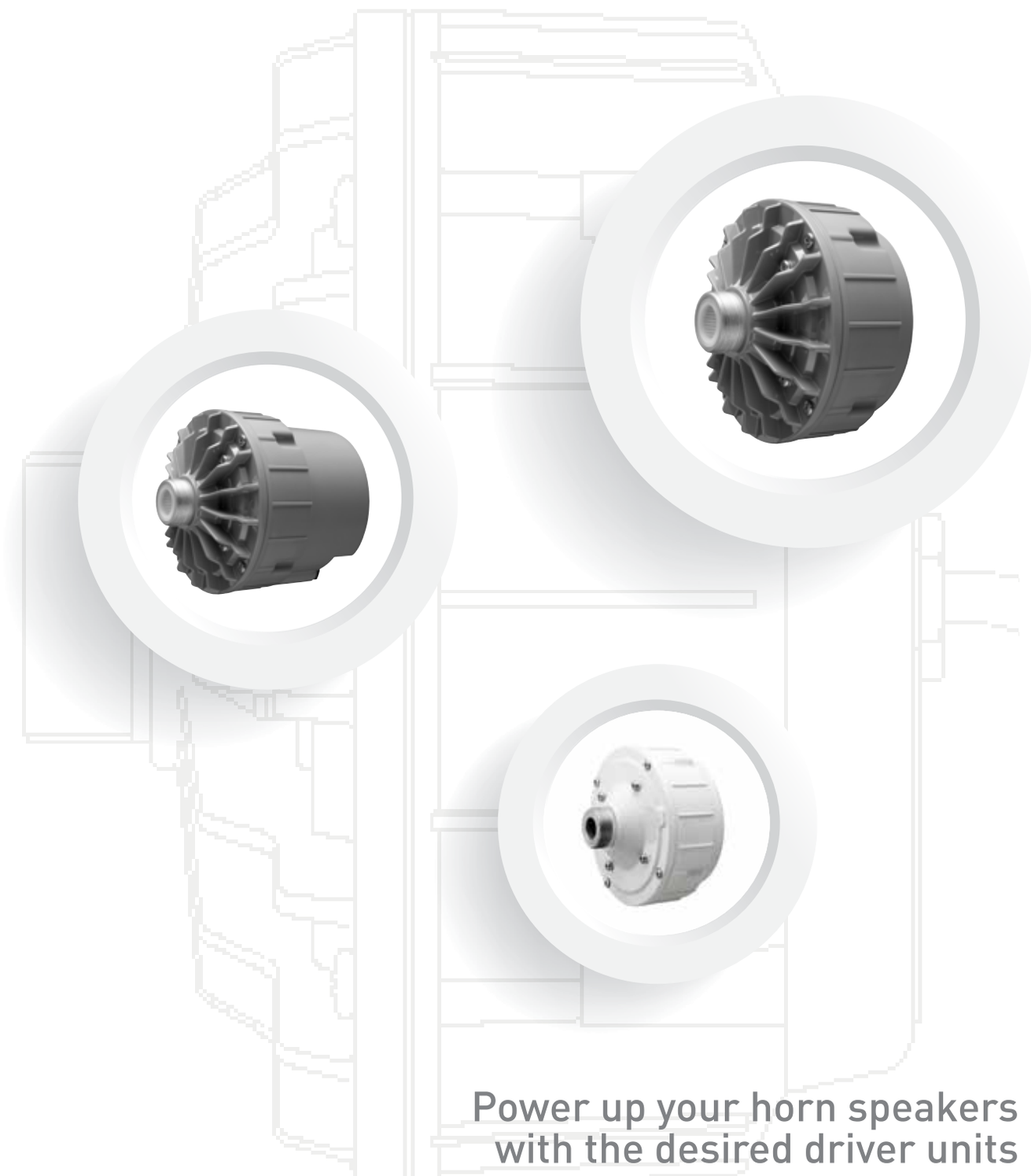
TOA

Separate Reflex Horn Speakers and Driver Units



Power up your horn speakers
with the desired driver units

TOA & Horn Speakers

TOA has been manufacturing horn speakers practically from the company's very beginning, over eighty years ago in 1934, and today we are recognized even among our longstanding industry contemporaries as a veteran of highest expertise in this field. By 1949 we had succeeded in developing Japan's first reflex-type horn speaker. We have always dedicated ourselves to being "an international company contributing to human society through sound and communication," valuing above all the physical craftsmanship that allows the delivery of the clearest possible sound information to listeners. In 1962, an inquiry from abroad led us to conduct transmission testing on an ultra-large PA system. This system, which used a 6.6-meter horn and a 4kW transistor amplifier, marked a transmission distance of 12 kilometers. This achievement would prove instrumental in laying out our destiny of long-running involvement in outdoor public address systems.

TOA-developed horn speakers were often painted blue, and they would become widely familiar as "blue trumpets" unique

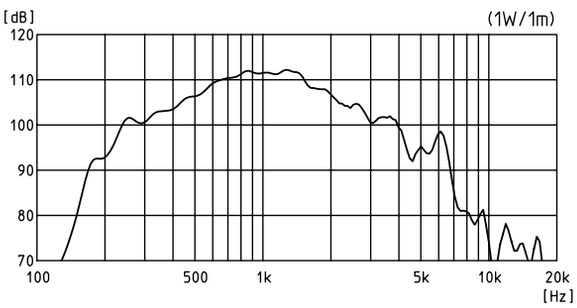
to TOA. In Indonesia, where we established both factory and sales facilities in 1976, TOA horn speakers became such a part of the public landscape that they were often referred to as "Toas." They are still a conspicuous part of everyday life there, most notably for public address among the country's many mosques.

Even today, horn speakers represent one of the fundamental shapes of public address speakers, offering a simple PA system that remains more indispensable than ever in delivering public announcements.
environments to continue deepening our expertise in outdoor sound broadcasting and reinforcement.

General Issues for Horn Speakers

Articulation

Every horn speaker comprise of a driver unit and a horn, and thus they achieve highest efficiency through impedance matching with the air. Sound pressure drops on both sides of the 1–2kHz range, however, resulting in certain distinctive audio characteristics that cannot be considered favorable in terms of creating good-quality sound.



These high and low range frequency characteristics is one of the key issues to horn speaker sound quality. Particularly, we understand that optimised high range contributes greatly to improving the articulation of outdoor broadcasts. Attenuation in the air is more conspicuous for the high frequency ranges.

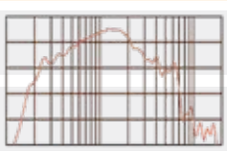
Durability

Out in the field, there is also an inherent need to have horn speakers deliver higher volume and send the sound farther. More often than not, attempts to meet this need through excessive power input cause malfunction by damaging or even destroying the speaker's driver unit. Therefore, in addition to frequency characteristics, driver unit durability is also one of the key factors to producing better sound quality.

Additionally, the events taken place in recent years have brought us to understand that in the disaster prevention market, enhanced frequency characteristics not only improves articulation, it also has a positive impact on long-distance sound transmission capability.

Our Development of Driver Units

TOA horn speaker driver units can be divided into several generations based on their diaphragm materials and constructions. From the use of dome-type diaphragms made of phenol-impregnated Conex in our early days of making diaphragm to switching the material to polyimide in 2004, we have models catering to all needs. In our most recent TU-660, ring-type diaphragm construction were used. Each of these various changes have aimed to improve sound quality (frequency characteristics), product quality, durability, and productivity. Now, the range for our types of driver units had widen to meet more needs.

	 TU-15/25/35/50 (1978) ~TU-730/750 (Japan 2000–present*) TU-630/650 (overseas 1998–2008) * TU-750 only	 TU-730A/730AM (Japan 2004–present) TU-631/651 (overseas 2008–present)	Start of R&D on driver unit using ring-type diaphragms (2012)	 TU-760 (Japan 2017–) TU-660 (overseas 2017–)
Diaphragm construction	**Dome**	**Dome**	**Ring**	**Ring**
Diaphragm materials	 **Conex (fabric), phenol (resin)**	 **Polyimide**	 **(multiple types studied)**	 **Polyimide**
High Frequency Characteristics			Aim: To improve high range performance by reducing divided vibration with harder structure	Adaptations to the phasing plug design further improve high range performance — Patent Pending
Low Frequency Characteristics		Material improves low range performance	Issue: Harder structure degrades low range performance.	Adaptations to the bottom plate design improve low range performance — Patent Pending
Quality & Durability	Phenol's susceptibility to humidity leads to deformation and greater chance of voice coil friction	Stable quality	Aim: To prevent voice coil friction by reducing divided vibration with harder structure	Improved upper cover heat dissipation, further improving durability
Productivity	Requires 1 month curing time	No curing time	No curing time	No curing time

TU-660 / TU-660M Specifications

DRIVER UNIT 60W TU-660

Ring-Type

** New Model **

	TU-660
Applicable Horns	TH-650, TH-652, TH-660
Rated Input	60 W
Rated Impedance	16 Ω
Sensitivity	110 dB (1 W, 1 m) (When operated with JIS C 5504 standard horn.)
Frequency Response	150 Hz -8 kHz (When operated with JIS C 5504 standard horn.)
Dust/Water Protection	IP65 (When a driver is operated with a horn.)
Horn Coupling	1 -3/8 18 threads (inch screw)
Polarity	Hot: Black, Com: White
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Flange: Aluminum, gray, powder coating Rear cover: ABS resin, gray Screws: Stainless steel Speaker cable: Polyvinyl chloride insulated cabtyre cable (6 mm (0.24") in diameter, 600 mm (23.62") in length)
Dimensions	ø139 x 108 (D) mm (ø5.47" X 4.25")
Weight	2 kg (4.41 lb)
Option	Driver unit cover: UC-200A Matching transformer: TM-30, TM-60T

DRIVER UNIT 60W WITH TRANS FORMER TU-660M

Ring-Type

** New Model **

	TU-660M
Applicable Horns	TH-650, TH-652, TH-660
Rated Input	60 W
Line Voltage	100 V line or 70 V line
Rated Impedance	100 V line: 170 Ω (60 W), 330 Ω (30 W), 670 Ω (15 W) 70 V line: 83 Ω (60 W), 170 Ω (30 W), 330 Ω (15 W), 670 Ω (7.5 W)
Sensitivity	110 dB (1 W, 1 m) (When operated with JIS C 5504 standard horn.)
Frequency Response	150 Hz -8 kHz (When operated with JIS C 5504 standard horn.)
Dust/Water Protection	IP65 (When a driver is operated with a horn.)
Horn Coupling	1 -3/8 18 threads (inch screw)
Polarity	Hot: Black, Com: White
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Flange: Aluminum, gray, powder coating Rear cover: ABS resin, gray Screws: Stainless steel Speaker cable: Polyvinyl chloride insulated cabtyre cable (6 mm (0.24") in diameter, 600 mm (23.62") in length)
Dimensions	ø139 x 151 (D) mm (ø5.47" x 5.94")
Weight	2.7 kg (5.95 lb)
Option	Driver unit cover: UC-200A

TU-631 / TU-631M Specifications

DRIVER UNIT 30W TU-631

Dome-Type

	TU-631
Applicable Horns	TH-650, TH-652, TH-660
Rated Input	30 W
Rated Impedance	16Ω
Sensitivity	110 dB (1 W, 1 m) (When operated with JIS C 5504 standard horn.)
Frequency Response	150 Hz -6 kHz (When operated with JIS C 5504 standard horn.)
Dust/Water Protection	IP65 (When a driver is operated with a horn.)
Horn Coupling	1 - 3/8 18 threads (inch screw)
Polarity	Hot: Black, Com: White
Operating Temperature	-20 °C to +60 °C (-4 °F to +140 °F) (no condensation)
Finish	Flange: Aluminum, gray, powder coating Rear cover: ABS resin, gray Screws: Stainless steel Speaker cable: Polyvinyl chloride insulated cabtyre cable (6 mm (0.24") in diameter, 600 mm (23.62") in length)
Dimensions	ø139 x 106 (D) mm (ø5.47" X 4.17")
Weight	1.4 kg (3.08 lb)
Option	Driver unit cover: UC-200A Matching transformer: TM-30T, TM-60T

DRIVER UNIT 30W WITH TRANS FORMER TU-631M

Dome-Type

	TU-631M
Applicable Horns	TH-650, TH-652, TH-660
Rated Input	30 W
Line Voltage	100 V line or 70 V line
Rated Impedance	100 V line: 330 Ω (30 W), 670 Ω (15 W), 1k Ω (10W), 2k Ω (5W) 70 V line: 170 Ω (30 W), 330 Ω (15 W), 670 Ω (7.5 W), 1k Ω (5W), 2k Ω (2.5W)
Sensitivity	110 dB (1 W, 1 m) (When operated with JIS C 5504 standard horn.)
Frequency Response	150 Hz -6 kHz (When operated with JIS C 5504 standard horn.)
Dust/Water Protection	IP65 (When a driver is operated with a horn.)
Horn Coupling	1 - 3/8 18 threads (inch screw)
Polarity	Hot: Black, Com: White
Operating Temperature	-20 °C to +60 °C (-4 °F to +140 °F) (no condensation)
Finish	Flange: Aluminum, gray, powder coating Rear cover: ABS resin, gray Screws: Stainless steel Speaker cable: Polyvinyl chloride insulated cabtyre cable (6 mm (0.24") in diameter, 600 mm (23.62") in length)
Dimensions	ø139 x 149 (D) mm (ø5.47" x 5.86")
Weight	1.9 kg (4.1 lb)
Option	Driver unit cover: UC-200A

TU-651 / TU-651M Specifications

DRIVER UNIT 50W TU-651

Dome-Type

	TU-651
Applicable Horns	TH-650, TH-652, TH-660
Rated Input	50 W
Rated Impedance	16Ω
Sensitivity	110 dB (1 W, 1 m) (When operated with JIS C 5504 standard horn.)
Frequency Response	150 Hz -6 kHz (When operated with JIS C 5504 standard horn.)
Dust/Water Protection	IP65 (When a driver is operated with a horn.)
Horn Coupling	1 - 3/8 18 threads (inch screw)
Polarity	Hot: Black, Com: White
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Flange: Aluminum, gray, powder coating Rear cover: ABS resin, gray Screws: Stainless steel Speaker cable: Polyvinyl chloride insulated cabtyre cable (6 mm (0.24") in diameter, 600 mm (23.62") in length)
Dimensions	ø139 x 106 (D) mm (ø5.47" X 4.17")
Weight	2.0 kg (4.41 lb)
Option	Driver unit cover: UC-200A Matching transformer: TM-30T, TM-60T

DRIVER UNIT 50W WITH TRANS FORMER TU-651M

Dome-Type

	TU-651M
Applicable Horns	TH-650, TH-652, TH-660
Rated Input	50 W
Line Voltage	100 V line or 70 V line
Rated Impedance	100 V line: 200 Ω (50 W), 330 Ω (30 W), 670 Ω (15 W) 70 V line: 100 Ω (50 W), 200 Ω (25W), 330 Ω (15 W), 670 Ω (7.5 W)
Sensitivity	110 dB (1 W, 1 m) (When operated with JIS C 5504 standard horn.)
Frequency Response	150 Hz -6 kHz (When operated with JIS C 5504 standard horn.)
Dust/Water Protection	IP65 (When a driver is operated with a horn.)
Horn Coupling	1 - 3/8 18 threads (inch screw)
Polarity	Hot: Black, Com: White
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Flange: Aluminum, gray, powder coating Rear cover: ABS resin, gray Screws: Stainless steel Speaker cable: Polyvinyl chloride insulated cabtyre cable (6 mm (0.24") in diameter, 600 mm (23.62") in length)
Dimensions	ø139 x 149 (D) mm (ø5.47" x 5.86")
Weight	2.7 kg (5.95 lb)
Option	Driver unit cover: UC-200A

TU-632 / TU-632M Specifications

DRIVER UNIT 30W
TU-632

Dome-Type

	TU-632
Applicable Horns	TH-650, TH-652, TH-660
Rated Input	30 W
Rated Impedance	16 Ω
Sensitivity	110 dB (1 W, 1 m) (When operated with JIS C 5504 standard horn.)
Frequency Response	150 Hz -6 kHz (When operated with JIS C 5504 standard horn.)
Dust/Water Protection	IP65 (When a driver is operated with a horn.)
Horn Coupling	1 - 3/8 18 threads (inch screw)
Polarity	Hot: Black, Com: White
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Flange: Aluminum, white, powder coating Rear cover: HIPS, white Screws: Stainless steel Speaker cable: Polyvinyl chloride insulated cabtyre cable (6 mm (0.24") in diameter, 450 mm (17.72") in length), white
Dimensions	ø139 x 106 (D) mm (ø5.47" X 4.17")
Weight	1.5 kg (3.31 lb)
Option	Driver unit cover: UC-200A Matching transformer: TM-30T, TM-60T

DRIVER UNIT 30W WITH TRANS FORMER
TU-632M

Dome-Type

	TU-632M
Applicable Horns	TH-650, TH-652, TH-660
Rated Input	30 W
Line Voltage	100 V line or 70 V line
Rated Impedance	100 V line: 330 Ω (30 W), 670 Ω (15 W), 1k Ω (10W), 2k Ω (5W) 70 V line: 170 Ω (30 W), 330 Ω (15 W), 670 Ω (7.5 W), 1k Ω (5W), 2k Ω (2.5W)
Sensitivity	110 dB (1 W, 1 m) (When operated with JIS C 5504 standard horn.)
Frequency Response	150 Hz -6 kHz (When operated with JIS C 5504 standard horn.)
Dust/Water Protection	IP65 (When a driver is operated with a horn.)
Horn Coupling	1 - 3/8 18 threads (inch screw)
Polarity	Hot: Black, Com: White
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Flange: Aluminum, white, powder coating Rear cover: HIPS, white Screws: Stainless steel Speaker cable: Polyvinyl chloride insulated cabtyre cable (6 mm (0.24") in diameter, 450 mm (17.72") in length), white
Dimensions	ø139 x 149 (D) mm (ø5.47" x 5.87")
Weight	1.8 kg (3.97 lb)
Option	Driver unit cover: UC-200A

TU-652 / TU-652M Specifications

DRIVER UNIT 50W
TU-652

Dome-Type

	TU-652
Applicable Horns	TH-650, TH-652, TH-660
Rated Input	50 W
Rated Impedance	16 Ω
Sensitivity	110 dB (1 W, 1 m) (When operated with JIS C 5504 standard horn.)
Frequency Response	150 Hz -6 kHz (When operated with JIS C 5504 standard horn.)
Dust/Water Protection	IP65 (When a driver is operated with a horn.)
Horn Coupling	1 - 3/8 18 threads (inch screw)
Polarity	Hot: Black, Com: White
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Flange: Aluminum, white, powder coating Rear cover: HIPS, white Screws: Stainless steel Speaker cable: Polyvinyl chloride insulated cabtyre cable (6 mm (0.24") in diameter, 450 mm (17.72") in length), white
Dimensions	ø139 x 106 (D) mm (ø5.47" X 4.17")
Weight	2 kg (4.41 lb)
Option	Driver unit cover: UC-200A Matching transformer: TM-30T, TM-60T

DRIVER UNIT 50W WITH TRANS FORMER
TU-652M

Dome-Type

	TU-652M
Applicable Horns	TH-650, TH-652, TH-660
Rated Input	50 W
Line Voltage	100 V line or 70 V line
Rated Impedance	100 V line: 200 Ω (50 W), 330 Ω (30 W), 670 Ω (15 W) 70 V line: 100 Ω (50 W), 200 Ω (25 W), 330 Ω (15 W), 670 Ω (7.5 W)
Sensitivity	110 dB (1 W, 1 m) (When operated with JIS C 5504 standard horn.)
Frequency Response	150 Hz -6 kHz (When operated with JIS C 5504 standard horn.)
Dust/Water Protection	IP65 (When a driver is operated with a horn.)
Horn Coupling	1 - 3/8 18 threads (inch screw)
Polarity	Hot: Black, Com: White
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Flange: Aluminum, white, powder coating Rear cover: HIPS, white Screws: Stainless steel Speaker cable: Polyvinyl chloride insulated cabtyre cable (6 mm (0.24") in diameter, 450 mm (17.72") in length), white
Dimensions	ø139 x 149 (D) mm (ø5.47" x 5.87")
Weight	2.7 kg (5.95 lb)
Option	Driver unit cover: UC-200A

TH-650 / TH-652 / TH-660 Specifications

REFLEX HORN SPEAKER
TH-650

	TH-650
Applicable Drivers	TU-631/631M, TU-632/632M, TU-651/651M. TU-652/652M, TU-660/660M
Sensitivity	110 dB (1 W, 1 m) (When operated with a driver.)
Frequency Response	200 Hz - 6 kHz (When operated with a driver.)
Dust/Water Protection	IP65 (When a driver is operated with a driver.)
Driver Coupling	1 - 3/8 18 threads (inch screw)
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Horn flare and flange: Aluminum, off-white, powder coating Reflector horn: ABS resin, off-white Bracket holder: Aluminum, gray, powder coating Bracket: Steel, gray, powder coating Screws and bolts: Stainless steel
Dimensions	ø500 x 394 (D) mm (ø19.68" X 15.51")
Weight	2.9 kg (6.39 lb)

REFLEX HORN SPEAKER
TH-652

	TH-652
Applicable Drivers	TU-631/631M, TU-632/632M, TU-651/651M. TU-652/652M, TU-660/660M
Sensitivity	110 dB (1 W, 1 m) (When operated with a driver.)
Frequency Response	200 Hz - 6 kHz (When operated with a driver.)
Dust/Water Protection	IP65 (When a driver is operated with a driver.)
Driver Coupling	1 - 3/8 18 threads (inch screw)
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Horn flare and flange: Aluminum, white, powder coating Reflector horn: HIPS, white Bracket: Steel, white, powder coating Screws and bolts: Stainless steel
Dimensions	ø500 x 357 (D) mm (ø19.69" X 14.06")
Weight	2.7 kg (5.95 lb)

REFLEX HORN SPEAKER
TH-660

	TH-660
Applicable Drivers	TU-631/631M, TU-632/632M, TU-651/651M. TU-652/652M, TU-660/660M
Sensitivity	110 dB (1 W, 1 m) (When operated with a driver.)
Frequency Response	200 Hz - 6 kHz (When operated with a driver.)
Dust/Water Protection	IP65 (When a driver is operated with a driver.)
Driver Coupling	1 - 3/8 18 threads (inch screw)
Operating Temperature	-20 °C to +55 °C (-4 °F to +131 °F) (no condensation)
Finish	Horn flare and flange: Aluminum, off-white, powder coating Reflector horn: ABS resin, off-white Bracket holder: Aluminum, gray, powder coating Bracket: Steel, gray, powder coating Screws and bolts: Stainless steel
Dimensions	ø600 x 425 (D) mm (ø23.62" X 16.73")
Weight	3.6 kg (7.93 lb)

DH-110 / DH-120 Specifications

STARIGHT HORN SPEAKER DH-110

(DHA-11 + DH-11B)

	DH-110
Applicable Drivers	TU-631/631M, TU-632/632M, TU-651/651M. TU-652/652M, TU-660/660M
Sensitivity	110 dB (1 W, 1 m) (When operated with a driver.)
Frequency Response	180 Hz - 6 kHz (When operated with a driver.)
Driver Coupling	1 - 3/8 18 threads (inch screw)
Variable Installation Angle	Vertical: +10°, -20° (when locally procured mounting bracket is used)
Finish	Horn A: Aluminum, ivory, powder coating L-shaped Adapter and Horn C: Aluminum, ivory, powder coating Bracket: Steel plate, ivory, powder coating
Dimensions	ø518 x 968 (D) mm (ø20.40" X 38.11")
Weight	5.3 kg (11.69 lb)
Accessory	Stainless steel bolt for assembly x 1 set, Gasket x 1 set, Anti-bird net x 1 set

STARIGHT HORN SPEAKER DH-120

(DHA-11 + DH-12B)

	DH-120
Applicable Drivers	TU-631/631M, TU-632/632M, TU-651/651M. TU-652/652M, TU-660/660M
Sensitivity	110 dB (1 W, 1 m) (When operated with a driver.)
Frequency Response	180 Hz - 6 kHz (When operated with a driver.)
Driver Coupling	1 - 3/8 18 threads (inch screw)
Variable Installation Angle	Vertical: +10°, -20° (when locally procured mounting bracket is used)
Finish	Horn A: Aluminum, ivory, powder coating L-shaped Adapter and Adapter: Aluminum, ivory, powder coating Bracket: Steel plate, ivory, powder coating
Dimensions	ø518 x 884 (D) mm (ø20.40" X 34.80")
Weight	5.3 kg (11.69 lb)
Accessory	Stainless steel bolt for assembly x 1 set, Gasket x 1 set, Anti-bird net x 1 set

Diaphragms & Driver Unit Cover

	Dome Diaphragm DG-30DB
Rated Input	50W
Rated Impedance	16Ω
Sensitivity	110dB (1W, 1m)
Frequency Response	150Hz - 6kHz
Applicable Driver Unit	TU-631/631M, TU-632/632M, TU-651/651M. TU-652/652M

	Ring Diaphragm
Rated Input	60W
Rated Impedance	16Ω
Sensitivity	110dB (1W, 1m)
Frequency Response	150Hz - 8kHz
Applicable Driver Unit	TU-660 / 660M

	UC-200A
Finish	Unit Cover: Glass fiber mixed unsaturated polyester resin, ivory Cover Fixing Screw: Stainless Steel
Weight	590g
Accessory	Washer x 2, Throat gasket x 1
Applicable Driver Unit	TU-631/631M, TU-632/632M, TU-651/651M. TU-652/652M, TU-660/TU-660M
Applicable Horn	TH-650, TH-660, TH-652, DH-110, DH-120

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Printed in Singapore (65) 865-1217-01