Acoustic Testing – Powered Products

Acoustic testing of Titon mechanical ventilation products is conducted in accordance with the following standards:

CME – BS EN 13141-6 – "Ventilation for buildings. Performance testing of components/products for residential ventilation. Exhaust ventilation system packages used in a single dwelling."

MVHR – BS EN 13141-7 – "Ventilation for buildings. Performance testing of components/products for residential ventilation. Performance testing of a mechanical supply and exhaust ventilation units (including heat recovery) for mechanical ventilation systems intended for single family dwellings."

The results are presented in the following format which provides details of the acoustic performance of the unit at each of the standard speed settings.

The 'A' Weighted Sound Power Level in dB is an "in-duct" measurement for the Outlet and Inlet given across the frequency range from 125Hz to 8kHz.

The overall level is the logarithmic addition of the frequency bands to give a single figure, this is provided with and without an 'A' weighting.

The casing breakout is a sound pressure level at a distance of 3 metres, this figure is the lowest quoted and is usually stated in the product literature. It is calculated from the Overall L_{WA} (sound power level) with a reduction to convert to the sound pressure at 3 meters.

Acoustic data

Standard: BS EN 13141-7:2004

Product **HRV1 Qplus**

		'A' Weighted Sound Power Levels dB re. 1pW Frequency Hz							Overall L_W	Overall L_{WA}	Casing Breakout dBA @ 3m
Speed		125	250	500	1k	2k	4k	8k			
1	Outlet	31	32	36	24	16	18	22	49	39	9
	Inlet	26	24	29	18	16	18	22	43	32	
	Breakout	11	15	23	14	13	18	22	31	27	
2	Outlet	42	42	49	40	31	21	22	59	51	14
	Inlet	31	32	35	24	17	18	22	48	38	
	Breakout	16	21	29	19	15	18	22	37	31	
3	Outlet	45	46	50	55	37	27	23	63	57	16
	Inlet	33	36	36	31	20	18	22	51	41	
	Breakout	22	26	31	26	17	18	22	41	34	
4	Outlet	49	50	51	58	42	33	26	67	60	20
	Inlet	36	39	39	36	24	19	22	54	44	
	Breakout	23	28	35	31	20	19	22	43	37	
5	Outlet	51	53	54	56	46	38	30	69	60	23
	Inlet	39	42	41	39	28	20	22	57	47	
	Breakout	26	35	37	34	24	22	22	47	40	
6	Outlet	54	56	57	57	50	42	36	72	63	27
	Inlet	42	45	45	41	32	23	22	59	49	
	Breakout	28	33	44	36	28	24	22	50	45	
7	Outlet	58	59	60	60	54	46	41	75	66	32
	Inlet	44	47	49	45	37	27	23	62	53	
	Breakout	30	36	49	39	32	28	22	54	50	
8	Outlet	59	63	63	63	59	50	46	77	69	33
	Inlet	47	51	51	47	42	31	25	65	56	
	Breakout	32	38	49	42	37	32	24	55	51	

Measurements taken at full speed with a resistance of 50Pa, then at the nominal speed settings of the unit and corresponding pressure.
Inlet and outlet levels are Induct

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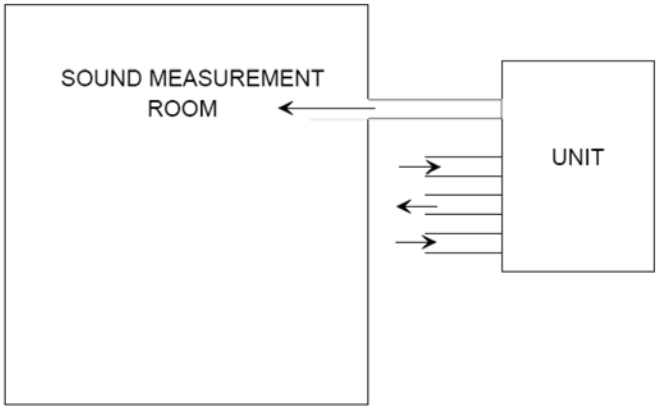
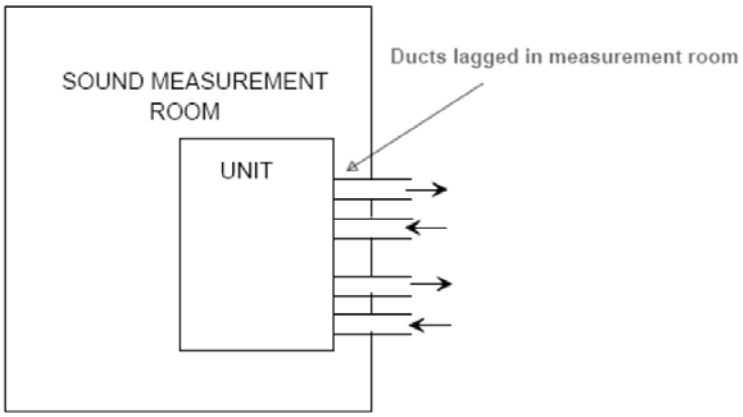
MVHR – Installation set up used during testing

In-duct sound power level measurement – the unit is installed with the outlet (or inlet) connected to the measurement room.

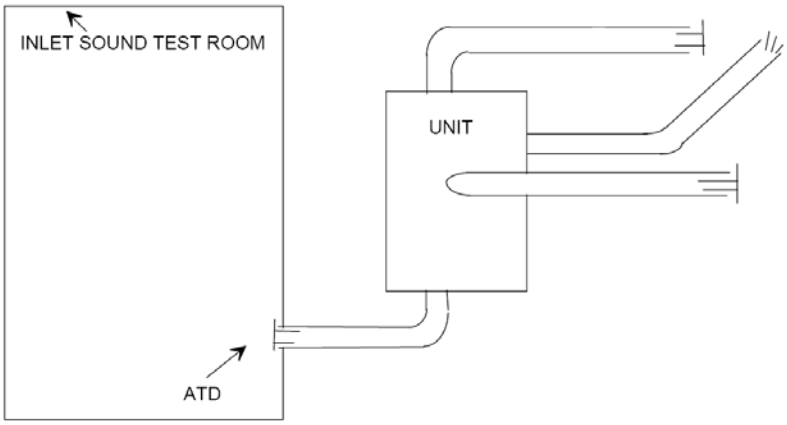


Casing breakout – the inlet and outlet ducts are connected to a separate room so the only noise measured is breakout from the casing.

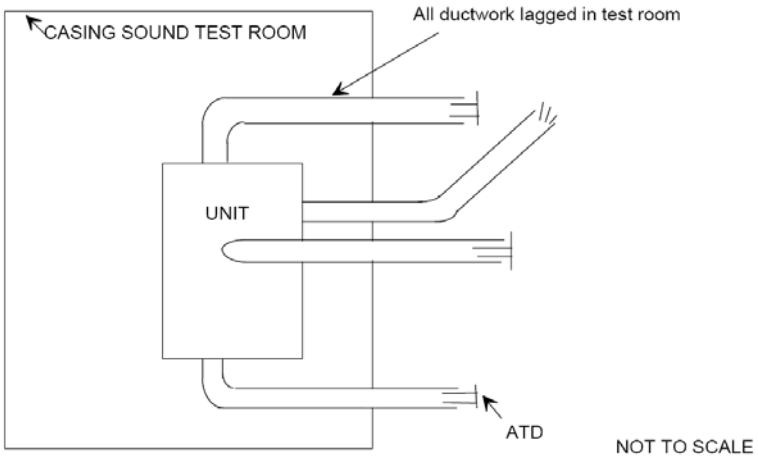


CME – Installation set up used during testing

Inlet sound power levels – all 3 inlets from the CME are fitted with a standard duct set up (as BS EN 13141-6), one is connected to the measuring room and the inlet sound power level recorded. The three inlets are connected to a 90 degree bend, 0.5m duct and an air terminal device.
The single outlet connected to a 0.5m duct, 45 degree bend, 2m duct and grille.
All duct work is 204 x 60mm plastic.



Casing breakout – the inlet and outlet ducts are connected to a separate room so the only noise measured is breakout from the casing.



Glossary

Sound Power Level – is a measurement of the actual sound level created at the source, it is not therefore affected by the environment into which the product is installed. This will always be the highest level quoted as no reductions have been applied for either the environment or distance from the source. Actual installed levels will therefore be significantly lower than these figures, but they are a useful base from which any system calculations can be derived.

Sound Pressure Level – this must be quoted at a given distance and is dependant on both the distance from the source and the environment (a hard walled reflective surface will have a higher level compared to a soft furnished room which absorbs more sound). Titon levels are given at a distance of 3m (which is common) and are free field, hemispherical radiation.

Free Field – An environment in which there are no reflective surfaces (useful to describe the sound pressure levels for comparative purposes)

Hemispherical Radiation – Sound radiates from a source in all directions, where the product is mounted on a wall or ceiling some sound is reflected from this mounting face. The casing sound pressure levels are based on hemispherical radiation which will be slightly higher than spherical radiation.

'A' Weighting – this is a correction to the frequency bands to replicate the sensitivity of the human ear to different frequencies. The weighting can be removed from the octave bands if required, the corrections are given in the table below.

Frequency Hz	125	250	500	1000	2000	4000	8000
'A' Weighting	-16	-9	-3	0	1	1	-1

Octave band – sound is produced at various frequencies and is therefore measured across a range of frequency or octave bands (as the above table). The figures can be combined to give an overall level using logarithmic addition.

In Duct Levels – a measurement of sound that is taken inside the duct of a ventilation system, this is likely to be a higher level than a non-ducted measurement.

Casing Breakout – a measurement of the sound that breaks out of the casing of a unit, the sound from the inlet and outlets of the unit does not form part of this measurement.