

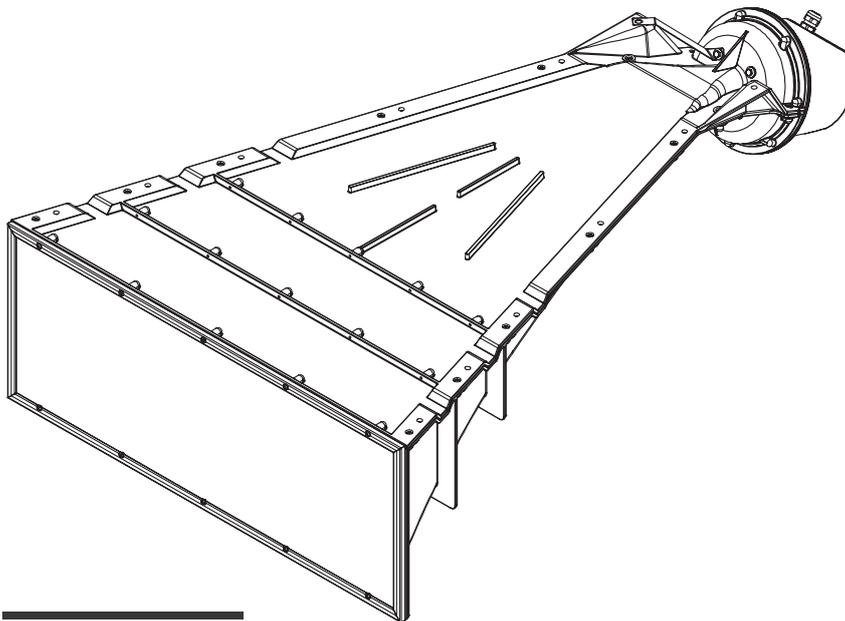
ABF-260/100W PA6 V0

Datasheet

Applies to Part Numbers:

TUN-570285

ABF-260/100W PA6 V0



EN54-24
CERTIFIED

Delivering Clear and Intelligible Messages


AXYS[®]
TUNNEL
by **HARMAN**

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1. Architectural and Engineering Specifications

The unit shall be constructed as a compression driver with 4" diaphragm and 2" exit coupled to a high-directivity waveguide. The waveguide shall be designed according to the patented¹ principle of the Acoustical Boundary Flare (ABF) geometry which ensures the generation of a coherent wavefront when the unit is flush mounted to a reflective plane such as a tunnel ceiling.

The unit is intended for use in both public address and voice alarm systems in environments with high ambient noise levels. It shall be compliant with EN 54-24. The unit shall be suitable for both indoor and outdoor use and therefore shall be compliant with the environmental requirements of EN 54-24 for both types A & B.

The unit shall be suitable for use in 100 V / 70 V professional and industrial audio installations. The audio signal shall be connected to a ceramic terminal block. A thermal fuse shall be included in the internal audio path to automatically disconnect the unit from the 100 V / 70 V line should the unit be exposed to extreme heat and/or fire.

Besides the aforementioned, the unit shall provide the following functionality:

- Fixed Highpass Filter (HPF).
- Power taps: 100 W and 50 W.

The electronics assembly (consisting of connector, fuse, filter and transformer) and the compression driver shall be grouped together inside the unit and shall be accessible by removing the protective rear cover of the unit. A gland shall be provided for cable entry on the top rear of the unit.

The waveguide and rear cover shall be constructed of fire-retardant polyamide (PA 6) with flammability specification according to UL94 with flame classification V0. On the top side of the enclosure a total of eight or more 9 mm mounting holes shall be provided (located on the left and right mounting flange).

As an additional mechanical safety measure, the unit shall be equipped with an external and internal stainless steel (AISI 316) bracket and Steel Wire Rope in order to ensure an additional mechanical interconnection of the compression driver, electronics assembly and rear cover. The mounting hole of the external safety bracket shall coincide with one of the mounting holes of the enclosure. When the unit is properly mounted, this provision shall mechanically secure the compression driver and electronics assembly in case the unit is exposed to extreme heat and/or fire.

A protective front shall be mounted onto the exit of the waveguide. This protective front shall consist of a grill formed by two stainless steel (AISI 316L) perforated plates contained within a fire-retardant rubber boundary frame. The grill properties shall be optimised to offer an optimum trade-off between acoustical performance (minimized HF damping) and water ingress protection. The front shall be removable to facilitate regular cleaning should this be required by the environmental classification with respect to dust deposit.

The complete loudspeaker unit shall meet the following criteria (when driven on the 100 W tap):

Typical frequency range of 300 - 12k Hz on reference axis (+3/-10 dB), max. SPL at 4 m of 117 dB SPL continuous, fixed nominal horizontal opening angle at 4 m of 40° (-6 dB, averaged 500 to 8k Hz), fixed nominal vertical opening angle at 4 m of 58° (-6 dB, averaged 500 to 8k Hz).

Dimensions are 1391 mm (54.8") L x 892 mm (35.1") W x 345 mm (13.6") H. Weight 21 kg (46 lbs).

The loudspeaker unit shall be the AXYS® model ABF-260/100W PA6 V0.

1. Patent publication number WO/2003/069952.

2. Specifications

Acoustical:¹

Frequency range ^{2, 3}	- No EQ	: 300 - 12k Hz (+3/-10 dB)
	- Preferred active EQ ⁴	: 400 - 11k Hz (+/- 3 dB)
Sensitivity (1 W / 4 m) ^{2, 5}	- No EQ	: 99 dB _{SPL}
	- Preferred active EQ ⁴	: 98 dB _{SPL}
Maximum SPL (100 W / 4 m) ^{2, 6}	- No EQ	: 117 dB _{SPL}
	- Preferred active EQ ⁴	: 116 dB _{SPL}
Horizontal coverage (-6 dB) ^{7, 9, 10}	- 500 Hz	: 43°
	- 1k Hz	: 31°
	- 2k Hz	: 37°
	- 4k Hz	: 45°
	- 8k Hz	: 43°
Vertical coverage (-6 dB) ^{8, 9, 10}	- 500 Hz	: 95°
	- 1k Hz	: 69°
	- 2k Hz	: 52°
	- 4k Hz	: 38°
	- 8k Hz	: 35°
Typical throw		: 50 m

Electrical:

Rated Impedance ^{11, 12}	- 100 W tap	: 100 Ω
	- 50 W tap	: 200 Ω
Rated Noise Power ^{4, 11}		: 100 W _{rms}
Rated Noise Voltage ^{4, 11}		: 100 V _{rms}
Polarity		: 100 W tap / 50 W tap = +, 0 V = -
Filters	- Highpass filter ^{13, 14}	: Fixed 1 st order HPF, F-3dB at ~300 Hz
Fuse	- Thermal fuse ¹³	: Open temperature 104 °C Rating >= 8 A @ 250 VAC One-shot operation (replaceable)
Connections	- Terminal block ^{13, 15}	: 100 W tap / 50 W tap / 0 V (common)
	- Material	: Steatite housing with brass inserts
	- Rated cross-section	: 2.5 mm ²
Cable gland	- Type	: PG 13.5
	- Minimum diameter	: 6 mm
	- Maximum diameter	: 12 mm
Suggested amplifiers		: AXYS® 100 V IndustryAmp series

General:

Temperature range (ambient) ¹⁶		: -40 to 70 °C
Transducer	- Type	: Compression driver (2" exit)
	- Diaphragm	: 4" titanium diaphragm
	- Voice Coil	: Aluminium wire on kapton former
	- Magnet assembly	: Neodymium ring magnet Copper shorting cap
Dimensions (L x W x H) ¹⁷		: 1391 mm (54.8") x 892 mm (35.1") x 345 mm (13.6")
Default colour	- Enclosure	: Black
	- Grill	: Metal
	- Grill frame	: Black
Weight		: 21 kg (46 lbs)
Enclosure material	- Enclosure	: Polyamide 6 (PA6)
	- Grill	: Stainless steel (AISI 316L) double perforated plates Rubber frame
	- Fixings ¹⁸	: Stainless steel (AISI 316)
Mounting		: 12 x 9 mm mounting hole
Flammability ¹⁹		: UL 94 / IEC 60695-11-10 class V0
Standards (incl. environmental tests and enclosure protection)		: EN 54-24 Type B (outdoor) ²¹
Enclosure protection ²⁰		: IP 66
Certificates		: CE, EN 54-24

Notes:

1. Measured on the 100 W tap unless specified otherwise. Device equipped with front-grill.
2. Measured at 4 m from the reference point on the reference axis according to EN 54-24:2008 (free field measurement setup). See Physical References section for details.
3. See SPL Plots section for details.
4. With active EQ as allowed in EN 54-24:2008, details of this EQ in Fig 6.
5. Measured with a broad-band pink noise signal, calculated from sound pressure levels analysed in 1/3 octave bands with centre frequencies from 100 - 10k Hz.
6. Measured with simulated programme signal according to IEC 60268-1:1985, 100 V_{rms} with a crest factor of 6 dB.
7. Measured in the horizontal plane at 4 m from the reference point according to EN 54-24:2008 (free field measurement setup). See Physical References section for details.
8. Measured in the vertical plane at 4 m from the reference point according to EN 54-24:2008 (free field measurement setup). See Physical References section for details.
9. Measured with a broad-band pink noise signal analysed in octave bands.
10. Directivity is generally distance dependent, the JBL Professional DDA software package should be used for detailed directivity analysis.
11. Defined according to EN 54-24:2008.
12. See Impedance Plots section for details.
13. Located inside the rear cover. Refer to the related Installation Manual for details.
14. Series capacitors in primary circuit, see Fig 7 and Fig 8 for details.
15. Provides screw terminals for either 100 W or 50 W tap connection. Maximum allowed wire cross-section 6 mm² (for stranded wire with end-sleeve).
16. Maximum ambient temperature for continuous operation is 40 °C. For ambient temperature below 0 °C a Frost protection scheme (as offered by the AXYS® IndustryAmp amplifiers) is advised.
17. Length of enclosure including front grill.
18. Compression driver mounting bolts and washers, security brackets and EJOT PT TX20 screws (grill, horn parts and rear cover).
19. Enclosure, grill frame rubber, rear cover gasket and cable gland materials.
20. Defined according to IEC 60529: 1992 +A2: 2013, valid for rear enclosure only.
21. Also compliant to the requirements of Type A (indoor).

3. SPL Plots

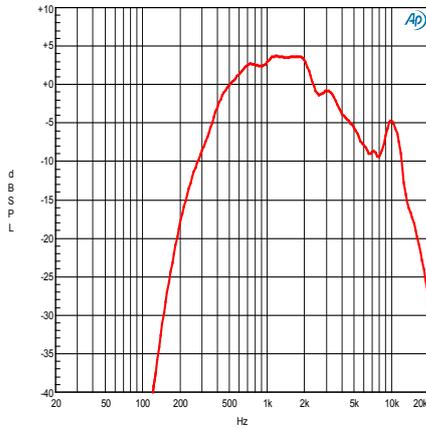


Fig 1 Normalized SPL vs frequency, 100 W tap / No active EQ.

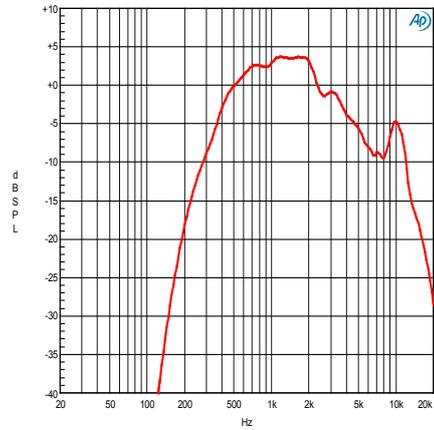


Fig 2 Normalized SPL vs frequency, 50 W tap / No active EQ.

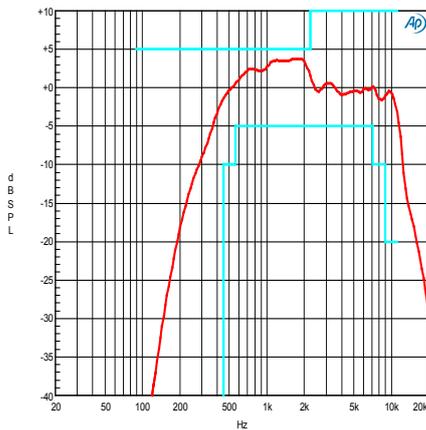


Fig 3 Normalized SPL vs frequency, 100 W tap / Preferred active EQ.

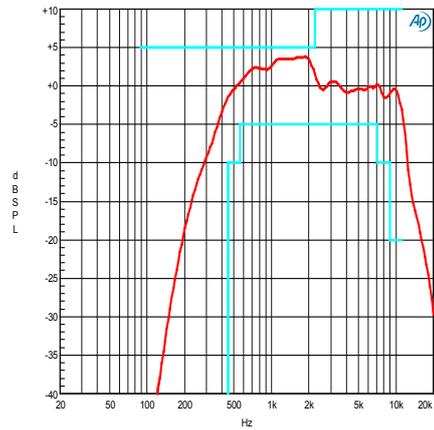


Fig 4 Normalized SPL vs frequency, 50 W tap / Preferred active EQ.

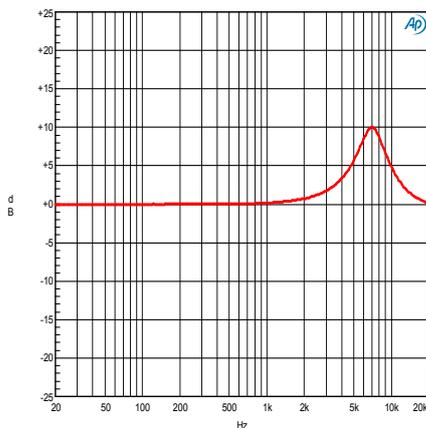


Fig 5 Frequency response of preferred active EQ.

2nd order parametric EQ section with parameters:
 $F_0 = 7.0 \text{ kHz} / Q = 2.0 / \text{Gain} = 10.0 \text{ dB}$

Freq (Hz)	Gain (dB)	Freq (Hz)	Gain (dB)
< 800	0.0	5k	5.7
1k	0.1	6.3k	9.2
1.25k	0.2	8k	8.7
1.6k	0.3	10k	4.9
2k	0.5	12.5k	2.3
2.5k	0.7	16k	0.8
3.15k	1.9	20k	0.2
4k	3.4		

Fig 6 Details of preferred active EQ, gain at 1/3 oct centre frequencies.

Notes:

- SPL magnitude data obtained from corrected ground plane measurements, MLS method, 8 ms time window, 1/3 oct averaged. SPL plots scaled to 3.5 dB SPL at 1.5k Hz.

- Preferred active EQ data is valid for 'Bell sym' parametric EQ type with parameters as shown in Fig 6. This EQ is provided by the DSP processing in the AXYS® IndustryAmp series amplifiers (e.g. PB-400 or PB-800).

4. Passive Highpass Filter Plots

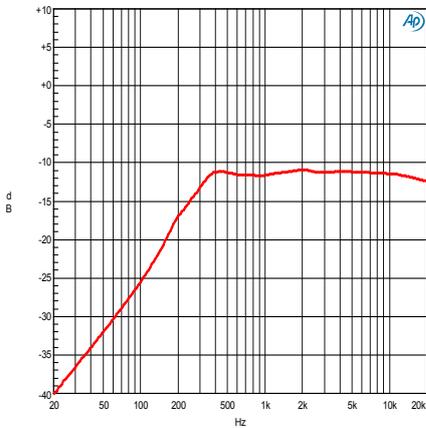


Fig 7 HPF transfer function (100 W tap).

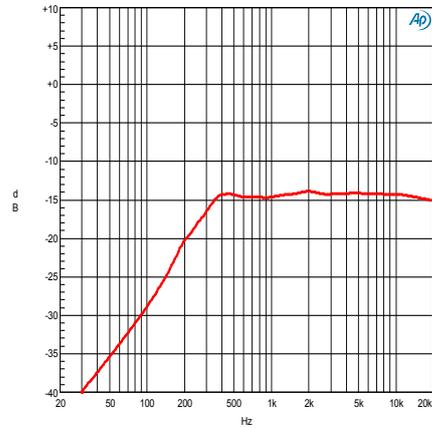


Fig 8 HPF transfer function (50 W tap).

Note:

Electrical transfer function magnitude vs frequency from primary input to compression driver terminals.

5. Impedance Plots

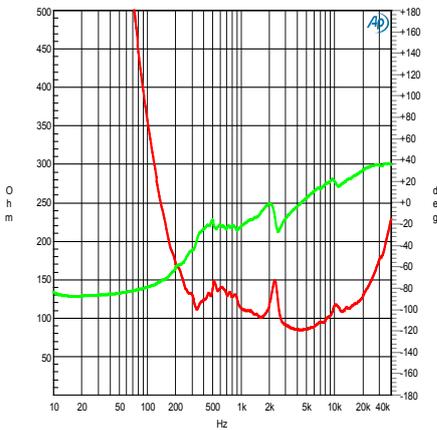


Fig 9 Impedance magnitude (red) and phase (green) vs frequency, 100 W tap.

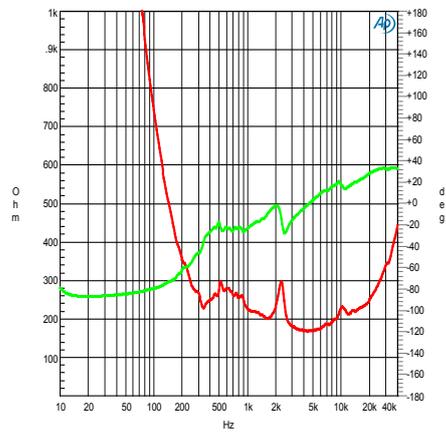
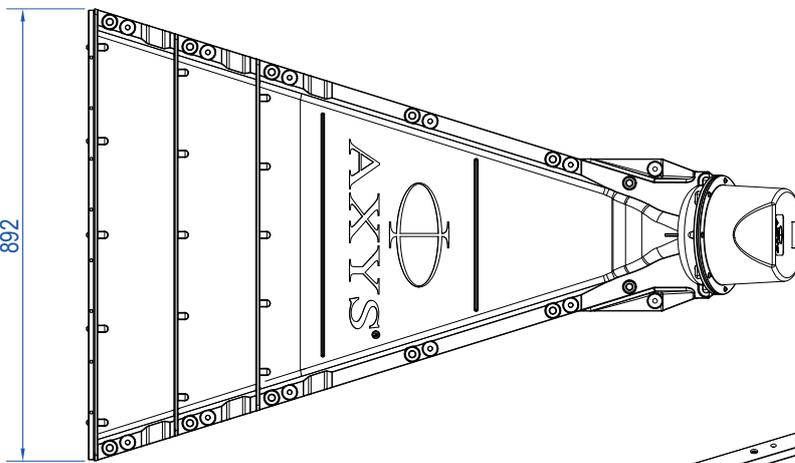
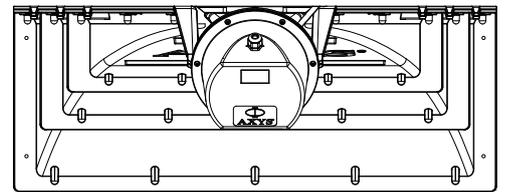
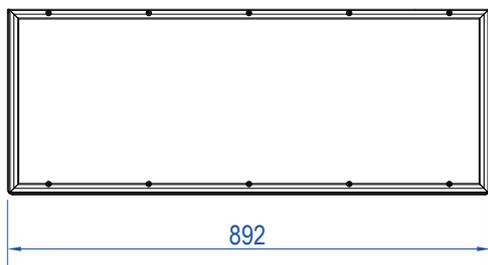
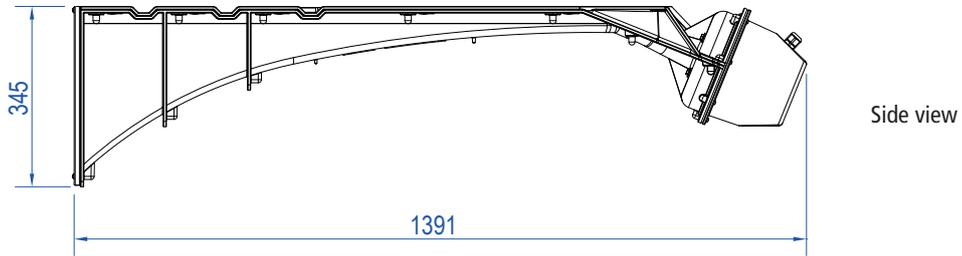
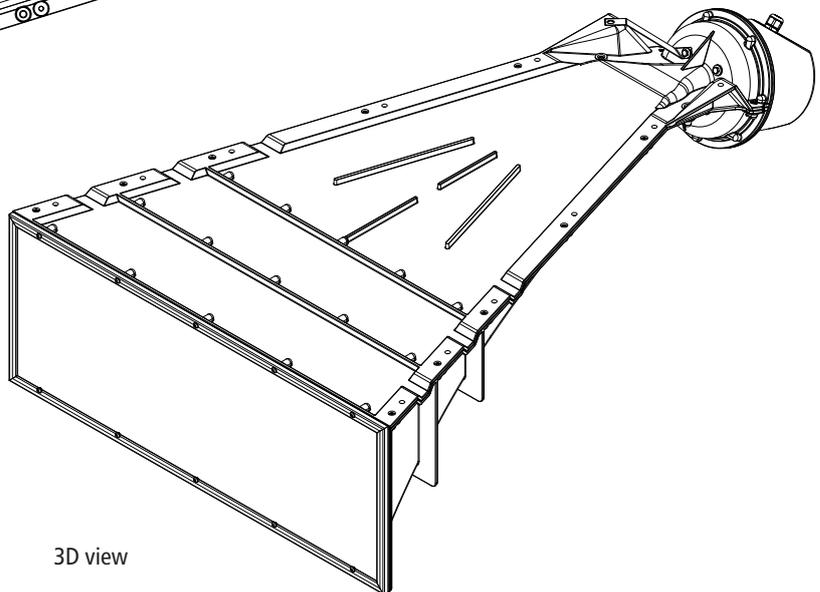


Fig 10 Impedance magnitude (red) and phase (green) vs frequency, 50 W tap.

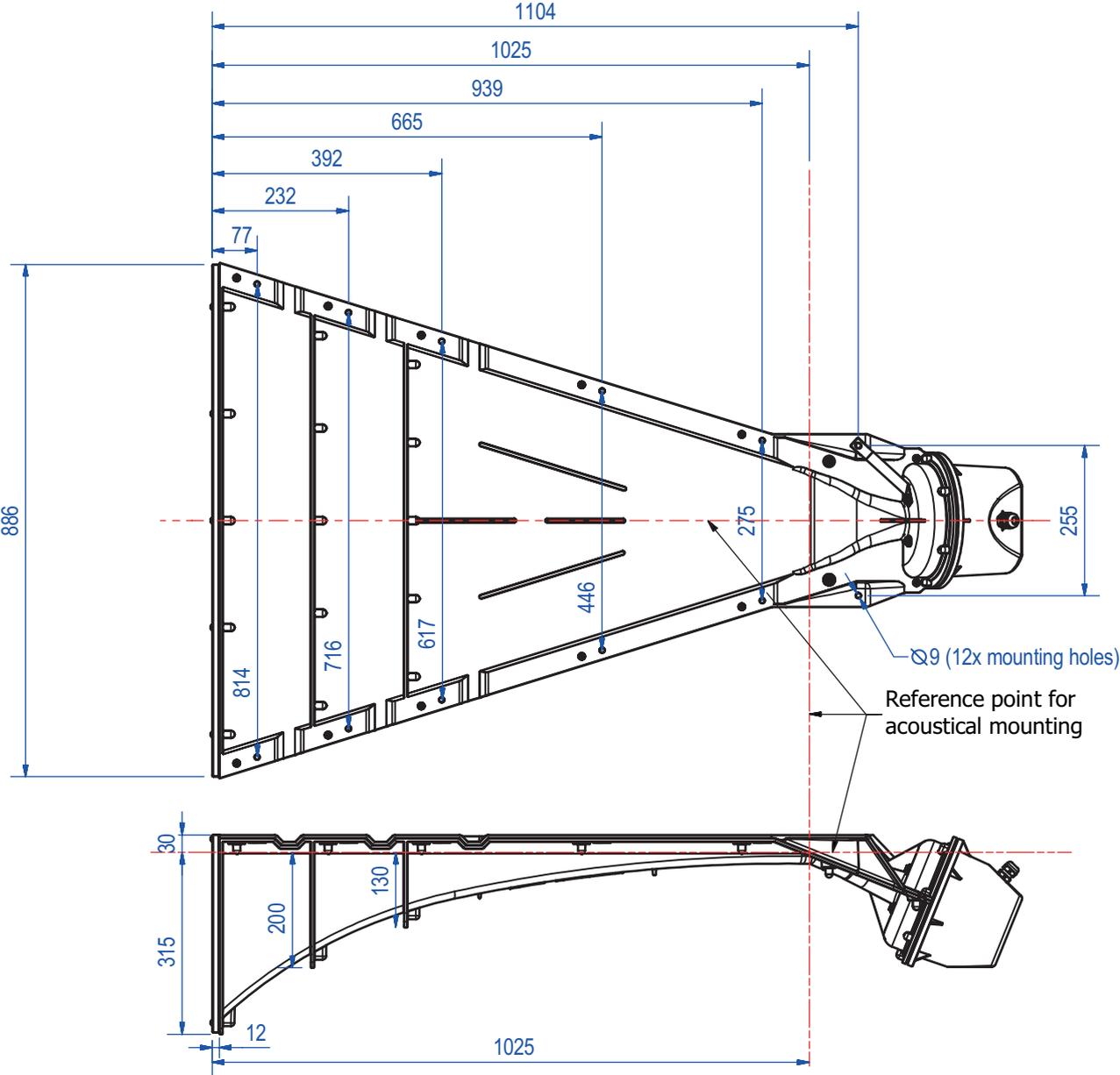
6. Mechanical Details



Top view

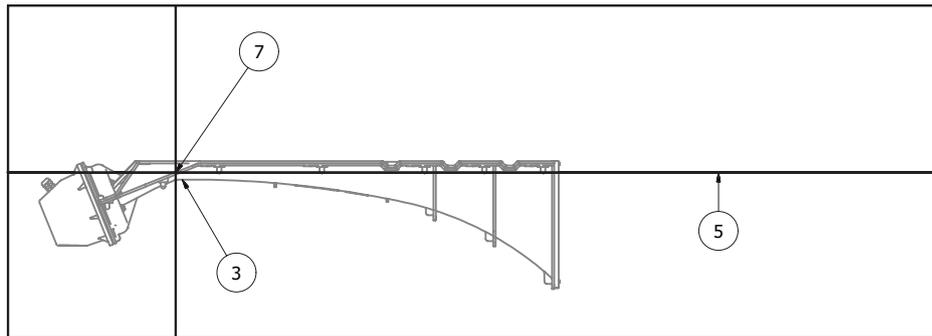
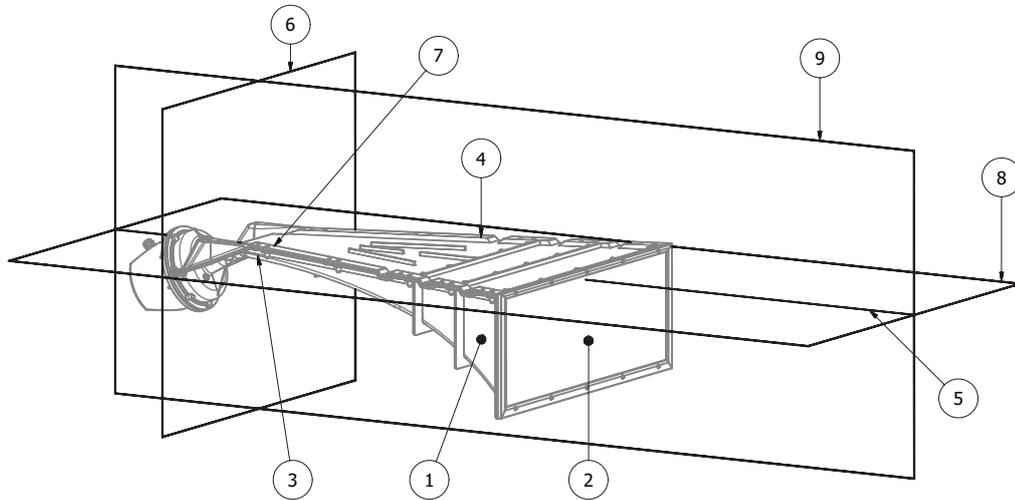


all dimensions are in mm



Locations of the mounting holes.

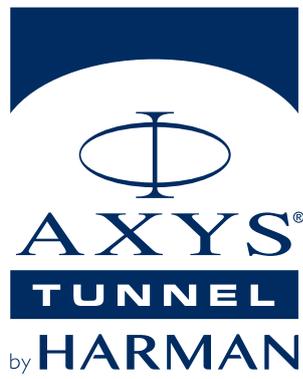
7. Physical References



Key	
1	horn
2	front grill
3	horn apex
4	horn mounting surface
5	reference axis
6	reference plane
7	reference point
8	horizontal plane
9	vertical plane

Notes:

1. The reference plane (6) intersects the enclosure through the horn apex (3).
2. The reference point (7), located in the reference plane (6), coincides with the centre of the horn apex (3).
3. The reference axis (5), through the reference point (7), is perpendicular to the reference plane (6).
4. The horizontal plane (8) is perpendicular to the reference plane (6) and parallel to the preferred mounting surface (4) of the horn (1).
5. The horizontal plane (8) and the vertical plane (9) contain the reference axis (5).



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