PW-1230DB/DW/SB/SW
PW-1430DB/DW/SB/SW
Plane Wave Speakers

PW-1230DB/PW-1230DW
Compact Double-Sided Radiation Type
PW-1230SB/PW-1230SW
Compact Single-Sided Radiation Type
PW-1430DB/PW-1430DW
Large Double-Sided Radiation Type
PW-1430SB/PW-1430SW
Large Single-Sided Radiation Type

DESCRIPTION

The TOA Plane Wave Speaker is a flat speaker system equipped with a plane wave unit consisting of a diaphragm, buffer, magnet, and case, enabling radiation of sound in narrow horizontal and vertical directivity patterns, delivering clear audio to a limited target area with minimal attenuation. The metal parts of the plane wave unit and the entire speaker cabinet are made of stainless steel, making the speaker rust-resistant.
The plane wave feature makes the speakers well-suited for information broadcast applications in locations such as railroad stations, where different announcements are made in close proximity.

FEATURES

Narrow Directivity

Speaker audio is less affected by reflected sounds from ceiling and floor, ensuring clear audio delivery even in areas with poor acoustic conditions, such as a long reverberation time.

Splash-proof Construction

Compliant with IPX4 (IEC60529) water protection standards, the speaker is suitable for use in a covered outdoor space protected from the elements.

Rust Resistance

The plane wave unit's metal parts and the speaker cabinet are made of stainless steel, making the speaker rust-resistant.

Beam-tilting Function

A built-in beam-tilting function makes it possible to shift sound radiation direction about five degrees downward of the horizontal axis.

Built-in High-pass Filter

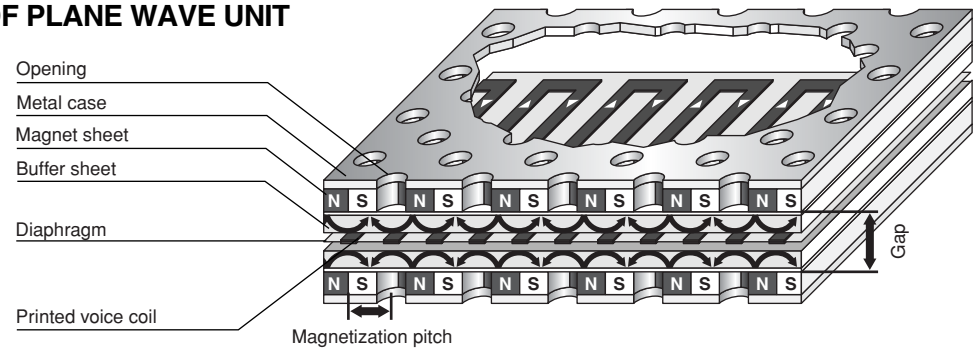
This filter prevents low-frequency sound radiation outside the coverage area.

Variety of Unit Numbers, Audio Radiation Patterns and Color Variations

Speakers are available in both compact (with two plane wave units) and large (with four plane wave units) sizes, double-sided (backward & forward) and single-sided (forward) radiation, and black or light ivory color variations.

TOA

STRUCTURE OF PLANE WAVE UNIT

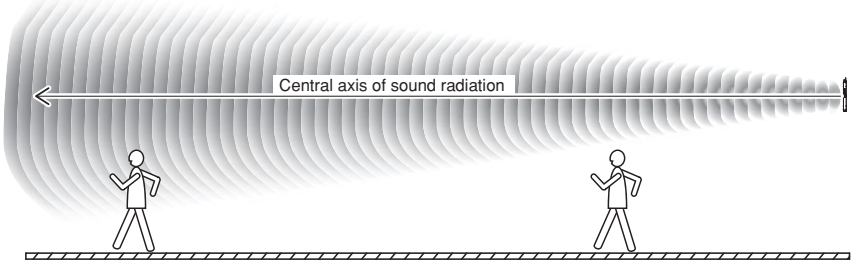


BEAM TILTING FUNCTION

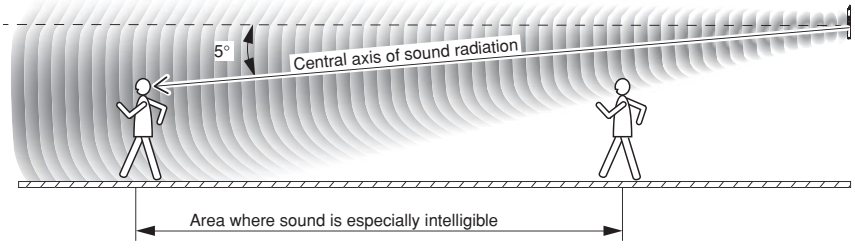
Shifting the beam tilting switch to “DOWNWARD” causes the sound radiation to be directed about 5° downward from the horizontal.

Switch setting	Radiation direction
FLAT	0°
DOWNWARD	5° Downward

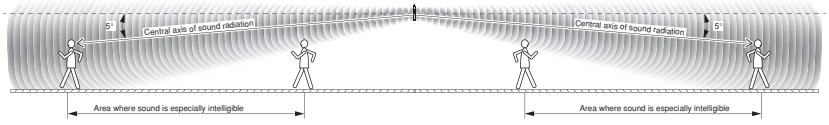
When shifted to “FLAT”



When shifted to “DOWNWARD”



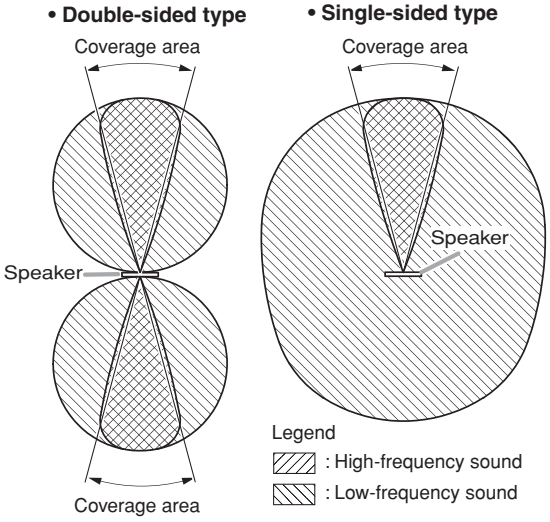
When shifted to “DOWNWARD” (Double-sided type)



HIGH PASS FILTER FUNCTION

Both types of speakers provide dispersion characteristics show as radiation patterns at right. To cut unwanted low-frequency sound radiation outside the coverage area, shift the high pass filter switch to the “ON” position. Frequencies below 450 Hz are cut at -12 dB/oct.
In this case, low-frequecy sounds in the coverage area are cut as well, however, this will have little influence on sound intelligibility.

Radiation patterns



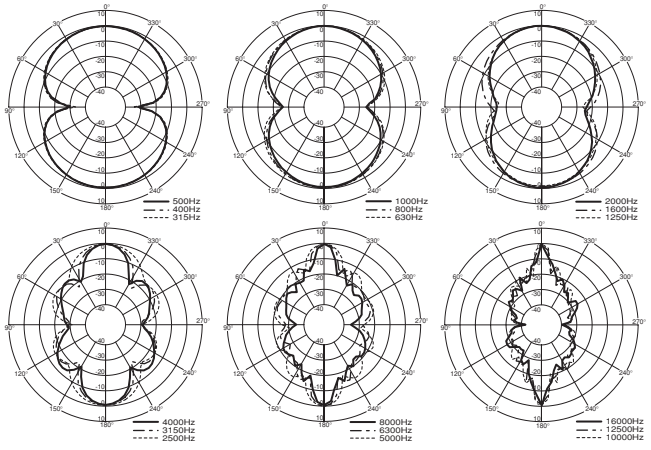
These radiation patterns are viewed from above the speakers.

CHARACTERISTIC DIAGRAMS

• PW-1230DB/PW-1230DW

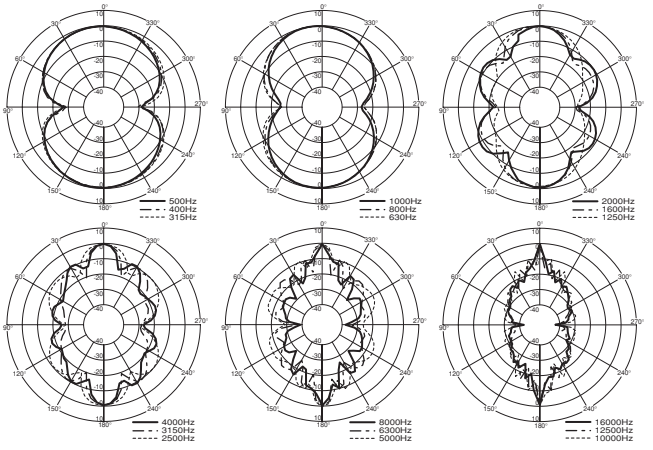
Polar Response

vertical FLAT



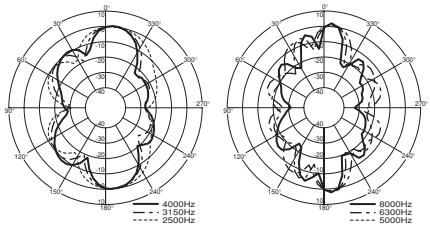
*With Beam Tilting Switch set to "FLAT"

horizontal FLAT



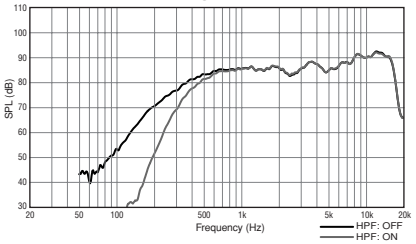
*With Beam Tilting Switch set to "FLAT"

DOWNWARD

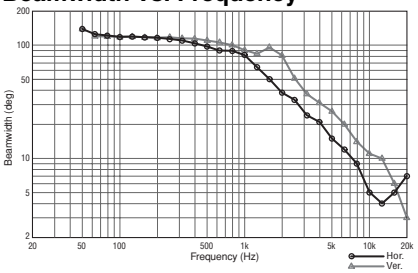


*With Beam Tilting Switch set to "DOWNWARD"

SPL vs. Frequency



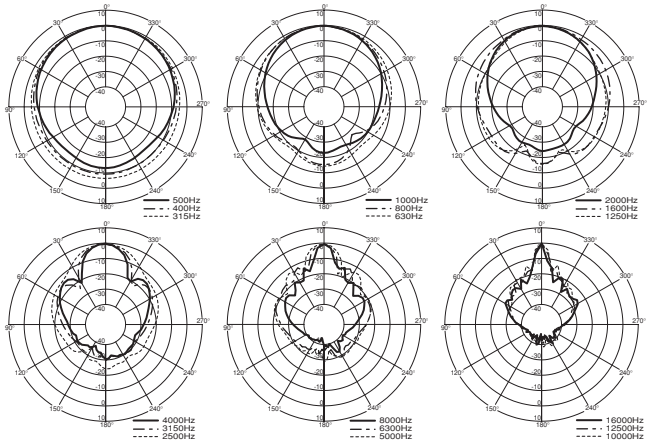
Beamwidth vs. Frequency



• PW-1230SB/PW-1230SW

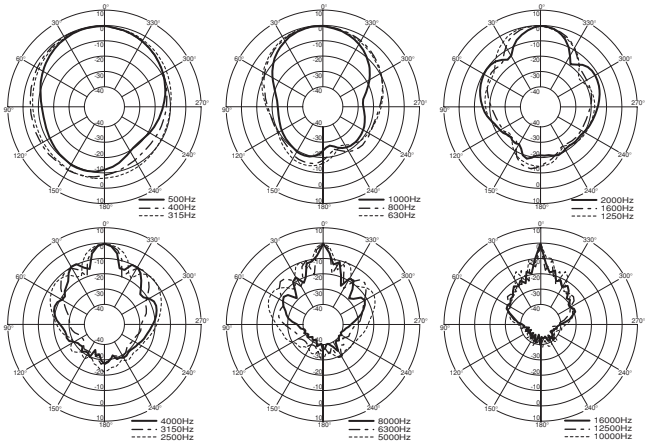
Polar Response

vertical FLAT



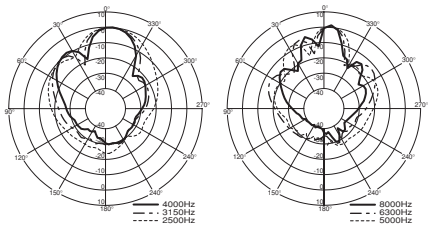
*With Beam Tilting Switch set to "FLAT"

horizontal FLAT



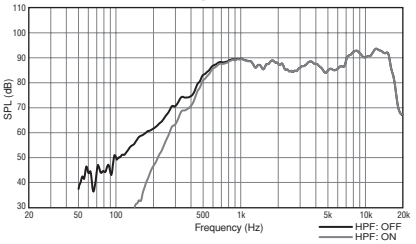
*With Beam Tilting Switch set to "FLAT"

DOWNWARD

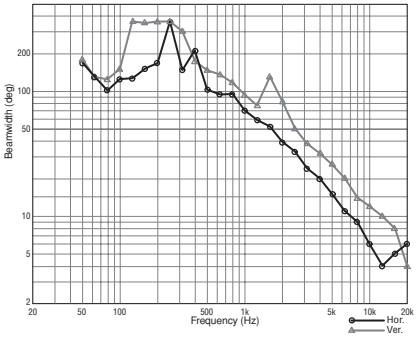


*With Beam Tilting Switch set to "DOWNWARD"

SPL vs. Frequency



Beamwidth vs. Frequency

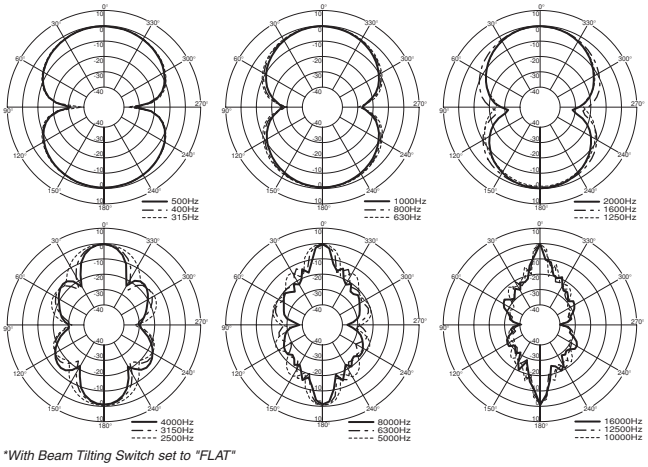


CHARACTERISTIC DIAGRAMS

• PW-1430DB/PW-1430DW

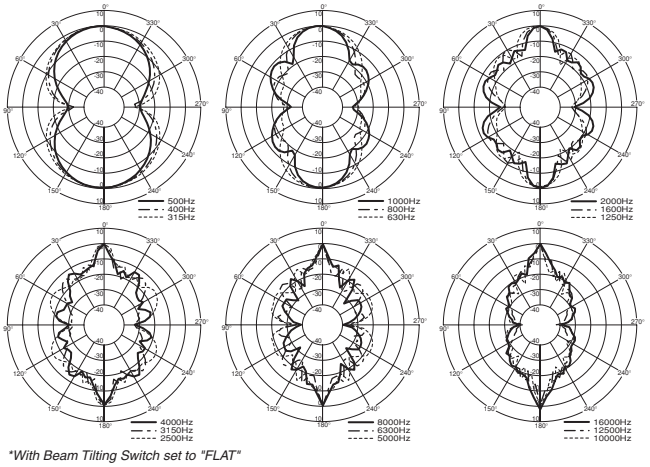
Polar Response

vertical FLAT



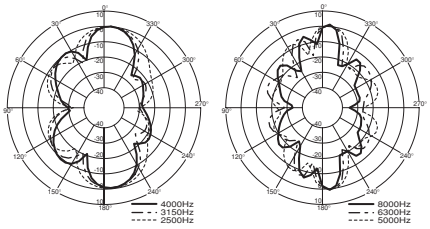
*With Beam Tilting Switch set to "FLAT"

horizontal FLAT



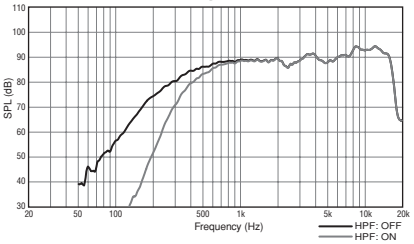
*With Beam Tilting Switch set to "FLAT"

DOWNWARD

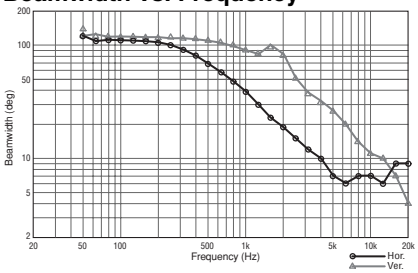


*With Beam Tilting Switch set to "DOWNWARD"

SPL vs. Frequency



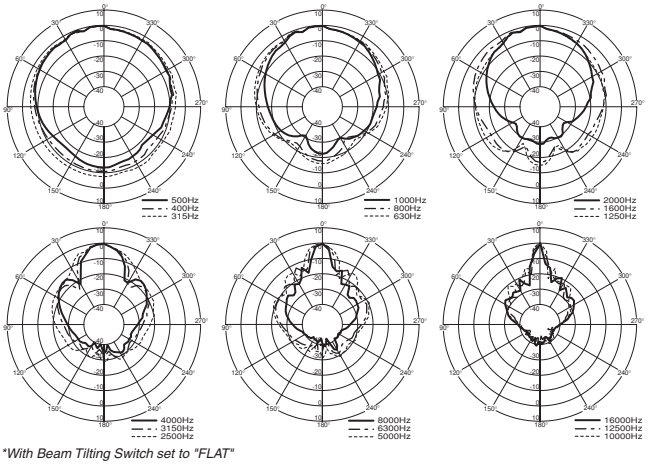
Beamwidth vs. Frequency



• PW-1430SB/PW-1430SW

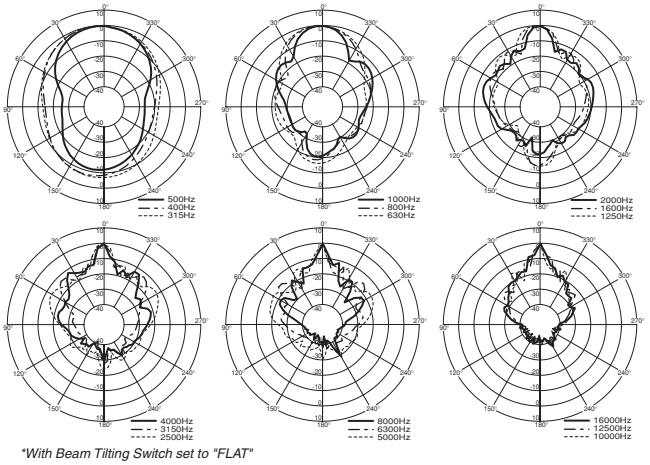
Polar Response

vertical FLAT



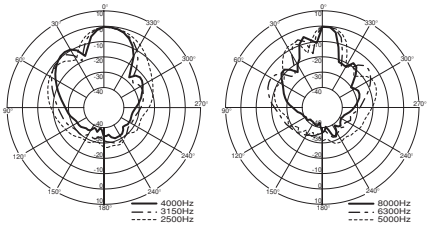
*With Beam Tilting Switch set to "FLAT"

horizontal FLAT



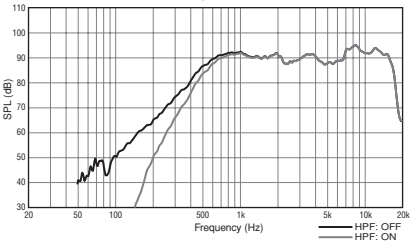
*With Beam Tilting Switch set to "FLAT"

DOWNWARD

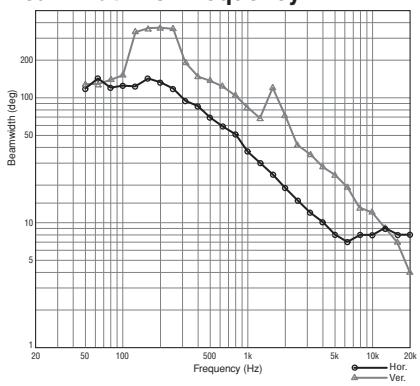


*With Beam Tilting Switch set to "DOWNWARD"

SPL vs. Frequency



Beamwidth vs. Frequency



SPECIFICATIONS

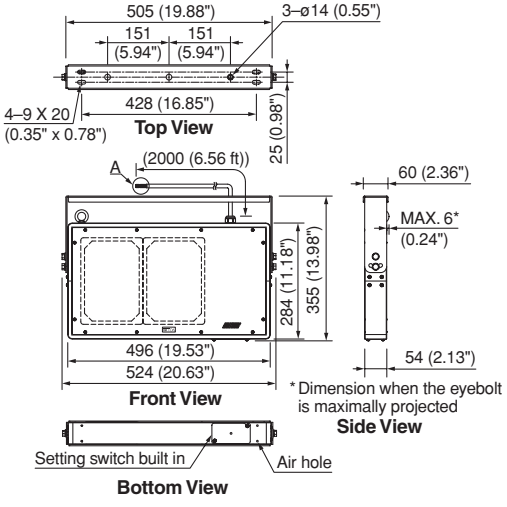
Model No.	PW-1230DB	PW-1230DW	PW-1230SB	PW-1230SW
Type of Radiation	Double-sided radiation (The side with TOA logo affixed: Positive pressure wave, Rear: Negative pressure wave)		Single-side radiation	
Rated Input	30 W			
Rated Impedance	High impedance 100 V line: 330 Ω (30 W), 670 Ω (15 W), 1 kΩ (10W), 2 kΩ (5 W) High impedance 70 V line: 170 Ω (30 W), 330 Ω (15 W), 670 Ω (7.5 W), 1 kΩ (5 W), 2 kΩ (2.5 W)			
Sensitivity	86 dB (1 W, 1 m equivalent measured at 4 m, 1 – 10 kHz) 86 dB (1 W, 1 m measured at 1 m, 1 – 10 kHz) (Beam tilting : FLAT, High pass filter: OFF)		87 dB (1 W, 1 m equivalent measured at 4 m, 1 – 10 kHz) 87 dB (1 W, 1 m measured at 1 m, 1 – 10 kHz) (Beam tilting : FLAT, High pass filter: OFF)	
Frequency Response	300 Hz – 17.5 kHz (Beam tilting : FLAT, High pass filter: OFF)		450 Hz – 17.5 kHz (Beam tilting : FLAT, High pass filter: OFF)	
Directivity Angle	Horizontal: 38° (2 kHz, 1/3 octave band), Vertical: 75° (2 kHz, 1/3 octave band)			
Speaker Unit	Plane wave unit (152 × 214 mm (5.98" × 8.43")) × 2			
Setting Switch	Beam tilting (radiation direction) FLAT: 0° downward/DOWNWARD: 5° downward High pass filter (450 Hz, -12dB/oct) : OFF/ON			
Speaker Cord	ø9 mm (0.35"), 6-core cabtyre cable, 2 m (6.56 ft)			
Water Protection	IPX4			
Operating Temperature	–10°C to +50°C (14°F to 122°F)			
Finish	Enclosure, Punched net and Mounting bracket: Stainless, black, semi-gloss, paint	Enclosure, Punched net and Mounting bracket: Stainless, light ivory, semi-gloss, paint	Enclosure, Punched net and Mounting bracket: Stainless, black, semi-gloss, paint	Enclosure, Punched net and Mounting bracket: Stainless, light ivory, semi-gloss, paint
Dimensions	524 (W) × 355 (H) × 60 (D) mm (20.63" × 13.98" × 2.36") (including mounting bracket)			
Weight	7.3 kg (16.09 lb) (including mounting bracket)		7.8 kg (17.2 lb) (including mounting bracket)	

Model No.	PW-1430DB	PW-1430DW	PW-1430SB	PW-1430SW
Type of Radiation	Double-sided radiation (The side with TOA logo affixed: Positive pressure wave, Rear: Negative pressure wave)		Single-side radiation	
Rated Input	30 W			
Rated Impedance	High impedance 100 V line: 330 Ω (30 W), 670 Ω (15 W), 1 kΩ (10 W), 2 kΩ (5 W) High impedance 70 V line: 170 Ω (30 W), 330 Ω (15 W), 670 Ω (7.5 W), 1 kΩ (5 W), 2 kΩ (2.5 W)			
Sensitivity	88 dB (1 W, 1 m equivalent measured at 4 m, 1 – 10 kHz) 85 dB (1 W, 1 m measured at 1 m, 1 – 10 kHz) (Beam tilting : FLAT, High pass filter: OFF)		90 dB (1 W, 1 m equivalent measured at 4 m, 1 – 10 kHz) 87 dB (1 W, 1 m measured at 1 m, 1 – 10 kHz) (Beam tilting : FLAT, High pass filter: OFF)	
Frequency Response	250 Hz – 17.5 kHz (Beam tilting : FLAT, High pass filter: OFF)		400 Hz – 17.5 kHz (Beam tilting : FLAT, High pass filter: OFF)	
Directivity Angle	Horizontal: 19° (2 kHz, 1/3 octave band), Vertical: 78° (2 kHz, 1/3 octave band)			
Speaker Unit	Plane wave unit (152 × 214 mm (5.98" × 8.43")) × 4			
Setting Switch	Beam tilting (radiation direction) FLAT: 0° downward/DOWNWARD: 5° downward High pass filter (450 Hz, -12dB/oct): OFF/ON			
Speaker Cord	ø9 mm (0.35"), 6-core cabtyre cable, 2 m (6.56 ft)			
Water Protection	IPX4			
Operating Temperature	–10°C to +50°C (14°F to 122°F)			
Finish	Enclosure, Punched net and Mounting bracket: Stainless, black, semi-gloss, paint	Enclosure, Punched net and Mounting bracket: Stainless, light ivory, semi-gloss, paint	Enclosure, Punched net and Mounting bracket: Stainless, black, semi-gloss, paint	Enclosure, Punched net and Mounting bracket: Stainless, light ivory, semi-gloss, paint
Dimensions	831 (W) × 355 (H) × 60 (D) mm (32.72" × 13.98" × 2.36") (including mounting bracket)			
Weight	11.4 kg (25.13 lb) (including mounting bracket)		11.9 kg (26.23 lb) (including mounting bracket)	

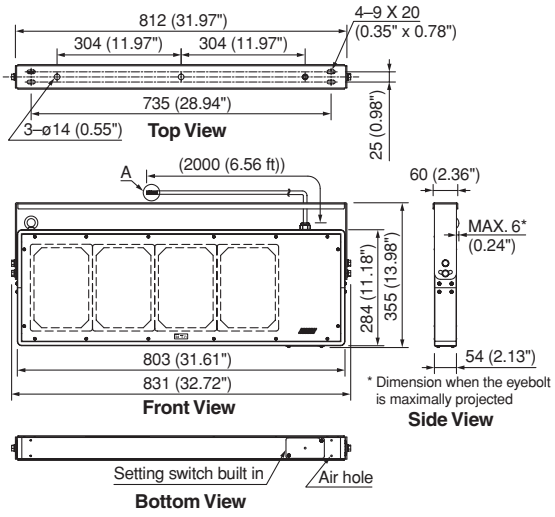
* Note: Do not install the unit where it is likely to be corroded in such place as indoor pools, bathrooms. or seaside.

APPEARANCE AND DIMENSIONAL DIAGRAM

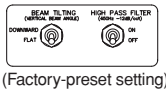
• PW-1230DB/DW/SB/SW



• PW-1430DB/DW/SB/SW

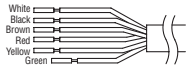


Setting Switch



(Factory-preset setting)

Magnified diagram of part A



COLOR		IMP.	100 LINE	70 LINE
COM	HOT			
WHT	GRN	170Ω	—	30W
	BLK	330Ω	30W	15W
	BRN	670Ω	15W	7.5W
	RED	1kΩ	10W	5W
	YEL	2kΩ	5W	2.5W

*The green lead is for high impedance 70V line use only. Never use it on high impedance 100V line since the amplifier or speaker itself may be damaged.

ARCHITECTURAL AND ENGINEERING SPECIFICATIONS

PW-1230DB/ PW-1230DW

The speaker shall be a flat system equipped with two plane wave units providing double-sided pressure waves with positive forward and negative backward sound radiation. Rated input shall be 30W. Rated impedance on a high-impedance 100 V line shall be: 330 Ω (30W), 670 Ω (15 W), 1 kΩ (10 W), and 2 kΩ (5W); and on a high-impedance 70 V line: 170 Ω (30W), 330 Ω (15 W), 670 Ω (7.5W), 1 kΩ (5 W), and 2 kΩ (2.5W). Sensitivity shall be 86 dB (at 1 W, 1 m equivalent measured at 4 m, 1 – 10 kHz, and 86 dB at 1 W measured at 1 m, 1 – 10 kHz), with 300 Hz to 17.5 kHz frequency response. Directivity angles shall be 38° horizontal and 75° vertical, (2 kHz, 1/3 octave band). The speaker unit shall consist of two 152 x 214 mm (5.98" x 8.43") plane wave units. Setting switches shall be provided for 0° to 5° downward beam tilting (radiation direction), and for an OFF/ON 450 Hz, -12dB/octave high-pass filter. The speaker cord shall be a 2 m (6.56 ft) ø9 mm (0.35"), 6-core cabtyre cable. Water protection rating shall be IPX4 compliant. Operating temperature shall be -10° C to +50° C (14° F to 122° F). The speaker enclosure and plane wave unit metal parts shall be stainless steel. The finish on the enclosure, punched net and mounting bracket shall be black (B) or light ivory (W) paint. The dimensions shall be 524 (W) x 355 (H) x 60 (D) mm (20.63" x 13.98" x 2.36"), and the weight shall be 7.3 kg (16.09 lb), including mounting bracket. The mounting bracket shall be pre-installed on the unit as an accessory.

The speaker shall be a TOA model PW-1230DB/ PW-1230DW.

PW-1230SB/ PW-1230SW

The speaker shall be a flat system equipped with two plane wave units providing a single-sided pressure wave. Rated input shall be 30W. Rated impedance on a high-impedance 100 V line shall be: 330 Ω (30W), 670 Ω (15 W), 1 kΩ (10 W), and 2 kΩ (5W); and on a high-impedance 70 V line: 170 Ω (30W), 330 Ω (15 W), 670 Ω (7.5W), 1 kΩ (5 W), and 2 kΩ (2.5W). Sensitivity shall be 87 dB (at 1 W, 1 m equivalent measured at 4 m, 1 – 10 kHz, and 87 dB at 1 W measured at 1 m, 1 – 10 kHz), with 450 Hz to 17.5 kHz frequency response. Directivity angles shall be 38° horizontal and 75° vertical, (2 kHz, 1/3 octave band). The speaker unit shall consist of two 152 x 214 mm (5.98" x 8.43") plane wave units. Setting switches shall be provided for 0° to 5° downward beam tilting (radiation direction), and for an OFF/ON 450 Hz, -12dB/octave high-pass filter. The speaker cord shall be a 2 m (6.56 ft) ø9 mm (0.35"), 6-core cabtyre cable. Water protection rating shall be IPX4 compliant. Operating temperature shall be -10° C to +50° C (14° F to 122° F). The speaker enclosure and plane wave unit metal parts shall be stainless steel. The finish on the enclosure, punched net and mounting bracket shall be black (B) or light ivory (W) paint. The dimensions shall be 524 (W) x 355 (H) x 60 (D) mm (20.63" x 13.98" x 2.36"), and the weight shall be 7.8 kg (17.2 lb), including mounting bracket. The mounting bracket shall be pre-installed on the unit as an accessory.

The speaker shall be a TOA model PW-1230SB/ PW-1230SW.

PW-1430DB/ PW-1430DW

The speaker shall be a flat system equipped with four plane wave units providing double-sided pressure waves with positive forward and negative backward sound radiation. Rated input shall be 30W. Rated impedance on a high-impedance 100 V line shall be: 330 Ω (30W), 670 Ω (15 W), 1 kΩ (10 W), and 2 kΩ (5W); and on a high-impedance 70 V line: 170 Ω (30W), 330 Ω (15 W), 670 Ω (7.5W), 1 kΩ (5 W), and 2 kΩ (2.5W). Sensitivity shall be 88 dB (at 1 W, 1 m equivalent measured at 4 m, 1 – 10 kHz, and 85 dB at 1 W measured at 1 m, 1 – 10 kHz), with 250 Hz to 17.5 kHz frequency response. Directivity angles shall be 19° horizontal and 78° vertical, (2 kHz, 1/3 octave band). The speaker unit shall consist of four 152 x 214 mm (5.98" x 8.43") plane wave units. Setting switches shall be provided for 0° to 5° downward beam tilting (radiation direction), and for an OFF/ON 450 Hz, -12dB/octave high-pass filter. The speaker cord shall be a 2 m (6.56 ft) ø9 mm (0.35"), 6-core cabtyre cable. Water protection rating shall be IPX4 compliant. Operating temperature shall be -10° C to +50° C (14° F to 122° F). The speaker enclosure and plane wave unit metal parts shall be stainless steel. The finish on the enclosure, punched net and mounting bracket shall be black (B) or light ivory (W) paint. The dimensions shall be 831 (W) x 355 (H) x 60 (D) mm (32.72" x 13.98" x 2.36"), and the weight shall be 11.4 kg (25.13 lb), including mounting bracket. The mounting bracket shall be pre-installed on the unit as an accessory.

The speaker shall be a TOA model PW-1430DB/ PW-1430DW.

PW-1430SB/ PW-1430SW

The speaker shall be a flat system equipped with four plane wave units providing a single-sided pressure wave. Rated input shall be 30 W. Rated impedance on a high-impedance 100 V line shall be: 330 Ω (30W), 670 Ω (15 W), 1 kΩ (10 W), and 2 kΩ (5 W); and on a high-impedance 70 V line: 170 Ω (30 W), 330 Ω (15 W), 670 Ω (7.5W), 1 kΩ (5 W), and 2 kΩ (2.5 W). Sensitivity shall be 90 dB (at 1 W, 1 m equivalent measured at 4 m, 1 – 10 kHz, and 87 dB at 1 W measured at 1 m, 1 – 10 kHz), with 400 Hz to 17.5 kHz frequency response. Directivity angles shall be 19° horizontal and 78° vertical, (2 kHz, 1/3 octave band). The speaker unit shall consist of four 152 × 214 mm (5.98" × 8.43") plane wave units. Setting switches shall be provided for 0° to 5° downward beam tilting (radiation direction), and for an OFF/ON 450 Hz, -12db/octave high-pass filter. The speaker cord shall be a 2 m (6.56 ft) ø9 mm (0.35"), 6-core cabtyre cable. Water protection rating shall be IPX4 compliant. Operating temperature shall be -10° C to +50° C (14° F to 122° F). The speaker enclosure and plane wave unit metal parts shall be stainless steel. The finish on the enclosure, punched net and mounting bracket shall be black or light ivory paint. The dimensions shall be 831 (W) × 355 (H) × 60 (D) mm (32.72" × 13.98" × 2.36"), and the weight shall be 11.9 kg (26.23 lb), including mounting bracket. The mounting bracket shall be pre-installed on the unit as an accessory.

The speaker shall be a TOA model PW-1430SB/PW-1430SW.

TOA Corporation
www.toa.jp
Specifications are subject to change without notice.
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