

## Acoustic data



Standard: BS EN 13141-7:2010 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

Product

**HRV4 Q Plus Eco**

Speed		'A' Weighted Sound Power Levels dB re. 1pW								Overall L <sub>W</sub>	Overall L <sub>WA</sub>	Casing Breakout dBA @ 3m
		Frequency Hz										
		63	125	250	500	1k	2k	4k	8k			
14l/s @ 1.4Pa (18%)	Induct Outlet	25	24	25	26	22	18	19	22	51	32	9
	Induct Inlet	23	22	24	19	17	17	20	22	50	30	
	Breakout	4	11	16	19	17	16	19	21	33	26	
30l/s @ 6Pa (30%)	Induct Outlet	28	37	37	41	36	28	20	22	57	45	12
	Induct Inlet	23	33	33	28	24	18	19	22	53	37	
	Breakout	4	15	21	26	22	18	19	21	36	30	
47.9l/s @ 15Pa (41%)	Induct Outlet	38	47	48	50	47	41	29	23	67	54	20
	Induct Inlet	26	42	43	36	35	26	20	22	60	46	
	Breakout	7	27	33	33	31	26	20	21	46	38	
65l/s @ 27Pa (53%)	Induct Outlet	44	49	55	55	53	49	39	28	72	60	26
	Induct Inlet	32	45	49	42	41	34	24	22	64	52	
	Breakout	11	25	38	41	36	33	22	21	50	44	
80.4l/s @ 41Pa (65%)	Induct Outlet	48	53	65	60	57	55	45	35	78	67	31
	Induct Inlet	35	49	53	45	45	40	29	22	68	55	
	Breakout	14	30	44	44	40	39	27	22	55	48	
96.2l/s @ 66Pa (77%)	Induct Outlet	49	56	67	64	61	60	50	42	80	70	34
	Induct Inlet	39	53	61	50	48	45	35	24	73	62	
	Breakout	17	34	46	47	43	44	32	22	57	51	
113.8l/s @ 93Pa (88%)	Induct Outlet	51	59	65	75	65	64	54	47	82	76	44
	Induct Inlet	44	56	56	60	51	49	39	28	75	63	
	Breakout	25	36	47	61	47	48	37	23	65	61	
123.1l/s @ 100Pa (100%)	Induct Outlet	51	60	63	74	67	65	56	49	82	76	41
	Induct Inlet	43	55	57	59	53	50	41	30	74	63	
	Breakout	22	37	45	57	49	50	38	24	62	59	

Measurements taken at full speed with a resistance of 100Pa, then at the stated percentage speed settings of the unit and corresponding reduced pressure  
 Inlet and outlet levels are Induct (BS EN 13141-7 clause 6.4.2 requirement), casing breakout is hemispherical - for spherical subtract 3dB  
 Titon acoustic data is independently tested at Sound Research Laboratories  
 Data is specifically tested for the Eco unit (100% bypass) - non bypass variants with deeper heat exchangers will offer lower acoustic levels

Product

<b>HRV4 Q Plus Eco</b>
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Speed		Sound Power Levels dB re. 1pW								Overall $L_W$	Overall $L_{WA}$	Overall dBA @ 3m Hemispherical	Overall dBA @ 3m Spherical
		Frequency Hz											
		63	125	250	500	1k	2k	4k	8k				
14l/s @ 1.4Pa (18%)	Open Outlet	33	27	27	26	21	17	18	23	36	28	11	8
	Open Inlet	31	25	26	19	16	16	19	23	34	26	9	6
	Breakout	30	27	25	22	17	15	18	22	33	26	9	6
30l/s @ 6Pa (30%)	Open Outlet	36	40	39	41	35	27	19	23	46	41	23	20
	Open Inlet	31	36	35	28	23	17	18	23	40	31	14	11
	Breakout	30	31	30	29	22	17	18	22	36	30	12	9
47.9l/s @ 15Pa (41%)	Open Outlet	46	50	50	50	46	40	28	24	56	51	33	30
	Open Inlet	34	45	45	36	34	25	19	23	49	40	23	20
	Breakout	33	43	42	36	31	25	19	22	46	38	20	17
65l/s @ 27Pa (53%)	Open Outlet	52	52	57	55	52	48	38	29	61	57	39	36
	Open Inlet	40	48	51	42	40	33	23	23	54	46	28	25
	Breakout	37	41	47	44	36	32	21	22	50	44	26	23
80.4l/s @ 41Pa (65%)	Open Outlet	56	56	67	60	56	54	44	36	69	63	45	42
	Open Inlet	43	52	55	45	44	39	28	23	57	50	32	29
	Breakout	40	46	53	47	40	38	26	23	55	48	31	28
96.2l/s @ 66Pa (77%)	Open Outlet	57	59	69	64	60	59	49	43	71	66	49	46
	Open Inlet	47	56	63	50	47	44	34	25	64	56	38	35
	Breakout	43	50	55	50	43	43	31	23	57	51	34	31
113.8l/s @ 93Pa (88%)	Open Outlet	59	62	67	75	64	63	53	48	76	73	56	53
	Open Inlet	52	59	58	60	50	48	38	29	64	59	42	39
	Breakout	51	52	56	64	47	47	36	24	65	61	44	41
123.1l/s @ 100Pa (100%)	Open Outlet	59	63	65	74	66	64	55	50	76	73	56	53
	Open Inlet	51	58	59	59	52	49	40	31	64	59	42	39
	Breakout	48	53	54	60	49	49	37	25	62	59	41	38

Measurements taken at full speed with a resistance of 100Pa, then at the stated percentage speed settings of the unit and corresponding reduced pressure

To enable simplified comparisons with other manufacturers data the above information is tested in accordance with BS EN 13141-7, the end reflection as defined in EN ISO 5135

for a 125mm (204x60mm) duct mounted flush with the wall, has been removed to provide an open outlet/open inlet sound power measurement (see page 1 of 2 for original data)

Figures shown are not 'A' weighted (other than the overall  $L_{WA}$ /dBA columns)

Titon acoustic data is independently tested at Sound Research Laboratories

Data is specifically tested for the Eco unit (100% bypass) - non bypass variants with deeper heat exchangers will offer lower acoustic levels

81353-SRL-RP-XT-001-P1 5/5/23

## Acoustic Testing – Powered products

Acoustic testing of Titon mechanical ventilation products is measured 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 and are 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 ‘A’ weighting

The casing breakout is a sound pressure level at a distance of 3 meters, this figure is the lowest quoted and is usually stated in catalogue details. It is calculated from the Overall L<sub>WA</sub> (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**

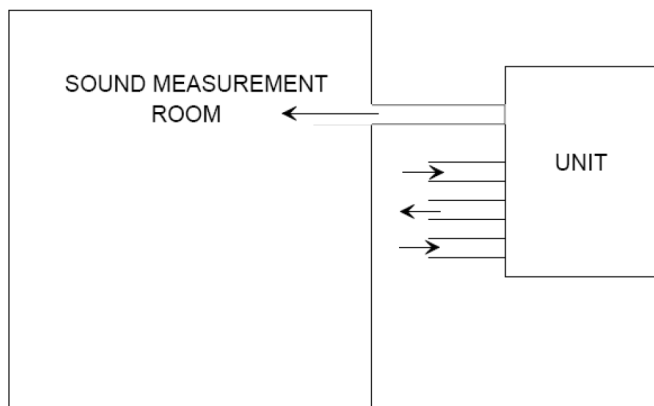
Speed		'A' Weighted Sound Power Levels dB re. 1pW							Overall L <sub>W</sub>	Overall L <sub>WA</sub>	Casing Breakout dB @ 3m
		Frequency Hz									
		125	250	500	1k	2k	4k	8k			
1	Outlet	31	32	36	24	16	18	22	49	39	9
	Inlet	26	24	29	18	16	18	22	43	32	
	Breakout	11	15	23	14	13	18	22	31	27	
2	Outlet	42	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 In-duct

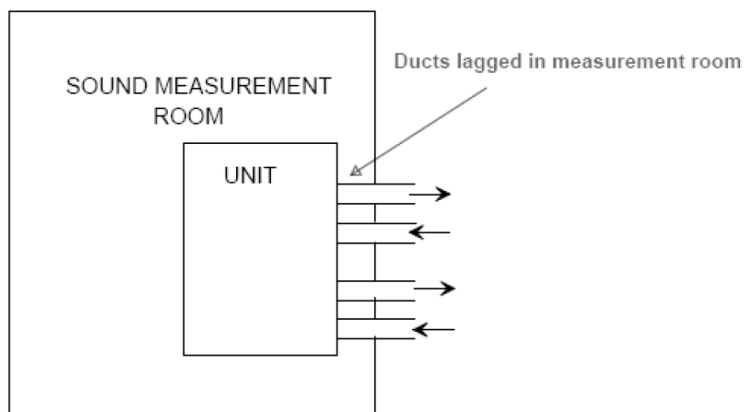
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MVHR – Installation set up used during testing

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

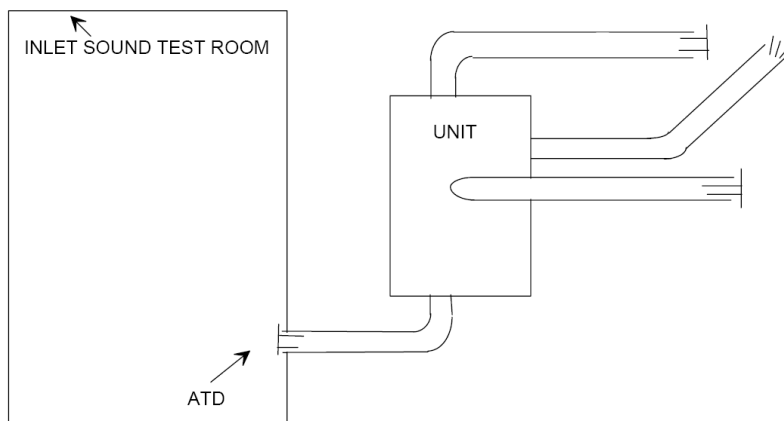


Casing breakout – the inlet and outlet ducts are connected to a separate room so the only noise measured is breakout from the casing

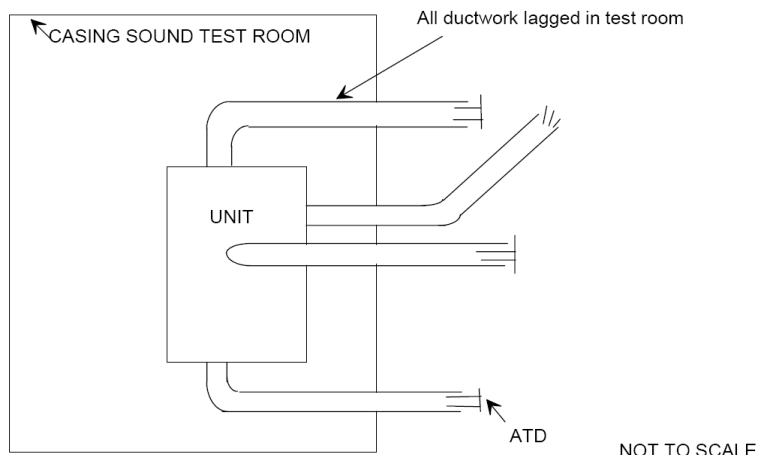


CME – Installation set up used during testing

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 connected with 90 degree bend, 0.5m duct, air terminal device  
The single outlet connected with 0.5m duct, 45 degree bend, 2m duct, grille  
All duct work 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 in which the product is installed. This will always be the highest levels 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 useful from which to base any system calculations.

**Sound Pressure Level** – this must be quoted at a given distance and is dependant on both the distance from the source and environment (a hard walled reflective surface will have a higher level than a soft furnished room which absorbs more sound). Tition levels are given at a distance of 3m (which is commonly quoted) 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.