditions	0°C to +40°C / 30% to 85% RH	
Finish	Control Section: ABS resin, metallic grey, 50% gloss, paint / Filter Section: Polycarbonate, optical cut filter	
Dimensions	ø37 × 241.8 mm	64 (W) × 91.3 (H) × 27.3 (D) mm
Weight	170 g (with batteries)	130 g (with batteries & strap)

Infrared System



Receiver



IR-500R



IR-510R



IR-520R

Features

- Wall-mount receiver
- With wall-mounting bracket
- Installation in electric circuit box possible
- Power indicator LED
- Reception area approx. 15 m
- Adjustable reception angle

Features

- Ceiling-mount receiver
- Stand mount also possible
- With ceiling mounting bracket
- Power indicator LED
- Reception radius approx. 8 m

Features

- Wall-mount receiver
- Wall or stand mount
- With stand mounting bracket
- Power indicator LED
- Reception area approx. 15 m

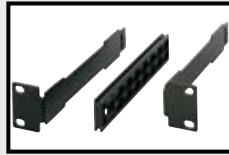
Specifications

	IR-500R	IR-510R	IR-520R
Power Source	24V DC (supplied from the optional IR-702T)	24V DC (supplied from the optional IR-702T)	24V DC (supplied from the optional IR-702T)
Current Consumption	Max. 40 mA	Max. 60 mA	Max. 30 mA
Infrared Detector Wavelength Carrier Frequency Reception Area Reception Angle	870 nm Channel A: 3.100 MHz/Channel B: 3.350 MHz Approx. 15 m Vertical: 80° (up to 30° movable downward) Horizontal: 80° (up to 30° movable left or right)	Approx. 15 m —	Approx. 15 m —
Connection Terminal	75 Ohm, BNC jack	75 Ohm, BNC jack	75 Ohm, BNC jack
Operating Temperature	0°C to +40°C	0°C to +40°C	0°C to +40°C
Operating Humidity	30% to 85% RH	30% to 85% RH	30% to 85% RH
Finish	Case: Polycarbonate resin, visible light cut filter Base: ABS resin, off-white	Case: Polycarbonate resin, visible light cut filter, Base: ABS resin, black	Case: Polycarbonate resin, visible light cut filter
Dimensions (W x H x D)	70 x 120 x 72 mm	ø120 x 71.3 mm	84.5 x 63.5 x 32 mm
Weight	220 g (unit only)	205 g (unit only)	100 g (unit only)

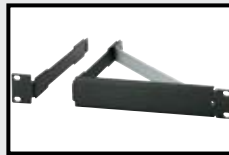


Infrared System

Infrared Wireless Tuner



MB-WT4



MB-WT3

Features

- 2-channel fixed-frequency tuner
- Up to 4 infrared light receivers per unit
- Two line outputs, one with a MIX output switch allowing output of mixed voices from channels A and B
- Equipped with signal reception light and knob for microphone volume control
- Rack-mountable with optional brackets (MB-WT3/MB-WT4)

Options

- MB-WT4: Rack-mount bracket kit for 2 IR-702T/700D, consists of 2 brackets and connector
- MB-WT3: 19"-Rack-mount bracket kit for 1 IR-702T/700D consists of 2 brackets, blank box and connector

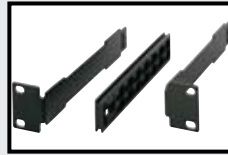
Specifications

	IR-702T
Power Source	AC mains 50/60 Hz (supplied from the accessory AC adaptor)
Power Consumption	15 W or less
Receiving Frequency	Channel A: 3.100 MHz / Channel B: 3.350 MHz
Receiver Sensitivity	S/N ratio over 50 dB (40 dB μ V input, 1 kHz modulation, \pm 4.8 kHz deviation)
S/N Ratio	>61 dB (60 dB μ V input, \pm 4.8 kHz deviation, A-weighted)
Tone Squelch Frequency	32.768 kHz
Infrared Receiver Input	75 Ohm, BNC jack \times 2 (Infrared wireless receiver's power source: 24V DC, max. 220 mA in total of 2 terminals)
Output	Channel A and B: -10 dB (\pm 4.8 kHz deviation, vol: max.), 600 Ohm, 3 pole phone jack
Frequency Response	100 Hz - 12 kHz
Operating Humidity	30% to 85% RH
Ambient Temperature	-10 °C to +50 °C
Finish	Case: ABS resin, black
Dimensions (W x H x D)	210 \times 44 \times 210.9 mm
Weight	630 g (unit only)



Infrared System

Infrared Wireless Distributor



MB-WT4



MB-WT3



YW-1022



YW-1024

Features

- Equipped with 4 receiver mixing outputs and 2 distribution outputs
- By using the IR-700D in conjunction with IR-702T and YW-1022/1024, a system with up to 16 infrared receivers is configurable
- Rack-mountable with optional brackets (MB-WT3/MB-WT4)

Options

- YW-1024 Distributor 1 into 4 outputs
- YW-1022 Distributor 1 into 2 outputs
- MB-WT4: Rack-mount Bracket Kit for 2 IR-702T/700D, consists of 2 brackets and connector
- MB-WT3: 19"-Rack-mount Bracket Kit for 1 IR-702T/700D consists of 2 brackets, blank box and connector

Specifications

	IR-700D
Power Source	AC mains 50/60 Hz (supplied from the accessory AC adaptor)
Power Consumption	25 W or less
Input/Output	4 mixing inputs, 2 distribution outputs
Band-Pass Frequency	3.0 – 6.0 MHz
Gain	0 dB (±3dB)
Infrared Receiver Input	75 Ohm, BNC jack × 4 (Infrared wireless receiver's power source: 24 V DC, 800 mA max. in total of 4 terminals)
Distribution Output	75 Ohm, BNC jack
Operating Humidity	30% to 85% RH
Ambient Temperature	-10 °C to +50 °C
Finish	Case: ABS resin, black
Dimensions (W x H x D)	210 × 44 × 200.9 mm
Weight	640 g (unit only)



UHF 5000 Series

Microphones (New!)



WM-5225



WM-5270



WM-5265

Features

- Electret condenser microphone
- Coverage 5 - 120 m
- 64 transmission channels
- On/Off switch prevents from rolling away
- Maximum input level 126 dB
- Low-battery indicator
- Only 1 AA battery required
- Built-in antenna

Application

Optimised for speech

Features

- Dynamic microphone
- Coverage 5 - 120 m
- Optimised PLL synthesizer
- Excellent sound quality
- Cardioid characteristics
- 64 transmission channels
- On/Off switch prevents from rolling away
- Maximum input level 142 dB
- Low-battery indicator
- Only 1 AA battery required
- Built-in antenna

Application

Optimised for vocals and speech

Features

- Dynamic microphone
- Optimised PLL synthesizer
- Excellent sound quality
- 64 transmission channels
- On/Off switch prevents from rolling away
- Maximum input level 132 dB
- Low-battery indicator
- Only 1 AA battery required
- Optional rechargeable battery available
- Built-in antenna

Application

Optimised for speech

Specifications

	WM-5225	WM-5270	WM-5265
Microphone Element	Electret condenser microphone, unidirectional	Dynamic microphone, cardioid	Dynamic microphone, unidirectional
Frequency Range	830 - 865 MHz (UHF D-Band), 606 - 636 MHz (G-Band + white space) 576 - 865 MHz (different sub-ranges for UHF A,B,C,E,F,G,H-Band)	794 - 830 MHz (UHF C-Band), 830 - 865 MHz (UHF D-Band)	830 - 865 MHz (UHF D-Band), 606 - 636 MHz (G-Band + white space) 576 - 865 MHz (different sub-ranges for UHF A,B,C,E,F,G,H-Band)
Channel Selectable*	64	64	64
RF Carrier Power	< 50 mW	< 50 mW	< 50 mW
Tone Frequency	32.768 kHz	32.768 kHz	32.768 kHz
Modulation System	PLL-Synthesizer	PLL-Synthesizer	PLL-Synthesizer
Max. Input Level	126 dB SPL	142 dB SPL	132 dB SPL
Maximum Deviation	± 40 kHz	± 40 kHz	± 40 kHz
Battery	LR6 (AA)	LR6 (AA)	LR6 (AA)
Battery Life	More than 10 hours (alkaline)	More than 10 hours (alkaline)	More than 10 hours (alkaline)
Indicator	Power/battery indicator	Power/battery indicator	Power/battery indicator
Antenna	Built-in	Built-in	Built-in
Ambient Temperature	- 10°C ... + 50°C	- 10°C ... + 50°C	- 10°C ... + 50°C
Finish	Resin, rubber coating	Resin, rubber coating	Resin, rubber coating
Dimensions (W x H x D)	ø 43.6 x 231.5 mm	ø 48 x 244 mm	ø 50 x 229 mm
Weight	180 g (incl. battery)	340 g (incl. battery)	205 g (incl. battery)
Accessories	Screw driver, pouch, microphone clip holder (incl. stand adaptor)	Screw driver, pouch, microphone holder (incl. stand adaptor), rolling stopper	Screw driver, pouch, microphone holder (incl. stand adaptor), rolling stopper

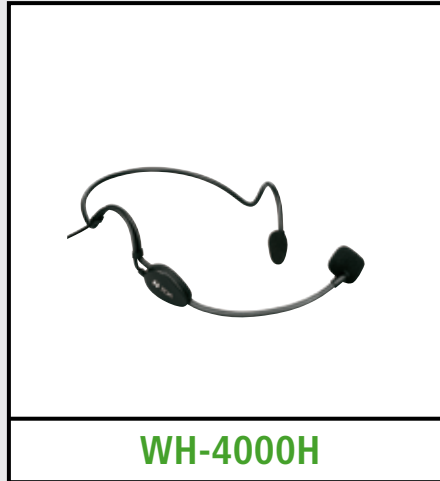
UHF 5000 Series



Microphones (New!)



WM-5325



WH-4000H



WH-4000A

Features

- Wireless transmitter
- 64 transmission channels
- Maximum input level: -14 to -29 dB
- Low-battery indicator
- Only 1 AA battery required
- Built-in antenna
- Neck-strap is provided

Features

- WH-4000H: Headset Microphone
- WH-4000A: Aerobic Headset Microphone

Options

- WH-4000H: Headset Microphone
- WH-4000A: Aerobic Headset Microphone
- YP-M5300: Lavalier Microphone
- YP-M5310: Lavalier Microphone

Specifications

	WM-5325
Connector	ø 3.5 mm plug
Frequency Range	576 - 865 MHz, 830 - 865 MHz (UHF D-Band), 606 - 636 MHz (UHF G-Band + white space)
Channel Selectable*	64
RF Carrier Power	< 50 mW
Tone Frequency	32.768 kHz
Modulation System	PLL-Synthesizer
Max. Input Level	-14 ... -29 dB
Maximum Deviation	± 40 kHz
Battery	LR6 (AA)
Battery Life	More than 10 hours (alkaline)
Indicator	Power/battery indicator
Antenna	Built-in
Ambient Temperature	- 10°C ... + 50°C
Finish	Resin, coating
Dimensions (W x H x D)	62 x 102.5 x 23 mm
Weight	90 g (incl. battery)
Accessories	Screw driver, storage case, neck strap

* The number of channels may differ from country to country



UHF 5000 Series

Microphones (new!)



YP-M5300



YP-M5310

Features

- Lavalier Microphone
- Electret condenser microphone
- With 1.3 m cable and plug lock
- High maximum input level
- ø 3.5 mm mini plug
- Only 20 g weight including cable

Features

- Lavalier Microphone
- Electret condenser microphone
- With 1.3 m cable and plug lock
- Omnidirectional characteristics
- ø 3.5 mm mini plug
- Only 20 g weight including cable

Specifications

	YP-M5300	YP-M5310
Microphone Element	Electret condenser microphone, unidirectional	Electret condenser microphone, omnidirectional
Connector	ø 3.5 mm plug	ø 3.5 mm plug
Frequency Response	100 Hz - 12000 Hz	100 Hz - 15000 Hz
Sensitivity	-63 dB	-64 dB
Max. Input Level	120 dB SPL	110 dB SPL
Cable Length	1.3 m	1.3 m
Finish	Dark black	Dark black
Weight	20 g (incl. cord)	20 g (incl. cord)

The specifications may change



UHF 5000 Series

Receivers



WT-5800



WT-5805



WT-5810

Features

- UHF-Receiver for rack mounting
- True diversity receiver
- 64 channels
- Triple squelch-function suppresses noise
- Mixing input allows cascading of receivers
- Antenna distribution output
- External antenna inputs
- Battery indicator

Options

- Mounting brackets for WT-5800:
MB-WT3 (1 receiver)
MB-WT4 (2 receivers)

Features

- UHF receiver for rack mounting
- TOA Space Diversity receiver
- 64 channels
- Triple squelch-function suppresses noise
- Mixing input allows cascading of receivers
- Battery indicator

Options

- Mounting brackets for WT-5805:
MB-WT3 (1 receiver)
MB-WT4 (2 receivers)

Features

- UHF receiver
- TOA Space Diversity receiver
- 16 channels
- Triple squelch-function suppresses noise
- Mixing input allows cascading of receivers
- 2 antenna
- Output with XLR (balanced) and phone jack (unbalanced)
- Battery indicator

Specifications

	WT-5800	WT-5805	WT-5810
Power Requirement	230 V AC, 50/60 Hz (using AC-DC adapter)		
Power Consumption	250 mA (12 V DC)	200 mA (12 V DC)	130 mA (12 V DC)
Receiving Frequency	794 - 830 MHz (UHF C-Band), 830 - 865 MHz (UHF D-Band)		
No of Channel Selectable	64	64	16
Audio Output	MIC: -60 dB, 600 Ohm, balanced, XLR-3-31, LINE: -20 dB, 600 Ohm, 1/4" phone jack (unbalanced)		
Mixing Input	-20 dB, 10 kOhm, phone jack (unbalanced)		
Antenna Input	75 Ohm, BNC (phantom power antenna) 9 V DC, 30 mA (max.)	—	—
Antenna Output	75 Ohm, BNC (Gain 0dB)	—	—
Receiving Sensitivity	Better than 90 dB, S/N ratio, (20 dBµV input, 40 kHz deviation)		
Squelch Sensitivity	18-40 dBµV variable		
Tone Frequency	32.768 kHz		
Indication	Audio (6 Step), RF (6 Step), ANT A/B, Audio (peak), battery	Audio (6 Step), RF (6 Step), ANT A/B, Audio (peak), battery	ANT A/B, Audio (peak), battery
Channel Check	Usable frequencies scanning		
S/N Ratio	> 110 dB (A-weight, unbalanced output)	> 110 dB (A-weight, unbalanced output)	> 104 dB (A-weight, unbalanced output)
Harmonic Distortion	Less than 1%		
Frequency Response	100 ... 15000 Hz, ±3 dB		
Ambient Temperature	-10°C ... +50°C		
Finish	Resin, black		
Dimensions (W x H x D)	210 x 44 x 205,1 mm	210 x 44 x 205,1 mm	206 x 40,6 x 152,7 mm
Weight	700 g	700 g	590 g

UHF Professional Series (64 channels)

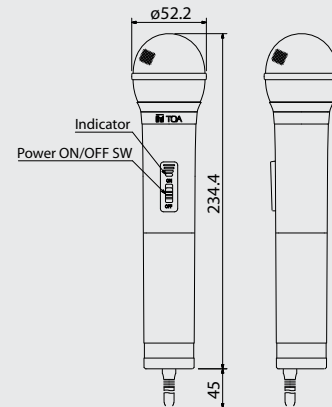
Handheld Microphone and UHF Lavalier Microphone



WM-4200

Features

- Dynamic handheld microphone
- Cardioid characteristics
- For vocal use
- Excellent and clear sound
- Compander system offers a wide dynamic range
- High sound pressure level enables singing loud and also singing close to the microphone
- Level can be adjusted to fit to any individual performer
- Rubber coating eliminates handling noise, reflections and allows a good handling of the microphone
- On / off switch prevents from accidental activation
- 64 channels are ideal for bigger events



Options

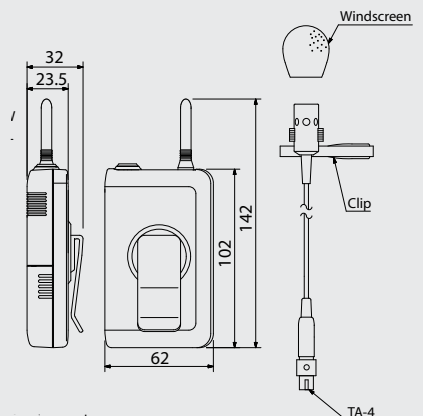
- ST-65: Desk Stand



WM-4300

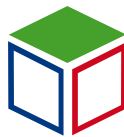
Features

- Lavalier microphone
- Cardioid characteristics
- Electret capsule ensuring a high intelligibility
- Rigid TA-4 plug
- Pocket transmitter
- 64 transmission channels
- Low-battery indicator
- Wide dynamic range through the compander circuit
- Belt clip is 360 degree rotatable and allows to fix the microphone capsule in any position at the clothes



Specifications

	WM-4200	WM-4300
Microphone Element	Dynamic microphone unit, cardioid pickup pattern	Electret condenser microphone, cardioid pickup pattern
Connector	-	TA-4 (XLR-type)
Modulation	FM	FM
Frequency Range	794-830 MHz UHF C-band, 830-865 MHz, UHF D-band	794-830 MHz UHF C-band, 830-865 MHz, UHF D-band
No of Channel Selectable	64	64
RF Carrier Power	Less than 50 mW	Less than 50 mW
Tone Frequency	32.768 kHz	32.768 kHz
Modulation System	PLL synthesizer	PLL synthesizer
Maximum Input Level	145 dB SPL	120 dB SPL
Maximum Deviation	±40 kHz	±40 kHz
Battery	6LR61 (9 V x 1), More than 10 hours (alkaline)	6LR61 (9 V x 1), More than 10 hours (alkaline)
Indication	Power / battery indicator	Power / battery indicator
Antenna	Herical antenna	Herical antenna
Ambient Temperature	-10°C to +50°C	-10°C to +50°C
Finish	Resin, rubber coating	Resin, coating
Dimensions (W x H x D)	ø 52.2 x 279.4 mm	62 x 142 x 32 mm
Weight	270 g (with battery)	150 g (with battery)



UHF Economy Series (16 channels)

UHF Wireless Tuner / Handheld Microphone



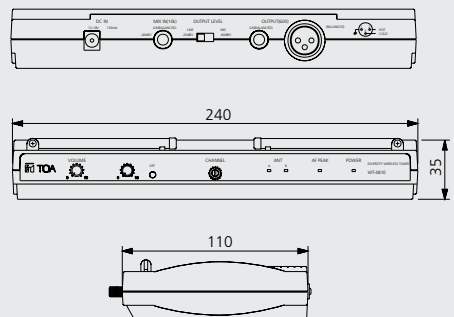
WT-4820

Features

- UHF Diversity Receiver for 1 or 2 optional UHF modules WTU-4800
- TOA Space Diversity Technology ensuring constant coverage
- Double squelch system supports a clear reception
- Mixing inputs allow cascading of several receivers
- 2 built-in antennas
- Mixing input for combination of receivers
- Rack-mountable

Options

- WTU-4800: UHF Tuner Module
- MB-WT3: Rack mounting of one WT-4820
- MB-WT4: Rack mounting of two WT-4820



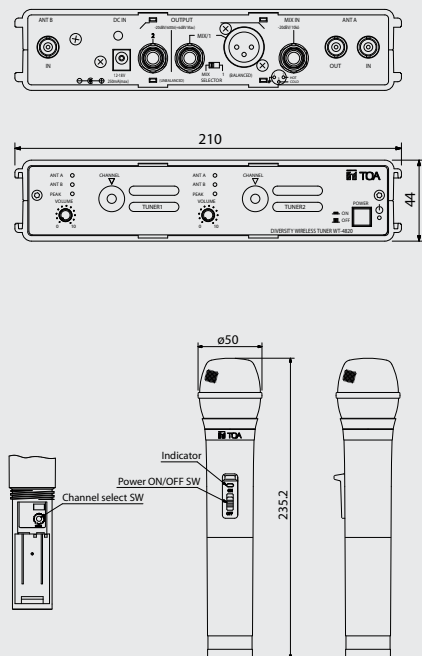
WM-4210

Features

- 16 channel frequency
- Optimised for vocals/singing
- Dynamic cardioid microphone element
- Maximum input level: 130 dB
- On/off-switch also keeps mic from rolling
- Flashing low-battery indicator
- Mic clip and storage case included
- Also compatible with TOA Professional Series WT-4800 Tuner (64 channel frequency-agile)

Options

- ST-65A: Desk Stand



Specifications

	WT-4820
Power Requirement	230 V AC mains (using AC-DC adapter)
Power Consumption	250 mA (12 V DC, with 2 tuner modules)
Receiving Frequency	794-830 MHz UHF C-band, 830-865 MHz, UHF D-band
Diversity System	TOA Space Diversity
No of Channel Selectable	16 CH
Receiving System	Double super-heterodyne
Audio Output	Mixing/Solo 1: -60 dB phone jack(unbalanced), -14 dB XLR-3-31 type connector (balanced) / Solo 2: -20 dB, 1/4" Phone jack (unbalanced) / 600 Ohm
Mixing Input	-20 dB, 10 kOhm, 1/4" Phone jack (unbalanced)
Antenna Input	75 Ohm, BNC (phantom powering for antenna) 9 V DC, 30 mA
Receiving Sensitivity	Refer to WTU-4800
Squelch Sensitivity	Refer to WTU-4800
Squelch System	Refer to WTU-4800
Indication	ANT A/B, Audio (peak), power
S/N Ratio	Better than 102 dB, (A-weight, balanced output)
Harmonic Distortion	Less than 1 %
Frequency Response	50 ... 18000 Hz, ± 3 dB
Ambient Temperature	-10°C to +50°C
Finish	Resin, black
Dimensions (W x H x D)	210 x 44 x 181 mm
Weight	770 g
Accessory	AC-DC adapter

	WM-4210
Microphone Element	Dynamic microphone unit, cardioid
Modulation	FM
Frequency Range	794-830 MHz UHF C-band, 830-865 MHz, UHF D-band
No of Channel Selectable	16
RF Carrier Power	Less than 50 mW
Tone Frequency	32.768 kHz
Modulation System	PLL synthesizer
Maximum Input Level	130 dB SPL
Maximum Deviation	±40 kHz
Battery	6LR61 (9 V x 1)
Battery Life	More than 10 hours (alkaline)
Indication	Power/battery indicator
Antenna	Internal antenna
Ambient Temperature	-10°C to +50°C
Finish	Resin, coating
Dimensions	ø 50 x 235.2 mm
Weight	270 g (with battery)
Accessory	stand adapter, screw driver, storage case



UHF 5000 Series

Accessories



WTU-4800



MB-WT3



YW-4500



MB-WT4



WD-4800



MB-15B

Features

- UHF Tuner Module for WT-4820, MX-628, ER-2930W and WA-1822

Options

- WT-4820: Wireless Tuner
- MX-628: Powered Mixer
- WA-1822: Wireless Meeting Amplifier
- ER-2930W: Megaphone

Features

- YW-4500: UHF Wireless Antenna
- Active antenna with attenuation switch, for wall-mounting
- MB-WT3: 19"-Rack Mounting Bracket Kit for 1 WT-4800, consists of 2 brackets, blank box and connector
- MB-WT4: Rack Mounting Bracket Kit for 2 WT-4800, consists of 2 brackets and connector

Features

- Power antenna distributor with 2 antenna inputs, 4 antenna outputs and 4 DC power outputs
- Antenna outputs are distributed to the tuner for maximum coverage area and effective clear sound
- Rack mountable with optional mounting brackets (MB-15B)

Specifications

	WTU-4800
Power Requirement	7-12 V DC
Receiving Frequency	794-830 MHz UHF C-band, 830-865 MHz, UHF D-band
Receiving System	Double super-heterodyne
Diversity System	TOA Space Diversity
Channels	16
S/N Ratio	> 80 dB
Harmonic Distortion	Less than 1%
Frequency Response	100 ... 12000 Hz, ±3 dB
Ambient Temperature	-10°C to +50°C
Finish	Steel
Dimensions (W x H x D)	60 x 25 x 139 mm
Weight	130 g

	YW-4500
Power Requirement	7-12 V DC (supplied from amplifier or tuner)
Current Consumption	Under 24 mA
Receiving Frequency	794-830 MHz UHF C-band, 830-865 MHz, UHF D-band
Dipole Ratio Relative Gain	More than 8 dB (780 MHz)
V.S.W.R	Less than 3.0
Output Impedance	75 Ohm
Mounting Hole Pitch	83.5 mm (dimensions for wiring box)
Ambient Temperature	-10°C to +50°C
Finish	AES resin, off-white
Dimensions (W x H x D)	105 x 140 x 126 mm
Weight	270 g

	WD-4800
Power Requirement	230 V AC
Frequency Range	VHF / UHF
Antenna Input	Dual 2 inputs (front x 1, rear x 1), 75 Ohm, BNC (phantom powering for antenna)
Antenna Output	Dual 4 outputs, 75 Ohm, BNC
DC Power Supply	4 outputs, (13 V DC / 250 mA)
Indication	Power
Ambient Temperature	-10°C to +50°C
Finish	Steel, coating
Dimensions (W x H x D)	420 x 44 x 305.5 mm
Weight	3.55 kg
Option	Rack-mounting bracket: MB-15B



UHF 5000 Series

Microphone / Tuner Sets (Basic system bundled in a set)



WS-5200

- A set consists of the handheld microphone WM-5220 and the tuner WT-5810
- For specifications of the models please see p. 32 and p. 34



WS-5300

- A set consists of the lavalier microphone WM-5320 and the tuner WT-5810
- For specifications of the models please see p. 33 and p. 34



WS-5300H

- A set consists of the headset microphone WM-5320H and the tuner WT-5810
- For specifications of the models please see p. 33 and p. 34

Matching Microphones and Accessories of the UHF 4000 Series



Handheld Microphones

Models

- WM-4200: Handheld Microphone for speech and vocals with 64 channels, for specifications please see p. 29
- WM-4210: Handheld Microphone for speech and vocals with 16 channels, for specifications please see p. 30



YW-4500

Features

- YW-4500: UHF Wireless Antenna
- Active antenna with attenuation switch, for wall-mounting
- For specifications please see p. 31



WD-4800

Features

- WD-4800: Power Antenna Distributor with 2 antenna inputs, 4 antenna outputs and 4 DC power outputs
- Rack mountable with optional mounting brackets (MB-15B)
- For specifications please see p. 31

Accessories



MB-WT4



MB-WT3

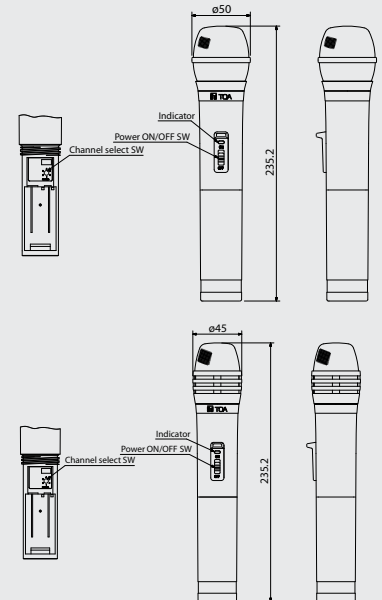


MB-15B



VHF Series

Handheld Microphones



Features

- Handheld Microphone
- 6 transmission channels
- Componder system offers a wide dynamic range
- A nose at the On/Off switch prevents microphone from rolling

- WM-3210: For vocal and speech use
- Cardioid characteristics
- Dynamic microphone element

- WM-3220: For speech use
- Cardioid characteristics
- Electret condenser capsule ensures high intelligibility

Application

School auditoriums, community centres, houses of worship, restaurants

Application

Lecture rooms in university or hotel, bingo halls, presenters at POS

Specifications

	WM-3210	WM-3220
Microphone Element	Dynamic, cardioid	Electret condenser, cardioid
Frequency Range	169 - 216 MHz, VHF	169 - 216 MHz, VHF
Channel Selectable	6	6
RF Carrier Power	< 50 mW	< 50 mW
Tone Frequency	32.768 kHz	32.768 kHz
Modulation System	PLL-synthesizer	PLL-synthesizer
Maximum Input Level	125 dB SPL	120 dB SPL
Maximum Deviation	± 40 kHz	± 40 kHz
Battery	9 V (6LR61)	9 V (6LR61)
Battery Life	> 10 h	> 10 h
Indication	Power + battery indicator	Power + battery indicator
Antenna	Internal antenna	Internal antenna
Ambient Temperature	- 10°C ... 50°C	- 10°C ... 50°C
Finish	Resin, coating	Resin, coating
Dimensions	$\phi 50 \times 235.2$ mm	$\phi 45 \times 235.2$ mm
Weight	250 g (incl. battery)	250 g (incl. battery)
Accessory	Stand adapter, screw driver	Stand adapter, screw driver



VHF Series

Belt Pack Microphones



WM-3310H



WM-3310

Features

- WM-3310: Lavalier microphone with belt clip (360 degree rotatable to fix the microphone capsule in any position on the clothing)
- WM-3310H: Headset microphone
- Cardioid characteristics
- Electret capsule ensuring a high intelligibility
- 3.5 mm phone plug with plug lock
- Pocket transmitter
- 6 transmission channels
- Low-battery indicator
- Wide dynamic range due to the compander circuit

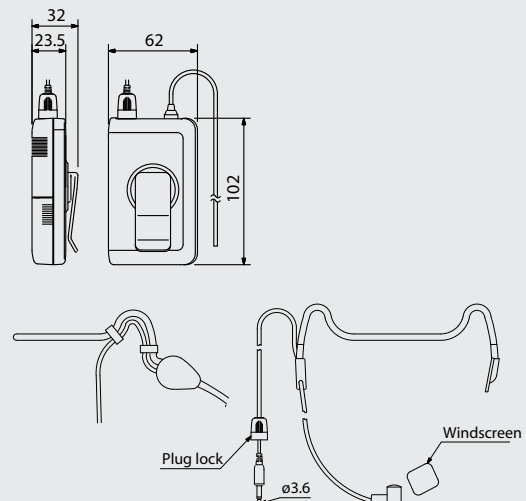
Application

Fitness studios, gymnasiums, school auditoriums, community centres, houses of worship, restaurants

Specifications

	WM-3310H	WM-3310
Microphone Element	Electret condenser, cardioid	
Connector	ø 3.5 mm plug	
Frequency Range	169 - 216 MHz, VHF	
Channel Selectable	6	
RF Carrier Power	< 50 mW	
Tone Frequency	32.768 kHz	
Modulation System	PLL-Synthesizer	
Maximum Input Level	120 dB SPL	
Maximum Deviation	± 40 kHz	
Battery	9 V (6LR61)	
Battery Life	> 10 h	
Indication	Power + battery indicator	
Antenna	1/4 lambda wire antenna	
Ambient Temperature	- 10°C ... 50°C	
Finish	Resin, coating	
Dimensions (W x H x D)	62 x 142 x 32 mm, dark grey	
Weight	135 g (with battery)	
Accessory	Screw driver	

Dimensions





VHF Series

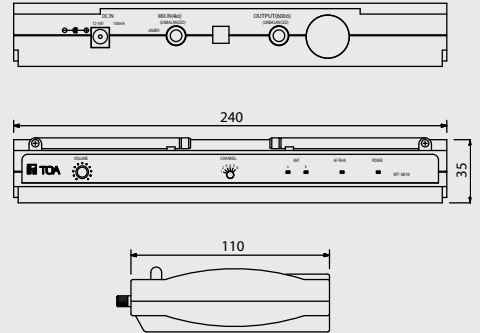
Wireless Tuners



WT-3810

Features

- VHF receiver
- TOA Space Diversity Technology ensuring constant coverage
- Scan function detects free resp. intermodulation-free channels to secure an undisturbed broadcasting
- Double squelch system supports clear reception
- WT-3800 features audio mixing input
- Receiver can be mounted in 19" racks with optional brackets
- 1 height unit
- 2 built-in antennas
- Colour: black



WT-3810



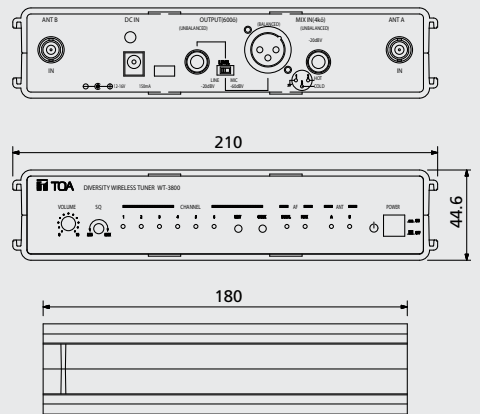
WT-3800

Options

- Rack mounting brackets for WT-3800:
MB-WT3 (1 unit)
MB-WT-4 (2 units)

Applications

Boardrooms, hotels, restaurants, schools, auditoriums, community centres



WT-3800

Specifications

	WT-3810	WT-3800
Power Requirement	230 V AC (using AC-DC adapter)	230 V AC (using AC-DC adapter)
Power Consumption	150 mA (13.8 V DC)	150 mA (13.8 V DC)
Receiving Frequency	169 - 216 MHz, VHF	169 - 216 MHz, VHF
Channel Selectable	6	6
Antenna	Integrated antenna	Input BNC, 75 Ohm
Receiving Sensitivity	Better than 80 dB	Better than 80 dB
Squelch Sensitivity	18 - 40 dB μ V variable	18 - 40 dB μ V variable
Tone Frequency	32.768 kHz	32.768 kHz
Indication	3	3
Channel Check	-	Usable frequencies scanning
Digital Control I/O	-	available
S/N Ratio	>100 dB	>100 dB
Harmonic Distortion	< 1 %	< 1 %
Frequency Response	100 ... 12000 Hz, \pm 3 dB	100 ... 12000 Hz, \pm 3 dB
Ambient Temperature	- 10°C ... 50°C	- 10°C ... 50°C
Finish	Resin, black	Resin, black
Dimensions (W x H x D)	240 x 35 x 110 mm	210 x 44.6 x 180 mm
Weight	380 g	600 g

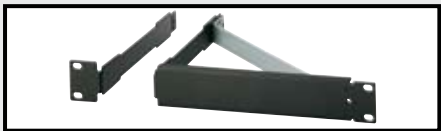


VHF Series

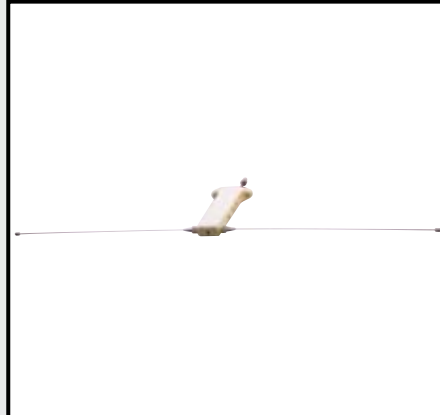
Accessories for the VHF Series



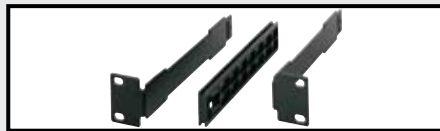
WTU-3800



MB-WT3



YW-3500



MB-WT4



WD-4800



MB-15B

Features

- VHF Tuner Module for WT-4820, MX-628 and WA-1822

Options

- WT-4820: Wireless Tuner
- MX-628: Powered Mixer
- WA-1822: Wireless Meeting Amplifier

Features

- YW-3500: VHF Wireless Antenna Dipole Antenna: Dipole ratio relative gain more than 6 dB, 75 Ohm output impedance, wall-mountable
- MB-WT3: 19"-Rack Mounting Bracket Kit for 1 WT-4800, consists of 2 brackets, blank box and connector
- MB-WT4: Rack Mounting Bracket Kit for 2 WT-4800, consists of 2 brackets and connector

Features

- WD-4800: Power Antenna Distributor with 2 antenna inputs, 4 antenna outputs and 4 DC power outputs
- The antenna outputs are distributed to the tuner for maximum coverage area and effective clear sound
- Rack-mountable with optional mounting brackets (MB-15B)

Specifications

	WTU-3800
Power Requirement	7-12 V DC
Receiving Frequency	169-216 MHz, VHF
Receiving System	Double super-heterodyne
Diversity System	TOA Space Diversity
Channels	6
S/N Ratio	> 80 dB
Harmonic Distortion	Less than 1 %
Frequency Response	100 ... 12000 Hz, ±3 dB
Ambient Temperature	-10°C to +50°C
Finish	Steel
Dimensions (W x H x D)	60 x 25 x 139 mm
Weight	130 g

	YW-3500
Power Requirement	8-10 V DC, (supplied from amplifier or tuner)
Current Consumption	Under 24 mA
Receiving Frequency	169-216 MHz, VHF
Dipole Ratio Relative Gain	More than 6 dB
V.S.W.R	Less than 2.6
Output Impedance	75 Ohm
Mounting Hole Pitch	68.5 mm (dimensions for wiring box)
Ambient Temperature	-10°C to +50°C
Finish	ABS resin, off-white
Dimensions (W x H x D)	197 x 850 x 32 mm
Weight	200 g

	WD-4800
Power Requirement	230V AC / 120 V AC
Frequency Range	VHF/UHF
Antenna Input	Dual 2 inputs (front x 1, rear x 1), 75 Ohm, BNC (phantom powering for antenna)
Antenna Output	Dual 4 outputs, 75 Ohm, BNC
DC Power Supply	4 outputs, (each output 13 V DC, 250 mA)
Indication	Power
Ambient Temperature	-10°C to +50°C
Finish	Steel, coating
Dimensions (W x H x D)	420 x 44 x 305.5 mm
Weight	3.50 kg
Option	Rack mounting bracket: MB-15B



Power Amplifiers A-2000 Series

Amplifiers (60 W - 240 W)



Features

- 4 wattages available: 30 W (A-2030) / 60 W (A-2060), 120 W (A-2120) or 240 W (A-2240)
- User-friendly front panel allows easy operation
- Excellent frequency response
- 3 electronically balanced microphone inputs, 2 AUX inputs and recording output
- Phantom power is provided to MIC 1, for supplying power to a condenser microphone
- Improved cost-performance level
- Wide tone-control adjustment range of ± 10 dB for both bass and treble
- Operation on either 230 V AC or 24 V DC
- 100 V / 70 V line or 4 Ohm speaker outputs
- Recording output
- 3 MIC inputs
- 2 AUX inputs for tuner, cassette player or other BGM sources
- Booster Amplifier (P-2240) for additional power
- 2-unit size
- Colour: black

Applications

Houses of worship, religious facilities, school auditoriums, offices and other small to medium sized locations with the need to connect multiple sound sources like microphones

Specifications

	A-2030	A-2060	A-2120	A-2240
Rated Output Power	30 W	60 W	120 W	240 W
Power Requirements	230 V AC, 50/60 Hz or 24 V DC	230 V AC, 50/60 Hz or 24 V DC	230 V AC, 50/60 Hz or 24 V DC	230 V AC, 50/60 Hz or 24 V DC
Power Consumption	34 W (AC) or 2 A (DC)	72 W (AC) or 4 A (DC)	124 W (AC) or 8 A (DC)	238 W (AC) or 15 A (DC)
Inputs	MIC 1: -60dB, 600 Ω , electronically balanced, 5-P DIN type MIC 2, 3: -60dB, 600 Ω , electronically balanced, phone jack AUX 1, 2: -20dB, 10k Ω , unbalanced, RCA pin jack Mute: Contact Pin 4 – 5, closure input (for MIC 1)			
Speaker Outputs	100 V, 70 V, 4 Ohm	100 V, 70 V, 4 Ohm	100 V, 70 V, 4 Ohm	100 V, 70 V, 4 Ohm
Frequency Response	50...20000 Hz (± 3 dB)	50...20000 Hz (± 3 dB)	50...20000 Hz (± 3 dB)	50...20000 Hz
Distortion	< 1 % (1 kHz)	< 1 % (1 kHz)	< 1 % (1 kHz)	< 1 % (1 kHz)
S/N Ratio	> 60 dB	> 60 dB	> 60 dB	> 60 dB
Tone Controls	Bass ± 10 dB (100 Hz) / Treble ± 10 dB (10000 Hz)	Bass ± 10 dB (100 Hz) / Treble ± 10 dB (10000 Hz)	Bass ± 10 dB (100 Hz) / Treble ± 10 dB (10000 Hz)	Bass ± 10 dB (100 Hz) / Treble ± 10 dB (10000 Hz)
Dimensions (W x H x D)	420 x 100.9 x 280.3 mm	420 x 100.9 x 280.3 mm	420 x 100.9 x 360.3 mm	420 x 100.9 x 360.3 mm
Finish	Panel: ABS resin black, case black steel plate	Panel: ABS resin black, case black steel plate	Panel: ABS resin black, case black steel plate	Panel: ABS resin black, case black steel plate
Weight	5 kg	7 kg	10.8 kg	13.2 kg

Power Amplifiers A-2000 Series



Booster Amplifier (240 W)



P-2240 Booster Amplifier

Features

- 240 W output power
- 100 V line input allows connection to speaker output of A-2000 series amplifiers
- Remote power control allows operation independently from A-2000 series amplifiers
- Emergency bypass of master volume
- 2 height units
- Colour: black

Specifications

	P-2240
Rated Output Power	240 W
Power Requirements	230 V AC, 50/60 Hz or 24 V DC
Power Consumption	520 W (AC) or 15 A (DC)
Inputs	Line-in: 0 dBV, 10 kOhm, balanced, screw terminal 100 V line in: 40 dBV, 330 kOhm, unbalanced, screw terminal Power remote control: Make contact
Output	Loop out: 0 dBV, 10 kOhm, balanced, screw terminal Speaker out: Balanced (floating) High impedance: 42 Ohm (100 V), 21 Ohm (70 V) Low impedance: 4 Ohm (31 V)
Frequency Response	50...20000 Hz (±3 dB)
Distortion	< 1 % (1 kHz)
S/N Ratio	> 60 dB
Tone Controls	Bass ±10 dB (100 Hz) / Treble ±10 dB (10000 Hz)
Dimensions (W x H x D)	420 x 101 x 360 mm
Finish	Panel: ABS resin black, case black steel plate
Weight	13.2 kg



Power Amplifiers A-1700 Series

Microphone Mixing Amplifiers (60 W - 240 W)



A-1706 / A-1712 / A-1724

Features

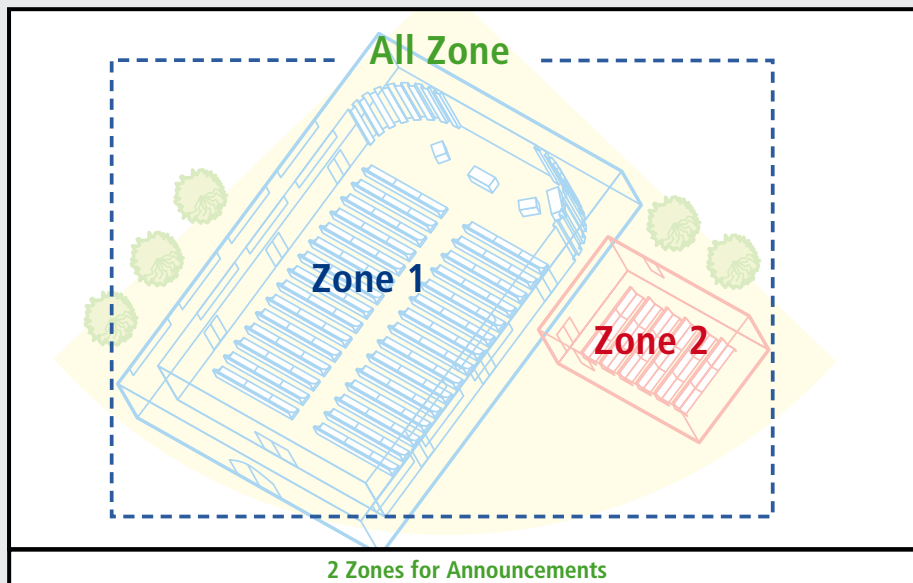
- 3 wattages available: 60 W (A-1706), 120 W (A-1712) or 240 W (A-1724)
- User-friendly front panel allows easy operation
- Individual zone speaker selection buttons enable broadcasting to 2 separate zones
- 6 microphone inputs
- One of 3 different program sources can be broadcasted
- High-quality circuitry for wide frequency response of 50 - 20000 Hz (e.g. for CD music sources and hook-up of FGM / BGM speakers)
- Recording output
- 6 MIC inputs
- AUX-1, 2, 3 inputs for tuner, cassette player or other BGM sources

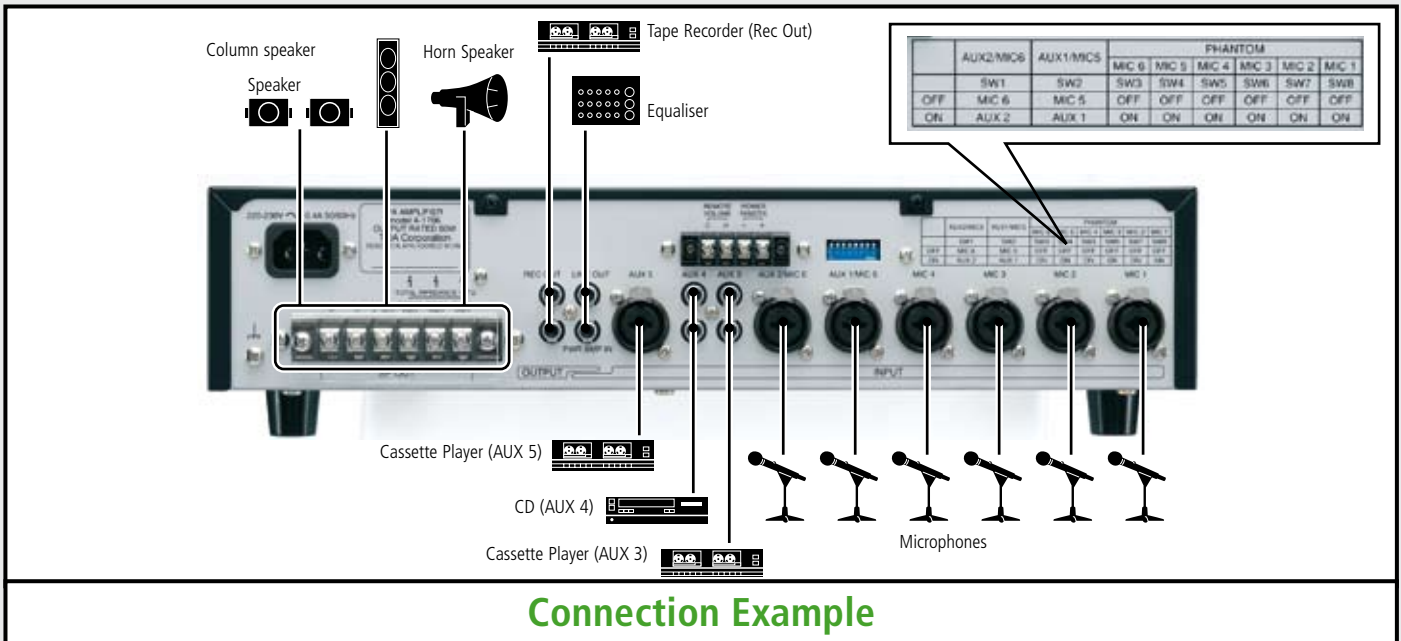
Applications

Houses of worship, religious facilities, school auditoriums, offices and other small to medium sized locations with the need to connect multiple sound sources like microphones

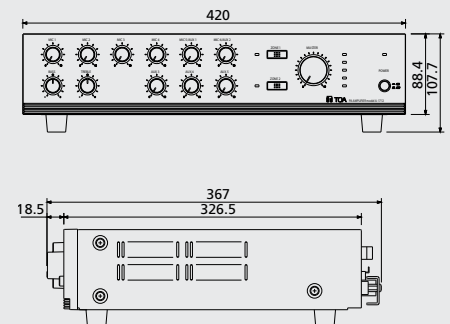
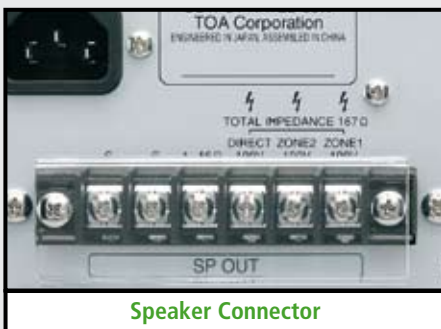
Options

- MB-25B: Mounting Bracket





Dimensions



Specifications

	A-1706	A-1712	A-1724
Rated Output Power	60 W	120 W	240 W
Power Requirements	230 V AC, 50/60 Hz	230 V AC, 50/60 Hz	230 V AC, 50/60 Hz
Power Consumption	150 W	258 W	532 W
Speaker Outputs	100 V (167 Ohm), 4-16 Ohm	100 V (83 Ohm), 4-16 Ohm	100 V (42 Ohm), 4-16 Ohm
Speaker Selection	2 Zones		
Recording Output	0 dBV, 600 Ohm, unbalanced, RCA pin jack		
Inputs: MIC 1-6	-60 dBV, 600 Ohm, balanced, combined XLR phone jack		
AUX 1-2	-20 dBV, 600 Ohm, balanced, combined XLR phone jack		
AUX 3-4	-20 dBV, 10 kOhm, unbalanced RCA pin jack		
AUX 5	-20 dBV, 10 kOhm, unbal. combined XLR phone jack		
PWR Amp In	0 dBV, 600 Ohm, unbalanced RCA pin jack		
Frequency Response	50...20000 Hz (±3 dB)		
Distortion	< 2 % (1 kHz)		
S/N Ratio	MIC: > 60 dB ; AUX : > 76 dB; Master: > 100 dB (Volume: min.)		
Tone Controls	Bass ±10 dB (100 Hz) / Treble ±10 dB (10000 Hz)		
Dimensions (W x H x D)	420 x 107.7 x 367 mm		
Finish	Panel: ABS resin black. Case: black steel plate		
Weight	9.3 kg	12.6 kg	13.5 kg



Power Amplifiers A-1800 Series

Mixer Power Amplifiers (30 W - 120 W)



A-1803 / A-1806 / A-1812

Features

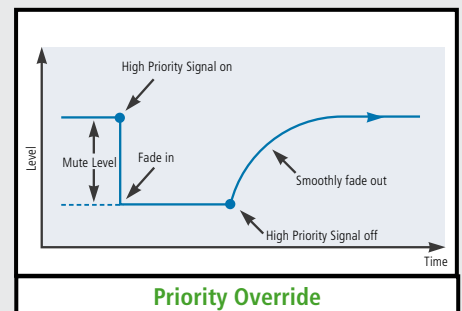
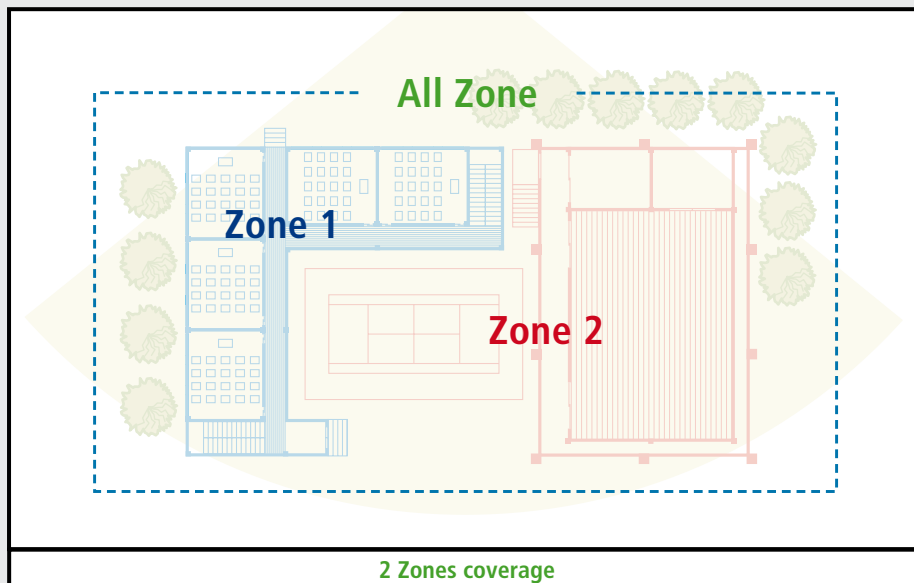
- Either 30 W (A-1803), 60 W (A-1806) or 120 W (A-1812)
- User-friendly front panel for easy operation
- Individual zone speaker selection buttons enable broadcasting to 2 separate zones
- 3 MIC inputs with MIC 1 priority override (priority microphone overrides BGM)
- One of 3 different program sources can be broadcasted
- High-quality circuitry enables wide frequency response of 50 - 20000 Hz (e.g. for CD music sources and for FGM/BGM speakers)
- Recording output
- Built-in MIC 1 chime for use with optional remote microphone PM-660D
- AUX-1, 2, 3 inputs for tuner, cassette player
- Operation on AC or on DC 24 V
- Remote-in terminal for emergency control with automatic setting of default output level for the emergency input
- Colour: black
- Booster amplifier for additional power (e.g. for more speakers in a system), connection to A-1800 Series amplifier's line out

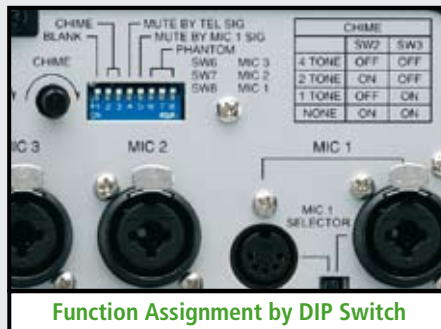
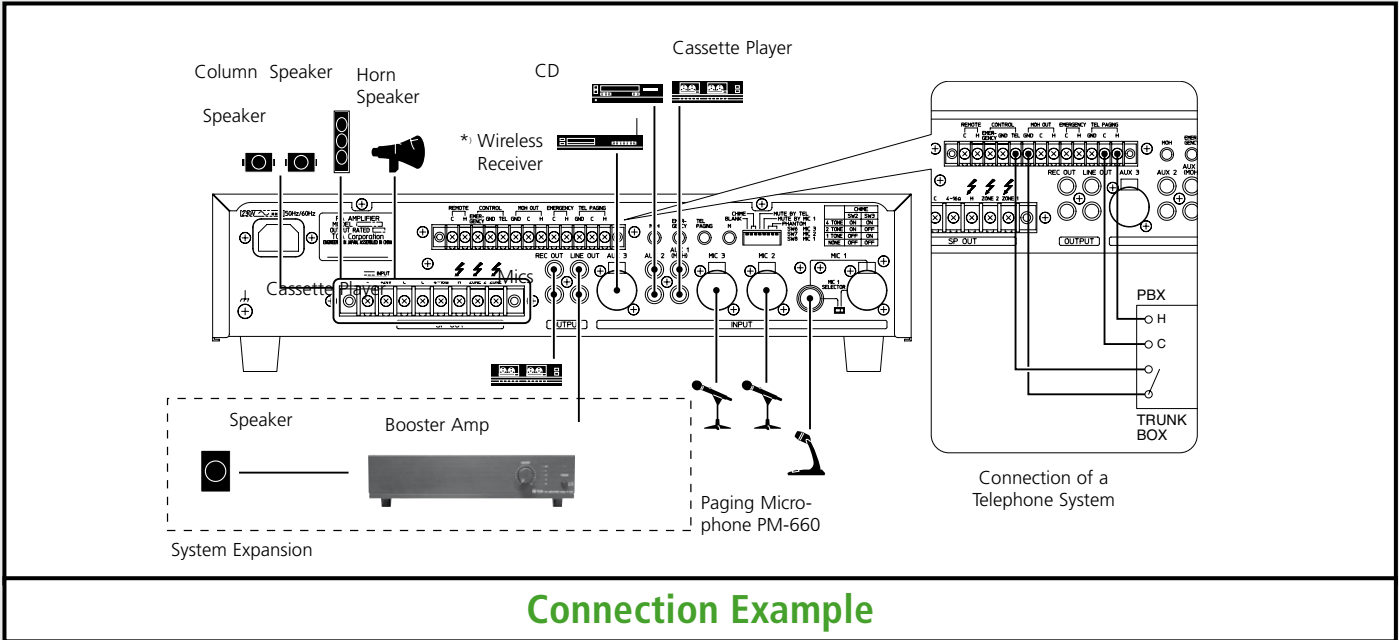
Applications

All-in-one PA amplifier (e.g. for small offices, shops, restaurants, etc.)

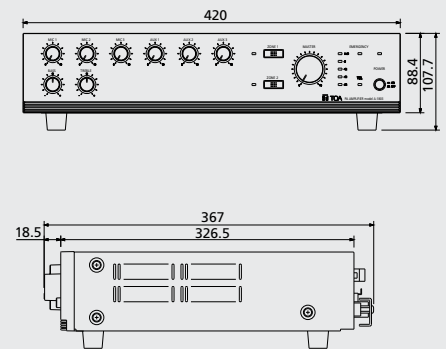
Options

- P-1812: Booster Amplifier 120 W
- MB-25B: Mounting bracket
- IT-453A: Input transformer
- YA-920: Volume control protection cover





Dimensions



Specifications

	A-1803	A-1806	A-1812
Rated Output Power	30 W	60 W	120 W
Power Requirements	230 V AC, 50/60Hz / DC: 24 V	230 V AC, 50/60Hz / DC: 24 V	230 V AC, 50/60Hz / DC: 24 V
Power Consumption	80 W	158 W	260 W
Speaker Outputs	100 V (330 Ohm), 4-16 Ohm	100 V (167 Ohm), 4-16 Ohm	100 V (83 Ohm), 4-16 Ohm
Speaker Selection	2 Zones		
Recording Output	0 dBV, 600 Ohm, unbalanced, RCA pin jack		
MIC 1 Input	-60 dBV, 600 Ohm, balanced, combined XLR phone jack or 5p DIN socket		
MIC 2 & MIC 3 Inputs	-60 dBV, 600 Ohm, balanced, combined XLR phone jack		
AUX 1 (MOH) Input	-20 dBV, 10 kOhm, unbal. RCA		
AUX 2 Input	-20 dBV, 10 kOhm, unbal. RCA		
AUX 3 Input	-20 dBV, 10 kOhm, unbal. combined XLR phone jack		
Chime	1-tone, 2-tone, ascending 4-tone or none		
Frequency Response	50...20000 Hz		
Distortion	< 2 % (1 kHz)		
S/N Ratio	MIC: > 60 dB; AUX : > 76 dB; Tel: > 90 dB		
Tone Controls	Bass ±10 dB (100 Hz) / Treble ±10 dB (10000 Hz)		
Dimensions (W x H x D)	420 x 107,7 x 367 mm		
Finish	Panel: ABS resin black, Case: black steel plate		
Weight	8.1 kg	9.4 kg	12.6 kg



Power Amplifiers

Booster Amplifier (120 W)



Rear view



PM-660D



Remote-in terminal



MB-25B



Speaker connection

Features

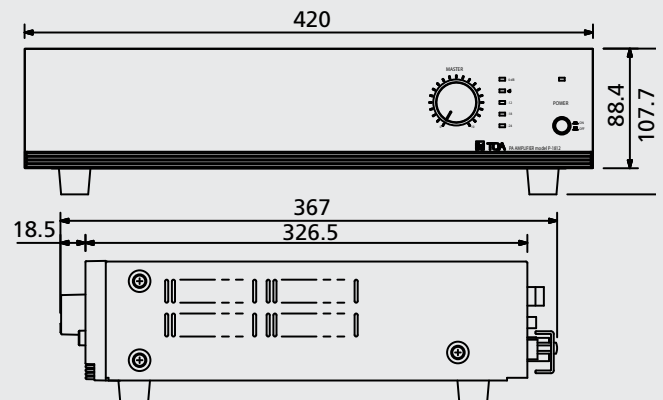
- Booster Amplifier allows more speakers in 1 system
- Connection to an A-1800 Series amplifier's line out
- Operation on AC or on DC 24 V to match installation requirements
- Rear panel remote-in terminal for emergency control
- Remote-control via main volume setting control: Output level for the emergency input
- Switchable input levels: -10 dBV or 0 dBV

Options

- Basic amplifier: A-1803, A-1806, A-1812
- Mounting brackets: MB-25B

Specifications

	P-1812
Rated Output Power	120 W
Power Requirements	230 V AC, 50/60 Hz / DC: 24 V
Power Consumption	258 W
Speaker Outputs	100 V (83 Ohm), 4-16 Ohm
Input	Line: 0 / -10 dBV, 10 kOhm, transformer balanced, RCA pin jack
Frequency Response	50...20000 Hz (± 3 dB)
Distortion	< 2 % (1 kHz)
S/N Ratio	> 97 dB
Dimensions (W x H x D)	420 x 107,7 x 367 mm
Finish	Panel: ABS resin black, Case: black steel plate
Weight	12.2 kg



Power Amplifiers



Power Amplifier Series (60 W - 360 W)



VP-1361 / VP-1241



VP-1121 / VP-1061

Features

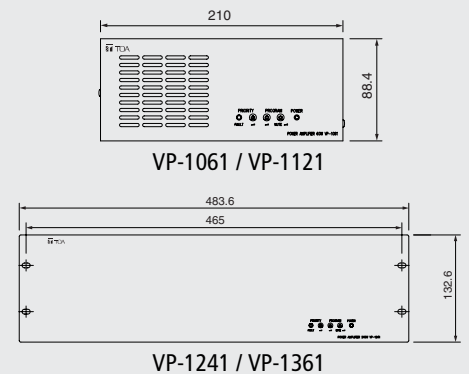
- 1-channel amplifier
- Highest durability
- 4 different wattages : 60 W (VP-1061), 120 W (VP-1121), 240 W (VP-1241), 360 W (VP-1361)
- For PA and emergency announcements
- Operation on AC or on DC 24 V to match both installation requirements and uninterrupted operation
- 2 parallel program inputs and 2 parallel priority inputs
- Relay contact for emergency announcements

- Removable terminal blocks
- Output current limiter
- For rack mount

Options

- YA-1000A Pilot Tone Module
- MB-25B-BK Rack Mounting Kit for one VP-1061 or VP-1121
- MB-25B-J Rack Mounting Kit for two units (VP-1061, VP-1121)

Dimensions



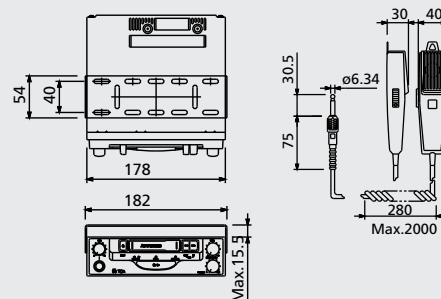
Specifications

	VP-1061	VP-1121	VP-1241	VP-1361
Rated Output Power	60 W	120 W	240 W	360 W
Power Requirements	230 V AC, 50/60 Hz / DC: 24 V	230 V AC, 50/60 Hz / DC: 24 V	230 V AC, 50/60 Hz / DC: 24 V	230 V AC, 50/60 Hz / DC: 24 V
Power Consumption	170 W / 100 W (EN60065) / DC 4.5 A	320 W / 160 W (EN60065) / DC 8.2 A	537 W / 240 W (EN60065) / DC 14.6 A	768 W / 330 W (EN60065) / DC 20.9 A
Speaker Outputs	100 V (167 Ohm), 4-16 Ohm	100 V (83 Ohm), 4-16 Ohm	100 V (42 Ohm), 4-16 Ohm	100 V (28 Ohm), 4-16 Ohm
Input	2 program inputs (parallel): 0 dB, 20 kOhm, balanced 2 priority inputs (parallel): 0 dB, 20 kOhm, balanced			
Frequency Response	80...16000 Hz (±3 dB)	80...16000 Hz (±3 dB)	80...16000 Hz (±3 dB)	80...16000 Hz (±3 dB)
Distortion	< 1 % (1 kHz)	< 1 % (1 kHz)	< 1 % (1 kHz)	< 1 % (1 kHz)
S/N Ratio	> 80 dB	> 80 dB	> 80 dB	> 80 dB
Dimensions (W x H x D)	210 x 88.4 x 338.7 mm	210 x 88.4 x 338.7 mm	483.6 x 132.6 x 337.8 mm	483.6 x 132.6 x 337.8 mm
Finish	Panel: Aluminium, black, alumite	Panel: Aluminium, black, alumite	Panel: Aluminium, black, alumite	Panel: Aluminium, black, alumite
Weight	6.9 kg	9.3 kg	13.4 kg	16.6 kg



Car Amplifiers

Mobile Amplifier with Cassette Deck for easy installation in Vehicles (15 W - 40 W)



Features

- DC operation from 12 V battery
- Rated output 10 W (CA-107), 20 W (CA-207), 40 W (CA-407)
- Built-in auto reverse cassette deck with pause function
- Unidirectional dynamic microphone with talk switch
- Front pause function
- Rugged construction
- DIN size, easy in-dash installation
- Non-RoHS product

Applications

Any kind of vehicle e.g. bus, ship, vehicle

Specifications

	CA-107	CA-207	CA-407
Power Supply	13.2 V DC (10 - 16 V DC)	13.2 V DC (10 - 16 V DC)	13.2 V DC (10 - 16 V DC)
Current Consumption	1.8 A	3.2 A	5.5 A
Rated Output Power	10 W	20 W	40 W
Output Impedance	8 Ohm	4 Ohm / 8 Ohm	4 Ohm / 8 Ohm
Distortion	< 5 %	< 5 %	< 5 %
Frequency Response	100 ... 10000 Hz ±3 dB	100 ... 10000 Hz ±3 dB	100 ... 10000 Hz ±3 dB
Inputs	MIC: -48 dBV, 600 Ohm	MIC: -48 dBV, 600 Ohm	MIC: -48 dBV, 600 Ohm
Dimensions (W x H x D)	178 x 50 x 181.5 mm	178 x 50 x 181.5 mm	178 x 50 x 181.5 mm
Weight	1.3 kg	1.5 kg	1.7 kg
Finish	Front Panel: ABS Resin, black. Case: zinc gilt steel	Front Panel: ABS Resin, black. Case: zinc gilt steel	Front Panel: ABS Resin, black. Case: zinc gilt steel
Cassette Section	Auto-Reverse	Auto-Reverse	Auto-Reverse
Tape Speed	4.76 cm/s	4.76 cm/s	4.76 cm/s
Wow & Flutter	<0.2 %	<0.2 %	<0.2 %
Microphone	Unidirectional with talk switch	Unidirectional with talk switch	Unidirectional with talk switch
Impedance	600 Ohm	600 Ohm	600 Ohm
Sensitivity	-73 dB ±3 dB	-73 dB ±3 dB	-73 dB ±3 dB

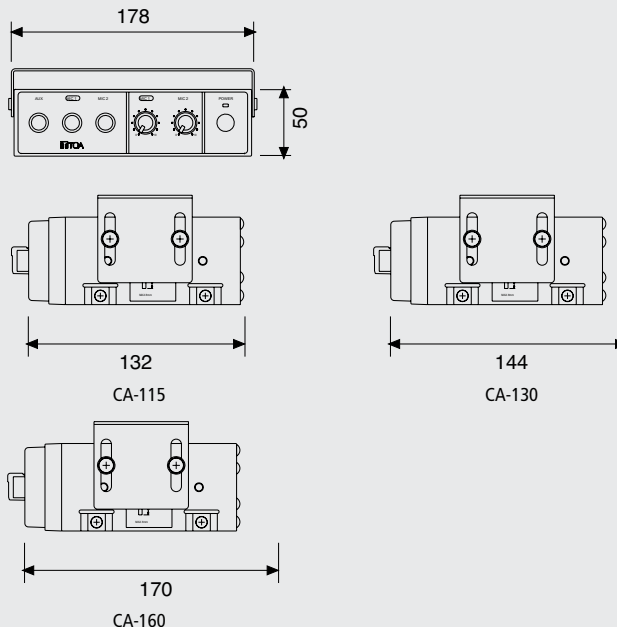
Car Amplifiers



Mobile Amplifier for easy installation in Vehicles



CA-115 / CA-130 / CA-160



Features

- DC operation from 12 V battery
- Rated output 15 W (CA-115), 30 W (CA-130), 60 W (CA-160)
- 2 MIC inputs
- AUX input for CD player, radio, etc.
- Unidirectional dynamic microphone with talk switch
- Front pause function
- DIN size, easy in-dash installation
- Rugged construction

Applications

Any kind of vehicle e.g. bus, ship, vehicle

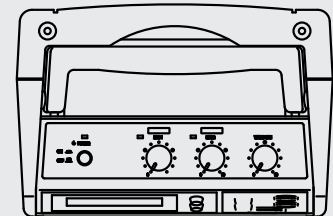
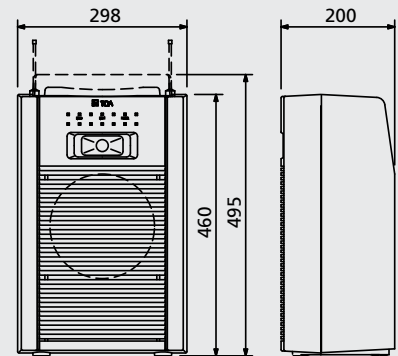
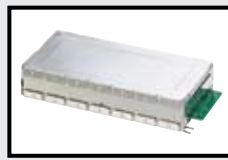
Specifications

	CA-115	CA-130	CA-160
Power Supply	14 V DC (10 - 16 V DC)	14 V DC (10 - 16 V DC)	14 V DC (10 - 16 V DC)
Current Consumption	< 3 A	< 5 A	< 9 A
Rated Output Power	15 W	30 W	60 W
Output Impedance	4 Ohm / 8 Ohm	4 Ohm / 8 Ohm	4 Ohm / 8 Ohm
Distortion	< 5 %	< 5 %	< 5 %
Frequency Response	100 ... 10000 Hz ± 3 dB	100 ... 10000 Hz ± 3 dB	100 ... 10000 Hz ± 3 dB
Inputs	MIC 1,2: 600 Ohm, 4 mV, phone jack AUX: 10 kOhm, 500 mV, phone jack	MIC 1,2: 600 Ohm, 4 mV, phone jack AUX: 10 kOhm, 500 mV, phone jack	MIC 1,2: 600 Ohm, 4 mV, phone jack AUX: 10 kOhm, 500 mV, phone jack
Finish	Front panel: ABS resin, black. Case: zinc plated steel sheet	Front panel: ABS resin, black. Case: zinc plated steel sheet	Front panel: ABS resin, black. Case: zinc plated steel sheet
Microphone (Accessory)	Unidirectional with talk switch	Unidirectional with talk switch	Unidirectional with talk switch
Impedance	600 Ohm	600 Ohm	600 Ohm
Sensitivity	-53 dB (1 kHz, 0 dB = 1 V/Pa)	-53 dB (1 kHz, 0 dB = 1 V/Pa)	-53 dB (1 kHz, 0 dB = 1 V/Pa)
Dimensions (W x H x D)	178 x 50 x 132 mm	178 x 50 x 144 mm	178 x 50 x 170 mm
Weight	0.9 kg	1.1 kg	1.2 kg



Wireless Meeting Amplifier

Portable Amplifier for Mobile Use with and without Cassette Unit



Features

- Compact and lightweight portable amplifier
- Maximum output power 25 W
- Built-in 2-way speaker, optional UHF (WTU-4800) or VHF (WTU-3800) tuner for wireless microphone operation
- Input volume and tone control for microphone input
- AUX input
- External speaker output
- Continuous operation for approx. 12 hours
- Built-in storage for wireless / wired microphones
- WA-1822C with cassette deck, featuring 2-track
- Battery indicator dims gradually according to battery status
- 1-channel monaural operation with adjustable recording / playback volume adjustment, tape speed control and auto-reverse

Options

- WTU-4800: Wireless Tuner Module
- WM-4210: Handheld Microphone

Applications

Ideal for any mobile application in schools, conference rooms, religious facilities and any kind of mobile event

Applicable Room Size

Application	Room size
Class room	8 x 14 m
Conference room	8 x 10 m
Outdoor	15 x 15 m
Church	10 x 15 m
Gymnasium	15 x 15 m

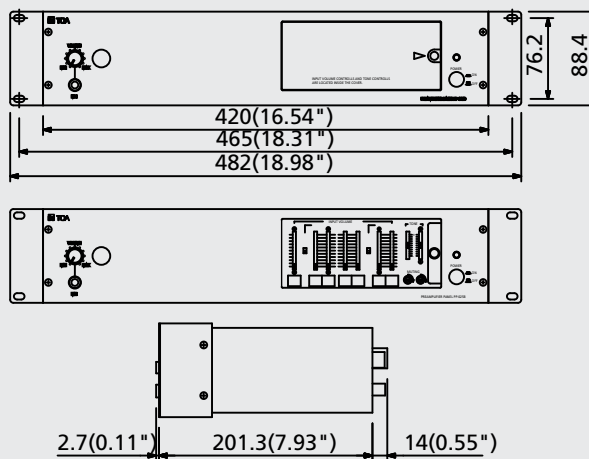
Specifications

	WA-1822	WA-1822C
Power Requirement	230 V AC, 50/60 Hz, Dry cells: 8 pcs. (R20P or „D“)	230 V AC, 50/60 Hz, Dry cells: 8 pcs. (R20P or „D“)
Power Consumption	AC: 44 W (rated output)	AC: 46 W (rated output)
Rated Output	AC: 20 W (Max. 40 W with external speaker), DC: 8 W	AC: 20 W (Max. 50 W with external speaker), DC: 8 W
Battery Life	Approx. 12 hours, battery indicator dims gradually according to status	Approx. 6 hours, battery indicator dims gradually according to status
Frequency Response	70 ... 10000 Hz (deviation 3 dB)	70 ... 10000 Hz (deviation 3 dB)
Distortion	Under 10 % (rated output)	Under 10 % (rated output)
Input	Wired mic: -48 dBV, 600 Ohm, AUX: -20 dBV, 10 kOhm	Wired mic: -48 dBV, 600 Ohm, AUX: -20 dBV, 10 kOhm
Output	External Speaker: 8-16 Ohm/over 20 W rated input or internal speaker Line/Rec.: -10 dBV, 1 kΩ	External Speaker: 8-16 Ohm/over 20 W rated input or internal speaker Line/Rec.: -10 dBV, 1 kΩ
S/N Ratio	Over 70 dB (rated output)	Over 70 dB (rated output)
Antenna	Rod antenna	Rod antenna
Cassette Deck Section	-	-
Reproduction System	-	Auto-reverse
Usable Tape	-	Normal tape
Tape Speed	-	4.8 cm/sec.
Fast Forward / Rewind Time	-	Approx. 100 sec. (C-60 tape)
Internal Speaker	20 cm full range speaker + tweeter	20 cm full range speaker + tweeter
Operation Temperature	AC: -10°C to +50°C, DC: 0°C to +40°C	AC: -10°C to +50°C, DC: 0°C to +40°C
Finish	ABS resin, light grey	ABS resin, light grey
Dimensions (W x H x D)	298 x 460 x 200 mm	298 x 460 x 200 mm
Weight	6 kg	6.7 kg



Preamplifier Panel

For Connection of Microphones, CD or Cassette Player



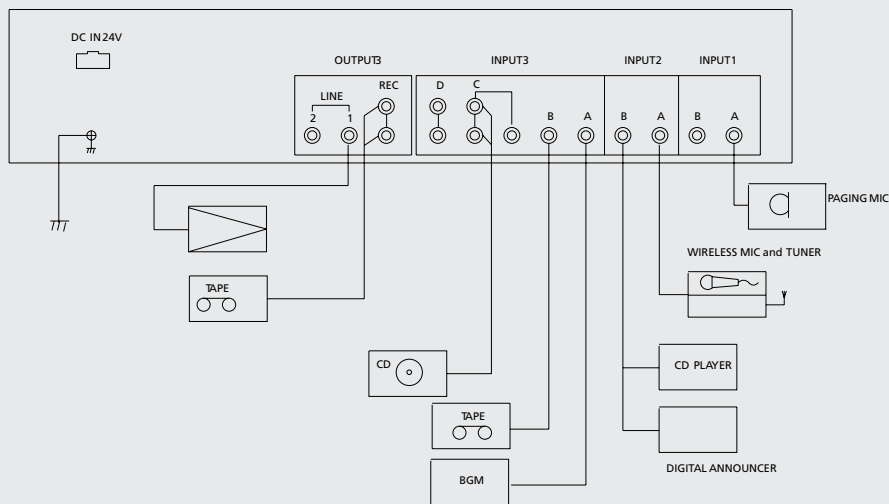
Features

- 8 inputs (2 x MIC / AUX, 6 x AUX) in 3 groups
- 2x line out/ 1x recording out
- Priority circuit (1>2>3) and individual muting level control (2&3) for input groups 2 and 3

Options

- EV-350R: Digital Announcer for Playback and Recording
- EV-350P: Digital Announcer for Playback
- VR-1005: Remote Microphone
- PM-660: Remote Microphone

Application Example



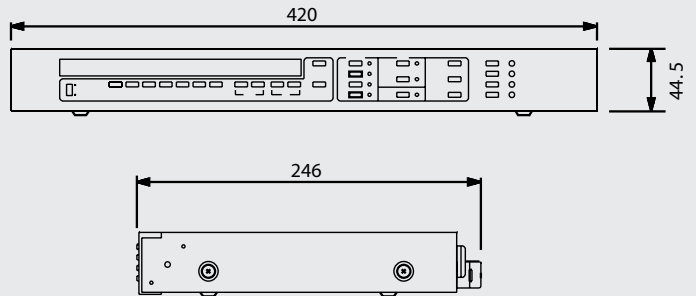
Specifications

	PP-025B
Power Requirement	24 V DC
Current Consumption	<200 mA
Inputs 1/2	1A: -2 /-62 dBV 600 Ohm 1B: -2 dBV 600 Ohm 2A: -2 /-62 dBV 600 Ohm 2B: -2 dBV 600 Ohm all balanced
Inputs 3	3A: -2 dBV 20 kOhm 3B: -2 dBV 20 kOhm ; 3C: -2 /-22 dBV 50 kOhm 3D: -22 dBV 50 kOhm all unbalanced
Connectors	Phone Jack; 3C + 3D: Phone + RCA Jack
Outputs	Line 1: 0 dBV 600 Ohm balanced; Line 2: 0 dBV 600 Ohm + Rec: -10 dBV 5 kOhm unbal.
Frequency Response	50 ... 15000 Hz ±3 dB
Tone Control	100, 10000 Hz, ±10 dB (at 1 kHz)
S/N Ratio	> 60 dB
Distortion	<1 %
Priority	Input 1 > 2 > 3
Dimensions (Height)	482 x 88.4 x 218 mm, 2-unit
Weight	3 kg
Colour	black



Program Timer

Timer for Announcements or Gongs



Features

- 4 independent channels with 30 programmable steps each
- For extension of the time schedule the merge of 4 channels into one is possible
- For holidays, periods or factory shut down, etc. a pause mode is provided
- 19" rack mounting (1 unit) with optional mounting bracket: MB-15B
- Colour: black
- Non-RoHS product

Applications

- School, shopping mall or production site

Specifications

	TT-104B
Power Requirement	230 V AC, 50/60 Hz
Power Consumption	3 W
Power Outage Protection	100 h
Program Capacity	30 steps per channel
No of Channels	4
Programmable Items	Day of the week, hour, minute, output channel
Output System	No-voltage (DRY) make contact (5-second pulse make output)
Output Capacity	24 V DC, 0.5 A
Clock Accuracy	±5 sec per month (25°C)
Display	Day of the week, hour, minute
Special Functions	Output switchover, pause mode, entire program cancellation
Dimensions (W x H x D)	1-unit, 420 x 47.5 x 246.5 mm
Weight	2.5 kg
Colour	black

Digital Sound Repeater



PC programmable Spot Announcer



EV-20R



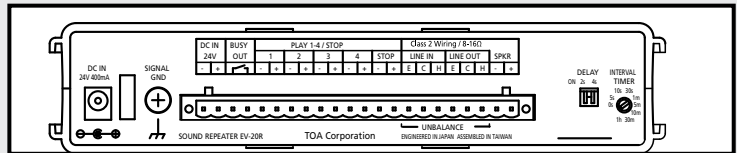
Mode selection



AD-246



MB-WT3



Rear view

Features

- For repeated high-quality broadcasts and announcements
- Easy to install and to use
- Feed-in BGM e.g. from external CD player possible
- Up to 4 separate messages can be stored and played back
- Built-in USB Interface allows the upload of audio files and announcements from a PC
- Announcements can be made by use of an external microphone
- Control inputs and outputs
- Speaker output
- Monitor output

Applications

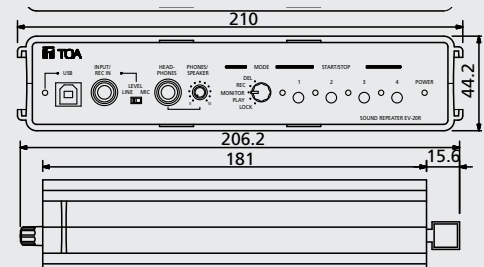
- Supermarket, shopping malls, production sites, train stops

Options

- AD-246: AC Adaptor
- MB-WT3: Rack Mounting brackets
- MB-WT4: Rack Mounting brackets (2x EV-20R)
- IT-450: Transformer

Specifications

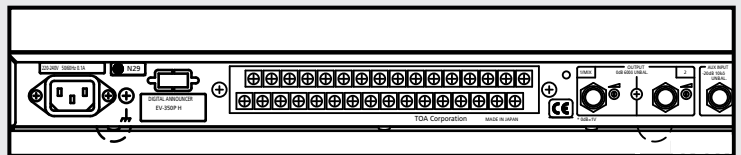
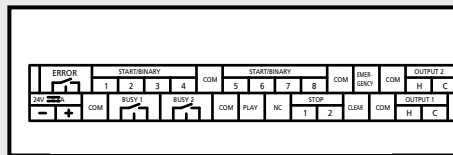
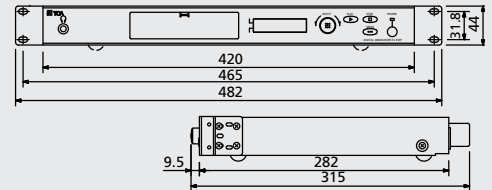
	EV-20R
Power Source	Supplied from an external 24 V DC/400 mA power supply or from an optional AD-246 AC adaptor
Power Consumption	10 W (rated output)
Wave Format	44.1 kHz sampling frequency, 16-bit PCM (monaural)
Frequency Response	20 ... 20000 Hz ±3 dB (1 kHz), 50 - 14000 Hz ±3 dB (IT-450 mounted, 1 kHz)
Distortion	Under 1 % (1 kHz, rated output)
Recording System	USB data transfer or analog recording
Control Input	Play 1 - 4, stop: No-voltage make contact input, pulse make length : 200 ms, open voltage: 30 V DC, short-circuit current : 10 mA, removable terminal block (22 pins)
Control Output	Busy: Contact capacity: 30 V DC/0.5 A, removable terminal block (22 pins)
Input	Input / Recording input : Mic: -60 dBV, 2.2 kOhm/ Line: -20 dBV, 10 kOhm, (Mic/Line changeable), unbalanced, phone jack/Line input : 0 dBV, 10 kOhm, unbalanced, removable terminal block (22 pins)
Output	Line output: 0 dBV, 600 Ohm, unbalanced, removable terminal block (22 pins) / Headphone output: 0 dBV, 100 Ohm, unbalanced, phone jack / Speaker output: 3 W, 8 Ohm, removable terminal block (22 pins)
LED Indicator	POWER, USB, START/STOP 1-4
Maximum No. of Messages	4
Maximum Recording Time	6 min
Message Delay Time	0, 2 or 4 s (selectable)
Playback Interval Time	endless, 0 s, 5 s, 10 s, 30 s, 1 min, 5 min, 10 min, 30 min or 1 h (selectable)
Finish	Case: ABS resin, black
Dimensions (W x H x D)	210 x 44.2 x 181 mm (excluding projection)
Weight	730 g
Accessory	CD-ROM (USB data transfer software and sample chimes recorded), USB cable (1 m)





Digital Record/Playback Announcer

Announcer for Broadcasting programmed Messages and Alarm Texts



Features

- EV-350R: For message recording and playback
- EV-350P: For playback
- LCD
- Easy operation for simple message recording and playback
- Playback priority modes and monitoring available
- 2 slots for cards for up to 256 programs playback
- Sampling frequencies are 32 and 44.1 kHz
- Internal self-diagnostic routine with failure control output for indication of system failures and missing memory cards

Specifications

	EV-350R	EV-350P
Power Source	220 – 240 V AC, 50 / 60 Hz, 1 A or 24 V DC, 0.4 A / Power consumption 12 W	220 – 240 V AC, 50 / 60 Hz, 1 A or 24 V DC, 0.3 A / Power consumption 9 W
Output	Output 1, 2: 0 dBV, 600 Ohm, unbalanced, phone jack & screw terminal; Headphone Output: 0 dBV, 100 Ohm, unbalanced, phone jack	Output 1, 2: 0 dBV, 600 Ohm, unbalanced, phone jack & screw terminal; Headphone Output: 0 dBV, 100 Ohm, unbalanced, phone jack
Input	Microphone: –55 dBV, 600 Ohm, unbalanced, phone jack, AUX: –20 dBV, 10 kOhm, unbalanced, phone jack & RCA pin jack	AUX: –20 dBV, 10 kOhm, unbalanced, phone jack
Frequency Response	20 – 20000 Hz (44.1 kHz sampling, 1 kHz reference)	20 – 20000 Hz (44.1 kHz sampling, 1 kHz reference)
Distortion	Under 0.3 % (44.1 kHz, recording method: extremely high)	Under 0.3 % (44.1 kHz, recording method: extremely high)
No. of Mountable Memory Cards	2 (Ports A...B) (option)	2 (Ports A...B) (option)
Capacity	2 cards: 256 or 1024 sentences, max. 4:26 hours	-
Recording Sound Quality	Sampling Frequency: 32 kHz, 44.1 kHz; Recording grade: Long (bit rate: 64 kbps), Normal (bit rate: 96 kbps), High (bit rate: 128 kbps), Extremely High (bit rate: 192 kbps)	-
Recording Time	Max.: 2:13 hours on one card (96 MB)	-
Playback Mode	Single- and dual-source playback (changeable)	Single- and dual-source playback (changeable)
No. of Playback Programs	8 programs (direct mode) or 256 programs (binary mode), 1 emergency message	8 programs (direct mode) or 256 programs (binary mode), 1 emergency message
Control Input	Activation 1...8, playback, pause 1, pause 2, emergency, recording, erasure/clear: No-voltage make-contact (over 50 ms), open voltage: 30 V DC, short circuit current: 10 mA, screw terminal, RS-232C terminal: D-sub connector (9-pin)	Activation 1...8, playback, pause 1, pause 2, emergency, clear: No-voltage make-contact (over 50 ms), open voltage: 30 V DC, short circuit current: 10 mA, screw terminal, RS-232C terminal: D-sub connector (9-pin)
Control Output	Output 1, 2, Error: screw terminal, contact capacity: 30 V DC, 0.5 A	Output 1, 2, Error: screw terminal, 8.2 mm, contact capacity: 30 V DC, 0.5 A
Display	LCD with backlight (16 characters x 2)	LCD with backlight (16 characters x 2)
Ambient Temperature	0°C to +50°C	0°C to +50°C
Humidity	Less than 90 % (must be free from dew condensation)	Less than 90 % (must be free from dew condensation)
Finish	Panel: Aluminum, black, 30 % gloss, paint; Case: Surface treated steel plate, black 30 % gloss	Panel: Aluminum, black, 30 % gloss, paint; Case: Surface treated steel plate, black 30 % gloss
Dimensions (W x H x D)	482 x 44 x 315 mm	482 x 44 x 315 mm
Weight	4 kg	4 kg

Applications

Alarm, emergency and commercial messages for department store, shop and office building

Options

- TT-104B: Programmable Timer
- SDP3B-Series: Memory Cards (PCMCIA-Cards are in 5 different sizes available from 8 MB (SDP3B-8) up to 96 MB (SDP3B-96))

Rack mounted Equipment



Junction Boxes

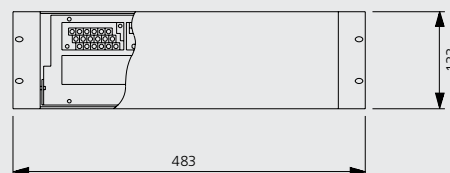
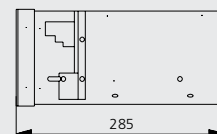


JB-031B

Features

- Junction box for connecting external components to rack-mounted components
- 4 blocks with 6 x 3 screw terminals each (18 terminals per block)
- Non-RoHS product

Dimensions

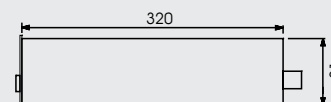
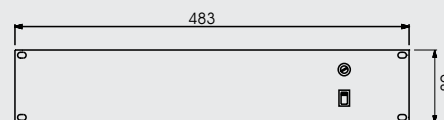


JP-028B

Features

- Junction Panel
- For connection and control of AC power lines (10 pairs of screw terminals)
- Switched outlets (controlled by front power switch relay or rear remote terminals), 24 V DC regulated, max 0.2 A for preamplifier and relay control
- AC power output is maximum 20 A (switched) or 10 A (unswitched)

Dimensions



Specifications

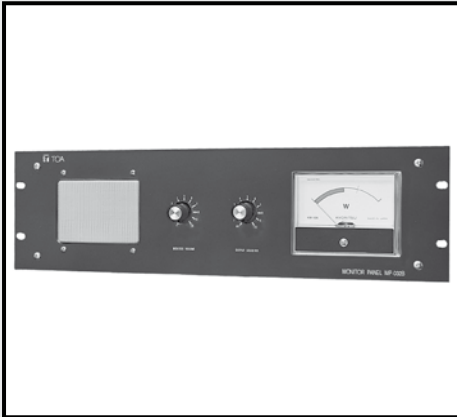
	JB-031B
Number of Terminals	3 terminal blocks x 4 (18 terminals per block)
Current Capacity	250 V/20 A per terminal
Colour	Black
Dimensions (W x H x D)	483 x 132.6 x 285 mm (3 units)
Weight	3.5 kg

	JP-028B
Power requirements	230 V AC, 50/60 Hz, 16 W AC Out: 20 A x 13 switched, 10 A x 5 unswitched DC Out: 24 V max. 0.2 A
No. of Terminals	10 x 2
Switch Capacity	20 A (380 V)
Dimensions (W x H x D)	483 x 89 x 350 mm (2 units)
Weight	5.7 kg
Colour	Black



Rack mounted Equipment

Monitor Panel for Sound and Signal Systems



MP-032B

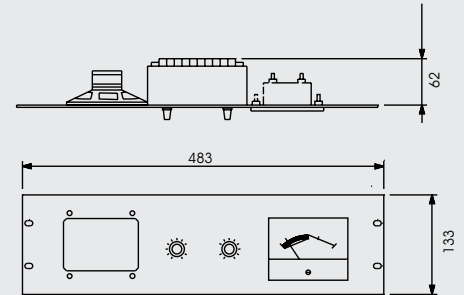
Features

- Rack mountable (3 units)
- Passive monitor panel for speaker line level
- Monitors up to 10 separate channels or 10 amplifiers
- Large easy-to-read watt meter for adjusting output level
- Additional audio monitoring with built-in 5" full range speaker.

Options

- YA-8: Connection Cable (8P DIN plug, 1 m length)

Dimensions

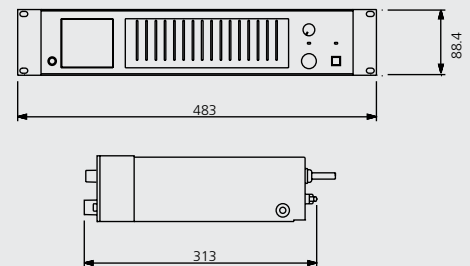


MP-1216

Features

- Monitor Panel for 16 channels
- Allows visual and aural monitoring of up to 16 audio signal channels with 8 Ohm, 100 V or line level
- 2 units can be linked for up to 32 channels (1 master monitor unit)
- 12-segment LED meter with calibrated scale for each input
- Audio monitoring of each channel through a built-in selector switch and loudspeaker
- All inputs balanced and transformer isolated

Dimensions



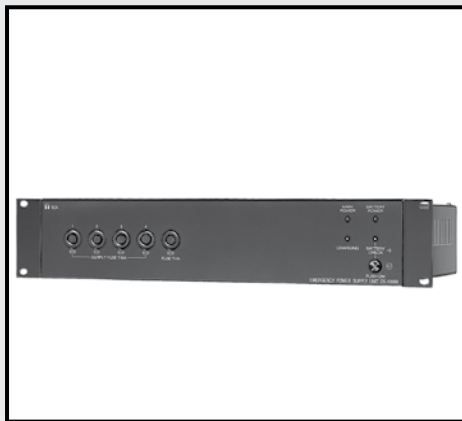
Specifications

	MP-032B	MP-1216
Input Lines	25 V (625 Ohm), 50 V (2.5 kOhm), 70 V (5 kOhm), 100 V (10 kOhm), switchable	Transformer isolated: +4 dB; 8 Ohm: 49 V; 100 V
Terminals	10 x 2	16 x 4
Controls	Channel selector switch, Volume control, Watt meter, Line voltage selector switch	Channel Selector Switch + Indicator, Output Level: LED Meter + Selected Channel, Power
Power Requirements	230 V AC, 50/60 Hz	230 V AC, 50/60 Hz, 25 W
Dimensions (W x H x D)	482.6 x 133 x 62 mm (3-units)	482.6 x 88.4 x 312.7 mm (2 units)
Weight	2.2 kg	5.3 kg
Colour	Black	Black

Rack Mounted Equipment



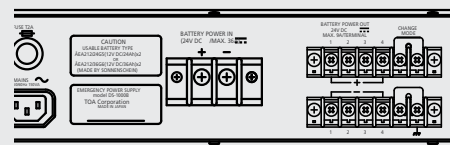
Emergency Power Supply (dryfit type)



DS-1000B

Features

- 4 DC power outputs to power amplifiers or emergency equipment in case of AC power failure
- Batteries are automatically charged
- 2 (optional) batteries required with 24 Ah or 36 Ah (12 V) each
- 4 indicators: main power, charging, battery power, battery check
- Non-RoHS product



Rear View

Blower Panel

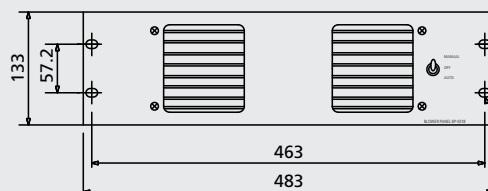
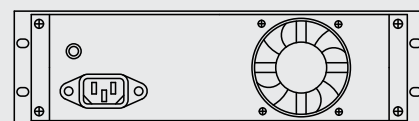


BP-031B

Features

- For regulating temperatures from 48°C down to 38°C
- The blower panel requires 3 units of rack space

Dimensions

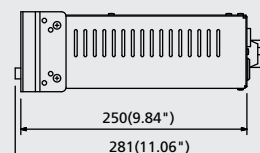
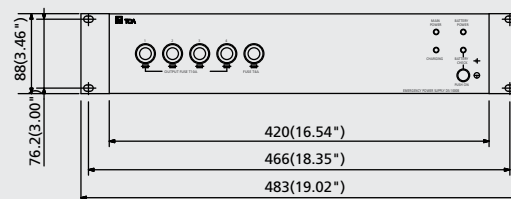


Specifications

	DS-1000B
Power Consumption	150 VA
Charge Current	Max.: 2.5 A
Dimension (Height)	2-unit
Weight	7 kg
Colour	Black

	BP-031B
Power Consumption	8.5 W
Ventilation	1500 ml/min
Dimension (Height)	3-unit
Weight	3.7 kg
Colour	Black

Dimensions (DS-1000B)





Racks and Accessories

Racks and Doors



CR-Series Rack



PGD Plexiglass Door



RC Rear Door



STC Rack Cover*



BC Bottom Panel



CB Caster Base



SB Rack Base



LF Levelling Rack Feet*



VP Vented Panel

* Accessory for
CR-15 to CR-44

Type Overview

Model	Description	Dimensions (W x H x D in mm)	Weight in kg
CR-15	Rack 15 units, incl. side panels	650 x 781 x 600	28.00
CR-22	Rack 22 units, incl. side panels	650 x 1092 x 600	35.00
CR-27	Rack 27 units, incl. side panels	650 x 1314 x 600	40.00
CR-35	Rack 35 units, incl. side panels	650 x 1670 x 600	51.00
CR-40	Rack 40 units, incl. side panels	650 x 1892 x 600	62.00
CR-44	Rack 44 units, incl. side panels	650 x 2070 x 600	66.00
CR-301D	Rack 30 units with rotatable frame	750 x 1545 x 500	72,00
CR-421D	Rack 42 units with rotatable frame	750 x 2080 x 500	104 kg
CR-421FD	Rack 42 units with rotatable frame, with door	750 x 2080 x 612	130 kg
RC-15	Rear door for CR-Series 15 units	485 x 666 x 20	3.90
RC-22	Rear door for CR-Serie 22 units	485 x 977 x 20	5.60
RC-27	Rear door for CR-Serie 27 units	485 x 1199 x 20	6.80
RC-35	Rear door for CR-Serie 35 units	485 x 1555 x 20	8.60
RC-40	Rear door for CR-Serie 40 units	485 x 1777 x 20	10.00
RC-44	Rear door for CR-Serie 44 units	485 x 1955 x 20	11.00
PGD-15	Plexiglass door for CR-Serie 15 units	566 x 781 x 25	6.20
PGD-22	Plexiglass door for CR-Serie 22 units	566 x 1092 x 25	8.00
PGD-27	Plexiglass door for CR-Serie 27 units	566 x 1314 x 25	9.00
PGD-35	Plexiglass door for CR-Serie 35 units	566 x 1670 x 25	11.10
PGD-40	Plexiglass door for CR-Serie 40 units	566 x 1892 x 25	12.30
PGD-44	Plexiglass door for CR-Serie 44 units	566 x 2070 x 25	13.30



CR-421D

- 2 versions CR-421D or CR-301D rotatable frame rack, CR-421FD with front door
- Completely mounted
- 2 mm steel plate
- Cable inserts at top and bottom
- Max. 400 mm depth of units
- Easy-to-open door thanks to a glider roll at the bottom of the door
- Holes for wall - and floor fixation
- 42-unit height or 30-unit height
- Colour: light grey, RAL 9035, structured paint

Racks and Accessories



Accessories



FAN-KIT Top Cover



PFP Front Vented Panel



SFP Front Panel



UD Drawer



SUS Rack Shelf



SA Sliding rail



FDL Lock



BCK Brush Strip



CR Screw Set M5

Overview Accessories

Model	Description	Dimensions (W x H x D in mm)	Weight in kg
SB-4	Caster base for CR-Series, height approx. 100...160 mm	650 x 100 x 600	4.50
CB-4	Rolling caster base, closed for CR-Series, height 160 mm	650 x 100 x 600	6.00
BC-3	3-fold bottom plate for CR-Series		
LF-4*	Leveller feet, adjustable		1.10
STC-2*	Top cover for CR-Series		
VP-2	Vented top cover	324 x 72 x 1.25	0.20
BCK-1	Brush strip for CR-Series		
FAN-KIT	Top cover with 2 fans		
SA-1	Sliding rail for heavy units		
FDL-1	Lock for racks		
CR-SS	Accessory Set: captive nut, washers Screws 100 pcs each		
SUS-2	Tray shelf, 2 units, 19 Inch	483 x 88 x 375	3.10
SUS-3	Tray shelf, 3 units, 19 Inch	483 x 88 x 375	3.40
PUS-2	Tray shelf, 2 units, perforated, 19 Inch	483 x 133 x 375	2.80
PUS-3	Tray shelf, 3 units, perforated, 19 Inch	483 x 133 x 375	3.00
UD-2	Drawer 2 units, closed, 19 Inch	483 x 88 x 382	8.00
UD-3	Drawer 3 units, closed, 19 Inch	483 x 133 x 382	9.20
SFP-1	Front panel 1 units, 19 Inch	483 x 44 x 1.5	0.30
SFP-2	Front panel 2 units, 19 Inch	483 x 88 x 1.5	0.56
SFP-3	Front panel 3 units, 19 Inch	483 x 133 x 1.5	0.80
PFP-1	Front panel, perforated, 1 units, 19 Inch	483 x 44 x 1.5	0.26
PFP-2	Front panel, perforated, 2 units, 19 Inch	483 x 88 x 1.5	0.52
PFP-3	Front panel, perforated, 3 units, 19 Inch	483 x 133 x 1.5	0.75

* Accessory for CR-15 to CR-44



Network Audio Adapter

Network Audio Adapter



NX-100 / NX-100S (small picture)

Description

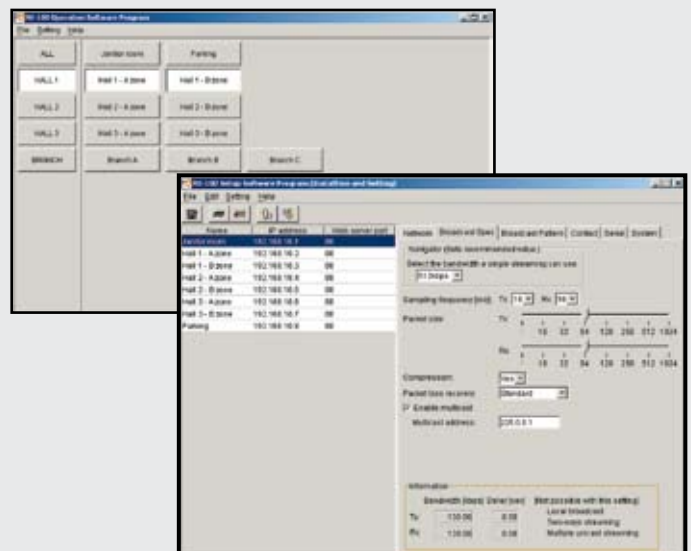
- 2-way audio signal transmission with a single NX-100 unit. Every unit is equipped with an audio input and an audio output
- Simultaneous transmission of audio signals to multiple locations possible
- Unicast: up to 4 locations, multicast: up to 64 locations
- No audio signal degradation or loss, even when transmitting over internet
- Improved data reliability using IP networks with the protocol's ability to prevent data problems during transmission
- Contact input can initiate and terminate audio transmissions without use of a PC
- Operational reliability over only software-driven application
- Low cost operation
- Operation on both AC and DC
- Software-driven operational menu
- Transmission of high quality audio signals of up to 14 kHz and control signals
- Serial data over networks using the IP protocol in real time
- Internet and LANs

- Significant cost reductions when transmitting audio signals to various remote areas as costly dedicated lines do not have to be used
- Differences between NX-100 and NX-100S:

	NX-100	NX-100S
Power source	AC power or DC 24 V	AC power
RS-232C port	Yes	No
Input signal LED	No	Yes
Input peak level LED	No	Yes
Phantom power supply	No	Yes
IPv6-compatible	Yes	No



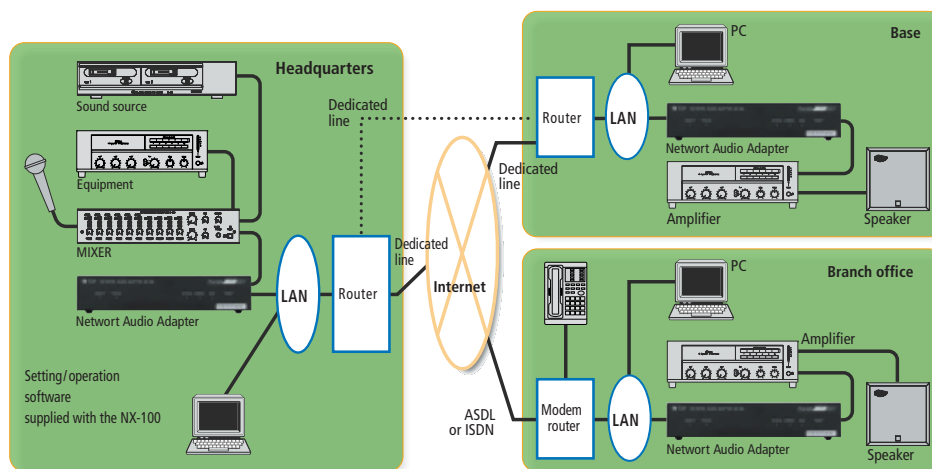
The world's first audio system to boast the „IPv6 Ready“ logo



Setup Software for Easy Access



Rear View NX-100 / NX-100S (small picture)



Application Example

Specifications

	NX-100	NX-100S
Power Source	24 V DC (removable terminal block 3-pins) or AC adapter AD-246 (optional) or equivalent	
Power Consumption	4.8 W (DC operation)	7 W (DC operation)
Audio Input	1 channel (isolated transformer), -58 dBV to 0 dBV, balanced (MIC/LINE changeable, volume adjustable with volume control), 2 kOhm, removable terminal block	1 channel (isolated transformer), -58 dBV to 0 dBV, balanced (MIC/LINE changeable, volume adjustable with volume control), 2 kOhm, removable terminal block, 24 V phantom power supply
Audio Output	1 channel (isolated transformer), balanced, 600 Ohm, removable terminal block 3-pins	
Frequency Response	50 ... 14000 Hz (when sampling frequency is 32 kHz)	
Distortion	Under 0.3 % (1 kHz, when sampling frequency 32 kHz)	
Control Input	8 channels, no-voltage make contact input, open voltage: 12 V DC, short-circuit current: 10 mA, removable terminal block 9-pins	
Control Output	8 channels, open collector output, withstand voltage: 30 V DC, control current: 50 mA max., removable terminal block 9-pins	
Network I/F	10BASE-T/100BASE-TX, Auto-Negotiation	
Network Protocol	TCP/IP, UDP, HTTP, RTP, ARP, ICMP, IGMP	
Audio Packet Transmission System	Unicast (up to 4 simultaneous transmissions), Multicast (up to 64 simultaneous transmissions)	
Operating Temperature	0°C to +50°C (0°C to +40°C when AC adapter is in use)	0°C to +40°C (0°C to +40°C when AC adapter is in use)
Operating Humidity	Under 90 % RH (no dew condensation should be produced)	
Finish	Steel plate, black, 30 % gloss	
Dimensions (W x H x D)	210 x 45 x 188 mm	
Weight	1.2 kg	



Infrared Conference Systems

Secure Conferences



TS-800 Series / TS-900 Series



Central Unit (TS-800)



Delegate Unit (TS-902)



Infrared Transmitter/Receiver Units (TS-905)



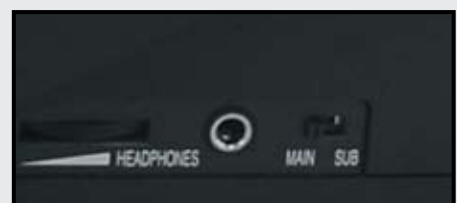
3 voting keys (TS-901/TS-902)

Features

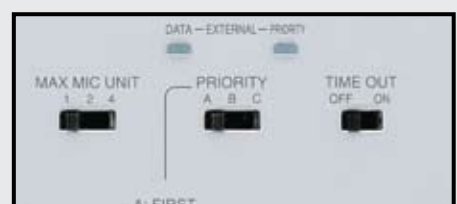
- For efficient communications for each kind of conferences
- System with voting function (TS-900) or standard system (TS-800)
- Safe and secure Infrared wireless technology
- Compact and lightweight chairman and delegate units
- Up to 96 active units (TS-900) and 64 active units (TS-800) per system
- Non-cabling enables easy installations
- Chairman unit features a priority speech key
- Speaker restriction function
- Auto Mic-Off function
- Installation status checkup function
- Conference control software available

Options

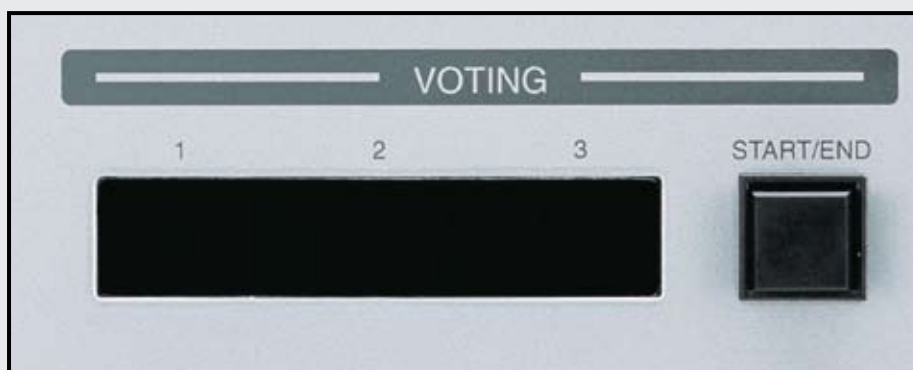
- AD-0910: AC Adapter
- BC-900: Battery Charger for BP-900
- BP-900: Lithium-Ion Battery for the units
- MB-TS900: Rack Mounting Bracket
- Distributor:
 - YW-1022 (1 into 2)
 - YW-1024 (1 into 4)
- TS-905: Infrared Transmitter / Receiver Units with 150° (vert.) x 360° (hor.) reception angle
- TS-907: Infrared Transmitter / Receiver Units with 90° (vert.) x 360° (hor.) reception angle
- TS-903: Standard Microphone
- TS-904: Long Microphone
- TK-906A: Basic Carrying Case
- TK-908A: Expansion Carrying Case



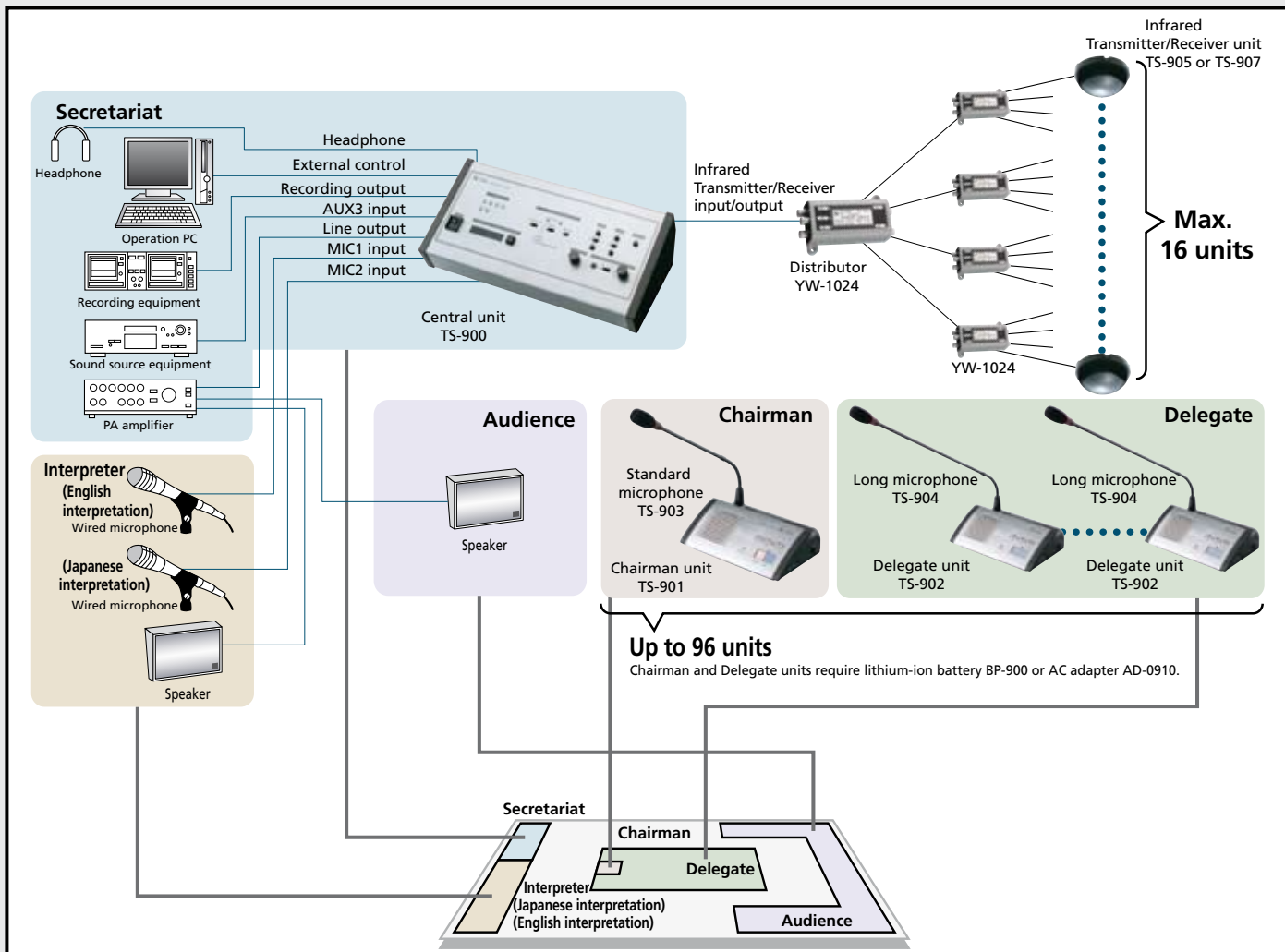
Translation Channel Selection (TS-901/902)



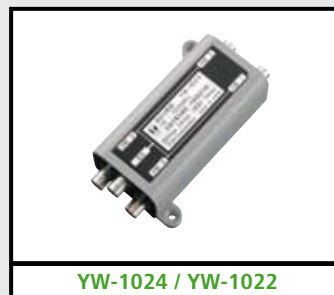
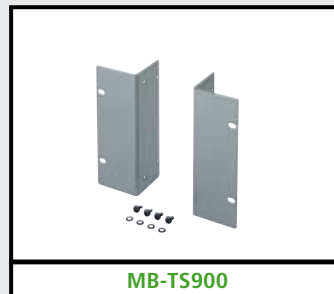
Function Selection (TS-800/TS-900)



Voting Result Display



TS-900 System Example

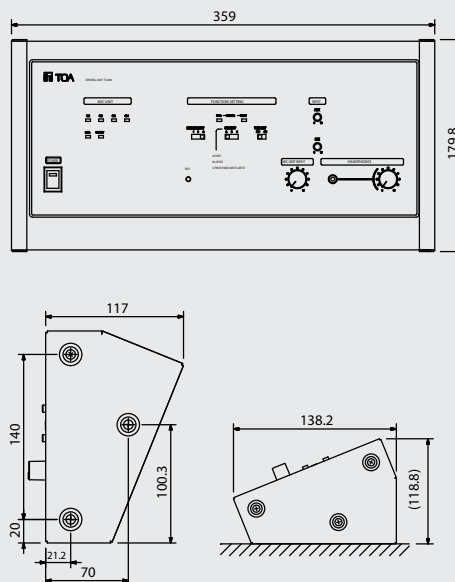


* without products



Infrared Conference System

Central Unit



Features

- Flexible and easy configuration in different rooms and with varied participant numbers
- Conference control software available
- Up to 64 active units per system
- Non-cabling enables easy installations
- Chairman unit features a priority speech key
- Speaker restriction function
- Auto Mic-Off function
- Installation status checkup function
- Very good coverage of transceivers
- Improved security from eavesdropping or annoying crosstalk
- Exceptional sound quality
- Audio input from a wired microphone or other sound source
- 2 different microphone types
- AC operation available with adaptor
- Colour: panel grey metallic

Options

- MB-TS900: Rack Mounting Brackets
- TK-908A: Carrying case for 8 units, 2 transceivers battery charger, batteries and microphones
- TK-906A: Carrying case for central unit, 6 units, 1 transceiver, battery charger, batteries and microphones

Specifications

	TS-800
Power Source	100-240 V AC, 50/60 Hz (supplied from AC adapter (accessory))
Power Consumption	72 W
Input	MIC: -60 dBV, 600 Ohm, unbalanced, phone jack. AUX: -20 dBV, 10 kOhm, unbalanced, phone jack
Output	REC: -20 dBV, 10 kOhm, unbalanced, phone jack, RCA pin jack. Headphone: Mini jack
Number of connectable Chairman / Delegate Units	64 active units
Number of connectable Infrared Transmitter/Receiver Units	4 units (up to 16 units by using 4 YW-1024 distributors)
Infrared Transmitter/Receiver I/O Terminal	4 BNC jacks
External Control Terminal	D-sub connector (9 P, male)
LED Indicator	Audio signal receiving indicators 1-4 CH, data signal receiving indicator, external control priority indicator, external control communication indicator, power indicator, battery indicator (flashes when a chairman / delegate unit's battery nears complete discharge)
Selectable Functions	Simultaneous speaker no. setting switch: 1/2/4. Mic-off setting switch: Time out on/off. speech priority selector switch: A/B/C (A: First-in-first-out priority, B: Last-in-first-out priority, C: Fixed for the first unit, and last-in-first-out for the subsequent units)
Operating Temperature	0°C to +40°C
Finish	Panel: Surface-treated steel plate, grey metallic paint, semi-gloss
Weight	2.7 kg
Accessory	AC adapter (Cord length: 1.8 m DC cord and 2 m detachable AC cord)
Dimensions (W x H x D)	359 x 118.8 x 179.8 mm

Infrared Conference System



Chairman's Unit and Delegate's Unit



TS-801 (+ TS-903)



TS-802 (+ TS-904)

Features

- Compact and lightweight Chairman and Delegate units
- Attractive unit equipped with removable microphone, speaker and priority switch
- 2 different version for chairman (TS-801) and delegates (TS-802)
- When the speaker is on, the microphone of the chairman's unit is automatically turned off to avoid feedback and vice versa
- One recording output
- Ring shaped in-use LED
- Multiple chairman's units can be operated simultaneously
- TS-801 only: Pressing the priority switch activates the chime and overrides delegate's units
- Easy hook-up

Options

- BP-900: Lithium Ion Battery
- TS-903: Standard Microphone
- TS-904: Long Microphone
- AD-0910: AC adapter

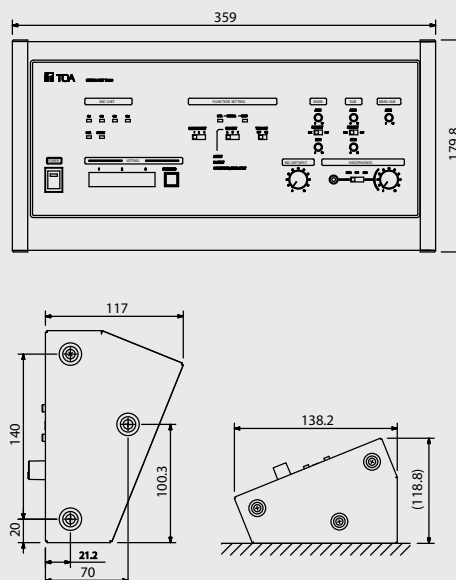
Specifications

	TS-801	TS-802
Power Source	7.4 V DC (battery), 9 V DC (AC adapter) (supplied from BP-900 battery (option) or AD-0910 AC adapter (option))	7.4 V DC (battery), 9 V DC (AC adapter) (supplied from BP-900 battery (option) or AD-0910 AC adapter (option))
Current Consumption	MAX. 270 mA	MAX. 270 mA
Infrared Emitter/Detector	Wavelength	870 nm (AM: Brightness modulation)
	Modulation Method	Frequency modulation
	Carrier Frequency	Transmission: Audio channel 1: 7.35 MHz, Audio channel 2: 8.10 MHz, Audio channel 3: 8.55 MHz, Audio channel 4: 9.15 MHz, Control channel: 6.45 MHz Reception: Audio channel: 1.95 MHz
	Acceptance Angle	Vertical: 90°, Horizontal: 120°
Emission Angle	Vertical: 90°, Horizontal: 120°	Vertical: 90°, Horizontal: 120°
Covering Range	7 m (radius)	7 m (radius)
Input	Microphone terminal: Combined type of XLR-4-31 (dedicated for connecting the optional TS-903 or TS-904)	Microphone terminal: Combined type of XLR-4-31 (dedicated for connecting the optional TS-903 or TS-904)
Output	Monitor speaker: 8 Ohm, 0.2 W. Headphone: Mini jack x2	Monitor speaker: 8 Ohm, 0.2 W. Headphone: Mini jack x2
LED Indicator (TS-801/802)	Speech indicator (flashes when the unit is out of communication range), Power indicator (flashes when the unit is out of communication range or when the battery level is low)	Speech indicator (flashes when the unit is out of communication range), Power indicator (flashes when the unit is out of communication range or when the battery level is low)
Battery Life	Approx. 10 hours (when the fully-charged BP-900 battery is used with „During Speech“ to „Standby“ ratio of 1:2)	Approx. 10 hours (when the fully-charged BP-900 battery is used with „During Speech“ to „Standby“ ratio of 1:2)
Operating Temperature	0°C to +40°C	0°C to +40°C
Finish	Top panel: ABS resin, Grey metallic, paint, semi-matte	Top panel: ABS resin, Grey metallic, paint, semi-matte
Dimensions (W x H x D)	210 x 65.9 x 152 mm	210 x 65.9 x 152 mm
Weight	630 g	630 g



Infrared Conference System with Voting Function

Central Unit



Features

- 2 channels for 2 languages
- Conference control software available
- Safe and sure Infrared Wireless Technology
- Compact and lightweight Chairman and Delegate units
- Up to 96 units per system
- Non-cabling enables easy installations
- For bilingual conferencing and voting with triple choice vote function
- Chairman unit features a priority speech key
- Speaker restriction function
- Auto Mic-Off function / installation status checkup function
- Good coverage
- Improved security from eavesdropping or annoying crosstalk
- Flexible and easy configuration in different rooms and with varied participant numbers
- Exceptional sound quality
- Audio input from a wired microphone or other sound source
- AC operation available with adaptor
- Colour: panel grey metallic

Options

- TK-908A: Carrying case for 8 units, 2 transceivers battery charger, batteries and microphones
- TK-906A: Carrying case for central unit, 6 units, 1 transceiver, battery charger, batteries and microphones

Specifications

	TS-900
Power Source	100-240 V AC, 50/60 Hz (supplied from AC adapter (accessory))
Power Consumption	72 W
Input	MIC1 (base Language): -60 dBV, 600 Ohm, unbalanced, phone jack; MIC2 (translation language): -60 dBV, 600 Ohm, unbalanced, phone jack; AUX1 (base language): -20 dBV, 10 kOhm, unbalanced, phone jack; AUX2 (translation language): -20 dBV, 10 kOhm, unbalanced, phone jack; AUX3 (Base and translation language): -20 dBV, 10 kOhm, unbalanced, phone jack
Output	LINE: -20 dBV, 10 kOhm, unbalanced, phone jack; REC: -20 dBV, 10 kOhm, unbalanced, phone jack, RCA pin jack; headphone: Mini jack
Number of connectable Chairman / Delegate Units	96 units
Number of connectable Infrared Transmitter / Receiver Units	4 units (up to 16 units by using 4 YW-1024 distributors)
Infrared Transmitter/Receiver I/O Terminal	4 BNC jacks
External Control Terminal	D-sub connector (9 P, male)
LED Indicator	Voting result indicators 1-3 (7-segment LED, double-digit number), audio signal receiving indicators 1-4 CH, data signal receiving indicator, external control priority indicator, external control communication indicator, power indicator, battery indicator (flashes when a chairman/delegate unit's battery nears complete discharge)
Selectable Functions	Simultaneous speaker No. setting switch: 1/2/4; mic-off setting switch: TIME OUT, on/off, speech priority selector switch: A/B/C (A: First-in-first-out priority, B: Last-in-first-out priority, C: Fixed for the first unit, and last-in-first-out for the subsequent units)
Microphone Mix / Cut Switch (for the Base Language)	MIC/CUT (Mix): Chairman/delegate units + MIC 1 + AUX 1 + AUX 3 -> base language; (cut): MIC 1 + AUX 1 + AUX 3
Microphone Mix / Cut Switch (for the Translation Language)	MIC/CUT (Mix): Chairman/Delegate units + MIC 2 + AUX 2 + AUX 3 -> translation language; (cut): MIC 2 + AUX 2 + AUX 3
AUX 3 Mixing Select Switch	MIC/CUT (Mix): AUX 3 input is relayed to the line output. (Cut): AUX 3 input is not relayed to the line output
Operating Temperature	0°C to +40°C
Finish	Panel: Surface-treated steel plate, grey metallic, paint, semi-gloss
Weight	2.8 kg
Accessory	AC adapter (cord length: 1.8 m DC cord and 2 m detachable AC cord)
Dimensions (W x H x D)	359 x 118.8 x 179.8 mm

Infrared Conference System with Voting Function



Chairman's Unit and Delegate's Unit



TS-901 (+ TS-903)



TS-902 (+ TS-904)

Features

- Attractive unit equipped with removable microphone, speaker and priority switch
- 2 different versions for chairman (TS-901) and delegates (TS-902)
- 3 voting keys
- Channel selector for conference language
- When the speaker is on, the microphone of the unit is automatically turned off to avoid feedback and vice versa
- 1 recording output
- Ring shaped in-use LED
- Multiple chairman's units can be operated simultaneously
- TS-901 only: Pressing the priority switch activates the chime and overrides delegate's units
- Easy hook-up

Options

- BP-900: Lithium Ion Battery
- TS-903: Standard Microphone
- TS-904: Long Microphone
- AD-0910: AC adapter

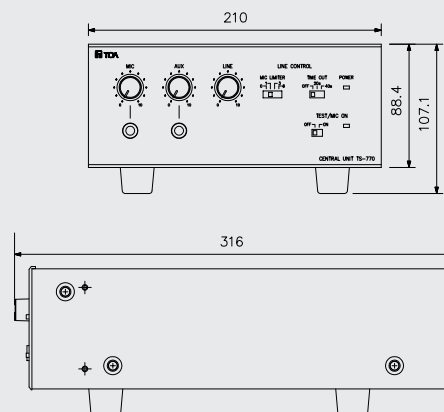
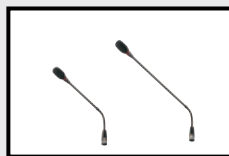
Specifications

	TS-901	TS-902
Power Source	7.4 V DC (battery), 9 V DC (AC adapter) (supplied from BP-900 battery (option) or AD-0910 AC adapter (option))	7.4 V DC (battery), 9 V DC (AC adapter) (supplied from BP-900 battery (option) or AD-0910 AC adapter (option))
Current Consumption	MAX. 270 mA	MAX. 270 mA
Infrared Emitter/Detector	Wavelength	870 nm (AM: Brightness modulation)
	Modulation Method	Frequency modulation
	Carrier Frequency	Transmission: Audio channel 1: 7.35 MHz, Audio channel 2: 8.10 MHz Audio channel 3: 8.55 MHz, Audio channel 4: 9.15 MHz, Control channel: 6.45 MHz Reception: Base language channel: 1.95 MHz, Translation language channel: 2.25 MHz
	Acceptance Angle	Vertical: 90°, Horizontal: 120°
	Emission Angle	Vertical: 90°, Horizontal: 120°
	Covering Range	7 m (radius)
Input	Microphone terminal: Combined type of XLR-4-31 (dedicated for connecting the optional TS-903 or TS-904)	Microphone terminal: Combined type of XLR-4-31 (dedicated for connecting the optional TS-903 or TS-904)
Output	Monitor speaker: 8 Ohm, 0.2 W, Headphone: Mini jack x2	Monitor speaker: 8 Ohm, 0.2 W, Headphone: Mini jack x2
LED Indicator	Speech indicator (flashes when the unit is out of communications range), Power indicator, voting status indicator 1-3 (flashes when the unit is out of communications range or when the battery level is low)	Speech indicator (flashes when the unit is out of communications range), Power indicator, voting status indicator 1-3 (flashes when the unit is out of communications range or when the battery level is low)
Battery Life	Approx. 10 hours (when the fully-charged BP-900 battery is used with „During Speech“ to „Standby“ ratio of 1:2)	Approx. 10 hours (when the fully-charged BP-900 battery is used with „During Speech“ to „Standby“ ratio of 1:2)
Operating Temperature	0°C to +40°C	0°C to +40°C
Finish	Top panel: ABS resin, grey metallic, paint, semi-gloss	Top panel: ABS resin, grey metallic, paint, semi-gloss
Dimensions (W x H x D)	210 x 65.9 x 152 mm	210 x 65.9 x 152 mm
Weight	640 g	640 g



Portable Conference System

Central Unit



System

Compact wired conference system with a capacity of up to 210 units. Remote participation via phone or internet is possible. Clear sound, easy set up and convenient storage are self-evident.

Features

- TS-770 supplies DC Power to all units
- Lamp indicator
- Jack for microphone input, and AUX input
- Microphone, AUX, line (for conference unit's built-in speaker) and chime (on chairman's unit) volume controls
- Delegate's unit simultaneous operation (1,3, or 6) and automatic mic-off setting (OFF/20-sec/40-sec) switches
- Line 1 & 2 output connection terminals each for 35 conference units
- Equalizer Input
- System expandable to 210 units by connection of 3 central units (70 units per central unit)

Options

- YR-770-2M / YR-770-10M Extension Cables for connection of a TS-770 expansion amplifier or the connection of two conference units. 8 pin DIN socket / DIN plug. 2 m (YR-770-2M) or 10 m (YR-770-10M) long
- TK-776 / TK-778 Carrying and Storage Case
TK-776: for 1 central unit, 8 units and the cables
TK-778: for 12 units and the cables

Specifications

	TS-770
Power Requirements	220 / 230 V AC, 50/60 Hz (selectable)
Power Consumption	Max. 60 W
Input	Mic: 600 Ω, -60 dBV, AUX 1: 10 kΩ, -20 dBV,
Output	Recording; 10 kΩ, -20 dBV, unbal, phone jack, 2x pin jack, unbalanced, phone jack
Controls	Speaker restriction can be set to 1,3 or 6 / automatic mic-off function; off, 20 sec., 40 sec., (selectable)
Connecting Capacity	Max. 70 units per TS-770 / max. 35 units per line (max. 210 units with 3 x TS-770)
Dimensions (W x H x D)	210 x 107.1 x 316 mm
Weight	4 kg
Finish	Case: Pre-coated steel plate, black, 30% gloss, aluminum panel
Options	Extension cable: YR-770-2M / YR-770-10M

Portable Conference System



Chairman's Unit and Delegate's Unit

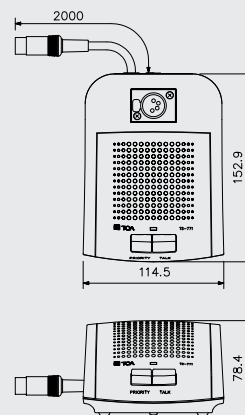


TS-771 / TS-772



TS-773 / TS-774

Dimensions



Functions

- TS-771: Chairman's unit
- TS-772: Delegate's unit
- Built-in speaker
- A ring-shaped LED on the optional microphone indicates that the microphone is on
- To prevent howling, the built-in speaker is turned off while the microphone is on
- Press-to-talk priority speech button activates chime and overrides delegate's unit (TS-771 only)
- Press-to-talk button
- Recording output mini-jack for connection to a recording device
- Multiple simultaneous chairman's units operation possible
- 8P quick-lock type mini-DIN socket
- Long or short gooseneck microphone (optional)

Options

Microphones for TS-771 and TS-772

- TS-773: 368 mm
- TS-774: 518 mm

The microphones fit both chairman's and delegate's unit

Specifications

	TS-771	TS-772
Power Requirements	35 V DC, under 30 mA supplied from central unit	
Output	Recording: 10 kOhm, -20 dBV, unbalanced, mini jack Internal speaker: 130 Ohm, 200 mW, headphone: 32 Ohm Contact output: 24 V DC, max 50 mA (open collector output)	
Control	Speech button, priority button, chime button	Speech button
Dimensions (W x H x D)	114.5 x 78.4 x 152.9 mm	
Weight	780 g	
Finish	Case: ABS resin, black; panel: grey metallic, semi-gloss paint	
Option	Microphone : TS-773 / TS-774	

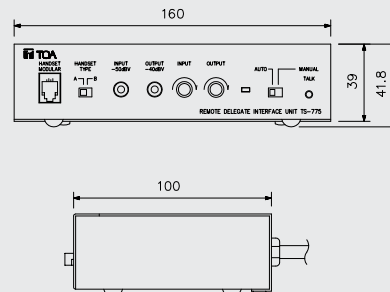


Portable Conference System

Remote Delegate Interface



TK-778



Features

- For connection of external delegates via telephone, IP telephone (up to 70 PCs per TS-770), mobile phone
- Speech method selectable
- Handset connector on the front
- Handset type selectable
- Control output
- Line input for other conference units

Options

Carrying and Storage Cases

- TK-776: for 1 Central Unit, 8 Units and the cables
- TK-778: for 12 Units and the cables

Specifications

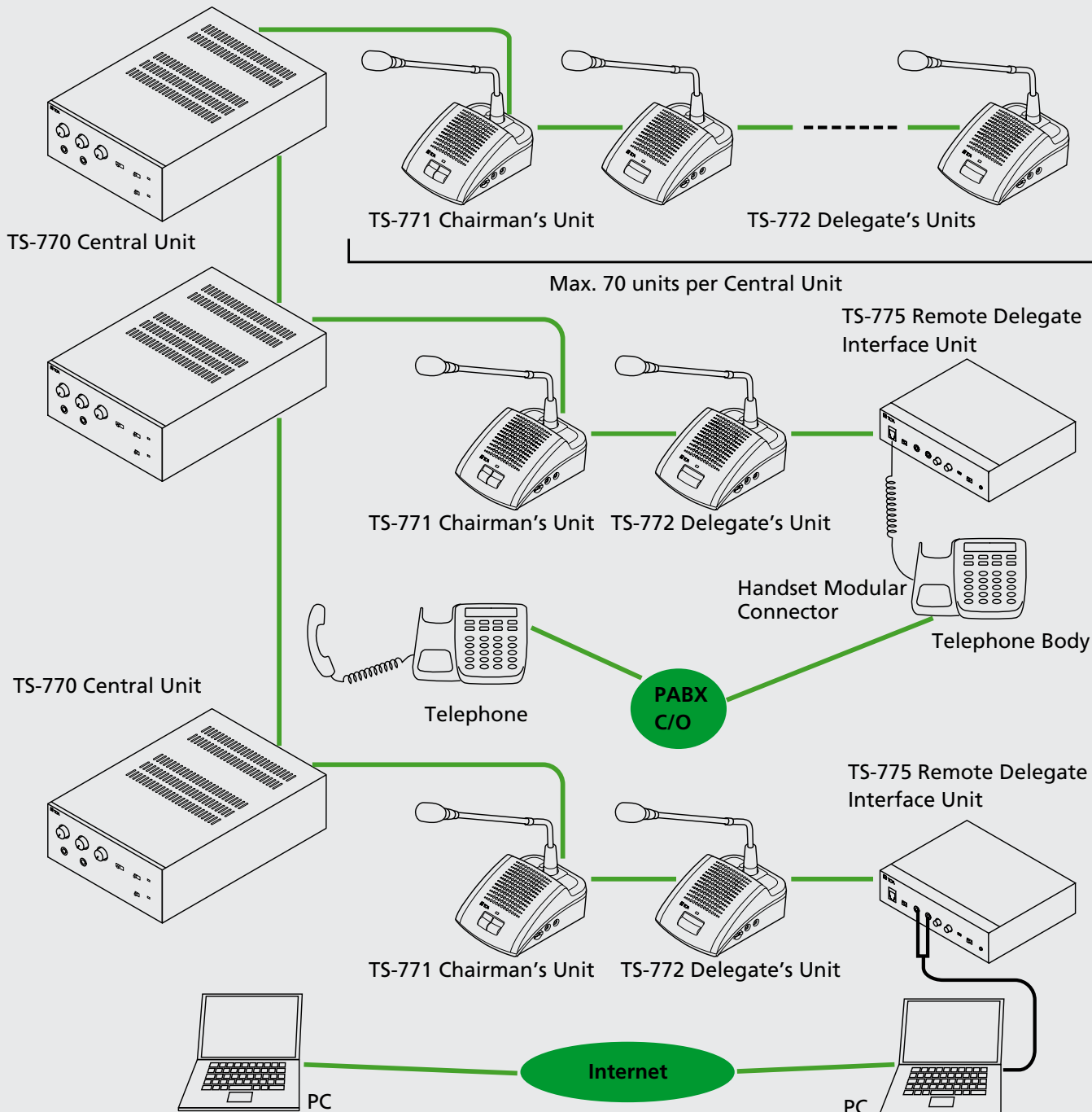
	TS-775
Power Requirements	35 V DC (supplied from optional central unit)
Current Consumption	<30 mA
Input	-60 dBV, 200 Ohm; balanced; mini phone jack with VR control
Output	-60 dBV, 22 Ohm; balanced; mini phone jack with VR control
Metoda mówienia	Auto: Voice-activated automatic switching, Manual: Talk-key activated
Operating Temperature	0°C to +40°C
Operating Humidity	Under 90% RH
Finish	Pre-coated steel plate, black
Dimensions (W x H x D)	160 x 41,8 x 100
Weight	700 g

Portable Conference System



TS-770 Series System Example

TS-770 Central Unit



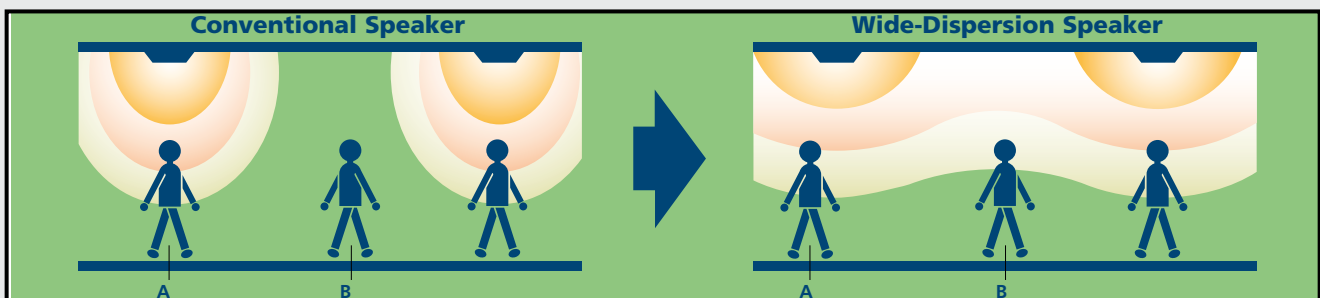


Ceiling Speakers

F-Series Wide Dispersion Flush-Mount Ceiling Speakers

TOA introduces a new range of ceiling-mounted speakers that have been designed and engineered to overcome some of the limiting factors that have been associated with conventional ceiling-mount speakers. Most noticeable has always been the high-frequency roll-off that resulted from limited speaker dispersion characteristics. TOA's new ceiling speaker range provides well-balanced audio reproduction without treble attenuation over an expanded listening area thanks to the extra-wide dispersion characteristics that are part of the overall speaker design.

Perceived speaker directionality and beaming tendencies are minimised, resulting in a natural, well-balanced sound over a wide area at all levels. Conventional speakers exhibit high frequency roll-off characteristics as the distance between speaker and listener increases. An ideal ceiling-mounted speaker's response characteristics should include wide dispersion and non-frequency dependent directionality and this ceiling speaker series proves that.

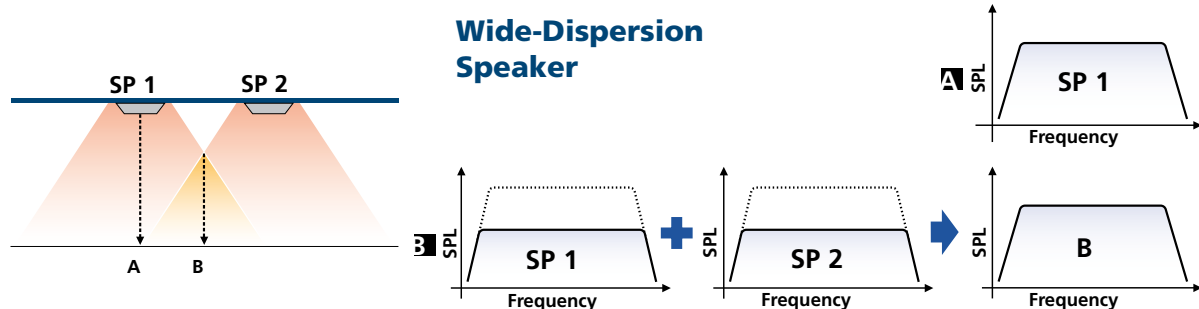
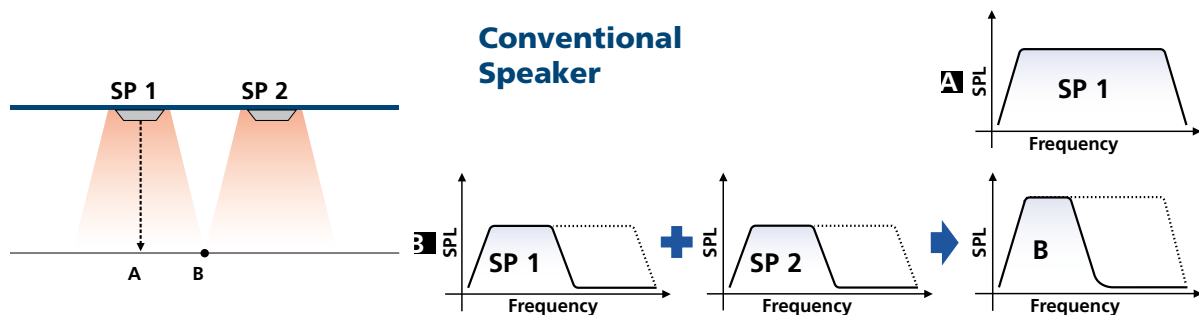


System Features

- Designed to blend into ceilings with a smooth, low-profile design
- Extra ease of use and higher cost-effectiveness with the metal "back can" enclosure for the speaker rear (F-122C, F-2352C, F-2852C, F-2322C models)
- F-122C arouses increased speaker response control with optional Equalising Speaker Controller (AC-120)
- Minimal high frequency roll-off allows clear and well-balanced sound reproduction over a wide listening area

Expanded listening area coverage thanks to the extra wide dispersion characteristics of TOA's ceiling speakers

enables to utilise fewer speakers to cover a desired area, allowing more cost-effective installations.

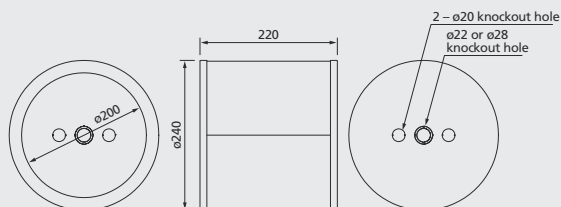
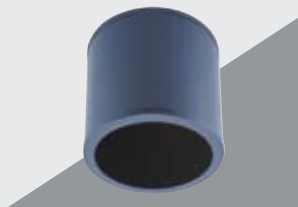




Ceiling Speakers

Accessories for F-Series Speakers

HY-BC1 Back Can

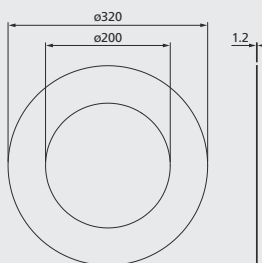


The HY-BC1 Back Can is a metal case attached to flush-mount ceiling speakers when mounted in exposed applications. The Back Can is hung from a ceiling suspension pipe.

Specifications

Finish	Surface-treated steel plate, t0.8, black, paint
Weight	1.5 kg
Accessory	Rubber grommet x 2

HY-TR1 Trim Ring

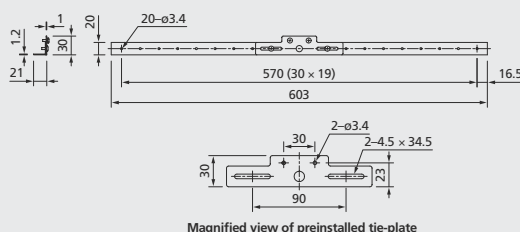
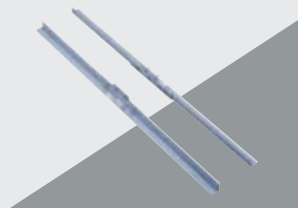


The HY-TR1 Trim Ring allows installation of flush-mounted ceiling speakers in pre-existing ceiling panel holes which are over 200 mm in diameter. The use of 2 Trim Rings allows the speaker to be mounted in holes from 240 mm to 300 mm in diameter.

Specifications

Ceiling Hole Diameter	ø 200 – ø 300 mm
Finish	Surface-treated steel plate, white, paint
Weight	500 g

HY-TB1 Tile Bar Bridge

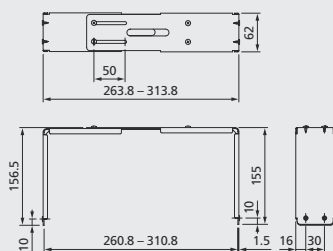
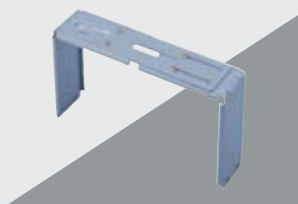


The HY-TB1 is a channel bar to be used when supporting flush-mounted ceiling speakers by way of ceiling bars to prevent their full weight from being directly applied to the ceiling panel during installation. This channel bar is used in conjunction with reinforcement hardware supplied with the speaker. 1 complete set consists of 2 HY-TB1 bars.

Specifications

Finish	Steel plate, plating
Weight	500 g (for set of 2 bars)
Accessory	Mounting screw x 4

HY-AH1 Anchor Hanging Bracket



The HY-AH1 Anchor Hanging Bracket is designed to support ceiling-suspended speakers from an anchor bolt in order to prevent the speaker's full weight from being directly applied to the ceiling panel. It is used in conjunction with reinforcement hardware supplied with the speaker.

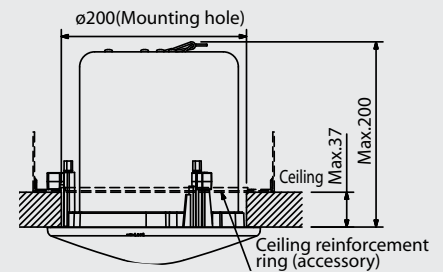
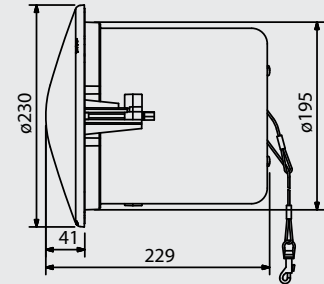
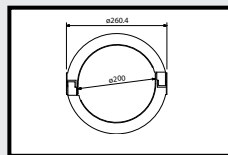
Specifications

Finish	Steel plate, plating
Weight	700 g
Accessory	Paper pattern x 1



Ceiling Speakers

Extreme Wide Dispersion Ceiling Speaker (30 W)



Features

- 30 W full range speaker
- Wide dispersion angle
- Dispersion-Control System „DISC“ solves the problem of severe sound quality drop-off effect
- Diffuser of the speaker is developed to tremendously increase the dispersion angle
- High quality sound over a wide area with fewer speakers
- Reduces cabling expenses
- Colour: white (RAL9010)
- Back can made of steel
- Fire-resistant baffle and rim according to UL94 V-0, plus steel punched net
- The „DISC“ consists of the F-122C wide dispersion speaker and the AC-120 electronic controller to optimise sound dispersion pattern of the speaker
- A single AC-120 can control several F-122C speakers
- 8 or 16 Ohm impedance or 100 V line systems

Applications

- Corridors in shopping malls, hotels and office buildings
- Areas with demanding safety standards (UL94 V-0)

Options

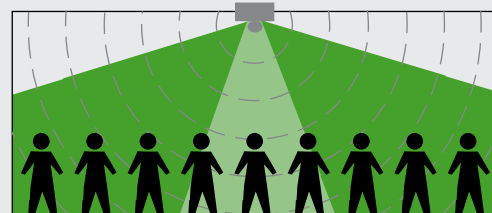
- AC-120: Controller
- HY-AH1: Anchor Hanging Bracket
- HY-BC1: Back Can
- HY-TB1: Tile bar bridge
- HY-TR1: Trim Ring

Specifications

	F-122C
System	12 cm cone driver, bass-reflex
Power Handling Capacity	120 W (8 Ohm)
Rated Input Power	30 W (High impedance, 16 Ohm)
Tappings 100 V	30 W / 10 W / 3 W / 1 W
Tappings 70 V	30 W / 15 W / 5 W / 1.5 W / 0.5 W
Frequency Response	70 Hz ...20000 Hz (-10 dB)
SPL (1 W / 1 m)	90 dB
SPL at Rated Input (1 m)	105 dB
Dimensions of Baffle	ϕ 230 mm
Mounting Depth	max. 200 mm
Ceiling Hole Diameter	200 mm
Weight	3.7 kg

Wide dispersion versus conventional dispersion

- Conventional Speaker
- Wide Dispersion Speaker



Ceiling Speakers



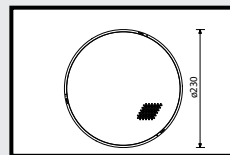
Wide Dispersion Ceiling Speaker with Flat Front Grille (30 W)



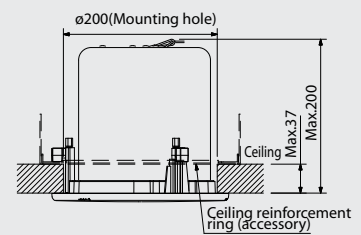
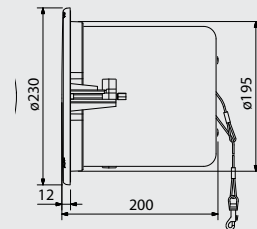
Baffle



Rim and Front Grille



Visible Diameter



Ceiling Mounting

Features

- Compact bass reflex ceiling speaker
- Flat front panel
- Wide frequency response
- High power
- Quick and easy installation
- Front grille: white (RAL 9010)
- Steel plate back can
- Fire-resistant baffle and rim according to UL94 V-0, plus steel punched net
- Overload protection
- For 8, 16 Ohm impedance and for 100 V / 70 V line systems

Options

- HY-AH1: Anchor Hanging Bracket
- HY-BC1: Back Can
- HY-TB1: Tile Bar Bridge
- HY-TR1: Trim Ring

	F-2322C
System	12 cm cone driver, bass-reflex
Power Handling Capacity	120 W (8 Ohm)
Rated Input Power	30 W (high impedance, 16 Ohm)
Tappings 100 V	30 W / 10 W / 3 W / 1 W
Tappings 70 V	30 W / 15 W / 5 W / 1.5 W / 0.5 W
Frequency Response	70 Hz...20000 Hz (-10 dB)
SPL (1 W / 1 m)	90 dB
SPL at Rated Input (1 m)	105 dB
Dimensions of Baffle	Ø 230 mm
Mounting Depth	max. 200 mm
Ceiling Hole Diameter	200 mm
Weight	3.7 kg

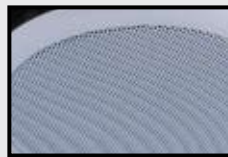


Ceiling Speakers

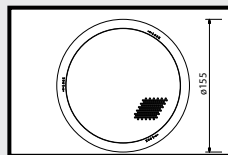
Compact Wide Dispersion Speaker (6 W)



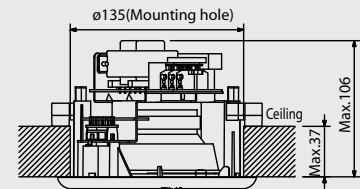
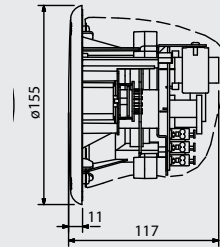
Baffle



Rim and Front Grille



Visible Diameter



Ceiling Mounting

Features

- Compact ceiling speaker
- Wide range frequency response
- Especially for low profile ceilings with limited depth
- Flat front panel
- For Application with lower power requirement
- Colour: white front grille
- Fire-resistant baffle and rim according to UL94 V-0, plus steel punched net
- Built-in overload protection circuitry for low frequencies
- 8 Ohm, 16 Ohm, 100 V and 70 V systems

Options

- HY-RR1: Reinforcement Ring for weak ceiling

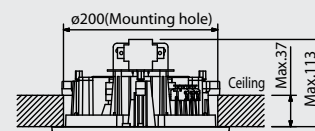
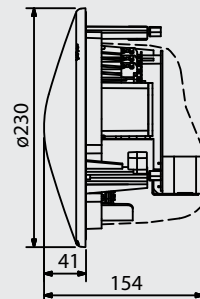
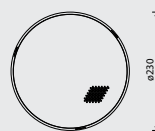
Specifications

	F-1522SC
System	10 cm cone driver, bass-reflex
Power Handling Capacity	18 W (8 Ohm)
Rated Input Power	6 W (high impedance, 16 Ohm)
Tappings 100 V	6 W / 3 W
Tappings 70 V	6 W / 3 W / 1.5 W
Frequency Response	65 Hz ... 18000 Hz (-10 dB)
SPL (1 W / 1 m)	88 dB
SPL at Rated Input (1 m)	96 dB
Dimensions of Baffle	Ø 155 mm
Mounting Depth	max. 107 mm
Ceiling Hole Diameter	135 mm
Weight	1.0 kg

Ceiling Speakers



Low-Depth 2-Way Wide Dispersion Ceiling Speaker (6 W)



Ceiling Mounting

Features

- 2-way speaker
- For low power use
- Cost-effective
- Without back for low profile ceilings with minimal depth
- With a diffuser for wide dispersion of high frequencies
- Colour: white (RAL 9010)

- 8 or 16 Ohm impedance or for 100 V line
- Rear net for dust protection
- Fire-resistant baffle and rim according to UL94 V-0, plus steel punched net

Options

- HY-RR2: Reinforcement Ring

Specifications

	F-2352SC
System	2-way, 12 cm cone driver, bass-reflex
Power Handling Capacity	18 W (8 Ohm)
Rated Input Power	6 W (high impedance, 16 Ohm)
Tappings 100 V	6 W / 3 W / 1 W / 0.5 W
Tappings 70 V	6 W / 3 W / 1.5 W / 0.5 W / 0.25
Frequency Response	80 Hz ... 20000 Hz (-10 dB)
SPL (1 W / 1 m)	89 dB
SPL at Rated Input (1 m)	97 dB
Dimensions of Baffle	Ø 230 mm
Mounting Depth	max. 113 mm
Ceiling Hole Diameter	200 mm
Weight	1.5 kg

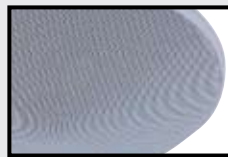


Ceiling Speakers

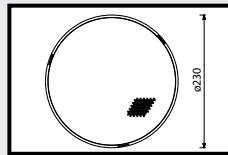
2-Way Wide Dispersion Ceiling Speaker (30 W)



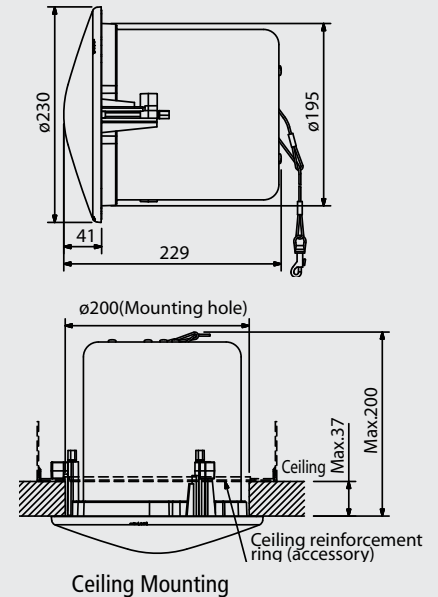
Baffle



Rim and Front Grille



Visible Diameter



Ceiling Mounting

Features

- 2-way hi-fi speaker
- 60 W high power
- Diffuser with wide dispersion angle for high quality sound over a wide area
- Less speakers required than in a conventional speaker arrangement
- Colour: white (RAL 9010)
- Steel plate back can
- Fire-resistant baffle and rim according to UL94 V-0, plus steel punched net
- 8 or 16 Ohm impedance or 100 V line

Options

- HY-AH1: Anchor Hanging Bracket
- HY-BC1: Back Can
- HY-TB1: Tile Bar Bridge
- HY-TR1: Trim Ring

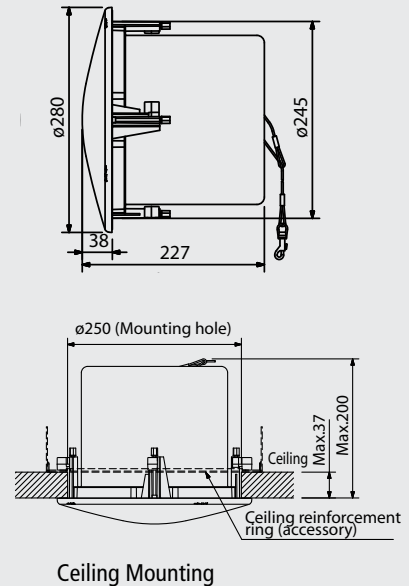
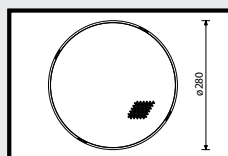
Specifications

	F-2352C
System	2-way, 12 cm cone driver, bass-reflex
Power Handling Capacity	120 W (8 Ohm)
Rated Input Power	30 W (high impedance, 16 Ohm)
Tappings 100 V	30 W / 10 W / 3 W / 1 W
Tappings 70 V	30 W / 15 W / 5 W / 1.5 W / 0.5 W
Frequency Response	70 Hz ... 20000 Hz (-10 dB)
SPL (1 W / 1 m)	90 dB
SPL at Rated Input (1 m)	105 dB
Dimensions of Baffle	Ø 230 mm
Mounting Depth	max. 200 mm
Ceiling Hole Diameter	200 mm
Weight	3.7 kg

Ceiling Speakers



High Power 2-Way Wide Dispersion Ceiling Speaker (60 W)



Features

- 2-way speaker
- For high power (60 W) applications
- Locations with higher ceilings (3 to 6 meter)
- Diffuser for wide dispersion of high frequencies
- For 8, 16 Ohm and 100 V line
- Back can made of steel
- Fire-resistant baffle and rim according to UL94 V-0, plus steel punched net

Applications

Halls, corridors, stairways

Options

- HY-AH1: Anchor Hanging Bracket
- HY-TB1: Tile Bar Bridge

Specifications

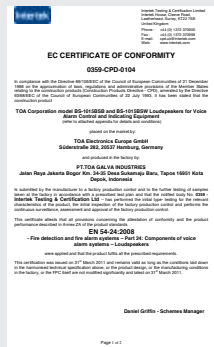
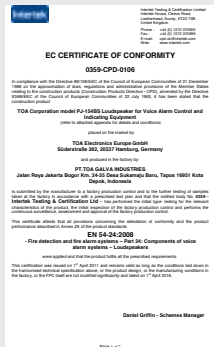
	F-2852C
System	2-way, 16 cm Cone Driver, Bass-Reflex
Power Handling Capacity	180 W (8 Ohm)
Rated Input Power	60 W (High Impedance, 16 Ohm)
Tappings 100 V	60 W / 30 W / 15 W / 3 W
Tappings 70 V	60 W / 30 W / 15 W / 7.5 W / 1.5 W
Frequency Response	60 Hz ... 20000 Hz (-10 dB)
SPL (1 W / 1 m)	91 dB
SPL at Rated Input (1 m)	109 dB
Dimensions of Baffle	ϕ 280 mm
Mounting Depth	max. 227 mm
Ceiling Hole Diameter	250 mm
Weight	5.1 kg



The EN 54-24 sign for certified speaker



What is the meaning of this sign?



TOA only marks devices and speakers which are already certified!

You may already have recognised this EN 54 sign. All speakers and devices passed comprehensive tests resulting in a certificate of an independent notified testing institution.

What is the exact meaning of this sign?

A large number of buildings is equipped with fire detection systems. If a public address system is linked to the fire alarm system it is called voice alarm system – if all components are certified.

In many buildings a voice evacuation system according to EN 54 is mandatory. For this purpose our certified speakers shall be used.

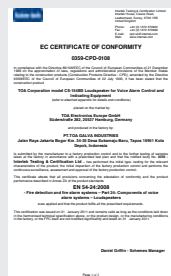
The EN 54 came into force in April 2011. TOA was the first manufacturer to meet all three parts applicable to voice evacuation components already in March 2010:

- EN 54-4: Power Supply Equipment
- EN 54-16: Voice Alarm and Indicating Equipment
- EN 54-24: System Loudspeakers

Our extensive range of certified speakers include:

- Ceiling speakers
- Wall speakers
- Sound projection speakers
- Pendant speakers
- 2-Way speakers
- Design speakers

Furthermore TOA is continuously increasing its certified product range and is offering guidance on the EN 54 and ISO 7240 standards in order to help planning future-proof systems and investments in compliant products.



TOA Voice Evacuation Systems fit your needs



Ceiling Speakers



Certified Firedome Ceiling Mount Speaker



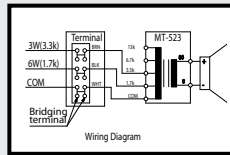
PC-1867F / PC-1867FC (EN 54-24 certified)



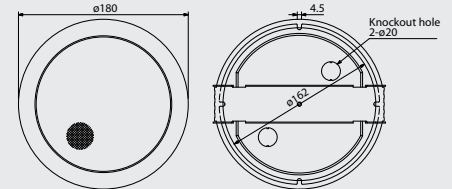
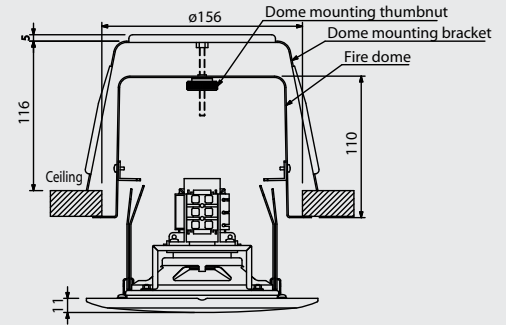
Rim and Grille



Ceramic Screw Terminal



Wiring Diagram



Features

- Ceiling speakers
- 9 W (continuous program)
- Fire dome
- Easy installation with spring catches
- Baffle, frame, net: aluminium steel
- Colour: off-white (RAL 9010)
- PC-1867FC is EN 54-24 certified and is therefore legalised for a use in conjunction with fire detection systems
- 12 cm speaker
- For mounting in 156 mm holes
- PC-1867F: screw terminals
- PC-1867FC: ceramic screw terminal block (in compliance with British Standard BS5839 Part 8)
- Fire dome made of steel
- Fire-resistant baffle and rim, plus aluminium net

Applications

Especially for environments with demanding safety requirements of fire protection in public buildings like train terminals, supermarkets, office buildings, hotels and fitness centers
 PC-1867FC for voice alarm systems according to EN 54-24

Certificates

- EN 54-24 : 1438/CPD/0183 Type A, ISO 7240-24 , according BS 5839-8

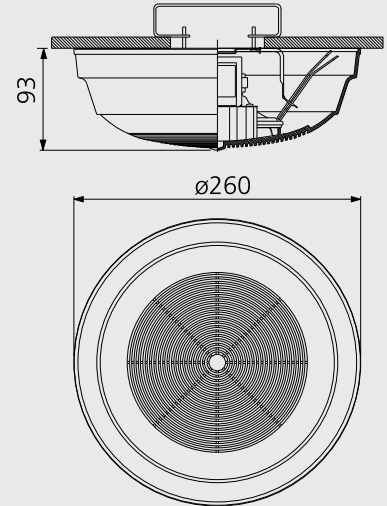
Specifications

	PC-1867F	PC-1867FC
Dynamic Cone Driver	12 cm	12 cm
Rated Input	6 W (100 V), 3 W (70 V)	6 W (100 V), 3 W (70 V)
Continuous Program	9 W	9 W
Tappings 100 V	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W
Tappings 70 V	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W
Frequency Response	100 Hz ... 16000 Hz	100 Hz ... 16000 Hz
SPL (1W, 1m)	90 dB	90 dB
SPL at Rated Input (1 m)	98 dB	98 dB
Dimension of Baffle	ø 180 mm	ø 180 mm
Mounting Depth	110 mm	110 mm
Ceiling Hole Diameter	156 mm	156 mm
Weight	1300 g	1300 g
Certificates	-	EN 54-24: 1438 /CPD /0183, Type A according to BS 5839-8



Ceiling Speakers

Surface Mount Ceiling Speaker



Features

- Ceiling speaker
- 9 W continuous program
- Colour: off-white (RAL 9010)
- For 100 V and 70 V lines
- Push-in connectors with In/Out bridges
- Easy installation with spring catches
- Vaulted baffle ABS resin

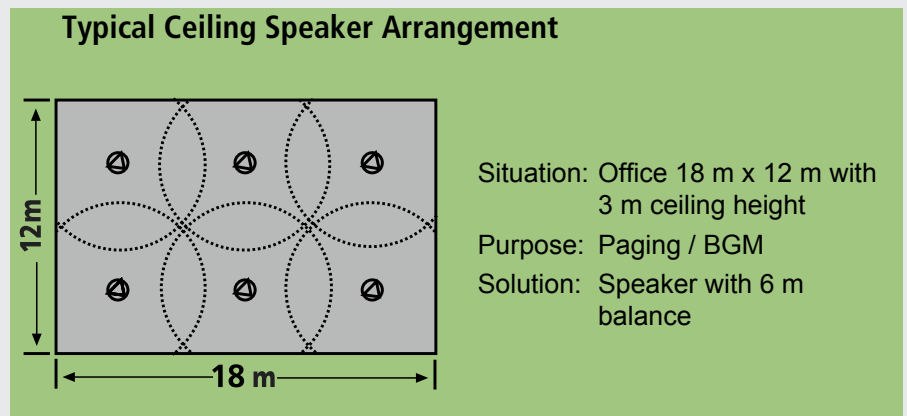
Applications

Surface mounting e.g. for subsequent installation

Specifications

	PC-2668
Dynamic Cone Driver	12 cm
Rated Input	6 W
Continuous Program	9 W
Tappings 100 V	6 W / 3 W / 1,5 W / 0,8 W
Tappings 70 V	3 W / 1,5 W / 0,8 W / 0,4 W
Frequency Response	100 Hz ... 16000 Hz
SPL (1 W, 1 m)	90 dB
SPL at Rated Input (1 m)	98 dB
Dimension of Baffle	ø 260 mm
Shape	Round
Weight	650 g / 820 g with bracket

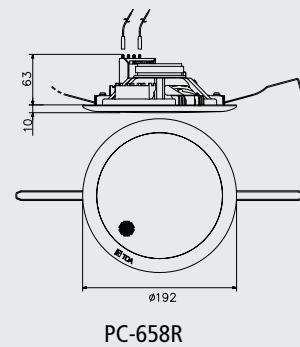
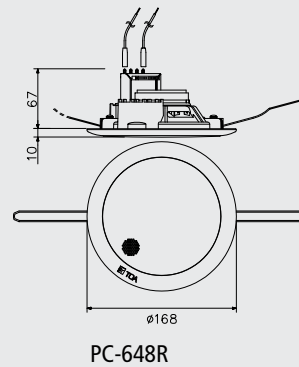
Application Example



Ceiling Speakers



Flush Mount Speaker



Features

- Thin panel
- Special design for thin ceiling
- Fast & easy installation with spring clamp
- Baffle: PP resin, off-white / SECC punching net, off-white
- Push-in connectors for speaker cables
- In-/Out bridge connection

Amplifier Model	Amplifier Output	Speaker Total Input	Total Quantity of Speakers		
			1 W	3 W	6 W
A-2030 / A-1803	30 W	30 W	30	10	5
A-2060 / A-1706 / A-1806	60 W	60 W	60	20	10
A-2120 / A-1712 / A-1812	120 W	120 W	120	40	20
A-2240 / A-1724	240 W	240 W	240	80	40

Specifications

	PC-648R	PC-658R
Speaker Component	12 cm	16 cm
Rated Input	6 W (100 V) / 3 W (70 V)	6 W
Tappings 100 V	6 W / 3 W / 1 W	6 W / 3 W / 1 W
Tappings 70 V	3 W / 1.5 W / 0.5 W	3 W / 1.5 W / 0.5 W
Frequency Response	100 Hz ... 18000 Hz	65 Hz ... 18000 Hz
SPL (1W, 1m)	90 dB	90 dB
Dimension	ø 168 mm x 77 mm	ø 192 x 73 mm
Ceiling Hole Diameter	145±5 mm	170±5 mm
Weight	470 g	500 g



Ceiling Speakers

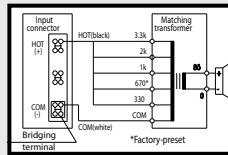
High Quality Ceiling Mount Speaker



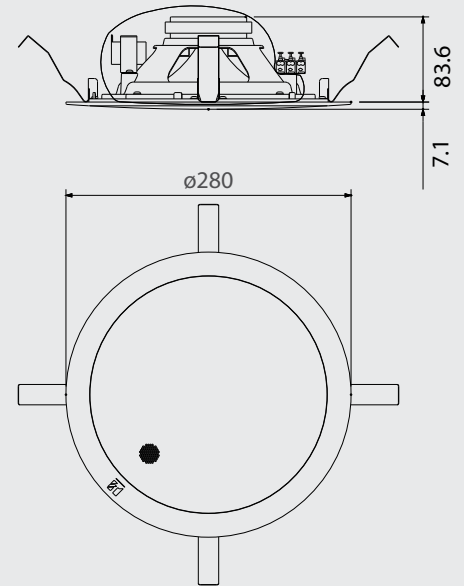
Rim and Grille



Mounting



Wiring Diagram (PC-2852)



Features

- Ceiling speakers
- Rated input 15 W (PC-2852) or 6 W (PC-2869)
- Very high sound pressure level
- Easy installation with spring catches
- Baffle, frame, net: Steel
- Colour: off-white (RAL 9010)
- 20 cm speaker
- For mounting in 250 mm holes
- Push-in terminals
- Bridge wiring

Applications

Ideal for use in any kind of public building where paging and BGM are broadcasted

Specifications

	PC-2869	PC-2852
Speaker Component	20 cm double cone type	20 cm coaxial cone type
Rated Input	6 W	15 W
Tappings 100 V	6 W / 3 W / 1.5 W / 0.8 W	15 W / 10 W / 5 W / 3 W
Tappings 70 V	3 W / 1.5 W / 0.8 W / 0.4 W	15 W / 7.5 W / 5 W / 2.5 W
Frequency Response	40 Hz ...20000 Hz	45 Hz ...20000 Hz
SPL (1W, 1m)	94 dB	96 dB
Dimension	ø 280 x 92 mm	ø 280 x 92 mm
Mounting Depth	83.6 mm	83.6 mm
Ceiling Hole Diameter	250 mm	250 mm
Weight	1400 g	1600 g

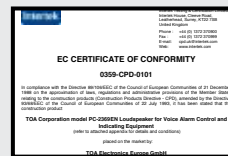
Ceiling Speakers



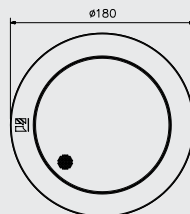
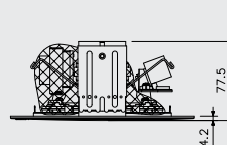
Certified Ceiling Mount Speaker



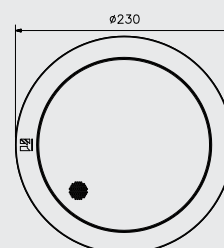
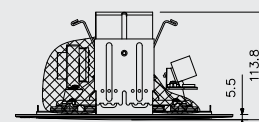
PC-1869 EN



Certificate (Detail)



PC-1869EN



PC-2369EN

Features

- Flat front panel
- For mounting in 110 mm depth (PC-2369EN) or 80 mm depth (PC-1869EN)
- Ceramic screw terminal block and thermal fuse
- Quick and easy installation

Certificates

- EN 54-24 : 0359-CPD-0100, Type A, ISO 7240-24 (PC-1869 EN)
- EN 54-24 : 0359-CPD-0101, Type A, ISO 7240-24 (PC-2369 EN)

Applications

Ideal for use in any kind of public building where pagings and BGM are broadcasted
PC-1869EN / PC-2369EN for voice evacuation systems according to EN 54

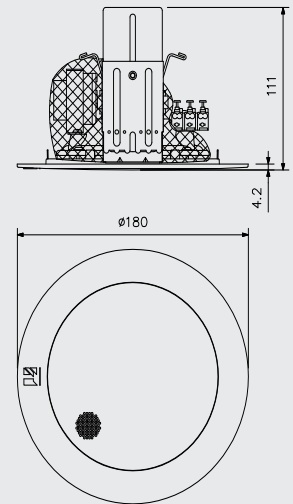
Specifications

	PC-1869EN	PC-2369EN
Speaker Component	12 cm cone type	16 cm double cone type
Rated Input	6 W (100 V), 3 W (70 V)	6 W (100 V), 3 W (70 V)
Tappings 100 V	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W
Tappings 70 V	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W
Frequency Response	100 Hz ... 18000 Hz	70 Hz ... 18000 Hz
SPL (1 W, 1 m)	94 dB (1 W / 1 m, 500 Hz - 5 kHz)	94 dB (1 W / 1 m, 500 Hz - 5 kHz)
Dimension	ø 180 x 80 mm	ø 230 x 110 mm
Mounting Depth	80 mm	110 mm
Weight	820 g	1.1 kg
Other Features	Ceramic screw terminals, thermal fuse	
Finish	Steel, white paint (equiv. RAL 9010)	
Certificates	EN 54-24: 0359-CPD-0100, Type A ISO 7240-24	EN 54-24: 0359-CPD-0101, Type A ISO 7240-24
IP Grade	IP 21c	IP 21c



Ceiling Speakers

Flush Mount Speaker

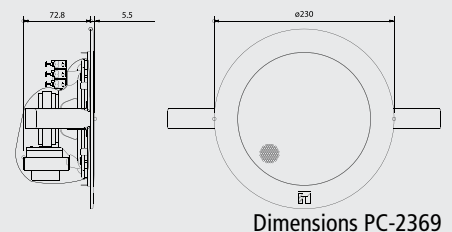
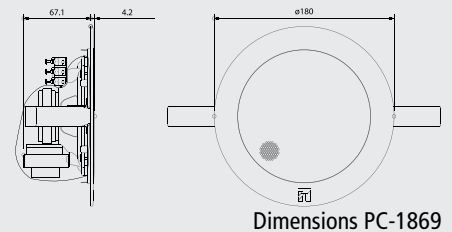


Features

- Thin panel
- Special design for thin ceiling
- Fast & easy installation with spring catches
- Push-in connectors for speaker cables
- In-/Out bridge connection
- Baffle: Steel plate, off-white paint / Grille: Surface-treated steel plate net, off-white paint (RAL 9010 or equivalent)
- Ceiling Speaker
- 6 W rated input
- Colour: off-white (RAL 9010)
- For 100 V and 70 V lines
- Push-in connectors with In/Out bridges
- Easy installation with spring catches
- Vaulted baffle steel plate

Specifications

	PC-1869	PC-2369	PC-1869S
Speaker Component	12 cm cone type	16 cm double cone type	12 cm
Rated Input	6 W	6 W	6 W
Tappings 100 V	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W
Tappings 70 V	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W
Frequency Response	55 Hz ...18000 Hz	45 Hz ...20000 Hz	55 Hz ...18000 Hz
SPL (1W, 1m)	90 dB	93 dB	90 dB
Dimension	ø 180 x 72 mm	ø 230 x 79 mm	ø 180 x 111 mm
Ceiling Thickness	67.1 mm	72.8 mm	max. 34 mm
Ceiling Hole Diameter	150 mm	200 mm	150 mm
Weight	620 g	760 g	750 g



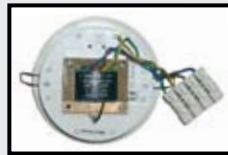
Ceiling Speakers



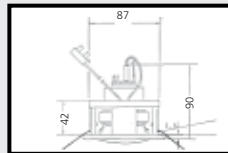
Small Diameter Flush-Mount Ceiling Speakers



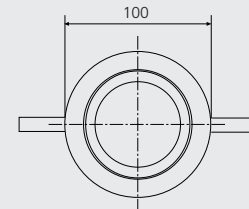
PC-6C / PC-6G / PC-6W



PC-6WM rear



Wiring Diagram



Features

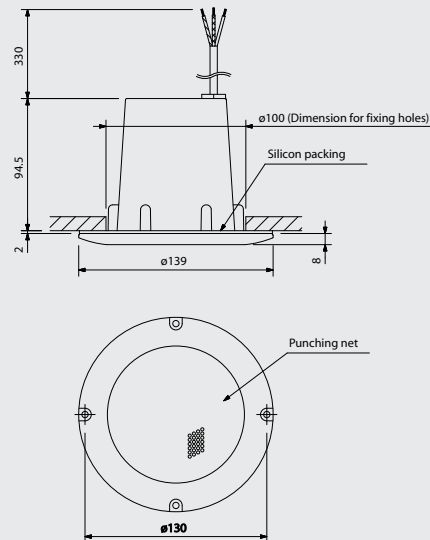
- Smallest diameter for blending into the ceiling without disfiguring the ceiling design
- For 92 mm holes
- Easy snap-in installation
- Baffle ABS resin
- Colour: black (PC-6B/BM) or white (PC-6W/WM) or chrome (PC-6C/CM) or metallic gold (PC-6G/GM)
- 5 pieces per package
- „M“ models for 100 V line: (PC-6BM, PC-6CM, PC-6GM, PC-6WM)

	PC-6B / PC-6C / PC-6G / PC-6W	PC-6BM / PC-6CM / PC-6GM / PC-6WM
Dynamic Cone Driver	6.8 cm	6.8 cm
Rated Input	6 W	6 W
Continuous Program	8 W	8 W
Impedance	4 Ohm	100 V
Tappings 100 V	-	6 W / 3 W / 1,5 W
Frequency Response	150 Hz ...18000 Hz	150 Hz ...18000 Hz
SPL (1 W, 1 m)	85 dB	85 dB
SPL at Rated Input (1 m)	93 dB	93 dB
Dimension of Baffle	ø 100 mm	ø 100 mm
Mounting Depth	96 mm	96 mm
Ceiling Hole Diameter	92 mm	92 mm
Weight	400 g	600 g



Ceiling Speakers

Clean Room Speaker / Shower Room Speaker



Features

- PC-3CL: Clean room / shower room speaker
- 3 W rated input
- For humid or high temperature areas
- Weatherproof in compliance with IP-64
- Resistant against formalin and iodine solutions
- For 100 V line
- Wide temperature range of -20...60°C
- Fits in $\varnothing 100$ mm holes
- PC-5CL: Clean room speaker
- 5 W rated input
- Sealed high-molecular speaker membrane to prevent floating dust particles from contaminating the environment
- Resistant against formaline

Applications

PC-3CL: Shower rooms, indoor pools, hospitals, chemical factories
 PC-5CL: Laboratories and computer rooms

Specifications

	PC-3CL	PC-5CL
Dynamic Cone Driver	7.7 cm	8 cm
Rated Input	3 W	5 W
Continuous Program	4.5 W	7.5 W
Impedance	3.3 kOhm (100 V)	2 kOhm (100 V)
Frequency Response	150 Hz ... 20000 Hz	150 Hz ... 20000 Hz
SPL (1 W, 1 m)	87 dB	87 dB
SPL at Rated Input (1 m)	92 dB	94 dB (97 dB siren sound)
Dimension of Baffle	$\varnothing 139$ mm	116 mm
Mounting Depth	104.5 mm	110 mm
Ceiling Hole Diameter	100 mm	98 mm
Temperature Range	-20 ... + 60 °C	-20 °C ... + 55 °C
Weight	550 g	620 g

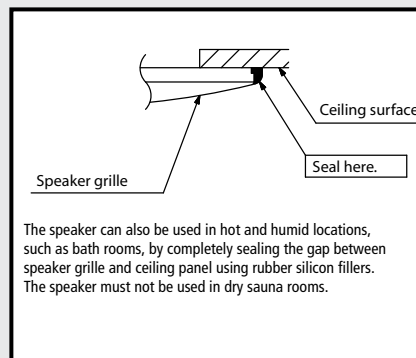
Ceiling Speakers



Shower Room Speaker



Extra Wide Rim



Mounting in Steam Rooms

Features

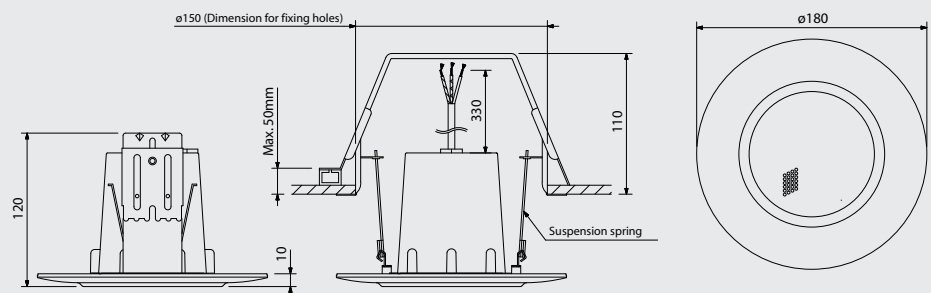
- Ceiling speaker
- For humid or high temperature areas
- In compliance with IP-64
- Wide temperature range of -10...50°C
- For 100 V line
- Fits in 150 mm holes

Applications

Shower rooms, indoor pools

Specifications

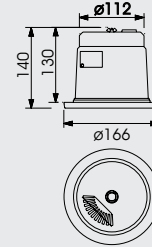
	PC-3WR
Dynamic Cone Driver	7.7 cm
Rated Input	3 W
Continuous Program	4.5 W
Impedance	3.3 kOhm (100 V)
Frequency Response	180 Hz ... 20000 Hz
SPL (1 W, 1 m)	88 dB
SPL at Rated Input (1 m)	93 dB
Dimension of Baffle	ø 180 mm
Mounting Depth	110 mm
Ceiling Hole Diameter	150 mm
Temperature Range	-10° ... + 50°C
Weight	700 g



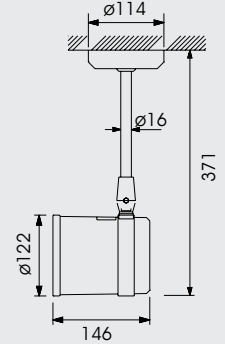


Ceiling Speakers

Heat-Resistant Ceiling Speakers



PC-129



PC-139

Features

- Heat-resistant speakers
- PC-129: ceiling speaker
- PC-139: pendant ceiling speaker
- High SPL
- Colour: ivory
- Withstand 380 °C air stream for 15 minutes
- Dielectric strength of 1000 V AC (1 minute) between terminal and body
- Insulation resistance >10 MOhm, 500 V DC
- Non-RoHS product

Applications

Production areas with high temperature

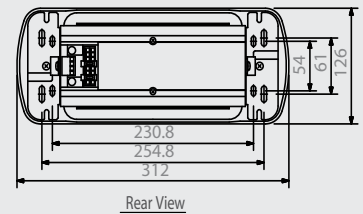
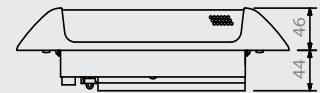
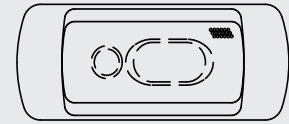
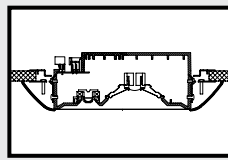
Specifications

	PC-139	PC-129
Dynamic Cone Driver	8 cm	7.7 cm
Rated Input	1 W	1 W
Continuous Program	1.5 W	1.5 W
Impedance	10 kOhm	10 kOhm
Frequency Response	500 Hz ... 10000 Hz	500 Hz ... 8000 Hz
SPL (1 W, 1 m)	100 dB	100 dB
SPL at Rated Input (1 m)	100 dB	100 dB
Dimensions (dia. x D / length)	ø122 x 146 / 371 mm	ø 166 x 140 mm
Dimension of Baffle	-	166 mm
Mounting Depth	-	130 mm
Ceiling Hole Diameter	-	123 mm
Temperature Range	max. 380°C, 15 Min.	max. 380°C, 15 Min.
Weight	1.7 kg	1.6 kg

Harmonised Engineering Speaker



Designer Speaker System



Features

- Sleek and attractive 2-way design speaker
- 90 W
- Ferrofluid-cooled balanced dome tweeters and neodymium magnet cone woofers
- Narrow coverage area allows a controlled sound
- Speaker axis can be mounted to match with the room axis
- Sound direction can be adjusted within 90°
- Colour: white
- Built-in transformer allows both high and low impedance: 4 Ohm, 16 Ohm or 70 V, 100 V-line
- High power handling
- Easy installation in standard electrical gang boxes
- Fire-rated ABS enclosure (UL Standard 94: V-0 grade)
- HY-H1: Adapter frame included

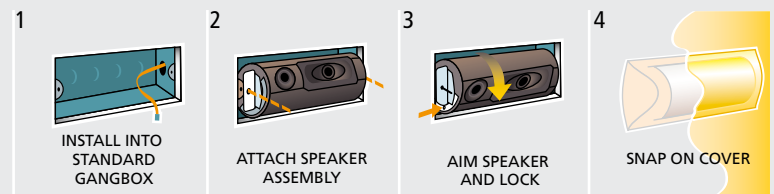
Applications

Houses of worship, hotels, offices, museums, restaurants, retail stores, residential spaces

Specifications

	H-1
Enclosure	Sealed
Rated Input 4 Ohm / 100 V	30 W / 12 W
Continuous program 4 Ohm/ 100 V	90 W / 18 W
Impedance	4 Ohm / 16 Ohm
Tappings	100 V: 830 Ohm (12 W), 1.7 kOhm (6 W), 3.3 kOhm (3 W) 70 V: 420 Ohm (12 W), 830 Ohm (6 W), 1.7 kOhm (3 W), 3.3 kOhm (1.5 W)
Frequency Response	120 Hz ... 20000 Hz
SPL (1 W, 1 m)	85 dB
Dimensions (W x H x D)	312 x 126 x 90 mm
Weight	1.5 kg
Colour	white

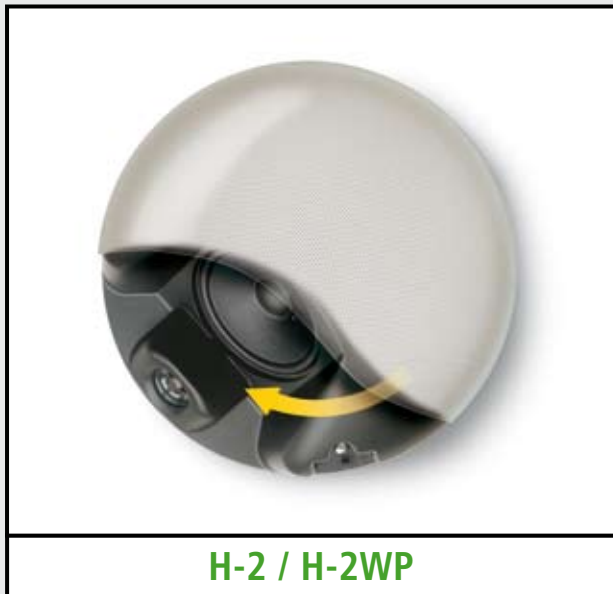
Installation Procedure



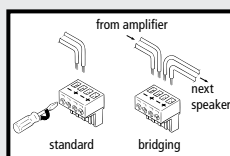


Harmonised Engineering Speaker

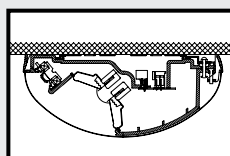
Designer Speaker System



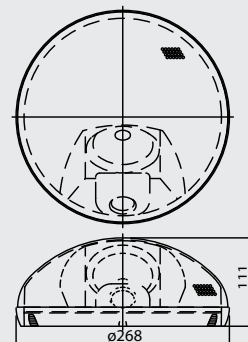
H-2



Connection



Ceiling Mount



Features

- 2-way design speaker
- Pleasant design
- Excellent acoustic properties
- High power handling of 120 W (continuous program)
- Fire-rated ABS enclosure (UL standard 94: V-0 grade)
- H-2WP: Weatherproof IP 64 certified, matches the requirements for outdoor application
- Ferrofluid-cooled balanced dome tweeters, neodymium magnet cone woofers
- Narrow coverage area allows a controlled sound
- Speaker axis can be mounted to match with the room axis
- Sound direction can be adjusted within 360°
- Easy installation in standard electrical gang boxes

Applications

Hotels, houses of worship, office buildings, museums, shops

Weatherproof version: terraces, gardens, patios and swimming pools

Specifications

	H-2	H-2WP
Enclosure	Sealed	Sealed
Rated Input 4 Ohm / other	40 W / 12 W	40 W / 12 W
Continuous program 4 Ohm / other	120 W / 18 W	120 W / 18 W
Impedance	4 Ohm / 16 Ohm / 70 V / 100 V	4 Ohm / 16 Ohm / 70 V / 100 V
Tappings	100V: 830 Ohm (12 W), 1.7 kOhm (6 W), 3.3 kOhm (3 W) 70V: 420 Ohm (12 W), 830 Ohm (6 W), 1.7 kOhm (3 W), 3.3 kOhm (1.5 W)	100V: 830Ohm (12 W), 1.7kOhm (6 W), 3.3 kOhm (3 W) 70V: 420 Ohm (12 W), 830 Ohm (6 W), 1.7 kOhm (3 W), 3.3 kOhm (1.5 W)
Frequency Response	100 Hz...20000 Hz	100 Hz...20000 Hz
SPL (1 W, 1 m)	88 dB	88 dB
Dimensions (W x H x D)	ø 268 x 111 mm	ø 268 x 111 mm
Weight	2.1 kg	2.1 kg
Colour	White	White

Installation Procedure



Harmonised Engineering Speaker



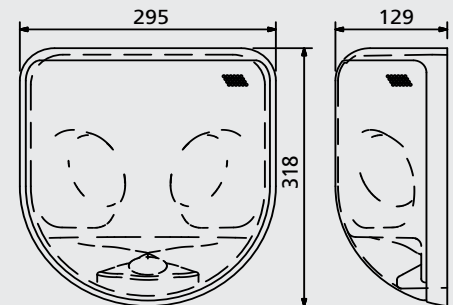
Designer Speaker System



Inside View



H-3



Features

- 2-way speaker
- Stylish design
- Quality audio between the speakers as well as directly in front of each speaker unit
- Ideal for long but narrow areas such as corridors
- H-3WP: weatherproof version for outdoor applications
- Dome tweeters and neodymium magnet cone woofers
- Easy unobtrusive installation at above head-height
- On-wall installation
- 180 degree coverage pattern, eliminating dead audio spaces
- Either low impedance (8 Ohm / 16 Ohm) or high impedance (70 V / 100 V)
- Fire-resistant ABS according to UL94: V-0

Applications

Ideal for corridors. One version for indoor and one for outdoor installation

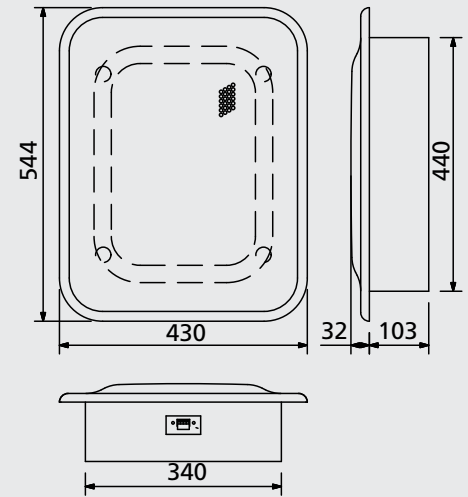
Specifications

	H-3	H-3WP
Enclosure	Sealed, 2-way speaker	Sealed, 2-way speaker
Speaker	2 x 4" (10 cm) cone speaker, dome tweeter (neodymium magnet)	2 x 4" (10 cm) cone speaker, dome tweeter (neodymium magnet)
Impedance	8 Ohm / 16 Ohm / 100 V / 70 V	8 Ohm / 16 Ohm / 100 V / 70 V
Tappings 100 V	30 W (330 Ohm), 15 W (670 Ohm), 7.5 W (1.3k Ohm)	30 W (330 Ohm), 15 W (670 Ohm), 7.5 W (1.3k Ohm)
Tappings 70 V	30 W (170 Ohm), 15 W (330 Ohm), 7.5 W (670 Ohm), 3.75 W (1.3 kOhm)	30 W (170 Ohm), 15 W (330 Ohm), 7.5 W (670 Ohm), 3.75 W (1.3 kOhm)
SPL (1 W, 1 m)	89 dB	89 dB
Power Handling Capacity	150 W (8 Ohm), Rated: 50 W (8 Ohm) or 30 W (16 Ohm and high impedance)	150 W (8 Ohm), Rated: 50 W (8 Ohm) or 30 W (16 Ohm and high impedance)
Frequency Response	100 Hz...20000 Hz	100 Hz...20000 Hz
Connectors	Phoenix-screw terminals (2x2-p)	Phoenix-screw terminals (2x2-p)
Finish	Fire-resistant ABS resin black (UL 94 V-0), grille: stainless plate, white paint, grille frame; fire-resistant ABS resin, white, paintable; base frame: steel plate	Fire-resistant ABS resin black (UL 94 V-0), grille: stainless plate, white paintable, grille frame; fire-resistant ABS resin, white; base frame: steel plate
Dimensions (W x H x D)	295 x 318 x 129 mm	295 x 318 x 129 mm
Weight	3.3 kg	3.3 kg
Water Resistance	-	IPx4
Accessory	Base frame	Base frame



Harmonised Engineering Speaker

Flush-mount Subwoofer with minimum depth



Features

- For undisturbed interior aesthetics
- Compact dimensions
- Extremely small depth for flush-mounting
- Acoustic Super Woofer enclosure
- High volume for an excellent low frequency audio response
- Easy installation in a wall or a ceiling

Option

- MT-S0601 Transformer (for 100 V / 70 V)

Applications

Flush-mount installation in the wall and in ceilings

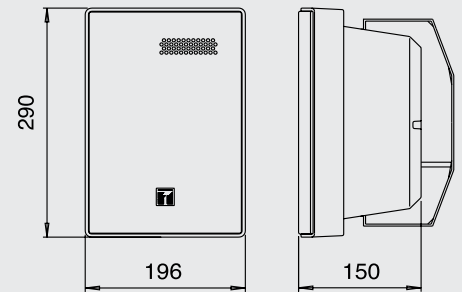
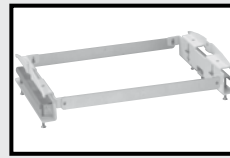
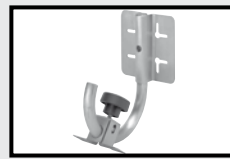
Specifications

	HB-1
Enclosure	Acoustic Super Woofer (ASW)
Speaker	8" (20 cm) Woofer
Impedance	8 Ohm
SPL (1 W, 1 m)	91 dB (1 W/1 m, 1/2 free sound space)
Power Handling Capacity	240 W (40 -200 Hz), rated: 80 W (40 -200 Hz)
Frequency Response	45 Hz ... 200 Hz (-10 dB, 1/2 free sound space)
Connectors	Phoenix-screw terminals (2x2-pin)
Finish	Fire resistant, ABS (UL 94 V-0) enclosure: steel plate, black, grille: steel plate, white, grille frame Fire-resistant ABS resin, white
Dimensions (W x H x D)	430 x 544 x 135 mm
Weight	11 kg (incl. mounting brackets)
Accessory	Mounting brackets
Optional Accessory	Transformer MT-S0601 (for 100 V / 70 V)

Universal Speaker



2-Way Bass-Reflex Speaker (30 W)



Features

- Aesthetic design
- Solid sound performance
- Various installation options
- Smooth sound characteristics for excellent sound quality and speech clarity
- 2-way bass reflex speaker
- 30 W
- Colour: black (BS-1030B) or white (BS-1030W)
- 8 Ohm / 100 V selectable
- Splash-proofed (IPx4)
- Mounting: directly to a wall either vertically or horizontally or with mounting brackets (U-bracket or optional bracket SP-410) or flush-mount (optional frame SP-420 required)
- Switchover control for high (70 V/100 V) or low (8 Ohm) impedance built-in on the back-side of the box

Applications

Matches with aesthetic environments e.g. in hotel receptions, shops, restaurants

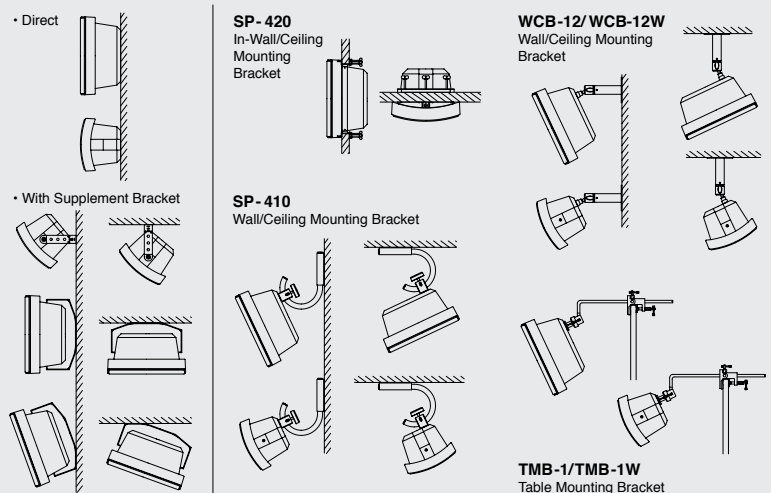
Options

- SP-410: Wall/Ceiling Mounting bracket
- SP-420: Flush Mounting Frame
- ST-16A: Speaker Stand
- TMB-1: Table Mounting Bracket (Non-RoHS product)
- BS-1030B: WCB-13B Wall Mounting Bracket
- BS-1030W: WCB-13W Wall Mounting Bracket

Specifications

	BS-1030B / BS-1030W
Enclosure	2-way bass reflex type
Rated Input	30 W
Impedance	8 Ohm
Tappings (100 V / 70 V)	30 W / 20 W / 15 W / 10 W / 5 W
SPL (1 W / 1 m)	90 dB
Frequency Response	80 Hz ... 20000 Hz
Speaker Components	12 cm dynamic cone-type speaker, 2.5 cm balanced dome tweeter
Speaker Cable	2-core cabtyre cable (diameter 6 mm)
Operating Temperature	-10°C to +50°C
Water Resistance	IPx4 (can be installed vertically or horizontally)
Material/Finish	BS-1030B: Enclosure; ABS resin, black, paint, grille; surface treated steel plate, black, powder coating, bracket; surface treated steel plate, black, powder coating, BS-1030W: white
Dimensions (W x H x D)	196 x 290 x 150 mm (without bracket)
Weight	2.5 kg (without bracket)

Mounting Examples





Wall Flush-Mount Speaker

Speaker for Unobtrusive Installation in wall or furniture



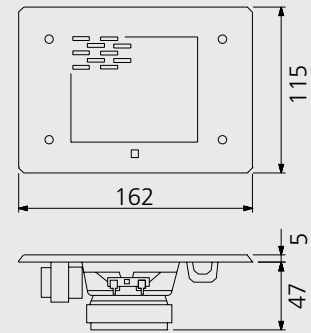
PC-391



PC-391T



YC-150E



Features

- Small rectangular speaker
- For in-wall installation
- Stainless steel baffle, silver
- Flush-mounting
- PC-391T with attenuator

Applications

Hotels, hospital rooms, reception counters

Options

- YC-150E: Back Box (Non-RoHS product)
Please note: the YC-150E back box has to be installed 5...30 mm deeper behind the surface of the wall.

Specifications

	PC-391	PC-391T
Dynamic Cone Driver	7.7 cm	7.7 cm
Rated Input	3 W	3 W
Continuous Program	4.5 W	4.5 W
Impedance	3.3 kOhm, 10 kOhm (100 V)	3.3 kOhm (100 V)
Frequency Response	150 Hz ... 18000 Hz	150 Hz ... 18000 Hz
SPL (1 W, 1 m)	86 dB	86 dB
SPL at Rated Input (1 m)	91 dB	91 dB
Dimensions (W x H x D)	162 x 115 x 46 mm	162 x 115 x 56 mm
Weight	560 g	600 g
Special Features	–	With attenuator: OFF, 12, 6, 0 dB

Box Speakers



2-way Cabinet Speaker



BS-20W(black) / **BS-20W-WHT** (white)



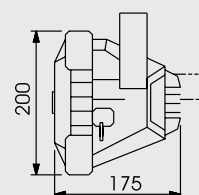
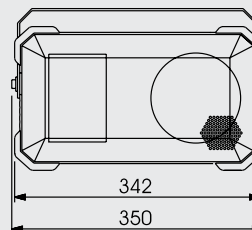
BS-20W-WHT (white)



Bracket



Front Grille



Features

- 20 W rated input
- For both BGM and FGM applications
- UV-resistant paint
- Colour: black (BS-20W) and white (BS-20W-WHT)
- Non-RoHS product
- CD Horn for constant directivity (piezo driver): 90° vertical x 30° horizontal
- Splashproof sealed IPx4 equivalent
- Enclosure ABS resin, punched net grille
- Mounting bracket: Zinc coated steel plate with stainless steel bolts
- For 100 V Systems

Applications

Locations with high humidity and temperature, for outdoor use

Specifications

	BS-20W	BS-20W-WHT
Dynamic Cone Driver	13 cm + CD-Horn	13 cm + CD-Horn
Rated Input	20 W	20 W
Continuous Program	30 W	30 W
Tappings 100 V	20W / 15W / 10W / 5W	20W / 15W / 10W / 5W
Frequency Response	100 Hz ... 20000 Hz	100 Hz ... 20000 Hz
SPL (1 W, 1 m)	94 dB	94 dB
SPL at Rated Input (1 m)	107 dB	107 dB
Dimensions* (W x H x D)	350 x 225 x 213 mm	350 x 225 x 213 mm
Weight	3.6 kg	3.6 kg
Other Features	IPx4 equivalent	IPx4 equivalent

* without bracket

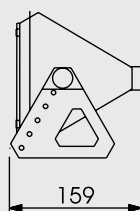
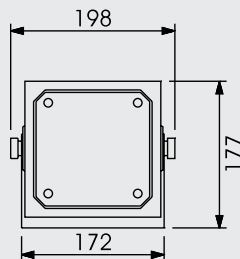


Box Speakers

Splashproof Speaker



BS-10WL (8Ω) / BS-5W (100V)



Features

- Splashproof (IPx4 equivalent)
- 360° rotatable box speaker
- For damp and high humidity temperature areas
- For BGM and FGM applications
- Finish: metal, grey
- BS-5W for 100 V systems
- BS-10WL for 8 Ohm

Applications

Shower-room, swimming pool

Specifications

	BS-5W	BS-10WL
Speaker	10 cm	10 cm
Rated Input	5 W	10 W
Continuous Program	7.5 W	30 W
Tappings 100 V	5 W, 3 W, 2 W	–
Low Impedance	–	8 Ohm
Frequency Response	120 Hz ... 18000 Hz	80 Hz ... 18000 Hz
SPL (1 W, 1 m)	90 dB	90 dB
SPL at Rated Input (1 m)	97 dB	100 dB
Operation Temperature	-20 °C ... + 55 °C	-20 °C ... + 55 °C
Dimensions (W x H x D)	198 x 177 x 159 mm	198 x 177 x 159 mm
Weight	1.4 kg	1.5 kg
Finish	Polypropylene, aluminium grille, steel bracket	Polypropylene, aluminium grille, steel bracket
Other Features	IPx4 equivalent	IPx4 equivalent

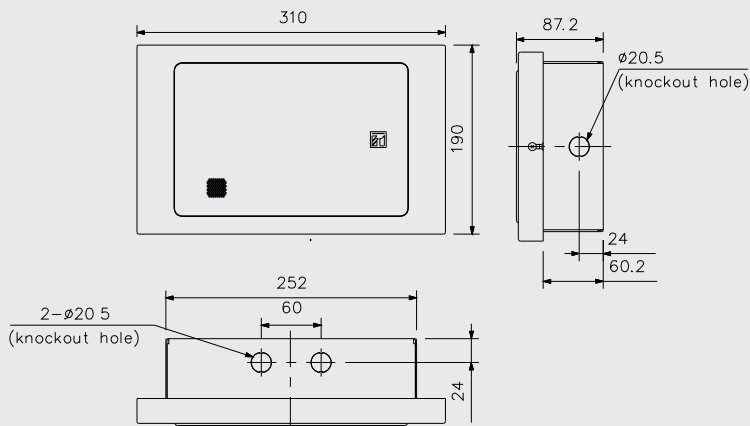
Wall Mount Speakers



Certified Metal Cabinet Speaker



BS-680F / BS-680FC (EN 54-24 certified)



Features

- Surface or flush-mounting
- 6 W rated input
- High sound quality through 16 cm double cone speaker
- High sound pressure level
- Colour: off-white (RAL 9010 or equivalent)
- BS-680 FC is EN 54-24 certified and is therefore legalised for a use in conjunction with fire detection systems
- Bridge wiring possible
- Two ceramic screw terminal blocks and thermal fuse (BS-680FC)
- In compliance with BS 5839 part 8 (BS-680FC)
- Enclosure metal, punched net grille
- Mounting bracket: Zinc coated steel plate with stainless steel bolts
- For 100 V / 70 V Systems

Applications

Public Address Systems in public buildings and hotels
 BS-680FC: Voice Evacuation Systems according to EN 54-24

Certificate

- BS-680FC: EN 54-24 : 1438/CPD/0178 Type A, ISO 7240-24, according BS 5839-8

Specifications

	BS-680F	BS-680FC
Speaker Element	16 cm double cone type	16 cm double cone type
Rated Input	6 W (100 V) / 3 W (70 V)	6 W (100 V) / 3 W (70 V)
Tappings 100 V	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W
Tappings 70 V	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W
Frequency Response	150 Hz ... 20000 Hz	150 Hz ... 20000 Hz
SPL (1 W, 1 m)	94 dB	94 dB
Connector	Push-in connector (bridging terminal)	Screw terminal (ceramic) bridging available
Dimensions (W x H x D)	310 x 190 x 87.2 mm	310 x 190 x 87.2 mm
Weight	3 kg	2.6 kg
Certificate	-	EN 54-24 : 1438/CPD/0178 Type A, ISO 7240-24, according BS 5839-8



Wall Mount Speakers



Modern design box speaker (certified)



BS-634 / BS-634T



BS-1034S



Certificate (detail)

Features

- Flat rectangular box speaker
- 6 W (BS-634) or 10 W (BS-1034) rated input
- High sound quality and clarity
- Vertical or horizontal mounting
- For wall-mount installation
- Colour: off-white, BS-1034S: silver
- Case: HIPS resin, punching net: SECC
- BS-634T with attenuator
- Bridge wiring available

Applications

Hotels, restaurants, conference rooms and department stores
 BS-1034EN: Voice Evacuation Systems according to EN 54-24

Certificate

- BS-1034EN: EN 54-24: 0359-CPD-0102, Type A, ISO 7240-24

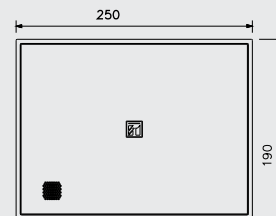
Specifications

	BS-634	BS-634T	BS-1034	BS-1034S	BS-1034EN
Speaker Component	LF: 12 cm cone type HF: 2.5 cm balanced dome tweeter	LF: 12 cm cone type HF: 2.5 cm balanced dome tweeter	12 cm cone type	LF: 12 cm cone type HF: 2.5 cm balanced dome tweeter	LF: 12 cm cone type HF: 2.5 cm balanced dome tweeter
Rated Input	6 W	6 W	10 W	10 W	10 W
Tappings 100 V	6 W / 3 W	6 W	10 W / 5 W / 3 W / 1 W	10 W / 5 W / 3 W / 1 W	10 W / 5 W / 3 W / 1 W
Tappings 70 V	3 W / 1.5 W	3 W	10 W / 5 W / 2.5 W / 1.5 W / 0.5 W	10 W / 5 W / 2.5 W / 1.5 W / 0.5 W	10 W / 5 W / 2.5 W / 1.5 W / 0.5 W
Frequency Response	120 Hz ... 18000 Hz	120 Hz ... 18000 Hz	120 Hz ... 20000 Hz	120 Hz ... 20000 Hz	120 Hz ... 20000 Hz
SPL (1 W, 1 m)	90 dB	90 dB	90 dB	90 dB	89 dB
Connectors	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
Dimensions (W x H x D)	210 x 330 x 80 mm	210 x 330 x 80 mm	210 x 330 x 80 mm	210 x 330 x 80 mm	210 x 330 x 80 mm
Weight	1.3 kg	1.3 kg	1.4 kg	1.4 kg	1.4 kg
Certificates	–	–	–	–	EN 54-24: 0359-CPD-0102, Type A ISO 7240-24

Wall Speakers



Cabinet Speaker for Wall Mounting



Features

- 6 W rated input
- Wooden cabinet with PVC sheet and HIPS baffle
- Colour off-white (RAL 9010 or equivalent)
- BS-678T / BS-678BT with attenuator (Off, -12 dB, -6 dB, 0 dB)
- Vertical or horizontal installation
- For wall-mount installation
- Easy impedance selection
- Bridge wiring possible
- Push-in connector

Applications

Universal use box for every kind of PA system

Specifications

	BS-678	BS-678T	BS-678B	BS-678BT
Speaker Component	16 cm double cone type	16 cm double cone type	16 cm double cone type	16 cm double cone type
Rated Input	6 W	6 W	6 W	6 W
Tappings 100 V	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W
Tappings 70 V	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W
Attenuator	–	Off, -12 dB, -6 dB, 0 dB	–	Off, -12 dB, -6 dB, 0 dB
Frequency Response	150 Hz ... 20000 Hz	150 Hz ... 20000 Hz	150 Hz ... 20000 Hz	150 Hz ... 20000 Hz
SPL (1 W, 1 m)	94 dB	94 dB	94 dB	94 dB
Connector	Push-in connector (bridging terminal)	Push-in connector (bridging terminal)	Push-in connector (bridging terminal)	Push-in connector (bridging terminal)
Dimensions (W x H x D)	250 x 190 x 110 mm	250 x 190 x 110 mm	250 x 190 x 110 mm	250 x 190 x 110 mm
Color	white	white	black	black
Weight	1.7 kg	1.7 kg	1.7 kg	1.7 kg



Wall Speakers



Certified Cabinet Speaker for Wall Mounting (New!)



BS-678BSB



Certificate (detail)

Features

- 6 W rated input
- Wooden cabinet with PVC sheet and HIPS baffle
- Colour off-white (BS-678BSW : RAL 9010 or equivalent) or black (BS-678BSB)
- Vertical or horizontal installation
- For wall-mount installation
- Easy impedance selection
- Bridge wiring possible
- 2 Ceramic screw terminals
- Thermal fuse
- According British standard

Applications

Voice Evacuation Systems according to EN 54-24
 Universal use in VA systems. Especially if a future expansion of the system is expected

Certificate

- EN 54-24 : 0359-CPD-0103 Type A, ISO 7240-24, according BS 5839-8

Specifications

	BS-678BSW	BS-678BSB
Speaker Component	16 cm speaker	16 cm speaker
Rated Eingang	6 W (100 V) / 3 W (70 V)	6 W (100 V) / 3 W (70 V)
Tapping 100 V	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W
Tapping 70 V	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W
Frequency Response	150 Hz ... 18000 Hz	150 Hz ... 18000 Hz
SPL (1 W, 1 m)	94 dB	94 dB
Connection	Screw terminals (bridging possible)	Screw terminals (bridging possible)
Dimensions (W x H x D)	250 x 190 x 108 mm	250 x 190 x 108 mm
Colour	white	black
Weight	1.7 kg	1.7 kg
Certificate	EN 54 -24: 0359-CPD-0103, Type A, ISO 7240-24, according BS 5839-8	EN 54 -24: 0359-CPD-0103, Type A, ISO 7240-24, according BS 5839-8
Protection	IP 21c	IP 21c

Wall Speakers



Certified 2-Way Speaker (New!)



BS-1015BSB / BS-1015BSW



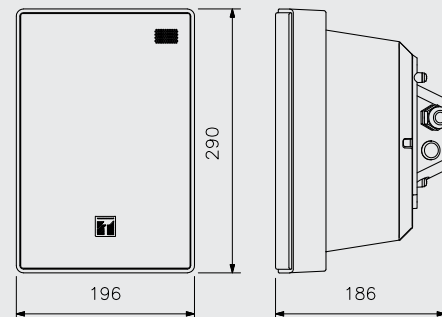
BS-1015BSW Detail



BS-1015BSB



Certificate (detail)



Features

- Aesthetic design
- Various installation options
- Mounting: directly to a wall either vertically or horizontally or with mounting brackets (U-bracket or optional bracket SP-410) or flush-mount (optional frame SP-420 required)
- Colour: black (BS-1015BSB) or white (BS-1015BSW)
- Optimised for music reproduction and sound clarity
- Additional PG gland available
- Ceramic screw terminal
- Thermal fuse

Options

- SP-410: Wall/Ceiling Mounting Bracket
- SP-420: Flush Mounting Frame
- ST-16A: Speaker Stand

Applications

Voice Evacuation Systems according to EN 54-24
Fits architecturally sophisticated environments.
For music distribution or announcements e.g. in public buildings, traffic terminals, supermarkets, office towers, hotels and health clubs

Certificate

- EN 54-24 : 0359-CPD-0104, Type A, ISO 7240-24, according to BS 5839-8

Specifications

	BS-1015BSB / BS-1015BSW
Enclosure	2-way bass reflex type
Rated Input	15 W
Impedance	100 V / 70 V
Tappings (100 V / 70 V)	15 W / 10 W / 5 W
SPL (1 W / 1 m)	90 dB (1 W / 1 m)
Frequency Response	80 Hz ... 20000 Hz
Speaker Components	12 cm dynamic cone-type speaker, 2.5 cm balanced dome tweeter
Speaker Cable	2-core cabtyre cable (diameter 6 mm)
Operating Temperature	-10°C ... +50°C
Protection	IP X3 (can be installed vertically or horizontally)
Material/Finish	BS-1015BSB: Enclosure; ABS resin, black, paint, grille; surface treated steel plate; BS-1015BSW: white
Dimensions (W x H x D)	196 x 290 x 186 mm (without bracket)
Weight	2.0 kg (without bracket)
Certificates	EN 54 -24: 0359-CPD-0104, Type A, ISO 7240-24, according to BS 5839-8

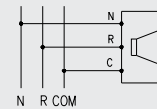
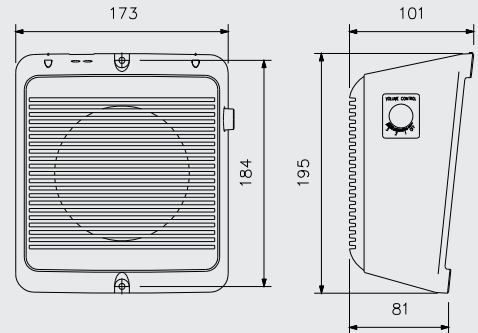


Wall Speakers

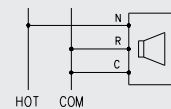
Cabinet Speaker for Wall Mounting



BS-633AT



3-wire connection



2-wire connection

Features

- 6 W rated input
- HIPS resin speaker
- For highly intelligible sound reproduction
- Budget friendly speaker
- Colour off-white (RAL 9010 or equivalent)
- Wide operating temperature range: -10 °C ... + 50 °C
- Surface mount
- BS-633AT with built-in attenuator for OFF, -12 dB, -6 dB, 0 dB (3W) or OFF, -13 dB, -7 dB, 0 dB (6W)
- Easy impedance selection
- 2-wire or 3-wire connection (BS-633AT)
- Bridge wiring possible
- Push-in connector

Specifications

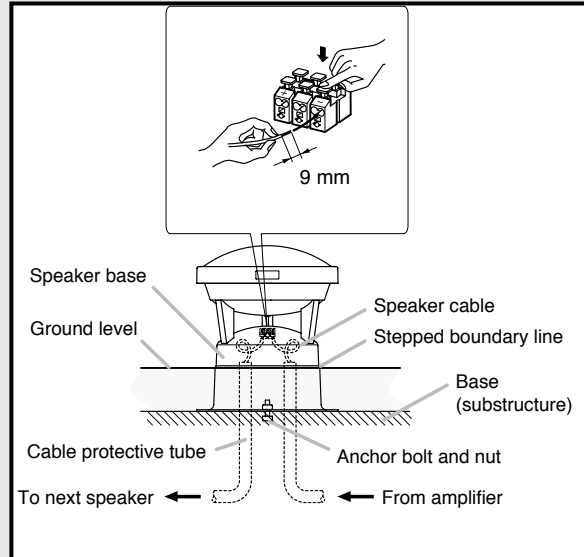
	BS-633A	BS-633AT
Speaker Component	12 cm cone type speaker	12 cm cone type speaker
Rated Input	6 W	6 W
Tappings 100 V	6 W / 3 W / 1 W	6 W / 3 W
Tappings 70 V	3 W / 1.5 W / 0.5 W	3 W / 1.5 W
Frequency Response	120 Hz ... 15000 Hz	120 Hz ... 15000 Hz
SPL (1 W, 1 m)	91 dB	91 dB
Operating Temperature	-10 °C ... +50 °C	-10 °C ... +50 °C
Connector	Push-in connector (bridging terminal)	Push-in connector (bridging terminal)
Dimensions (W x H x D)	173 x 195 x 101 mm	173 x 195 x 101 mm*
Weight	780 g	810 g
Other Features	-	Attenuator OFF, -12 / -6 / 0 dB (6 W) Attenuator OFF, -13 / -7 / 0 dB (3 W)

* excl. volume control

Garden Speaker



Outdoor Speaker for Convenient Installation



Easy Connection

Features

- Stylish, attractively designed outdoor speaker
- Blending well into the surroundings of various locations
- Highly reliable performance
- Fullfills IPX4 requirements
- High performance
- Compact speaker
- Ideal for paging and background music
- Positioning e.g. in garden shrubbery
- Enclosure made of FRP resin
- Exceptional resistance to corrosion and moisture (IPX4)
- Ideal for outdoor installations
- Speaker wiring and base unit can be installed in the ground
- High impedance

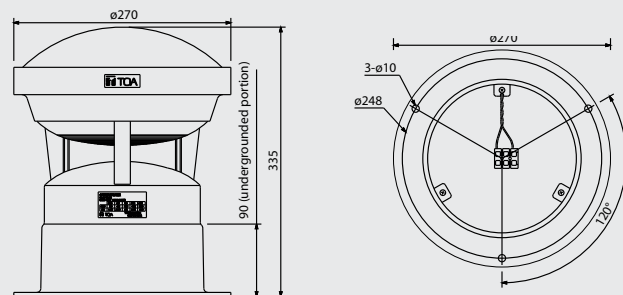
Applications

Gardens, theme parks, resort facilities

Specifications

	GS-302
Enclosure	Sealed type
Rated Input	30 W (100 V line), 15 W (70 V line)
Rated Impedance	100 V line: 330 Ω (30 W), 670 Ω (15 W), 1 kΩ (10 W), 2 kΩ (5 W), 3.3 kΩ (3 W) / 70 V line: 330 Ω (15 W), 670 Ω (7.5W), 1 kΩ (5 W), 2 kΩ (2.5 W), 3.3 kΩ (1.5 W)
SPL (1 W / 1 m)	87 dB
Frequency Response	100 ... 8,000 Hz
Speaker Component	12 cm splash-proof cone type
Input Terminal	Push-in terminal
Applicable Cable	Solid copper wire: $\phi 0.8 - \phi 1.6$ mm Stranded copper wire: 0.75 - 1.25 mm ²
Water Capability	Meets IPX4 requirements
Finish	Top cover and base: FRP resin, speaker panel: ABS resin, legs: aluminum, dark grey, semi-gloss, paint
Dimensions	$\phi 270 \times 335$ (H) mm
Weight	2.4 kg

Dimensions





Pendent Speakers

Speaker for Ceiling Suspension Installation



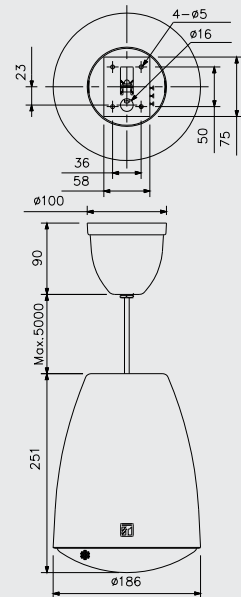
PE-64 / PE-304



Speaker



Ceiling Cover



Features

- Special design to blend with lighting equipment
- 30 W (PE-304) or 6 W (PE-64) rated input
- Rugged HIPS resin enclosure
- Excellent sound quality
- Colour: off-white (RAL 9010 or equivalent)
- Paintable
- 12 cm dynamic cone speaker plus balanced dome tweeter
- Inputs for 100 V and 70 V systems, PE-304 additionally with 8 Ohm input
- Easy impedance selection
- Equipped with 5 m cord

Applications

Supermarkets, shopping malls, lobby, rooms without suspended ceilings

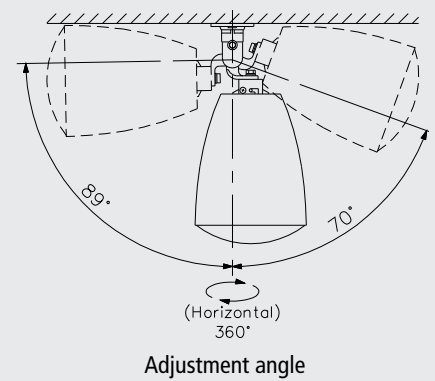
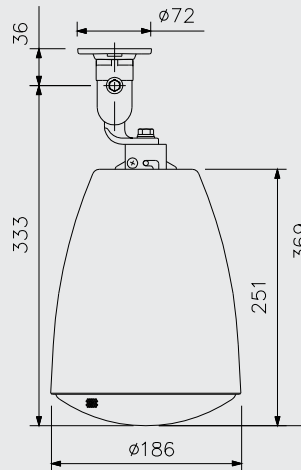
Specifications

	PE-64	PE-304
Dynamic Cone Driver	12 cm	12 cm
Rated Input	6 W	30 W
Impedance	100 V / 70 V	100 V / 70 V / 8 Ohm
Tappings 100 V	6 W / 3 W / 1 W	30 W / 20 W / 15 W / 10 W / 5 W
Tappings 70 V	3 W / 1.5 W / 0.5 W	30 W / 20 W / 15 W / 10 W / 5 W
Frequency Response	100 Hz...18000 Hz	70 Hz...20000 Hz
SPL (1 W, 1 m)	90 dB	91 dB
Connection	Push-in connector (bridging terminal, 2-branch)	Push-in connector (bridging terminal, 2-branch)
Dimensions	ø 186 x 251 mm	ø 186 x 251 mm
Weight	1.5 kg	2.1 kg

Projection Speakers



Projection Speaker for Ceiling and Wall Installation



Features

- Indoor speaker
- Wide range frequency response
- Housing: HIPS resin, grille: steel net
- Easy to mount
- Colour off-white (RAL 9010 or equivalent)
- Projection speaker
- For 100 V, 70 V systems, PJ-304 additionally for 8 Ohm systems
- Complete with mounting bracket for easy installation

Applications

For buildings with high noise level

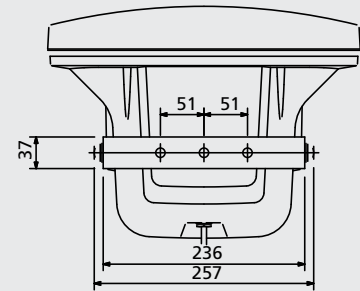
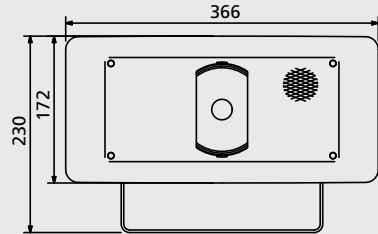
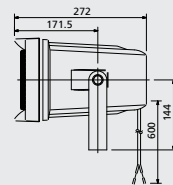
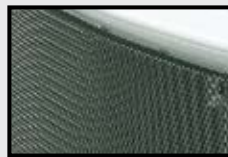
Specifications

	PJ-64	PJ-304
Speaker Component	12 cm	12 cm
Rated Input	6 W	30 W
Impedance	100 V / 70 V	100 V / 70 V / 8 Ohm
Tappings 100 V	6 W / 3 W / 1 W	30 W / 20 W / 15 W / 10 W / 5 W
Tappings 70 V	3 W / 1.5 W / 0.5 W	30 W / 20 W / 15 W / 10 W / 5 W
Frequency Response	100 Hz ... 18000 Hz	70 Hz ... 20000 Hz
SPL (1 W, 1 m)	90 dB	91 dB
Dimensions (with bracket)	ø 186 x 369 mm	ø 186 x 369 mm
Weight	1.5 kg	2.1 kg



Projection Speakers

Splashproof Projection Speaker



Features

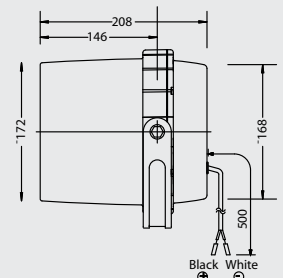
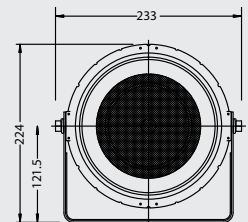
- Square splashproof speaker (IP 64) for outdoor use (CS-154 / CS-304) or round splashproof speaker (CS-64)
- 6 W (CS-64), 15 W (CS-154) or 30 W (CS-304)
- High SPL
- Weatherproof polyurethane resin paint
- Impact-proof light weight ABS resin enclosure
- Complete with stainless steel mounting bracket for easy installation
- For 100 V, 70 V and 8 Ohm systems with rotary impedance selector switch
- Constant directivity coverage (90 degree in horizontal)

Applications

Outdoor use e.g. in industrial environments or on ships

Specifications

	CS-64	CS-154	CS-304
Dynamic Cone Driver	12 cm	12 cm	12 cm
Rated Input	6 W	15 W	30 W
Continuous Program	9 W	22.5 W	45 W
Tappings 100 V	6 W / 3 W / 1 W	15 W / 10 W / 5 W	30 W / 20 W / 10 W
Tappings 70 V	6 W / 3 W / 1.5 W / 0.5 W	15 W / 7.5 W / 5 W / 2.5 W	30 W / 15 W / 10 W / 5 W
Frequency Response	130 Hz ... 13 kHz	150 Hz ... 15000 Hz	120 Hz ... 15000 Hz
SPL (1 W, 1 m)	96 dB	97 dB	98 dB
Dimensions	233 x 224 x 208 mm	366 x 230 x 272 mm	366 x 230 x 272 mm
Weight	1.5 kg	2.8 kg	3.1 kg
Protection	IP x4	IP 65 weatherproof	IP 65 weatherproof
Finish	ABS resin, off-white, punched net: dark grey, bracket, screws: stainless steel	ABS resin, off-white, punched net: dark grey, bracket, screws: stainless steel	ABS resin, off-white, punched net: dark grey, bracket, screws: stainless steel



Projection Speakers



Certified Splashproof Projection Speaker (New!)



Features

- Projection speaker
- 6 W (CS-64BS) or 15 W (CS-154BS) rated power
- Splash proof for outdoor use
- Lightweight and rugged construction
- High SPL
- 100 V or 70 V
- PG gland
- Ceramic screw terminals
- Thermal fuse
- Stainless steel bracket for easy installation
- Stainless steel screws

Applications

Voice Evacuation Systems according to EN 54-24
Plants, park houses, stations, stadiums, swimming pools and outdoor areas, etc.

Certificate

- EN 54-24 : 0359-CPD-0108 Type B, ISO 7240-24, according BS 5839-8 (CS-154BS)
- EN 54-24 : 0359-CPD-0107 Type B, ISO 7240-24, according BS 5839-8 (CS-64BS)

Specifications

	CS-64BS	CS-154BS
Dynamic Cone Driver	12 cm cone type speaker	12 cm cone type speaker
Rated Power	6 W (100 V / 70 V)	15 W (100 V / 70 V)
Continuous Program	9 W	22,5 W
Tapping 100 V	6 W / 3 W / 1 W	15 W / 10 W / 5 W
Tapping 70 V	6 W / 3 W / 1,5 W / 0,5 W	15 W / 7,5 W / 5 W / 2,5 W
Frequency Response	130 Hz ... 13000 Hz	150 Hz ... 15000 Hz
SPL (1 W, 1 m)	96 dB	97 dB
Operation Temperature	-20°C ... + 55°C	-20°C ... + 55°C
Dimensions (B x H x T)	233 x 224 x 249 mm	366 x 230 x 310 mm
Weight	1.7 kg	3.0 kg
Connection	Ceramic screw terminals, thermal fuse	Ceramic screw terminals, thermal fuse
Finish	ABS resin, white Front grille: Steel, dark grey	ABS resin, white Front grille: Steel, dark grey
Certificate	EN 54-24: 0359-CPD-0107, Type B, ISO 7240-24, according BS 5839-8	EN 54-24: 0359-CPD-0108, Type B, ISO 7240-24, according BS 5839-8
Protection	IP 34c	IP 65c



Projection Speakers



Certified Projection Speakers (New!)



PE-154EN / PE-154BS



PJ-154BS



Certificate (PJ-154BS)



Certificate (PE-154EN/BS)

Features

PE-154BS / PE-154EN

- 15 W rated power
- 2-way speaker
- Rugged HIPS enclosure
- Excellent sound quality
- Colour: White (RAL 9010 or equivalent)
- 100 V or 70 V
- 5 m cable (PE-154EN) or 3 m fire resistant cable (PE-154BS)
- PE-154BS: 2 Ceramic screw terminals, thermal fuse, fire resistant cable, 5-core

PJ-154BS

- 15 W rated power
- 2-way projection speaker
- Wide frequency response
- Enclosure: Resin, grille: Steel
- Easy installation (mounting bracket included)
- Colour white (RAL 9010 or equivalent)
- 100 V or 70 V
- External connection box with PG-Gland
- 2 Ceramic screw terminals, thermal fuse
- Fire resistant cable, 5-core

Applications

Voice Alarm Systems according to EN 54. Supermarkets, shopping malls, lobbies, rooms with great ceiling height, restaurants, bars, public buildings and schools, etc.

Certificates

- PE-154EN, PE-154BS
EN 54-24 : 0359-CPD-0105 Type A, ISO 7240-24, PE-154BS: BS 5839-8
- PJ-154BS:
EN 54-24 : 0359-CPD-0106 Type A, ISO 7240-24, BS 5839-8

Specifications

	PE-154BS	PE-154EN	PJ-154BS
Speaker	2-way speaker 12 cm cone type, 2.5 cm tweeter	2-way speaker 12 cm cone type, 2.5 cm tweeter	2-way speaker 12 cm cone type, 2.5 cm tweeter
Rated Power	15 W (100 V), 7.5 W (70 V)	15 W (100 V), 7.5 W (70 V)	15 W (100 V), 7.5 W (70 V)
Impedance	100 V / 70 V	100 V / 70 V	100 V / 70 V
Tapping 100 V	15 W / 10 W / 5 W	15 W / 10 W / 5 W	15 W / 10 W / 5 W
Tapping 70 V	7.5 W / 5 W / 2.5 W	7.5 W / 5 W / 2.5 W	7.5 W / 5 W / 2.5 W
Frequency Response	70 Hz...20000 Hz	70 Hz...20000 Hz	70 Hz ... 20000 Hz
SPL (1 W, 1 m)	91 dB	91 dB	91 dB
Connection	Ceramic screw terminals, thermal fuse, 3 m fire resistant cable, 5-core	Ceramic screw terminals, thermal fuse, 5 m cable, 2-core	Ceramic screw terminals, thermal fuse, fire resistant cable, 5-core, external connection box
Dimensions	ø 186 x 251 mm	ø 186 x 251 mm	ø 186 x 251mm
Weight	2.1 kg	2.1 kg	2.1 kg
Certificate	EN 54-24: 0359-CPD-0105, Type A ISO 7240-24, BS 5839-8	EN 54-24: 0359-CPD-0105, Type A	EN 54-24: 0359-CPD-0106, Type A ISO 7240-24, BS 5839-8
Protection	IP 21c	IP 21c	IP 21c



Horn Speakers

Reflex Horn Speaker for Individual Drivers



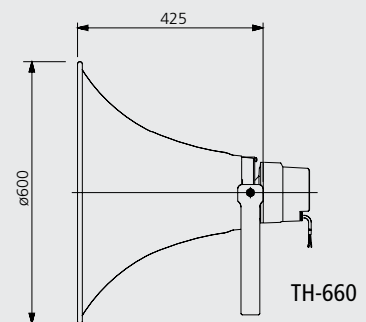
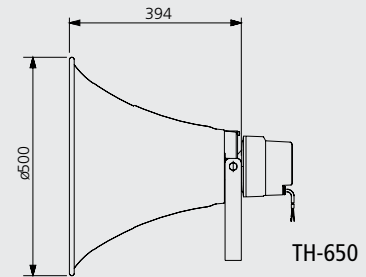
TH-660



TH-650



TU-631M



Features

- Weatherproof construction for outdoor use
- Durable construction provides reliable operation over a long time
- Round shape ensures high speech clarity and sound quality and symmetrical sound dispersion - also suitable for music reproduction
- Shock-resistant
- Aluminium horn with durable powder coating
- Use with (optional) TU-Series Driver
- High or low impedance depending on driver
- Colour: off-white (corresponding RAL 9010) and grey (corresponding RAL 7042)

Applications

Outdoor use e.g. for train stations or on ships

Options

- TU-631 (30 W), TU-631M (30 W, 100 V), TU-651 (50 W), TU-651M (50 W, 100 V): Drivers
- UC-200A: Driver Unit Cover

Specifications

	TH-650	TH-660
Sound Pressure Level	110 dB (1 W, 1 m) (When operated with a driver)	110 dB (1 W, 1 m) (When operated with a driver.)
Frequency Response	200 Hz ... 6,000 Hz (When operated with a driver)	200 Hz... 6,000 Hz (When operated with a driver)
IP Code	IP65 (When operated with a driver)	IP65 (When operated with a driver)
Driver Coupling	1 3/8 18 threads (inch screw)	1 3/8 18 threads (inch screw)
Finish	Off-white, horn flare and flange: aluminum, powder coating; reflector horn: ABS resin; bracket holder: aluminum, grey, powder coating; bracket: steel, grey, powder coating; screws and bolts: stainless steel	
Dimensions	ø 500 x 394 (D) mm	ø 600 x 425 (D) mm
Weight	2.9 kg	3.6 kg

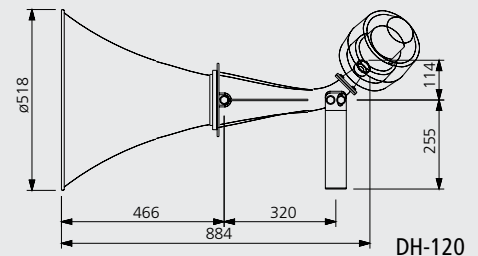
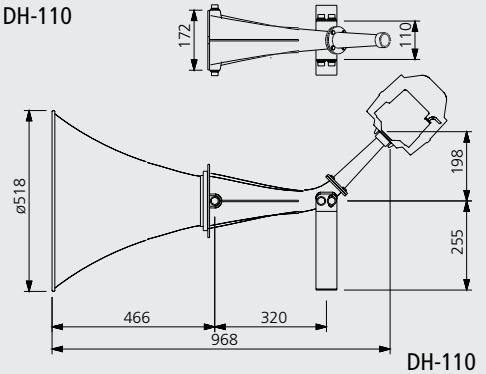


Horn Speakers

Straight Horn



DH-110



Features

- Classic design horn
- Provides clear, highly articulate sound in high noise environments
- Ultra high sound pressure level
- Metal horn
- Colour ivory
- For use with drivers TU-631, TU-651 or TU-631M / TU-651M
- DH-110 for 1 driver
DH-120 for 2 drivers
- Including bird net, bolts and gaskets
- Drivers are not included

Applications

Long distance voice broadcasting at construction sites or at large gatherings of people

Options

- TU-631, TU-651: Drivers 30 or 50 W for low impedance
- TU-631M, TU-651M: Drivers 30 or 50 W for high impedance

Specifications

	DH-110	DH-120
Frequency Response	180 Hz ... 6000 Hz (with driver)	180 Hz ... 6000 Hz (with driver)
SPL (1 W, 1 m)	110 dB (with driver)	110 dB (with driver)
Dimensions	ø 518 x 968 mm (w/o driver)	ø 518 x 884 mm (w/o driver)
Weight	5.3 kg	5.3 kg
Required Optional Drivers	1x TU-651 or TU-651M/TU-631/ TU-631M (option)	2 x TU-651 or TU-651M/TU-631/ TU-631M (option)

Horn Speakers



Reflex Horn Speaker with Very High Sound Pressure Level



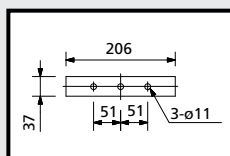
TC-615/ TC-631/ TC-615M/ TC-631M



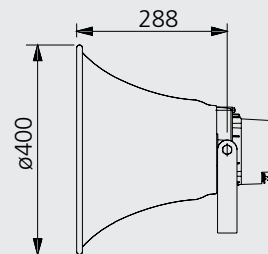
Reflex Horn



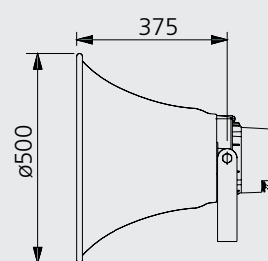
Durable Construction



Bracket



TC-615



TC-631

Features

- Weatherproof for outdoor use
- High efficiency 15 W (TC-615) or 30 W (TC-631) horn speaker
- Very rugged and durable construction ensures long term reliable operation
- High sound pressure level
- Good quality sound reproduction
- Colour: off-white/dark grey
- Aluminium horn and ABS reflex horn and driver housing
- 8 Ohm (TC-615), 16 Ohm (TC-631) or 100 V / 70 V line (TC-615M, TC-631M)
- With 600 mm cable

Applications

Paging (indoor / outdoor), BGM (outdoor)

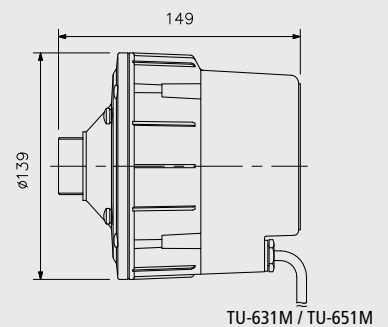
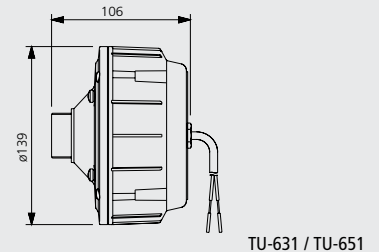
Specifications

	TC-615	TC-631	TC-615M	TC-631M
Rated Input	15 W	30 W	15 W	30 W
Low Impedance	8 Ohm	16 Ohm	–	–
Line Voltage Tappings 100 V Tappings 70 V	–	–	100 V line or 70 V line 15 W / 10 W / 5 W / 3 W 15 W / 7.5 W / 5 W / 2.5 W / 1.5 W	100 V line or 70 V line 30 W / 15 W / 10 W / 5 W 30 W / 15 W / 7.5 W / 5 W / 2.5 W
SPL (1 W, 1 m)	108 dB	110 dB	108 dB	110 dB
Frequency Response	250 Hz... 7000 Hz	200 Hz ... 6000 Hz	250 Hz... 7000 Hz	200 Hz ... 6000 Hz
Operating Temperature	-20 °C ... + 55 °C	-20 °C ... + 55 °C	-20 °C ... + 55 °C	-20 °C...+ 55 °C
Finish	Horn flare: aluminum, off-white, powder coating; reflector horn: ABS resin, off-white; bracket holder: aluminum, grey, powder coating; bracket: steel, grey, powder coating; rear cover: ABS resin, grey, screw and bolts: stainless steel			
Speaker Cable	600 mm in length, 6 mm in diameter, polyvinyl chloride insulated cabtyre cable			
Dimensions (W x D)	ø 400 x 376 mm	ø 500 x 463 mm	ø 400 x 376 mm	ø 500 x 463 mm
Weight	3 kg	4.1 kg	3.2 kg	4.5 kg
Features	IP 65 weatherproof	IP 65 weatherproof	IP 65 weatherproof	IP 65 weatherproof



Horn Speakers

Driver Unit for Horn Speakers



Features

- 4 different types: TU-651 (50 W, low impedance) TU-651M (50 W, high impedance) TU-631 (30 W, low impedance), TU-631M (30 W, high impedance)
- High efficiency driver units for horns
- Weatherproof
- Excellent frequency response
- Available as low impedance 16 Ohm or 100 V / 70 V line („M“-models)
- Rated input of 50 W (TU-651/651M) or 30 W (TU-631/TU-631M)

Options

- TH-650: Speaker, TH-660 Speaker
- DH-110: Speaker, DH-120 Speaker

Specifications

	TU-651	TU-651M	TU-631	TU-631M
Rated Input	50 W	50 W	30 W	30 W
Continuous Program	75 W	75 W	45 W	45 W
Low Impedance	16 Ohm	–	16 Ohm	–
Tappings 100 V	–	50 W / 30 W / 15 W	–	30 W / 15 W / 10 W / 5 W
Tappings 70 V	–	50 W / 25 W / 15 W / 7.5 W	–	30 W / 15 W / 7.5 W / 5 W / 2.5 W
Frequency Response	150 Hz ... 6000 Hz	150 Hz ... 6000 Hz	150 Hz ... 6000 Hz	150 Hz ... 6000 Hz
SPL (1 W, 1 m)	110 dB	110 dB	110 dB	110 dB
SPL at Rated Input (1 m)	127 dB	127 dB	125 dB	125 dB
Coupling (inch)	1-3/8"	1-3/8"	1-3/8"	1-3/8"
Dimensions	ø 139 x 106 mm	ø 139 x 148.5 mm	ø 139 x 106 mm	ø 139 x 148.5 mm
Weight	2.0 kg	2.7 kg	1.4 kg	1.9 kg

Horn Speakers



Certified Reflex Horn Speaker (New!)



Certificate (detail)

SC-615BS

Features

- Weatherproof for outdoor use IP-65
- Legalised for Voice Alarm Systems
- Very rugged and durable construction ensures long term reliable operation
- Oval horn for good intelligibility
- Wide frequency response
- Aluminium horn
- ABS driver housing
- Colour: white (RAL 9010 or equivalent)
- Extreme high SPL 109 dB (1 W / 1 m)
- 100 V or 70 V system
- Additional PG gland available
- Ceramic screw terminals
- Thermal fuse
- Stainless steel mounting brackets
- Shock resistant horn
- Easy impedance selection

Applications

Voice Alarm Systems according to EN 54. Outdoor areas, factory premises, ships, park houses, stations, stadiums, open air pools, etc.

Options

- YS-151S Mounting Bracket

Certificate

- EN 54-24 : 0359-CPD-0109 Type B, ISO 7240-24, according BS 5839-8

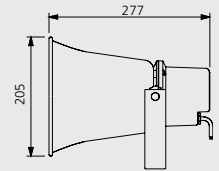
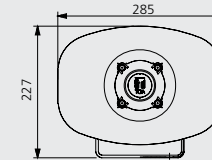
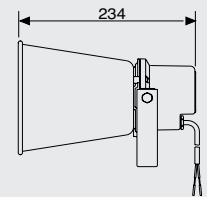
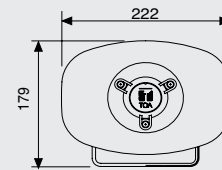
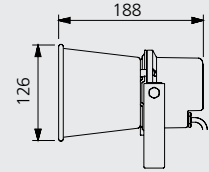
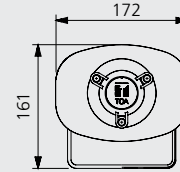
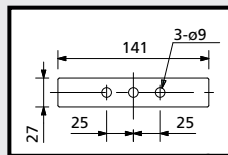
Specifications

	SC-615BS
Rated Power	15 W (100 V / 70 V)
Tapping 100 V	15 W / 10 W / 5 W / 3 W
Tapping 70 V	15 W / 7,5 W / 5 W / 2,5 W / 1,5 W
SPL (1 W, 1 m)	109 dB
Frequency Response	315 Hz... 12500 Hz
Operating Temperature	-20 °C ... + 55 °C
Connection	Ceramic screw terminals, thermal fuse
Finish	Horn: Aluminium white coated, driver housing ABS Resin, stainless steel bracket
Dimensions (W x H x D)	172 x 200 x 229 mm
Weight	1,5 kg
Certificate	EN 54-24 : 0359-CPD-0109 Type B, ISO 7240-24 according BS 5839-8
Protection	IP-65c



Horn Speakers

Reflex Horn Speaker with Wide Frequency Response (low impedance)



Features

- 3 different wattages available: 10 W (SC-610), 15 W (SC-615) or 30 W (SC-630)
- Weatherproof
- IP65, for outdoor use
- Very rugged speaker with durable construction ensures long term reliable operation
- High quality sound
- High efficiency horn speaker
- Wide frequency response
- Easy impedance selection through switch
- Aluminium horn and ABS driver housing
- Colour: off-white (RAL 9010 equivalent)
- High SPL 110 - 113 dB (1 W, 1 m)
- Low impedance 8 Ohm
- Stainless steel bracket
- Shock resistant oval horn

Applications

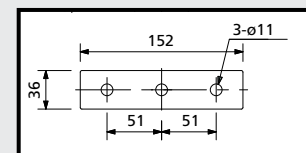
Specially for outdoor use e.g. in train stations, parkings

Options

- YS-151S: Swivel Bracket

	SC-610	SC-615	SC-630
Rated Input	10 W (mobile mount use: 5 W)	15 W (mobile mount use: 10 W)	30 W (mobile mount use: 15 W)
Rated Impedance	8 Ohm	8 Ohm	8 Ohm
Frequency Response	315 Hz... 12500 Hz	280 Hz ... 12500 Hz	250 Hz... 10000 Hz
SPL (1 W, 1 m)	110 dB (at 500 to 2500 Hz peak level)	112 dB (at 500 to 2500 Hz peak level)	113 dB (at 500 to 2500 Hz peak level)
Sensitivity when used as Microphone	-24 dB at 1 kHz	-22 dB at 1 kHz	-20 dB at 1 kHz
Operating Temperature	-20°C ... + 55°C*	-20°C ... + 55°C*	-20°C ... + 55°C*
Speaker Cable	600 mm in length, 6 mm in diameter, polyvinyl chloride insulated cable	600 mm in length, 6 mm in diameter, polyvinyl chloride insulated cable	600 mm in length, 6 mm in diameter, polyvinyl chloride insulated cable
Dimensions	172 x 161 x 188 mm	222 x 179 x 234 mm	285 x 227 x 277 mm
Weight	1 kg	1.1 kg	1.7 kg
Features	IP 65 weatherproof	IP 65 weatherproof	IP 65 weatherproof

* must be free from dew condensation



Horn Speakers



Reflex Horn Speaker with Wide Frequency Response (high impedance)



SC-610M / SC-615M / SC-630M

Features

- 3 different versions available: 10 W (SC-610M), 15 W (SC-615M) or 30 W (SC-630M)
- High impedance 100 V line
- All other features are identical to the SC-610 / SC-615 / SC-630 series

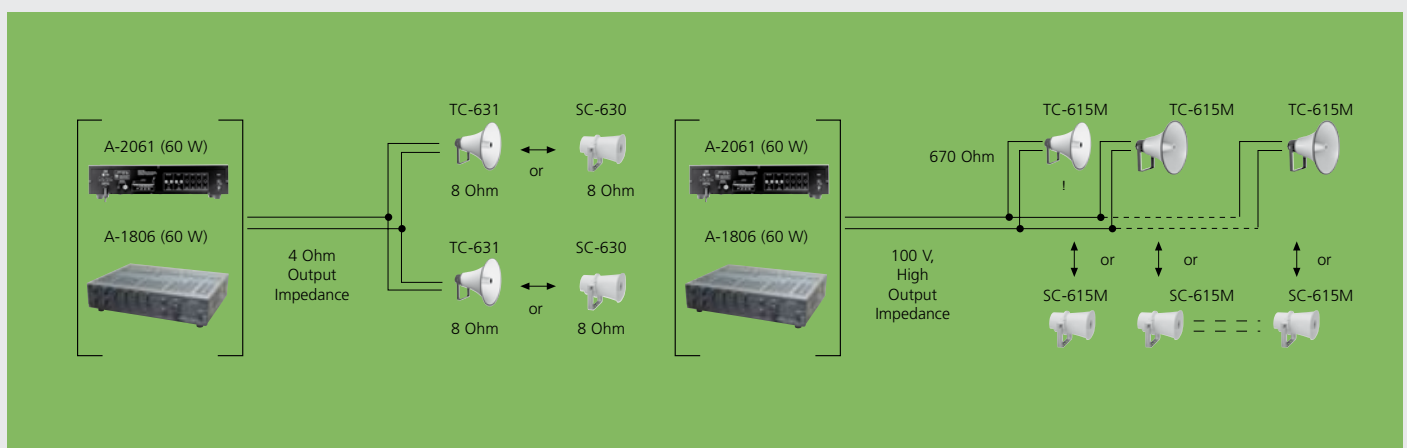
Options

- YS-151S: Swivel Bracket

Specifications

	SC-610M	SC-615M	SC-630M
Rated Input	10 W	15 W	30 W
Rated Impedance 100 V	10 W / 5 W / 3 W / 1 W	15 W / 10 W / 5 W / 3 W	30 W / 15 W / 10 W / 5 W
Rated Impedance 70 V	10 W / 5 W / 2.5 W / 1.5 W / 0.5 W	15 W / 7.5 W / 5 W / 2.5 W / 1.5 W	30 W / 15 W / 7.5 W / 5 W / 2.5 W
SPL (1 W, 1 m)	110 dB (at 500 to 2500 Hz peak level)	112 dB (500 to 2500 Hz peak level)	113 dB (at 500 to 2500 Hz peak level)
Frequency Response	315 Hz... 12,500 Hz	280 Hz... 12,500 Hz	250 Hz... 10,000 Hz
Sensitivity when used as Microphone	-24 dB at 1 kHz	-22 dB at 1 kHz	-20 dB at 1 kHz
Operating Temperature	-20°C ... +55°C (must be free from dew condensation)	-20°C ... +55°C (must be free from dew condensation)	-20°C ... +55°C (must be free from dew condensation)
Speaker cable	600 mm in length, 6 mm in diameter, Polyvinyl chloride insulated cable	600 mm in length, 6 mm in diameter, Polyvinyl chloride insulated cable	600 mm in length, 6 mm in diameter, Polyvinyl chloride insulated cable
Dimensions (W x H x D)	172 x 161 x 188 mm	222 x 179 x 234 mm	285 x 227 x 277 mm
Weight	1.2 kg	1.3 kg	2 kg
Features	IP65 weatherproof	IP65 weatherproof	IP65 weatherproof

Typical Connection of Low Impedance and High Impedance Speakers



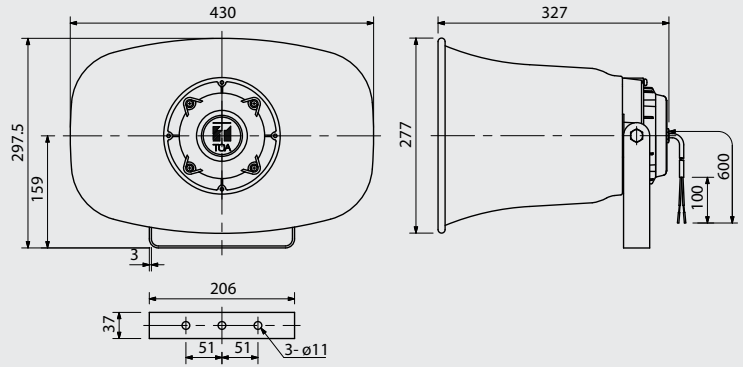


Horn Speakers

Reflex Horn Speaker



SC-651



Features

- 50 W rated input
- Anti-shock construction
- High sound pressure level
- Fully weatherproof IP65
- Colour: ivory, dark brown painted steel bracket
- Aluminium and ABS resin construction with special powder coating
- Including 600 mm cable

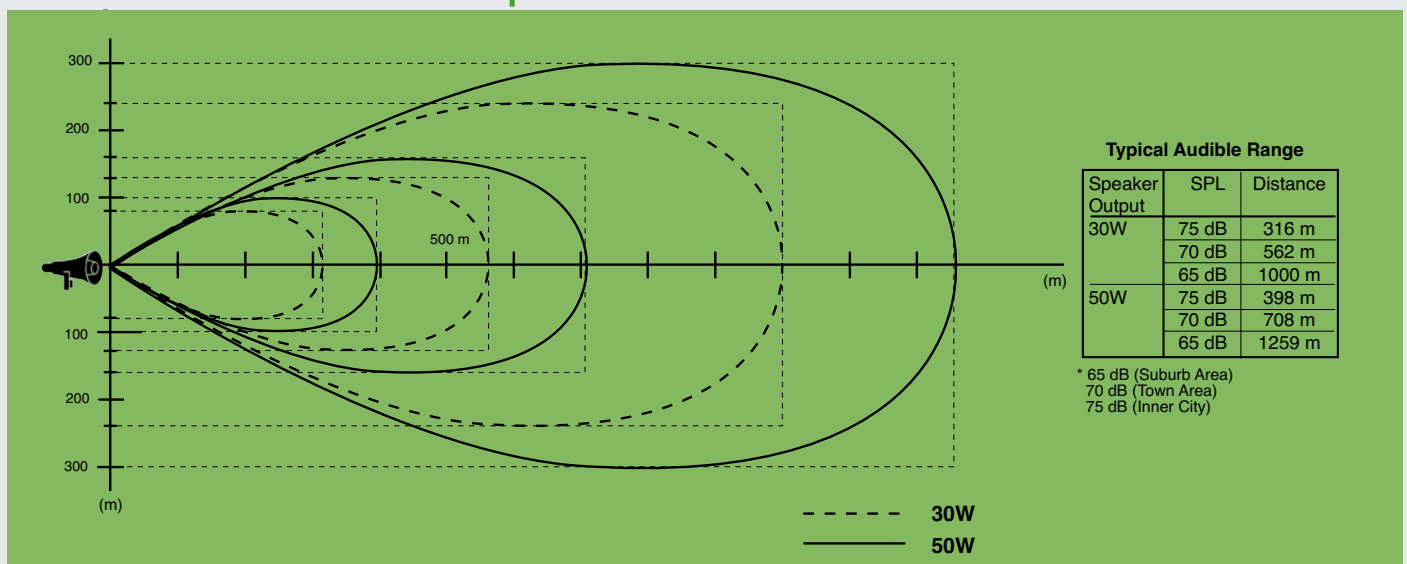
Applications

Outdoor use in manufacturing plants, vehicles.

Specifications

	SC-651
Rated Input	50 W (mobile mount use: 30W)
Low Impedance	16 Ohm
Frequency Response	250 Hz ... 6000 Hz
SPL (1 W, 1 m)	109 dB
Operating Temperature	-20°C ... + 55°C (must be free from dew condensation)
Speaker Cable	600 mm in length, 6 mm in diameter, polyvinyl chloride insulated cable
Dimensions (W x H x D)	430 x 297.5 x 327 mm
Weight	3.4 kg
Protection	IP 65

Distribution Pattern of Horn Speakers



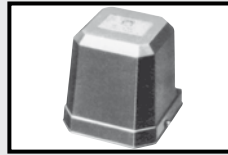
Horn Speakers



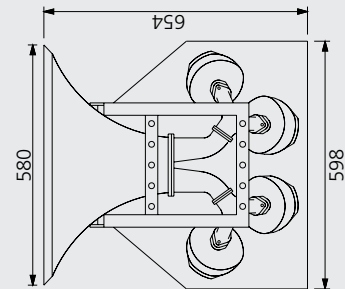
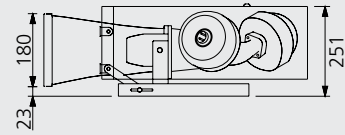
Ultra High Power Speaker



SC-240



TM-60T



Features

- Uniform dispersion for intelligible sound
- Extremely high sound pressure level
- Ideal for signal and voice transmission over long distances or in noisy environments
- Wide directivity
- 360 W continuous program
- Horn vertically adjustable
- 131 dB SPL at rated input
- Aluminium die casting
- Directional speaker
- Outdoor use
- Bracket, driver units included
- Colour: Ivory
- Non-RoHS product

Applications

For public address announcements e.g. on large industrial areas, beaches (life guard)

Options

- TM-60T: 60 W Transformer for 100 V lines (secondary impedances: 4/8/16 Ohm), weight 1.3 kg, non-RoHS product

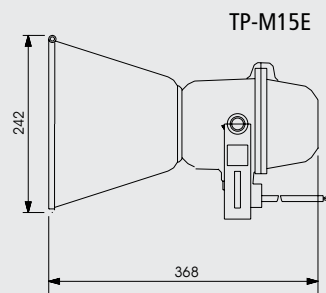
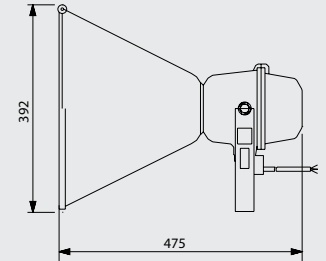
Specifications

	SC-240
Driver Type	included, 4 drivers
Rated Input	240 W
Continuous Program	360 W
Rated Impedance	8 Ohm x 4
Frequency Response	250 Hz ... 5000 Hz
SPL (1 W, 1 m)	107 dB
SPL at Rated Input (1 m)	131 dB
Dimensions (W x H x D)	598 x 251 x 654 mm
Weight	28 kg



Horn Speakers

Explosion-Proof Speaker



Features

TP-M15E:

- Explosion-proof according to eG4 Standard (JIS-C0903)
- Aluminium horn
- Ivory and dark grey finish
- Excellent frequency response
- High sound pressure level
- Mounting brackets are supplied for easy installation

TP-M15D:

- Explosion-proof according to eG4 Standard (JIS-C0903)
- 20 W
- Power aluminium horn
- Colour: ivory and dark grey
- Excellent frequency response
- High sound pressure level
- Mounting brackets are supplied for easy installation
- Non-RoHS product

Applications

For hazardous and explosion sensitive areas

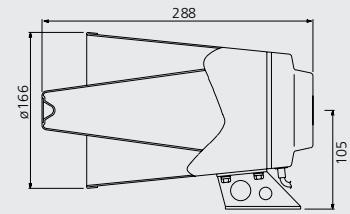
Specifications

	TP-M15E	TP-M15D
Rated Input	15 W	15 W
Continuous Program	22.5 W	22.5 W
Tappings 100 V	15 W / 10 W / 5 W	15 W / 10 W / 5 W
Frequency Response	300 Hz ... 5500 kHz	350 Hz ... 4500 Hz
SPL (1 W, 1 m)	104 dB	104 dB
SPL at Rated Input (1 m)	116 dB	116 dB
Dimensions	ø 392 x 475 mm	ø 242 x 368 mm
Weight	4.9 kg	4.3 kg
Protection	Explosion-proof: eG4 / JIS-C0903	Explosion-proof: eG4 / JIS-C0903

Horn Speakers



Reflex Horn for Mobile Applications



TC-35P

TC-35P

Features

- Trumpet type reflex horn speaker
- Anti-shock construction
- Small horn with low wind resistance, ideal for mobile applications
- 35 W power
- Weatherproof
- Colour: horn white, silver bracket
- Aluminium construction
- 8 Ohm
- Non-RoHS product

Applications

For mounting on vehicles

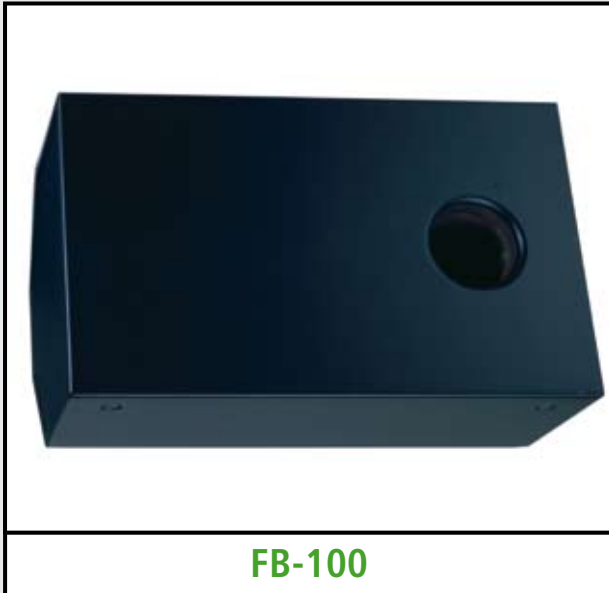
Specifications

	TC-35P
Rated Input	35 W
Continuous Program	53 W
Low Impedance	8 Ohm
Frequency Response	250 Hz ... 8000 Hz
SPL (1 W, 1 m)	104 dB
SPL at Rated Input (1 m)	120 dB
Dimensions (W x H x D)	∅ 166 x 288 mm
Weight	2 kg
Protection	Weatherproof, anti-shock

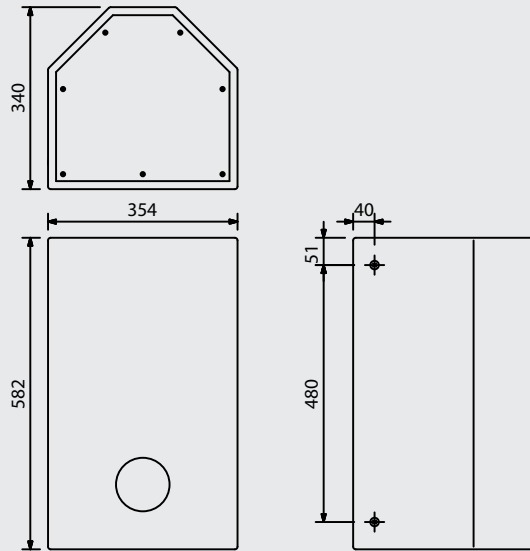


Subwoofer

Design Subwoofer



FB-100



Features

- Compact subwoofer
- For mounting on floor, wall, corner or ceiling
- 450 W high-power subwoofer system
- 6 rigging points for suspended mounting
- MDF enclosure, paintable
- Optional matching transformer MT-S0601 for high impedance operation
- 25 cm woofer with large \varnothing 120 mm ferrite magnet and extended voice coil for distortion free bass response
- Acoustic band pass filter for smooth low frequency response and high efficiency
- Detachable Phoenix screw terminal blocks ready for loop-through parallel connection of multiple speakers

Applications

Restaurants, shops, conference rooms, AV-presentation rooms

Options

- MT-S0601: (rated 60 W) 100 V-Transformer

Specifications

	FB-100
Enclosure	Acoustic Super Woofer (ASW)
Rated Input	150 W (40 ... 200 Hz)
Continuous Program	450 W (40 ... 200 Hz)
Impedance	8 Ohm
SPL (1W, 1m)	94 dB (installation in 1/2 free sound field)
Frequency Response	35 Hz... 160 Hz (-10 dB)
Speaker Component	25 cm cone speaker
Input Terminal	Detachable screw terminal, (+)/(-) 2 each (for bridging connection)
Usable cable	Solid cable, stranded cable: 0.2 ... 2.5 mm ² (AWG No. 24 ... 14)
Finish	MDF, black, paint
Dimensions (W x H x D)	354 x 582 x 340 mm
Weight	16 kg

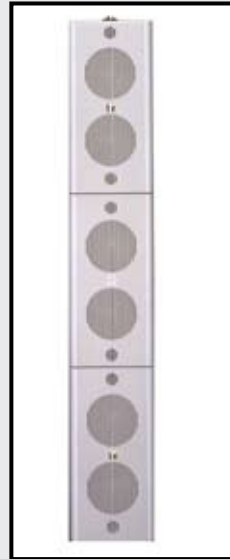
Column Speakers



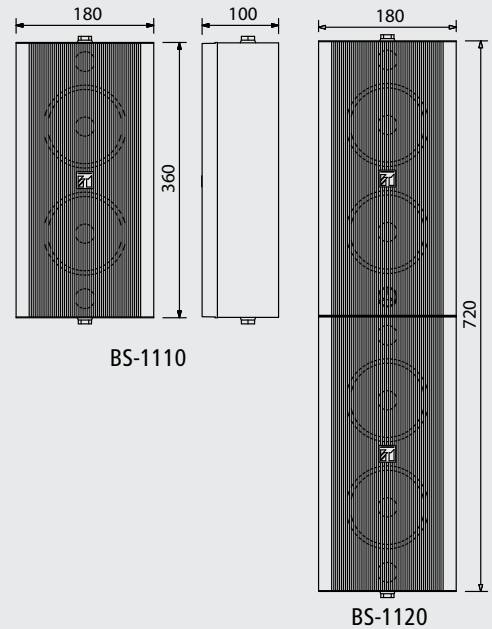
Speaker for Universal Use



BS-1110W / BS-1120W



Vertical Array



Features

- 10 W (BS-1110W) or full range 20 W (BS-1120W) column speaker
- Wooden enclosure
- Indoor use
- Robust construction and impact resistance
- Wide coverage dispersion
- Colour: white (RAL 9010)
- Mounting options: Wall-mount, tilt brackets or on a stand
- BS-1110 W with 2 x 12 cm cone speaker and BS-1120 W with 4 x 12 cm cone speaker and dome tweeter
- Wide horizontal and narrow vertical dispersion angle
- Low impedance (4 or 8 Ohm) or high impedance (100 V).
- Vertical array possible

Applications

Religious facilities, school auditoriums
BS-1110 for indoor use especially in sports facilities due to robust construction and impact resistance

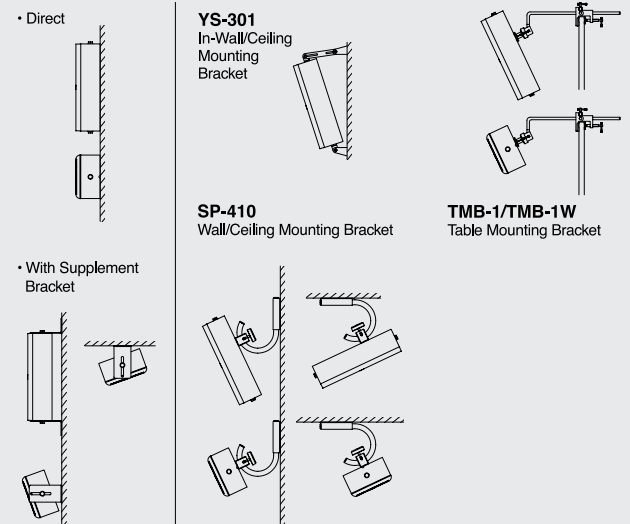
Options

- YS-301: Mounting Bracket (Non-RoHS product)
- SP-410: Wall/Ceiling Mounting Bracket
- TMB-1: Table Mounting Bracket (Non-RoHS product)
- ST-16A: Speaker Stand

Specifications

	BS-1110W	BS-1120W
Dynamic Cone Driver	2 x 12 cm	4 x 12 cm
Rated Input	10 W	20 W
Continuous Program	15 W	30 W
Impedance	4 Ohm, 100 V, 70 V Tappings 100V / 70 V: 10 W / 5 W	8 Ohm, 100 V, 70 V Tappings 100V / 70 V: 20 W / 10 W
Frequency Response	150 Hz ... 14000 Hz	150 Hz ... 20000 Hz
SPL (1 W, 1 m)	92 dB	95 dB
SPL at Rated Input (1 m)	102 dB	105 dB
Temperature	-10 °C ... +55 °C	-10 °C ... +55 °C
Dimensions (W x H x D)	180 x 360 x 100 mm	180 x 720 x 100 mm
Weight	2.9 kg	5.1 kg

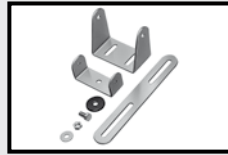
BS-1110 Mounting Options





Column Speakers

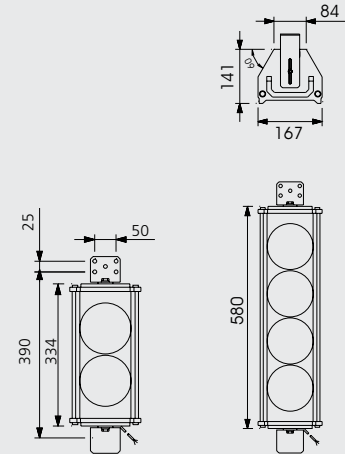
Splashproof Column Speaker



YS-301



YS-302



Features

- Splashproof column speakers suitable for outdoor use (not weatherproof)
- Speakers coming complete with wall mounting brackets or can be fitted to a speaker stand
- Constructed from extruded aluminium, in silver grey finish and with a black punched metal net grille
- For 100 V systems

Options

- YS-301: Outdoor Mounting Brackets with small adjustment of the vertical angle (Non-RoHS product)
- YS-302: Mounting Brackets (Non-RoHS product)

Applications

Halls, churches and other religious facilities, auditoriums

Specifications

	TZ-105	TZ-205
Dynamic Cone Driver	2 x 12 cm	4 x 12 cm
Rated Input	10 W	20 W
Continuous Program	15 W	30 W
Rated Impedance	100 V Tappings 10 W / 5 W	100 V Tappings 20 W / 10 W
Frequency Response	150 Hz ... 10000 Hz	150 Hz ... 10000 Hz
SPL (1 W, 1 m)	90 dB	93 dB
SPL at Rated Input (1 m)	100 dB	106 dB
Dimensions (W x H x D)	167 x 334 x 141 mm	167 x 580 x 141 mm
Weight	3.4 kg / 4 kg incl. brackets	5.1 kg / 5.7 kg incl. brackets

Accessories



Flush Mount Volume Controls / Attenuators



AT-12UP / AT-50UP



AT-12UPR / AT-50UPR



AT-063P/AT-303P/AT-603P

Features

- Volume control for 100 V line
- Flush mounting: DIN 49037
- Continuous attenuation in 12 steps
- Suitable with GIRA switch accessories
- AT-12UP: 12 W, mounting depth: 26 mm
- AT-50UP: 50 W, mounting depth: 40 mm

Options

- Gira Switch Accessories

Features

- Volume control for 100 V Line
- Flush mounting: DIN 49037
- Continuous attenuation in 12 steps
- Suitable with GIRA switch accessories
- AT-12UPR: 12W, with priority relay, mounting depth: 26 mm
- AT-50UPR: 50 W, with priority relay, mounting depth: 40 mm

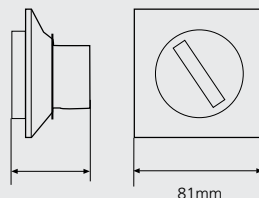
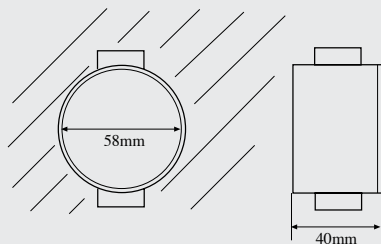
Options

- Gira Switch Accessories

Features

- Attenuators with 5 step attenuation: „OFF“ -18 dB, -12 dB, -6 dB, 0 dB
- Push-in connector allows quick terminal-cable connection
- 2 or more attenuators can be bridged
- Useable cables are IV (indoor vinyl) or HIT (heat resistant vinyl) \varnothing 0.8 - 1.2 mm or standard cable with cross-sectional area of 0.75-1.25 mm²
- For emergency call transmission (3-wire)
- Knob, panel, plate: ABS resin, milk white, case: ABS resin, black
- AT-063P: 6 W
- AT-303P: 30 W
- AT-603P: 60 W

Flush Mounting





Accessories

Program Selector and Preamplifier for PA Speakers



PGW-6 / PGW-6R



UP-MV-206

Features

- Program selector
- Flush mounting DIN 49037
- One of 6 programs selectable
- PGW-6R with priority relay
- Mounting depth: 30 mm

Options

- Gira Switch Accessories

Features

- Flush mount amplifier (DIN 49037)
- Pre-amplifier with microphone (XLR) and AUX (RCA pin) input
- Phantom voltage for microphone on PCB selectable
- Volume control for microphone and AUX separately
- For flush mounting 3 flush mount boxes are required according to DIN 49037
- Finish: off-white

Specifications

	UP-MV206
Output (bal.)	6 dBu, 600 Ohm, screw terminal
Microphone Input (bal.)	-64 dBu ... -36 dBu (XLR)
Phantom to Microphone	24 V
Aux Input (unbal.)	2x -20 dBu ... +6 dBu, pin jack, cinch
Frequency Response	Microphone: 130 Hz ... 25000 Hz, Aux: 40 Hz ... 25000 Hz
Operation Voltage	17,5 V ... 28,5 V, DC (30 mA)
Standard	UP55 DIN 49037
Dimensions (W x H x D)	224 x 81 x 33 mm

Personal PA System



Belt Megaphone with Headset (New!)



ER-1000 (10 W)



Volume Control



Microphone



Speaker

Features

- Ultra-light weight 480 g
- Easy to wear and easy to operate
- Elastic waist belt extendable to up to 120 cm. A 30 cm extension belt and a pouch for audio player included
- Headset-type lightweight and comfortable-to-wear microphone
- Large rotating volume control and independent power on/off switch
- Audio player input
- AUX input terminal allows public address announcements to be made while BGM is being played
- Low power consumption for long operation time
- Six alkaline AA dry batteries provide up to 8 hours of use
- Battery spacers for operation with four AA batteries, to save batteries

Applications

Museum, Guided Tour

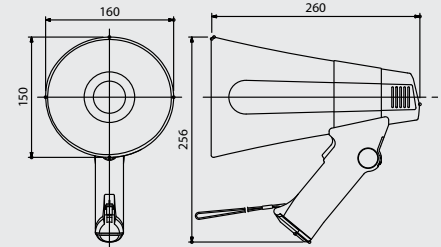
Specifications

	ER-1000
Power Requirement	10 W (6 batteries) / 4 W (4 batteries)
Battery	6 x 1.5 V or 4 x 1.5 V (LR6 / AA)
Battery Life	Approx. 8 hours / AUX stereo input operation: Approx. 4.5 hours
Audible Range	80 m (with 6 batteries)
Frequency Response	300 Hz – 14 kHz (deviation: -26 dB)
Headset Microphone	Headset type, electret condenser microphone
Finish	Front case: ABS resin, light grayish purple / Rear case: ABS resin, dark grayish purple / Grille: Surface-treated steel plate, dark grayish purple, paint. Waist belt: Elastic rubber, black
Dimensions	133 (W) × 96 (H) × 222 (D) mm (belt excluded)
Weight	480 g main PA unit (belt included, batteries excluded); / Headset microphone: 50g / Extension belt: 40g



Compact Handmegaphones

10W Handheld Megaphone



Features

- Compact megaphone
- Cost-effective model
- Reflex trumpet horn
- Unidirectional dynamic microphone with press-to-talk switch
- Operates on 8 x R6 type batteries (option)
- ER-520W with built-in whistle signal
- ER-520S red fireman's megaphone with built-in siren
- Colour: ER-520, ER-520W: white and grey
ER-520S: red, carry strap: black
- Finish: ABS-resin

Applications

For security service, police, fireworkers and for each kind of demonstration

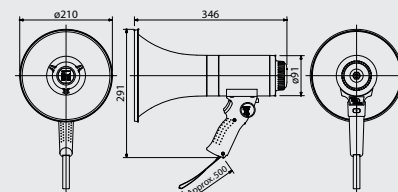
Specifications

	ER-520	ER-520W	ER-520S
Output Power max.	10 W	10 W	10 W
Rated Output	6 W	6 W	6 W
Signals	-	Whistle	Siren
Audible Range approx.	Voice 250 m	Voice 250 m, Signal 315 m	Voice 250 m, Signal 315 m
Batteries: Qty / Type	8 x 1,5 V (AA/R6P)	8 x 1,5 V (AA/R6P)	8 x 1,5 V (AA/R6P)
Battery Life	Approx. 10 hours (voice)	Approx. 10 hours (voice)	Approx. 10 hours (voice)
Battery Life on Signal	-	30 min	40 min
Dimensions (W x H x D)	160 x 256 x 260 mm	160 x 256 x 260 mm	160 x 256 x 260 mm
Weight (without batteries)	620 g	650 g	650 g

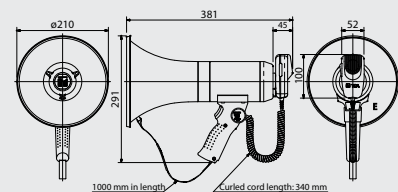
Handmegaphones



Megaphones with High-Range Audibility



ER-1215



ER-3215

Features

- Compact megaphone with instant-on amplifier
- Good sound quality due to wide frequency response
- High audible range
- Neodym magnet for high power
- Polyimide diaphragm
- Low power consumption
- Rugged enclosure
- Howl-free unidirectional dynamic microphone with press-to-talk switch
- Antibacterial treatment for sanitary use
- 6 x R14 (C) type batteries
- Improved endurance
- Finish: ABS-resin H
- ER-1215: Horn light grey, other: grey
- ER-1215S with built-in siren signal
Colour: red
- ER-3215 with additional handheld microphone. Colour: Horn light grey, other: grey

Applications

For security service, police, fireworkers, trade union and for each kind of demonstration

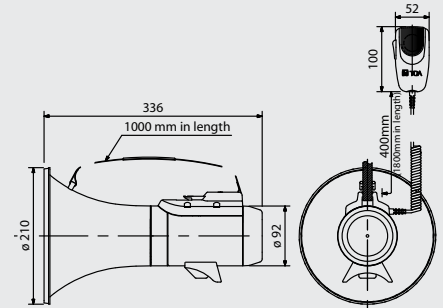
Specifications

	ER-1215	ER-1215S	ER-3215
Output Power max.	23 W	23 W	23 W
Rated Output	15 W	15 W	15 W
Signals	–	Siren	–
Audible Range approx.	Voice 315 m	Voice 315 m, signal 500 m	Voice 400 m
Batteries: Qty / Type	6 x 1,5 V (R 14)	6 x 1,5 V (R 14)	6 x 1,5 V (R 14)
Battery Life	voice 14 hours	voice 14 hours	voice 9 hours
On Signal	–	20 minutes	–
Dimensions (W x H x D)	210 x 291 x 346 mm	210 x 291 x 346 mm	210 x 291 x 381 mm
Weight (without batteries)	1.1 kg	1.2 kg	1.3 kg (incl. microphone)



Shoulder Type Megaphones

Megaphones with High-Range Audibility



Features

- Compact megaphone with shoulder strap
- Anti-bacterial treatment
- Handheld microphone
- High audible range
- ER-2215W with whistle signal
- Finish: ABS-resin
- Colour: grey / light grey
- Instant-on amplifier
- Howl-free unidirectional dynamic microphone with press-to-talk switch
- 6 x R14 type batteries
- Improved endurance

Options

- ST-16A: Stand

Applications

For security service, police and for each kind of demonstration

Specifications

	ER-2215	ER-2215W
Output Power max.	23 W	23 W
Rated Output	15 W	15 W
Signals	–	Whistle
Audible Range	Approx. 400 m	Approx. 400 m (500 m whistle)
Batteries: Qty / Type	6 x 1.5 V (R 14)	6 x 1.5 V (R 14)
Battery Life	Voice approx. 9 hours	Voice approx. 9 hours
Battery Life On Signal	–	Approx. 20 min
Dimensions (W x H x D)	ø 210 x 336 mm	ø 210 x 336 mm
Weight (without batteries)	1.2 kg (with microphone)	1.3 kg (with microphone)

Shoulder Type Megaphones



Megaphone with Extreme High Audible Range



ER-2230W



ST-16A



Control Panel

Features

- High power shoulder megaphone for extreme long distance messages
- Whistle signal
- Anti-bacterial treatment
- Microphone lock switch
- Colour: light grey / grey
- Finish of horn: aluminium, case top: die-cast aluminium, others: ABS-resin
- Splash-proof cover included
- Auxiliary-input with volume control for tape or radio and earphone output
- 10 x R20P type batteries or external 12 V power supply
- Power plug cord (for 12 V battery) included
- Mountable on stand

Options

- ST-16A: Stand
- DM-1100, DM-1300: Microphones

Specifications

	ER-2230W
Output Power max.	45 W
Rated Output	30 W
Signals	Whistle
Audible Range approx.	800 m, whistle 1000 m
Batteries: Qty / Type	10 x 1,5 V (R 20P)
External DC	10 V ... 13.8 V
Battery Life	Voice: 17 hours
Battery Life On Signal	1.5 hours
AUX Input	-10 dBv, 30 kOhm
Dimensions	ø 351 x 512 mm
Weight (without batteries)	3.75 kg (incl. microphone)

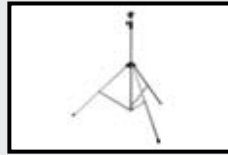


Shoulder Type Megaphones

Megaphone for Wireless Microphone Use



ER-2930W



ST-16A



Control Panel



WTU-4800



Standard Microphone



WM-5220



Fold-down Flex Antenna

Features

- High power megaphone with shoulder strap
- For extreme long distance messages
- Antibacterial treatment
- 10 x D-type battery or external 12 V power supply (with optional YR-69B connection cable)
- Colour grey / light grey
- Finish of horn: aluminium, case top: die-cast aluminium, others: ABS-resin
- Splash-proof cover included
- Whistle signal
- Equipped with a receptacle for optional wireless microphone module
- For TOA tuner modules WTU-4800 and WTU-3800
- Built-in antenna
- Auxiliary-input with volume control for tape or radio and earphone output
- 10 x R20P type batteries or external 12 V power supply
- External power input (12 V battery)
- Mountable on stand

Options

- ST-16A: Stand
- WTU-4800: UHF Tuner Module
- UHF Microphones e.g. WM-5220
- WTU-3800: VHF Tuner Module
- VHF Microphones e.g. WM-3220

Specifications

	ER-2930W
Output Power max.	45 W
Rated Output	30 W
Signals	Whistle
Audible Range approx.	800 m, whistle approx. 1000 m
Batteries Qty / Type	10 x 1,5 V (R 20P)
External DC	10 V – 13,8 V
Battery Life	17 hours
Battery Life On Signal	1,5 hours
AUX Input	-10 dBv, 30 kOhm
Dimensions (Diameter x L)	ø 351 x 512 mm
Weight (without batteries)	3,95 kg (incl. microphone)
Features	Wireless microphone application

Measuring Instrument



Impedance Meter



Big display



Function keys



Test leads

Features

- For easy and exact measurement of speaker impedances including long cable length
- Battery driven for mobile use (4 Mignon (AA) batteries)
- One set of batteries for 30 - 60 hours operation time (depending on the measurement range)
- Graphic conversion table impedance - power
- Oscillator generates 1 kHz frequency
- Measurement range of 5 to 100 kOhm.
- The ZM-104A comes with a case and one set of test leads

Specifications

	ZM-104A
Scale	Ohm
Measurement Range	x1 : 5 - 1,000 Ohm x10 : 50 - 10,000 Ohm x100 : 500 - 100,000 Ohm
Accuracy	±10 %
Oscillation Frequency	1000 Hz ±10 %
Power Requirement	4 x R6 batteries (6 V)
Dimensions (without case)	110 x 58 x 180 mm 120 x 220 x 63 mm (incl. case)
Weight	700 g (incl. case)



EVERYTHING UNDER CONTROL

Due to the fact that we are living in a world that is getting more and more unsafe, TOA provides combined solutions of audio & video technology: Video surveillance systems that can see just as good throughout the night as they can during daytime and alarm systems that start at the push of a button.

Or even evacuation systems that lead people safely and without stress out of buildings in a short period. Through our long years of experience TOA does stand for reliability. Talking about security, one thing is for sure the technology must be secure.

EN 54 for Voice Evacuation Systems

More Security with EN 54 certified products



TOA offers the first fully EN 54 certified voice alarm system

Nowadays, security and safety is a very precious item that is constantly challenged by external influences.

Wherever humans are gathering it is essential to have the right messages in the right spot. Even more so, there are several things that distract the positive atmosphere in this environment – fire danger, bomb threats and amok shootings.

These incidences are unforeseen and therefore precaution needs to be taken in order to have appropriate measures in place and provide clear instructions through voice messages.

TOA's history and experience in providing systems for communication and safety makes it self understanding to meet and even exceed high demands of life protection and safety standards. As a result TOA products are certified according to the EN 54 standards.

EN 54 stipulates the product and testing requirements for voice alarm components in fire detection and alarm systems. The norm is put in place in order to improve the communication of installed systems with the outside world – users, installers, firemen and, most importantly, the public. Also, EN 54 states the availability of system functionality in most adverse operating environments.

TOA is the first manufacturer of voice evacuation systems that offers a fully certified system consisting of system manager, amplifiers, speakers and emergency power supply. We thrive for offering not only the best, but also the most secure solution as the right message at the right time is crucial for increased personal safety.

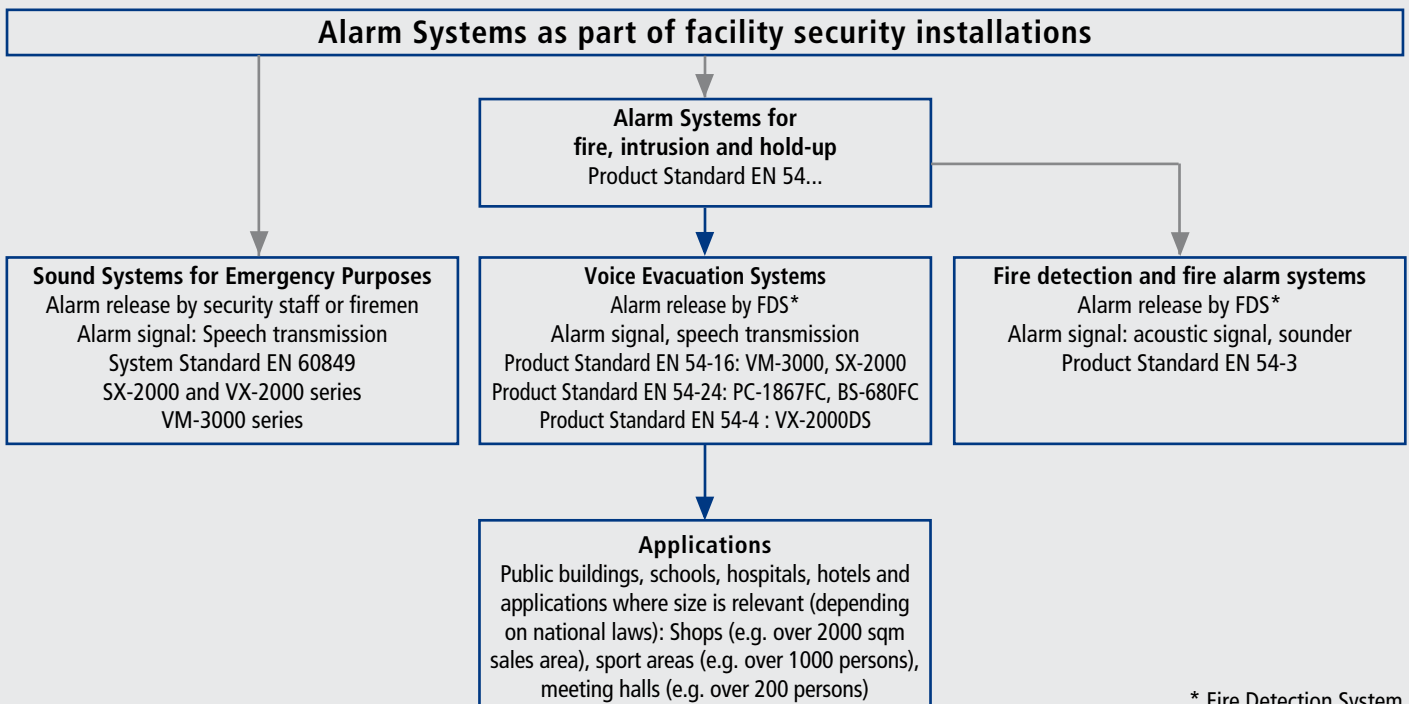
All EN 54 standards will become effective across the member states of the European Union in March 2011. TOA was the first manufacturer to

meet all three parts applicable to voice evacuation components already in March 2010:

- EN 54-4: Power Supply Equipment
- EN 54-16: Voice Alarm and Indicating Equipment
- EN 54-24: System Loudspeakers

Not living in a country, where EN 54 is applicable? The standards ISO 7240-4, ISO 7240-16 and ISO 7240-24 are the international equivalents. Our EN 54 certified systems are compliant with these standards as well.

Furthermore TOA is continuously increasing its certified product range and is offering guidance on the EN 54 and ISO 7240 standards in order to help planning future-proof systems and investments in compliant products.

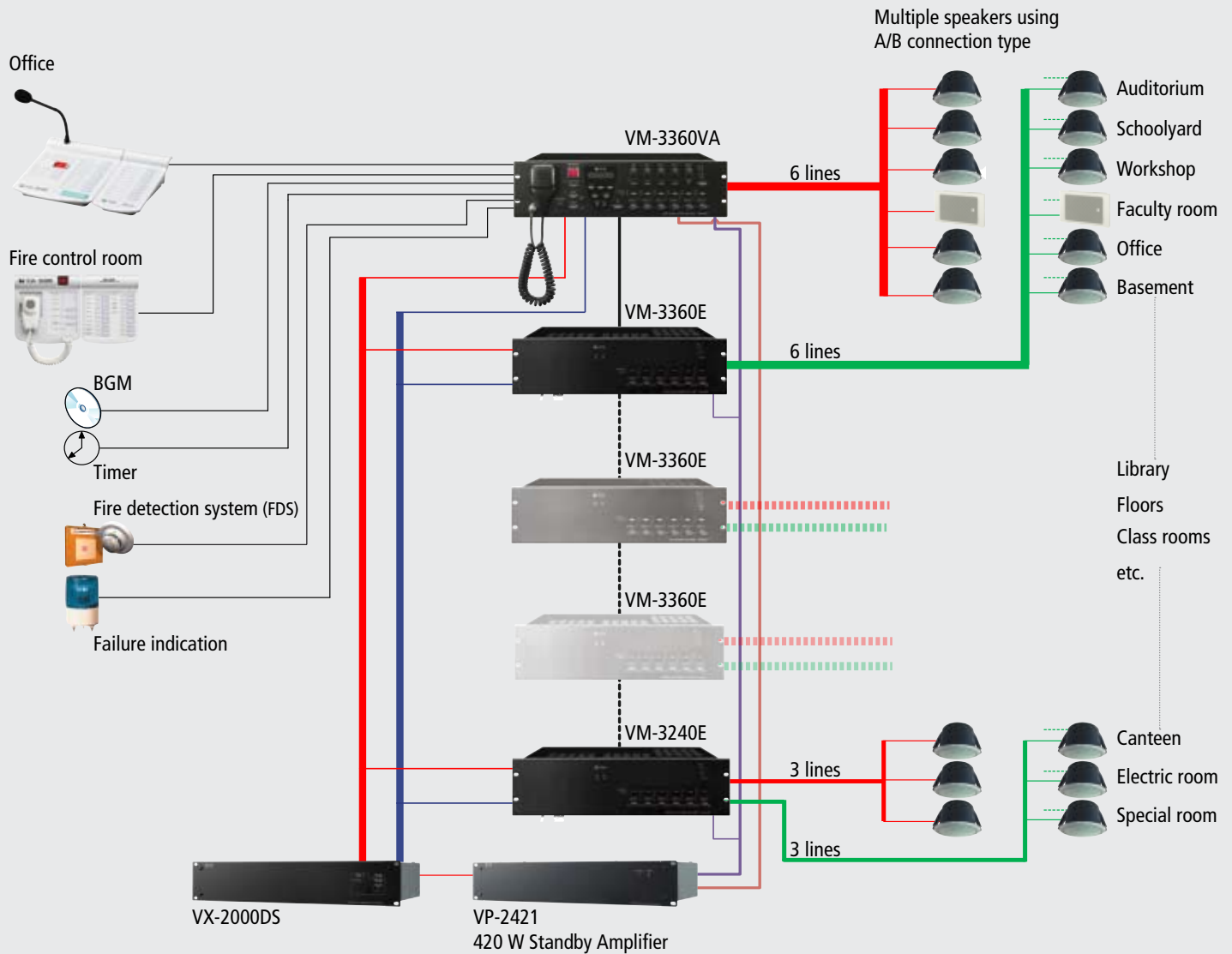


* Fire Detection System



EN 54 for Voice Evacuation Systems

System Example according to EN 54



TOA Voice Evacuation Systems that suit your needs





VM-3000 Series



PA Management System



VM-3000 Series

Description

The VM-3000 Series has digital audio processing and control, with fully digital audio mixing and a built-in high-quality electronic voice message feature. The system may be set up directly using the controls and LCD display on the front panel, which also enables easy operation of the system. Operational versatility is further enhanced by a dedicated PC software configuration capability for uploading and downloading settings via LAN.

The incorporation of wide-ranging functional capabilities, superb reliability and versatility make the VM-3000 a highly cost-effective emergency broadcast and public address system.

The system is EN 54-16 certified.

Certificate No : 1438/CPD/0180

System Features

- Max. 4 MIC/LINE inputs
- 2 BGM inputs
- Up to 4 Fireman's/Remote Microphones connectable (max. 2 Fireman's Microphones)
- Max. 60 assignable speaker zone outputs (6 zones per amplifier)
- Volume setting possible for each zone
- Digital audio processed & controlled with full digital audio mixing (DSP)
- Built-in high quality electronic voice message
- Intuitive configuration
- Zone setting, priority setting, failure detection setting by dedicated PC software
- LCD display shows current status and configuration setting of system units

Functions

Emergency functions

- Continuous speaker line monitoring without interruption of BGM distribution or paging announcements
- Complete fault detection and indication
- Off-site log check capability via LAN
- Both built-in and remote Fireman's Microphones
- Built-in voice alarm message
- 2-phase voice alarm message (Alert and Evacuation) broadcasting

Paging functions

- 2 Remote Microphone interface lines
- Paging (All zones/Group/Individual)
- 2-channel broadcast with external amplifier (Paging/BGM)



First fully EN 54 certified voice alarm system

including the power supply and matching speakers!



VM-3000 Series



System Management Amplifier



VM-3240VA / VM-3360VA

Features

- System management amplifier
- Power outputs 240 W (VM-3240VA) and 360 W (VM-3360VA)
- 1 management amplifier per system
- Front panel-mounted LCD display for settings and operation status
- Automatic message function
- Playback of up to 6 recorded general

- announcements and 2 recorded emergency announcements
- Up to 2 RM-300MF Emergency Remote Fireman's Microphones can be connected
- Up to 4 RM-200M General Broadcast Remote Microphones and RM-300MF Fireman's Microphones can be connected
- EN 54-16 certified. Certificate No : 1438/CPD/0180

Options

- **VM-3240E**: 240 W Extension Amplifier
- **VM-3360E**: 360 W Extension Amplifier
- **RM-300MF**: Fireman's Microphone
- **RM-320F**: Fireman's Microphone Extension
- **RM-200M**: Remote Microphone
- **RM-210**: Remote Microphone Extension
- **IT-450**: Input Transformer, 600 Ohm

Specifications

	VM-3240VA	VM-3360VA
Power Requirement	230 V AC, 50/60 Hz	
Power Consumption (AC mains)	600 W (with rated output signal), 260 W (according to EN60065)	850 W (with rated output signal), 380 W (according to EN60065)
Rated Output	240 W	360 W
Frequency Response	50 – 20,000 Hz, ±3 dB (at 1/3 rated output)	
Distortion	< 0.7% (at rated output, 1 kHz)	
Signal-to-Noise Ratio	Over 85 dB	
Inputs	Input 1 – 3: -50 dB* (MIC)/-10dB (LINE) (changeable) 600 Ohm, electronically balanced combined XLR connector (female)/ phone jack Input 4: -50 dB* (MIC) / -10 dB (LINE) (changeable) 600 Ohm, electronically balanced, removable terminal block (14 pins) BGM 1 – 2: -10 dB, 10 kOhm unbalanced, RCA pin jack External amplifier Input: 100 V Line removable terminal block (14 pins)	
Outputs	Speaker output 1 – 6: Total load within rated output, removable terminal block (14 pins), Direct output from internal or external amplifier, removable terminal block (16 pins) Recording output BGM / Paging 0 dB*, 10 kOhm, unbalanced, RCA pin jack	
Controls	Input 1 – 8: No-voltage make contact input, open voltage: 24 V DC, short-circuit current: under 2 mA, removable terminal block (14 pins) Output 1 – 8: Isolated open collector output, withstand voltage: 30 V DC, operating current: under 10 mA, removable terminal block (14 pins)	
Emergency Controls	Input 1 – 5: No-voltage make contact input, open voltage : 24 V DC, short-circuit current: under 2 mA, RJ45 female connector Input 6: Isolated voltage input: Inactive: -24V ±20%/Active: +24 V ±20%, RJ45 female connector Status out: Relay contact output, withstand voltage: 40 V DC, operating current: 2 – 300 mA, RJ45 female connector	
DC-24 V-Output	24 V DC, maximum feeding current 0.3 A	
Dimensions (W x H x D)	482 x 132.6 x 431.2	
Weight	16.5 kg	19 kg



VM-3000 Series



Extension Amplifier



VM-3240E / VM-3360E

Features

- Extension amplifier
- Up to 9 VM-3240E or VM-3360E Extension Amplifiers
- 240 W (VM-3240E) or 360 W (VM-3360E)
- 6 speaker line outputs
- 8 control inputs and 8 control outputs for general broadcasts
- 6 inputs and 3 outputs for emergency broadcasts
- Connected to the VM-3240VA or VM-3360VA via the VM Link connector (CAT5)
- EN 54-16 certified. Certificate No : 1438/CPD/0180

Options

- VM-3240VA: 240 W System Amplifier
- VM-3360VA: 360 W System Amplifier

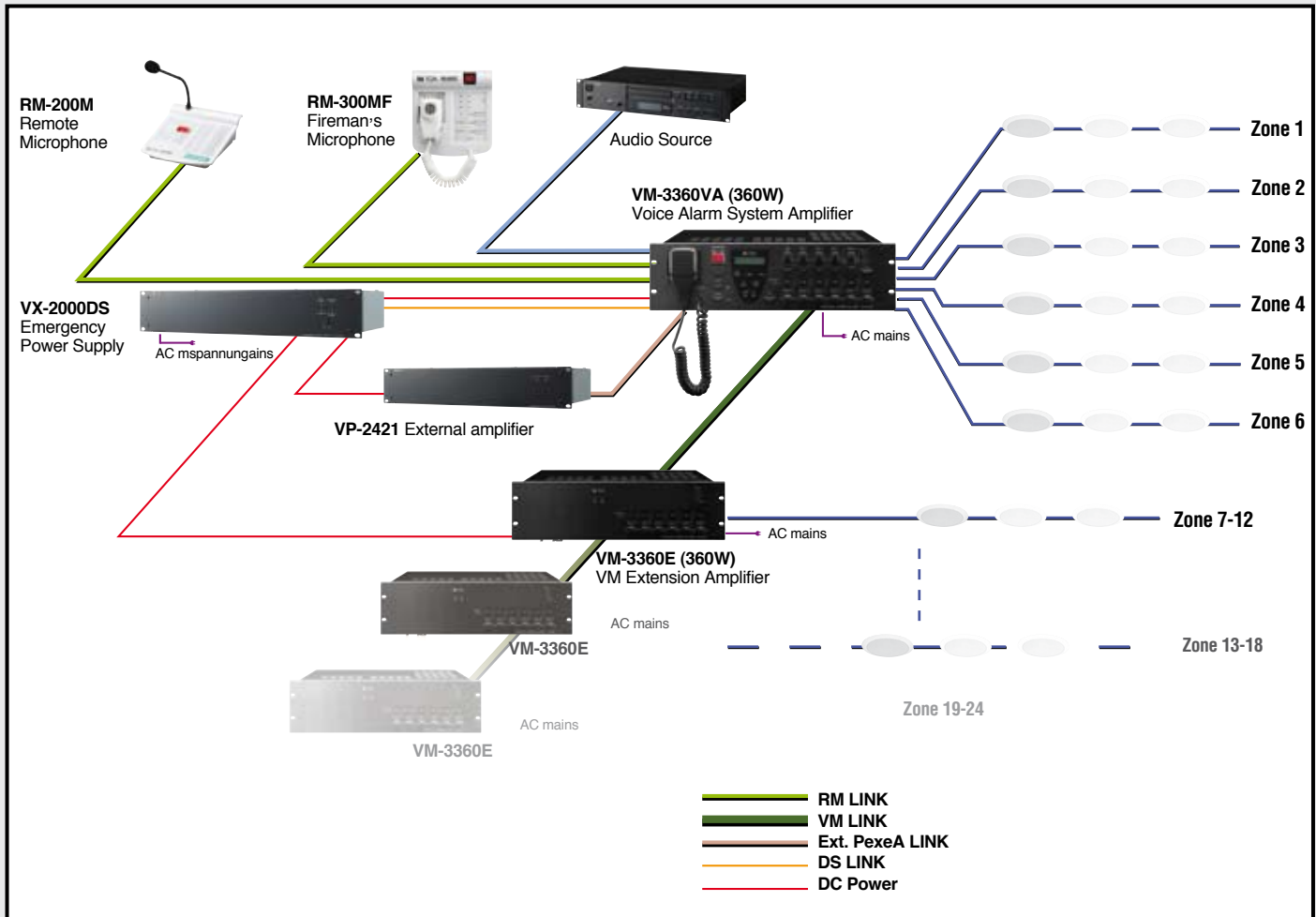
Specifications

	VM-3240E	VM-3360E
Power Requirement	230 V AC, 50/60 Hz	
Power Consumption (AC mains)	600 W (with rated output signal), 260 W (according to EN60065)	850 W (with rated output signal), 380 W (according to EN60065)
Rated Output	240 W	360 W
Frequency Response	50 – 20,000 Hz, ±3dB (at 1/3 rated output)	
Distortion	Under 0.7% (at rated output, 1 kHz)	
Signal-to-Noise Ratio	Over 85 dB	
Inputs	External amplifier Input: 100 V line, removable terminal block (14 pins)	
Outputs	Speaker output 1 – 6: Total within rated output, removable terminal block (14 pins) Direct output from internal or external amplifier, removable terminal block (16 pins)	
Control	Input 1 – 8: No-voltage make contact input, open voltage: 24 V DC, short-circuit current: under 2 mA, removable terminal block (14 pins) Output 1 – 8: Isolated open collector output, withstand voltage: 30 V DC, operating current: under 10 mA, removable terminal block (14 pins)	
Emergency Control	Input 1 – 5: No-voltage make contact input, open voltage : 24 V DC, short-circuit current: under 2 mA, RJ45 female connector Input 6: Isolated voltage input: Inactive; -24V ±20%/ Active; +24 V ±20%, RJ45 female connector Status out: Relay contact output, withstand voltage: 40 V DC, operating current: 2 – 300 mA, RJ45 female connector	
DC-24 V-Output	24 V DC, maximum feeding current 0.3 A	
Dimensions (W x H x D)	482 x 132.6 x 407	
Weight	18 kg	19 kg

VM-3000 Series



Application Example

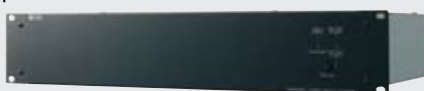


Options



Power Amplifier

VP-2241: 1 x 240 W
 VP-2421: 1 x 420 W
 Power Amplifier uses the VP-200VX Power Amplifier Input Module per channel.



VX-2000DS Emergency Power Supply

The VX-2000DS Emergency Power Supply Unit supplies the DC power to each equipment in the VM-3000 system by connecting the VX-200PS Power Supply Unit. EN 54-16 certified. Certificate No : 1134-CPD-083

VX-200PS Power Supply Unit

The VX-200PS Power Supply Unit is mounted in the VX-2000PF Power Supply Frame when in use.



VX-2000PF Power Supply Frame

The VX-2000PF permits the VX-200PS Power Supply Unit to be mounted in an equipment rack. Up to 3 VX-200PS units can be installed in the unit.



Certified according to EN 54-4 by notified body pursuant to Construction Products Directive 89/106/EWG. Since August 2009 only certified power supplies are allowed to built-in in voice alarm systems (connected to a fire alarm system)



VM-3000 Series



Fireman's Microphone



RM-300MF / RM-320F



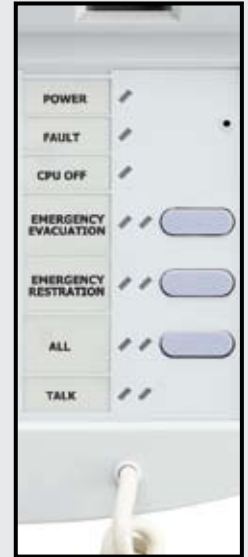
RM-320F



Alarm-Switch



Microphone



Function Keys

Features

RM-300MF:

- For emergency broadcasts made by firemen to evacuate
- For activation of emergency mode, start and stop of automatic emergency announcements, reset emergency signals, and live microphone announcements
- CPU OFF switch allows all-zone calls (simultaneous attenuator-free all calls). No general broadcasts can be made.
- EN 54-16 certified. Certificate No : 1438/CPD/0180

RM-320F:

- The Fireman's Microphone Extension enables zone selection or failure indication/ reset function.
- Up to 3 RM-320F can be connected to the Fireman's Microphone, expanding the available keys up to 20 per unit.
- 20 function keys per unit.
- Zone selection (1 – 20) and failure indication/ acknowledgement functions can be assigned to each function key using the dedicated software.

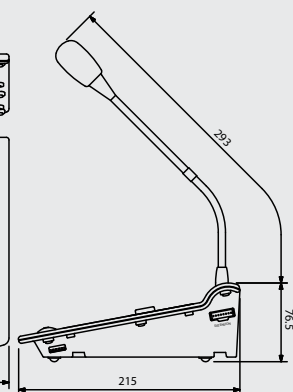
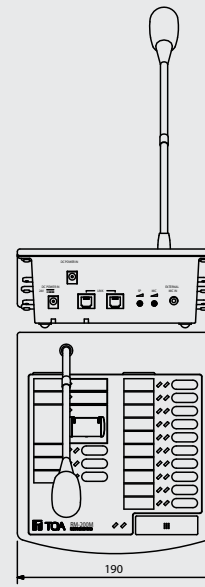
Specifications

	RM-300MF	RM-320F
Power Requirement	24 V DC (Operating range: 15 – 40 V DC)	From RM-200MF
Current Consumption	100 mA (up to 550 mA with 3x RM-320F)	155 mA max. (in terms of DC power inputs of RM-300MF)
Distortion	< 1%	-
Frequency Response	200 – 15,000 Hz	-
Signal-to-Noise Ratio	> 55 dB	-
Audio Output	0 dBV, 600 Ohm, balanced	-
Microphone	Unidirectional dynamic microphone, compression circuit	-
Volume Control	Microphone, buzzer	-
Operation key	Emergency key, Evacuate key, Alert key, Emergency reset key, CPU switch, Reset switch	-
Key Extension	By RM-320F	20
Connection Cable	Shielded CPEF cable or Category 5 STP cable, M3 screw terminal	Connection by way of dedicated cable
Finish	ABS resin, bluish grey	ABS resin, bluish grey
Dimensions (W x H x D)	200 x 215 x 82.5 mm	175 x 215 x 70 mm
Weight	1.1 kg	700 g

VM-3000 Series



Remote Microphone



Features

- Elegant design
- Zone, group and all-call paging, and initiating of pre-recorded messages
- Indication of communication failure, busy zones etc.
- Extraordinary clarity and lowest distortion through built-in compression circuit
- Up to 4 remote microphones can be connected to the VM-3000 system amplifier
- Up to 800 m total cable length
- RM-210: Allows zone selection of up to 10 zones
- Colour: Bluish grey

Options

- AD-246: AC Adapter
- WH-4000A: Headset
- WB-RM200: Wall-mounting bracket

Specifications

	RM-200M	RM-210
Power Requirement	24 V DC (Operating range: 14 – 28 V DC)	From RM-200M
Current Consumption	100 mA maximum	20 mA max. (in terms of DC power inputs of RM-200M)
Distortion	< 1%	-
Frequency Response	100 – 20000 Hz	-
Signal-to-Noise Ratio	> 60 dB	-
Audio Output	0 dBV, 600 Ohm, balanced	-
Microphone	Unidirectional electret condenser microphone	-
Emergency Broadcast	Activation of Emergency Broadcast (pre-recorded announcement or live microphone announcement) by Emergency Broadcast Switch	-
Key Extension	By RM-210	10
Connection Cable and Connector	Category 5 STP cable, RJ45 connector	Connection to RM-200M, RM-200X or RM-200XF by way of dedicated cable
Finish	ABS resin, bluish gray	ABS resin, bluish grey (PANTONE 538 or its equivalent)
Dimensions (W x H x D)	190 x 76.5 x 215 mm (Gooseneck microphone excluded)	110 x 76.5 x 215 mm
Weight	750 g	350 g



VM-2000 Series

PA Management System



VM-2000 Series

Description

Taking advantage of TOA's long-accumulated technological expertise and knowledge in security and audio, the VM-2000 Series is part of a selected range of sound management equipment. Featuring outstanding audio performance, this range of equipment satisfies a growing need for reliable and efficient communications for various applications including office buildings, schools, shopping malls, retail shops, factories, hospitals and transportation terminals.

Communication Expert

Targeted at medium-sized facilities, every VM-2000 Series unit offers 3 mic/line inputs, 2 BGM inputs and remote microphone capability as well as telephone paging. All controls and indicators are laid out in a logical, easy-to-use manner that supports operation. Tonal preferences may be set for each channel in order to op-

imize the sound for speech or music signals. The processed input signals can then be sent to any of 5 independent loudspeaker zones as desired, or automatically to all in the case of an emergency. Operation is simple and trouble-free for site staff. And the VM-2000 Series' clean, attractive design makes it well-suited for installation in a building's operation center equipment rack or even on a desk in the reception area.

Built to expand with your requirements

The VM-2000 Series is designed with cost-effectiveness in mind, allowing for expansion as your needs grow. For instance, if the standard 5 loudspeaker zones are not enough, the main unit can be linked by up to 8 units for servicing up to 45 zones. The VM-2000 Series' cost-effectiveness allows installation to be basic at first, then expanded as particular requirements dictate. Optional

accessories and related equipment are available to meet specific requirements and enhance the operational scope. The VM-2000 Series conforms to most international emergency sound system standards and requirements.

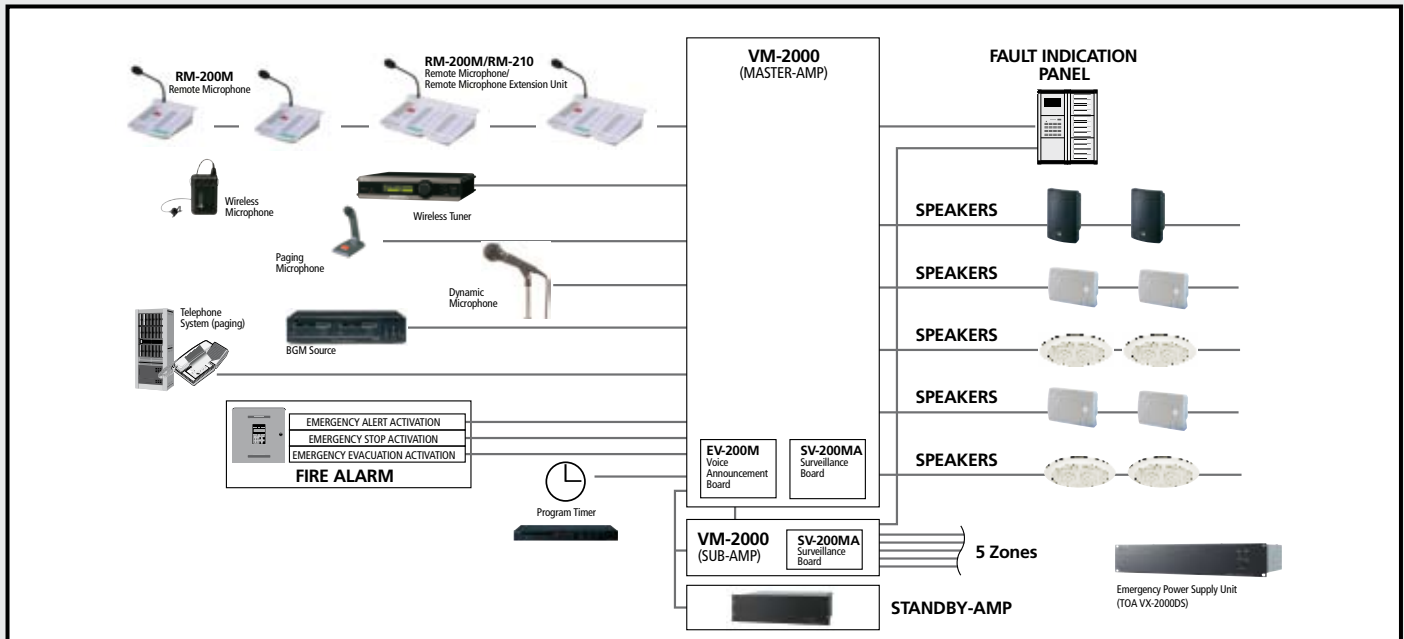
Remote microphone extends system control

Adding convenience to a communication system is the RM-200M Remote Microphone that allows announcements to be made to any speaker zone and emergency announcements to all zones. These announcements can be made live or pre-recorded announcements can be activated. The remote microphone can be connected to the RM-210 Remote Microphone Extension unit.



VM-2000 Series

Application Example



Specifications

	VM-2120	VM-2240
Power Requirement	AC: mains, 50/60 Hz, DC: 24 V DC/7.5 A	AC: mains, 50/60 Hz, DC: 24 V DC/15 A
Power Consumption (AC mains)	Under normal operating conditions according to EN60065: 107 W	Under normal operating conditions according to EN60065: 255 W
Current Consumption (24V DC Power Input)	Under normal operating conditions according to EN60065: 2.1 A	Under normal operating conditions according to EN60065: 5 A
Rated Output	120 W	240 W
Output Voltage/Impedance	100 V/83 Ohm, 70 V/42 Ohm, 50 V/21 Ohm	100 V/42 Ohm, 70 V/21 Ohm, 50 V/10 Ohm
Frequency Response	50 – 16000 Hz	50 – 16,000 Hz
Distortion	< 1%	
Signal-to-Noise Ratio	> 60 dB	
Tone Control	Bass: 100 Hz ±10 dB, Treble: 10 kHz ±10 dB (Inputs 1 – 3 and BGM individually adjustable)	
Remote Microphone/Expansion Amplifier Connection	2 RJ45 female connectors for connecting the RM-200M remote microphone and the VM-2120 or VM-2240 unit used as an expansion amplifier; maximum distance: 800 m in total, Link cable: category 5 shielded number of connectable RM-200M's: Up to 4 twisted-pair straight cable (TIA/EIA-568A standard)	
Inputs	1-3 for MIC, LINE XLR connector /phone jack, Input 1 is additionally DIN connector, telephone paging: Push-in terminal, BGM 1-2 and power amp: RCA pin jack, external speaker line: 100V	
Speaker output	Plug-in screw connector, 5-zone selector with attenuator (all zones simultaneously selectable)	
Direct speaker line output	Direct output from the power amplifier output transformer (attenuator bypassed), Plug-in screw connector	
Other Outputs	Line, recording, preamplifier: 0 dB*1, 10 kΩ, RCA pin jack	
Control Input	For controlling Inputs 1 – 3, push-in terminal block no-voltage make contact input, open voltage: 3.3 V DC, short-circuit current: under 1 mA	
Control Input and Output	D-sub connector (25-pin, female)	
External Attenuator Control Output	Plug-in screw connector, relay	
Surveillance Input and Output	D-sub connector (25-pin, female)	
Power Supply	24 V DC/0.1 A, for supplying power to an optional amplifier control Unit RU-2001/2002, push-in terminal block*4	
Chime Tone	Built-in chime: 2-tone chime/2-tone chime (fast repeat)/4-tone chime (Up)/Single-tone chime/4-tone chime (up & down)/gong/off	
Function	Voice announcement board sound source: pre-recorded chime, 2 unit stacking (VM-2120 or VM-2240), emergency broadcast (sequential control), broadcast priority control, surveillance (failure detection) function, power supply to only 1 remote microphone (RM-200M), line resistance: Under 24 (one way)	
Operating Temperature	0°C to +40°C	
Finish	Panel: ABS resin, dark grey, paint, case: steel plate, dark grey, paint	
Dimensions (W x H x D)	419 x 143.3 x 355.7 mm	
Weight	12.5 kg	14.5 kg



VM-2000 Series

System Management Amplifier and Optional Accessories



VM-2120 / VM-2240



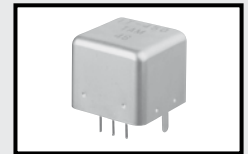
EV-200



SV-200M



MB-36



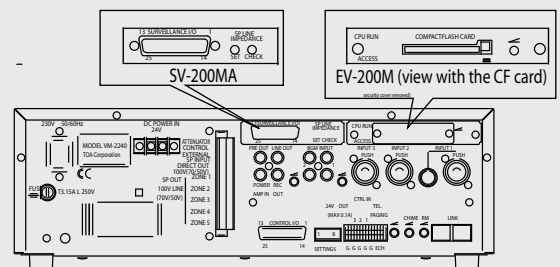
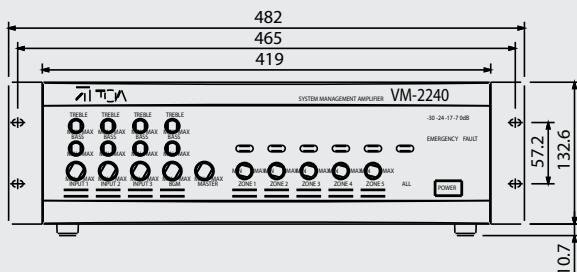
IT-450

Features

- Programmable system management amplifier
- VM-2120 (120 W) or VM-2240 (240 W)
- 5 switchable high impedance speaker zones with adjustable attenuators
- 9 units can be combined to increase the output power and number of zones
- 4 input channels come with volume and bass/ treble control on the front panel
- Both BGM inputs with level pre-adjustment
- The routing to the zones of the 3 microphone/ line level inputs and the telephone paging input can be pre-set
- Additional features: Emergency power input, remote power control, 7 built-in chimes etc.
- 19" rack mountable (3 units, optional MB-36 brackets required)

Options

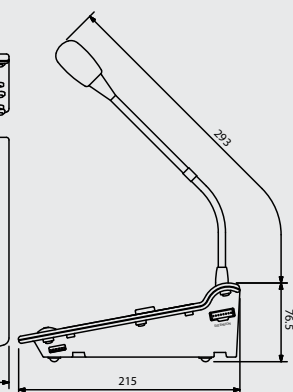
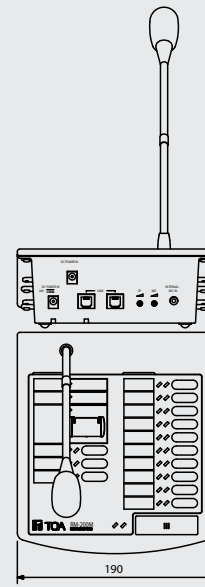
- **EV-200M:** Voice Announcement Board for installation in the VM-2000 system management amplifier
- Playback of pre-recorded messages, 2 for emergency and 5 for commercial purpose plus 1 individual chime
- Messages are stored on CF memory cards
- Playback duration depends on the the memory card's capacity
- The unit checks the availability of the messages and memory card automatically
- **SV-200MA:** Surveillance Board for installation in the VM-2000 system management amplifier
- Monitoring of 5 speaker lines on short circuit, break and earth leakage as well as power amplifier
- In case of failure, it controls the common failure indicators and offers detailed failure information on separate outputs
- In case of a short circuit on certain speaker lines, it cuts this line from the amplifier to avoid affecting other speaker lines
- **MB-36:** Mounting Brackets for cabinet rack mounting of VM-2000 series amplifiers
- **IT-450:** Input Transformer, 600 Ohm
- **SDCF-03:** Compact Flash Adaptor for recording the memory cards with the EV-350 or by means of PC software





VM-2000 Series

Remote Microphone



Features

- Attractive design
- Zone, group and all-call paging, and starting pre-recorded messages
- Emergency sequence can be started by pressing the alarm button which is covered by a hinged lid
- Indication of system failure, line failure, busy zones etc.
- Extraordinary clarity and extraordinary low distortion due to built-in compression circuit
- Up to 4 remote microphones can be connected to the VM-2000 system amplifier
- Up to 800 m total cable length
- RM-210: Allows announcements in up to 10 zones
- Up to 4 RM-210 possible
- When 2 VM-2000 are combined, then a RM-210 is required to start a pre-recorded announcement from the EV-200M
- Colour: bluish grey

Options

- AD-246: AC adapter
- WH-4000A: Headset
- WB-RM200: Wall-mounting bracket

Specifications

	RM-200M	RM-210
Power Requirement	24 V DC (Operating range: 14 – 28 V DC)	From RM-200M
Current Consumption	100 mA maximum	20 mA max. (in terms of DC power inputs of RM-200M)
Distortion	< 1%	-
Frequency Response	100 – 20000 Hz	-
Signal-to-Noise Ratio	> 60 dB	-
Audio Output	0 dBV, 600 Ohm, balanced	-
Microphone	Unidirectional electret condenser microphone	-
Function Keys	Speaker Zones 1 – 5 or Zones 1 – 10 (2 stacked amplifiers connection), Microphone: volume control, Groups 1 – 2, and All-Zone Broadcast	-
Emergency Broadcast	Activation of Emergency Broadcast (pre-recorded announcement or live microphone announcement) by Emergency Broadcast Switch	-
Voice Message Control	Activation of 5 messages	-
Key Extension	By RM-210	10
Connection Cable and Connector	Category 5 STP cable, RJ45 connector	Connection to RM-200M, RM-200X or RM-200XF by way of dedicated cable
Finish	ABS resin, bluish gray	ABS resin, bluish grey (PANTONE 538 or its equivalent)
Dimensions (W x H x D)	190 x 76.5 x 215 mm (Gooseneck microphone excluded)	110 x 76.5 x 215 mm
Weight	750 g	350 g



VX-2000 Series

VX-2000 System



System with Remote Mic and Fireman's Mic

Description

The VX-2000 Series is a versatile voice alarm and public address system that fulfills the requirements of EN 60849 standard for general purpose and emergency broadcasts. It is configured for simple as well as for complex installations. The total system is composed of Amplifiers, Power Supply, Emergency Power Supply, Fireman's Microphone and user-specified number of Remote Microphones.

The most important factor in an emergency system is total reliability. The VX-2000 features include multiple failure detection measures that constantly check components and speaker lines for any faults or abnormalities which are informed via visual and sound indicators. The VX-2000 features a scalable architecture that can be easily expanded as requirements grow. Its fully modular configuration facilitates assembling a system that is ideally optimized for a particular application with specific modules. The VX-2000 offers a high-performance cost-effective solution to any environment's broadcast and public address requirements.

Features

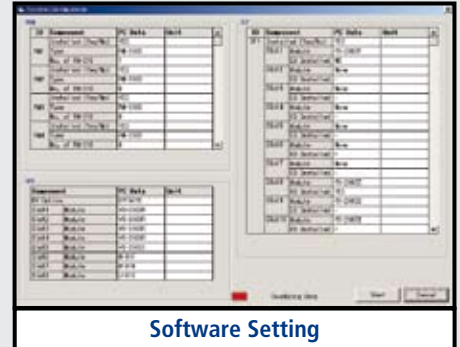
- Full compliance with the EN 60849 standards
- System status can be confirmed on Remote Microphones
- Fireman's Microphone is available
- Simultaneous dual-source pre-recorded message broadcasts
- Convenient multi-language configuration
- Continuous non-interruptive surveillance, even during broadcast

Applications

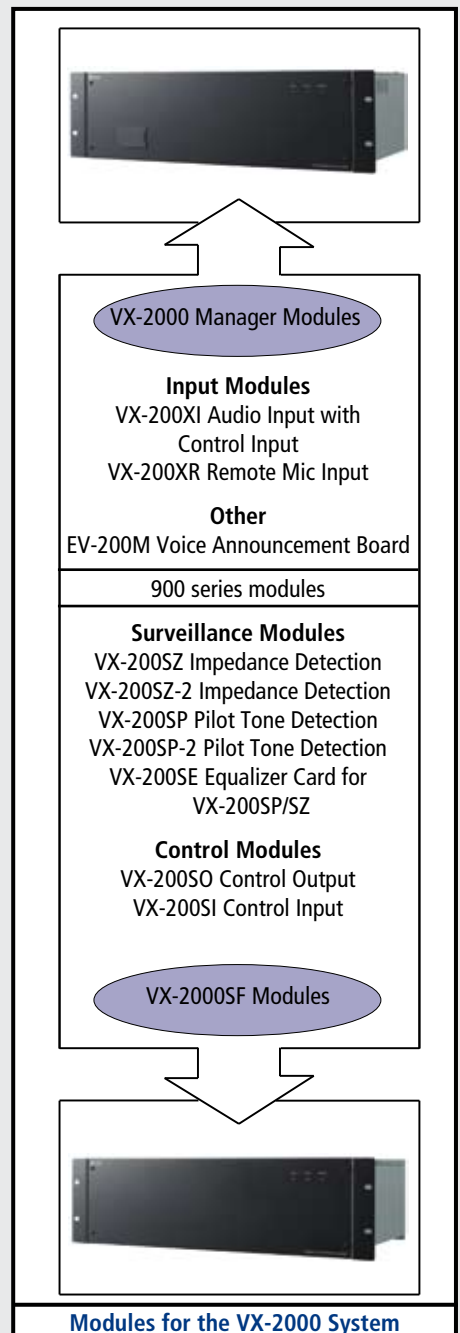
Public buildings for example schools, train stations, shopping malls or administrative buildings which need to fulfill the demanding requirements of emergency evacuation according to EN 60849 as well as standard PA requirements

Options

- EV-200M: Voice announcement board
- IT-450: Input transformer (600 Ohm)



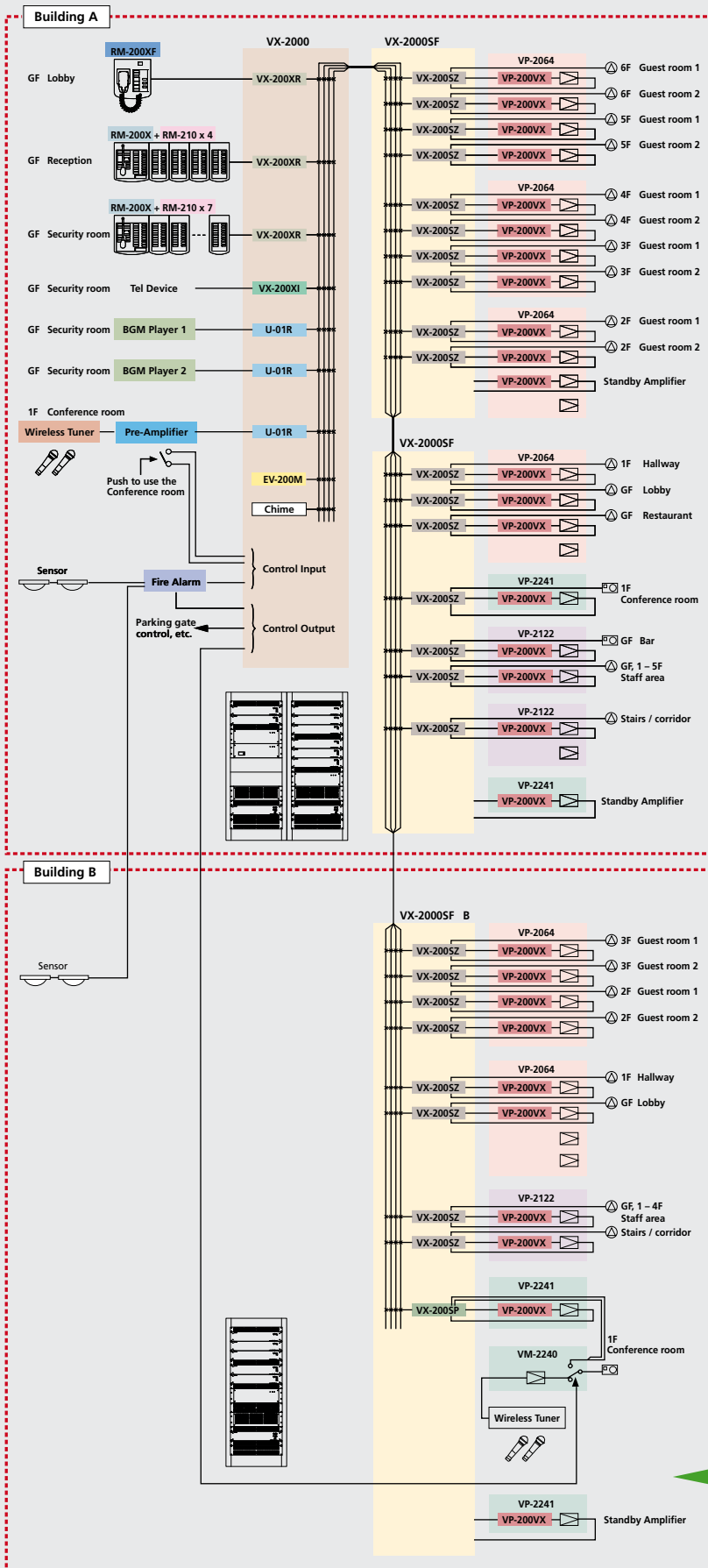
Software Setting



Modules for the VX-2000 System

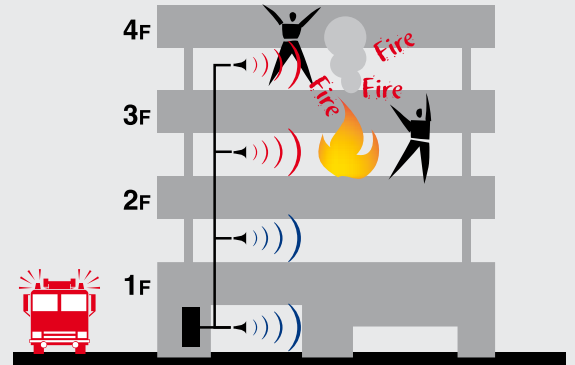


VX-2000 Series



System Configuration

Using the input matrix VX-2000 (System Manager) and the output matrix VX-2000SF (Surveillance Frame)



Automatic dual broadcasting

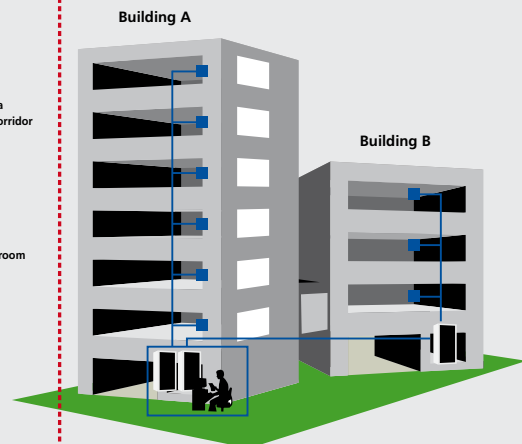
When activated by a remote microphone or fire detection system link, simultaneous dual broadcasting is possible by using 2 voice announcement cards to allow different messages* to be available at the same time such as alert and evacuation messages

*A maximum of 4 broadcasts are simultaneously possible

Simultaneous Dual Broadcast Example
(2 EV-200M voice announcement boards installed in the VX-2000)

■ Red)) In an emergency the system automatically broadcasts an evacuation message to the building's 3rd and 4th floors

■ Blue)) Along with the evacuation message the system automatically broadcasts an alert message to the 1st and 2nd floor simultaneously



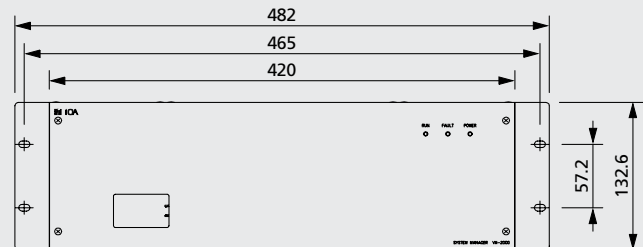


VX-2000 Series

System Manager



Rear View



Features

- Input matrix unit that assigns input signals to 4 audio buses
- Central manager of the VX-2000 System
- Up to 8 units of the VX-200XI, VX-200XR, and 900 Series input modules can be mounted into the System Manager
- The VX-2000 controls audio signal routing, priorities, and peripheral equipment
- Input and output control settings are performed by way of a PC software
- Up to 2000 system events and failures can be logged with a PC, and the log can be viewed

Options

- VX-200XR: Remote Mic Input Module
- VX-200XI: Audio / Control Input Module
- 900 series plug-in modules:
 M-01F, U-01F, U-01R, U-03R
 (M-01M, M-01P, M-03P, M-51F, M-61F, U-01P, U-03S, U-61S, S-20S non-RoHS products)

Specifications

	VX-2000
Power Source	24 V DC (operating range: 20 – 40V DC)
Current consumption	Under 650 mA (20 V DC)
Input	-20 dBV, unbalanced
Number of module slots	8
Audio Link Output	Number of audio buses: 4, 0 dBV, electronically balanced, RJ45 female connector
Monitor Output	0 dBV, electronically balanced, XLR receptacle (3 pins)
Frequency Response	20 – 20000 Hz
S/N Ratio	> 60 dB
Distortion	< 0.5 %
Cross Talk	< -60 dB (1 kHz, 0 dB)
Control Input	16 inputs, RJ45 connector x 2
Control Output	16 outputs, RJ45 connector x 2
Chime Tone	Built-in chime: 4-tone chime (up)/4-tone chime (down)/2-tone chime/Gong
Communication System	PC (setting software to be installed): D-sub connector (9 pins), cross cable, RS-232C, VX-2000SF: RJ45 connector, twisted-pair straight cable (TIA/EIA-568A standard), LONWORKS RS-485
Operating Temperature	0° C to +40° C
Finish	Panel: Surface-treated steel plate, black, 30 % gloss, paint
Dimensions (W x H x D)	482 x 132.6 x 337 mm
Weight	6.4 kg

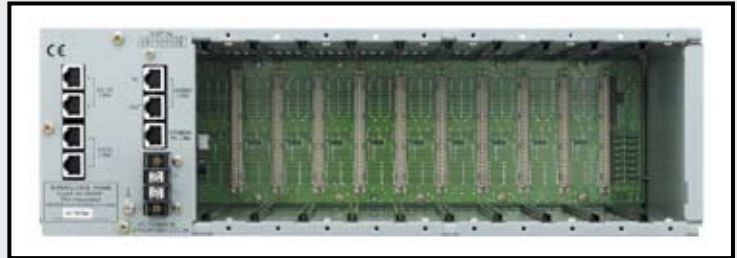


VX-2000 Series

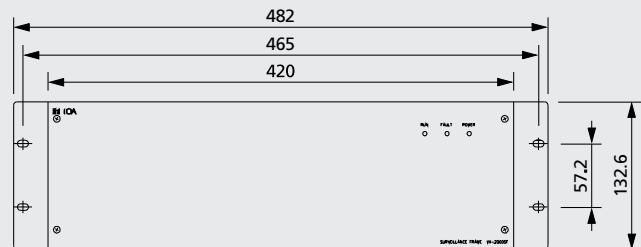
Surveillance Frame



VX-2000SF



Rear View



Features

- Surveillance Frame is the output matrix of the VX-2000 system
- A total of 10 units of output modules and control modules can be installed
- Assigns audio signals to individual zones from 4 audio buses
- Up to 5 units per system
- Rack-mountable, 3 units height
- 1 standby amplifier per VX-2000SF
- In case of power amplifier failure, output is automatically switched to the standby amplifier
- Output volume setting with PC system software
- 6 types of modules can be inserted

Options

- Pilot Tone Detection Modules: VX-200SP-2, VX-200SP
- Impedance Detection Modules: VX-200SZ, VX-200SZ-2
- VX-200SI: Control Input Module
- VX-200SO: Control Output Module

Specifications

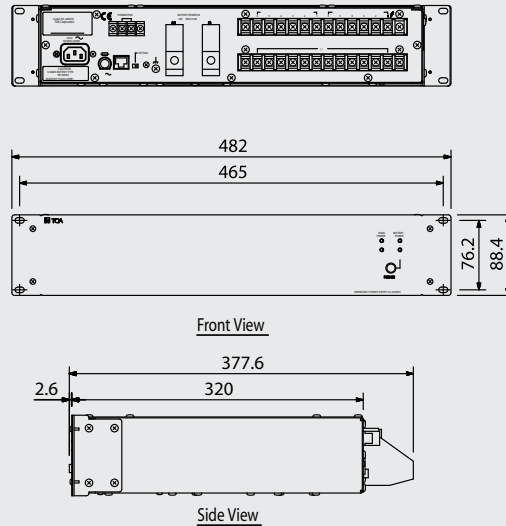
	VX-2000SF
Power Source	24 V DC (operating range: 20 – 40V DC)
Current Consumption	Under 2 A (40V DC)
Number of Module Slot	10, usable modules: VX-200SZ, VX-200SP, VX-200SI, VX-200SO
Frequency Response	20 Hz ... 20000 Hz (when use VX-200SZ: 120 Hz ... 20000 Hz)
S/N Ratio	> 60 dB
Distortion	< 0.5 %
Cross Talk	< -60 dB (1 kHz, 0 dBV)
Audio Link Input/Output	Number of audio buses: 4, 0 dBV, electronically balanced, RJ45 connector
Standby Amplifier Link	RJ45 female connector for connecting the VP-2064, VP-2122, VP-2241, VP-2421 Power Amplifier.
Communication System	VX-2000, VX-2000SF: RJ45 female connector x 2, LONWORKS RS-485 VX-2000DS; RJ45 connector x 2
Operating Temperature	0° C to +40° C
Finish	Panel: Surface-treated steel plate, black, 30% gloss, paint
Dimensions (W x H x D)	482 x 132.6 x 337 mm
Weight	5.6 kg
Accessory	Pre-installed rack mounting bracket (pre-installed on the unit), blank panel x 9, standby amp. cable (3m) x 1



VX-2000 Series



Emergency and Standard Power Supply



Features

- Supplies the DC power to each component in the VX-2000 system by connecting the VX-200PS Power Supply Unit
- Continuous surveillance and charging of batteries (2 x 12 V, sealed lead batteries)
- Temperature-based compensation of charging voltage
- Automatic switchover to backup battery in case of AC mains failure
- EN 54-4 certified
Certificate No : 1134-CPD-083

Specifications

	VX-2000DS
Power Source	230 V AC, 50/60 Hz
Power Consumption	240 W max.
Battery	24V (12V x 2)*
Charging Method	Trickle charging
Charging Current	5 A max
Charging Output Voltage	27.3 V \pm 0.3 V (at 25°C) Temperature correction coefficient: -40 mV/°C
Power Supply Input	6 M4 screw terminal, distance between barriers: 11 mm
DC Power Output	6 (25 A max. each) M4 screw terminal, distance between barriers: 11 mm
Control Connector	RJ45 female connector for connecting the VX-2000SF. Twisted-pair straight cable (TIA/EIA-568A standard) Type of control signal: Battery check, AC power status, DC power status, charging circuit failure, and battery failure
Battery Connection	1 pair of positive and negative terminals, applicable cable diameter: AWG 6 – AWG 1/0
Operating Temperature	0°C to +40°C
Finish	Panel: Surface-treated steel plate, black, 30% gloss, paint
Dimensions (W x H x D)	482 x 88.4 x 377.6 mm
Weight	10.5 kg

*We recommend Panasonic LC-X1265PG / APG(65 Ah)

VX-2000 Series



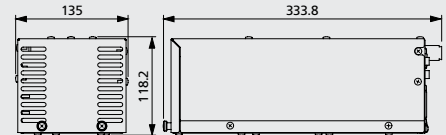
Power Supply



Features

- Up to 3 VX-200PS Power Supply units can be mounted in the VX-2000PF Power Supply Frame
- 2 DC output channels per unit
- EN 54-4 certified.
Certificate No : 1134-CPD-083

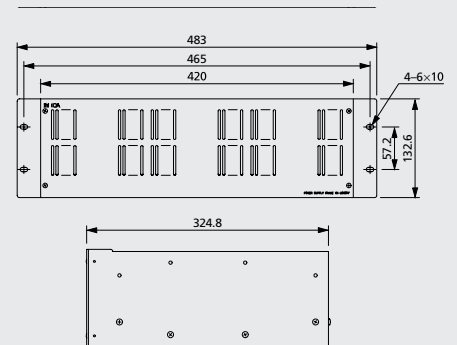
Dimensions



Features

- VX-2000PF frame for rack mounting of up to 3 VX-200PS Power Supply Units
- EN 54-4 certified.
Certificate No : 1134-CPD-083

Dimensions



Specifications

	VX-200PS	VX-2000PF
Power Source	230 V AC, 50/60 Hz	-
Power Consumption	580 W	-
PS OUT	Rated output: 210 W (29 V, 7.25 A) x 2, Peak output: 400 W x 2, M4 screw terminal	-
Operating Temperature	0° to +40°C	-
Finish	Surface-treated steel plate	Panel: Surface-treated steel plate, black, 30 % gloss, paint
Dimensions (W x H x D)	135 x 118.2 x 333.8 mm	483 x 132.6 x 324.8 mm
Weight	13.2 kg	5.5 kg
Product Composition	Fuse (T3.15A L) x 1, Power cable x 1	Side panel x 2, Chassis x 1, Front panel x 1
Accessory	-	Rack mounting screw x 4, Fiber washer x 4
Usable Unit	-	VX-200PS (up to 3)



VX-2000 Series

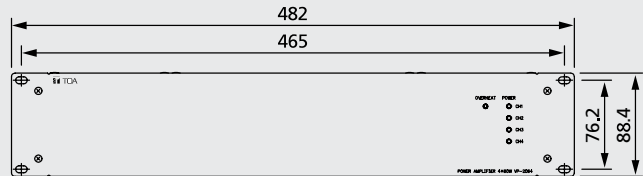
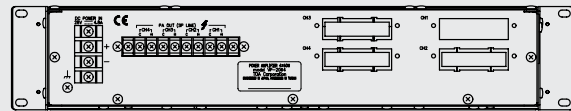
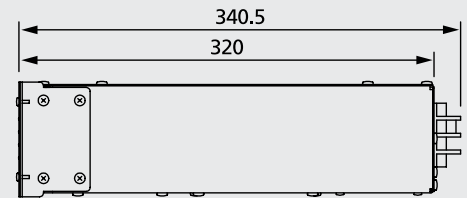
Power Amplifiers



VP-2064/VP-2122/VP-2241/VP-2421



VP-200VX



Features

- 4 different power configurations:
 - 60 W x 4 Channels (VP-2064)
 - 120 W x 2 Channels (VP-2122)
 - 240 W x 1 Channel (VP-2241)
 - 420 W x 1 Channel (VP-2421)
- Usable as program, priority and as standby amplifier for emergency switchover
- Power Amplifier uses 1 VP-200VX Power Amplifier Input Module per channel
- Programmable power amplifier standby function maximizes battery-powered operation time

Options

- VP-200VX: Amplifier Input Module
- VP-200VX-BGM: Amplifier Input Module with additional input for BGM

Specifications

	VP-2064	VP-2122	VP-2241	VP-2421
Type	Power Amplifier 4 x 60 W	Power Amplifier 2 x 120 W	Power Amplifier 1 x 240W	Power Amplifier 1 x 420 W
Power Source	28 V DC (operating range: 20 to 40 V DC) M4 screw terminal, distance between barriers: 12 mm	28 V DC (operating range: 20 to 40 V DC) M4 screw terminal, distance between barriers: 12 mm	28 V DC (operating range: 20 to 40 V DC) M4 screw terminal, distance between barriers: 12 mm	28 V DC (operating range: 20 to 40 V DC) M4 screw terminal, distance between barriers: 12 mm
Current Consumption (EN60065)	4.8 A in total	4.8 A in total	4.8 A	7.6 A
Rated Output Power	60 W x 4	120 W x 2	240 W	420 W
Output Voltage/Impedance	100 V/167 Ohm, 70 V/83 Ohm, 50 V/41 Ohm (selectable by the internal wiring change)	100 V/83 Ohm, 70 V/41 Ohm, 50 V/21 Ohm (selectable by the internal wiring change)	100 V/41 Ohm, 70 V/21 Ohm, 50 V/10 Ohm (selectable by the internal wiring change)	100 V/24 Ohm, 70 V/12 Ohm, 50 V/6 Ohm (selectable by the internal wiring change)
Number of Channels	4	2	1	1
Input	Specified by input module VP-200VX	Specified by input module VP-200VX	Specified by input module VP-200VX	Specified by input module VP-200VX
Number of Module Slots	4, usable module: VP-200VX	2, usable module: VP-200VX	1, usable module: VP-200VX	1, usable module: VP-200VX
Output	Power amplifier output (speaker line): M3.5 screw terminal	Power amplifier output (speaker line): M3.5 screw terminal	Power amplifier output (speaker line): M3.5 screw terminal	Power amplifier output (speaker line): M3.5 screw terminal
Frequency Response	40 to 16,000 Hz, ± 3 dB (at 1/3 rated output)	40 to 16,000 Hz, ± 3 dB (at 1/3 rated output)	40 to 16,000 Hz, ± 3 dB (at 1/3 rated output)	40 to 16,000 Hz, ± 3 dB (at 1/3 rated output)
Distortion	< 1% (at rated output, 1kHz)	< 1% (at rated output, 1kHz)	< 1% (at rated output, 1kHz)	< 1% (at rated output, 1kHz)
S/N Ratio	> 80 dB	> 80 dB	> 80 dB	> 80 dB
Panel Indicator	Channel power indicator: 4 channels, dual colour LED Overheat indicator: Yellow LED	Channel power indicator: 2 channels, dual colour LED Overheat indicator: Yellow LED	Channel power indicator: 1 channel, dual colour LED Overheat indicator: Yellow LED	Channel power indicator: 1 channel, dual colour LED Overheat indicator: Yellow LED
Operating Temperature	0° ... +40°C	0° ... +40°C	0° ... +40°C	0° ... +40°C
Finish	Panel: Surface-treated steel plate, black, 30% gloss, paint	Panel: Surface-treated steel plate, black, 30% gloss, paint	Panel: Surface-treated steel plate, black, 30% gloss, paint	Panel: Surface-treated steel plate, black, 30% gloss, paint
Dimensions (W x H x D)	482 x 88.4 x 340.5 mm	482 x 88.4 x 340.5 mm	482 x 88.4 x 340.5 mm	482 x 88.4 x 340.5 mm
Weight	11.2 kg	9.1 kg	8.1 kg	9.5 kg
Accessory	Rack mounting screw x 4, Fiber washer x 4	Rack mounting screw x 4, Fiber washer x 4	Rack mounting screw x 4, Fiber washer x 4	Rack mounting screw x 4, Fiber washer x 4

VX-2000 Series



Fireman's Remote Microphone



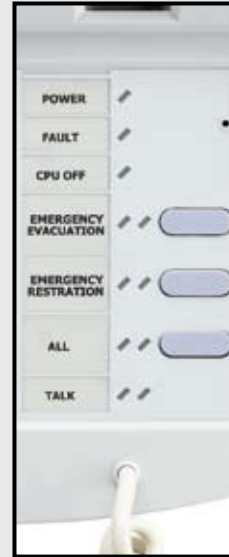
RM-200XF



Alarm-Switch



Microphone



Function Keys



RM-210

Features

- Special microphone for fireman's use
- For emergency broadcast and general purpose broadcast applications
- Push-button zone selection
- PC-programmable system software allows assignment of functions to the individual keys (each with 2 LED)
- Each RM-200XF handles up to 10 extensions of RM-210
- Up to 4 Fireman's microphones per 1 system
- CPU OFF switch for emergency broadcast to all zones even in case of a CPU error
- Automatic failure detection of emergency keys and in the signal path (control and audio signals) between microphone (including microphone element) and system manager

Options

- RM-210: Extension Unit
- YC-301: Back box
- YS-11A: Back box
- WB-RM200: Wall-mounting bracket for RM-200XF, RM-200X, RM-200M and RM-210

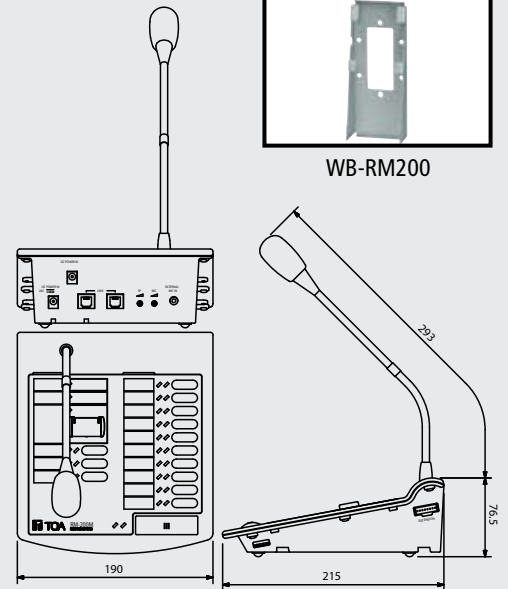
Specifications

	RM-200XF
Power Source	24 V DC (operating range: 16 – 40 V DC)
Current Consumption	Under 200 mA (RM-200XF), 850 mA (with 10 RM-210s connected)
Audio Output	0 dBV, 600 Ohm, balanced
Hand-Held Microphone	Dynamic microphone, function switch (default: press-to-talk), microphone element fault detection
Frequency Response	200 – 15,000 Hz
S/N Ratio	> 55 dB
Functions	Internal monitor speaker 200 mW/Volume control; microphone, monitor speaker
Number of Function Keys	5 (including hand-held microphone's switch), extendable up to 105 (with 10 RM-210s connected)
Key Extension	10 keys extension per RM-210, EXTENSION connector
Number of Connectable Units	4
Communication System	LONWORKS twisted pair free topology transceiver
Connection Cable and Connector	Category 5 STP cable, plug-in screw connector
Communication Distance	500 m (Free topology wiring)
Finish	ABS resin, bluish grey (PANTONE 538 or equivalent)
Dimensions (W x H x D)	200 x 215 x 82.5 mm (excluding the coiled cord)
Weight	1.2 kg



VX-2000 Series

Remote Microphone



Features

- RM-200X: System remote microphone
- For both emergency and general purpose broadcasts
- Zone, group and all-call paging, and starting pre-recorded messages
- PC-programmable system software permits desired functions to be assigned to individual function keys (equipped with 2 LED indicators)
- Up to 8 units of RM-200X and RM-200XF units can be connected within one system

Features

- RM-210: Key extension unit
- 10 additional keys
- Up to 9 RM-210 Remote Microphone Extension units can be used with each RM-200X Remote Microphone

Options

- WB-RM200: Wall mounting bracket for RM-200X, RM-200XF and RM-210
- WH-4000A: Headset

Specifications

	RM-200X	RM-210
Power Source	24 V DC (operating range: 16 – 40 V DC), supplied from RJ45 connector or power input jack (non-polarity type)	From RM-200X/MXF
Current Consumption	Under 200 mA (RM-200X), 750 mA (with 9 RM-210s connected)	20 mA max. (in terms of DC power inputs of RM-200X and RM-200XF)
Audio Output	0 dBV, 600 Ohm, balanced, RJ45 connector	-
External Microphone Input	-40 dB, 2.2 kΩ, unbalanced, mini jack, phantom powering	-
Distortion	<1 %	-
Frequency Response	100 ... 20000 Hz	-
S/N Ratio	> 60 dB	-
Internal Monitor Speaker	200 mW	-
Volume Control	Microphone volume control, Monitor speaker volume control	-
Number of Function Keys	15, extendable up to 105 (with 9 RM-210s connected, 10 keys each)	10
Number of Connectable Units	8 (including RM-200XF)	-
Communication	System: LONWORKS twisted pair free topology transceiver, Distance: max. 500 m (Free topology wiring)	-
Connection Cable and Connector	Category 5 STP cable, RJ45 connector	Connection to RM-200M, RM-200X or RM-200XF by way of dedicated cable
Finish	ABS resin, bluish grey (PANTONE 538 or its equivalent)	ABS resin, bluish grey (PANTONE 538 or its equivalent)
Dimensions (W x H x D)	190 x 76.5 x 215 mm (gooseneck microphone excluded)	110 x 76.5 x 215 mm
Weight	850 g	350 g



VX-2000 Series

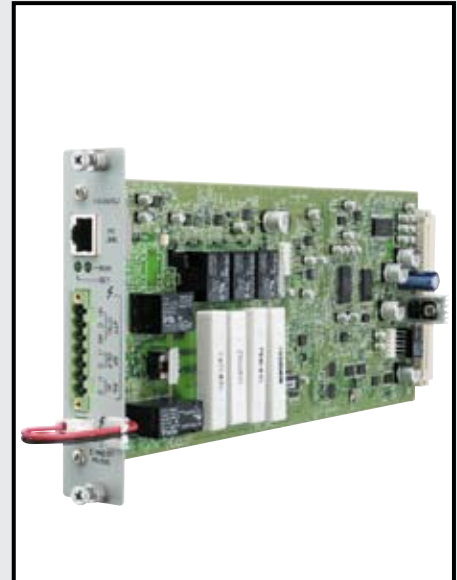
Modules



VX-200XI (For VX-2000)



VX-200XR (For VX-2000)



VX-200SZ (For VX-2000SF)

Features

- Audio Input Module with Control Input
- Control input terminals
- Low-cut and high-cut filters
- Gain controls
- Connects e.g. to paging microphone or other sound source equipment with both audio and control outputs
- Audio input sensitivity -70 dB or -20 dB by internal switch
- For VX-2000 frame's input module slot

Features

- Remote Microphone Input Module for RM-200X Remote Microphone or RM-200XF Fireman's Microphone
- For VX-2000 frame's input module slot

Features

- Audio output module with impedance detection
- Speaker line impedance detection
- For VX-2000SF Surveillance Frame
- Detection of speaker line short circuits, open circuits by comparing impedance values, and ground fault

Specifications

	VX-200XI	VX-200XR
Power Source	Supplied from VX-2000	Supplied from VX-2000
Current Consumption	Under 30 mA	Under 17 mA
Connectable Microphones	–	RM-200X and RM-200XF
Input Sensitivity	MIC: -70 to -42.5 dBV LINE: -20 to $+7.5$ dBV MIC or LINE with selector switch	
Control Input	No-voltage make contact, open voltage: 17 V DC, short circuit current: Under 5 mA	–
Input Connector	RJ45 female connector	RJ45 female connector
Finish	Panel: Aluminium, hairline	Panel: Aluminium, hairline
Dimensions (W x H x D)	35 x 78 x 88 mm	35 x 78 x 88 mm
Weight	70 g	70 g
Applicable Model	VX-2000	VX-2000

	VX-200SZ	VX-200SZ-2 (s. next page)
Power Source	Supplied from VX-2000SF	Supplied from VX-2000SF
Current Consumption	Under 150 mA	Under 170 mA
Speaker Output	Plug-in screw connector	2 outputs (A, B), plug-in screw connector
Power Amplifier Input	Plug-in screw connector for connecting the VP-2064, VP-2122, VP-2241, VP-2421 power amplifier	
Fault Detection System	Short circuit, open circuit (impedance detection method), ground fault	
Finish	Panel: Surface-treated steel plate	
Dimensions (W x H x D)	30.5 x 132.6 x 290.3 mm	
Weight	320 g	335 g
Applicable Model	VX-2000SF	VX-2000SF

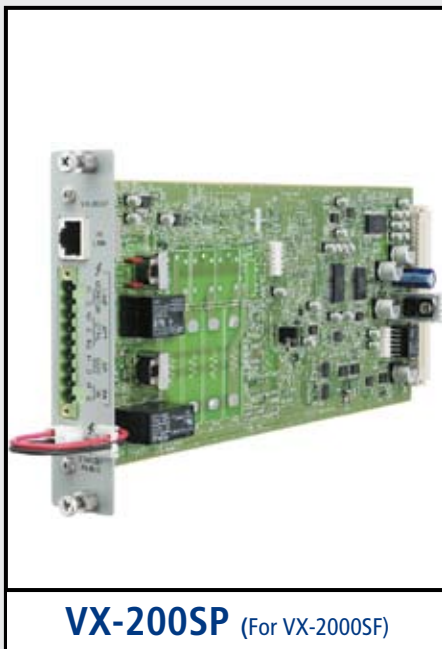


VX-2000 Series

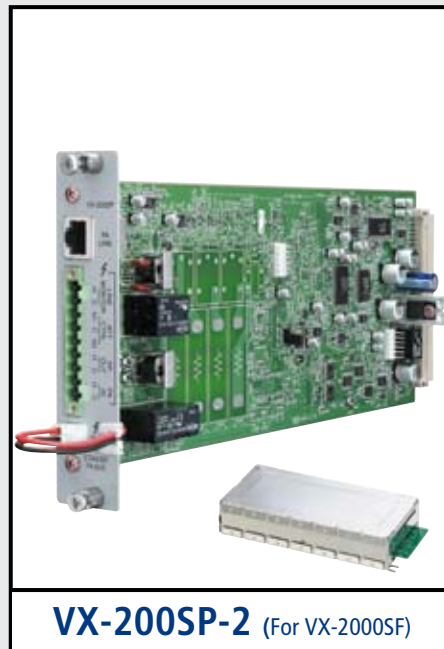
Modules



VX-200SZ-2 (For VX-2000SF)



VX-200SP (For VX-2000SF)



VX-200SP-2 (For VX-2000SF)

Features

- Audio Output Module with Impedance Detection
- 2 speaker outputs (A and B), broadcasts can be maintained even if 1 of the 2 outputs fails
- Failures indication by LED on the panel

Features

- Audio Output Module with Pilot Tone Detection
- For speaker line monitoring
- Detection of speaker line short circuits, open circuits by monitoring for the presence of a pilot signal, and ground fault

Features

- Consists of Audio Output Module with Pilot Tone Detection + End of Line Module
- Connected to the end of the speaker line
- Eliminates the necessity of using the speaker line for line monitoring
- Shielded cable must be used for the speaker line

Specifications

	VX-200SP	VX-200SP-2
Power Source	Supplied from VX-2000SF	Supplied from VX-2000SF
Current Consumption	Under 100 mA	Under 100 mA
Power Amplifier Link	RJ45 female connector for connecting the VP-2064, VP-2122, VP-2241, VP-2421 Power Amplifier.	
Line Monitor	Plug-in screw connector	Plug-in screw connector
External Attenuator	Plug-in screw connector, relay, no-voltage make contact output	Plug-in screw connector, relay, no-voltage make contact output
Control Output	Transfer type, withstand voltage: 30 V DC, 250 V AC, contact current: Under 7A	Transfer type, withstand voltage: 30 V DC, 250 V AC, contact current: Under 7A
Speaker Output	Plug-in screw connector	Plug-in screw connector
Power Amplifier Input	Plug-in screw connector for connecting the VP-2064, VP-2122, VP-2241, VP-2421 Power Amplifier	
Fault Detection System	Short circuit, open circuit (pilot tone detection method), ground fault	Short circuit, open circuit (pilot tone detection method), ground fault
Finish	Panel: Surface-treated steel plate	
Dimensions (W x H x D)	30.5 x 132.6 x 290.3 mm	30.5 x 132.6 x 290.3 mm
Weight	240 g	235 g
Applicable Model	VX-2000SF	VX-2000SF
End Of Line Unit (Accessory)	-	Power supplied from the VX-200SP-2, speaker line connection: Plug-in connector, weight: 22 g

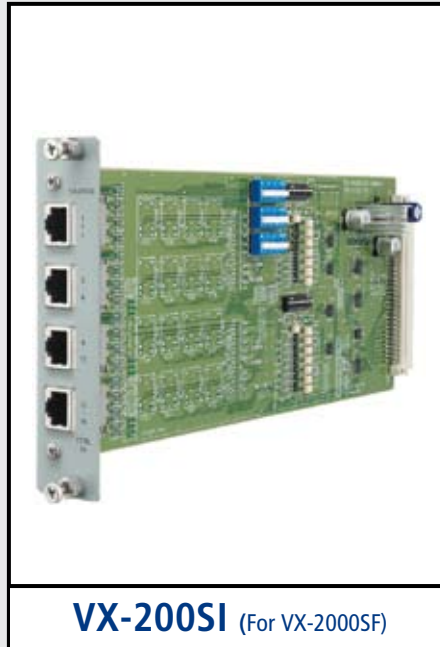


VX-2000 Series

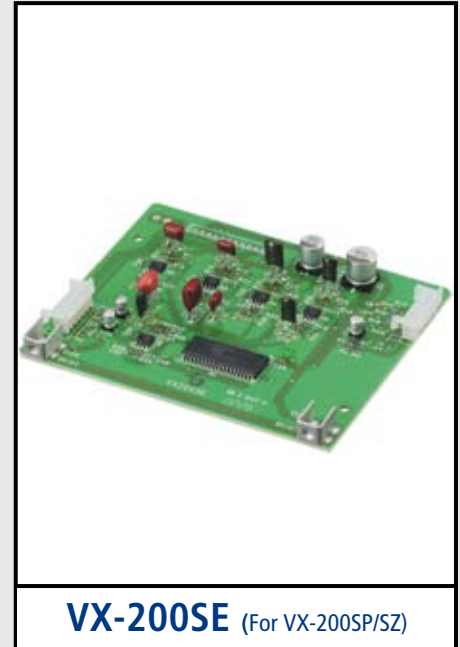
Modules



VX-200SO (For VX-2000SF)



VX-200SI (For VX-2000SF)



VX-200SE (For VX-2000SP/SZ)

Features

- Control Output Module
- Increases the number of control outputs in the VX-2000 system
- 16 control outputs
- No-voltage “make” contacts can be output to external equipment depending on the internal event
- Up to 128 control outputs per system

Features

- Control Input Module
- Increases the number of control inputs
- 16 control inputs
- Receives a contact signal from connected external equipment and controls the system
- Up to 128 control inputs per system

Features

- Equalizer Card
- 9-band, 1-channel equalizer
- To be mounted on the circuit board of VX-200SP Pilot Tone Detection module
- VX-200SP-2 Pilot Tone Detection module
- VX-200SZ Impedance Detection module
- VX-200SZ-2 Impedance Detection module
- Settings are performed by using the VX-2000 setting software

Specifications

	VX-200SO	VX-200SI	VX-200SE
Power Source	Supplied from VX-2000SF	Supplied from VX-2000SF	Supplied from VX-2000SZ/ SZ2, VX-2000SP/ SP2
Current Consumption	<150 mA	< 100 mA	< 50 mA
Equalizer Centre Frequency	–	–	80 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 12 kHz
Gain Range	–	–	±12 dB, adjustable in 2 dB steps
Control Output	16 outputs, no-voltage make contact, contact capacity: 28 V DC, 1A, RJ45 connector	16 inputs, no-voltage make contact, open voltage: 24 V DC, short circuit current: under 10mA, RJ45 connector	–
Finish	Panel: Surface-treated steel plate	Panel: Surface-treated steel plate	
Dimensions (W x H x D)	30.5 x 132.6 x 290.3 mm	30.5 x 132.6 x 290.3 mm	110 x 90 x 21.4 mm
Weight	250 g	200 g	50 g
Applicable Model	VX-2000SF	VX-2000SF	VX-2000SZ, VX2000SZ2, VX-2000SP, VX-2000SP2



VX-2000 Series

Modules



VP-200VX (For VP-2000 Amps)



VP-200VX BGM (For VP-2000 Amps)



EV-200M (For VX-2000)

Features

- Power Amplifier Input Module
- For transmission of status and audio signal between amplifier and control module
- To be built-in in the VP-2064, VP-2122, VP-2241 or VP-2421 power amplifier

Features

- Power Amplifier BGM Input Module
- For mixing the audio signal of the VX-2000 system with an audio signal of an external input

Features

- Voice Announcement Board for playback
- Up to 2 modules for a VX-2000 system
- Up to 8 programs
- Includes compact memory flash card (128MB)

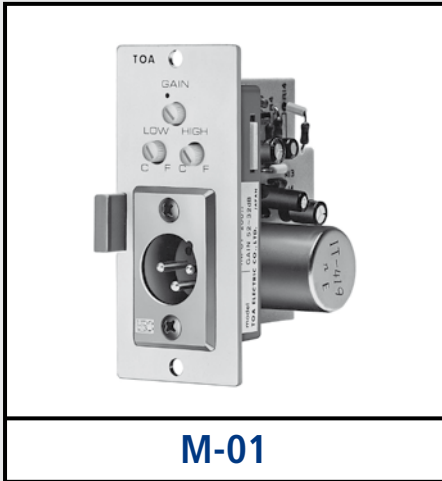
Specifications

	VP-200VX	EV-200M
Power Source	Supplied from VP-2064, VP-2122, VP-2241 or VP-2421	24 V DC, 0.2 A
Power Consumption	< 30 mA	5 W
Output	—	0 dBV
Frequency Response	—	20 Hz ... 20000 Hz (44.1 kHz sampling)
Power Amplifier Link	RJ45 connector for connecting the VX-2005P/SP2 or VX-2005Z/SZ2 audio output module	—
Distortion	—	Under 0.3% (44.1 kHz, recording method: Extremely high)
Playback Mode	—	Single source playback
No. of Playback Program	—	8 programs
Operating Temperature	—	0°C to +50°C
Finish	Panel: Surface-treated steel plate	—
Dimensions (W x H x D)	88 x 25.8 x 83.2 mm	120 x 18.6 x 121 mm
Weight	50 g	110 g
Applicable Model	VP-2064, VP-2122, VP-2241, VP-2421	VX-2000



VX-2000 Series

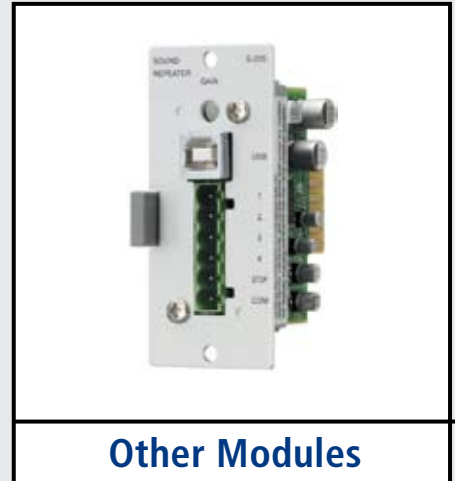
Accessory Modules



M-01



M-51



Other Modules

Features

- Microphone input module
- Phantom power
- Balanced, low impedance
- Filter: High pass, low pass
- Connector:
M-01M: XLR
M-01P: 1/4" phone plug
M-01S: Screw terminal
- Non-RoHS product

Features

- Microphone input module
- Phantom power
- Balanced, low impedance
- Filter: High pass, low pass
- Voice gate function, sensitivity adjustable
- Connector:
M-51F: XLR
M-51S: Screw terminal
- Non-RoHS product

Features

- U-03R Module
Input (for VX-2000)
- U-01F Module
Aux input (for VX-2000)
- U-01S Module
Input (for VX-2000)
- S-20S
Voice Announcement Board (for VX-2000SF)
Non-RoHS product

Specifications

	M-01	M-51	U-01	U-03
Input Impedance	200 Ohm, balanced	200 Ohm, balanced	220 kOhm, unbalanced	220 kOhm, unbalanced
Current Consumption	9 mA	27 mA	—	< 8 mA
Sensitivity	-60 dBV	-60 dBV	-20 dBV	-20 dBV
Frequency range	25 Hz ... 20000 Hz	25 Hz ... 20000 Hz	20 Hz ... 20000 Hz	20 Hz ... 20000 Hz
Finish	Front: Steel plate	Front: Steel plate	Front: Steel plate	Front: Steel plate
Dimensions (W x H x D)	35 x 78 x 88 mm	35 x 78 x 88 mm	35 x 78 x 88 mm	35 x 78 x 88 mm
Weight	110 g	110 g	75 g	50 g
Applicable Model	VX-2000	VX-2000	VX-2000	VX-2000



SX-2000 Series

Network Audio Management System for large-scale system installations



SX-2000 Series

Description

The SX-2000 is a scalable system used for versatile and highly effective PA systems. The system features new matrixing capabilities, so that a single system can have its components distributed across different locations under centralized control. Ideal for large scale installations ranging from local systems to multiple buildings, the SX-2000 Series is particularly suitable for use in airports, railway stations, factories, shopping malls and large offices. The system's redundancy such as dual power source and system connections enables fail-safe operation. At the same time it is a cost-effective solution for any specific installation without long lead times and the expense of custom systems.

SX-2000 system configuration

The basic system comprises one SX-2100AI Audio Input Unit, one SX-2000AO or SX-2100AO Audio Output Unit and the SX-2000SM System Manager. It enables from 4 inputs/outputs right

up to 64 inputs and 256 outputs, with further expansion to 1416 control inputs/outputs if needed. The SX-2000 Series makes it simple to control an expanded system by use of networking with standard switching hubs and cables, IP Intercom Network audio adaptor(s) can also be used in the same network. It features functions such as feedback suppressor, compressor/auto-leveler, equalizer/filters, and auto mixing (with ducker) to ensure high sound quality. The SX-2100AI modular construction simplifies system configuration as it reduces use of plug-in modules. Therefore it allows flexibility of use with a wide range of input devices such as CD player, FM etc. to suit any particular application.

Fail-safe operation

The system features a self-surveillance to continuously monitor its status as well as speaker lines and connections. It generates alerts and email notifications to the system administrator along

with a failure log. Power failure protection is provided by two power supply channels plus a battery back-up which keeps the system operational without requiring an UPS. An additional analog backup line from the microphone to the amplifier allows simultaneous broadcasting even during a breakdown of the system's digital functions. The SX-2000 system can be password-protected and front keys can be locked.

Operational simplicity and easy maintenance

Control over the entire system is software-driven. Operation tasks are performed easily through menu and function buttons assisted by an LCD and status LEDs. Operation and maintenance tasks are easier compared to conventional systems.



SX-2000 Series

System Manager



SX-2000SM

Features

- Matrix system for Public Address and Voice Alarm
- Audio signal routing and priority control
- 8 control inputs, 8 control outputs
- Failure status outputs, failure data inputs/ switches
- Access indicators, mode indicators and failure indicators enabling a wide range of controls and status monitoring
- CF card slot
- Operations can be recorded on a CF card
- Redundant power system
- Automatic voice announcement for emergency purpose available
- System settings via LAN connection

Options

- VP-2064: 60 W by 4 channels amplifier
- VP-2122: 120 W by 2 channels amplifier
- VP-2241: 240 W by 1 channel amplifier
- VP-2421: 420 W by 1 channel amplifier
- VX-2000DS: Emergency Power Supply
- VX-200PS: Power Supply Unit
- VX-2000PF: Power Supply Frame
- DA-250FH: Multichannel Power Amplifier

Specifications

	SX-2000SM
Power Source	24 V DC; 2 power inputs
Current Consumption	Under 0.8 A
SX Link Network I/F	2 100BASE-TX circuits
Matrix System Specification	Bus: 16; audio input: Max. 64 ch, audio output: Max. 256 zones Contact input, contact output: Max. 1416 Priority control: 512 steps. Event log: Max. 1000 x 32 events
Matrix System Configuration	Connectable SX-2000AI No.: Max. 8 units. Connectable SX-2100AO No.: Max. 32 units. Connectable RM-200S No.: Max. 64 units (up to 8 RM-200S per SX-2000AI) Connection cable / device shielded category 5 twisted pair cable for LAN (CAT5-STP)
LAN	Network I/F 1 10BASE-T/100BASE-TX circuit. Network Protocol TCP/IP. Connection Cable Shielded Category 5 twisted pair cable for LAN (CAT5-STP)
Analog Link	Input/output connector output: 2. Connection cable shielded category 5 twisted pair cable for LAN (CAT5-STP)
Failure Data	3 inputs (ACK/RESET/LAMP TEST) and 4 outputs (CPU FAULT/GENERAL FAULT/CPU OFF/BUZZER)
Memory Card Slot	1 (supplied CF card (128MB))
Control	8 control outputs, 8 control inputs
Finish	Panel: Aluminium, black, alumite, case: Surface-treated steel plate
Dimensions (W x H x D)	482 x 44 x 333 mm
Weight	3.8 kg



SX-2000 Series

Audio Input Unit



SX-2100AI (front view / rear view)

Features

- Modular audio input unit
- 2 up to 8 inputs per unit
- Multiple units can be decentralized in a whole system
- Audio signals are transmitted digitally to the audio output unit
- Analog audio output function (1 channel) enables simultaneous all-zone calls for use in emergency situations
- Level meters for each input channel

- Volumes can be adjusted for each channel using the volume controls on the front panel or the SX-2000 software
- Volume controls can be locked using the SX-2000 software
- Internal monitoring speaker
- Dual-redundant power supply system

Options

- **SX-200RM**: Remote Microphone Interface Module
- **RM-200SF**: Remote Microphone
- **RM-200SA**: Remote Microphone
- **RM-210**: Extension Unit
- **D-921E**: Mic/Line Input Module
- **D-921F**: Mic/Line Input Module
- **D-922E**: Mic/Line Input Module
- **D-922F**: Mic/Line Input Module
- **D-936R**: Stereo Select Input Module

Specifications

	SX-2100AI
Power Source	24 V DC (2 independant power inputs)
Current Consumption	Under 1.5 A
Audio Input	8 inputs, for up to 4 modules
Audio Input Characteristics	Sampling frequency: 48 kHz
Analog Link Input / Output Connector Connection Cable / Device	1 input, 1 output, CAT5-STP, max. cable length 800m, 2 x RJ45 connector
SX Link Network I/F Connection Cable / Device	2 x 100Base TX CAT5-STP, maximum cable length 100m to hub
Operating Temperature	0°C ... +40°C
Finish	Panel: Aluminium, black, alumite, case: Surface-treated steel plate
Dimensions (W x H x D)	482 x 88.4 x 349 mm
Weight	7.2 kg



SX-2000 Series

System Remote Microphones and Input Modules for SX-2100AI




RM-2005A Remote Microphone

The RM-2005A is a remote microphone designed for TOA's Matrix System. It is equipped with: 13 function switches (which can be used to select individual zones or zone groups), a covered switch, and corresponding indicators.


RM-210 Remote Microphone Extension

The RM-210 is an extension unit for increasing the number of function keys of RM-2005, Remote Microphones.


SX-2100AI (Rear)




SX-200RM
Remote Microphone Interface Module
The SX-200RM is a dedicated remote microphone module for the SX-2000 Series audio input unit and can be used to connect two remote microphones. Input sensitivity can be adjusted.




D-921E
Mic/Line Input Module (24 bits monaural type)
The D-921E is a dedicated 2-channel microphone/line input module designed for use with the SX-2000AI and equipped with removable terminal block type connectors.




D-921F
Mic/Line Input Module (24 bits monaural type)
The D-921F is a dedicated 2-channel microphone/line input module designed for use with the SX-2000AI and equipped with XLR connectors.



D-922E
Mic/Line Input Module (20 bits monaural type)
The D-922E is a dedicated 2-channel microphone/line input module designed for use with the SX-2000AI and equipped with removable terminal block type connectors.



D-922F
Mic/Line Input Module (20 bits monaural type)
The D-922F is a dedicated 2-channel microphone/line input module designed for use with the SX-2000AI and equipped with XLR connectors.



D-936R
Stereo Select Input Module
The D-936R is a dedicated 4 stereo input module designed for use with the SX-2000AI and equipped with standard RCA pin jacks.

SX-2000 Series



Audio Output Unit



SX-2000AO

Features

- Audio output unit
- Multiple units can be decentralised in a system
- 8 audio outputs and 2 inputs can be mixed
- 8 control inputs and 8 control outputs
- Receives audio signals from the audio input unit via LAN
- Analog audio input function (1 channel) enables simultaneous all-zone calls for use in emergency situations
- Level meters for each output channel
- Key lock function for volume controls
- Volumes adjustable for each channel by front volume controls or the SX-2000 software
- The volume controls can be locked by SX-2000 software
- Internal monitoring speaker
- Emergency audio input and 24V emergency cut-off input
- 2 power inputs for dual-redundant power supply system

Options

- **VP-2064:** 60 W by 4 channels amplifier
- **VP-2122:** 120 W by 2 channels amplifier
- **VP-2241:** 240 W by 1 channel amplifier
- **VP-2421:** 420 W by 1 channel amplifier
- **VX-2000DS:** Emergency Power Supply
- **VX-200PS:** Power Supply Unit
- **VX-2000PF:** Power Supply Frame

Specifications

	SX-2000AO
Power Source	24 V DC (operating range: 20 – 40V DC from VX-200PS)
Current Consumption	Under 0.79 A
Audio Output	8 outputs, 0 dB, load: 600 Ohm or more
Audio Output Characteristics	Frequency Response: 20 Hz ... 20000 Hz , sampling frequency 48 kHz, D/A converter 24 bit
Control Input / Control Output	8 inputs / 8 outputs, removable terminal blocks (6 pins)
Emergency Line Input	Emergency signals switched and sent to input 1 (H,C,E) by relay, removable terminal blocks (3 pins)
Emergency-Cutoff 24 V Input	1 input, input current < 5 mA, removable terminal block (2 pins)
Analog Link	1 input, 1 output, connection cable CAT5-STP, max. cable length 800m, 2 x RJ45 connector
SX Link	2 x 100 Base TX with RJ 45 connector. Connection cable CAT5-STP, maximum cable length of 100m to hub
Operating Temperature	0° C ... +40° C
Finish	Panel: Aluminium, black, alumite, case: Surface-treated steel plate
Dimensions (W x H x D)	482 x 88.4 x 349 mm
Weight	6.2 kg



SX-2000 Series

Audio Output Unit



SX-2100AO

Features

- Multiple units can be decentralised in a system
- 8 audio outputs
- 8 control inputs and 8 control outputs
- 1 SX-2000CI Control Input Unit and 1 SX-2000CO Control Output Unit can be connected
- 2 local audio inputs with control inputs
- Emergency switchover to a standby amplifier
- Analog transmission path (1 channel) enables all-zone calls for use in emergency situations
- 2 channels of link connection terminals for connecting 2 VX-2000DS
- 2 inputs can be mixed and output.
- 2 power inputs for redundant power supply
- Level meters for each output channel allow monitoring of audio output levels
- Output volumes adjustable on the front panel
- Internal monitoring speaker
- Key-lock function

Options

- VP-2064: 60 W by 4 channels amplifier
- VP-2122: 120 W by 2 channels amplifier
- VP-2241: 240 W by 1 channel amplifier
- VP-2421: 420 W by 1 channel amplifier
- VX-2000DS: Emergency Power Supply
- VX-200PS: Power Supply Unit
- VX-2000PF: Power Supply Frame

Specifications

	SX-2100AO
Power Source	24 V DC (operating range: 20 – 40V DC from VX-200PS)
Current Consumption	Under 1.2 A
Audio Output	8 outputs, 0 dB, load: 600 Ohm or more
Audio Output Characteristics	Frequency Response: 20 Hz ... 20000 Hz , sampling frequency 48 kHz, D/A converter 24 bit
CI/CO Link	SX-2000CI / SX-2000CO: 1 interface, connection cable CAT5-STP, RJ45 connector
Local Audio Input	2 audio inputs, 0 dB, 10 kOhm, electronically balanced, RJ45 connector Frequency Response: 20 Hz ... 20000 Hz , sampling frequency 48 kHz, D/A converter 24 bit 2 Control inputs Connection cable CAT5-STP,
DS Link	VX-2000DS: 2 interface links, connection cable CAT5-STP, RJ45 connector
Analog Link	1 input, 1 output, connection cable CAT5-STP, RJ45 connector
SX Link	2 x 100 Base TX with RJ 45 connector. Connection cable CAT5-STP
Control Inputs / Outputs	8 / 8
Operating Temperature	0° C to +40° C
Finish	Panel: Aluminium, black, alumite, case: Surface-treated steel plate
Dimensions (W x H x D)	482 x 88.4 x 349 mm
Weight	7.1 kg

SX-2000 Series



Control Input Unit



SX-2000CI

Features

- Decentralised installation possible
- 32 control inputs
- Control input line failure detection
- Front panel LED for line status monitoring
- Supply of stabilized 24 V DC
- 2 independent power inputs
- RJ45 connectors

Options

SX-2100AI Audio Input Unit

Application

Airports, Exhibiton Centres, Event Centres, Hotels

Specifications

	SX-2000CI
Power Source	24 V DC, (operating range: 20 – 40V DC from VX-200PS)
Current Consumption	Under 0.55 A (when operated on 24 V DC)
Control Inputs	32 inputs, no-voltage make contact input, open voltage: 24V DC, short-circuit current: 2mA, photo coupler input, removable terminal block (16 pins)
CI/CO Link	Input: 1 input, output: 1 output, input/output connector : RJ45 connector Connection cable: Shielded category 5 twisted pair cable (CAT5-STP)
Maximum Cable Distance	800 m
Finish	Panel: Aluminium black, alumite, Case: Steel plate
Dimensions (W x H x D)	482 x 44 x 331.5 mm
Weight	3.6 kg



SX-2000 Series

Control Output Unit



SX-2000CO

Features

- Decentralised installation possible
- 32 control outputs
- Control input line failure detection
- Front panel LED for line status monitoring
- Supply of stabilized 24 V DC
- 2 independent power inputs
- RJ45 connectors

Options

SX-2000AO Audio Output Unit

Application

Airports, Exhibiton Centres, Event Centres, Hotels

Specifications

	SX-2000CO
Power Source	24 V DC, (operating range: 20 – 40V DC from VX-200PS)
Current Consumption	Under 0.29A (when operated on 24V DC)
Control Outputs	32 outputs no-voltage make contact output, relay contact output (withstand voltage: 40V DC, control current 2 mA to 300 mA), removable terminal block (16 pins)
CI/CO Link	Input: 1 input, output: 1 output, input/output connector : RJ45 connector Connection cable: Shielded category 5 twisted pair cable (CAT5-STP)
Maximum Cable Distance	800 m
Finish	Panel: Aluminium black, alumite, Case: Steel plate
Dimensions (W x H x D)	482 x 44 x 331.5 mm
Weight	3.6 kg

SX-2000 Series



Remote Microphone Input Module



SX-200RM

Features

- Input Module for mounting in the SX-2100AI
- 2 independent power inputs
- RJ45 connectors
- Input sensitivity separately adjustable

Options

- SX-2100AI: Audio Input Unit
- RM-200SA: Remote Microphone
- RM-200SF: Fireman's Microphone
- RM-210: Microphone Extension

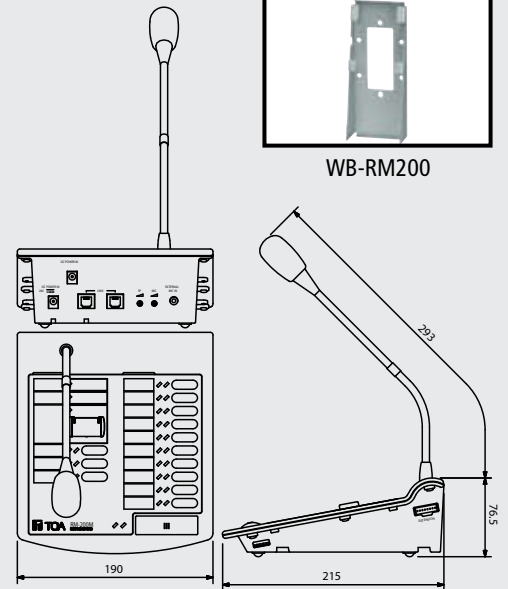
Specifications

	SX-200RM
Power Source	Supplied from SX-2100AI
Input	Monaural x 2, 0 dB (0 dB=0.775V), 10 Ohm, RCA pin jack
A/D Converter	24 bits
Sampling Frequency	48 kHz
Finish	Panel: Pre-coated steel plate, black, 30% gloss
Dimensions (W x H x D)	35 x 119.5 x 178.4 mm
Weight	190 g
Applicable Model	SX-2100AI



SX-2000 Series

Remote Microphone



Features

- Elegant design
- 13 function switches
- Zone, group, all-call paging, and start of pre-recorded messages
- Emergency sequence can be started with the alarm button which is covered by a hinged lid
- Indication of system failure, line failure, busy zones etc.
- Extraordinary clarity and distortion-free reproduction through built-in compression circuit
- Up to 64 remote microphones can be connected
- Covered switch prevents against accidental use
- Up to 800 m total cable length
- RM-210: Keyboard extension with 10 buttons
- Colour: Bluish grey

Options

- SX-200RM: Input Module
- WH-4000A: Headset
- WB-RM200: Wall mounting bracket

Specifications

	RM-200SA	RM-210
Power Requirement	24 V DC (Operating range: 15 – 40 V DC)	From RM-200SA
Current Consumption	290 mA maximum	20 mA max. (in terms of DC power inputs of RM-200SA)
Distortion	< 1%	-
Frequency Response	100 – 20,000 Hz	-
Signal-to-Noise Ratio	> 60 dB	-
Audio Output	0 dBV, 600 Ohm, balanced	-
Microphone	Uni directional electret condenser microphone, AGC	-
Monitor Speaker	Built-in	-
Emergency Broadcast	Activation of emergency broadcast (pre-recorded announcement or live microphone announcement) by emergency broadcast switch	-
Voice Message Control	Activation of 5 messages	-
Key Extension	Max. 4 extensions	10 keys
Connection Cable and Connector	Category 5 STP cable, RJ45 connector	Connection to RM-200SA by way of dedicated cable
Finish	ABS resin, bluish grey	ABS resin, bluish grey (PANTONE 538 or its equivalent)
Dimensions (W x H x D)	190 × 76.5 × 215 mm (Gooseneck microphone excluded)	110 × 76.5 × 215 mm
Weight	880 g	350 g



SX-2000 Series

Fireman's Microphone



RM-200SF



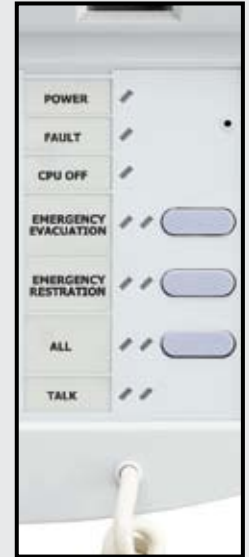
RM-210



Alarm-Switch



Microphone



Function Keys

Features

- Only for emergency broadcasts made by firemen for evacuation
- For activation of emergency mode, start and stop of automatic emergency announcements, reset emergency signals, and live microphone announcements
- CPU OFF switch allows all-zone calls (simultaneous all calls with attenuator override). No general broadcasts can be made.
- The RM-200SF Fireman's Microphone Extension enables zone selection or failure indication/failure reset function.
- Additional 10 function keys per RM-210 extension unit.

Specifications

	RM-200SF
Power Requirement	24 V DC (Operating range: 15 – 40 V DC)
Current Consumption	240 mA maximum
Distortion	< 1%
Frequency Response	200 – 15,000 Hz
Signal-to-Noise Ratio	> 55 dB
Microphone	Unidirectional dynamic microphone with AGC
Volume Control	Microphone, buzzer
Operation key	Emergency key, Evacuate key, Alert key, Emergency reset key, CPU switch, Reset switch
Key Extension	10 keys with RM-210, max. 5x RM-210, extension connector
Connection Cable	Shielded CPEF cable or Category 5 STP cable, M3 screw terminal
Finish	ABS resin, bluish gray
Dimensions (W x H x D)	200 x 215 x 95 mm
Weight	1.48 kg (with bracket)



Ceiling Speaker



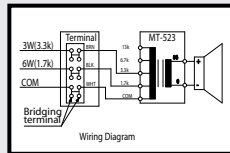
Firedome Ceiling-Mount Speaker (EN 54 certified model!)



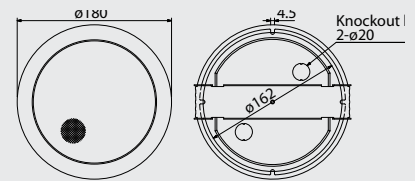
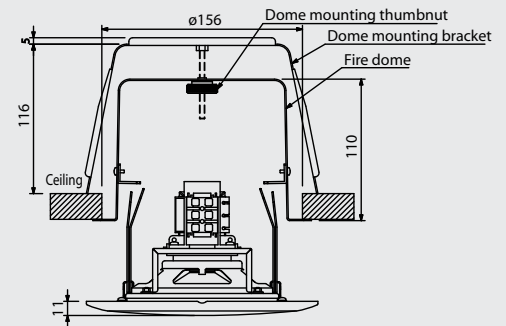
Rim and Grille



Ceramic Screw Terminal



Wiring Diagram



Features

- Ceiling Speaker
- 6 W (rated input)
- Steel fire dome
- Easy installation with spring catches
- For mounting in 156 mm holes
- Baffle, frame, net: Aluminium
- Colour: Off-white (equivalent RAL 9010)
- PC-1867FC is EN 54-24 certified and is therefore legalised for a use in conjunction with fire detection systems.
- 12 cm speaker
- Ceramic screw terminal block (In compliance with British Standard BS5839 Part 8)

Applications

Especially for environments with demanding safety requirements of fire protection in public buildings like train terminals, supermarkets, office buildings, hotels and fitness centers
For voice alarm systems according to EN 54-24

Certificates

- EN 54-24 : 1438/CPD/0183 Type A, ISO 7240-24 , according BS 5839-8

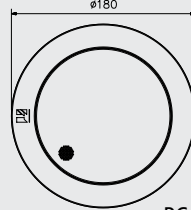
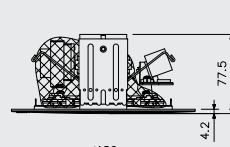
Specifications

	PC-1867FC
Dynamic Cone Driver	12 cm
Rated Input	6 W (100 V), 3 W (70 V)
Tappings 100 V	6 W / 3 W / 1.5 W / 0.8 W
Tappings 70 V	3 W / 1.5 W / 0.8 W / 0.4 W
Frequency Response	100 Hz ... 16 kHz
SPL (1W, 1m)	90 dB
SPL at Rated Input (1 m)	98 dB
Dimension of Baffle	Ø 180 mm
Mounting Depth	110 mm
Ceiling Hole Diameter	156 mm
Weight	1.3 kg (with bracket, firedome)

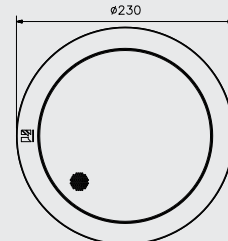
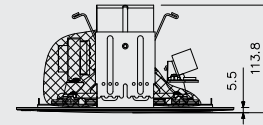
Ceiling Speakers



Certified Ceiling Mount Speaker



PC-1869EN



PC-2369EN

Features

- Flat front panel
- For mounting in 110 mm depth (PC-2369EN) or 80 mm depth (PC-1869EN)
- Ceramic screw terminal block and thermal fuse
- Quick and easy installation

Certificates

- EN 54-24 : 0359-CPD-0100, Type A, ISO 7240-24 (PC-1869 EN)
- EN 54-24 : 0359-CPD-0101, Type A, ISO 7240-24 (PC-2369 EN)

Applications

Ideal for use in any kind of public building where pagings and BGM are broadcasted
 PC-1869EN / PC-2369EN for voice evacuation systems according to EN 54

Specifications

	PC-1869EN	PC-2369EN
Speaker Component	12 cm cone type	16 cm double cone type
Rated Input	6 W (100 V), 3 W (70 V)	6 W (100 V), 3 W (70 V)
Tappings 100 V	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W
Tappings 70 V	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W
Frequency Response	100 Hz ... 18 000 Hz	70 Hz ... 18 000 Hz
SPL (1 W, 1 m)	94 dB (1 W / 1 m, 500 Hz - 5 kHz)	94 dB (1 W / 1 m, 500 Hz - 5 kHz)
Dimension	ø 180 x 80 mm	ø 230 x 110 mm
Mounting Depth	80 mm	110 mm
Weight	820 g	1.1 kg
Other Features	Ceramic screw terminals, thermal fuse	
Finish	Steel, white paint (equiv. RAL 9010)	
Certificates	EN 54-24: 0359-CPD-0100, Type A ISO 7240-24	EN 54-24: 0359-CPD-0101, Type A ISO 7240-24
IP Grade	IP 21c	IP 21c



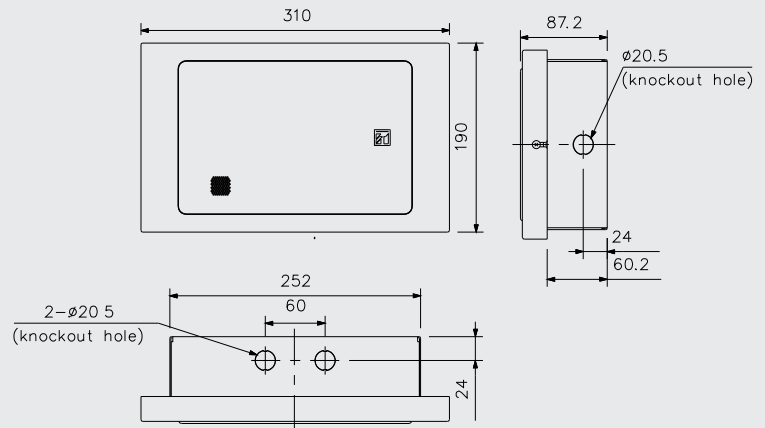
Wall Mount Speakers



Metal cabinet speaker (certified)



BS-680FC (EN 54-24 certified)



Features

- Surface- or flush-mounting
- High sound quality through 16 cm double cone speaker
- High sound pressure level
- Colour: off-white (RAL 9010 or equivalent)
- BS-680FC is EN 54-24 certified and is therefore eligible for use in conjunction with fire detection systems.
Certificate No : 1438/CPD/0178
- In compliance with BS 5839 part 8 (BS-680FC)
- Bridge wiring possible
- Two ceramic screw terminal blocks and thermal fuse (BS-680FC)
- Enclosure metal, punched net grille
- Mounting bracket: Zinc coated steel plate with stainless steel bolts
- For 100 V / 70 V Systems

Applications

Voice Evacuation Systems according to EN 54-24
Public Address Systems in public buildings and hotels

Certificate

- BS-680FC: EN 54-24 : 1438/CPD/0178 Type A, ISO 7240-24, according BS 5839-8

Specifications

	BS-680FC
Speaker Element	16 cm double cone type
Rated Input	6 W (100 V) / 3 W (70 V)
Tappings 100 V	6 W / 3 W / 1.5 W / 0.8 W
Tappings 70 V	3 W / 1.5 W / 0.8 W / 0.4 W
Frequency Response	150 Hz ... 20000 Hz
SPL (1 W, 1 m)	94 dB
Connector	Screw terminal (ceramic) bridging + thermal fuse
Dimensions (W x H x D)	310 x 190 x 87.2 mm
Weight	2.6 kg
Other Features	EN 54 certified, BS 5839-8 equivalent

Wall Mount Speakers



Modern design box speaker (certified)



Certificate (detail)

Features

- Flat rectangular box speaker
- 10 W rated input
- High sound quality and clarity
- Vertical or horizontal mounting
- For wall-mount installation
- Colour: off-white
- Case: HIPS resin, punching net: SECC
- Bridge wiring available

Applications

Voice Evacuation Systems according to EN 54-24
Hotels, restaurants, conference rooms and department stores

Certificate

- EN 54-24: 0359-CPD-0102, Type A, ISO 7240-24

Specifications

	BS-1034EN
Speaker Component	LF: 12 cm cone type HF: 2.5 cm balanced dome tweeter
Rated Input	10 W
Tappings 100 V	10 W / 5 W / 3 W / 1 W
Tappings 70 V	10 W / 5 W / 2.5 W / 1.5 W / 0.5 W
Frequency Response	120 Hz ... 20000 Hz
SPL (1 W, 1 m)	89 dB
Connectors	Push-in terminal
Dimensions (W x H x D)	210 x 330 x 80 mm
Weight	1.4 kg
Certificates	EN 54-24: 0359-CPD-0102, Type A ISO 7240-24



Wall Speakers



Certified Cabinet Speaker for Wall Mounting (New!)



BS-678BSB



Certificate (detail)

Features

- 6 W rated input
- Wooden cabinet with PVC sheet and HIPS baffle
- Colour off-white (BS-678BSW : RAL 9010 or equivalent) or black (BS-678BSB)
- Vertical or horizontal installation
- For wall-mount installation
- Easy impedance selection
- Bridge wiring possible
- 2 Ceramic screw terminals
- Thermal fuse
- According British standard

Applications

Voice Evacuation Systems according to EN 54-24
Universal use in VA systems. Especially if a future expansion of the system is expected

Certificate

- EN 54-24 : 0359-CPD-0103 Type A, ISO 7240-24, according BS 5839-8

Specifications

	BS-678BSW	BS-678BSB
Speaker Component	16 cm speaker	16 cm speaker
Rated Eingang	6 W (100 V) / 3 W (70 V)	6 W (100 V) / 3 W (70 V)
Tapping 100 V	6 W / 3 W / 1.5 W / 0.8 W	6 W / 3 W / 1.5 W / 0.8 W
Tapping 70 V	3 W / 1.5 W / 0.8 W / 0.4 W	3 W / 1.5 W / 0.8 W / 0.4 W
Frequency Response	150 Hz ... 18000 Hz	150 Hz ... 18000 Hz
SPL (1 W, 1 m)	94 dB	94 dB
Connection	Screw terminals (bridging possible)	Screw terminals (bridging possible)
Dimensions (W x H x D)	250 x 190 x 108 mm	250 x 190 x 108 mm
Colour	white	black
Weight	1.7 kg	1.7 kg
Certificate	EN 54 -24: 0359-CPD-0103, Type A, ISO 7240-24, according BS 5839-8	EN 54 -24: 0359-CPD-0103, Type A, ISO 7240-24, according BS 5839-8
Protection	IP 21c	IP 21c

Wall Mount Speakers



Certified 2-Way Speaker (New!)



BS-1015BSB / BS-1015BSW



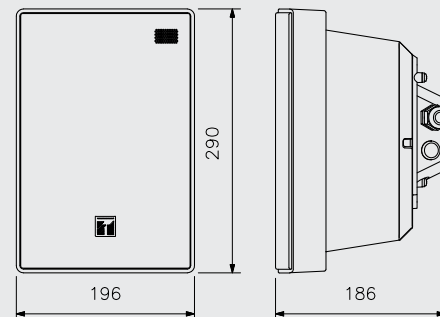
BS-1015BSW Detail



BS-1015BSB



Certificate (detail)



Features

- Aesthetic design
- Various installation options
- Mounting: directly to a wall either vertically or horizontally or with mounting brackets (U-bracket or optional bracket SP-410) or flush-mount (optional frame SP-420 required)
- Colour: black (BS-1015BSB) or white (BS-1015BSW)
- Optimised for music reproduction and sound clarity
- Additional PG gland available
- Ceramic screw terminal
- Thermal fuse

Options

- SP-410: Wall/Ceiling Mounting Bracket
- SP-420: Flush Mounting Frame
- ST-16A: Speaker Stand

Applications

Voice Evacuation Systems according to EN 54-24
Fits architecturally sophisticated environments.
For music distribution or announcements e.g. in public buildings, traffic terminals, supermarkets, office towers, hotels and health clubs

Certificate

- EN 54-24 : 0359-CPD-0104, Type A, ISO 7240-24, according to BS 5839-8

Specifications

	BS-1015BSB / BS-1015BSW
Enclosure	2-way bass reflex type
Rated Input	15 W
Impedance	100 V / 70 V
Tappings (100 V / 70 V)	15 W / 10 W / 5 W
SPL (1 W / 1 m)	90 dB (1 W / 1 m)
Frequency Response	80 Hz ... 20 000 Hz
Speaker Components	12 cm dynamic cone-type speaker, 2.5 cm balanced dome tweeter
Speaker Cable	2-core cabtyre cable (diameter 6 mm)
Operating Temperature	-10°C ... +50°C
Protection	IP X3 (can be installed vertically or horizontally)
Material/Finish	BS-1015BSB: Enclosure; ABS resin, black, paint, grille; surface treated steel plate; BS-1015BSW: white
Dimensions (W x H x D)	196 x 290 x 186 mm (without bracket)
Weight	2.0 kg (without bracket)
Certificates	EN 54 -24: 0359-CPD-0104, Type A, ISO 7240-24, according to BS 5839-8



Projection Speakers



Certified Projection Speakers (New!)



PE-154EN / PE-154BS



PJ-154BS



Certificate (PJ-154BS)



Certificate (PE-154EN/BS)

Features

PE-154BS / PE-154EN

- 15 W rated power
- 2-way speaker
- Rugged HIPS enclosure
- Excellent sound quality
- Colour: White (RAL 9010 or equivalent)
- 100 V or 70 V
- 5 m cable (PE-154EN) or 3 m fire resistant cable (PE-154BS)
- PE-154BS: 2 Ceramic screw terminals, thermal fuse, fire resistant cable, 5-core

PJ-154BS

- 15 W rated power
- 2-way projection speaker
- Wide frequency response
- Enclosure: Resin, grille: Steel
- Easy installation (mounting bracket included)
- Colour white (RAL 9010 or equivalent)
- 100 V or 70 V
- External connection box with PG-Gland
- 2 Ceramic screw terminals, thermal fuse
- Fire resistant cable, 5-core

Applications

Voice Alarm Systems according to EN 54. Supermarkets, shopping malls, lobbies, rooms with great ceiling height, restaurants, bars, public buildings and schools, etc.

Certificates

- PE-154EN, PE-154BS
EN 54-24 : 0359-CPD-0105 Type A, ISO 7240-24, PE-154BS: BS 5839-8
- PJ-154BS:
EN 54-24 : 0359-CPD-0106 Type A, ISO 7240-24, BS 5839-8

Specifications

	PE-154BS	PE-154EN	PJ-154BS
Speaker	2-way speaker 12 cm cone type, 2.5 cm tweeter	2-way speaker 12 cm cone type, 2.5 cm tweeter	2-way speaker 12 cm cone type, 2.5 cm tweeter
Rated Power	15 W (100 V), 7.5 W (70 V)	15 W (100 V), 7.5 W (70 V)	15 W (100 V), 7.5 W (70 V)
Impedance	100 V / 70 V	100 V / 70 V	100 V / 70 V
Tapping 100 V	15 W / 10 W / 5 W	15 W / 10 W / 5 W	15 W / 10 W / 5 W
Tapping 70 V	7.5 W / 5 W / 2.5 W	7.5 W / 5 W / 2.5 W	7.5 W / 5 W / 2.5 W
Frequency Response	70 Hz...20000 Hz	70 Hz...20000 Hz	70 Hz ... 20000 Hz
SPL (1 W, 1 m)	91 dB	91 dB	91 dB
Connection	Ceramic screw terminals, thermal fuse, 3 m fire resistant cable, 5-core	Ceramic screw terminals, thermal fuse, 5 m cable, 2-core	Ceramic screw terminals, thermal fuse, fire resistant cable, 5-core, external connection box
Dimensions	ø 186 x 251 mm	ø 186 x 251 mm	ø 186 x 251mm
Weight	2.1 kg	2.1 kg	2.1 kg
Certificate	EN 54-24: 0359-CPD-0105, Type A ISO 7240-24, BS 5839-8	EN 54-24: 0359-CPD-0105, Type A	EN 54-24: 0359-CPD-0106, Type A ISO 7240-24, BS 5839-8
Protection	IP 21c	IP 21c	IP 21c

Projection Speakers



Certified Splashproof Projection Speaker (New!)



CS-154BS



Front grille



Certificate (detail)

CS-64BS / CS-154BS

Features

- Projection speaker
- 6 W (CS-64BS) or 15 W (CS-154BS) rated power
- Splash proof for outdoor use
- Lightweight and rugged construction
- High SPL
- 100 V or 70 V
- PG gland
- Ceramic screw terminals
- Thermal fuse
- Stainless steel bracket for easy installation
- Stainless steel screws

Applications

Voice Evacuation Systems according to EN 54 Plants, park houses, stations, stadiums, swimming pools and outdoor areas, etc.

Certificate

- EN 54-24 : 0359-CPD-0108 Type B, ISO 7240-24, according BS 5839-8 (CS-154BS)
- EN 54-24 : 0359-CPD-0107 Type B, ISO 7240-24, according BS 5839-8 (CS-64BS)

Specifications

	CS-64BS	CS-154BS
Speaker	12 cm cone type	12 cm cone type
Rated Power	6 W (100 V / 70 V)	15 W (100 V / 70 V)
Continuous Program	9 W	22,5 W
Tapping 100 V	6 W / 3 W / 1 W	15 W / 10 W / 5 W
Tapping 70 V	6 W / 3 W / 1,5 W / 0,5 W	15 W / 7,5 W / 5 W / 2,5 W
Frequency Response	130 Hz ... 13000 Hz	150 Hz ... 15000 Hz
SPL (1 W, 1 m)	96 dB	97 dB
Ambient temperature	-20°C ... + 55°C	-20°C ... + 55°C
Dimensions (B x H x T)	233 x 224 x 249 mm	366 x 230 x 310 mm
Weight	1.7 kg	3.0 kg
Connection	Ceramic screw terminals, thermal fuse	Ceramic screw terminals, thermal fuse
Finish	ABS resin, white Front grille: Steel, dark grey	ABS resin, white Front grille: Steel, dark grey
Certificate	EN 54-24: 0359-CPD-0107, Type B, ISO 7240-24, according BS 5839-8	EN 54-24: 0359-CPD-0108, Type B, ISO 7240-24, according BS 5839-8
Protection	IP 34c	IP 65c



Horn Speakers



Certified Reflex Horn Speaker (New!)



Certificate (detail)

Features

- Weatherproof for outdoor use IP-65
- Legalised for Voice Alarm Systems
- Very rugged and durable construction ensures long term reliable operation
- Oval horn for good intelligibility
- Wide frequency response
- Aluminium horn
- ABS driver housing
- Colour: white (RAL 9010 or equivalent)
- Extreme high SPL 109 dB (1 W / 1 m)
- 100 V or 70 V system
- Additional PG gland available
- Ceramic screw terminals
- Thermal fuse
- Stainless steel mounting brackets
- Shock resistant horn
- Easy impedance selection

Applications

Voice Alarm Systems according to EN 54. Outdoor areas, factory premises, ships, park houses, stations, stadiums, open air pools, etc.

Options

- YS-151S Mounting Bracket

Certificate

- EN 54-24 : 0359-CPD-0109 Type B, ISO 7240-24, according BS 5839-8

Specifications

	SC-615BS
Rated Power	15 W (100 V / 70 V)
Tapping 100 V	15 W / 10 W / 5 W / 3 W
Tapping 70 V	15 W / 7,5 W / 5 W / 2,5 W / 1,5 W
SPL (1 W, 1 m)	109 dB
Frequency Response	315 ... 12 500 Hz
Operating Temperature	-20 °C ... + 55 °C
Connection	Ceramic screw terminals, thermal fuse
Finish	Horn: Aluminium white coated, driver housing ABS Resin, stainless steel bracket
Dimensions (W x H x D)	172 x 200 x 229 mm
Weight	1,5 kg
Certificate	EN 54-24 : 0359-CPD-0109 Type B, ISO 7240-24 according BS 5839-8
Protection	IP-65c



IP Intercom System N-8000

N-8000 IP-Intercom and Voice Security System



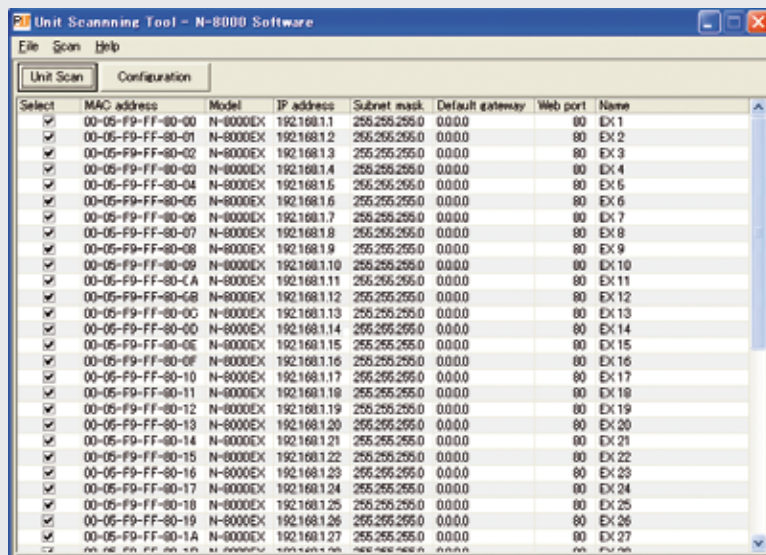
N-8000 Series

Description

- IP network-compatible intercom system
- Efficient wide area connections even between remote locations
- Consists of exchange unit, interface units and dedicated stations
- From 2 up to 3072 stations and up to 16 stations per exchange
- Various types of stations: Master station with or without LCD display, hands-free stations, sub-stations, IP stations and heavy duty type, dust- and water-resistant (IP54) stations
- System maintenance by PC software available
- Mountable in EIA standard rack (1-unit size) or to a wall using the included brackets
- Echo canceller function for easy hands-free full-duplex conversation between stations
- Stations with built-in speaker which allows station paging
- Dial functions: Redial, recall, short / automatic dialing, group call, busy / no answer / no response call forwarding, call hold, and scan monitor
- High quality audio with frequencies up to 7 kHz

Features

- for extra clarity
- PA paging by external PA systems
- Total broadcast capabilities of up to 192 zones with paging and all-zone paging
- Employs packet audio technology
- Network interface allowing up to 192 exchanges to be connected over a network using additional network intercom exchanges
- Simple system setup with only 2 IP stations possible



Automatic Unit Detection for Easy Access also in large systems

Applications

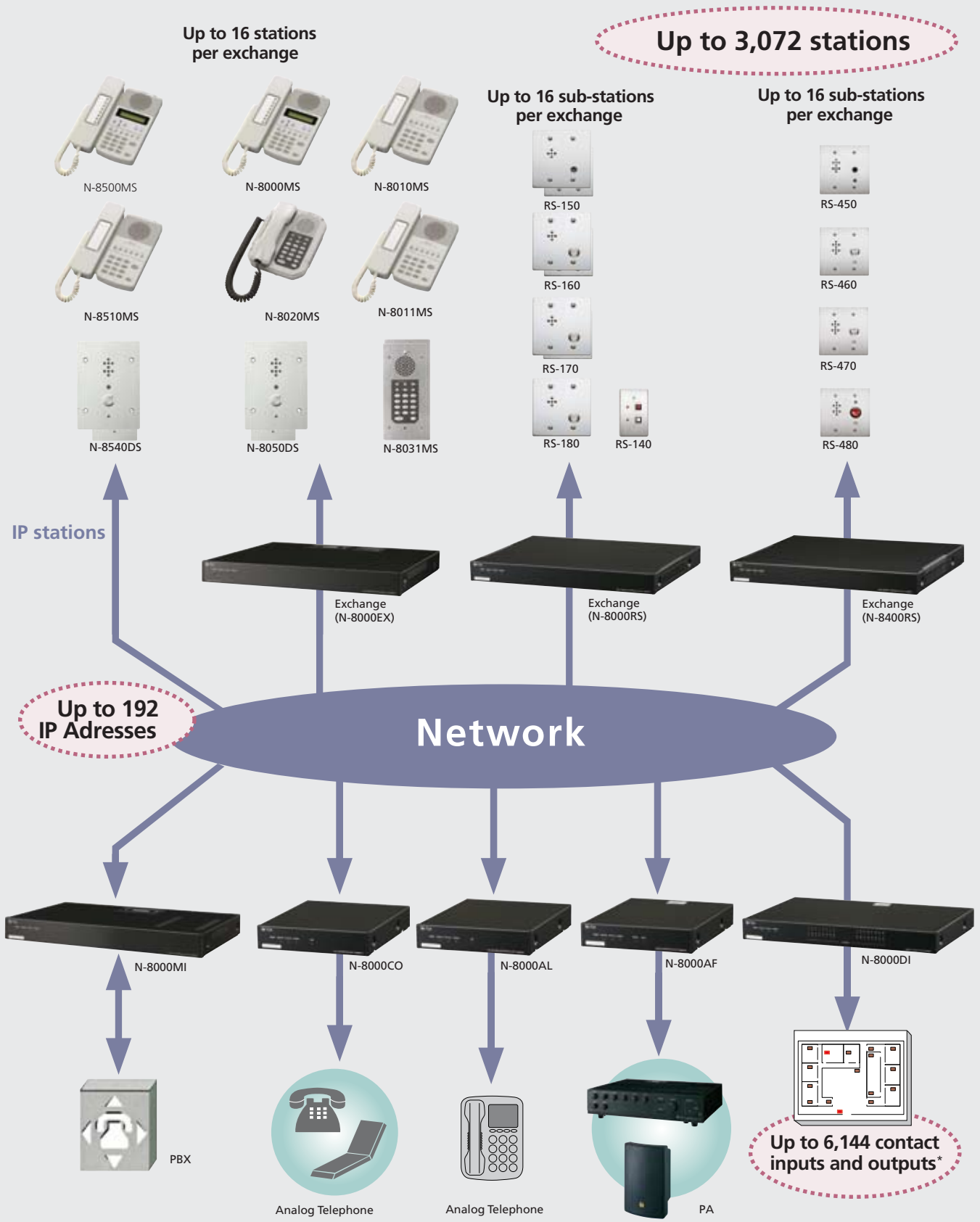
- Transportation
- Schools
- Parking lots
- Prisons
- Stadiums
- Hospitals
- Office Towers and Offices

For further information please request for the N-8000 catalogue.



IP Intercom System N-8000

System Overview



IP Intercom System N-8000



Exchanges / Sub-Station Interfaces



N-8000EX

Features

- IP Network Intercom Exchange
- 10/100Base-TX Ethernet network connection
- Occupies one network node (192 max.)
- 16 station capacity
- Stations connect to exchange via twisted pair cable
- 4 internal/8 external speech links
- 2 audio paging outputs
- 2 relay outputs
- Dimensions: 420 x 44.3 x 349 mm, 4.2 kg



N-8010EX

Features

- IP Network Intercom Exchange
- 10/100Base-TX Ethernet network connection
- Occupies one network node (192 max.)
- 16 station capacity
- 2-wire connection between stations and exchange
- 1 internal/2 external speech links
- Dimensions: 420 x 44.3 x 349 mm, 4.2 kg



N-8000RS

Features

- Sub-station Interface Unit
- 10/100Base-TX Ethernet network connection
- Occupies one network node (192 max.)
- 16 sub-station capacity
- 3-wire connection between stations and unit
- 2 speech links
- Dimensions: 420 x 44.3 x 325.5 mm, 3.9 kg



N-8010RS

Features

- Sub-station Interface Unit
- 10/100Base-TX Ethernet network connection
- Occupies one network node (192 max.)
- 16 sub-station capacity
- 3-wire connection between stations and unit
- 1 speech link
- Dimensions: 420 x 44.3 x 325.5 mm, 3.8 kg



N-8400RS

Features

- Sub-station Interface Unit
- 10/100Base-TX Ethernet network connection
- Occupies one network node (192 max.)
- 16 sub-station capacity
- 4-wire connection between stations and unit
- 2 speech links
- Dimensions: 420 x 44.3 x 325.5 mm, 4 kg



IP Intercom System N-8000

Interface Units



N-8000AL

Features

- Telephone Interface Unit
- 10/100Base-TX Ethernet network connection
- Occupies one network node (192 max.)
- Single telephone line allowing one analogue telephone to be connected
- 210 x 44.3 x 267 mm, 1.7 kg



N-8000AF

Features

- Audio Interface Unit
- 10/100Base-TX Ethernet network connection
- Occupies one network node (192 max.)
- 1 MIC/LINE audio line input
- 1 audio line output
- 8 contact inputs and 8 contact outputs
- Time synchronization input
- Built-in timer and chime
- 210 x 44.3 x 267 mm, 1.7 kg



N-8000MI

Features

- Multi Interface Unit
- 10/100Base-TX Ethernet network connection
- Occupies one network node (192 max.)
- Audio Inputs for BGM, External Tone or PA
- 2 audio line inputs (0 dBV) with 2 trigger inputs
- 2 audio line outputs (0 dBV) with 2 relay outputs
- Contact Bridge
- 16 contact inputs and 16 contact relay outputs
- Telephone Interface (E&M type), 2 channels
- Surveillance of system line and network status
- 420 x 44.3 x 239.5 mm, 2.8 kg



N-8000DI

Features

- Direct Select Unit
- 10/100 Base-TX Ethernet network connection
- Occupies one network node (192 max.)
- 32 contact inputs
- 32 contact outputs
- Function to diagnose system line and network status
- 420 x 44.3 x 267 mm, 2.8 kg



N-8000CO

Features

- C/O Interface Unit
- 10/100 Base-TX Ethernet network connection
- Occupies one network node (192 max.)
- Analog central office line circuit allowing the stations to make and receive calls to and from the telephone line
- 210 x 44.3 x 267 mm, 1.7 kg



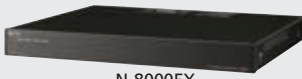








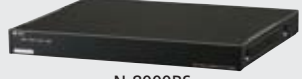













Accessories for N-8000 series

Model	Description
YC-280	Wall Mount Brackets for N-8000MS, N-8010MS and N-8020MS, Wall Mount Brackets for N-8011MS
AD-1210P	AC Adapter for N-8500MS, N-8510MS and N-8540DS
YC-850	Wall Mount Bracket for N-8000RS, N-8010RS, N-8400RS, N-8000DI, N-8000AF, N-8000AL, N-8000CO units.
YC-251	Surface Mount Back Box for N-8031MS
YC-241	Flush Mount Back Box for N-8031MS
YC-801	Flush Mount Box for RS-140
YC-802	Wall Mount Box for RS-140 (white)
YC-150	Flush Mount Back Box for N-8050DS and N-8540DS
YS-13A	Surface Mount Back Box for N-8050DS and N-8540DS
YC-302	2-Gang Electrical Box (flush mount)
E-7000TB	Terminal Board



IP Intercom System N-8000

Station Selection Chart

	Station	with bracket	Wall-mount	Applicable Exchange / Interface
Master / Door Stations	 N-8000MS	→	Outdoor type  N-8050DS	 N-8000EX
	 N-8010MS	→	 N-8050SB	
	 N-8011MS	→	 N-8031MS	 N-8010EX
	 N-8020MS	→	 N-8031SB	
RS Sub-stations	3-wire shielded type station		Vandal-resistant type  RS-150	 N-8000RS
	4-wire type station		 RS-160  RS-170  RS-180  RS-140  RS-450  RS-460  RS-470  RS-480 Outdoor type	 N-8010RS  N-8400RS
IP Stations	 N-8500MS	→	 N-8540DS Outdoor type	
	 N-8510MS	→		



IP Intercom System N-8000

Master Stations



N-8000MS

Features

- Master station with LCD display
- Hands-free or handset conversation
- Auto-dialer function
- Headset terminal
- External speaker terminal
- High sound quality

Options

- YC-280: Wall Mounting Bracket



N-8010MS

Features

- Master station
- Hands-free or handset conversation
- High sound quality

Options

- YC-280: Wall Mounting Bracket



N-8011MS

Features

- Hands-free master station
- Space saving design
- High sound quality

Options

- YC-290: Wall Mounting Bracket



N-8020MS

Features

- Industrial use master station
- Dustproof and waterproof construction IP54
- Wide ambient temperature range
- Connection of external speaker

Options

- YC-280: Wall Mounting Bracket



N-8031MS

Features

- Flush-mount master station
- Hands-free operation
- One-touch dialing with external optional switch

Options

- RS-191: Hand-Set



RS-191

Features

- Handset for N-8031MS



IP Intercom System N-8000

IP Stations, Door Stations and Board Units



N-8500MS

Features

- IP Multifunctional master station
- For network connection (LAN / WAN)
- Can be used in conjunction with N-8000MI
- Powered by PoE switching hub or 12 V DC (with optional AC adaptor)

Options

- AD-1210P: AC Adaptor
- YC-280: Wall Mounting Bracket



N-8540DS

Features

- IP Door station for indoor use
- Flush-mount
- For network connection (LAN / WAN)
- Can be used in conjunction with N-8000MI
- Powered by PoE switching hub or 12 V DC (with optional AC adaptor)

Options

- AD-1210P: AC Adaptor
- YC-150: Wall Mounting Box



N-8510MS

Features

- IP Master station
- For network connection (10/100 Base TX)
- Hands-free or handset conversation
- High sound quality
- Powered by PoE switching hub or 12 V DC (with optional AC adaptor)

Options

- AD-1210P: AC Adaptor
- YC-280: Wall Mounting Bracket



N-8050DS

Features

- Door station for indoor use
- Hands-free conversation
- Contact output for controlling an electronic lock

Options

- YC-150: Back Box



N-8031SB

Features

- Hands-free master station board unit
- For custom made solutions
- Features like N-8031MS

Options

- RS-191: Handset



N-8050SB

Features

- Hands-free door station board unit
- For custom made solutions
- Features like N-8050DS



IP Intercom System N-8000

Sub-Stations



RS-150

Features

- Cost-effective
- Indoor use
- Half-duplex conversation
- Dimensions: 120 (W) × 120 (H) × 48.5 (D) mm



RS-160

Features

- Vandal-proof
- Indoor use
- Heavy duty stainless steel faceplate
- Half-duplex conversation
- Dimensions: 120 (W) × 120 (H) × 57.5 (D) mm



RS-170

Features

- Vandal-proof and weather-resistant
- Outdoor/Indoor use
- Heavy duty stainless steel faceplate
- Half-duplex conversation
- Dimensions: 120 (W) × 120 (H) × 57.5 (D) mm



RS-180

Features

- Vandal-proof and weather-resistant
- Outdoor / Indoor use
- Heavy duty stainless steel faceplate
- Allows connecting to a remote alarm light or siren
- Call lamp
- Half-duplex conversation
- Dimensions: 120 (W) × 120 (H) × 58.5 (D) mm



RS-140

Features

- Switch Panel with call and privacy button
- For talk back conversation
- Handset conversation (with optional RS-141)
- Half-duplex conversation
- Use 100 V speaker for input / output



RS-141

Features

- Handset for RS-140 switch panel
- Half-duplex conversation

IP Intercom System N-8000



Sub-Stations



RS-450

Features

- Cost-effective
- Indoor use
- Connection to N-8400RS Interface Unit
- Half-duplex conversation
- Dimensions: 120 (W) × 120 (H) × 48.5 (D) mm



RS-460

Features

- Vandal-resistant call button
- Half-duplex communication
- Heavy duty stainless steel faceplate
- Indoor use
- Dimensions: 120 (W) × 120 (H) × 57.5 (D) mm



RS-470

Features

- Vandal-resistant call button
- Half-duplex communication
- Heavy duty stainless steel faceplate
- Weather-resistant for outdoor/indoor use (IP54)
- Connection to N-8400RS Interface Unit
- Dimensions: 120 (W) × 120 (H) × 57.5 (D) mm



RS-480

Features

- Vandal-resistant red call button
- Half-duplex communication
- Heavy duty stainless steel faceplate
- Weather-resistant for outdoor/indoor use (IP54)
- Control output
- Connection to N-8400RS Interface Unit
- Dimensions: 120 (W) × 120 (H) × 58.5 (D) mm



RS-481

Features

- Handset for RS-480
- Full-duplex conversation



SOUND TRANSFERS EMOTIONS

Your personal experience is directly connected to your hearing. TOA has developed Professional Sound Systems that provide the perfect sound effect in every environment. Whether it is a concert hall where the smallest sound has to be transmitted to the furthest points or a sports stadium, where 10'000's are shouting, screaming and celebrating, or a conference or meeting where every single person has to be heard. We guarantee feelings that not just reach the ears but touch the hearts of humans.



Digital Amplifiers

4-Channel Power Amplifiers



DA-250F (top) / DA-250FH (bottom)

Features

- Fully digital
- Real 1000 W R.M.S. power
- 4 channels
- Compact size with only 1 unit height
- Efficiency of 85% max.
- Ideal for fixed installation
- 2 configurations: DA-250F for low impedance application, DA-250FH for 70 V / 100 V application
- Each channel with independent power supply
- Control covers eliminate tampering
- Low-noise constant speed fans
- Stacking possible
- Bridged mode for DA-250F possible
- Protection circuitry
- Pulse width modulation with controlled power supply

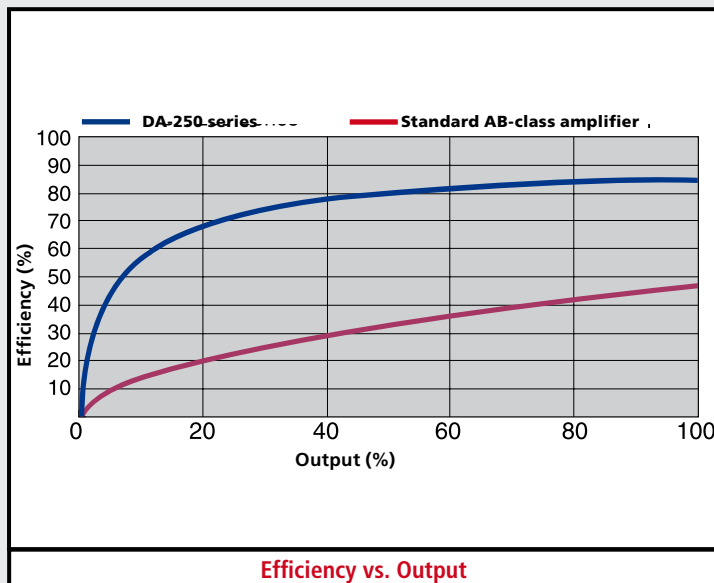
Applications

DA-250F for multi-zone application such as presentation and press conference rooms, restaurants, etc.

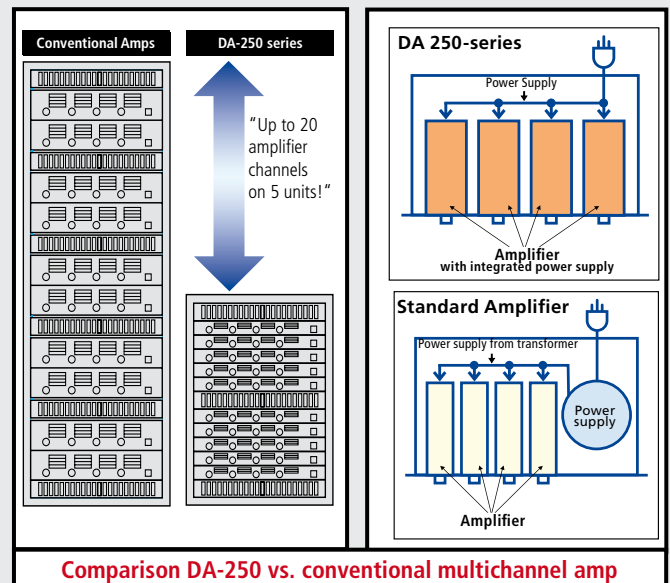
DA-250FH for exhibition halls, sports facilities and gymnasiums, houses of worship, meeting halls

Options

- MT-251H: Transformer



Efficiency vs. Output



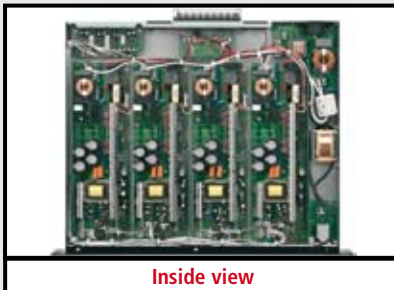
Comparison DA-250 vs. conventional multichannel amp



Connection of inputs and outputs

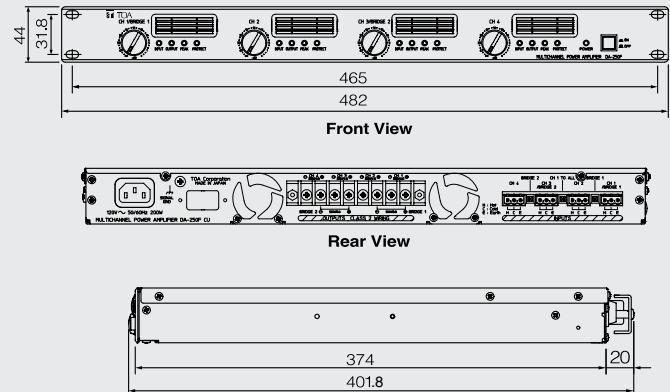
Transformer

Dimensions



Inside view

	MT-251H
Load	0 – 250 W
Primary Impedance	100 V : 40 Ohm / 66.6 Ohm 70 V : 19.6 Ohm / 32.6 Ohm
Secondary Impedance	100 V : 40 Ohm / 66.6 Ohm 70 V : 19.6 Ohm / 32.6 Ohm 50 V : 10 Ohm / 16.6 Ohm 35 V : 4.9 Ohm
Frequency response	30 Hz ... 18000 Hz (+0 dB, -3 dB)
Connector	Screw terminals (M3)
Weight	2.4 kg



Front View

Rear View

Specifications

	DA-250F	DA-250FH
Power Source	230 V AC, 50 / 60Hz	230 V AC, 50 / 60 Hz
Number of Channels	4	4
Total Output (all channels driven)	1000 W (1 kHz, 4 Ohm)	1000 W (1 kHz, 40 Ohm)
Power Output	4 x 250 W (4 Ohm) / 4 x 170 W (8 Ohm) / 2 x 500 W (8 Ohm, bridged)	4 x 250 W (70 V / 100 V)
Power Consumption (IEC 60065)	200 W	200 W
Frequency Response	20 Hz ... 20000 Hz, ± 1 dB	50 Hz ... 20000 Hz, -3dB, 0dB
Total Harmonic Distorsion (1kHz)	0,1 %	0,1 %
S/N Ratio (A weighted)	100 dB	100 dB
Damping Factor	100	120
Input Impedance	10 kOhm (unbalanced), 20 kOhm (balanced)	10 kOhm (unbalanced), 20 kOhm (balanced)
Controls	Volume control, LEDs : Indicator for each channel: input, output, peak, protection, in-use	
Connection	Inputs: Detachable terminal block (electronically balanced). Outputs: screw terminals (M4). For AWG 14-22	
Protection Circuit	Amplifier section: DC output, overheat protection, load shorting, overload current, maximum output; Power supply section: overheat protection, AC rush current	
Dimensions (W x H x D)	482 mm x 44 mm x 401.8 mm (EIA standard rack)	
Weight	6.8 kg	
Finish	Front: Aluminum, alumite process, black; Case: plated steel sheet	
Accessories	Terminal block connector (3-pins) x 4, cover volume control x 4	



Digital Amplifiers

2-Channel Power Amplifiers



DA-250D / DA-250DH

Features

- 2 Versions: 4 Ohm (DA-250D) or 100 V (DA-250DH)
- 2 x 250 W output power
- Class D design 85 % efficient
- Independent power supply for each channel
- Light weight and compact
- Ideal for professional audio systems which require a reliable operation
- Colour: Black
- Rack mountable, 2 units height
- Stack up to 5 units without open spaces between units
- Selectable stereo or bridge operation (DA-250D)
- Forced-air cooling system
- Low heat dissipation
- Comprehensive protection circuitry
- Removable dust filters for easy maintenance

Options

- MT-251H: Matching output transformer

Applications

Arena, gymnasium, health club, stadium, auditorium, multi-purpose hall, convention centre, shopping mall, house of worship, restaurant / bar / pub

Specifications

	DA-250D	DA-250DH
Power Source	230 V AC, 50 / 60Hz	230 V AC, 50 / 60 Hz
Number of Channels	2	2
Power Output	2 x 250 W (4 Ohm) / 2 x 170 W (8 Ohm)	2 x 250 W (70 V / 100 V)
Power Consumption (EN standard)	120 W	120 W
Frequency Response	20 Hz ... 20000 Hz, ±1dB	50 Hz ... 20000 Hz, -3dB, 0dB
Total Harmonic Distorsion (1kHz)	0,1 %	0,1 %
S/N Ratio (A weighted)	100 dB	100 dB
Input Impedance	10 kOhm (electronically balanced)	
Controls	Volume level control (per channel), LEDs : Power, Indicator for each channel: input, output, peak, protection	
Connection	Input: Detachable terminal block (3 pins), XLR-3-31 / Output: screw terminals (M4)	
Protection Circuit	Overheat, short circuit, overload, unusual DC voltage output	
Dimensions (W x H x D)	482 mm x 44 mm x 401.8 mm (EIA standard rack)	
Weight	5.3 kg	
Finish	Front: Aluminum, alumite process, black; Case: plated steel sheet	

Digital Amplifiers



4-Channel Power Amplifiers



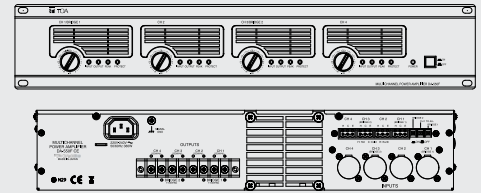
DA-550F / DA-500FH



Independent Operation



MT-251H



Outline



Rear Connection DA-500F

Features

- 2 Versions: 4 Ohm (DA-550F) or 100 V (DA-500FH)
- 4 x 500 W (DA-500FH), or 4 x 550 W (DA-550F) output power
- Class D design 85 % efficient
- Independent power supply for each channel
- Light weight and compact
- Ideal for professional audio systems which require a reliable operation
- Colour: Black
- Rack mountable with 2 units
- Stack up to 5 units without open spaces between units
- Selectable stereo or bridge operation (DA-550F)
- Forced-air cooling system
- Low heat dissipation
- Comprehensive protection circuitry
- Removable dust filters for easy maintenance

Options

- MT-251H: Matching output transformer for DA-500FH

Applications

Arena, gymnasium, health club, stadium, auditorium, multi-purpose hall, convention centre, shopping mall, house of worship, restaurant / bar / pub

Specifications

	DA-550F	DA-500FH
Power Source	230 V AC, 50 / 60Hz	230 V AC, 50 / 60 Hz
Number of Channels	4	4
Power Output	4 x 550 W (4 Ohm) / 4 x 370 W (8 Ohm) / 2 x 1100 W (8 Ohm, bridged)	4 x 500 W (70 V / 100 V)
Power Consumption (EN standard)	380 W	380 W
Frequency Response	50 Hz ... 20000 Hz, ±1dB	50 Hz ... 20000 Hz, -3dB, +0dB
Total Harmonic Distorsion (1kHz)	0,1 %	0,1 %
S/N Ratio (A weighted)	100 dB	100 dB
Input Impedance	10 kOhm (electronically balanced)	
Controls	Volume level control (per channel), LEDs : Power, Indicator for each channel: input, output, peak, protection	
Connection	Input: Detachable terminal block (3 pins), XLR-3-31, output: screw terminals (M4)	
Protection Circuit	Overheat, short circuit, overload, unusual DC voltage output	
Dimensions (W x H x D)	482 mm x 88 mm x 401.4 mm (EIA standard rack)	
Weight	9 kg	
Finish	Front: Aluminum, alumite process, black, case: plated steel sheet	
Accessories	Terminal block connector (3-pins) x 4, cover volume control x 4	



Digital Mixing System

D-2000 Series Digital Mixer



D-2000 Series

Features

- Expandable to 128 input/output
- Various modules and peripherals can be combined to create the best possible sound in small to medium-size venues of all types
- User-specific configurations
- Fully modular design makes it a simple matter to create a configuration that meets specific user requirements
- The system is featuring a 24-bus matrix

Auto-mixing :

- NOM (Number of Open Microphones)
- Ducker function (Auto-Mute function)

Highly effective feedback suppression

- Feedback elimination for up to 4 channels
- Each channel can control 12 problem frequencies.

2 versatile suppression modes

- Either presetable auto mode or realtime dynamic mode

Essential audio processing

- Delay, high pass, low pass and notch filters, parametric equalizers, compression/auto leveller, gate, crossover frequencies and input trim gain

The dedicated software's graphic, visually attractive user interface helps streamline settings and adjustments

Application

Hotel banquet and function rooms, indoor sports facilities, multipurpose halls and houses of worship

Software Requirements

	D-2000 Series
PC-Type	PC-AT compatible
Hardware	CPU: Pentium4 2GHz or more Memory: 1GB or more (2GB or more recommended) Display adapter: XGA (1024 x 768) or more Network adapter: 10BASE-T or more
Operating System	Windows Vista, Windows XP (SP2) or later
Software	NET Framework 3.5 (included in the supplied CD) installation required



Digital Mixing Processor Unit



D-2008SP

Features

- 32 preset memories for user convenience
- Up to 32 different routing and parameter configurations can be stored for frequent changes in staging, seating and speaker arrangements
- Intuitive GUI
- Mixing console option offers easy user operation (D-2008SP can be connected via network to the D-2012C mixing)
- User-friendly VCA control
- D-2000 Series units used in conjunction with the optional D-911 VCA Fader Unit provides more of an analog mixer user interface
- A RS-232C port allows external control by third party A/V control units

Specifications

	D-2008SP
Power Supply	220 – 240 V AC, 50 Hz
Power Consumption	76 W
Frequency Response	20Hz – 20000 Hz, ± 1 dB (+4 dB Input)
Sampling Frequency	48 kHz
Inputs and Outputs	Input: Max. 32 channels, modular construction (modules optional) Output: Max. 32 channels, modular construction (modules optional) Monitor bus; 1 stereo input, 1 stereo output, headphone: 1 stereo
Signal Processing	Feedback suppression function, auto mixing function, auto mixing group, parametric equalizer high-pass filter, low-pass filter, notch filter, all-pass filter, high shelving filter, low shelving filter, horn equalizer, crossover filter, compressor/auto-leveler, output delay, BUS delay, matrix, CobraNet matrix, crosspoint gain
Presets	32
Aux Functions	Key lock function
LAN	10BASE-T/100BASE-TX, (Automatic-Negotiation) connected via a switching hub Network protocol: TCP/IP Connection cable: Shielded Category 5 or higher twisted pair LAN cable (CAT5-STP) Maximum cable distance: 100m (between D-2008SP and switching sub)
Control	RS-232C, D-sub connector (9 pins) Used for external control Module: Remote control module slot: 2
Operating Temperature	+5 °C ... +40 °C
Dimensions	482 x 132,6 x 343,4 mm
Weight	6,3 kg



Digital Mixing System

Modules

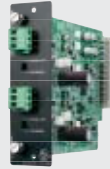
Input Modules

Mic/Line Input (monaural type)



D-2000AD1

- 4-channel, XLR connectors
- A/D converter: 24 bit
- Phantom power supply (48V)
- THD : 0.008% or less



D-921E

- 2-channel, removable terminal block
- A/D converter: 24 bit
- Phantom power supply (15V)
- THD : 0.05% or less



D-921F

- 2-channel, XLR connectors
- A/D converter: 24 bit
- Phantom power supply (15V)
- THD : 0.05% or less



D-922E

- 2-channel, Removable terminal block
- A/D converter: 20 bit
- Phantom power supply (15V)
- THD : 0.05% or less



D-922F

- 2-channel, XLR connectors
- A/D converter: 20 bit
- Phantom power supply (15V)
- THD : 0.05% or less

Mic/Line Input (stereo type)

D-936R

- 4-channel, RCA pin jack
- A/D converter: 24 bit
- THD : 0.05% or less



Digital Input

D-923AE

- 2-channel line input
- Applicable Format: AES/EBU



D-937SP

- 1-channel stereo line input
- Applicable Format: S/PDIF



Output Modules

Line Output



D-2000DA1

- 4-channel, XLR connectors
- D/A converter: 24 bit
- THD : 0.008% or less



D-971M

- 4-channel, XLR connectors
- D/A converter: 24 bit
- THD : 0.05% or less



D-971E

- 4-channel, Removable terminal block
- D/A converter: 24 bit
- THD : 0.05% or less



D-971R

- 4-channel, RCA pin jack
- D/A converter: 24 bit
- THD : 0.05% or less



D-961SP

- 2-channel stereo line output
- Coaxial RCA jack
- Applicable Format: S/PDIF



D-972AE

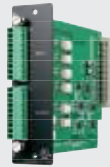
- 4-channel line output
- XLR connectors
- Applicable Format: AES/EBU

Remote Control Module

Remote Control

D-981

- 8 inputs/8 outputs
- Removable terminal block connectors



D-983

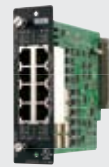
- 24 inputs/16 outputs
- RJ45 connectors



VCA Control

D-984VC

- Interface to D-911 Remote Controller
- 8 RJ-45 connectors
- Control up to 12 inputs, 8 outputs



CobraNet* Interface Module



*CobraNet was developed by Cirrus Logic, a US company and is a network protocol utilizing Ethernet networks to perform high-quality multi-channel digital transmission. It allows using existing Ethernet equipment such as CAT-5 switching hubs.

D-2000CB

- Allows audio transmission among D-2008SPs.

VCA Fader Unit



D-911

VCA Fader Unit for controlling 12 inputs/ 8 outputs, channel gains and 8 contact controls when used with the D-984VC.

Digital Mixing System



Remote Console Unit



D-2012C

Features

- Mixing console option offers easy user operation
- The digital mixing processor D-2008SP can be connected via network to the mixing console D-2012C
- 12 motorized faders and 8 rotary encoders
- Access to up to 80 channels
- Simplified mixing operation that suit non-professional users
- Monitoring of input and output channel signal levels
- Recalling preset memory settings
- Contact control

Specifications

	D-2012C
Power Supply	AC mains, 50 / 60 Hz
Power Consumption	18 W
Volume Adjustment	100 mm motorized fader × 12, Rotary encoder × 8
Line Input	1 channel (stereo), +10 to -20 dB*1, 10 kΩ, unbalanced, RCA Pin-jack
Headphone Output	Stereo 100 mW + 100 mW (32 Ω load), standard stereo phone-jack
Monitor-Bus	1 stereo input, 1 stereo output
LAN	Network I/F: 10BASE-T/100BASE-TX (Automatic-Negotiation) RJ45 connector, Connected via a switching hub Network protocol: TCP/IP Connection cable: Shielded twisted pair (STP) Category 5 or higher LAN cable Maximum cable distance: 100m (109.36 yd) (between D-2008SP and switching sub)
Control	RS-232C, D-sub connector (9 pins) Used for maintenance use
Dimensions	482 × 266 × 138 mm
Weight	6.6 kg



Digital Modular Mixer

High-resolution sound quality and remote functions in a compact mixer



D-901

Description

Ready for any requirement. The new TOA D-901 digital mixer is a fully modular, cost-effective digital mixer featuring a 12-input, 8-bus, 8-output channel configuration (12 x 8 matrix) with easy operation that can be expanded as application requires.

All-in-one design. The compact D-901 is just 3U-sized but incorporates several of the most important functions. These include a digital mixer, feedback suppression, auto mixing, parametric EQ, compression, delay and echo. Its remarkable operational scope allows it to do the work that conventionally requires several different pieces of equipment, providing a cost-effective solution that is perfect for any requirement.

Feedback suppressor. This sophisticated and TOA proprietary function automatically processes feedback at certain frequencies through constant monitoring, then automatically attenuates precisely the problematic frequencies, keeping the audio sounding natural.



Interface for AMX / Crestron

Automatic mixing function. The D-901's automatic mixing function adjusts input level automatically to make operating easier. It features smart "number of open microphones" (NOM) attenuation that sets the gain for all microphone inputs according to the number of microphone inputs utilized. This allows satisfactory levels to be set without feedback problems. A "Ducker" function operates when an input channel is open, to enable that channel's priority to initiate the low channel signal that will attenuate the other channels.

Sound processing. As a full-featured digital mixer, the D-901 incorporates several useful built-in functions to ensure maximum performance without requiring other equipment. A compressor can be switched in, to reduce the dynamic range between the smallest and largest signals, preventing amplifier clipping at high levels. The flexible crossover function allows setting speaker crossover points and filter slopes to optimize multichannel speaker systems. Full equalization and filter setting configurations can be saved in up to 16 memories for instant recall. The time delay function can be used to align remote speakers or to drive delay speakers.

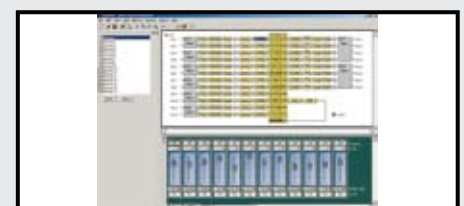
Ergonomic control layout. Convenient front panel controls and display make it easy to perform all functions and confirm parameter settings without requiring a PC. Another advantage is the

ability to store up to 16 sound parameter setting configurations in memory for instant recall when required. These include crossover, EQ, filter slope settings, time delay and other parameters. Control settings can also be locked to prevent unauthorized tampering.

Wide application scope and remote control ability. The D-901 can be externally controlled with an external signal trigger or the RS-232C port on the back panel which enables the D-901 to easily interface with external equipment.



Easy Front Panel Operation



or Software Control

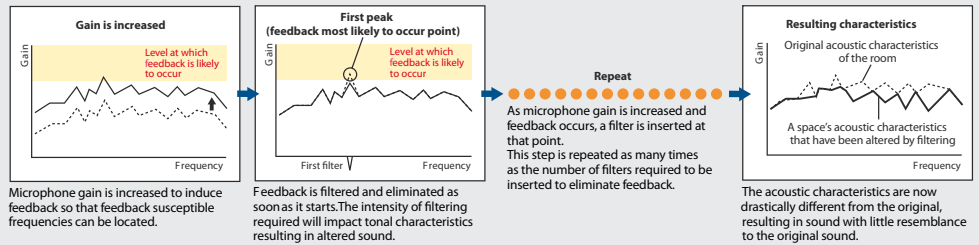


Two out of Multiple Functions

Feedback Suppression

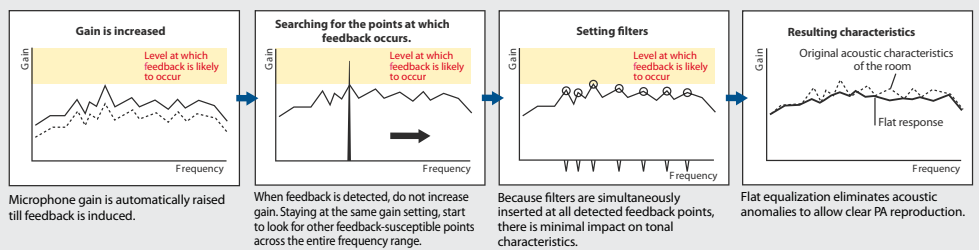
Conventional suppression

Manual cancellation of feedback is imprecise as filtering problematic frequencies affects neighboring frequencies as well. This tonally impacts the signal and often results in audio that does not sound natural.

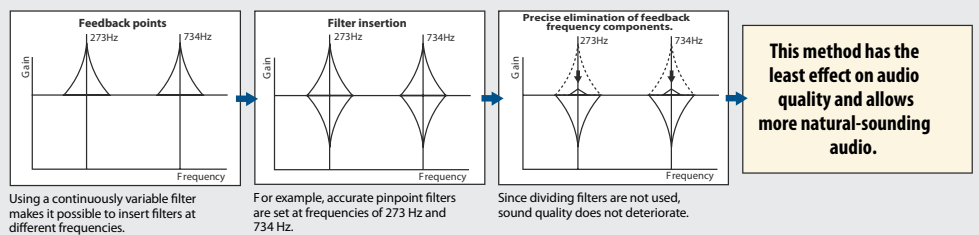


TOA feedback suppressor

This proprietary technique works by automatically detecting the frequencies where acoustic feedback is occurring. Once these frequencies are detected, the suppressor automatically sets precisely notch filters that drastically attenuate only those frequencies with accurate pinpoint filtering.



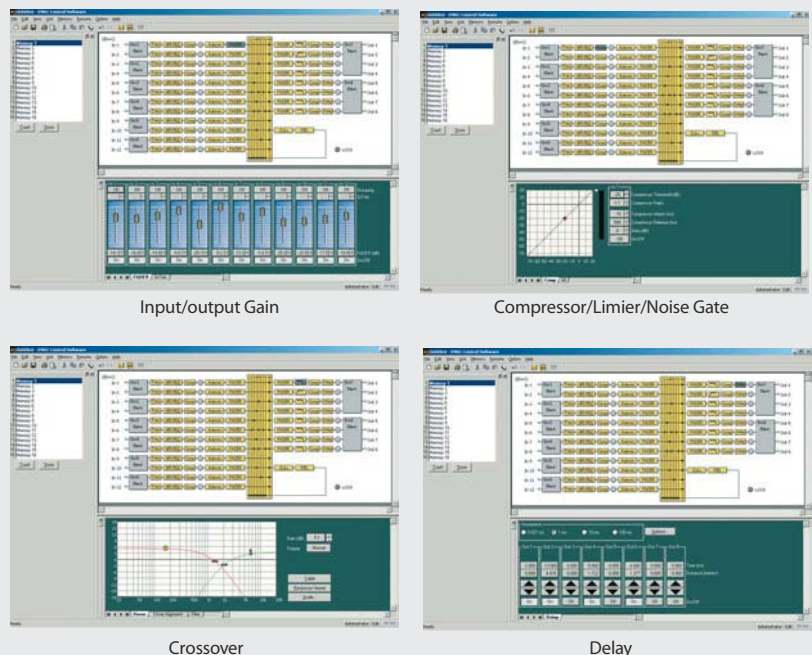
Audio signals are therefore minimally affected because only the problematic frequencies are attenuated to negligent levels by suppressor's action.

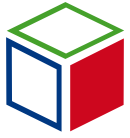


D-901 PC Software

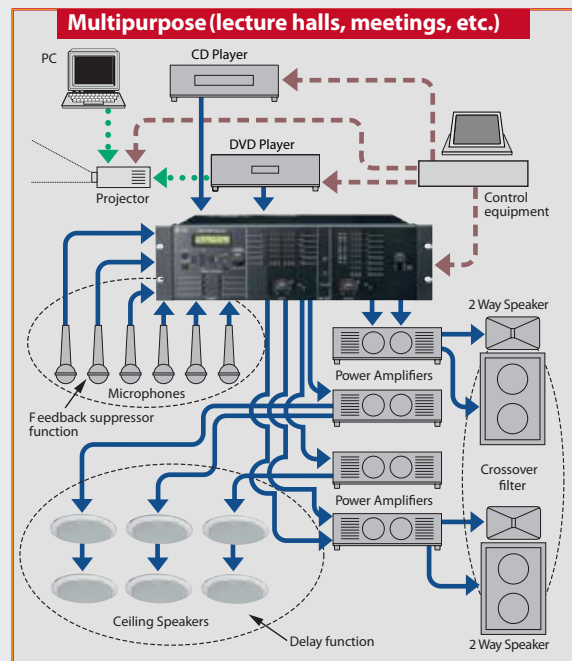
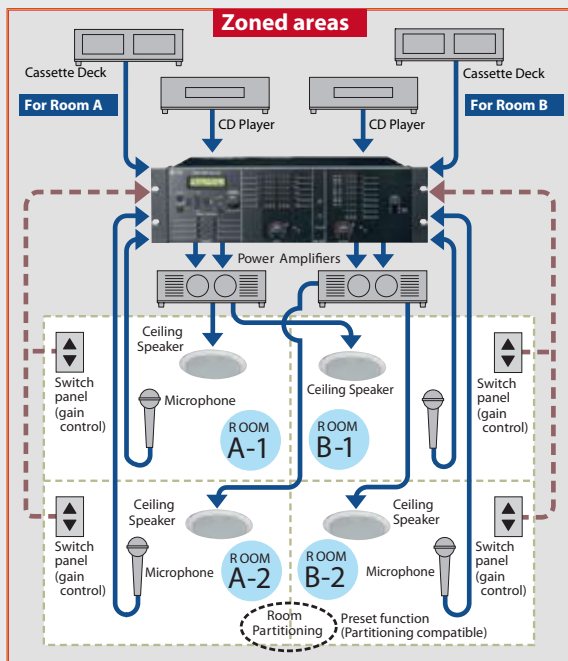
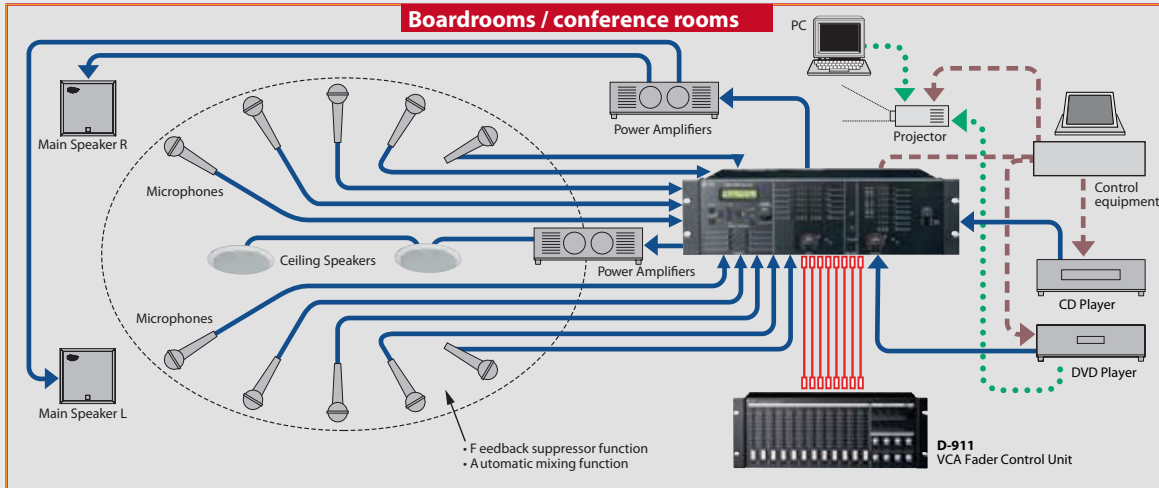
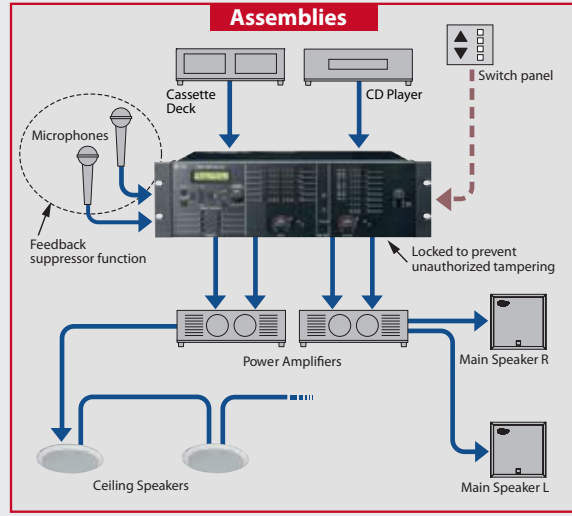
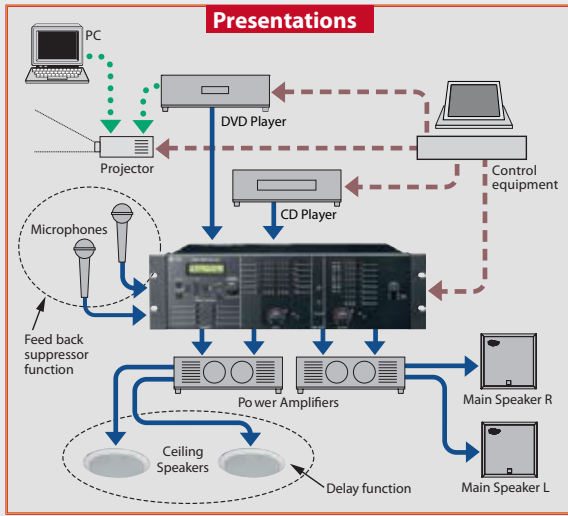
The D-901 comes standard with dedicated software to assist in D-901 system configuration, parameter setting and general setup using a PC. The software features menu-driven operation with an easy to understand GUI. The software offers comprehensive control over virtually every possible function. For set up these include crossover slopes, combinations, and storing crossover configurations. For operation, menus offer dedicated pages for viewing and adjusting matrix, trim, EQ, compression, automix, gating, filtering, delay, echo and feedback suppression settings as well as mic/line input modules and many others. Presets can be configured and stored for immediate recall when desired. In addition, the software allows determining user level as well as preparing the D-901 for remote control. Lastly, a full assortment of protection functions can be utilized.

* Download installation program from TOA's homepage (<http://www.toa-products.com/international/>) and save it to the desktop.





Digital Modular Mixer



Video Control Sound

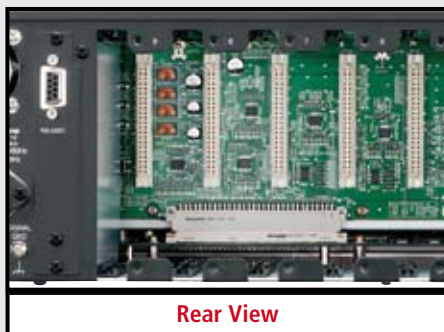
Application Examples

Digital Modular Mixer

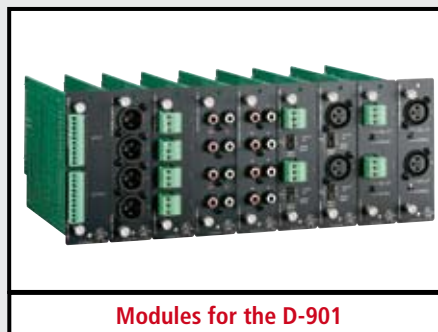


Rear View (equipped with optional modules)

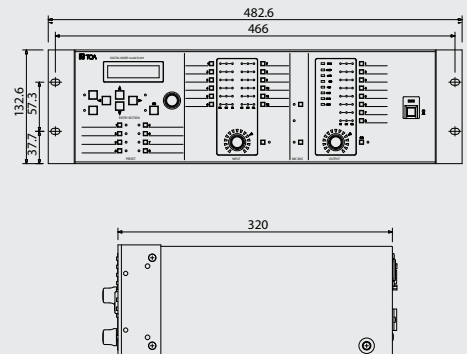
Dimensions



Rear View



Modules for the D-901



Specifications

	D-901
Power Source	100 – 120 V, 230 V AC, 50 / 60 Hz
Power Consumption	40 W
Operating Temperature	+5° C ... +40° C
Frequency Response	20 – 20000 Hz, ±1 dB (±4 dBu 1 Input)
Input	Max. 12 channels, modular construction (modules optional)
Output	Max. 8 channels, modular construction (modules optional)
Signal Processing	Feedback suppression function: 12 filters (auto/dynamic), auto mixing function: ducker (automatic muting), NOM attenuation, equalizer / filter: parametric equalizer: 20 – 20000 Hz, ±15 dB, Q: 0.267 – 69.249, filtering: high-pass filter 20 – 20000 Hz, 6 dB/oct., 12dB/oct. low-pass filter 20 – 20000 Hz, 6 dB/oct, 12 dB/oct, notch filter 20 – 20000 Hz, Q: 8.651 – 69.249 all-pass filter 20 – 20000 Hz, Q: 0.267 – 69.249, high shelving filter 6 – 20000 Hz, ±15 dB low shelving filter 20 – 500Hz, ±15 dB, horn equalizer 20000 Hz, 0 to +18 dB (1 dB steps), compressor: crossover filter: LR / BW / BE 20 – 20000 Hz, 6 dB/oct, 12 dB/oct, 18 dB/oct, 24 dB/oct, threshold: –20 dB to +20 dB, ratio: 1:1, 2:1, 3:1, 4:1, 8:1, 12:1, 20:1, infinite:1, attack time : 0.2 ms – 5 s, release time: 10 ms to 5 s, Delay gain: – infinite to +10 dB, delay time: 0 – 682.6 ms (0.021 ms steps), matrix: 12 x 8
Preset Memory	16
Auxiliary Function	System locking function
Control	RS-232C, D-sub connector (9 pins), remote control module (option)
Front Panel Section	Preset memory recall key: 8, LCD screen, screen shift key (up/down/left/right), setting knob, Input level indicator: dual colour LED, output level indicator: dual colour LED, channel selector key: 12 (input channel selection) 8 (output channel selection), Channel volume control: 1 (input channel selection) 1 (output channel selection)
Rear Panel	Input module slot: 6 (input/output module slot: 2), Output module slot: 2 Remote control module slot: 1
Finish	Panel: aluminum, hair-line finish, black, others: pre-coated steel plate, black, 30 % gloss
Dimensions	482.6 x 132.6 x 320 mm (excluding projection), 3 units
Weight	6.9 kg



Digital Modular Mixer

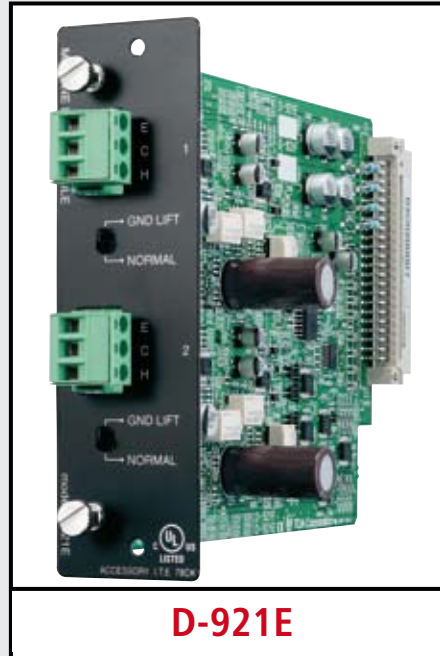
Microphone / Line Input Modules



D-921F

Features

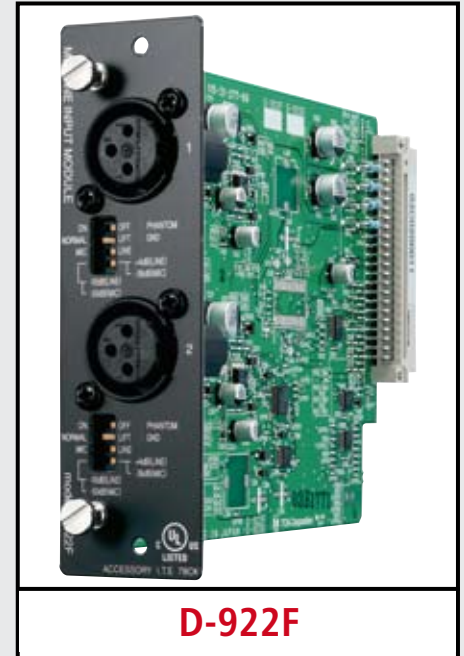
- 2-channel Microphone / Line Input Module (24 bits monaural type)
- With XLR connectors
- Input sensitivity and phantom power settings can be performed at the front panel



D-921E

Features

- 2-channel Microphone / Line Input Module (24 bits monaural type)
- With removable terminal block type connectors
- Input sensitivity and phantom power settings can be performed at the front panel



D-922F

Features

- 2-channel Microphone / Line Input Module (20 bits monaural type)
- With XLR connectors
- The D-901's 4-pole DIP switch is used to set the input sensitivity, phantom power supply, and ground lifting

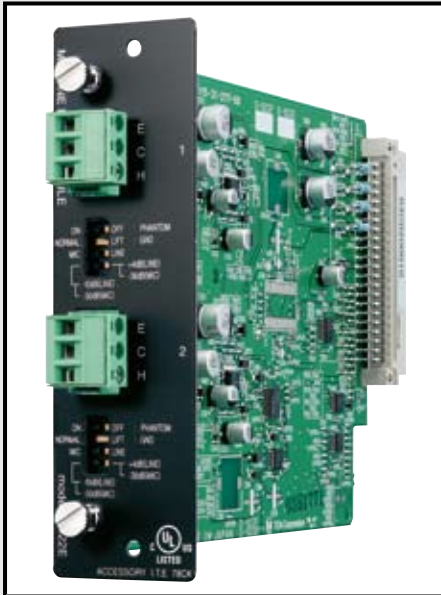
Specifications

	D-921F	D-921E	D-922F
Input	2 channels, Mic / Line changeable Mic: -50/-36 dB, 4.7 kOhm, electronically-balanced, equivalent to XLR-3-31 type Line: -10/+4 dBV, 10 kOhm, electronically-balanced, equivalent to XLR-3-31 type Phantom power supply (+15 V, can be used when set for the microphone), Ground lift switch	2 channels, Mic / Line changeable Mic: -50/-36 dB, 4.7 kOhm, electronically-balanced, removable terminal block type connector Line: -10/+4 dBV, 10 kOhm, electronically-balanced, removable terminal block type connector Phantom power supply (+15 V, can be used when set for the microphone), Ground lift switch	2 channels, -50/-36/-10/+4 dB (Selectable with the DIP switch), 4.7 kOhm, electronically-balanced, equivalent to XLR-3-31 type Phantom power supply (15 V, can be set with DIP switch) Ground lift switch (can be set with the DIP switch)
A/D Converter	24 bits	24 bits	20 bits
Frequency Response	20...20000 Hz, ±1 dB (+4 dBu input)	20 ... 20000 Hz, ±1 dB (+4 dBu input)	20 ... 20000 Hz, ±1 dB (+4 dBu input)
Sampling Frequency	48 kHz	48 kHz	48 kHz
Dynamic Range	Over 100 dB (IHF-A weighted) (+4 dBu input)	Over 100 dB (IHF-A weighted) (+4 dBu input)	Over 85 dB (IHF-A weighted) (+4 dBu input)
Total Harmonic Distortion	Under 0.05% (+4 dBV input)	Under 0.05 % (+4 dBV input)	Under 0.2 % (+4 dBV input)
Finish	Panel: Pre-coated steel plate, black, 30 % gloss	Panel: Pre-coated steel plate, black, 30 % gloss	Panel: Pre-coated steel plate, black, 30 % gloss
Dimensions (W x H x D)	35 x 119.5 x 178.4 mm	35 x 119.5 x 178.4 mm	35 x 119.5 x 178.4 mm
Weight	150 g	140 g	135 g
Accessory		Removable terminal block type connector (preinstalled on the unit) x 2	



Digital Modular Mixer

Microphone / Line Input Modules



D-922E



D-936R

Features

- 2-channel Microphone / Line Input Module (20 bits monaural type)
- With removable terminal block type connectors
- The D-901's 4-pole DIP switch is used to set the input sensitivity, phantom power supply, and ground lifting

Features

- Stereo Select Input Module
- 4 stereo inputs
- With standard RCA pin jacks
- 2 stereo transmission modes:
 - 1) Selection of one of the 4 stereo inputs for transmission to the D-901
 - 2) Mixing of all 4 stereo inputs, transmitting the mixed signal to the D-901 through left / right channel outputs
- Mode settings and stereo selection are performed on the front panel

Specifications

	D-922E	D-936R
Input	2 channels, -50/-36/-10/+4 dBV (Selectable with the DIP switch), 4.7 kOhm, electronically-balanced, removable terminal block type connector Phantom power supply (15 V, can be set with the DIP switch) Ground lift switch (can be set with the DIP switch)	4 stereo inputs (selection of 1 stereo or mixing of all 4 stereo inputs) -10 dB, 10 kOhm, RCA pin jack
A/D Converter	20 bits	24 bits
Frequency Response	20 ... 20000 Hz, ±1 dB (+4 dBV input)	20 ... 20000 Hz, ±1 dB (+4 dBV input)
Sampling Frequency	48 kHz	48 kHz
Dynamic Range	Over 85 dB (IHF-A weighted) (+4 dBu input)	Over 100 dB (IHF-A weighted)
Total Harmonic Distortion	Under 0.2 % (+4 dBV input)	Under 0.05 %
Finish	Panel: Pre-coated steel plate, black, 30 % gloss	Panel: Pre-coated steel plate, black, 30 % gloss
Dimensions (W x H x D)	35 x 119.5 x 178.4 mm	35 x 119.5 x 178.4 mm
Weight	125 g	145 g
Accessory	Removable terminal block type connector (preinstalled on the unit) x 2	



Digital Modular Mixer

Digital Input Modules



D-923AE



D-937SP

Features

- 2-channel Line Digital Input Module
- Digital signals can be input, permitting direct connection of the D-901 Digital Mixer to equipment having a digital output
- AES/EBU-Format
- Owing to the built-in sample rate converter, the module can handle signals of various sampling frequencies

Features

- Stereo 1-channel Line Digital Input Module
- For digital signal input, permitting direct connection of the D-901 Digital Mixer to equipment having a digital output
- S/PDIF-Format
- Owing to the built-in sample rate converter, the module can handle signals of various sampling frequencies
- When this module is used, one of the 4 stereo inputs is selected for output to the D-901
- Input selection can be performed at the front panel, by PC software or through a remote control module

Specifications

	D-923AE	D-937SP
Input	2 channels, 2.0 – 7.0 V (p-p), 110 Ohm, XLR-3-31 or equivalent	Stereo 1 channel line (Selectable 1 of 4 inputs), 0.5 V (p-p), 75 Ohm, coaxial RCA jack × 2 Square optical connector × 2
Applicable Format	AES/EBU (2 channel multiplexed)	S/PDIF (2 channel multiplexed)
Sampling Frequency	32 – 48 kHz	32 – 48 kHz
Finish	Panel: Pre-coated steel plate, black, 30% gloss	Panel: Pre-coated steel plate, black, 30% gloss
Dimensions (W x H x D)	35 x 119.5 x 178.4 mm	35 x 119.5 x 178.4 mm
Weight	130 g	130 g



Digital Modular Mixer

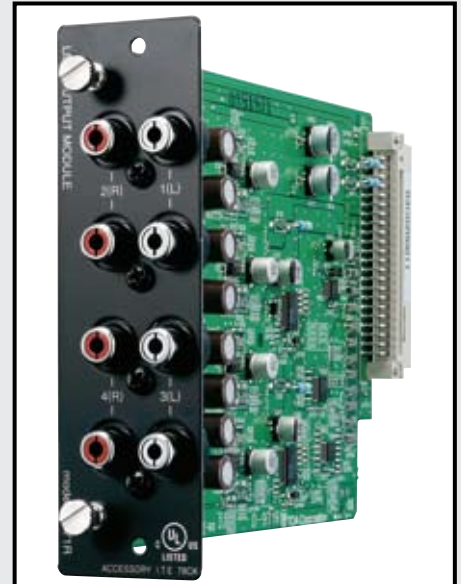
Line Output Modules



D-971M



D-971E



D-971R

Features

- 4-channel Line Output Module
- With XLR connectors
- 2 Line Output Modules may be used at the same time

Features

- 4-channel Line Output Module
- With removable terminal block type connectors
- 2 Line Output Modules may be used at the same time

Features

- 4-channel Line Output Module
- With standard RCA pin jacks

Specifications

	D-971M	D-971E	D-971R
Output	4 channels, +4 dBu, adaptable load of over 600 Ohm, electronically-balanced, equivalent to XLR-3-32 type	4 channels, +4 dBu, adaptable load of over 600 Ohm, electronically-balanced, removable terminal block type connector	4 channels (2 outputs for each channel), -10 dBu, adaptable load of over 600 Ohm, RCA pin jack
D/A Converter	24 bits	24 bits	24 bits
Frequency Response	20 ... 20000 Hz, ±1 dB	20 ... 20000 Hz, ±1 dB	20 ... 20000 Hz, ±1 dB
Sampling Frequency	48 kHz	48 kHz	48 kHz
Dynamic Range	Over 100 dB (IHF-A weighted)	Over 100 dB (IHF-A weighted)	Over 100 dB (IHF-A weighted)
Total Harmonic Distortion	Under 0.05 %	Under 0.05 %	Under 0.05 %
Finish	Panel: Pre-coated steel plate, black, 30 % gloss	Panel: Pre-coated steel plate, black, 30 % gloss	Panel: Pre-coated steel plate, black, 30 % gloss
Dimensions (W x H x D)	35 x 119.5 x 178.4 mm	35 x 119.5 x 178.4 mm	35 x 119.5 x 178.4 mm
Weight	165 g	140 g	150 g



Digital Modular Mixer

Digital Output Modules



D-961SP

Features

- 2-Stereo-Channel Digital Output Module
- Digital signals can be output, permitting direct connection of the D-901 Digital Mixer to equipment having a digital input
- S/PDIF-Format
- Each pair of optical output and coaxial output is output in parallel



D-972AE

Features

- 4-Channel Digital Output Module
- With the use of this module, digital signals can be output, permitting direct connection of the D-901 Digital Mixer to equipment having a digital input
- AES/EBU-Format

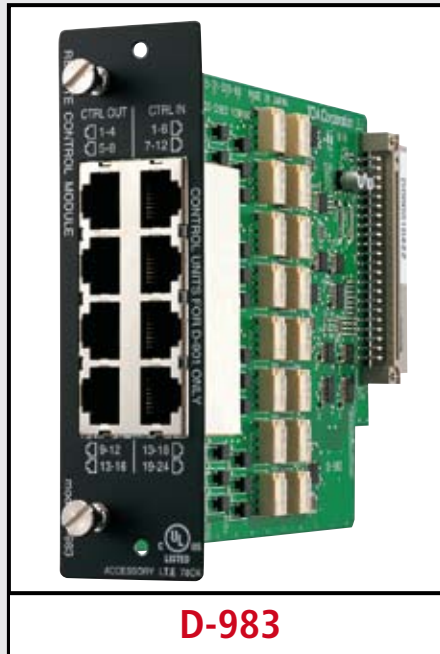
Specifications

	D-961SP	D-972AE
Output	2-stereo-channel line (with splitter, can be output to each pair of optical output and coaxial output in Parallel), 0.5 V (p-p), 75 Ohm, Coaxial RCA jack × 2 Square optical connector × 2	4 channels, 5.0 V (p-p), 110 Ohm, XLR-3-32 or equivalent × 2
Applicable Format	S/PDIF (2 channel multiplexed)	AES/EBU (2 channel multiplexed)
Sampling Frequency	48 kHz	48 kHz
Finish	Panel: Pre-coated steel plate, black, 30 % gloss	Panel: Pre-coated steel plate, black, 30 % gloss
Dimensions (W x H x D)	35 x 119.5 x 178.4 mm	35 x 119.5 x 178.4 mm
Weight	130 g	130 g

Digital Modular Mixer



Remote Control Modules



Features

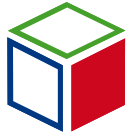
- 8 contact inputs, 8 contact outputs
- Permits preset memory recall, input/output channel volume control, stereo input selection and channel ON/OFF operation to be remotely controlled from external equipment
- Tally output can also be provided for external control

Features

- 24 contact inputs, 16 contact outputs
- Permits preset memory recall, input/output channel volume control, stereo input selection and channel ON/OFF operation to be remotely controlled from external equipment
- Tally output can also be provided for external control

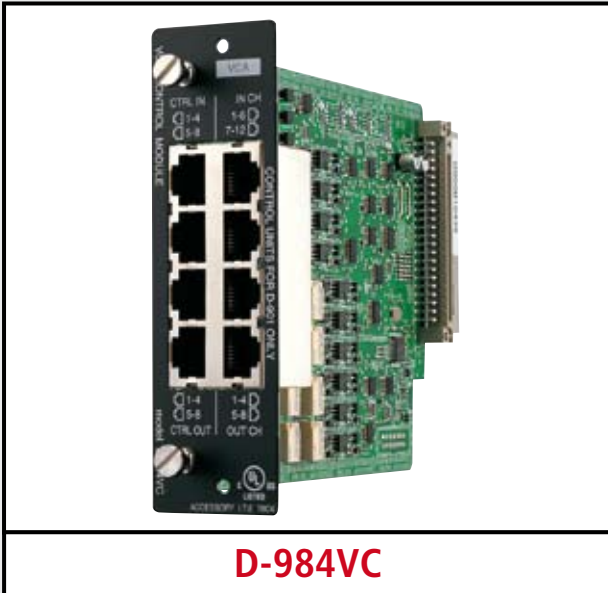
Specifications

	D-981	D-983
Control input	COM + terminals 1 – 8: Open voltage: 5 V DC, short-circuit current: 5 mA removable terminal block type connector	COM + terminals 1-24: Open voltage: 5 V DC, short-circuit current: 5 mA RJ45 connector x 4
Control	Any preset memory can be recalled	Any preset memory can be recalled
Preset Memory Selection	Control method: No-voltage make of over 100 ms/no-voltage make single pulse of over 100 ms	Control method: No-voltage make of over 100 ms/no-voltage make single pulse of over 100 ms
Volume	Volume can be turned UP or Down for any input and output channels. Control method: 1 step variation for no-voltage make single pulse of over 100 ms 1 step continuous operation for every 70 ms for no-voltage make of over 100 ms. Can be reset when at break. Variable range: -∞ dB to +10 dB. Any input/output channels can be turned ON and OFF.	Any input/output channel volume can be turned UP or DOWN. Control method: 1 step variation for no-voltage make single pulse of over 100 ms, 1 step continuous operation for every 70 ms for no-voltage make of over 100 ms. Can be reset when at break. Variable range: -∞ dB to +10 dB Any input/output channels can be turned ON and OFF.
Channel	Control method: No-voltage make of over 100ms/ no-voltage make single pulse of over 100 ms	Control method: No-voltage make of over 100 ms/no-voltage make single pulse of over 100 ms Input channel lines of the D-936R (optional) or the D-937SP (optional)
Stereo selection	Any stereo input can be selected. Control method: No-voltage make of over 100 ms/ no-voltage make single pulse of over 100 ms	(4 stereo input module) can be selected. Control method: No-voltage make of over 100 ms/ no-voltage make single pulse of over 100 ms
Control output	COM + terminals 1 – 8: No-voltage make contact input, contact capacity: 24 V DC, 100 mA removable terminal block type connector	COM + terminals 1-16: No-voltage make contact, contact capacity: 24 V DC, 100 mA RJ45 connector x 4
Finish	Panel: Pre-coated steel plate, black, 30 % gloss	Panel: Pre-coated steel plate, black, 30 % gloss
Dimensions (W x H x D)	35 x 119.5 x 178.4 mm	35 x 119.5 x 178.4 mm
Weight	125 g	170 g



Digital Modular Mixer

VCA Control Module



D-984VC

Features

- 20 VCA control inputs, 8 contact inputs and 8 contact outputs
- By using VCA controls from external equipment, this module permits the D-901's volumes of 12 inputs and 8 outputs to be controlled
- By using contact input controls from external equipment, this module permits the preset memory recall, input/output channel gains, stereo input selection, and channel ON/OFF to be controlled
- By using contact output controls, tally outputs can also be provided for external control

Specifications

	D-984VC
VCA Control Input	+5 V GND, terminal 1 - 20 (12 input channels, 8 output channels), RJ45 connector x 4, control contents: volume control of each input/output channel, variable range: $-\infty$ dB to +0 dB
Contact Input	COM + terminal 1-8: open voltage: 5 V DC, short-circuit current: 5 mA, RJ45 connector x 2
Preset Memory Selection	Any preset memory can be recalled. Control method: No-voltage make of over 100ms/ No-voltage make single pulse of over 100ms
Volume control	Any input/output channel volume can be turned UP or DOWN. Control method: 1 step variation for no-voltage make single pulse of over 100ms 1 step continuous operation for every 70ms for no-voltage make of over 100 ms. Can be reset when at break. Variable range; $-\infty$ dB to +10 dB
Channel	Any input/output channel can be turned ON and OFF. Control method: No-voltage make of over 100 ms / no-voltage make single pulse of over 100 ms
Stereo Selection	Input channel lines of the D-936R (optional), or the D-937SP (optional) (4 stereo input module) can be selected. Control method: No-voltage make of over 100 ms/ No-voltage make single pulse of over 100 ms
Contact Output	COM + terminal 1-8: No-voltage make contact, contact capacity: 24 V DC, 100mA, RJ45 connector x 2
Finish	Panel: Pre-coated steel plate, black, 30 % gloss
Dimensions (W x H x D)	35 x 119.5 x 178.4 mm
Weight	170 g

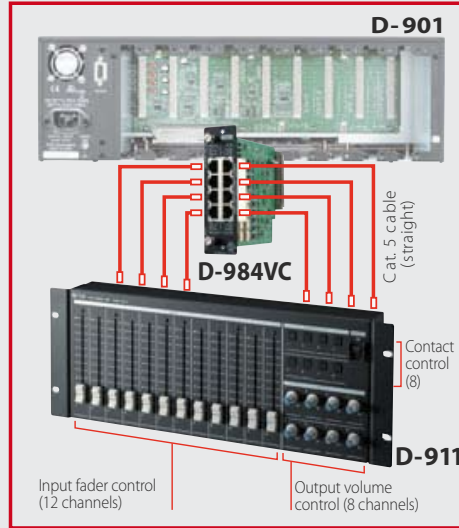


Digital Modular Mixer

VCA Fader Unit



D-911



Interconnection D-911 and D-901

Features

- 100 mm fader
- Volume control of all channels and contact controls
- 12 Fader for input channels
- 8 output volume controls
- 8 LED-illuminated switches
- Remote power control
- Optional D-984VC module required
- Rack mountable

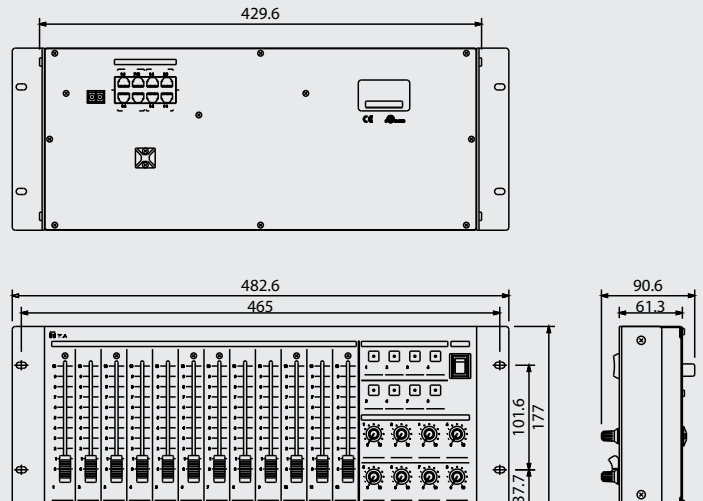
Options

- D-984VC: VCA control module

Specifications

	D-911
Power Supply	5 V DC (supplied from the optional D-984VC)
Connector	RJ45 connector × 8
Input Fader Control	Input fader (100 mm) × 12
Output Volume Control	Output volume control × 8
Contact Control	Illuminated switch × 8
Remote Switch	Seesaw switch for activating the remote function of the power distributor
Remote Output	No-voltage make contact output (contact capacity: 30 V DC, 4A)
Finish	Panel: Pre-coated steel plate, black, 30% gloss
Dimensions (W × H × D)	482.6 × 177 × 61.3 mm (excluding projection)
Weight	2.7 kg
Accessory	Fader knob (Red, Yellow) × 3 each, Volume knob (Red) × 2, Rack mounting screw × 4, Rack mounting fiber washer × 4, Rack mounting bracket (preinstalled on the unit) × 2

Dimensions





Digital Mixer

Digital Matrix Mixer



M-9000M2

Features

- Combination of Matrix and Mixer Mode
- 8 slots for modules
- 4 priorities selectable
- 2 DSP output channels included
- 10-band parametric equalizer
- Ducker-function (priority)
- Aluminum front panel and steel case
- For rack-mounting, 2 units height
- Colour: black
- Up to 16 panels can be connected to 1 M-9000M2 by using a RC-001T control module
- Panels can be cascaded
- Different modules, remote panels and a

- sensing microphone for individual adjustment to the ambient noise
- Easy to use software with new functions

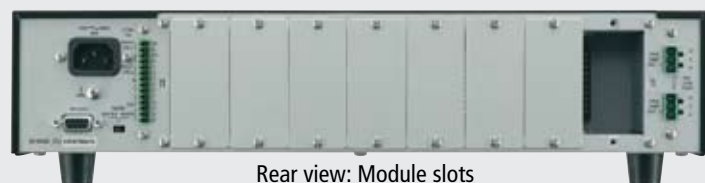
Applications

Restaurants, bars, hotels, conference rooms and board rooms, auditoriums, offices, museums, fitness clubs and theme parks

Options

- D-001T: Input module
- ZP-001T: Telephone module
- T-001T: Output module
- AN-001T: Ambient noise control module
- C-001T: Input / output control module
- AN-9001: Sensor microphone
- RC-001T: RS-485 control module
- SS-9001: Speaker selection module
- D-001R: Line input module with DSP
- Various Remote Panel:
ZM-9001, ZM-9002, ZM-9003,
ZM-9011, ZM-9012, ZM-9013, ZM-9014

Specifications



Rear view: Module slots

	M-9000M2
Audio Input	Max. 8 channels, modular (modules optional)
Audio Output	Preamplifier outputs 1 and 2: 0 dBV, 600 Ohm, balanced, removable terminal blocks (3-pins), max. 8 outputs
Control Inputs and Outputs	RS-232C, D-sub connector (9-pins); 4 control inputs and outputs each, remote volume control, removable terminal blocks.
Crosstalk	> 64 dB (20000 Hz)
Functions	Tone control (bass, treble: ± 12 dB), 10-bands parametric equalizer (31 steps, Q: 0,3 ...5), 15 speaker equalizer, high pass (-12 dB / Oct), low pass (-12 dB / Oct), Compressor (depth 1 to 5), Delay (0 ... 40 ms in 1ms steps), 32 scene/event memories, 2 operation modes: mixer or matrix, key-lock
Frequeny Range	20 Hz ... 20000 Hz
Total Harmonic Distorsion	< 0,008 %
S/N Ratio	90 dB
Power Supply	230 V (50 / 60 Hz)
Power Consumption	40 W
Finish	Front: Aluminum, black, case: steel plate, black
Dimensions (W x H x D)	420 x 107.6 x 353 mm, 2 units
Weight	6 kg (without modules)



M-9000 Modules

D-001T

Dual Mic /Line Input Module with DSP

2 balanced mic / line Inputs
 Digital signal processing:
 10-band parametric EQ
 Bass / treble, loudness
 High pass / low pass filters, compressor
 Adjustable sensitivity (-60 ... -10 dB, 9-steps)
 Phantom power (24 V DC)
 Detachable terminal block
 Max. 4 input modules / chassis
 Required for VOX-function and input measure



T-001T

Dual Line Output Expansion Module with DSP

2 balanced line outputs
 Digital signal processing:
 -10-band parametric EQ
 -Bass / treble, loudness
 -High pass / low pass filters, compressor
 Detachable terminal block
 Max. 3 output modules / chassis



AN-9001

Ambient Noise Sensor Microphone

Ceiling or wall mount condenser microphone.
 Fits one gang electrical box
 Use with AN-001T module or DP-L2 processor



ZP-001T

Telephone Zone Paging Module

Telephone paging to up to 8 zones. Uses DTMF dialing access outputs
 Dial up to 8 output zones in one operation. Compatible with analog extension or page port.
 Page port operation requires closed contact. RJ-11 telephone plug or detachable screw terminals
 Max. 1 telephone module / chassis



C-001T

Input / Output Control Module

8 assignable control inputs for activation
 Event / volume / mute / remote power on-off
 Emergency mute
 8 assignable control outputs for activating external relays
 Detachable screw terminals
 Max. 1 control module / chassis



SS-9001

Speaker Selection Module

Up to 4 speaker lines switchable
 2 amplifier inputs for announcements and BGM
 Interconnectable to other TOA systems



AN-001T

Ambient Noise Control Module

Automatic adjusts output gain to compensate for changes in ambient noise level
 2 microphone inputs with 24 V phantom power
 14 preset gain ratios
 Each input can be assigned to control a specific output
 Only in combination with AN-9001 sensor microphone
 Max. 2 modules per chassis



RC-001T

RS-485 Control Module

For up to 16 RS-485 remote control panels
 Bi-directional RS-485 communication
 Control, status feedback display for each remote function
 Dual ports for up to 8 modules
 24V DC power adapter (optional AD-246) required for each port
 May be used in any control option slot in addition with C-001T



D-001R

Line Input Module with DSP

Two RCA phone inputs per channel provides stereo summing
 Digital Signal Processing
 -10-Band Parametric EQ
 -Bass / Treble, Loudness
 -High and Low Pass Filters
 -Compressor



Detachable screw terminals
 Max. 4 modules / chassis

ZM-9001

Remote Panel with 6 Buttons

6 buttons to activate preset selection or volume up/down
 Wiring: single conductor shielded cable
 Max loop resistance 50 Ohm per line
 Mounting in one gang electrical box
 Maximum 2 remote panels per chassis



ZM-9002

FRemote Panel with 4 Buttons and Volume Control

4 buttons to activate preset selection or volume up/down
 Volume control knob
 Wiring: single conductor shielded cable
 Max loop resistance 50 Ohm per line
 Mounting in one gang electrical box
 Maximum 2 remote panels per chassis



ZM-9003

Remote Panel with 4 interlocking selection buttons and 2 momentary buttons

Max. loop resistance: 250 ohms per line
 Removable Terminal Block
 Maximum two ZM-9003 per chassis



ZM-9011

Assignable Remote Button Panel

Four assignable buttons with LED status indicator for Xpoint settings (on/off, select), paging activation, scene, relay activation
 Assignable ID rotary adjustment on box.
 RC-001T required



ZM-9012

Assignable Volume Controller

Rotary Encoder can be assigned to control any input or output volume
 RC-001T required



ZM-9013

Assignable Remote Button Panel

Eight assignable buttons with LED status indicator for Xpoint settings (on/off, select), paging activation, scene, relay activation. Assignable ID rotary adjustment on box. RC-001T required



ZM-9014

Assignable Remote Button Panel

Four assignable buttons with LED status indicator for Xpoint settings (on/off, select), paging activation, scene, relay activation. Assignable ID rotary adjustment on box. RC-001T required





Digital Mixer

Smart One-Touch Digital Stereo Mixer



M-633D

Features

- One-touch operation
- Automatic resonance control (ARC) with room mode frequency detection and inverse response curve for compensation
- Automatic clippguard (ACG)
- Automatic feedback suppressor (FBS)
- Automatic mute function
- Clearly, highly articulate sound
- 1 unit height
- 12 input channels
- 6 output channels
- 2 monaural channel and 1 stereo channel bus
- Rack-mountable with optional brackets, 2 units height
- Colour: black

Applications

Meeting rooms, gymnasiums, houses of worship

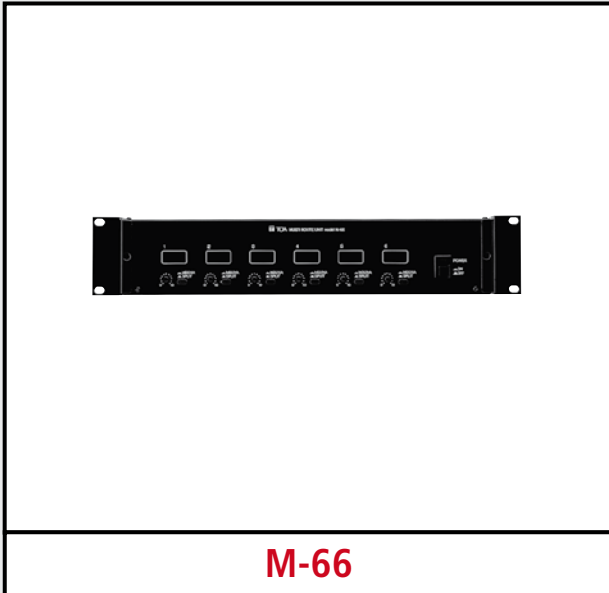
Specifications

	M-633D
Input	6 monaural input channels, switchable LINE, MIC or PHANTOM: LINE : -10 dB*, 2.4 kOhm, MIC : -46 dB*, 2.4 kOhm, PHANTOM : -46 dB*, 2.4 kOhm, supplies +24V DC / 10 mA, electronically balanced Removable terminal block (3 pins), phone jack 3 stereo inputs (L, R): -10 dB* / 10 kOhm, RCA jack, stereo mini jack
Output	2 monaural outputs: 0 dB*, electronically balanced, removable terminal block (3 pins) 1 stereo output (L, R): 0 dB*, electronically balanced, removable terminal block (3 pins) 1 stereo recording output (L,R): -10 dB*, RCA jack
Bus Line	Monaural channel x 2, stereo channel x 1
THD	< 0.03%
Sampling Frequency	48 kHz / 24 bits
Signal Processing	Automatic Resonance Control (ARC), Feedback Suppressor (FBS), Automatic Clippguard (ACG), Automatic Mute
Dynamic Range	>90 dB
Frequency Range	20 Hz ... 20000 Hz
S/N Ratio	90 dB or more (IHF-A weighted)
Power Supply	230 V (50 / 60 Hz)
Power Consumption	14 W
Finish	Front: Aluminum, black, case: steel plate, black
Dimensions (W x H x D)	420 x 44 x 341.3 mm, 1 unit
Weight	4 kg



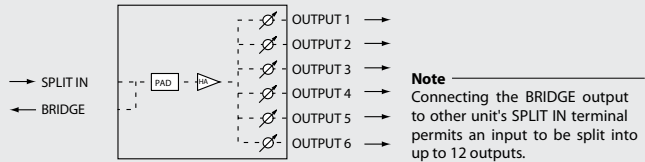
Multi-Route Unit

6 Channel Router



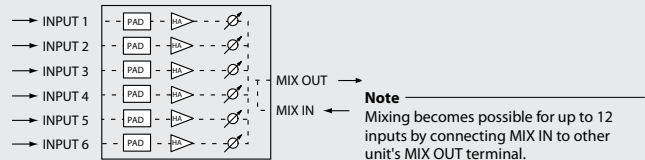
Functions as a splitter

- One input can be split into up to 6 outputs per unit.
- Split outputs can be expanded by connecting multiple units.
- Signal level can be individually adjusted for each output.



Functions as a mixer

- Up to 6 inputs can be mixed together and sent out from 1 output per unit.
- Inputs can be expanded by connecting multiple units.
- Sensitivity level (-60,-40,-10,+10 dB) can be individually set for each input.
- Signal level can be individually adjusted for each input.



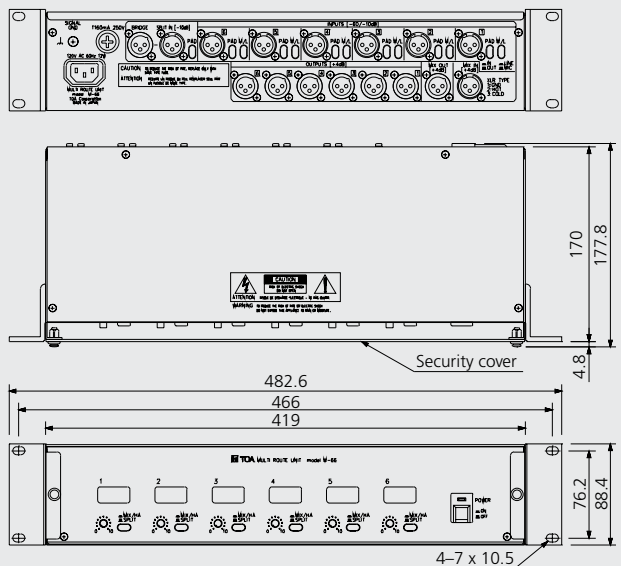
Features

- Unit can be operated as a 6-input-6-output microphone preamplifier / line driver or splitter / combiner (mixer)
- Front panel switch for assigning signal configurations
- Mountable on the EIA standard equipment rack (2-unit size)
- Colour: black
- Mic/Line level selector switch and 20 dB PAD on each input channel for a wide range of precise signal settings from microphone to line levels
- Cascading multiple units for increasing the number of inputs and outputs
- Simultaneous use of multiple functions (i.e. different functions can be assigned to different channels)
- Electrically-balanced inputs and outputs
- Security cover protects the unit against accidental changes

Specifications

	M-66
Power Source	230 V AC, 50 / 60 Hz
Power Consumption	12 W
Input	6 inputs, mic / line changeable, 2 kOhm, XLR-3-31 compatible (electrically balanced); -60 dBu (Mic), -10 dB (Line)
Split Input	-10 dBu, 2 kOhm, XLR-3-31 compatible (electrically balanced)
Mix Input	+4 dBu, 10 kOhm, XLR-3-31 compatible (electrically balanced)
Output	6 outputs, +4 dBu (appropriate impedance not less than 600 Ohm)
Mix Output	+4 dBu (impedance > 600 Ohm), XLR-3-32 compatible
Other	Bridging output: XLR 3-32 compatible; Input sensitivity selector switch: Input 1 to 6 (Line, Mic); pad switch: Input 1 to 6, split input (20 dB); function selector switch: 1 to 6 (MIX / HA, Split)
Frequency Response	20 ... 20000 Hz (+1, -3 dB)
Distortion	< 0,01 % (1 kHz, line level nominal input, output)
Noise	Output: Less than -100 dBu (band pass filter, vol. minimal)
Temperature Range	0°C - 40°C
Finish	Panel, case: Pre-coated steel plate, black, 30 % glossy; security cover: acrylic, grey (smoke)
Dimensions (W x H x D)	482.6 x 88.4 x 177.8 mm
Weight	3 kg

Dimensions





Digital Audio Processor

Automatic resonance control for optimising the sound field



DP-K1

Description

Do you know this situation? The parameters of the sound system have been measured and adjusted and after 4 weeks you receive the call: "The announcements cannot be understood?" You enter your car, drive to the location and repeat the complete procedure. Stop now! TOA again leads the way in ensuring optimised commercial sound audio with an easy-to-operate digital audio processor outfitted with an 8-input/8-output capability. It's no longer necessary to puzzle the sound. The ARC (Auto Resonance Control) system of the DP-K1 recognises automatically the resonance frequencies in a room and suppresses its transmissions for providing ideal room acoustics - even if a layman operates the system. The DP-K1 additionally features equalizer, crossover filter, compressors, delay and matrix, whose parameter can be easily configured by PC.

Features

- Digital signal processor with max. 8 inputs and outputs
- Antiresonance function for 8 channels
- A variety of filters, dynamic (noise gate, compressor), delay, crossover, matrix
- Modular inputs and outputs for easy adjustment of the system
- Different input and output modules available
- Adjustment by PC via LAN possible
- Easy to use and many automatic functions
- Rack-mountable

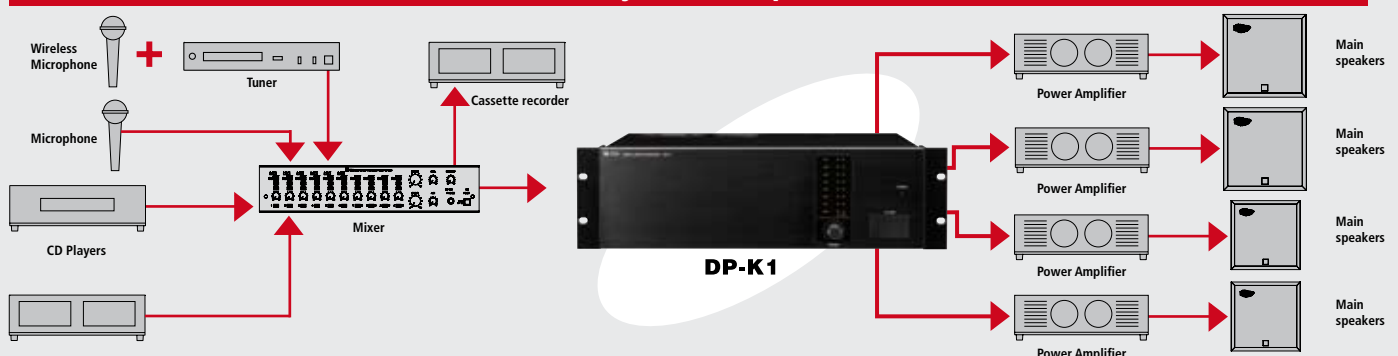
Applications

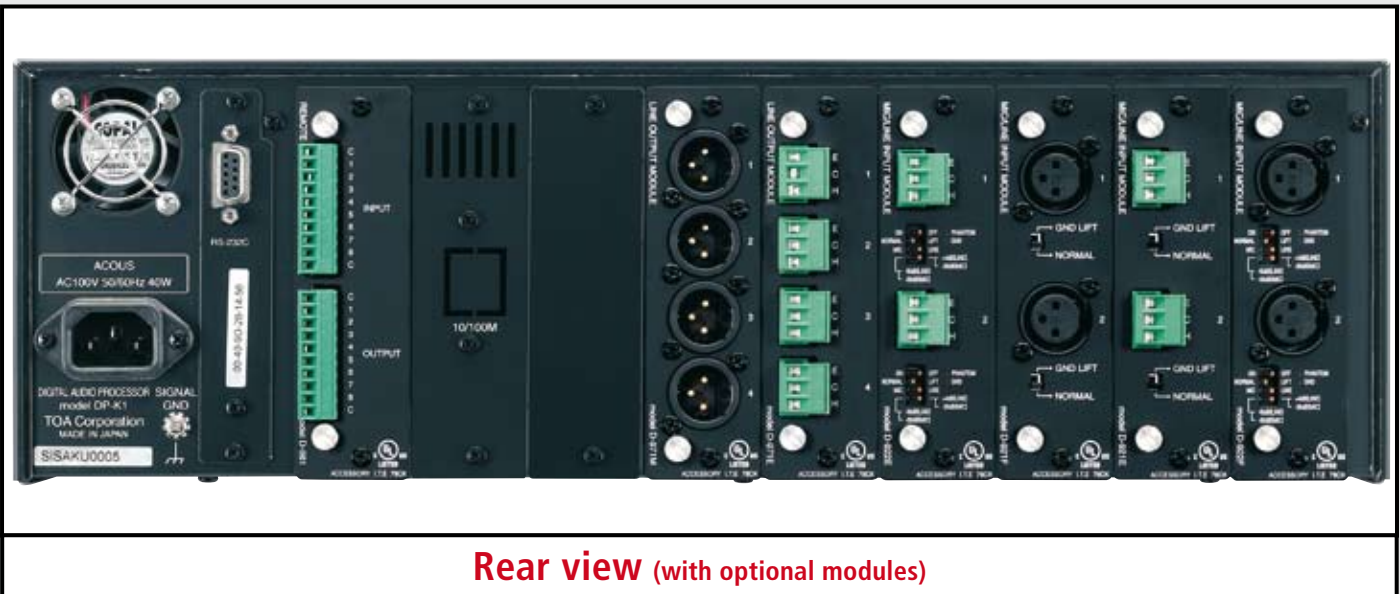
Churches, stadiums, halls, conference rooms, convention centers, airports and many other buildings where a high intelligibility is mandatory

Options

- Mic / Line Input Modules: D-921E, D-921F, D-922E, D-922F
- Stereo input module: D-936R
- Digital input modules: D-923AE, D-937SP
- Analog output modules: D-971E, D-971M, D-971R
- Digital output modules: D-972AE, D-961SP
- Control modules: D-981, D-983

System example





Rear view (with optional modules)

Specifications

	DP-K1
Power Supply	230 V, 50 / 60 Hz
Power Consumption	40 W
Frequency Response	20 ... 20000 Hz, ± 1 dB (+4 dBu)
Inputs	Up to 8 channels, modular (modules optional)
Outputs	Up to 8 channels, modular (modules optional)
Signal Processing	
Auto Resonance Control Function	Parametric equalizer: 20 ... 20000 Hz, ± 12 dB, Q: 0,267 - 69,249
Equalizer / Filter	Parametric equalizer: 20 ... 20000 Hz, ± 12 dB, Q: 0,267 - 69,249 Filter: (total amount of filters depends on the number of input and output channels) High pass filter: 20 ... 20000 Hz, 6 dB/Oct., 12 dB/Oct Low pass filter: 20 Hz ... 20000 Hz, 6 dB/Oct., 12 dB/Oct Notch filter: 20 Hz ... 20000 Hz, Q: 8,651 - 69,249 All pass filter: 20 Hz ... 20000 Hz, Q : 0,267 -- 69,249 High shelving filter: 6000 ... 20000 Hz, ± 15 dB Low shelving filter: 20 ... 500 Hz, ± 15 dB Horn-Equalizer: 20000 Hz, 0 bis +18 dB,(1dB steps) Crossover filter: 20 Hz ... 20000 Hz, 6 dB/Oct, 12 dB/Oct, 18 dB/Oct, 24 dB/Oct (LR, BW, BE)
Compressor	(Compressor mode) threshold: -16 to +24 dB (1 dB steps) Compression ratio: 1 : 1; 2 : 1; 3 : 1; 4 : 1; 8 : 1; 12 : 1; 20 : 1; ∞ : 1 Attack time: 0,02 ms ... 100 ms, release time: 10 ms - 5 s Delay: 0 - 682,6 ms (0,021 ms steps)
Delay	Delay time: 0 ... 682,6 ms (0,021ms steps)
Matrix	Matrix 8 \times 8
Gain control	$-\infty$ to 0 dB (1 dB steps)
Presets	8
Other Functions	Key-lock
PC Software	OS: Windows*1 2000/XP Control via: LAN (Ethernet) 10/100 BASE-T, auto negotiation, RJ45 connector
Front Panel Section	Preset memory recall knob, input signal indicator: green LED, output signal indicator: green LED
Module Slots (rear)	Input modules: 4, output modules: 2, remote control module: 1
Ambient Temperature	+5 ... + 40 °C
Finish	Front: Aluminum, hair-line, black, others: pre-coated steel plate, black, 30% gloss
Dimensions (W x H x D)	482,6 \times 132,6 \times 320 mm
Weight	7,4 kg
Accessories	Power cord (2 m), 19" rack mounting brackets x 2, rack mounting screws x 4, blank panels x 8, module mounting screws x 4, CD (Software)

*1 Windows is a registered trademark of Microsoft Corporation.



Monitor Panel

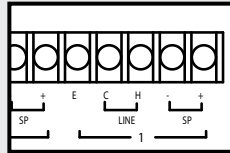
Monitoring of Sound and Signal



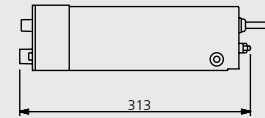
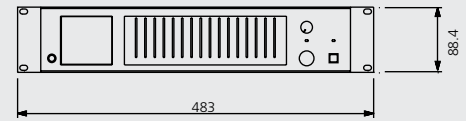
Rear



Volume + channel selector



Channel 1 connection



Features

- Monitor Panel for 16 channels
- Allows visual and aural monitoring of up to 16 audio signal channels with 8 Ohm, 100 V or line level
- 2 units can be linked for up to 32 channels (with optional cable YA-8: 1 master monitor unit)
- 12-segment LED meter with calibrated scale for each input
- Audio monitoring of each channel through a built-in selector switch and loudspeaker
- All inputs balanced and transformer isolated

Options

- YA-8: Connection Cable (8P DIN plug, 1m)

Specifications

	MP-1216
Nominal Input Levels	Transformer isolated : +4 dB; 8 Ohm: 49 V; 100 V
Terminals	16 channels x 5 terminals (2 x for speaker, 3 x for line)
Controls	Channel Selector Switch + Indicator, Output Level: LED Meter + Selected Channel, Power
Power Requirements	230 V 50 Hz, 25 VA
Dimension (W x H x D)	483 x 80.4 x 313, 2-unit height
Weight	5.3 kg
Colour	Black

Equalizer



Graphic Equalizer


E-232

E-1231

Features

E-1231

- 28 filters on ISO 1/3 octave
- Center frequencies 31.5 Hz ... 16 kHz
- Cut variable coverage
- Calibrated scales with dB-factors
- Security cover
- Colour: black
- Additional high- and low-pass filters with variable frequencies from 15 Hz to 300 Hz (6 or 12 dB oct) and 2.5 kHz to 30 kHz
- Variable (± 12 dB) input level control for a variety of input levels and sources
- LED peak monitoring of input and output levels, for proper gain structuring
- Bypass switch

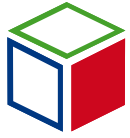
E-232

- 14 filters on ISO 2/3 octave
- Center frequencies from 40 Hz to 16 kHz
- Active bandpass
- Bandreject summed-in-parallel filters with minimum phase shift
- Security cover
- Colour: black
- Variable independent 6 dB or 12 dB boost or cut at each center frequency
- Precision calibrated linear scales with dB-factors
- Continuously variable high pass filter (15...300 Hz)

- Manual bypass and automatic bypass at power loss
- LED peak monitoring of input and output levels, for proper gain structuring

Specifications

	E-1231	E-232
Application	Equalizer	Equalizer
Input Impedance	10 kOhm	30 kOhm
Input Level	max. +20 dBm (1 kHz)	+4 dBu (max. +32 dBu)
Output Impedance	600 Ohm	1 kOhm
Output Level	max. +20 dBm (600 Ohm load)	+4 dBu (max. +20 dBu)
Frequency Response	20 Hz ... 20000 Hz (± 1 dB)	20 Hz ... 20000 Hz (+1 / -2 dB)
Distortion	<0,01 % (1 kHz)	<0,01%
Dynamic range	114 dB	118 dB
Center Frequencies (Hz)	31.5, 40, 50, 63, 80, 100, 125, 160, 250, 315, 500, 400, 630, 800, 1 k, 1.25 k, 1.6 k, 2 k, 2.5 k, 3.15 k, 4 k, 5 k, 6.3 k, 8 k, 10 k, 12.5 k, 16 k	40, 63, 100, 160, 250, 400, 630, 1 k, 1.6 k, 2.5 k, 4 k, 6.3 k, 10 k, 16 k
Gain	± 12 dB	± 12 dB switchable
Dimensions (W x H x D)	483 x 88 x 317 mm	483 x 44 x 311 mm
AC-Mains	230 V, 50 / 60 Hz	230 V AC, 50 / 60 Hz
Power Consumption	11 W	13 W
Standard Rack Height (U)	2	1
Weight	4.5 kg	3.8 kg



Digital Ambient Noise Controller

Automatic Volume Adjustment of BGM and Announcements by Ambient Noise



DP-L2

Description

The TOA DP-L2 Digital Ambient Noise Controller is the easy, automatic solution to the problem of keeping BGM and announcements audible and understandable when the ambient noise levels at an airport check-in counter or boarding gate, or a shopping mall, restaurant or pub, are higher because a large number of people are present. Furthermore, the DP-L2 also works to keep music and information audio from reaching levels that are irritating to customers and staff when the surrounding ambient noise levels are not so high.

Automatic and Accurate Input and Output Sound Level Adjustment

The DP-L2 is a digital audio processor with an ambient noise control (ANC) function that makes automatic changes in its output sound levels de-

pending on the amount of surrounding noise, and an automatic level control (ALC) function that automatically adjusts the input signal level so it is appropriate at all times.

BGM and announcements remain audible and understandable at all times, with no annoying loudness for customers and employees.

Output Signal excluded from Ambient Noise Sensing
The ambient noise sensor microphone enables accurate measurement of BGM/announcement listening-area noise levels.

In addition, for complete accuracy, a DP-L2 feature exclusive to TOA automatically separates the unit's own output signal from the calculation of the ambient sound level, instead of just mixing all sound sources together, meaning that the volume

control is not affected by the broadcast signal. This allows to install the microphone everywhere where appropriate. Additionally, a monitoring feature makes it possible to check the sound collected by the ambient noise sensor microphone.

Easy, Quick Installation and Simple Operation

The DP-L2 fits on a standard 1U size rack, so there is no time-consuming, complex installation procedure. All functions can be easily set from the unit's front panel, thanks to the LCD, keys and knobs.

A key-lock function prevents accidental incorrect front-panel key settings, and there are also front-mounted LED meters for input/output signal levels, as well as ALC and ANC levels.

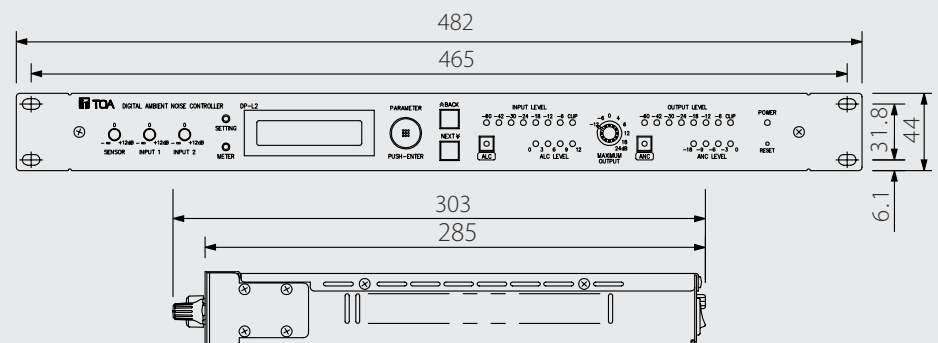
Features

- Digital audio processor adjusts BGM / announcement sound volume to match changes of ambient noise
- Automatic and accurate input and output sound level adjustment
- Output excluded from ambient noise sensing
- Easy, quick installation and simple operation
- 1-unit size
- Colour: black

Applications

Airport check-in counters, boarding gates, shopping malls, restaurants or pub,s railway stations

Dimensions



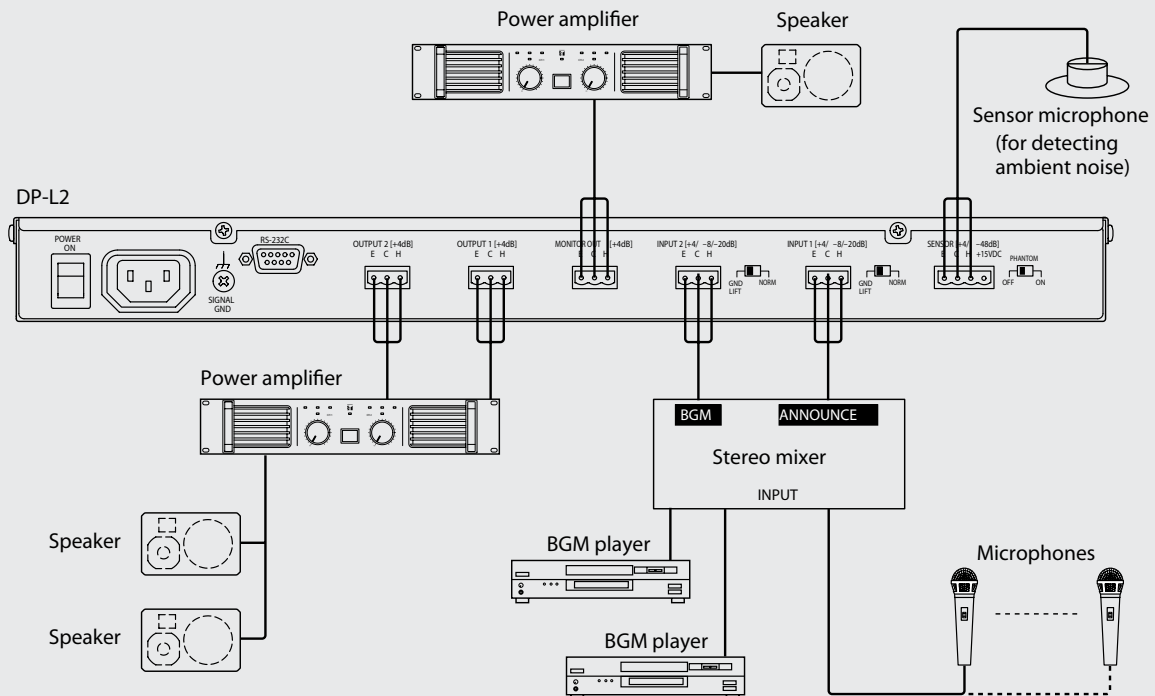


Consistently Pleasant-Sounding BGM and Information



DP-L2 (Rear View)

Application Example



Specifications

	DP-L2
Power Source	AC mains, 50 / 60 Hz
Power Consumption	20 W
Sampling Frequency	48 kHz
Frequency Response	20 Hz ... 20000 Hz, ± 1 dB
Dynamic Range	Over 108 dB (IHF-A weighted)
Distortion	Under 0.006 %, 1 kHz, + 4 dB input/output (20 ... 20000 Hz BPF)
Input	Sensor Input, Input 1 & 2 (removable terminal blocks)
Output	Monitor Output, Output 1 & 2 (removable terminal blocks 3 pins)
A/D, D/A Converter	24 bit
Signal Processing	Automatic level control, ambient noise control, maximum output signal level control, input level indicator, output level indicator
Other Features	Phantom power switch (sensor input), key lock function, ground lift switch (INPUT 1, INPUT 2), input/output bypass function in power off
Operating Temperature	0°C to +40°C
Operating Humidity	Under 90 % RH (no condensation)
Finish	Pre-coated steel plate, black, 30 % gloss
Dimensions (W x H x D)	482 x 44 x 303 mm
Weight	3.7 kg



TOA Digital Audio Control

Digital Signal Processor, 2 Inputs and 6 Outputs



DQ-A01



DQ-A02



DQ-C01

Features

- 2 inputs and 6 outputs
- Digital signal processing and digital control of complex analog devices
- Easy, versatile installation
- Windows™-based software program with real-time processing, matrix unit configuration and parameter settings
- The software is highly intuitive with graphic display of the frequency and phase response
- Editing and data file storage can be done online or offline
- Configuration in a wide range of system setups matching most installation requirements
- 16 presets
- Single or linked in multiples, processing for systems of any size or configuration can be easily designed and adjusted
- Analog and digital inputs and outputs
- Powerfully precise array of operating functions
- Configuration can be expanded by input and output modules each selectable either digital (AES/EBU) or analog (20-bit converters)
- CLEAR Conversion Technology for optimised sound quality
- Up to 30 DP-0206 can be connected and controlled with a PC
- System interface
- Three module slots for expansion modules

Applications

Ideal for the use in halls with a variety of different requirements or for rental companies

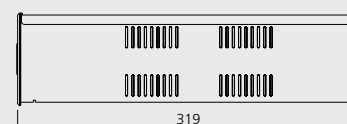
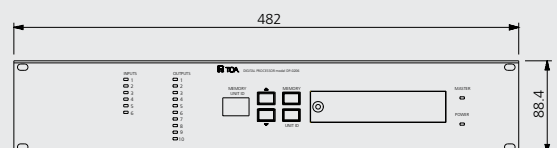
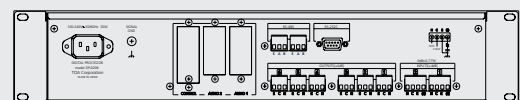
Options

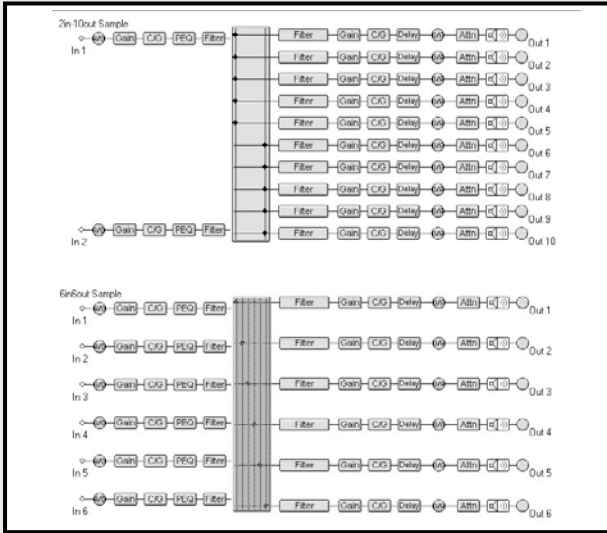
- DQ-A01 (2- channel input),
- DQ-A02 (2-channel output)
- DQ-C01 for remote recall of presets and output levels and output mute

Specifications

	DP-0206
Power Consumption	30 W
Power Source	100...240 V AC, 50 / 60 Hz
Inputs	2 (max. 6 with 2x DQ-A01), 10 kOhm, +4 dBm (max. +24 dBm), electronically balanced connector: 4-pole terminal block type
Outputs	6 (max. 10 with 2x DQ-A01) +4 dBm (max. +24 dBm), 600 Ohm, electronically balanced connector: 3-pole terminal block type
AD/DA converter	24 bit
Sampling rate	48 kHz
Interfaces	RS232C, RS485
Control	PC software Windows®95/98/NT
Remote Control	With DQ-C01: Presets, Volume, Mute
Preset Memories	16
Frequency Response	20 ... 20000 Hz (±1 dB)
Dynamic Range	110 dB (IHF-A)
THD	< 0.05 % (at +4 dBm)
Dimensions (W x H x D)	482 x 88.4 x 331.1 mm (2 units)
Weight	4.65 kg

Dimensions

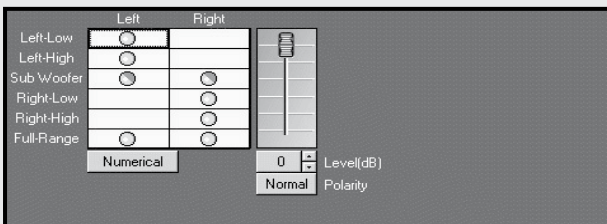




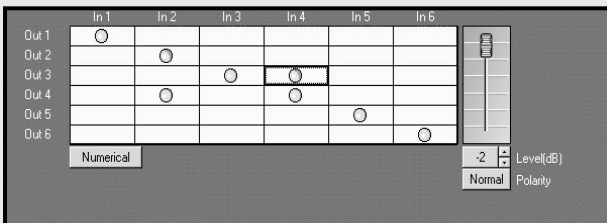
DP-0206 Signal Flow Diagram



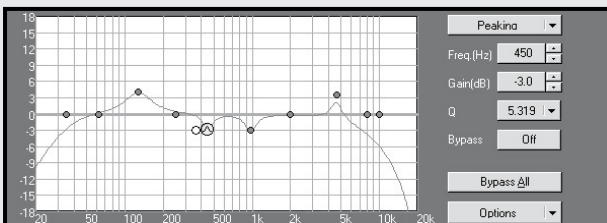
DP-0206 Rear View



Software Control: Matrix 2 in / 6 out



Software Control: Matrix 6 in / 6 out



Software Control: Equalizer

The high performance capabilities of the TOA Digital Audio Control represent a major advance in digital signal processing and in digital control of complex analog devices. The 2-in by 6-out DP-0206 provides over 20 signal processing functions.

All units are accessed by a Windows™* based software program with real-time processing, matrix unit configuration and parameter settings. The software is highly intuitive and therefore easy to use.

Editing and data file storage can be done off-line and on-line in real time. Settings are software-driven and delivered via the system interface to the independently operation hardware.

The units also feature 16 presets for remote control without a computer. By using units either singly or linked in multiples, processing for systems of any size or configuration can be easily designed and tuned.

The TOA CLEAR-Conversion® technology of the signal processor's 24-bit AD-converter provides minimum quantisation errors and excellent sound quality. The matrix unit has a 64-point switching matrix for its 8 input mix buses and a 64-point level controlled matrix for the 8 output mix buses, both electronically balanced.

The systems can be used at several performance places which provide different requirements for the sound system because each setting can easily be restored by simply pressing a button.

Control Software

Both the matrix DX-0808 and the processor DP-0206 are software controlled. The programs are running on Windows™ on a PC and therefore they are highly intuitive and easy to use. The installation can easily be done with the setup program.

Setting of parameters can be done on-line or off-line. The on-line operation runs in real-time and can be done over a long distance via RS-485 interface.

Additionally to the online mode complete data sets can be transmitted among PC and the device. Up to 16 different parameter settings can be stored in 1 file and in 1 unit.

The user configures the signal processing devices and then sets the parameters for the processor. The matrix can be defined as a single or a cascaded one consisting of up to 4 units. The connection points can be set for the input and output matrix (latter with volume adjustment).

The settings of the filters can be checked through the graphic display of the amplitude- /phase- /group delay- frequency response. The access can be protected against unauthorized access by setting passwords in three levels.

*Windows™ is a trademark of Microsoft Corporation in the USA and other countries.



Line Arrays

True Line Array in Slim Tower Configuration



Slim Line Array

Description

TOA Line Array Speaker Systems are designed to perform perfectly with ideal sound dispersion characteristics in spaces that pose difficulties for conventional speaker systems. Available in different configurations and with a wide range of mounting possibilities to suit particular requirements precisely. These slim tower configured speakers and modular speaker systems offer perfect solutions for difficult sound reinforcement problems that require effective coverage.

Driver complement. The speakers are 2-way line array speakers, each containing 32 speaker elements – 8 x 10 cm woofers and 24 high frequency drivers. Driver units are installed vertically and with minimal space between units in order to create a continuous linear sound source for a uniform sound pressure that resists attenuation with distance.

Sound dispersion characteristics. The speaker features a linear shaped speaker for distance sound transmission and a gently curved speaker

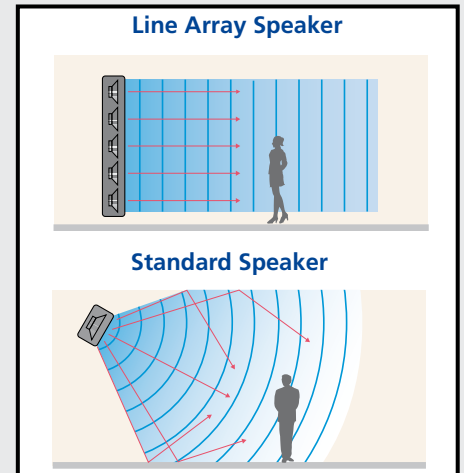
designed for a 10° vertical coverage area which offers ideal sound coverage over a shorter distance. Directed sound dispersion speakers limit vertical sound dispersion in order to focus directivity at the targeted listening area.

Multi-speaker array-configurable. Both systems can be combined. Less difference in sound level is perceived whether close to or somewhat distant from the speakers, providing an uniform response.

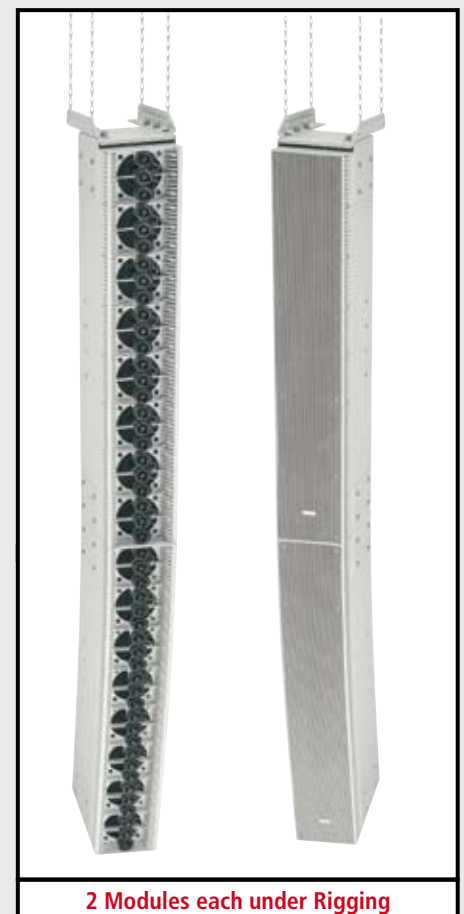
Reflection-free. The speakers' construction and characteristics make them resist floor- and ceiling-originating reflections, enhancing clarity even in reverberant spaces and other problematic environments.

Feedback-resistant. The design of the speakers also makes them highly resistant against annoying feedback because volume levels are not extraordinarily high even close to the speakers and makes setting gain levels easier.

Biamp or single amp drive. Factory-set for single amplifier driving, the speakers can sim-



Principle of Line Arrays vs Standard Speaker



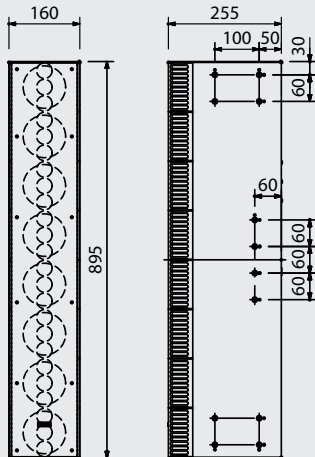
2 Modules each under Rigging

ply be set for biamping by making a simple internal wiring change. For optimal biamping, a digital signal processor can be employed to set crossover frequency points. **High impedance-compatible.** The speaker can also be conveniently set for high-impedance application by using the optional MT-S0601 matching transformer.

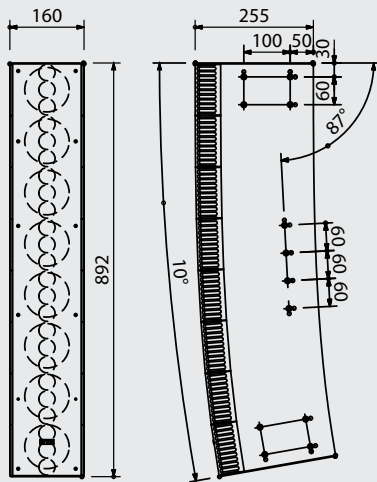


SR-S4L

Dimensions

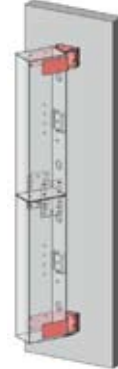


SR-S4S

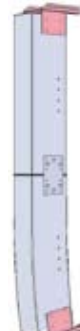
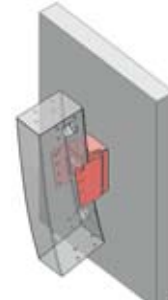


Variable Mounting

SR-EP4

SR-WB4
+ SR-EP4

SR-FS4 + SR-EP4

SR-FB-4
SR-TB4

SR-TB4



SR-SA4 + ST-34B

Protection Pad / SR-PP4



Specifications

	SR-S4L	SR-S4LWP	SR-S4S	SR-S4SWP
Enclosure	Bass-reflex type	Sealed type	Bass-reflex type	Sealed type
Power Handling Capacity	Continuous program: 600 W	Continuous program: 600 W	Continuous program: 600 W	Continuous program: 600 W
Rated Impedance	8 Ohm	8 Ohm	8 Ohm	8 Ohm
Sensitivity	94 dB (1W, 1m)	94 dB (1W, 1m)	93 dB (1W, 1m)	93 dB (1W, 1m)
Frequency Response	70 ... 20000 Hz (with optional DP-0206 Digital processor)	70 ... 20000 Hz (with optional DP-0206 Digital processor)	70 ... 20000 Hz (with optional DP-0206 Digital processor)	70 ... 20000 Hz (with optional DP-0206 Digital processor)
Crossover Frequency	3500 Hz	3500 Hz	3500 Hz	3500 Hz
Directivity Angle	Horizontal: 90°, vertical: 0°	Horizontal: 90°, vertical: 0°	Horizontal: 90°, vertical: 10°	Horizontal: 90°, vertical: 10°
Speaker Component	Low frequency: 10 cm cone-type × 8, High frequency: 2.5 cm balanced dome-type × 24	Low frequency: 10 cm cone-type × 8, High frequency: 2.5 cm balanced dome-type × 24	Low frequency: 10 cm cone-type × 8, High frequency: 2.5 cm balanced dome-type × 24	Low frequency: 10 cm cone-type × 8, High frequency: 2.5 cm balanced dome-type × 24
Input Connector	M5 screw terminal and Neutrik NL4MP × 2 (usable cable connector: Neutrik NL4FC)	...	M5 screw terminal and Neutrik NL4MP × 2 (usable cable connector: Neutrik NL4FC)	...
Connected Cable	...	Direct cable withdrawal from internal speaker: ø 8.6mm, conductor cross section: 1.25 mm ² , 4-core cable, 3 m	...	Direct cable withdrawal from internal speaker: ø 8.6mm, conductor cross section: 1.25 mm ² , 4-core cable, 3 m
Water Protection	...	IPx4	...	IPx4
Finish	MDF, white (equivalent RAL 9010), paint	Plywood, white (equiv. RAL 9010), urethane coating	MDF, white (equivalent RAL 9010), paint	Plywood, white (equiv RAL 9010), urethane coating
Front Grille	Punched steel plate, paint white	Punched stainless steel (SUS304), acrylic paint white	Punched steel plate, paint white	Punched stainless steel (SUS304), acrylic paint white
Dimensions (W x H x D)	160 x 895 x 255 mm	160 x 895 x 255 mm	160 x 892 x 303 mm	160 x 892 x 303 mm
Weight	16 kg	16 kg	16 kg	16 kg



Line Arrays

Middle Line Arrays for Fixed Installation with High SPL



SR-A12L / SR-A12LWP / SR-A12S / SR-A12SWP

Description

- Line Arrays for indoor (SR-A12L, SR-A12S) and for outdoor use (SR-A12L WP, SR-A12S WP)
- Ideal coverage by 2 different enclosures (linear: SR-A12L and curved SR-A12S)
- High fidelity sound
- Wide frequency range
- Compact but powerful 2-way constructions
- Wide range of mounting brackets for flexible speaker mounting
- Combination possible for uniform sound coverage in various environments

Features

- 12" woofer and a high-frequency horn connected to 2 high-performance compression drivers
- Horn features a phase front wave control throat for best performance from the compression drivers
- 5-degree taper to transmit sound over distance / 15-degree taper provides wider short range coverage
- Easy maintenance and servicing
- Replacement of defective drivers from the rear within seconds

Applications

For any kind of stage for concert halls as well as for open air concerts

Options

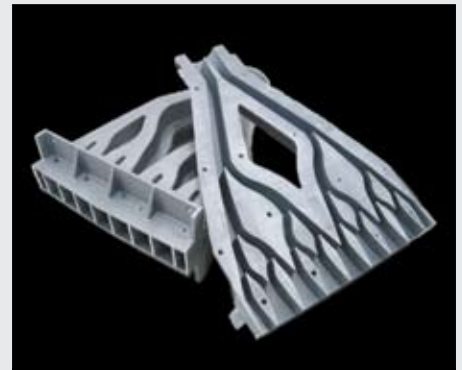
- SR-RF12: Rigging Frame
- DP-0206: Digital Sound Processor
- SR-RF12WP: Weather Proof Rigging Frame



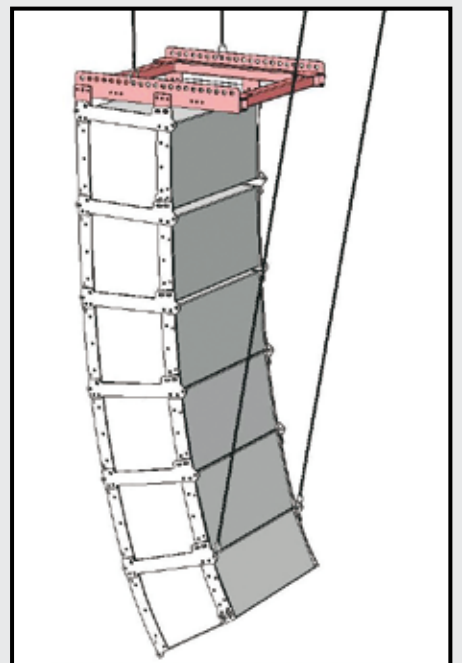
SR-A18 Subwoofer



Line Arrays for each kind of Events



Construction of Line Array



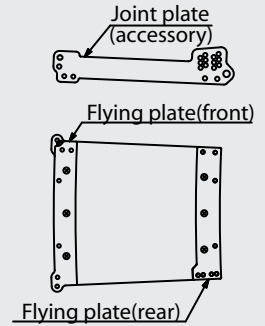
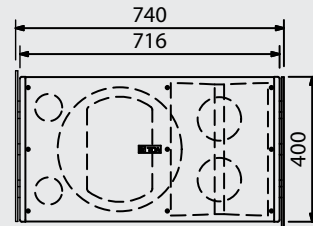
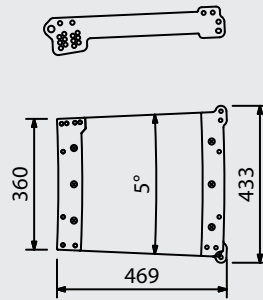
Rigging



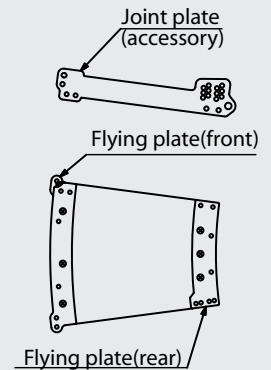
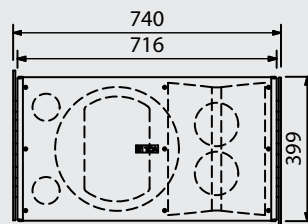
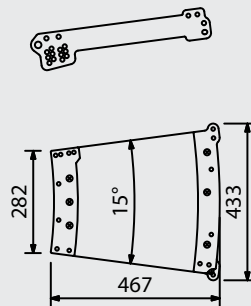
Rigging

Dimensions

SR-A12L



SR-A12S



Specifications

	SR-A12L	SR-A12LWP	SR-A12S	SR-A12SWP
Enclosure	Bass-reflex type	Sealed type	Bass-reflex type	Sealed type
Power Handling Capacity	Continuous program: low frequency 450 W, high frequency 180 W	Continuous program: low frequency 450 W, high frequency 180 W	Continuous program: low frequency 450 W, high frequency 180 W	Continuous program: low frequency 450 W, high frequency 180 W
Rated Impedance	Low frequency 8 Ohm, high frequency 16 Ohm	Low frequency 8 Ohm, high frequency 16 Ohm	Low frequency 8 Ohm, high frequency 16 Ohm	Low frequency 8 Ohm, high frequency 16 Ohm
Sensitivity	Low frequency 98 dB (1W, 1m), HF 110 dB	Low frequency 98 dB (1W, 1m), HF 110 dB	Low frequency 98 dB (1W, 1m), HF 109 dB	Low frequency 98 dB (1W, 1m), HF 109 dB
Frequency Response	50 Hz ... 20000 Hz (with optional DP-0206 Digital processor)	50 Hz ... 20000 Hz (with optional DP-0206 Digital processor)	50 Hz ... 20000 Hz (with optional DP-0206 Digital processor)	50 Hz ... 20000 Hz (with optional DP-0206 Digital processor)
Crossover Frequency	1000 Hz	1000 Hz	1000 Hz	1000 Hz
Coverage Angle	Horizontal: 90°, vertical: 5°	Horizontal: 90°, vertical: 5°	Horizontal: 90°, vertical: 15°	Horizontal: 90°, vertical: 15°
Speaker Component	Low frequency: 30 cm cone-type, High frequency: wave front control horn 90° (hor) x 5° (ver) + 2x compression driver	Low frequency: 30 cm cone-type, High frequency: wave front control horn 90° (hor) x 5° (ver) + 2x compression driver	Low frequency: 30 cm cone-type, High frequency: wave front control horn 90° (hor) x 15° (ver) + 2x compression driver	Low frequency: 30 cm cone-type, High frequency: wave front control horn 90° (hor) x 15° (ver) + 2x compression driver
Input Connector	M5 screw terminal and Neutrik NL4MP x 2 (usable cable connector: Neutrik NL4FC)	...	M5 screw terminal and Neutrik NL4MP x 2 (usable cable connector: Neutrik NL4FC)	...
Connected Cable	...	Direct cable withdrawal from internal speaker: ø 8.6mm, conductor cross section: 1.25 mm ² , 4-core cable, 3 m	...	Direct cable withdrawal from internal speaker: ø 8.6mm, conductor cross section: 1.25 mm ² , 4-core cable, 3 m
Water Protection	...	IPx4	...	IPx4
Finish	Plywood, black, urethane painting	Plywood, black, urethane painting	Plywood, black, urethane painting	Plywood, black, urethane painting
Front Grille	Punched steel plate, paint black	Punched stainless steel (SUS304), acrylic paint black	Punched steel plate, paint black	Punched stainless steel (SUS304), acrylic paint black
Dimensions (W x H x D)	740 x 433 x 469 mm	740 x 433 x 469 mm	740 x 433 x 469 mm	740 x 433 x 469 mm
Weight	49 kg	51 kg	47 kg	48 kg

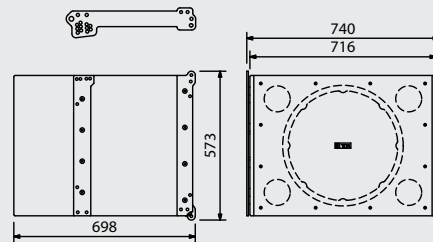


Line Arrays

Subwoofer for the Line Arrays



Inside View



Features

- Subwoofer adjusted with SR-A12 Line Array series
- Employs multi amplifier drive system
- Ideal in conjunction with DP-0206 signal processor
- 46 cm cone speaker
- 80 Hz crossover frequency
- 720 W continuous program

Options

- DP-0206: Digital Signal Processor

Specifications

	SR-A18B
Enclosure	Bass-reflex type
Power Handling Capacity	Continuous program: 720 W
Rated Impedance	8 Ohm
Sensitivity	95 dB (1 W, 1 m)
Frequency Response	40 ... 400 Hz (when using the optional DP-0206 Digital Processor)
Crossover Frequency	80 Hz (when using the optional DP-0206 Digital Processor)
Speaker Component	46 cm cone-type
Input Connector	M5 screw terminal, distance between barriers: 12.2 mm and Neutrik NL4MP x 2 (usable cable connector: Neutrik NL4FC)
Finish Enclosure	Plywood black, paint
Front Grille	Punched steel plate, black, acrylic paint
Dimensions (W x H x D)	740 x 573 x 698 mm
Weight	66 kg (including accessories)
Accessory	Joint plate x 2, Joint plate mounting bolt (M10) x 16



Line Arrays

Accessories for the Line Array Speaker Systems

Accessories for Slim Line Array Speakers



SR-FS4
Floor Stand



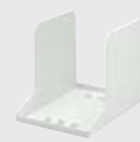
SR-EP4
Extension Plate
for indoor use



SR-TB4
Wall Tilt Bracket
for indoor use



SR-WB4
Wall Mounting Bracket
for indoor use



SR-SA4
Stand Adapter



SR-PP4
Protection Pad



SR-EP4WP
Extension Plate
for outdoor use



SR-TB4WP
Wall Tilt Bracket
for outdoor use



SR-WB4WP
Wall Mounting Bracket
for outdoor use



SR-FB4
Flying Bracket

Accessories for Middle Line Array Speakers



SR-RF12
Rigging Frame
for indoor use



SR-RF12WP
Rigging Frame
for outdoor use

Accessory for both series

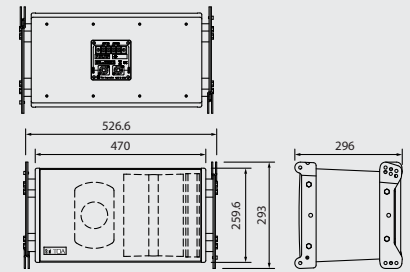
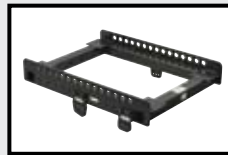


DP-0206
Digital Processor

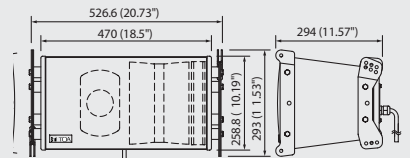


Line Arrays

Middle Line Array Type C



SR-C8L



SR-C8S

Features

- Sync-Drive wave guide technology
- Uniform, high frequency sound field with excellent sound clarity and minimal interference
- Phase wave-front control technology for a high-frequency sound range that is attenuation-free and high fidelity
- Focus on the targeted listening area for precise sound directivity
- Adjustable speaker overlap angles (0 to 5 degrees), for more flexible speaker directivity control
- Adjustable sound coverage by connecting a number of speakers and combining speakers with different dispersion angles
- Feedback resistant - reflection-free operation
- Single or bi-amp mode
- Stacking possible
- Splash-proof speaker models : SR-C8LWP/SR-C8SWP
- Drivers can be quickly replaced from the rear of the speaker enclosure

Options

- SR-CL8: Cluster Bracket
- SR-RF8: Rigging Frame
- SR-RF8WP: Weatherproof Rigging Frame
- SR-SB8: Rigging Support Bracket
- SR-TP8: Tilt Joint Bracket
- D-2000: Digital Mixer

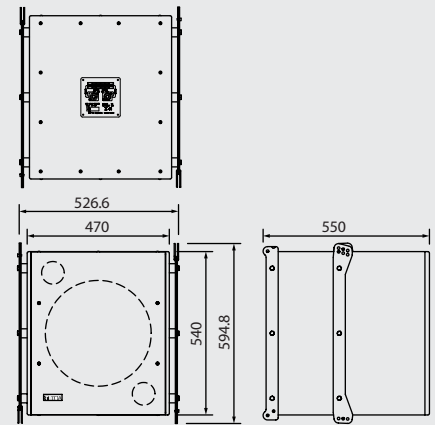
Specifications

	SR-C8L	SR-C8S	SR-C8LWP	SR-C8SWP
Enclosure	Bass-reflex type			
Power Handling Capacity	Continuous program: 360 W (single-amp mode) / low frequency: 360 W, high frequency: 180 W (bi-amp mode)			
Rated Impedance	16 Ω (single-amp mode), low frequency: 16 Ω, high frequency: 16 Ω (bi-amp mode)			
Sensitivity	98 dB (1 W, 1 m) (single-amp mode); low: 95 dB (1W, 1m), high: 110 dB (1W, 1m) (bi-amp mode)			
Frequency Response	65 – 20000 Hz (when equalised at recommended parameters)			
Crossover Frequency	1600 Hz (when equalized at recommended parameters)			
Directivity Angle	Horizontal: 110°, vertical: 5°	Horizontal: 110°, vertical: 15°	Horizontal: 110°, vertical: 5°	Horizontal: 110°, vertical: 15°
Speaker Component	Low frequency: 20 cm (8") cone type / High frequency: Wave-front control horn + compression drivers × 2			
Input Connector	M5 screw terminal, distance between barriers: 12.2 mm and Neutrik NL4MP × 2		Direct cable, 3 m	
Operating Temperature	—		-10°C to +50°C	
Dust/Water Protection	—		IPX4	
Finish	Enclosure: Plywood, black, urethane paint Plywood, black, urethane coating Front grille: Punched steel plate, black, paint Punched stainless steel, black, paint			
Dimensions (W x H x D)	526.6 × 293 × 296 mm	526.6 × 29 × 294 mm	526.6 × 293 × 296 mm	526.6 × 293 × 294 mm
Weight	17 kg	16 kg	17 kg	16 kg



Line Arrays

Middle Line Array Type C Subwoofer



Features

- 38cm (15") subwoofer
- Uniform, high frequency sound field
- Input connectors include screw terminal connections and two Neutrik NL4 type sockets
- High power handling of 450 W continuous program
- Plywood enclosure with black urethane paint
- Speaker grille punched steel plate with black paint
- Enclosure equipped with M8 threaded steel plates for the secure attachment of optional accessory brackets
- Accessory brackets for suspension and stand mounting
- Splash-proof speaker model: SR-C15BWP

Options

- SR-CL8: Cluster Bracket
- SR-RF8: Rigging Frame
- SR-RF8WP: Weatherproof Rigging Frame
- SR-SB8: Rigging Support Bracket
- SR-TP8: Tilt Joint Bracket
- D-2000: Digital Mixer

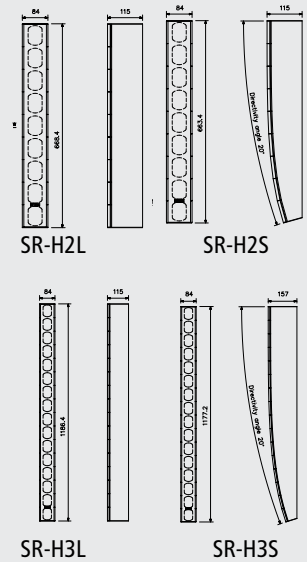
Specifications

	SR-C15B	SR-C15WP
Enclosure	Bass-reflex type	
Power Handling Capacity	Continuous program: 450 W	
Rated Impedance	8 Ω	
Sensitivity	93 dB (1 W, 1 m)	
Frequency Response	40 – 400 Hz (when equalized at recommended parameters)	
Crossover Frequency	125 Hz (when equalized at recommended parameters)	
Speaker Component	38 cm (15") cone type	
Input Connector	M5 screw terminal, distance between barriers: 12.2 mm and Neutrik NL4MP x 2	—
Connected Cable	—	Direct cable withdrawal from internal speaker: ø8.6 mm conductor cross section: 1.25 mm ² , 4-core cable, 3 m
Operating Temperature	—	-10°C to +50°C
Dust / Water Protection	—	IPX4
Finish	Enclosure: Plywood, black, urethane paint, Front grille: Punched steel plate, black, paint	Enclosure: Plywood, black, urethane coating, Front grille: Punched stainless steel plate, black, paint
Dimensions (W × H × D)	526.6 × 594.8 × 550 mm	
Weight	41 kg	



Line Arrays

Small Slim Line Arrays



Features

- Small Line Array with excellent directivity
- Narrow 84 mm design
- 4 models: 180 W (SR-H2S/SR-H2L) or 360 W (SR-H3S/SR-H3L) and straight (SR-H2L/SR-H3L) or curved design (SR-H2S/SR-H3S)
- Sync-Drive (Synchronous Nexus Control) technology create an ideal linear sound source
- Clear sound with reduced attenuation over distance
- Reflection-free and feedback resistant
- Unique aperture front grille structure enhances the horizontal dispersion
- Speakers are designed for optimally precise vertical directivity
- Curved speaker models for improved vertical dispersion
- Up to two straight units can be connected
- Optional mounting brackets available, for wall-mounting, rigging and stand mounting
- Removable input terminal connectors for easy hook-ups

Options

- MT-S0301: Matching transformer for high-impedance operation
- SR-TB3: Wall Tilt Bracket
- SR-WB3: Wall Mounting Bracket
- SR-FB3: Flying Bracket
- SR-EP3: Extension Plate
- SR-SA3: Stand Adapter
- ST-34B: Speaker Stand

Specifications

	SR-H2L	SR-H2S	SR-H3L	SR-H3S
Enclosure	Bass-reflex type			
Power Handling Capacity	Continuous program: 180 W		Continuous program: 360 W	
Rated Impedance	8 Ohm			
Sensitivity	92 dB (1 W, 1 m equivalent, measured at 4 m)	90 dB	95 dB	92 dB (1 W, 1 m equivalent, measured at 8 m)
Frequency Response	80 – 18000 Hz (-10 dB)	90 – 17000 Hz (-10 dB)	110 – 18000 Hz (-10 dB)	90 – 17000 Hz (-10 dB)
Directivity Angle	Horizontal: 90°, vertical: 0° (within the range of speaker height)	Horizontal: 90°, vertical: 20° (within the range of speaker height)	Horizontal: 90°, vertical: 0° (within the range of speaker height)	Horizontal: 90°, vertical: 20° (within the range of speaker height)
Speaker Component	7 cm (2.8") cone-type × 9		7 cm (2.8") cone-type × 16	
Input Connector	Removable input connector			
Finish Enclosure	MDF, white, urethane paint. Front grille: Punched steel plate, white, acrylic paint			
Dimensions (W x H x D)	84 x 668.4 x 115 mm	84 x 663.4 x 115 mm	84 x 1186.4 x 115 mm	84 x 1177.2 x 157 mm
Weight	4.4 kg	4.2 kg	7.6 kg	7.9 kg



Line Arrays

Slim Line Array Accessories

Various Mounting Possibilities



SR-WB3
Wall Mounting Bracket

SR-TB3
Wall Tilt Bracket

SR-FB3
Flying Bracket



SR-EP3
Extension Plate

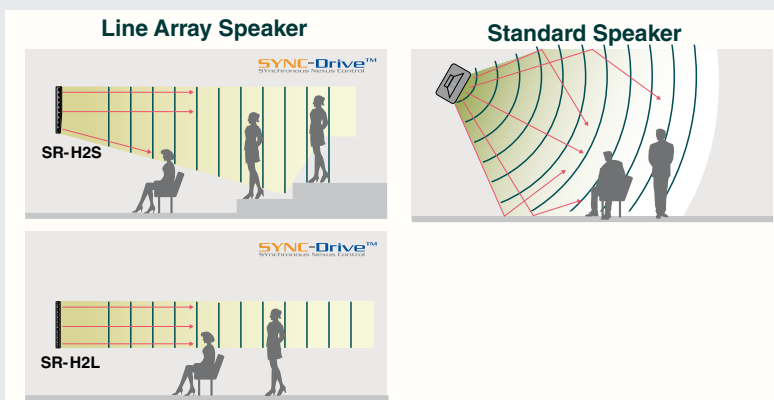
ST-34B
Speaker Stand

SR-SA3
Stand Adapter

MT-S0301
Matching Transformer



Directivity comparison





Compact Array

A whole new Angle on Sound!



HX-5B / HX-5W / HX-5B-WP / HX-5W-WP

Description

The HX-5 is an innovative modular speaker design that incorporates the best characteristics of the traditional, cumbersome woofer enclosure combined with a CD horn-loaded high frequency driver and the full-range compact speaker enclosure without the drawbacks associated with each type. The HX-5 features remarkably easy to control coverage characteristics including problematic low frequencies and can be installed in a multitude of ways while maintaining a modern, unobtrusive appearance.

This system fills an important need for versatile public address equipment that can provide high quality reinforcement for a wide range of venues. Available in black and white finish to complement a venues interior colour scheme, the HX-5 is ideal for medium size venues of all different shapes. These include auditoriums, places of worship, banquet halls, community centres as well as dance halls, sport bars, shopping malls, boardrooms, gyms, health clubs and many others.

Adjustable sound dispersion A system is configured by vertically stacking of 4 speaker modules with a total driver complement of 4 woofers and 12 tweeters positioned along the baffle surface. This configuration allows the variable directivity control and low-frequency dispersion control comparable to use a large constant-directivity

horn speaker. A choice of 4 directivity angles – 15, 30, 45 and 60 degrees– can be employed as needed. For instance, a specific directivity angle, or each module can have its directivity independently set for a specific coverage requirement. If 2 or multiple modules are connected to configure an arc, they effectively function as an immense single speaker controlling directivity for considerably lower frequencies. As a result, public address functions demonstrate optimal intelligibility even in environments with long reverb times.

Minimal reflective effects Whether mounted on the wall or ceiling, the HX-5 is remarkably free from the comb filter and interference effects often encountered with other speaker designs. It can therefore produce more low frequency output even when mounted on the wall or ceiling.

Versatile mounting options Compared to many other speaker designs, the HX-5 Series is remarkably easy to install in several ways. It can be hung with chains, strong wires and cables using the accessory brackets. There are also options for hanging with a pre-install frame by itself or configured with a subwoofer. And of course, as an option, ceiling and wall brackets as well as an adapter for use with a dedicated stand are provided.



HX-5 Rigging



HX-5W / HX-5W-WP

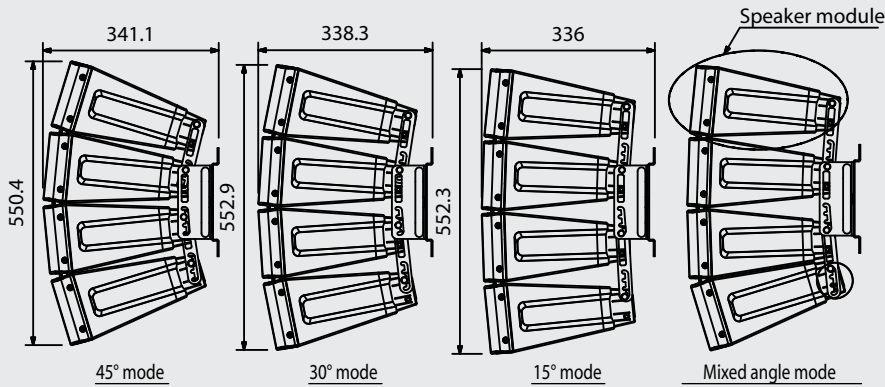


HX-5B / HX-5B-WP

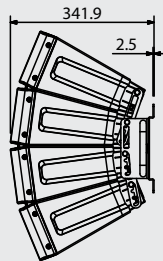
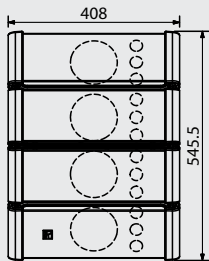
Compact Array



Adjustment of the directivity angle

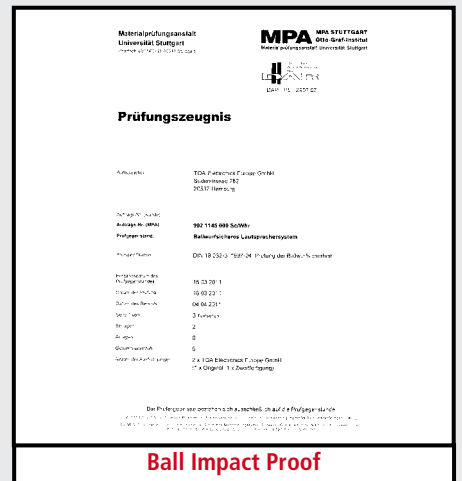
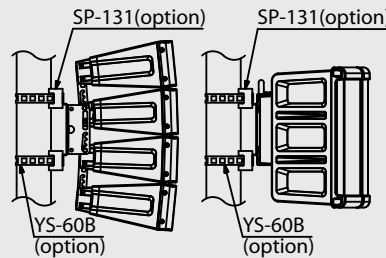


Dimensions



Mounting Example

Pole mounting



Specifications

	HX-5B	HX-5W	HX-5B-WP	HX-5W-WP
Enclosure	Bass-reflex type	Bass-reflex type	Sealed type	Sealed type
Power Handling Capacity	Continuous pink noise: 200 W, Continuous program: 600 W			
Rated Impedance	8 Ohm			
Sensitivity (1W, 1m)	96 dB (60° mode), 97 dB (45° mode), 98 dB (30° mode), 99 dB (15° mode)			
Frequency Response	70 ... 20000Hz (-10dB) (60°mode) 75 ... 20000Hz (-10dB) (45°mode) 80 ... 20000Hz (-10dB) (30°mode) 85 ... 20000Hz (-10dB) (15°mode)	70 ... 20000Hz (-10dB) (60°mode) 75 ... 20000Hz (-10dB) (45°mode) 80 ... 20000Hz (-10dB) (30°mode) 85 ... 20000Hz (-10dB) (15°mode)	95 ... 20000Hz (-10dB) (60°mode) 100 ... 20000Hz (-10dB) (45°mode) 105 ... 20000Hz (-10dB) (30°mode) 110 ... 20000Hz (-10dB) (15°mode)	95 ... 20000Hz (-10dB) (60°mode) 100 ... 20000Hz (-10dB) (45°mode) 105 ... 20000Hz (-10dB) (30°mode) 110 ... 20000Hz (-10dB) (15°mode)
Crossover Frequency	4kHz			
Directivity Angle	Horizontal: 100°(over 2000 Hz) Vertical: 60°(over 800 Hz), 45°(over 1.2 kHz), 30°(over 1.6 kHz), 15°(over 3.2 kHz) variable			
Speaker Component	Low frequency: 12 cm cone-type x 4, High frequency: Balanced dome-type x 12			
Input Terminal	Speakon NL4MP x 2 and M4 screw terminal	Speakon NL4MP x 2 and M4 screw terminal	—	—
Speaker Cord	—	—	2-core cabtyre cord with diameter of 6 mm	2-core cabtyre cord with diameter of 6 mm
Water Protection	—	—	IP-X4 (Install with every speaker module downward)	IP-X4 (Install with every speaker module downward)
Operating Temperature	—	—	-15°C ... +50°C	-15°C ... +50°C
Finish	Enclosure: Polypropylene, black	Enclosure: Polypropylene, white	Enclosure: Polypropylene, black	Enclosure: Polypropylene, white
Dimensions	408 (W) x 546 (H) x 342 (D) mm			
Weight	16 kg			
Accessory	Hanging bracket x 2, Hex. wrench x 1			



Compact Array

Accessories for the HX-5 Series Speaker

For HX-5B:



HY-PF1B
Rigging Frame
for indoor use



HY-CW1B
Ceiling Mounting Bracket
for indoor use



HY-WM1B
Mounting Bracket
for indoor use



HY-WM2B
Mounting Bracket
for indoor use



HY-CN1B
Extension Bracket
for indoor use

For HX-5W:



HY-PF1W
Rigging Frame
for indoor use



HY-CW1W
Ceiling Mounting Bracket
for indoor use



HY-WM1W
Mounting Bracket
for indoor use



HY-WM2W
Mounting Bracket
for indoor use



HY-CN1W
Extension Bracket
for indoor use

For HX-5B-WP and HX-5W-WP:



HY-PF1WP
Rigging Frame
for outdoor use



HY-CW1WP
Ceiling Mounting Bracket
for outdoor use



HY-WM1WP
Mounting Bracket
for outdoor use



HY-WM2WP
Mounting Bracket
for outdoor use



HY-CN1W-WP
Extension Bracket
for outdoor use of
HX-5W-WP



HY-CN1B-WP
Extension Bracket
for outdoor use of
HX-5B-WP

For HX-5 Series:



HY-ST1
Speaker Stand
Adapter

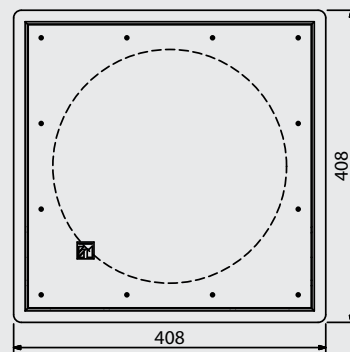
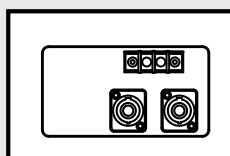


MT-200
Matching
Transformer

Subwoofer



Perfect Matching with the HX-5 Series Speaker



Features

- Compact Subwoofer
- 30 cm (12") woofer
- Ideal in conjunction with HX-5 speaker
- Extremely wide frequency range
- For floor-, wall-, corner- or ceiling-mount
- 600 W high-power subwoofer system
- Carry handle
- For rigging
- Colour: Black(FB-120B) or white (FB-120W)

- Speakon® connector
- Cascading of multiple units

Options

- Rigging Frame:
HY-PF1B (black) or
HY-PF1W (white)

Applications

Medium-sized installations, (e.g. clubs, stages for live performances, houses of worship, auditoriums, youth centers or multi-purpose halls)

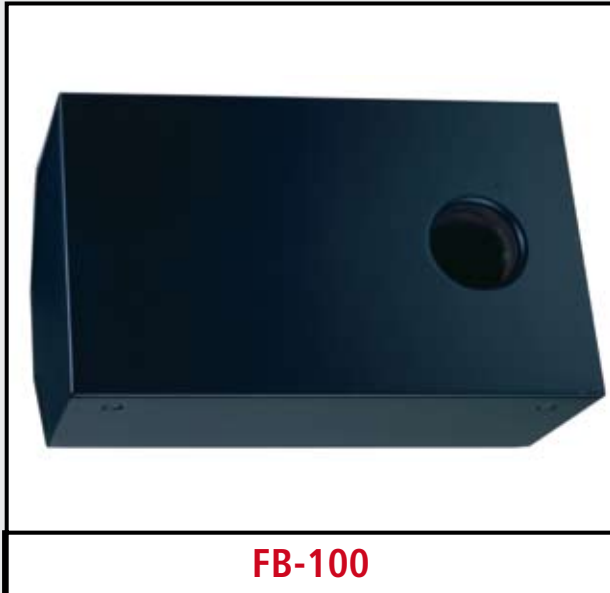
Specifications

	FB-120B / FB-120W
Rated Input	600 W
Impedance	8 Ohm
Sound Pressure Level	90 dB (1 W, 1 m) resp. 96 dB (1 W, 1 m) 1/2 free sound field
Frequency Response	40 ... 1200 Hz (-10 dB)
Speaker Component	30 cm cone-type speaker
Input Terminal	Speakon NL4MP x 2 and M4 screw terminals
Finish	Enclosure plywood, metal front grille black (FB-120B) or white (FB-120W)
Dimensions (W x H x D)	408 x 408 x 450 mm
Weight	15 kg

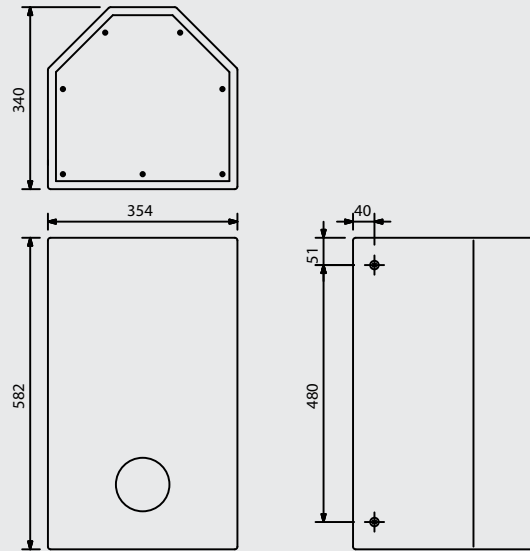


Subwoofer

Design Subwoofer



FB-100



Features

- Compact subwoofer
- For floor-, wall-, corner- or ceiling-mount
- 450 W high-power subwoofer system
- 6 rigging points for suspended mounting
- MDF enclosure, paintable
- Optional matching transformer MT-S0601 for high-impedance operation
- 25 cm speaker with large 120 mm diameter ferrite magnet and extended voice coil for distortion-free bass response
- Acoustic band pass filter for smooth low frequency response and high efficiency
- Detachable Phoenix screw terminal blocks ready for loop-through parallel connection of multiple speakers

Applications

Restaurants, shops, conference rooms, AV-presentation rooms

Options

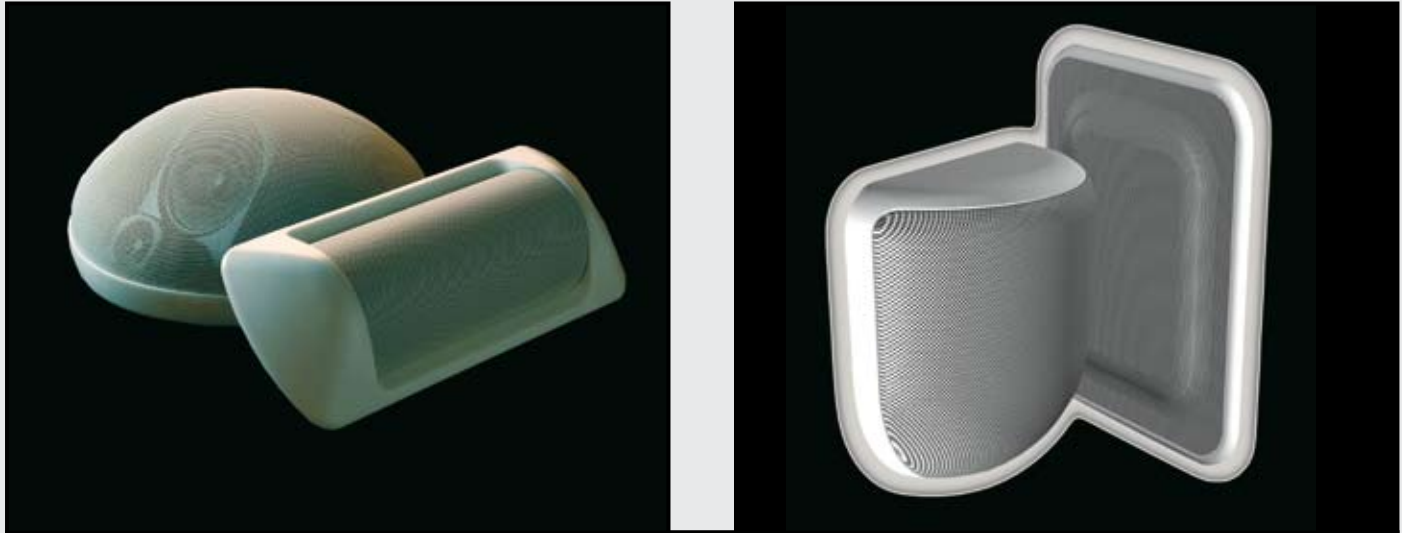
- MT-S0601: 100V-Transformer / rated 60 W

	FB-100
Enclosure	Acoustic Super Woofer (ASW)
Rated Input	150 W (40 – 200 Hz)
Continuous Program	450 W (40 – 200 Hz)
Impedance	8 Ohm
Sound Pressure Level	94 dB (1 W, 1 m) installation in 1/2 free sound field
Frequency Response	35 – 160 Hz (–10 dB) installation in 1/2 free sound field
Speaker Component	25 cm cone speaker
Input Terminal	Detachable screw terminal, (+)(–) 2 each (for bridging connection)
Usable cable	Solid cable, stranded cable: 0.2 – 2.5 mm ² (AWG No. 24 – 14)
Finish	MDF, black, paint
Dimensions (W x H x D)	354 x 582 x 340 mm
Weight	16 kg
Option	Matching transformer: MT-S0601 (rated 60 W)



Harmonized Engineering Speaker

Design Speaker System



H-Series Speaker

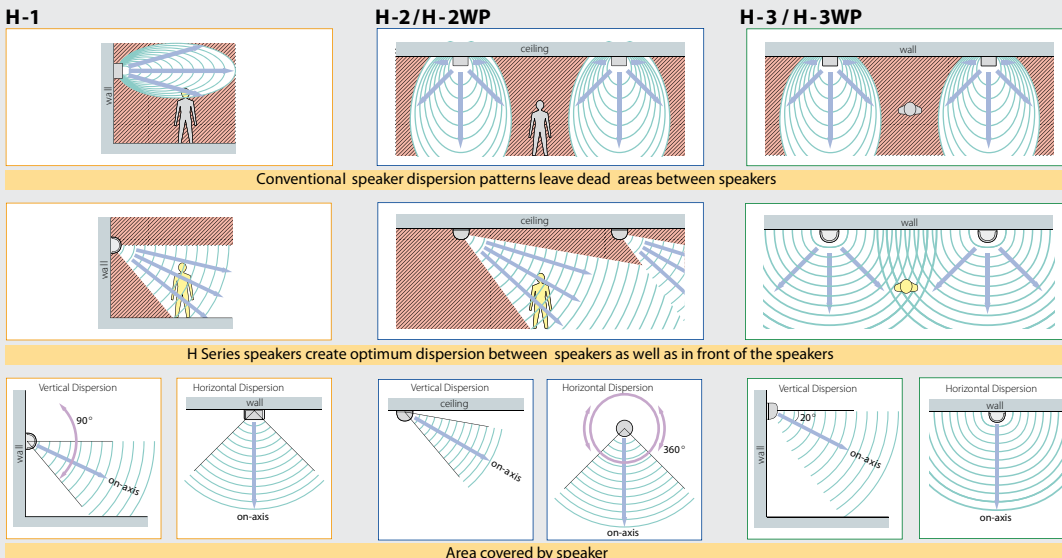
Description

Invisible High Performance The H-Series may be perfectly integrated into the environment, evolving the high TOA sound quality. Whichever model selected, the 2-way H-Series speakers can be relied on to deliver accurate, highly qualitative sound reproduction that enhances any program.

- Every H-Series model utilizes a passive crossover with optimized filter slopes built-in
- Natural boost at frequencies between 200 Hz to 300 Hz due to reinforcement of those frequencies with half- and quarter-space loading of enclosures after installation
- Enclosures have been designed to minimize reflections and since brackets are not required for installation, common problems such as out-of-phase wall or ceiling reflections can be minimized
- Easily paintable exterior grille and frame to match surrounding decor
- For easy use in distributed speaker systems, each speaker has a built-in 70 V/100 V matching transformer
- A removable terminal block accepts up to 14 AWG speaker wires and loop-through terminations are provided when wiring a distributed speaker system

The principle of harmonized engineering speakers

Speaker sound dispersion characteristics



H-1

Up to 90° locking driver positioning adjustment

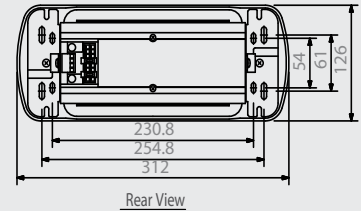
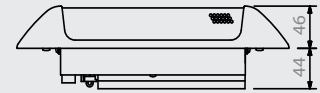
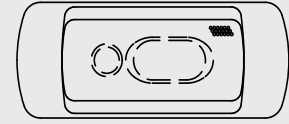
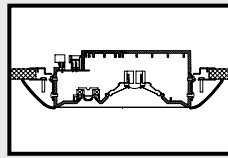
H-2

Up to 360° locking driver positioning adjustment



Harmonized Engineering Speaker

Design Speaker System



Features

- Attractive 2-way design speaker
- 90 W (continuous program)
- Ferrofluid-cooled, balanced dome tweeters and neodymium magnet cone woofers
- Narrow coverage area allows a controlled sound
- Speaker axis can be mounted to match with the room axis
- Sound direction can be adjusted within 90°
- Colour: White
- Built-in transformer allows both high and low impedance: 4 Ohm, 16 Ohm or 70 V, 100 V
- Easy installation in standard electrical gang boxes
- Fire-rated ABS enclosure (Standard UL 94 V-0 grade)

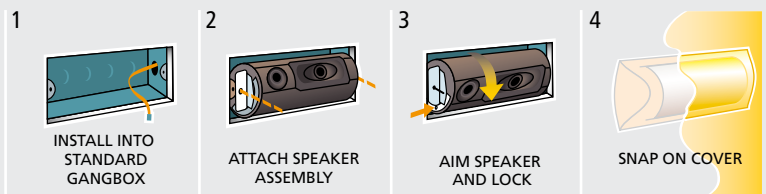
Applications

Houses of worship, hotels, offices, museums, restaurants, retail stores, residential spaces

Specifications

	H-1
Enclosure	Sealed type
Rated Input 4 Ohm/other	30 W / 12 W
Continuous Program 4 Ohm/other	90 W / 18 W
Impedance	4 Ohm / 16 Ohm
Tappings	100 V: 830 Ohm (12 W), 1.7 kOhm (6 W), 3.3 kOhm (3 W) / 70 V: 420 Ohm (12 W), 830 Ohm (6 W), 1.7 kOhm (3 W), 3.3 kOhm (1.5 W)
Frequency Response	120...20000 Hz
SPL (1W, 1m)	85 dB (installation in 1/2 free sound field)
Dimensions (W x H x D)	312 x 126 x 90 mm
Weight	1.5 kg (incl. adapter frame)
Colour	White

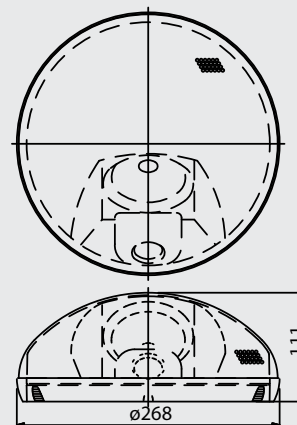
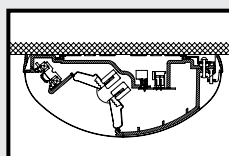
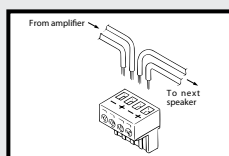
Installation Procedure



Harmonized Engineering Speaker



Design Speaker System



Features

- 2-way design speaker
- Pleasant design
- Excellent acoustical characteristics
- High power handling of 120 W (continuous program)
- Fire-rated ABS enclosure (Standard UL 94 V-0 grade)
- H-2WP: Weatherproof IP 64 certified, matches the requirements for outdoor applications
- Ferrofluid-cooled, balanced dome tweeters, neodymium magnet cone woofers
- Narrow coverage area allows controlled sound
- Speaker axis can be mounted to match the room axis
- Sound direction can be adjusted within 360°
- Easy installation in standard electrical gang boxes

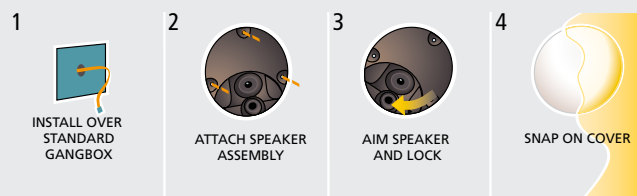
Applications

- Hotels, houses of worship, office buildings, museums, shops
- Weatherproof version: Terraces, gardens, patios, swimming pools

Specifications

	H-2	H-2WP
Enclosure	Sealed type	Sealed type
Rated Input 4 Ohm / other	40 W / 12 W	40 W / 12 W
Continuous Program 4 Ohm / other	120 W / 18 W	120 W / 18 W
Impedance	4 Ohm / 16 Ohm	4 Ohm / 16 Ohm
Tappings 100 V	830 Ohm (12 W), 1.7 kOhm (6 W), 3.3 kOhm (3 W)	830 Ohm (12 W), 1.7 kOhm (6 W), 3.3 kOhm (3 W)
Tappings 70 V	420 Ohm (12 W), 830 Ohm (6 W), 1.7 kOhm (3 W), 3.3 kOhm (1.5 W)	420 Ohm (12 W), 830 Ohm (6 W), 1.7 kOhm (3 W), 3.3 kOhm (1.5 W)
Frequency Response	100...20000 Hz	100...20000 Hz
SPL (1 W, 1 m)	88 dB	88 dB
Dimensions (W x H x D)	ø 268 x 111 mm	ø 268 x 111 mm
Weight	2.1 kg	2.1 kg
Colour	White	White

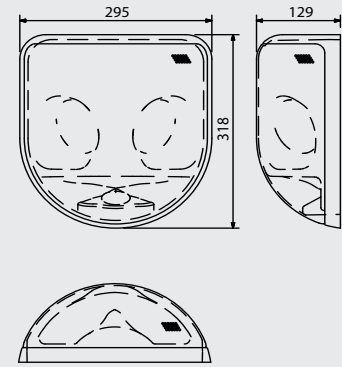
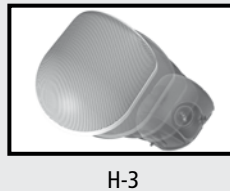
Installation Procedure





Harmonized Engineering Speaker

Designer Speaker System



Features

- 2-way speaker
- Stylish design
- High quality sound between and in front of each speaker unit
- Ideal for long but narrow areas such as corridors or tea gardens
- H-3WP: Weatherproof version for outdoor applications
- Dome tweeters and neodymium magnet cone woofers
- Easy, unobtrusive installation at above head-height
- Installation directly to wall
- 180 degree coverage pattern, eliminating acoustically dead areas
- Either low impedance (8 Ohm / 16 Ohm) or high impedance (70 V / 100 V)
- Fire resistant ABS according to UL 94 V-0

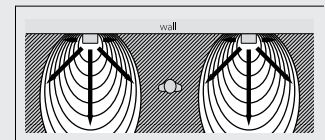
Applications

Ideal for corridors
One version each for indoor and outdoor installation

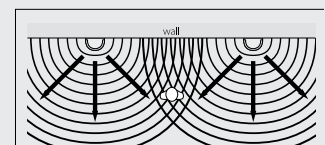
Specifications

	H-3	H-3WP
Enclosure	Sealed type, 2-way speaker	Sealed type, 2-way speaker
Speaker	2 x 4" (10 cm) cone speaker, dome tweeter (neodymium magnet)	2 x 4" (10cm) cone speaker, dome tweeter (neodymium magnet)
Impedance	8 Ohm / 16 Ohm, 100 V, 70 V	8 Ohm / 16 Ohm, 100 V, 70 V
Tappings 100 V	100 V: 30 W (330 Ohm), 15 W (670 Ohm), 7,5 W (1.3k Ohm)	100 V: 30 W (330 Ohm), 15 W (670 Ohm), 7,5 W (1.3k Ohm),
Tappings 70 V	70 V: 30 W (170 Ohm), 15 W (330 Ohm), 7,5 W (670 Ohm), 3,75 W (1.3 kOhm)	70 V: 30 W (170 Ohm), 15 W (330 Ohm), 7,5 W (670 Ohm), 3,75 W (1.3 kOhm)
SPL (1 W, 1 m)	89 dB	89 dB
Power Handling	150 W (continuous program, 8 Ohm) 50 W (rated, 8 Ohm)	150 W (continuous program, 8 Ohm) 50 W (rated, 8 Ohm)
Frequency Response	100...20000 Hz	100...20000 Hz
Connectors	Phoenix-screw terminals (2 x 2-p)	Phoenix-screw terminals (2 x 2-p)
Finish	Fire-resistant ABS resin black (UL 94 V-0), grille: stainless steel plate, white, paintable, grille frame: fire-resistant ABS resin, white, paintable; base frame: steel plate	Fire-resistant ABS resin black (UL 94 V-0), grille: stainless steel plate, white, paintable, grille frame: fire-resistant ABS resin, white, paintable; base frame: steel plate
Water Resistance	-	IPx4
Dimensions (W x H x D)	295 x 318 x 129 mm	295 x 318 x 129 mm
Weight	3.3 kg	3.3 kg
Accessory	Base frame	Base frame

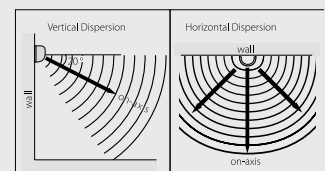
Speaker Sound Dispersion Characteristics



Conventional speaker dispersion patterns leave dead areas between speakers.



H Series speakers create optimum dispersion between speakers as well as in front of the speakers.

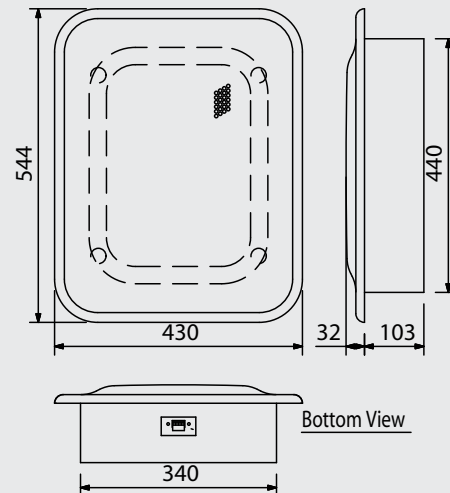


Area covered by speaker.

Harmonized Engineering Speaker



Flush Mount Subwoofer with Minimum Depth



Features

- Unobtrusive design
- Compact dimensions
- Very low installation depth for flush-mounting
- Acoustic super woofer enclosure
- Frequency response exactly matches with H-1, H-2 and H-3
- Large volume for an excellent low frequency audio response
- Easy installation

Applications

Flush-mount installation into the wall and into ceilings

Specifications

	HB-1
Enclosure	Acoustic Super Woofer (ASW)
Speaker	8" (20 cm) Woofer
Impedance	8 Ohm
SPL (1W, 1m)	91 dB (1 W / 1 m, 2 PI Space)
Power Handling	240 W (continuous program), 80 W (rated)
Frequency Response	45 ... 200 Hz (-10 dB, 2PI Space)
Connectors	Phoenix-Screw Terminals (2x2-p.)
Finish	Fireresistant, ABS (UL 94 V-0) Enclosure: steel plate, black, Grille: Steel plate, white, Grille frame: Fire resistant ABS resin, white
Dimensions (W x H x D)	430 x 544 x 135 mm
Weight	11 kg (incl. mounting brackets)
Accessory	Mounting brackets
Optional Accessory	Transformer MT-S0601 (for 100 V / 70 V)



Fashion Speaker for Foreground Music

Wide-Dispersion Speaker System (15 W / 30 W)



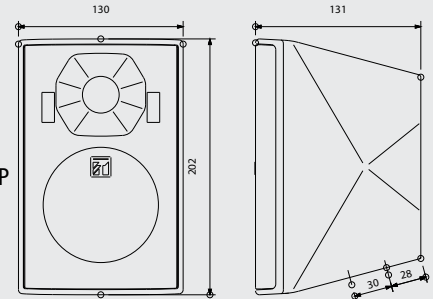
F-1000W / F-1000WT / F-1000WTWP



View inside



Rear view F-1000WTWP



Features

- Compact speaker
- 3 different versions available: Low impedance, high impedance ("T") for 100 V line and weatherproof version ("WP")
- Up to 90 W continuous program (F-1000B / F-1000W)
- Great variety of brackets available
- 2-way speaker with high quality 10 cm woofer and balanced dome tweeter
- Paintable
- Colour:
F-1000B / F-1000BT / F-1000BTWP: Black
F-1000W / F-1000WT / F-1000WTWP: White
- Dispersion angle of 90° x 90°
- Octagonal horn for clear, wide-area sound coverage
- Easy impedance selection by rotary switch
- Rugged HIPS enclosure
- Covered rear-mounted terminal block (WP version)
- Built-in speaker protection for low impedance models
- Speaker bracket, joint bracket, wall bracket, bracket fixing screw included

Options

- HY-CM10B: Black ceiling mounting bracket
- HY-CM10W: White ceiling mounting bracket
- HY-BH10B: Board hanger bracket
- HY-CL10B: Cluster bracket
- ST-16A: Speaker stand
- Especially for F-1000BTWP/F-1000WTWP:
YS-60B pole mounting bracket (Non-RoHS)

Specifications

	F-1000B / F-1000W	F-1000BT / F-1000WT	F-1000BTWP / F-1000WTWP
System	2-Way, bass-reflex enclosure	2-Way, bass-reflex enclosure	2-Way, bass-reflex enclosure
Rated Input	30 W	15 W	15 W
Continuous Program	90 W	-	-
Tappings 100V	-	15 W / 5 W / 3 W / 1 W	15 W / 5 W / 3 W / 1 W
Tappings 70V	-	15 W / 7.5 W / 2.5 W / 1.5 W / 0.5 W	15 W / 7.5 W / 2.5 W / 1.5 W / 0.5 W
Low Impedance	8 Ohm	-	-
Frequency Response	85 ... 20000 Hz (-10dB)	85 ... 20000 Hz (-10dB)	85 ... 20000 Hz (-10dB)
Crossover Frequency	5 kHz	5 kHz	5 kHz
SPL (1W, 1m)	87 dB	87 dB	87 dB
Connector	Push-in terminal	Push-in terminal	Push-in terminal
Water Protection	-	-	IPx4
Temperature	-	-	-10 °C to + 50 °C
Finish	Enclosure: HIPS resin, punched net: surface treated steel plate	Enclosure: HIPS resin, punched net: surface treated steel plate	Enclosure: HIPS resin, punched net: surface treated steel plate
Dimensions (W x H x D)	130 x 202 x 131 mm	130 x 202 x 131 mm	130 x 202 x 131 mm
Weight	1.8 kg	1.8 kg	2 kg

Fashion Speaker for Foreground Music



Wide-Dispersion Speaker System (30 W / 50 W)



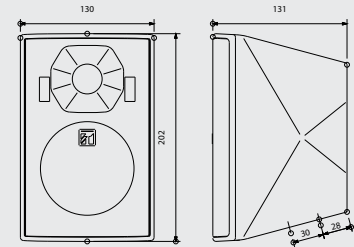
F-1300B / F-1300BT / F-1300BTWP



F-1300W / F-1300WT / F-1300WTWP



HY-CM10W



F-1300B / F-1300BT / F-1300BTWP

Features

- Compact speaker
- 3 different versions available: Low impedance, high impedance ("T") for 100 V line and weatherproof version ("WP")
- Up to 150 W continuous program (F-1300B / F-1300W)
- Great variety of brackets available
- 2-way speaker with high quality 20 cm woofer and balanced dome tweeter
- Paintable
- Colour:
F-1300B / F-1300BT / F-1300BTWP: Black
F-1300W / F-1300WT / F-1300WTWP: White
- Dispersion angle of 90° x 90°
- Octagonal horn for clear, wide-area sound coverage
- Easy impedance selection by rotary switch
- Rugged HIPS enclosure
- Covered rear-mounted terminal block (WP version)
- Built-in speaker protection for low impedance models
- Speaker bracket, joint bracket, wall bracket, bracket fixing screw included

Options

- HY-CM10B: Black ceiling mounting bracket
- HY-CM10W: White ceiling mounting bracket
- HY-BH10B: Board hanger bracket
- HY-CL10B: Cluster bracket
- ST-16A: Speaker stand
- Especially for F-1000BTWP/F-1000WTWP: YS-60B pole mounting bracket (Non-RoHS)

Specifications

	F-1300B / F-1300W	F-1300BT / F-1300WT	F-1300BTWP / F-1300WTWP
System	2-Way, bass-reflex enclosure	2-Way, bass-reflex enclosure	2-Way, bass-reflex enclosure
Rated Input	50 W	30 W	30 W
Continuous Program	150 W	-	-
Tappings 100V	-	60 W / 30 W / 15 W / 3 W	60 W / 30 W / 15 W / 3 W
Tappings 70V	-	60 W / 30 W / 15 W / 7.5 W / 1.5 W	60 W / 30 W / 15 W / 7.5 W / 1.5 W
Low Impedance	8 Ohm	-	-
Frequency Response	80 ... 20000 Hz (-10dB)	80 ... 20000 Hz (-10dB)	80 ... 20000 Hz (-10dB)
Crossover Frequency	2 kHz	2 kHz	2 kHz
SPL (1W, 1m)	90 dB	90 dB	90 dB
Connector	Push-in terminal	Push-in terminal	Push-in terminal
Water Protection	-	-	IPx4
Temperature	-	-	-10 °C to + 50 °C
Finish	Enclosure: HIPS resin, punched net: surface treated steel plate	Enclosure: HIPS resin, punched net: surface treated steel plate	Enclosure: HIPS resin, punched net: surface treated steel plate
Dimensions (W x H x D)	162 x 250 x 161 mm	162 x 250 x 161 mm	162 x 250 x 161 mm
Weight	3.1 kg	3.6 kg	3.6 kg



Fashion Speaker for Foreground Music

Wide-Dispersion Speaker System (60 W)



F-2000W / F-2000WT / F-2000WTWP



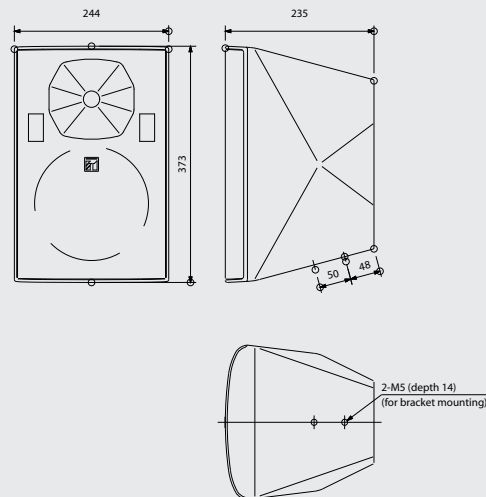
F-2000B / F-2000BT / F-2000BTWP



HY-CL20B



HY-CM20W



Features

- Compact speaker
- 3 different versions available: Low impedance, high impedance ("T") for 100 V line and weatherproof version ("WP")
- Up to 180 W continuous program (F-2000B / F-2000W)
- Great variety of brackets available
- 2-way speaker with high quality 20 cm woofer and balanced dome tweeter
- Paintable
- Colour:
F-2000B / F-2000BT / F-2000BTWP: Black
F-2000W / F-2000WT / F-2000WTWP: White
- Dispersion angle of 110° x 100°
- Easily mountable 80° x 80° horn adapter for increased dispersion control included
- Octagonal horn for clear, wide-area sound coverage
- Easy impedance selection by rotary switch
- Rugged HIPS enclosure
- Covered rear-mounted terminal block (WP version)
- Built-in overload protection for low impedance models
- Speaker bracket, joint bracket, wall bracket, bracket fixing screw included

Options

- HY-CM20B: Black ceiling mounting bracket
- HY-CM20W: White ceiling mounting bracket
- HY-CL20B: Cluster bracket
- ST-16A: Speaker stand
- Especially for F-2000BTWP/F-2000WTWP:
- SP-131: Speaker mounting bracket
- YS-60B: Pole mounting bracket (Non RoHS)

Specifications

	F-2000B / F-2000W	F-2000BT / F-2000WT	F-2000BTWP / F-2000WTWP
System	2-Way, bass-reflex enclosure	2-Way, bass-reflex enclosure	2-Way, bass-reflex enclosure
Rated Input	60 W	60 W	60 W
Continuous Program	180 W	-	-
Tappings 100V	-	60 W / 30 W / 15 W / 3 W	60 W / 30 W / 15 W / 3 W
Tappings 70V	-	60 W / 30 W / 15 W / 7.5 W / 1.5 W	60 W / 30 W / 15 W / 7.5 W / 1.5 W
Low Impedance	8 Ohm	-	-
Frequency Response	65 ... 20000 Hz (-10dB)	65 ... 20000 Hz (-10dB)	65 ... 20000 Hz (-10dB)
Crossover Frequency	2.5 kHz	2.5 kHz	2.5 kHz
SPL (1W, 1m)	92 dB	92 dB	92 dB
Connector	Push-in terminal	Push-in terminal	Push-in terminal
Water Protection	-	-	IPx4
Temperature	-	-	-10 °C to + 50 °C
Finish	Enclosure: HIPS resin, punched net: surface treated steel plate	Enclosure: HIPS resin, punched net: surface treated steel plate	Enclosure: HIPS resin, punched net: surface treated steel plate
Dimensions (W x H x D)	244 x 373 x 235 mm	244 x 373 x 235 mm	244 x 373 x 235 mm
Weight	6.5 kg	7.4 kg	7.4 kg

Fashion Speaker for Foreground Music



Optional Accessories

Mounting Brackets for F-1000 / F-1300 Series

HY-BH10B

Board Hanger Bracket

- For F-1000 Series
- Colour: Black
- Weight 210 g
- Dimensions (W x H x D) 48 x 100 x 108 mm



HY-CL10B and HY-CL10W

Cluster Bracket

- HY-CL10B: Black
- HY-CL10W: White



HY-CM10B and HY-CM10W

Wall / Ceiling Bracket

- Weight 210 g
- Dimensions (W x H x D) 48 x 100 x 108 mm
- HY-CM10B: Black
- HY-CM10W: White



Mounting Brackets for F-2000 Series

HY-CL20B and HY-CL20W

Cluster Bracket

- HY-CL20B: Black
- HY-CL20W: White



HY-CM20B / HY-CM20W

Wall / Ceiling Bracket

- For F-2000 Series
- Weight 610 g
- Dimensions (W x H x D) 84 x 135 x 175 mm
- HY-CM20B: Black
- HY-CM20W: White



Stand

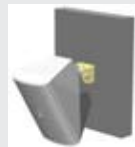
ST-16A

Speaker Stand

- Height 1130...1660 mm
- Max. Load 6 kg
- Colour: Silver



Various Installation Options



Wall mounting



Ceiling mounting



Ceiling mounting



Stand mounting



Ceiling mounting



Cluster mounting



Pole mounting



Pole mounting



Board hanger

Matching Subwoofers

FB-120B / FB-120W

Subwoofer (600 W)

- For F-1300 / F-2000 Series
- FB-120B: Black
- FB-120W: White



FB-100

Subwoofer (450 W)

- For F-1300/ F-2000 Series
- Colour: Black



HB-1

Subwoofer (240 W)

- For F-1000 Series
- Colour: White





Coaxial Array Speaker

Compact Integrated 2-Way Speaker



HS-120B/HS-120W/HS-1200BT/HS-1200WT



Rear view



Front view



ST-34B

Features

- For mobile or fixed installation e.g. in clubs, banquet rooms or schools, etc.
- Easy to carry and easy to install, with handle for easy transportability
- Rubber feet for straight positioning
- Can be used as a floor monitor
- Twin input terminal connections (Speakon® and screw terminals) for fixed and mobile installation
- Well-controlled sound coverage: 90° horizontal x 40° vertical
- 12" LF speaker
- 2-way unit system equipped with a large-diameter woofer and array tweeter
- Size and weight have been reduced thanks to the use of the array tweeter
- Compact and versatile design enables a broad range of applications
- Multi-purpose speaker designed for both permanent installations and mobile PA
- A model with a built-in matching transformer, for use in high-impedance applications
- Colour black or white

Options

- HY-1200HB / HY-1200HW: Horizontal orientation, mounting on wall/ceiling
- HY-1200VB/ HY-1200VW: Vertical orientation, mounting on wall/ceiling
- HY-C0801* / HY-C0801W* Ceiling mounting bracket
- HY-W0801* / HY-W0801W* Wall mounting bracket
- ST-34B: Speaker Stand

*in combination with HY-1200 series brackets

Specifications

	HS-120B	HS-120W	HS-1200BT	HS-1200WT
Speaker Component	30 cm (12") cone-type, Balanced dome-type x 6			
Power Handling Capacity	100 W (rated) 300 W (continuous program)	100 W (rated) 300 W (continuous program)	60 W (rated, high impedance) 100 W / 300 W (low impedance)	60 W (rated, high impedance) 100 W / 300 W (low impedance)
Rated Impedance (High) (Low)	— 8 Ω	— 8 Ω	70 V / 100 V 8 Ω	70 V / 100 V 8 Ω
Sensitivity	97 dB (1 W, 1 m)	97 dB (1 W, 1 m)	97 dB (1 W, 1 m)	97 dB (1 W, 1 m)
Frequency Response	80 - 20000 Hz	80 - 20000 Hz	70 - 20000 Hz	70 - 20000 Hz
Directivity Angle	Horizontal: 90°, Vertical: 40°			
Dimensions (W x H x D)	361 x 448 x 320 mm			
Weight	8.5 kg	8.5 kg	10 kg	10 kg
Finish (Colour)	Black Polypropylene	White Polypropylene	Black Polypropylene	White Polypropylene

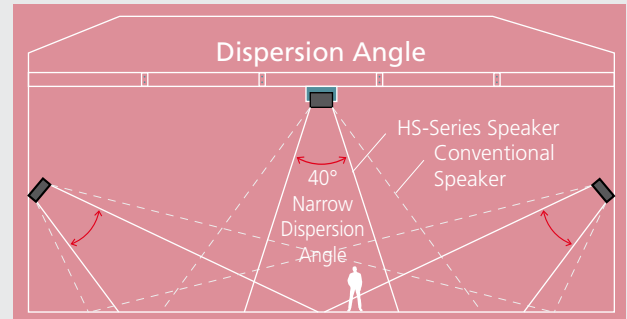


Coaxial Array Speaker

Compact Integrated 2-Way Speaker



HS-1500B/HS-150W/HS-1500BT/HS-1500WT



Narrow directivity control, e.g. for stage application

Features

- For mobile or fixed installation e.g. in clubs, banquet rooms or schools, etc.
- Easy to carry and easy to install, with handle for easy transportability
- Rubber feet for straight positioning
- Can be used as a floor monitor
- Twin input terminal connections (Speakon® and screw terminals) for fixed and mobile installation
- Well-controlled sound coverage: 90° horizontal x 40° vertical
- 15" LF speaker
- 2-way unit system equipped with a large-diameter woofer and array tweeter
- Size and weight have been reduced thanks to the use of the array tweeter
- Compact and versatile design enables a broad range of applications
- Multi-purpose speaker designed for both permanent installations and mobile PA
- A model with a built-in matching transformer, for use in high-impedance applications
- Colour black or white

Options

- HY-1500HB / HY-1500HW: Horizontal orientation, mounting on wall / ceiling
- HY-1500VB / HY-1500VW: Vertical orientation, mounting on wall / ceiling
- HY-C0801* / HY-C0801W* Ceiling mounting bracket
- HY-W0801* / HY-W0801W* Wall mounting bracket
- ST-34B: Speaker Stand*

*in combination with HY-1500 series brackets

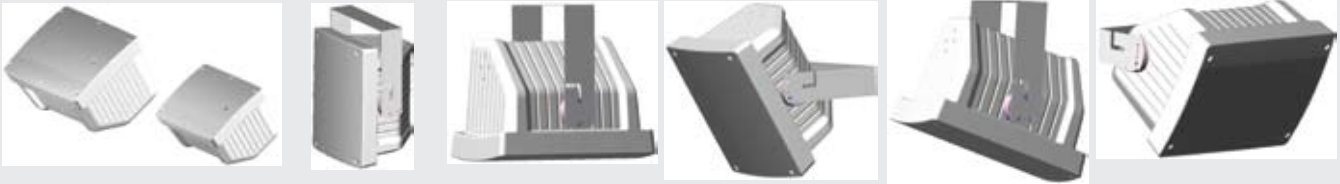
Specifications

	HS-150B	HS-150W	HS-1500BT	HS-1500WT
Speaker Component	38 cm (15") cone-type, balanced dome-type x 6			
Power Handling Capacity	100 W (rated) 300 W (continuous program)	100 W (rated) 300 W (continuous program)	60 W (rated, high imped.) 100 W / 300 W (low impedance)	60 W (rated, high imped.) 100 W / 300 W (low impedance)
Rated Impedance (High) (Low)	— 8 Ω	— 8 Ω	70 V / 100 V 8 Ω	70 V / 100 V 8 Ω
Sensitivity	98 dB (1 W, 1 m)	98 dB (1 W, 1 m)	98 dB (1 W, 1 m)	98 dB (1 W, 1 m)
Frequency Response	70 - 20000 Hz	70 - 20000 Hz	60 - 20000 Hz	60 - 20000 Hz
Directivity Angle	Horizontal: 90°, Vertical: 40°			
Dimensions (W x H x D)	451 x 560 x 400 mm	451 x 560 x 400 mm	451 x 560 x 400 mm	451 x 560 x 400 mm
Weight	12 kg	12 kg	14 kg	14 kg
Finish (Colour)	Black Polypropylene	White Polypropylene	Black Polypropylene	White Polypropylene



Coaxial Array Speaker

Various Installation Options



Mounting brackets for Wall / Ceiling

HY-1500HB



HY-1500HW



HY-1200HB



HY-1200HW



HY-1500VB



HY-1500VW



HY-1200VB



HY-1200VW



Stand Mounting

ST-34B

Speaker Stand



Mounting Brackets for Ceiling

HY-C0801* HY-C0801W*



Mounting Brackets for Wall

HY-W0801*

HY-W0801W*



* in combination with HY-1200 / HY-1500 series brackets

High Performance Systems



Wedge-shaped 2-Way System with a Variety of Mounting Options



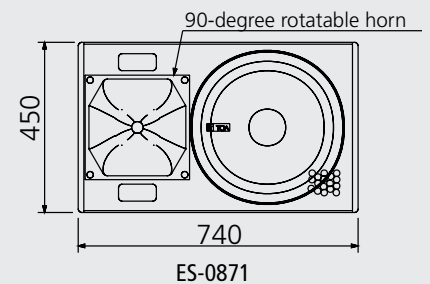
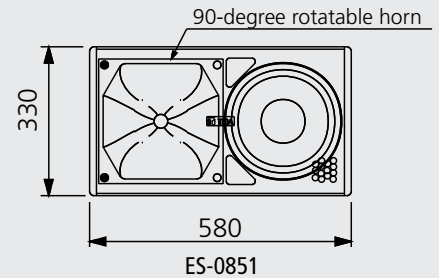
HY-0851CL



HY-B0801



HY-0871WS



Features

- 2-way bass-reflex box
- 600 W continuous program
- 25 cm woofer (ES-0851) or 38 cm woofer (ES-0871)
- Wedge-shaped rear for installation close to walls, ceilings or edges or usage as floor monitor
- Great number of matching mounting brackets and also on stands and at pipes
- Finish: Black, plywood enclosure
- 90° rotatable CD-horn with high efficiency compression driver for 90° x 60° coverage
- Highly effective built-in crossover network
- 2 x Speakon® + 1 screw terminal inputs

Application

Live music in halls, sporting facilities, schools, religious facilities, convention halls, discotheques

Options

For ES-0851:

- HY-0851CL: Wall / ceiling bracket (1 pair), maximum load of 28 kg
- HY-0851ST: Bracket for HY-B0801/C0801/W0801/ ST-32, use for vertical mounting, maximum load of 28 kg,
- HY-0852ST: Bracket for HY-C0801/W0801, use for horizontal mounting, maximum load of 28 kg
- HY-B0801: Ceiling pipe bracket for use with HY-0851ST/0852ST, maximum load of 32 kg
- HY-C0801: Ceiling bracket for use with HY-0851ST /0852ST, maximum load of 32 kg
- HY-W0801: Wall bracket for use with HY-0851ST /0852ST, maximum load of 32 kg
- ST-32: Speaker stand for use with HY-0851ST

For ES-0871:

- HY-0871CL: Wall / ceiling (1 pair), maximum load of 45 kg
- HY-0871WS: Wall (1 set) , maximum load of 45 kg

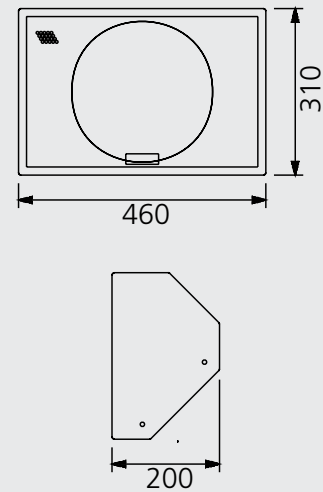
Specifications

	ES-0851	ES-0871
System	2-Way Bass-Reflex Box	2-Way Bass-Reflex Box
Rated Input	200 W	200 W
Continuous Program	600 W	600 W
Dispersion	90° x 60° / 60° x 90°	90° x 60° / 60° x 90°
Impedance	8 Ohm	8 Ohm
Frequency Response	80 ... 20000 Hz	70 ... 20000 Hz
Crossover Frequency	1.8 kHz	1.8 kHz
SPL (1W, 1m)	97 dB	100 dB
Dimensions (W x H x D)	580 x 330 x 255 mm	740 x 450 x 337 mm
Weight	20 kg	37 kg
Input Terminal	2x Neutrik NL4MP (Speakon) + 1x M5 Screw Terminal	2x Neutrik NL4MP (Speakon) + 1x M5 Screw Terminal



High Performance Systems

2-Way Coaxial Sub-Speaker System



Features

- 2-Way Coaxial Speaker
- 25 cm low frequency cone speaker and CD horn (60° x 60° coverage)
- Fitted with compression driver with titanium diaphragm
- Compact size despite the power
- Good sound coverage in combination with the T-650 Dual CD-Horn Speaker
- High power due to DIFFRAX (horn structure for coaxial speaker that is aimed at controlling the influence of the diffraction effect at the edge of high frequency horn's opening)

Applications

Ideal for medium sized halls such as indoor sports facilities and multi-purpose halls with high reverberation

Options

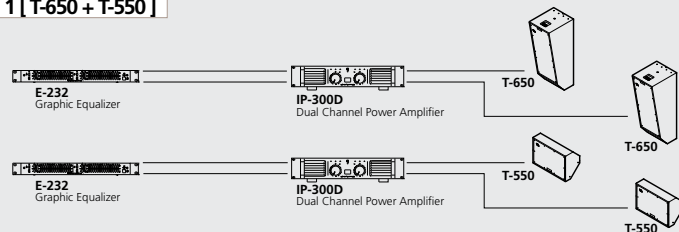
- MT-S0601: Transformer for 100 V / 70 V

Specifications

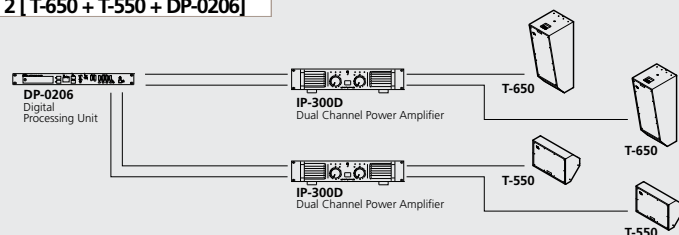
	T-550
Enclosure	Sealed
Speaker Component	2-way coaxial unit with 25 cm cone speaker, CD-horns with driver
Dispersion (hor. x vert.)	60° x 60°
Rated Input	60 W
Continuous Program	180 W
Impedance	8 Ohm
Frequency Response	100 ... 20000 Hz
Crossover Frequency	2.5 kHz
SPL (1 W, 1 m)	96 dB
Dimensions (W x H x D)	460 x 310 x 200 mm
Weight	11 kg
Input Terminal	M5 screw terminal
Accessories	Mounting brackets
Option	Matching transformer MT-S0601 100 V / 70 V

System Example

Example 1 [T-650 + T-550]



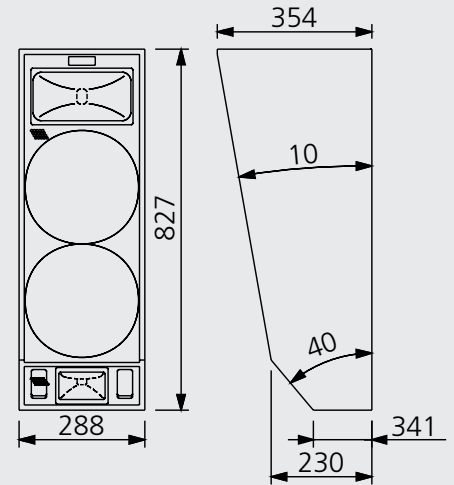
Example 2 [T-650 + T-550 + DP-0206]



High Performance Systems



Dual CD-Horn Main Speaker System



Features

- Covers wide rectangular areas by combining a short distance (90° hor. x 40° vert.) and a long distance (60° horizontal x 30° vertical) horn
- Ensures sound clarity by means of the fixed directional horns
- Adjustable angle
- Colour: Black
- Crossover frequency set at 1.2 kHz
- Two woofers control the directivity of the mid and low frequencies
- Built-in overload protection

Applications

Medium-sized halls such as indoor sports facilities and multi-purpose halls with high reverberation

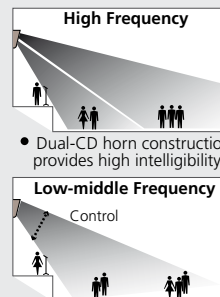
Options

- MT-S0601: 70 V / 100 V-Transformer / rated 60 W

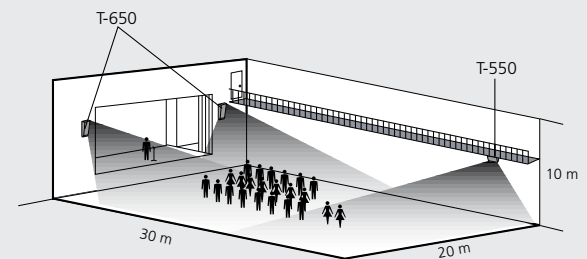
Specifications

	T-650
Enclosure	Bass-Reflex Type
Speaker Component	25 cm x 2 cone speaker, 2 CD-horns with drivers
Dispersion (hor. x ver.)	60° x 30° and 90° x 40°
Rated Input	120 W
Continuous program	360 W
Impedance	8 Ohm
Frequency Response	80 ... 20000 Hz
Crossover Frequency	1.2 kHz
SPL (1 W, 1 m)	100 dB
Dimensions (W x H x D)	288 x 827 x 354 mm
Weight	22 kg
Input Terminal	MS screw terminal
Accessories	Mounting brackets

Area coverage



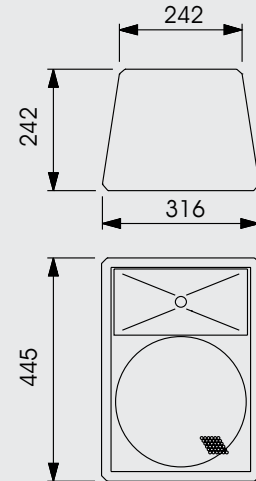
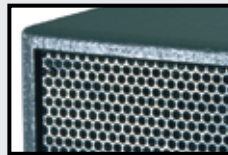
- Dual-CD horn construction provides high intelligibility.
- Well-controlled vertical directivity by using two woofers.





Processor Controlled Speaker Systems

Ultra Compact Full Range Bass-Reflex System



Features

- Very compact 2-way speaker
- Trapezoidal shape
- For both on-the-road and fixed installation
- Ideal in combination with the processor AC-S05 and the subwoofer SR-L05
- High power handling capacity (450 W)
- High quality sound
- Heavy duty construction and long-term reliability
- Colour: Dark grey, black front grille
- 25 cm (10") woofer
- HF compression driver with titanium diaphragm mounted on a 90° x 40° CD-horn
- Low loss passive crossover network
- Two 4-pole Speakon® jacks (connected parallel) and screw terminal
- Several optional mounting accessories available
- Enclosure: MDF with rugged epoxy paint

Options

- M-9000M2 Digital Mixer
- SR-L05: Subwoofer

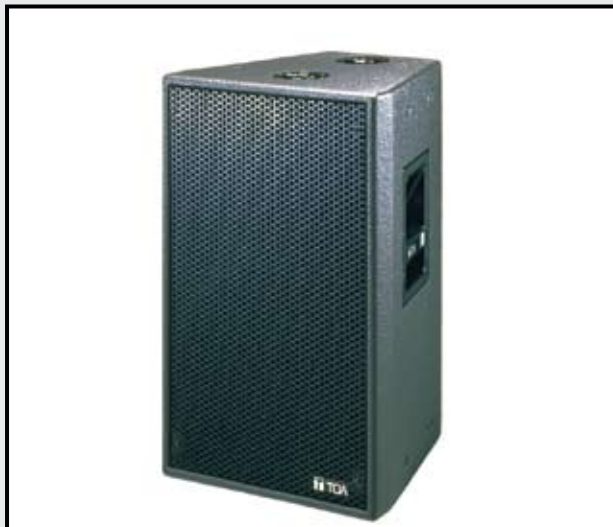
Specifications

	SR-F05
Speaker	LF 25 cm cone speaker, HF CD-Horn
Recommended Power (at 8 Ohm) in combination with processor, selectable	> 100 / 300 W
Continuous Program	450 W
Rated Input	150 W
SPL (1 W, 1 m)	99 dB
Peak SPL at 1 m	131 dB
Impedance	8 Ohm
Frequency Response	60 ... 18000 Hz
Dispersion	90° x 40°
Dimensions (W x H x D)	316 x 445 x 242 mm
Weight	17 kg
Connectors	2 x 4-pin Speakon

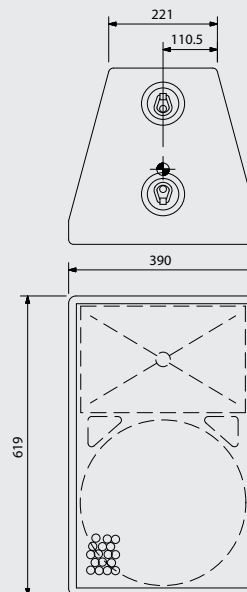
Processor Controlled Speaker Systems



Full Range Bass-Reflex System for Mobile Use



SR-F09 / SR-F09V1



Features

- 2-way, trapezoidal speaker
- For mobile application
- Smooth sound characteristics with processor AC-S09
- High power handling capacity: 600 W
- 30 cm (12") woofer
- Highest quality sound
- Enclosure: MDF with rugged epoxy paint
- Colour: Black
- 2 ring / stud pan fittings on the top and on the bottom, each for quick mounting
- Can quickly be clustered and flown with optional ATM FLY-WARE (TM)
- Heavy duty construction and long-term reliability
- HF compression driver with titanium diaphragm mounted on a 90° x 60° CD-horn (SR-F09V1) or 60° x 40° CD-horn (SR-F09)
- Low loss passive crossover network
- Two 4-pole Speakon® jacks (connected parallel) and a screw terminal

Options

- M-9000M2 Digital Mixer
- SR-L05, SR-L09: Subwoofer

Specifications

	SR-F09	SR-F09V1
Speaker	LF 25 cm cone speaker, HF CD-Horn	LF 25 cm cone speaker, HF CD-Horn
Recommended Power (at 8 Ohm) in combination with processor, selectable	> 400 W / 200 W	> 400 W / 200 W
Continuous Program	600 W	600 W
Rated Input	200 W	200 W
SPL (1 W, 1 m)	100 dB	100 dB
Peak SPL at 1 m	133 dB	133 dB
Impedance	8 Ohm	8 Ohm
Frequency Response	70 ... 20000 Hz	70 ... 20000 Hz
Dispersion	60° x 40°	90° x 60°
Dimensions (W x H x D)	390 x 619 x 364 mm	390 x 619 x 364 mm
Weight	35 kg	35 kg
Connectors	2x 4-pin Speakon + 1x M5 screw terminal	2x 4-pin Speakon + 1x M5 screw terminal



Processor Controlled Speaker Systems

Full Range Bass-Reflex System for Fixed Installation



SR-F09V2 / SR-F09V3

Features

- For fixed installation
- 3/8" nuts on each side, top and bottom, to fix eye-bolts and fly the systems with steel wires
- 2-way, trapezoidal speaker
- Smooth sound characteristics with processor AC-S09
- High power handling capacity (600 W)
- 30 cm (12") woofer
- Highest quality sound
- Enclosure: MDF with rugged epoxy paint
- Colour: Black
- HF compression driver with titanium diaphragm mounted on a 90° x 60° CD horn (SR-F09V3) or 60° x 40° CD horn (SR-F09V2)
- Low loss passive crossover network
- Two 4-pole Speakon® jacks (connected parallel) and a screw terminal

Options

- M-9000M2 Digital Mixer
- SR-L05, SR-L09: Subwoofer

Specifications

	SR-F09V2	SR-F09V3
Speaker	LF 25cm cone speaker, HF CD-Horn	LF 25cm cone speaker, HF CD-Horn
Recommended Power (at 8 Ohm) in combination with processor, select.	> 400 W / 200 W	> 400 W / 200 W
Continuous Program	600 W	600 W
Rated Input	200 W	200 W
SPL (1 W, 1 m)	100 dB	100 dB
Peak SPL at 1 m	133 dB	133 dB
Impedance	8 Ohm	8 Ohm
Frequency Response	70 ... 20000 Hz	70 ... 20000 Hz
Dispersion	60° x 40°	90° x 60°
Dimensions (W x H x D)	390 x 619 x 364 mm	390 x 619 x 364 mm
Weight	35 kg	35 kg
Connectors	2x 4-pin Speakon + 1x M5 Screw terminal	2x 4-pin Speakon + 1x M5 Screw terminal

Processor Controlled Speaker Systems



Bass-Reflex Subwoofer System



Features

SR-L09

- Subwoofer characteristics adjusted with the SR-F09 series speakers characteristics
- For mobile as well as fixed-installations
- High power handling capacity (900 W)
- Very low frequency response
- Heavy duty construction and long-term reliability
- 2 handles on each side
- Enclosure: MDF with rugged epoxy paint
- Colour: Dark grey and black front grille
- 2 x 38 cm (15") woofers providing an ultra-long stroke of the cone (40 mm) for low distortion in super low frequencies
- 2 x Speakon® jack and a screw terminal

SR-L05

- Subwoofer
- For mobile application as well as fixed installations
- High power handling capacity (450 W)
- Very low frequency response
- Heavy duty construction and long-term reliability • 38 cm (15") woofer providing an ultra-long stroke of the cone (40 mm) for low distortion in super low frequencies
- Enclosure: MDF with rugged epoxy paint
- Colour: Dark grey and black front grille
- Equipped with a Speakon® jack and a screw terminal
- 2 handles on each side

Options

- SR-F05: Full Range Bass Reflex System
- M-9000M2 Digital Mixer

Specifications

	SR-L05	SR-L09
Subwoofer	1 x 38 cm	2 x 38 cm
Recommended Power (at 8 Ohm) in combination with processor, selectable	> 300 W / 400 W	> 400 W / 200 W
Continuous Program	450 W	900 W
Rated Input	150 W	300 W
SPL (1 W, 1 m)	93 dB	96 dB
Peak SPL at 1 m	125 dB	131 dB
Impedance	8 Ohm	4 Ohm
Frequency Response	35 ... 1000 Hz	35 ... 1000 Hz
Dimensions (W x H x D)	452 x 629 x 502 mm	829 x 629 x 606 mm
Weight	36 kg	67 kg
Connectors	2x 4-pin Speakon + 1x M5 screw terminal	2x 4-pin Speakon + 1x M5 screw terminal

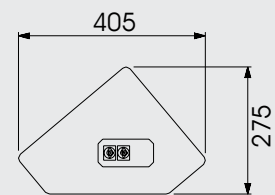
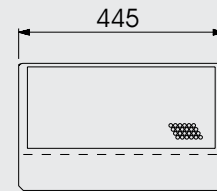


Processor Controlled Speaker Systems

Ultra Compact Full Range Stage Monitor



AC-S05



Features

- Very compact 2-way floor monitor speaker
- For both mobile and fixed installation use
- High power handling capacity (450 W)
- High quality sound
- Heavy duty construction and long-term reliability
- 25 cm (10") woofer
- The horn of the SR-M05L is left, the one of the SR-M05R right
- Enclosure: MDF with rugged epoxy paint
- Colour: Dark grey and black front grille
- HF compression driver with titanium diaphragm mounted on a 40° x 40° CD-horn
- Low loss passive crossover network
- 2 Neutrik NL4MP 4-pole Speakon® jacks (connected parallel) and a screw terminal

Options

- M-9000M2 Digital Mixer

Specifications

	SR-M05L / SR-M05R
Speaker	LF 25 cm cone speaker, HF CD-Horn
Recommended Power (at 8 Ohm) in combination with processor, selectable	> 100 / 300 W
Continuous Program	450 W
Rated Input	150 W
SPL (1 W, 1 m)	99dB
Peak SPL at 1 m	131 dB
Impedance	8 Ohm
Frequency Response	60 Hz - 18 kHz
Dispersion	40° x 40°
Dimensions (W x H x D)	445 x 275 x 405 mm
Weight	18.5 kg
Connectors	2x 4-pin. Speakon

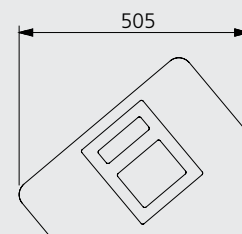
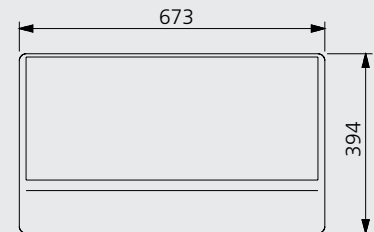
Processor Controlled Speaker Systems



High Power 2-Way Monitor System



SR-M3L / SR-M3R



Features

- Floor Monitor System
- High power handling (600 W)
- Extremely rugged construction for reliable, mobile use
- SR-M3L is used for left hand and SR-M3R is used for right hand placing
- Bass reflex enclosure with 15" (38 cm) woofer
- Carrying handles
- High frequency driver features a large, high-power driver, a titanium diaphragm, and a 40 ° (horizontal) x 60 ° (vertical) CD horn
- Single-amplifier driven speaker system with passive internal networks
- Convertable to "biamp" operation by replacing the unit's internal wiring with a standard accessory cable
- 2 Neutrik NL4MP connectors are provided to permit parallel speaker connections

Applications

Speakers for stage and live entertainment

Specifications

	SR-M3L / SR-M3R
Enclosure	Bass-reflex type
Power Handling Capacity	600 W continuous program
Rated Impedance	8 Ohm
SPL (1 W, 1 m)	100 dB
Frequency Response	65 ... 20000 Hz
Crossover Frequency	1 kHz
Speaker Component	Low frequency: 38 cm cone speaker, High frequency: CD horn (40 x 60°) fitted with compression driver
Input Connector	Neutrik NL4MP x 2
Finish	Enclosure: Plywood, black, paint, Front grille: Steel plate, black, acrylic paint
Dimensions (W x H x D)	673 x 394 x 505 mm
Weight	34 kg

























Mounting Accessories

Speakers	FGM Speakers					
Installation Configurations	H-1	BS-1030B/W	BS-1110W	BS-1120W	F-1000B / BT F-1000W / WT	F-2000B / BT F-2000W / WT
Ceiling Mounting Bracket		 SP-420	 SP-410 WCB-12/12W		 HY-CM10B HY-CM10W (Photo)	 HY-CM20B (Photo) HY-CM20W
Wall Mounting Bracket		 SP-410 WCB-12/12	 YS-301			
Other Mounting Bracket		 Table Mounting Bracket TMB-1			 HY-BH10 Board Hanger Bracket	 HY-CB20 Cluster Bracket
Speaker Stand		 ST-16			 ST-16A	

Speakers	General Use Speakers		
Installation Configurations	ES-0851	ES-0871	ES-0422/ ES-0424/ ES-0426
Ceiling Mounting Bracket	 HY-0851CL	 HY-C0801 *1	 HY-0871CL
Wall Mounting Bracket	 HY-0851CL	 HY-W0801 *1	 HY-0871CL HY-0871WS
Ceiling Pipe Bracket	 HY-B0801 *1	*1: Use with Speaker Mounting Bracket HY-0851ST or HY-0852ST. *2: Use with HY-B0801, HY-C0801, HY-W0801 or Stand ST-32. *3: Use with HY-B0801, HY-C0801 or HY-W0801.	
Speaker Mounting Bracket	 HY-0851ST *2	 HY-0852ST *3	
Speaker Stand	*Use with HY-0851ST. ST-34B		

Mounting Accessories



Speakers	Compact Array Speakers					
	HX-5B	HX-5W	HX-5B-WP	HX-5W-WP	FB-120B	FB-120W
Installation Configurations						
Rigging Frame	 HY-PF1B	 HY-PF1W	 HY-PF1WP		 HY-PF1B	 HY-PF1W
Ceiling Mount Bracket	 HY-CW1B	 HY-CW1W	 HY-CW1WP			
Mount Bracket	 HY-WM1B HY-WM2B	 HY-WM1W HY-WM2W	 HY-WM1WP HY-WM2WP			
Extension Bracket	 HY-CN1B	 HY-CN1W	 HY-CN1B-WP	 HY-CN1W-WP		
Speaker Stand Adapter	 HY-ST1					



Speaker Reference

Model	Type	Continuous Power Input	Input Impedance	Freq. Response	Speaker Component	Efficiency (SPL)	Attenuators (Max. cut)	Finish	Grille	Connectors (incl. In / Out)	Other Features
• Monitor Speakers											
ME-120	Bass Reflex	150W	6Ω	60Hz-18kHz	12cm cone-type (magnetically shielded)	88dB		MDF, Black	Cloth, Black	Screw terminals (compatible with a dual-banana plug), gold plated	
ME-160	2-Way Bass Reflex			50Hz-20kHz	16cm resin-impregnated natural fiber cone woofer (magnetically shielded) 2.5cm soft-dome type (magnetically shielded)						

• SR (Z-Drive) Series Speakers

SR-F09	2-Way Bass Reflex	600W	8Ω	70Hz-20kHz (AC-S09's Use)	30cm, Cone Speaker (90°H x 40°V) CD Horn w/Compression Driver	100dB		Plywood, black, paint	Steel plate, black, acrylic paint	Neutrik NL4MP x 2, M5 screw	
SR-F09-V1											
SR-F09-V2											
SR-F09-V3											
SR-L09	Bass Reflex	900W	4Ω	35Hz-1kHz	38cm, Cone Speaker x 2	96dB					
SR-M05L/R	2-Way Bass Reflex	450W	8Ω	60Hz-18kHz	25cm, Compression Drover (90°H x 40°V) CD Horn	99dB		Epoxy Paint Black	Acrylic Paint Black	Neutrik NL4MP x 2	Medium Density Fiberboard Cabinet
SR-M3L/R		600W		65Hz-20kHz	38cm, Cone Speaker (60°H x 40°V) CD Horn w/Compression Driver	100dB	Plywood, black, paint	Steel plate, black, acrylic paint			

• ES Series

ES-0851	2-Way Bass Reflex	600W	8Ω	80Hz-20kHz	25cm Cone Speaker 90°H and 60°V (60°H x 90°V) CD Horn w/Compression Driver	97dB		Plywood, black, urethane paint	Steel plate, black, acrylic paint	Neutrik NL4MP x 2, M5 screw	
ES-0871				70Hz-20kHz	38cm Cone Speaker 90°H and 60°V (60°H x 90°V) CD Horn w/Compression Driver	100dB					
ES-0422	Sealed	240W	8Ω	120Hz-20kHz	Two 12cm Woofers, CD Horn w/Compression Driver(100°H x 50°V)	91dB		Wood Urethane Paint, White	Steel Plate Acrylic Paint, White	M5 Screw Terminal	Option, MT-S0601 Matching Transformer
ES-0424		360W			Four 12cm Woofers, CD Horn w/Compression Driver(100°H x 50°V)	95dB					
ES-0426					Six 12cm Woofers, CD Horn w/Compression Driver(100°H x 50°V)	96dB					
ES-0422WP	Sealed/Weather-Resistant	240W	8Ω	120Hz-20kHz	Two 12cm Woofers, CD Horn w/Compression Driver(100°H x 50°V)	91dB		Wood FRP Coating Paint, White	Stainless Steel Paint, White	M5 Screw Terminal	Option, MT-S0601 Matching Transformer
ES-0424WP		360W			Four 12cm Woofers, CD Horn w/Compression Driver(100°H x 50°V)	95dB					
ES-0426WP					Six 12cm Woofers, CD Horn w/Compression Driver(100°H x 50°V)	96dB					

• T Series Speakers

T-650	Bass Reflex	360W	8Ω	80Hz-20kHz	Two 25cm Woofers, Two CD Horns w/Compression Driver	100dB		Coniferous Plywood, Urethane Paint, Black	Steel Plate Acrylic Paint, Black	M5 Screw Terminal	Option: MT-S0601 Matching Transformer
T-550	Sealed	180W		100Hz-20kHz	2-Way Coaxial Unit, 25cm Woofer, CD Horn w/Compression Driver	96dB					

• H Series Speakers

H-1	2-Way Bass-Reflex/Foreground	12W*	4Ω, 16Ω, 100V: 830Ω, 1.7kΩ, 3.3kΩ 70V: 420Ω, 830Ω, 1.7kΩ, 3.3kΩ	120Hz-20kHz	8 x 5cm Woofer, Balanced Dome Tweeter	85dB		Fire-Resistant ABS Resin, White	Rolled Steel Plate, White	Detachable Screw Terminal, 2 each +/-		
H-2				100Hz-20kHz	10cm Woofer, Balanced Dome Tweeter	88dB			Steel Plate, Off-White			
H-2WP					ABS Resin, White	Stainless Steel Off-White						
H-3		30W*	8Ω, 16Ω, 100V: 330Ω, 670kΩ, 1.3kΩ 70V: 170Ω, 330Ω, 670Ω, 1.3kΩ	100Hz-20kHz	10cm Woofer x 2, 2.5cm Dome Tweeter	89dB			Fire-Resistant ABS Resin, Off-White			Steel Plate, Off-White
H-3WP									Fire-Resistant ABS Resin, Off-White			Stainless Steel Off-White
HB-1	Subwoofer	240W	8Ω	45Hz-200Hz	20cm Cone	91dB	Steel plate, Off-White	Punched Net, Off-White				

Notes: *: Rated Input

Speaker Reference



Model	Type	Continuous Power Input	Input Impedance	Freq. Response	Speaker Component	Efficiency (SPL)	Attenuators (Max. cut)	Finish	Grille	Connectors (incl. In/Out)	Other Features
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• F Series Speakers

F-10B/W	Sealed/Foreground	45W	8Ω	100Hz-18kHz	10cm Full-Range Speaker in Triangular Corner Enclosure	88dB		Black/White Triangle	Removable Matching Color Jersey	Hardwire	Optional X-former
F-10BM/ F-10WM		5W*	100V: 3.3kΩ/2kΩ 70V: 1.7kΩ, 1kΩ								Built-in Matching Transformer
F-1000B F-1000W	2-Way Bass Reflex	90W	8Ω	85Hz-20kHz	LF 10cm cone type HF balanced dome tweeter	87dB		HIPS black or white	Punched metal	Push-in terminal	Built-in Matching Transformer
F-1000BT F-1000WT		15W	100V: 670Ω/2kΩ/ 3.3kΩ/10kΩ 70V: 330Ω/670Ω/ 2kΩ/3.3kΩ/10kΩ								Built-in match. transf. IPx4 weatherproof
F-1000BTWP F-1000WTWP											
F-2000B F-2000W	2-Way Bass Reflex	180W	8Ω	65Hz-20kHz	LF 20cm cone type HF 25 mm dome tweeter	92 dB		HIPS black or white	Punched metal	Push-in terminal	Horn Adapter
F-2000BT F-2000WT		60W	100V: 170Ω/330Ω/ 670Ω/3.3kΩ 70V: 83Ω/170Ω/ 330Ω/670Ω/3.3kΩ								Built-in Matching Transformer Horn Adapter
F-2000BTWP F-2000WTWP											Built-in match. transf. IPx4 weatherproof Horn Adapter
F-505WP	2-Way Sealed/Weather-Resistant	60W*	83Ω 170Ω 330Ω 670Ω	80Hz-20kHz	20cm, Compression HF Driver 60°H x 40°V CD Horn	93dB		Polyprop. resin, Ivory	Stainless Steel, Ivory	Pigtail Cable	Overload Protected, Weather-Resistant Cabinet w/Handle
F-505WP-L		240W	8Ω		30cm, Compression HF Driver 60°H x 40°V CD Horn						
F-605WP		120W*	42Ω 83Ω 170Ω 330Ω								
F-605WP-L		360W	8Ω								

Notes: *: Rated Input

Model	Type	Continuous Program Input	Rated Input	Input Impedance	Freq. Response	Speaker Component	Sensitivity	Finish	Grille	Connection	Dust/Water Protection
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• F Series Ceiling Speakers

F-122C	Bass Reflex	120W	30W	100V: 330Ω, 1kΩ, 3.3kΩ, 10kΩ 70V: 170Ω, 330Ω, 1kΩ, 3.3kΩ, 10kΩ 25V: 170Ω, 330Ω, 1kΩ, 3.3kΩ, 10kΩ 16Ω, 8Ω	70 – 20kHz	12cm Cone Speaker	90dB			Removable locking connector	
F-2352C	2-Way Bass Reflex					Balanced dome tweeter, 12cm Cone Speaker					
F-2322C	Bass reflex/ Distributed FGM					12cm Cone Speaker					
F-2852C	2-Way Bass Reflex	180W	60W	100V: 170Ω, 330Ω, 670Ω, 3.3kΩ 70V: 83Ω, 170Ω, 330Ω, 670Ω, 3.3kΩ 25V: 83Ω, 170Ω, 330Ω, 670Ω, 3.3kΩ 16Ω, 8Ω	60 – 20kHz	Dome Tweeter, 16cm Cone Speaker	91dB		White	Punched Steel, White	
F-1522SC	Distributed FGM	18W	6W	100V: 1.7kΩ, 3.3kΩ, 10kΩ, 20kΩ 70V: 830Ω, 1.7kΩ, 3.3kΩ 25V: 830Ω, 1.7kΩ, 3.3kΩ, 8Ω, 16Ω	65 – 18kHz	10cm Cone Speaker	88dB				Push-in Terminal
F-2352SC				100V: 1.7kΩ, 3.3kΩ, 10kΩ, 20kΩ 70V: 830Ω, 1.7kΩ, 3.3kΩ, 10kΩ, 20kΩ 25V: 830Ω, 1.7kΩ, 3.3kΩ, 10kΩ, 20kΩ 8Ω, 16Ω	80 – 20kHz	12cm Cone Speaker, Balanced dome tweeter	89dB				



Speaker Reference

Model	Type	Continuous Program Input	Rated Input	Input Impedance	Freq. Response	Speaker Component	Sensitivity	Finish	Grille	Connection	Dust/Water Protection
SR-A12L	2-Way Bass Reflex	Low frequency: 450W High frequency: 180W		8Ω 16Ω	50Hz-20kHz*	Low frequency: 30 cm cone-type High frequency: Wave front control horn 90° (horizontal) × 5° (vertical) + compression driver × 2	Low frequency: 98dB High frequency: 110dB	Plywood, black, paint	Punched steel plate, black, acrylic paint	M5 screw terminal and Neutrik NL4MP × 2	IPX4
SR-A12LWP								Multi-layer wood, black, urethane coating	Punched stainless steel (SUS304), black, paint	Direct cable withdrawal	
SR-A12S								Multi-layer wood, black, paint	Punched steel plate, black, acrylic paint	M5 screw terminal and Neutrik NL4MP × 2	
SR-A12SWP								Multi-layer wood, black, urethane coating	Punched stainless steel (SUS304), black, paint	Direct cable withdrawal	
SR-A18B	Bass Reflex	720W		8Ω	40-400Hz*	48 cm cone-type	95dB	Plywood, black, paint	Punched steel plate, black, acrylic paint	M5 screw terminal and Neutrik NL4MP × 2	
SR-C8L	2-Way Bass Reflex	Low frequency: 360W High frequency: 120W		16Ω 16Ω	65Hz-20kHz*	Low frequency: 20 cm cone-type High frequency: Wave front control horn 110° (horizontal) × 5° (vertical) + compression driver × 2	Low frequency: 95dB High frequency: 110dB	Plywood, black, urethane paint	Punched steel plate, black, acrylic paint	M5 screw terminal and Neutrik NL4MP × 2	IPX4
SR-C8LWP								Plywood, black, urethane coating	Punched stainless steel plate, black, paint	Direct cable withdrawal	
SR-C8S								Plywood, black, urethane paint	Punched steel plate, black, acrylic paint	M5 screw terminal and Neutrik NL4MP × 2	
SR-C8SWP								Plywood, black, urethane coating	Punched stainless steel plate, black, paint	Direct cable withdrawal	
SR-C15B	Bass Reflex	450W		8Ω	40-400Hz*	38 cm cone-type	93dB	Plywood, black, urethane paint	Punched steel plate, black, acrylic paint	M5 screw terminal and Neutrik NL4MP × 2	IPX4
SR-C15BWP								Plywood, black, urethane coating	Punched stainless steel plate, black, paint	Direct cable withdrawal	
SR-H2L	Bass Reflex	180W		8Ω	80Hz-18kHz*	7cm cone-type × 8	92dB* ²	MDF, white, urethane paint	Punched steel plate, white, acrylic paint	Removable input connector	
SR-H2S					90Hz-17kHz*		90dB* ²				
SR-H3L		360W			110Hz-18kHz*	95dB* ³					
SR-H3S					90Hz-17kHz*	92dB* ³					
SR-S4L	2-Way Bass Reflex	600W		8Ω	70Hz-20kHz*	Low frequency: 10cm cone-type × 8 High frequency: 2.5cm balanced-dome tweeter × 24	94dB	MDF, white, paint	Punched steel plate, white, acrylic paint	M5 screw terminal and Neutrik NL4MP × 2	IPX4
SR-S4LWP	2-Way Sealed							Plywood, white, urethane coating	Punched stainless steel (SUS304), white, paint	Direct cable withdrawal	
SR-S4S	2-Way Bass Reflex							MDF, white, paint	Punched steel plate, white, acrylic paint	M5 screw terminal and Neutrik NL4MP × 2	
SR-S4SWP	2-Way Sealed							Plywood, white, urethane coating	Punched stainless steel (SUS304), white, paint	Direct cable withdrawal	
SR-T5	2-Way Bass Reflex	750W		8Ω	80Hz-20kHz	Low frequency: 13cm cone-type × 8 High frequency: Balanced-dome tweeter × 24	93dB	Plywood, black, urethane paint	Punched steel plate, black, acrylic paint	M5 screw terminal	

* When equalized at recommended parameters.

*² 1W, 1m equivalent, measured at 4m.

*³ 1W, 1m equivalent measured at 8m.

Speaker Reference



Model	Type	Continuous Program Input	Rated Input	Input Impedance	Freq. Response	Speaker Component	Sensitivity	Finish	Grille	Connection	Dust/Water Protection
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• Compact Array Speakers

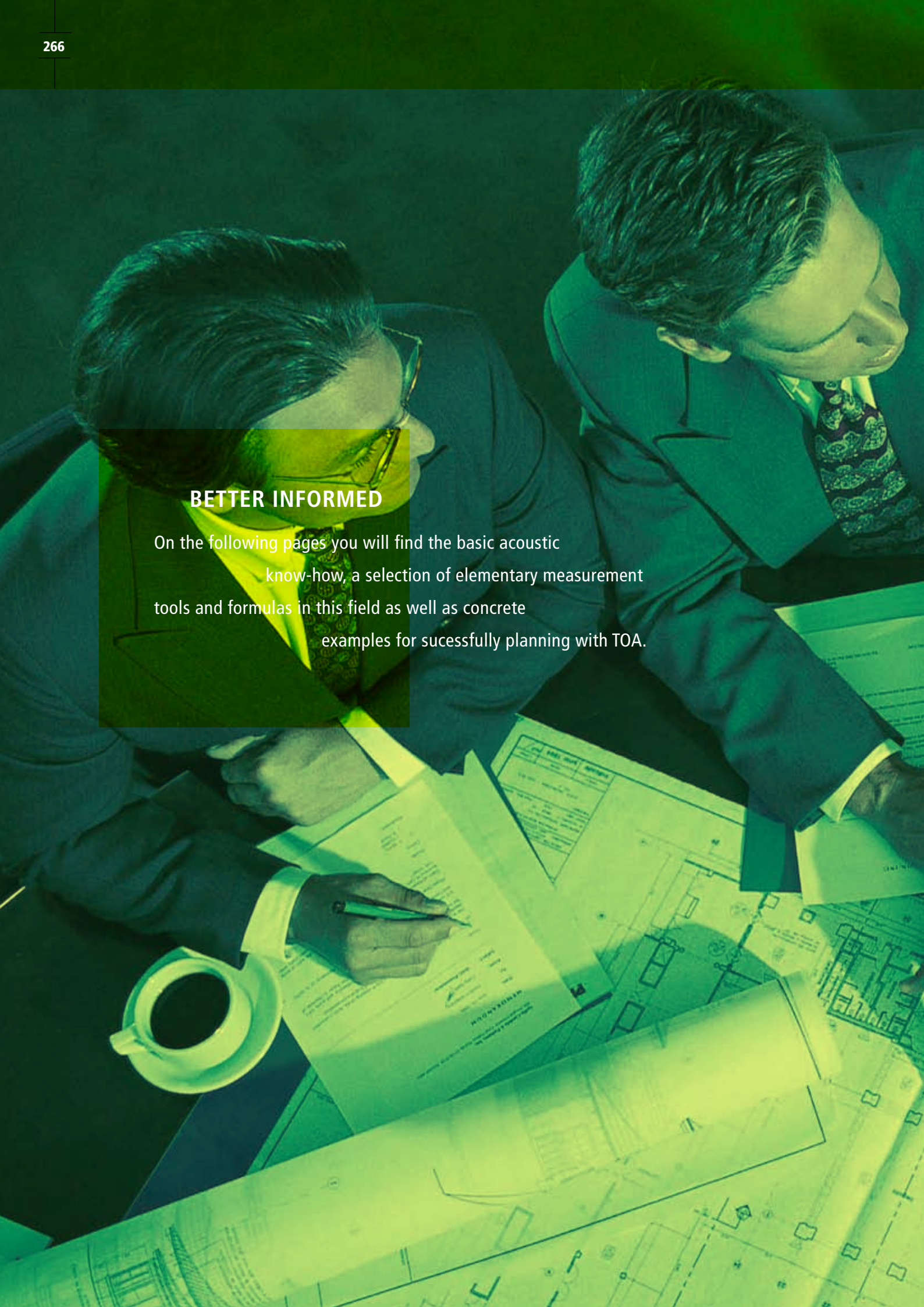
HX-5B	2-Way Bass Reflex	600W		8Ω	70Hz-20kHz (60° mode), 75Hz-20kHz (45° mode), 80Hz-20kHz (30° mode), 85Hz-20kHz (15° mode).	Low frequency: 12cm cone-type × 4 High frequency: Balanced-dome tweeter × 12	95dB (60° mode), 97dB (45° mode), 98dB (30° mode), 99dB (15° mode)	Enclosure: Polypropylene, black	Punched steel plate, black, paint	Neutrik NL4MP × 2 and M4 screw terminal		
HX-5W					Enclosure: Polypropylene, white			Punched steel plate, white, paint				
HX-5B-WP	2-Way Sealed				95Hz-20kHz (60° mode), 100Hz-20kHz (45° mode), 105Hz-20kHz (30° mode), 110Hz-20kHz (15° mode).			Enclosure: Polypropylene, black	Punched steel plate, black, paint	2-core cabtyre cable		IPX4
HX-5W-WP					Enclosure: Polypropylene, white			Punched steel plate, white, paint				
FB-120B	Bass Reflex	600W		8Ω	40Hz-1.2kHz	30cm cone-type	90dB	Poywood	Punched steel plate, black, paint	Neutrik NL4MP × 2 and M4 screw terminal		
FB-120W									Punched steel plate, white, paint			

• HS Series Speakers

HS-120B	2-Way Sealed	300W	60W	8Ω	80Hz-20kHz	Low frequency: 30cm cone-type High frequency: Balanced-dome tweeter × 6	97dB	Polypropylene, black	Surface-treated Steel Plate, black	Neutrik NL4MP Speakon and M4 screw terminal			
HS-120W					Polypropylene, white			Surface-treated Steel Plate, white					
HS-1200BT					8Ω 100V: 170Ω, 330Ω, 670Ω 70V: 83Ω, 170Ω, 330Ω, 670kΩ,			70Hz-20kHz	Polypropylene, black			Surface-treated Steel Plate, black	
HS-1200WT					Polypropylene, white			Surface-treated Steel Plate, white					
HS-150B			60W	8Ω	70Hz-20kHz	Low frequency: 38cm cone-type High frequency: Balanced-dome tweeter × 6	98dB	Polypropylene, black	Surface-treated Steel Plate, black				
HS-150W								Polypropylene, white	Surface-treated Steel Plate, white				
HS-1500BT								8Ω 100V: 170Ω, 330Ω, 670Ω 70V: 83Ω, 170Ω, 330Ω, 670kΩ,	60Hz-20kHz			Polypropylene, black	Surface-treated Steel Plate, black
HS-1500WT								Polypropylene, white	Surface-treated Steel Plate, white				

BETTER INFORMED

On the following pages you will find the basic acoustic know-how, a selection of elementary measurement tools and formulas in this field as well as concrete examples for successfully planning with TOA.







Sound Knowledge

This chapter shall give you a basic knowledge about electro-acoustics. It provides you with an idea about planning a simple sound system. Furthermore some information can help you to understand certain measures in existing sound systems and in sound system planning.

The Decibel Notation System

“Decibel” is often used in communication systems. The Decibel notation system was established to match audio signal levels with the human ear’s logarithmic perception and to reduce the wide range of physical values (the human’s ear has a dynamic range of 1 : 3 million). The Decibel value is the logarithm of a ratio between two (physical) values. Its abbreviation is “dB”.

(A Decibel is a tenth Bel, named in honour to Mr. Alexander Graham Bell.) When calculating with sound pressure levels, voltages and currents, then the calculation is:

$$dB := 20 \times \log_{10} (\text{value 1} / \text{value 2}) \quad (1)$$

In the further text, “log₁₀” is substituted by just “log”.

Example: A voltage ratio is calculated as: $dB := 20 \times \log (U_1 \text{ out} / U_2 \text{ in})$.
When calculating with power, then the formula is:

$$dB = 10 \times \log (P_1 / P_2) \quad (2)$$

In the further text several formulas do not contain the value 2. In this case the value 2 is equal 1 and the unit the same as of value 1.

The value 2 can be a fixed reference. Then a certain letter is added to the “dB”, indicating the reference value:

Reference	1 μV	1 mV	0.775 volt	1 volt	20 μPa *
Decibel	dBμV	dBmV	dBu (dBm)	dBV	dB SPL

* : 20 μPa (micro-Pascal = 0.00002 Pa) is the lowest sound pressure level which can be heard by the human’s ear at 1 kHz. This level is called threshold of hearing.

Table 1: Decibel reference values

Calculations with Decibel

The table below shows some relations in calculation and meaning between physical values and the Decibel:

Physical	Multi- plication	Division	< 1	1	> 1	nega- tive
	↓	↓	↓	↓	↓	↓
Decibel	Addition	Subtraction	nega- tive	0	posi- tive	impos- sible

Table 2: Decibel calculation rules

Example 1: An amplifier reinforces an input signal of 1 mV (millivolt) to an output signal of 1000 mV. Then the amplification is 1000 times (1000 : 1), or: $20 \times \log (1000) = +60 \text{ dB}$.

Example 2: An attenuator reduces a voltage to a tenth. The ratio between output and input is: $\text{Output/input} = 0.1 : 1 = 0.1$. In Decibel it is: $20 \times \log (0.1/1) = -20 \text{ dB}$.

Example 3: The attenuator (ex. 2) is connected after the amplifier (ex. 1). Then the total amplification is: $1000 \times 0.1 = 100$, or in Decibels it is: $60 \text{ dB} + (-20 \text{ dB}) = 60 \text{ dB} - 20 \text{ dB} = 40 \text{ dB}$.

A Little Bit of Acoustics

Sound and Frequency

Sound is a sparse and dense wave (vibration) transmitted in the medium of air. The rarefaction and compression wave of air stimulates our acoustic sense and is felt as a sound.

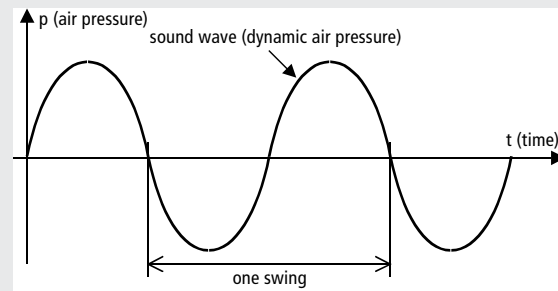


Figure 1: Sound wave swing

The frequency is the number of swings per second. Its unit is Hertz, abbreviated as ‘Hz’. 1000 Hz is also expressed as 1 kHz (kilo Hertz). The electro-acoustics treats the audible frequency range between 16 Hz and 20000 Hz.

Sound Pressure Level (SPL)

The sound pressure level is the strength or volume of the sound waves. The physical unit is Pascal [Pa]. In the electro-acoustics it is expressed in dB SPL, referring to the threshold of hearing. More details about SPL can be found in the chapter on loudspeakers.

Sound Transducers

Sound transducers are devices which convert sound waves into electrical signals and opposite.

Microphones

There are different types and transducer principles. The most popular types are the dynamic and electret (condenser) microphones. Dynamic microphones are tough and can process high sound pressure levels. Electret microphones have a better performance at high frequencies, are cheaper than dynamic microphones and require a power supply, either by a built-in battery or by phantom power.

The microphones come with different receiving characteristics. The main ones are omni-directional (receiving sound from all directions), and uni-directional (receiving sound mainly from the front).

Microphones for PA Systems

Paging Microphone

A paging microphone is a microphone combined with a talk button. This button usually works in the so called Press-To-Talk (PTT) mode. When depressing it, then an announcement can be made. After releasing the button, the broadcast will be stopped. Often the paging microphone is on a gooseneck or other mechanical extension fixed on a (desk) stand.

Remote Microphone

A remote microphone has a similar construction as a paging microphone. Additionally it is equipped with several buttons to control some functions of the PA system remotely. In most cases these buttons are used for zone selection.



Loudspeakers

Loudspeakers transfer electrical audio signals into sound waves. They are designed for different application and therefore they have different performances. Some specific features are explained in the further chapter.

Loudspeaker Types

Full-range Speaker

A full-range speaker can reproduce a wide frequency range, at least the main band of the whole audible range. A speaker with a frequency response from 250 to 8000 Hz or better can be called a full-range speaker.

Multi-Way Speaker

For a high quality sound, two or more speaker chassis, each designed for a specific frequency range, are combined to cover a wide frequency range. Depending on the number of combined frequency ranges, such a speaker is called a 2-way, 3-way etc. speaker.

Enclosure Types

A sealed box speaker is unproblematic in use. The speaker chassis' membrane is protected from extremely high movements by the counter-pressure of the air inside the enclosure.

A bass reflex speaker can reproduce low frequencies better than a sealed box speaker. But it is recommended to use a high pass (or low-cut) filter,

set at the lower frequency of the loudspeaker's frequency response. This prevents the speaker's membrane from high movements at very low frequencies which may cause a damage of the woofer.

Some loudspeakers as ceiling speakers have no enclosure. Their speaker chassis are designed to limit the membrane's movement to prevent the speaker from damage.

Horn Speakers

A horn speaker consists of a driver which converts the audio signal into acoustic waves and a horn which reinforces and bundles the sound waves. Horn speakers have a high efficiency and can reach a very high SPL.

Line Array Systems

Line array systems operate as a so-called line source. The decrease of SPL with the distance is less than that of a conventional speaker, therefore line array speakers are ideal to cover a wide audience area. They provide a wide horizontal coverage and a very small vertical coverage. They can be aimed exactly to the audience, so that only a minimum sound waves will be sent to reflecting walls and ceiling. This makes the line array speaker ideal for reverberant environments. Another advantage of line array speakers is that these do not cause any interference when stacked in a speaker cluster, i.e. the sound does not deteriorate.

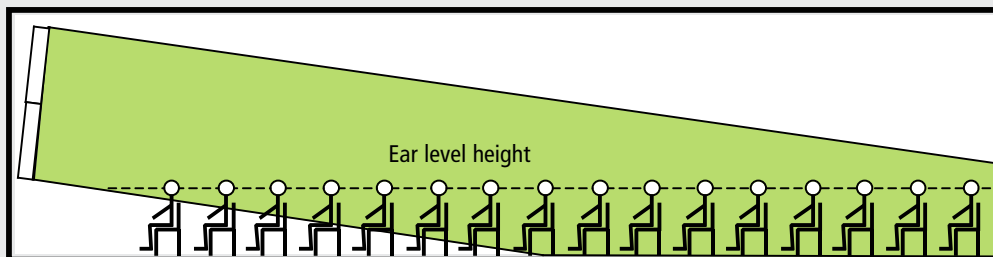


Figure 2: Vertical coverage of a line array speaker cluster

Loudspeaker Types and Application

There exist many different speaker designs which were constructed to fit with several requirements. Some examples are listed in the table below:

Loudspeaker Type	Application
PA Wall Speaker	General, background music, speech
PA Ceiling Speaker	General, background music, speech
PA Sound Projector	Aimed sound propagation, foreground and background music, speech
PA Pendant Speaker	General, design, background music, speech
PA Lamp Speaker	Unobtrusive sound, background music, speech
Design Speaker	Optically nice speakers, foreground music, speech
(Reflex) Horn Speaker	Large areas, noisy areas, outdoor, speech
Column Speaker	Wide horizontal and narrow vertical sound propagation, reverberant environment, speech
Professional Sound Speaker	High quality sound reinforcement, foreground music, speech
High Power Professional Sound Speaker	High quality sound reinforcement for large areas, foreground music, speech
Line Array Speakers	High quality sound reinforcement in reverberant environment and big halls, speaker clusters without interference, foreground music, speech
Subwoofer	Support of very low frequencies (disco, theatre, cinema, pop concert)

Table 3: Loudspeaker types and applications



Technical Specifications? We don't let you fall behind!

Specifications of Loudspeakers

Impedance

The impedance is the AC resistance. There are two types of speaker impedance systems: low impedance speakers and high impedance speakers. The low impedance speakers have impedances of 4, 8 or 16 ohms. The high impedance speaker's impedance depends on its input power and can be in the range between a few 10 ohms and several 1000 ohms.

Frequency Response

The frequency response is the range of frequencies which can be reproduced by the loudspeaker. It can be stated in a written format (e.g. 50 Hz - 20000 Hz) or in a graph:

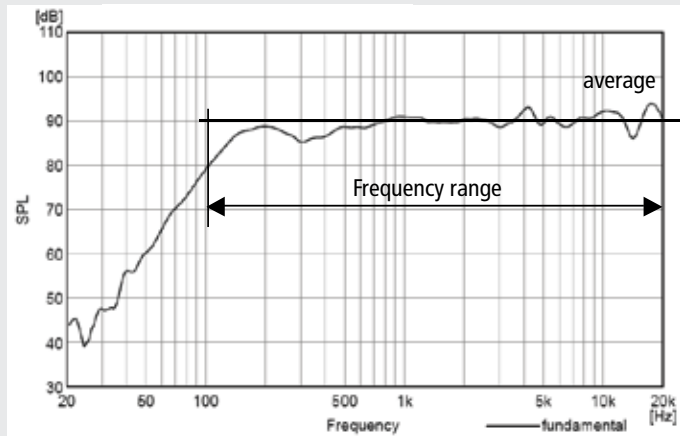


Figure 3: Frequency response of a loudspeaker

In the graph it is obvious that the SPL differs at different frequencies, therefore the written frequency response states the range where the SPL value differs not more than 10 dB from the average value. The written frequency response of the example above is: 100 Hz - 20000 Hz.

Sound Directivity and Coverage Angle

Loudspeakers with a low directivity distribute the sound over a wide area and loudspeakers with a high directivity bound the sound to a small area. The directivity indicates how much the speaker bundles the sound.

The coverage angle, also called the beamwidth, is defined as the angle between the points where the SPL is 6 dB below the SPL on the speaker axis. Several speakers provide different coverage angles in the horizontal and vertical plane, therefore a horizontal and vertical coverage angle is indicated. Most ceiling speakers and a few other speakers provide a symmetrical coverage angle. Then only one coverage angle is indicated.

The coverage angle depends on the frequency, therefore a detailed information is shown by a graph. When indicating only a coverage angle, also the frequency of it should be informed (e.g. „100°, 4 kHz“).

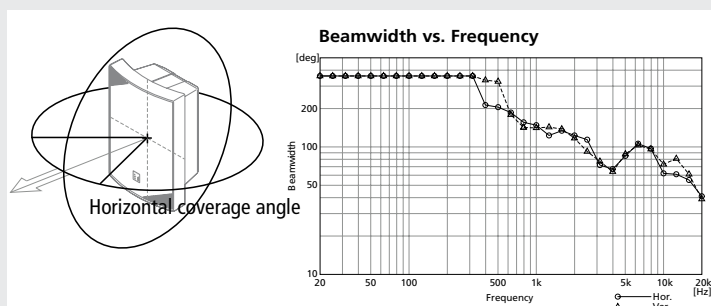


Figure 4: (L): Horizontal and vertical plane; (r): Coverage angle vs. frequency

Loudspeakers with a small coverage angle have an advantage in a reverberant environment: When the coverage angle covers only the audience and not any reflecting walls or ceilings, then the reflections are low and therefore also the reverberation, causing a better intelligibility. A typical speaker type for a reverberant environment is the column speaker. It has a wide horizontal coverage and a small vertical coverage.

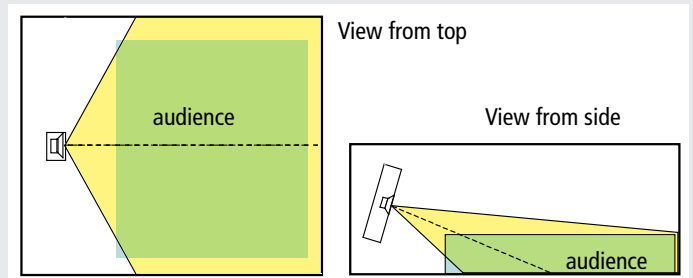


Figure 5: Coverage of a column speaker

Sensitivity of a Loudspeaker

At a certain distance and power, different loudspeakers provide different sound pressure levels. This is a specific value of a certain loudspeaker and is called sensitivity (pn), stated as \hat{A}_g SPL (1W, 1m)Åh. It is measured on the speaker axis (in front of the speaker) in a distance of 1 metre at 1 watt power. TOA declares the SPL average and not the maximum SPL (achieved at only one single frequency), if not stated otherwise. The unit can be written as:

$$\text{dB SPL (1W, 1m)} \quad \text{or} \quad \text{dB/Wm}$$

Calculations with Loudspeakers

SPL at a certain power

The SPL (at a distance of 1m) of a loudspeaker at a certain wattage is calculated as:

$$p = p_n + 10 \times \log(P) \quad [dB] \quad (3)$$

p: sound pressure level [dB] p_n : sensitivity of the speaker [dB]
 P: power (supplied to the speaker) [W]

Table 4 below shows some „dB“ values at different power to be added to the speaker's sensitivity. If a certain power is not in the table, then it can be combined by a multiplication/division of the power (refer to the example).

Wattage [W]	1	2	5	6	10	15	20	30	50	100
Increase of SPL [dB]	0	3	7	8	10	12	13	15	17	20

Table 4: Increase of sound pressure level at different supplied power

Example: 60 W are supplied to a speaker with a sensitivity of 90 dB/Wm;

$$\begin{aligned} \rightarrow \text{SPL} &= 90 \text{ dB} + 8 \text{ dB (6 watt}^*) + 10 \text{ dB (10 watt}^*) \\ &= 108 \text{ dB.} \end{aligned}$$

* from table 4



Sound System Design

SPL at a certain Distance

The sound pressure level of conventional speakers decreases with increasing distance as:

$$p = p_0 - 20 \times \log(d) \text{ [dB SPL]} \quad (4)$$

p: sound pressure level at distance p₀: SPL at 1 m d: distance [m]

In other words: When doubling the distance (x2), then the sound pressure level reduces to a quarter (1/4), or by 6 dB.

The relation between some distances and decreases of sound pressure level is as following:

Distance [m]	1	2	3	4	5	10	20	50	100
Decrease of sound pressure level [dB]	0	6	9.5	12	14	20	26	34	40

Table 5: Decrease of SPL with the distance; reference distance: 1 m

Example: A speaker produces a SPL of 105 dB at 1 m. What is the SPL at a distance of 5 metres? ± SPL = 105 dB - 14 dB (from table 3) = 91 dB.

SPL at certain power and distance

In a project the SPL must be calculated at a given power and distance to the speaker(s). So the formulas for SPL at a certain power and SPL at a certain distance will be combined. The SPL at a given power and distance can be calculated as:

$$p = p_n + 10 \times \log(P) - 20 \times \log(d) \text{ [dB SPL]} \quad (5)$$

p: sound pressure level [dB] p_n: sensitivity of the speaker [dB]
 d: distance from speaker P: power (supplied to the speaker) [W]

Example: A loudspeaker shall be installed in a room. The longest distance to the audience is 8 metre. The loudspeakers has a sensitivity of 90 dB/Wm and 30 watts input power. What SPL can be reached most far away from the loudspeaker?

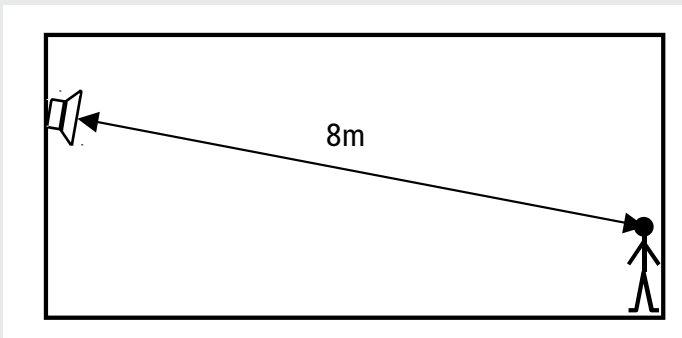


Figure 6: Distances of the speakers in the example

Calculation:

$$\begin{aligned} \text{SPL} &= 90 \text{ dB SPL} + 10 \times \log(30) - 20 \times \log(8) \\ &= 90 \text{ dB} + 15 \text{ dB} - 18 \text{ dB} = 87 \text{ dB SPL} \end{aligned}$$

Applying the tables 2 and 3:

$$\begin{aligned} \text{SPL} &= 90 \text{ dB SPL} + 15 \text{ dB (table 2)} - 12 \text{ dB (table 3)} - 6 \text{ dB (table 3)} \\ &= 87 \text{ dB SPL} \end{aligned}$$

Centralised Sound System

In a centralised sound system the speakers are installed at the same place. When a sound is combined with an optical event, then the sound should come from the direction of the event. A sound coming from another direction as the event would irritate the spectator.

Often the event is at the front of a room and sometimes there is a stage. In many cases the speakers will be placed at the left and right side of the event's place. The speaker should be mounted high to obtain a not too loud SPL near the speakers.

In case of a deep room supporting speakers can be installed at the walls or ceiling in the direction of the sound propagation. A smart solution is to send a delayed audio signal to the speakers in the rear, then the event will still be heard from the event's place.

Calculation of the delay time:

$$T = d/340 + 0.01 \text{ s [s]} \quad (6)$$

T: delay time [s] d: distance from front speaker to delay speaker [m]

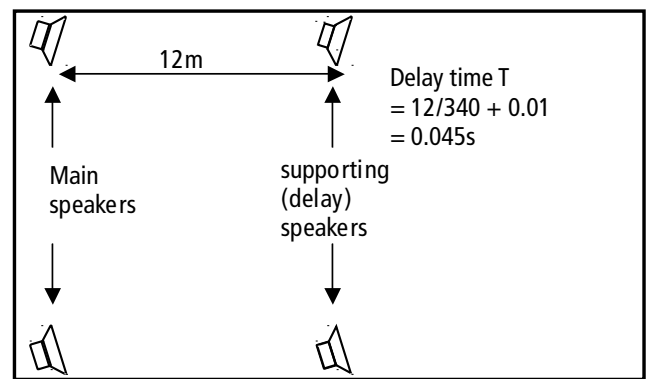


Figure 7: Frontal sound system with supporting (delay) speakers

Decentralised Sound Systems

If no optical event is combined with the sound or in large areas with a low ceiling height (e.g. a supermarket) a frontal sound system is neither necessary nor useful. A better solution is a decentralised (distributed) sound system in which the speakers are placed where needed.

Ceiling Sound Distribution Systems

The ceiling speakers should be arranged evenly over the area, i.e. with the same distance between each other. Important for the design of such a system is the required intelligibility. It depends on:

- ceiling height
- speaker's coverage angle
- purpose of usage (quality of sound)

The higher the speaker, the wider the covered listening area (ear level height) which is approx. 1.5 metres above the floor.

For a good intelligibility the audibility of 6 kHz should be good at each place. A reasonable intelligibility is reached at 4 kHz, but BGM can be worse.



TOA applies Technology and Know-How

Coverage angle	Good intelligibility	Fair intelligibility	BGM
Standard ceiling speaker	60°	90°	120°
TOA standard ceiling speakers (PC-600/PC-1800 series)	75°	100°	140°
TOA wide dispersion ceiling speakers (F-series)	150°	180°	180°

Table 6: coverage angle

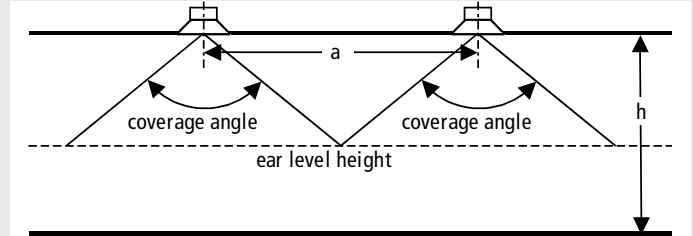


Figure 8: Graphical explanation of speaker installation with certain coverage angles

Distance and minimum SPL between TOA standard ceiling speakers at different intelligibilities and 6 watt power:

Ceiling height	h	[m]	3	3.5	4	4.5	5	5.5	6
Good Intelligibility	a	[m]	2.30	3.10	3.80	4.60	5.40	6.10	6.90
	min. SPL	[dB]	92	90	88	86	85	84	83
Fair Intelligibility	a	[m]	3.60	4.80	6.00	7.20	8.30	9.50	10.70
	min. SPL	[dB]	90	88	86	84	83	82	81
BGM	a	[m]	8.20	11.00	13.70	16.50	19.20	22.00	24.70
	min. SPL	[dB]	85	82	81	79	78	76	75

Table 7: Speaker distance of TOA standard ceiling speakers for different intelligibilities in a ceiling speaker system

Public Address Systems

PA systems always operate in mono. They are used to distribute one or more audio signals into different zones (broadcast areas). The audio signals can be background music (BGM), manual or automatic announcements (paging), or signal tones (chime, alarm tones). Usually the audio signals will not be mixed, only one is sent to a certain zone or several zones. A priority control system is provided to avoid conflicts if two or more audio signals shall be broadcasted into the same zones. Most PA systems operate with high impedance speaker lines.

Priority System

Some broadcast signals are more important than others. With the priority control different priority levels can be assigned to certain audio sources. Example:

Emergency > paging > BGM

Another kind of priority comes into force, if several audio sources have the same priority level:

- First-in-first-out (served priority): The source which was activated first will get priority.

- Last-in-first-out (served priority): The source which was activated last will get priority.

The priority system is important for a proper operation of a PA system. It operates automatically and avoids conflicts by overlapping announcements.

High Impedance Speaker Line System (100-Volt Systems)

High impedance systems provide a speaker line level of 100 volt (at full power of the audio signal), sometimes 70 or 50 volts. This has several advantages over low impedance systems and makes the high impedance systems ideal for the typical PA Application.

Features and Advantages:

- long cables can be used because of low current
- > low loss on the speaker line

- all loudspeakers can be connected parallel
- > easy installation
- > single speakers can be switched off or on and volume controls can be used without affecting other speakers on the line
- > different types of loudspeakers with different wattages can be connected to the same speaker line
- > Easy calculation of the required power of the power amplifier: Just by adding the speakers' power; the total (rated) power of the speakers must not exceed the total (rated) output power of a power amplifier

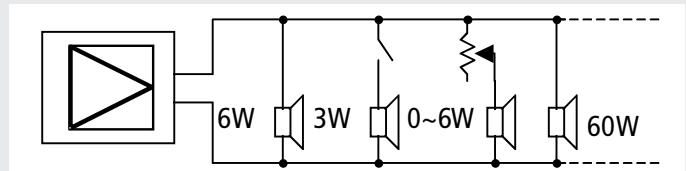


Figure 9: Different loads, switches and volume controls on one 100-volt speaker line

The figure above illustrates the described advantages. The required power is the sum of all wattages of the speakers: 6W + 3W + 6W + 60W = 75W

Calculation of Power and Impedance

After planning and installation of the speaker line(s), they should be checked to avoid an overload of the amplifier and to find breaks or short circuits. This can be done by measuring the line's impedance with an impedance meter (e.g. TOA ZM-104). The formula below shows the relation between speaker line voltage, wattage and impedance.

$$Z = U^2 / P = 10,000 / P \quad (7)$$

Z: impedance [ohm] U: voltage [volt] P: power [watt]

Example: Speakers with a total power of 75 watt are connected to a speaker line. What impedance is on the speaker line?

$$Z = 10000 / 75 = 133 \text{ Ohm}$$

System Planning



Calculation of Cable Effective Area

In PA systems the speaker line is designed to have no more loss than 10%. The required effective cross-section area of a speaker line cable can be found in the table below:

Min. effective cross section area in mm² at a loss of 10%

power	cable length						
	50 m	100 m	200 m	300 m	500 m	750 m	1000 m
30 W	0.05	0.09	0.19	0.28	0.47	0.71	0.95
60 W	0.09	0.19	0.38	0.57	0.95	1.42	1.89
120 W	0.19	0.38	0.76	1.13	1.89	2.84	3.78
240 W	0.38	0.76	1.51	2.27	3.78	5.67	7.56
360 W	0.57	1.13	2.27	3.40	5.67	8.51	11.34
420 W	0.66	1.32	2.65	3.97	6.62	9.92	13.23

Table 8: Effective cross section area in regard to cable length and power

For speaker lines usually solid cables (not stranded) are used. The isolation shall withstand 500 ... 600 VDC.

Planning a PA System

The way of planning a PA system will be explained by the following example.

Example: Supermarket

The supermarket has the following specifications:

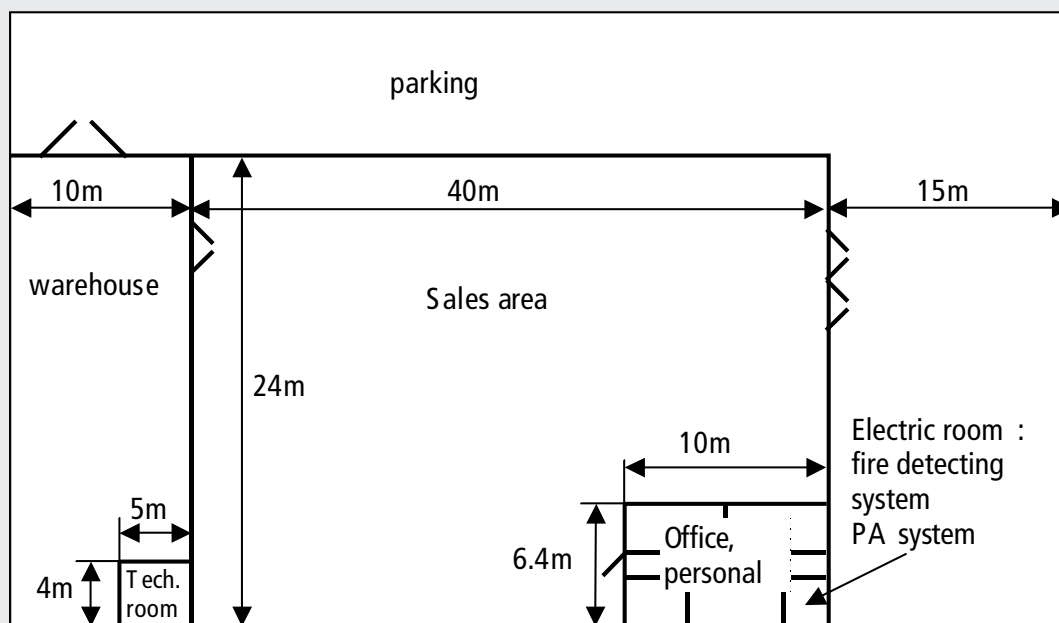
Area	Size	Ceiling		Ambient noise	Panic noise
		Type	Height		
Sales	1120 m ²	false	4 m	55 dB SPL	80 dB SPL
Ware-house	260 m ²	solid	5 m	65 dB SPL	75 dB SPL
staff, office	80 m ²	false	4 m	50 dB SPL	75 dB SPL
Technical room	20 m ²	solid	5 m	85 dB SPL	85 dB SPL
Parking	800 m ²	-	-	60 dB SPL	80 dB SPL

Table 9: Supermarket specifications

Required functions of the PA system:

- BGM in selectable zones – each of the areas shall be a zone -> 5 zones
- 1 remote microphone for director's office
- 3 paging microphones for cashiers
- Emergency function:
 - Automatic and manual voice alarm
 - Emergency microphone in utility room

Dimensions of the supermarket:





Systems are nothing without Sound

Selection of speakers

In case of an emergency, the sound system must provide a sound pressure level of min. 6 dB above the panic level. The minimum intelligibility should be fair.

Calculation per Zone

Zone / Speaker selection	dB SPL required / achieved	Calculation	Speaker power required
Sales area TOA standard ceiling speakers	80 + 6 = 86 / 86	Using table 4, at fair intelligibility, ceiling height 4m and minimum SPL = 86 dB -> distance between speakers: 6 m (grey in table) Arranging the speakers evenly, then $1120 \text{ m}^2 / 36 \text{ m}^2 = 31.1$ -> 32 ceiling speakers are required	32x 6 watt = 192 watt
Warehouse 2 horn speakers SC-610M	75 + 6 = 81 / 86	Installation: At 5m height on the centre of the long outer wall, each facing into the opposite corner -> maximum distance: $\text{sqrt}(12^2+10^2+3.5^2) = 16 \text{ m}$. Formula (5) with 16m and 10 watt: $110 \text{ dB} + 10 \times \log(10) - 20 \times \log(16) = (110 + 10 - 24) \text{ dB} = 96 \text{ dB}$. 96 dB is much more than 81 dB -> setting speakers to 1 watt, -> table 2: (96 - 10) dB SPL = 86 dB SPL	2x 1 watt = 2 watt
Office TOA standard ceiling speakers	75 + 6 = 81 / 83 83 81	One ceiling speaker per room. Big rooms: Longest room dimension is approx. 6m, similar as speaker spacing in sales area, same height. Required SPL: 5 dB less than sales area, i.e. power for the speakers can be reduced. Next speaker tapping: 3 watt (1/2 power := -3 dB, see table 2) -> (86 - 3) dB = 83 dB Small rooms: Half length of big rooms, table 3 -> 6 dB more SPL, can be compensated by -6 dB power, table 2: Quarter power of big rooms -> 3 watt / 4 = 0.75 watt -> speaker tapping: 0.8 watt Floor: Less than double length of big rooms, table 3 -> less than 6 dB less SPL (... 4-5 dB), can be compensated by 3 dB power (SPL is already 2 dB higher as required), table 2: double power of big rooms -> 2x 3 watt = 6 watt	3x 3 watt = 9 watt 1x 0.8 watt 1x 6 watt
Technical room 1 horn speaker SC-610M	85 + 6 = 91 / 94 dB	Installation near the room's ceiling -> maximum distance to the ear level height is approx. 6m (estimated). Calculation similar as in the warehouse, formula (5) with 20m and 10 watt: $110 \text{ dB} + 10 \times \log(10) - 20 \times \log(6) = (110 + 10 - 16) \text{ dB} = 104 \text{ dB}$ is much more than 91 dB -> setting speakers to 1 watt -> table 2: (104 - 10) dB SPL = 94 dB SPL	1x 1 watt
Parking area 3 horn speakers SC-610M	80 + 6 = 86 / 89 dB	2 speakers installed at the long wall and 1 at the small wall in a height of 5m. Longest distance at right side: $d = \text{sqrt}(15^2 + 12^2 + 5^2)$ approx. 20m. Formula 5 with 20m and 10 watt: $110 \text{ dB} + 10 \times \log(10) - 20 \times \log(20) = 110 \text{ dB} + 10 \text{ dB} - 26 \text{ dB} = 94 \text{ dB}$. This is 8 Db more than required -> lower tapping: 3 watt, reduction of SPL by 5 dB (formula 3: $10 \times \log(10/3)$).	3x 3 watt = 9 watt
Total speaker power required:			219.8 watt

Selection of the Amplification System

The required functions can be achieved with the VM-2000 system. The system manager VM-2240 (240 watt) provides enough power for the speakers (219.8 watt).



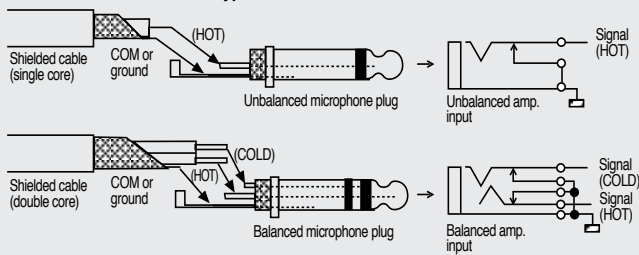
Microphones and amplifiers

Microphones

Wiring of microphones

Output from a microphone is rather weak. Therefore, it is important to use shielded cable for microphones to prevent line noise. The low impedance shielded cable intended for microphones are commercially available. The shielded cable is generally used to transmit the audio signals from microphones (-70 dB/0.3mV) or source equipment (0dB/1V).

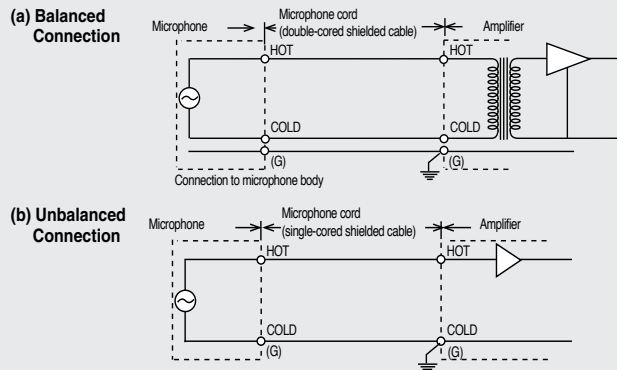
Balanced and unbalanced type



Balanced and unbalanced output

There are two kinds of output from a microphone: Balanced and unbalanced. With balanced output the audio signal appears between the hot (on-going audio signal) and cold (return audio signal), which are both independent of the ground. With unbalanced output the audio signal appears between the hot and ground (connected to the cold). The connection between balanced output and balanced input (on the amplifier side) is virtually unaffected by external line noise and it is used for wiring between long distances. Double-cored shielded cable is used for connecting

balanced output, and single-cored shielded cable is used for connecting unbalanced output.



Distance of extension for microphone cords

The following table shows the maximum extension distance for microphone cords. When distance extends beyond the following figures, excessive noise will make the microphone impractical and therefore it will be necessary to use a microphone pre-amplifier to boost the signal level to minimize the influence of noise.

Microphone output	Amplifier input	Microphone cord extension distance
Unbalanced	Unbalanced	20m
Balanced	Unbalanced	20m
Balanced	Balanced	100m

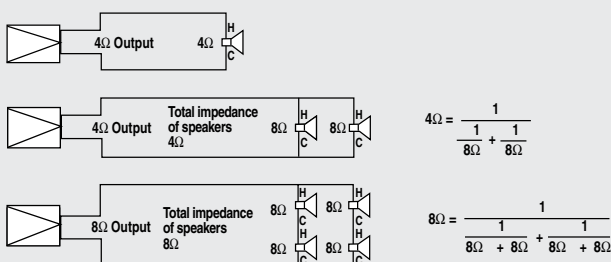
Amplifiers

High-Impedance Connection and Low-Impedance Connection

The PA amplifiers generally come with low-impedance speaker outputs (indicated as 4 Ω, 8 Ω, 16 Ω, etc) and high-impedance outputs (indicated as 70V, 100V, etc). Low-impedance output is used when a small number of speakers (1 to 4) is used and there is a short distance (10-some meters) between amplifiers and speakers. High-impedance output is used with a large number of speakers and a longer distance of wiring. Speakers with transformers are used for high-impedance output. For a PA system: high impedance connection should be used if possible, in consideration of wrong speaker connections and transmission efficiency.

Example of low-impedance connection:

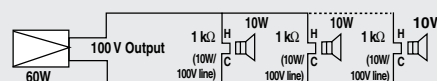
It is necessary to design the total speaker input impedance to be larger than the amplifier output impedance. When the total speaker impedance is lower than the amplifier output impedance, unstable operation or amplifier malfunction may result. The wiring distance between amplifier and speaker should be less than 10-some meters. If the wiring distance is greater than this, the output power from the amplifier will be consumed as heat in the cables, and not be able to supply the speaker with sufficient power.



Example of High-Impedance Connection:

In a PA system to cover a large area, the wiring distance will be greater, so high impedance connection is used predominantly. In high-impedance connection, all speakers (each with a transformer) will be connected in parallel. Avoid using these speakers together with those without transformers.

In high-impedance connection, as long as you have parallel connection. It will be sufficient to design the total speaker input to be lower than the amplifier output, and this will help eliminate complex impedance calculation.



Speaker input impedance (10W/100V line)

$$Z = \frac{100 (V)^2}{10 (W)} = 1 \text{ k}\Omega$$

Amplifier output impedance

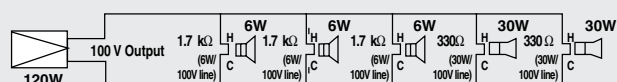
$$Z = \frac{100 (V)^2}{60 (W)} = 167 (\Omega)$$

Total impedance of speakers

$$Z = \frac{1}{\frac{1}{1 \text{ k}(\Omega)} + \frac{1}{1 \text{ k}(\Omega)} + \frac{1}{1 \text{ k}(\Omega)} + \frac{1}{1 \text{ k}(\Omega)} + \frac{1}{1 \text{ k}(\Omega)} + \frac{1}{1 \text{ k}(\Omega)}} = 167 (\Omega)$$

Amplifier output 60W = total speaker input (60W)

Even when connecting speakers with different inputs, there will be no problem as long as the total wattage of the speakers does not exceed the amplifier output.



Amplifier output impedance

$$Z = \frac{100 (V)^2}{120 (W)} = 83 (\Omega)$$

Total impedance of speakers

$$Z = \frac{1}{\frac{1}{1.7 \text{ k}(\Omega)} + \frac{1}{1.7 \text{ k}(\Omega)} + \frac{1}{1.7 \text{ k}(\Omega)} + \frac{1}{330 (\Omega)} + \frac{1}{330 (\Omega)}} = 128 (\Omega)$$

Amplifier output 120W > total speaker input (78W)



IP Grades

IP Grade Panel

What is IP standard?

This standard provides a system for classifying the degrees of protection provided by the enclosures of electrical equipment under the International Electrotechnical Commission (IEC) publication 529.

The type of protection covered by this system of classification is as follows.

- Protection of persons against contact with or approach to live parts and against contact with moving parts inside the enclosure and protection of the equipment against ingress of solid foreign bodies.
- Protection of the equipment inside the enclosure against harmful ingress of water.

1st Numeral: Protection against solid foreign objects		2nd Numeral: Protection against ingress of water	
0		0	
1	Non-protected Protected against solid foreign objects of 50mm ϕ and greater.	1	Non-protected Protected against vertically falling water drops.
2	Protected against solid foreign objects of 12.5mm ϕ and greater.	2	Protected against vertically falling water drops when enclosure tilted up to 15°.
3	Protected against solid foreign objects of 2.5mm ϕ and greater.	3	Protected against splashing water.
4	Protected against solid foreign objects of 1.0mm ϕ and greater.	4	Protected against splashing water.
5	Dust-protected	5	Protected against water jets.
6	Dust-tight	6	Protected against powerful water jets.
X	Not tested	7	Protected against the effects of temporary immersion in water.
		8	Protected against the effects of continuous immersion in water.
		X	Not tested

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A-2240
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AD-0910
AD-246
AD-1210P
AN-001T
AN-9001

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BP-900
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BS-1030B
BS-1030W
BS-1034 / EN
BS-1034S
BS-10WL
BS-5W
BS-633A
BS-633AT
BS-634
BS-634T
BS-678
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BS-678BT
BS-678T
BS-680F
BS-680FC

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CA-130
CA-160
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CP-93
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CS-64 / BS

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D-921E

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D-922F
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D-2000CB
D-2000DA1
D-2012C
D-2080SP
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DA-250DH
DA-250F
DA-250FH
DA-500F
DA-550FH
DP-0206
DP-K1
DP-L2
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DQ-A02
DQ-C01
DS-1000B

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EM-800
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ER-1206W
ER-1215
ER-1215S
ER-2215
ER-2215W
ER-2230W
ER-2930W
ER-3215
ER-520
ER-520S
ER-520W
ER-604W
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ES-0422W
ES-0424
ES-0424W
ES-0426

ES-0426WP
ES-0851
ES-0871
ES-C0651
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EV-20R
EV-350P
EV-350R
EV-CF128M

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F-1000BTWP
F-1000W
F-1000WT
F-1000WTWP
F-122C
F-1300B
F-1300BT
F-1300BTWP
F-1300W
F-1300WT
F-1300WTWP
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F-2000BT
F-2000BTWP
F-2000W
F-2000WT
F-2000WTWP
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F-2352C
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H-3
H-3WP
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HS-120W
HS-150B
HS-150W
HS-1200BT
HS-1200WT
HS-1500BT
HS-1500WT
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HX-5B-WP
HX-5W
HX-5W-WP

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IR-200M
IR-300M
IR-500R
IR-510R
IR-520R
IR-700D
IR-702T

J

JP-028B

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M-66
M-9000M2
MB-TS900
MP-032B
MP-1216
M-633D
MT-200

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N-8000AL
N-8000CO
N-8000DI
N-8000EX
N-8000MI
N-8000MS
N-8000RS
N-8010EX
N-8010MS
N-8010RS
N-8011MS
N-8020MS
N-8031MS
N-8050DS
N-8500MS
N-8510MS
N-8540DS
NX-100
NX-100S

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P-2240
PC-1867F
PC-1867FC
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PC-2668
PC-2852
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PC-391T
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PE-64
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PJ-304
PJ-64
PM-20EV
PP-025B

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RM-200RJ
RM-200SA
RM-200SF
RM-200X
RM-200XF
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RM-300MF
RM-320F
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RS-141
RS-150
RS-160
RS-170
RS-180
RS-191
RS-450
RS-460
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SC-610M
SC-615
SC-615BS
SC-615M
SC-630
SC-630M
SC-651
SR-A12L
SR-A12LWP
SR-A12S
SR-A12SWP
SR-A18B
SR-C8L
SR-C8LWP
SR-C8S
SR-C8SWP
SR-C15B
SR-C15BWP
SR-F09
SR-F09-V1
SR-F09-V2
SR-F09-V3
SR-L09
SR-F05
SR-H2L
SR-H2S

SR-H3L
SR-H3S
SR-M05L
SR-M05R
SR-M3L
SR-M3R
SR-T5
SS-9001
SV-200MA
SX-200RM
SX-2000
SX-2000AO
SX-2000CI
SX-2000CO
SX-2000SM
SX-2100AI
SX-2100AO

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TC-615
TC-615M
TC-631
TC-631M
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TH-660
TS-770
TS-771
TS-772
TS-773
TS-774
TS-775
TS-800
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TS-904
TS-905
TS-907
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TU-651M
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U-01R

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VM-2240
VM-3240E
VM-3360E
VM-3240VA
VM-3360VA
VP-200VX
VP-1061
VP-1121

VP-1241
VP-1361
VP-2064
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VP-2241
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VR-1010
VR-1020
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VX-2000DS
VX-2000PF
VX-2000SF
VX-200PS
VX-200SE
VX-200SI
VX-200SO
VX-200SP
VX-200SP-2
VX-200SZ
VX-200SZ-2
VX-200XI
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WM-4210
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WT-4820
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WTU-4800

Y

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YW-1024
YW-3500
YW-4500

Z

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D-2000CB	N-8000AL	
D-2000DA1	N-8000CO	
D-2008SP	N-8000DI	
D-901	N-8000EX	
D-911	N-8000MI	
D-921E	N-8000MS	
D-921F	N-8000RS	
D-922E	N-8010EX	
D-922F	N-8010MS	
D-923AE	N-8010RS	
D-936R	N-8011MS	
D-937SP	N-8020MS	
D-961SP	N-8031MS	
D-971E	N-8050DS	
D-971M	N-8400RS	
D-971R		
D-972AE		
D-981	R	
D-983	RS-140	
D-984VC	RS-141	
DA-250D	RS-150	
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DA-250F	RS-170	
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DA-550F	RS-191	
DP-0206	RS-450	
DP-K1	RS-460	
DP-L2	RS-470	
	RS-480	
E	RS-481	
E-1231		
E-232		



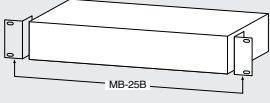




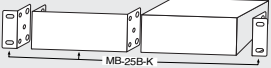
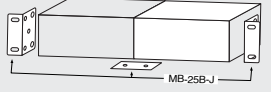
Matching Brackets



Mountable Equipment			Rack Mounting Brackets		
	Name	Model	Appearance	Appearance, Size and Color	Setting
Voice Evacuation System	VM-2000 Series	VM-2120		MB-36 (3-size) Color: Gray 	 MB-36
		VM-2240			
Wireless Microphone System	Power Antenna Distributor	WD-4800		MB-15B (1-size) Color: Black 	 MB-15B
	UHF Wireless Tuner	WT-5800		MB-WT3 (1-size) Color: Black 	 MB-WT3
		WT-5805			
		WT-4820			
	Infrared Wireless Tuner	IR-702T		MB-WT4 (1-size) Color: Black 	 MB-WT4
Infrared Wireless Distributor	IR-700D				
Program Timer & Other Equipment	Sound Repeater	EV-20R		MB-15B (1-size) Color: Black 	 MB-15B
	Program Timer	TT-104B			
Network-Related System	Network Audio Adapter	NX-100		MB-15B-BK (1-size) (Color: Black) 	 MB-15B-K
		NX-100S			



Matching Brackets

Mountable Equipment			Rack Mounting Brackets			
Name	Model	Appearance	Appearance, Size and Color	Setting		
Amplifiers	Mixer Amplifier	A-2030 A-2060 A-2120 A-2240		MB-25B (2-size) Color: Black 	 MB-25B	
		A-1803 A-1806 A-1812				
		A-1706 A-1712 A-1724				
	Power Amplifier	P-2240 P-1812				
		VP-1061				MB-25B-BK (2-size) Color: Black  MB-25B-K
		VP-1121				MB-25B-J (2-size) Color: Black  MB-25B-J













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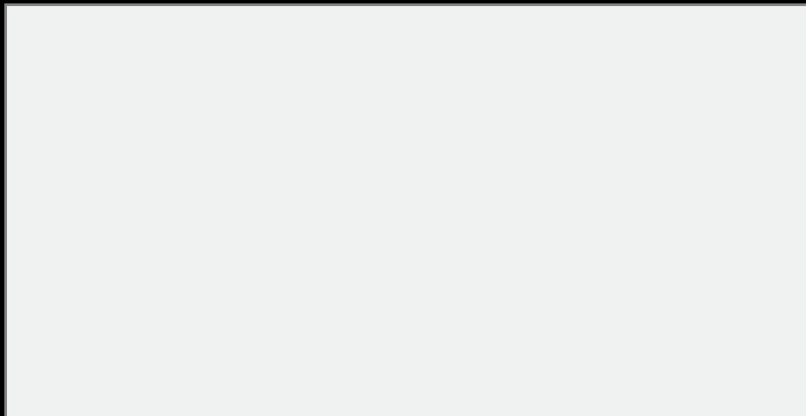
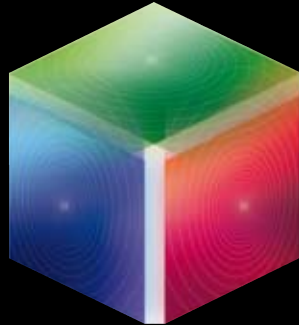
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