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 **HRV4.25 Q Plus Eco**

		'A' Weighted Sound Power Levels dB re. 1pW Frequency Hz								Overall L_W	Overall L_{WA}	Casing Breakout dBA @ 3m
Speed		63	125	250	500	1k	2k	4k	8k			
13.5l/s @ 1Pa (18%)	Induct Outlet	28	26	26	27	20	18	20	22	54	34	9
	Induct Inlet	24	24	24	19	16	17	19	22	51	30	
	Breakout	3	11	17	20	19	16	19	21	34	27	
35.2l/s @ 5.3Pa (30%)	Induct Outlet	32	44	42	45	41	34	23	22	63	50	16
	Induct Inlet	23	37	36	31	29	21	20	22	55	41	
	Breakout	6	20	25	31	27	20	20	22	40	34	
57.8l/s @ 15Pa (41%)	Induct Outlet	41	49	61	54	52	47	36	26	73	63	27
	Induct Inlet	29	46	58	40	39	33	23	22	68	58	
	Breakout	9	26	42	39	35	31	21	21	52	44	
80.8l/s @ 29Pa (53%)	Induct Outlet	47	54	70	61	58	57	45	36	81	71	32
	Induct Inlet	34	50	54	48	45	42	30	23	69	57	
	Breakout	15	31	47	44	41	40	27	22	57	50	
104l/s @ 46Pa (65%)	Induct Outlet	51	58	71	68	63	63	52	44	83	73	36
	Induct Inlet	40	54	60	53	50	48	37	26	73	62	
	Breakout	21	35	48	50	46	46	34	22	59	54	
134.9l/s @ 69Pa (77%)	Induct Outlet	54	61	65	79	68	67	59	50	85	80	44
	Induct Inlet	44	57	58	61	55	52	43	32	76	65	
	Breakout	30	38	47	61	51	51	41	25	66	62	
150.3 l/s @ 96Pa (88%)	Induct Outlet	58	63	68	79	72	71	65	54	88	81	47
	Induct Inlet	53	60	60	64	58	56	49	37	81	68	
	Breakout	41	43	50	64	54	54	47	29	70	65	
157.8 l/s @ 100Pa (100%	Induct Outlet	60	64	68	79	73	72	66	55	88	81	47
	Induct Inlet	49	60	61	64	59	56	50	37	79	68	
	Breakout	41	41	50	63	55	54	47	31	70	64	

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

Acoustic data

Product **HRV4.25 Q Plus Eco**

		Sound Power Levels dB re. 1pW Frequency Hz								Overall L_W	Overall L_{WA}	Overall dBA @ 3m Hemispherical	Overall dBA @ 3m Spherical
Speed		63	125	250	500	1k	2k	4k	8k				
13.5l/s @ 1Pa (18%)	Open Outlet	36	29	28	27	19	17	19	23	38	29	11	8
	Open Inlet	32	27	26	19	15	16	18	23	35	26	9	6
	Breakout	29	27	26	23	19	15	18	22	34	27	9	6
35.2l/s @ 5.3Pa (30%)	Open Outlet	40	47	44	45	40	33	22	23	51	45	28	25
	Open Inlet	31	40	38	31	28	20	19	23	43	34	17	14
	Breakout	32	36	34	34	27	19	19	23	40	34	16	13
57.8l/s @ 15Pa (41%)	Open Outlet	49	52	63	54	51	46	35	27	64	58	40	37
	Open Inlet	37	49	60	40	38	32	22	23	60	52	34	31
	Breakout	35	42	51	42	35	30	20	22	52	44	27	24
80.8l/s @ 29Pa (53%)	Open Outlet	55	57	72	61	57	56	44	37	73	66	48	45
	Open Inlet	42	53	56	48	44	41	29	24	59	51	33	30
	Breakout	41	47	56	47	41	39	26	23	57	50	32	29
104l/s @ 46Pa (65%)	Open Outlet	59	61	73	68	62	62	51	45	75	69	52	49
	Open Inlet	48	57	62	53	49	47	36	27	64	56	39	36
	Breakout	47	51	57	53	46	45	33	23	59	54	36	33
134.9l/s @ 69Pa (77%)	Open Outlet	62	64	67	79	67	66	58	51	80	77	59	56
	Open Inlet	52	60	60	61	54	51	42	33	66	61	43	40
	Breakout	56	54	56	64	51	50	40	26	66	62	44	41
150.3 l/s @ 96Pa (88%)	Open Outlet	66	66	70	79	71	70	64	55	81	78	61	58
	Open Inlet	61	63	62	64	57	55	48	38	69	64	47	44
	Breakout	67	59	59	67	54	53	46	30	70	65	47	44
157.8 l/s @ 100Pa (100%)	Open Outlet	68	67	70	79	72	71	65	56	81	79	61	58
	Open Inlet	57	63	63	64	58	55	49	38	69	64	47	44
	Breakout	67	57	59	66	55	53	46	32	70	64	47	44

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

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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_{WA} (sound power level) with a reduction to convert to the sound pressure at 3 meters.

Acoustic data

Titon®

Standard: BS EN 13141-7:2004

Product **HRV1 Qplus**

		'A' Weighted Sound Power Levels dB re. 1pW Frequency Hz							Overall	Overall	Casing Breakout
Speed		125	250	500	1k	2k	4k	8k	L_W	L_{WA}	dBA @ 3m
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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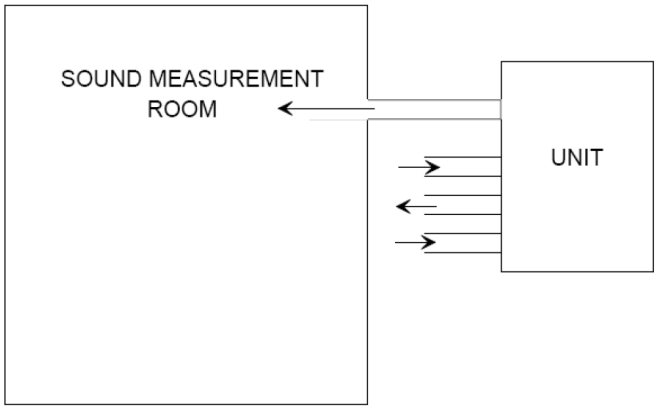
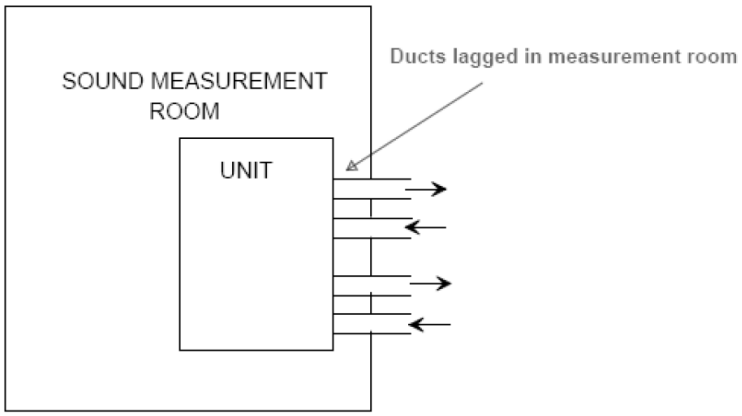
MVHR – Installation set up used during testing

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

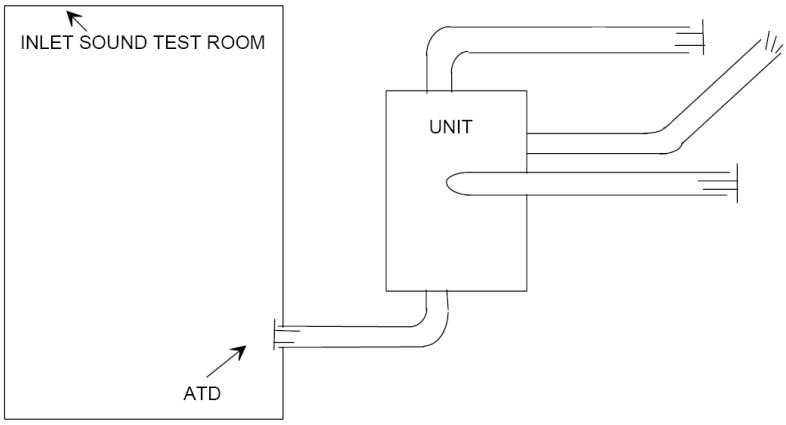


Casing breakout – the inlet and outlet ducts are connected to a separate room so the only noise measured is breakout from the casing

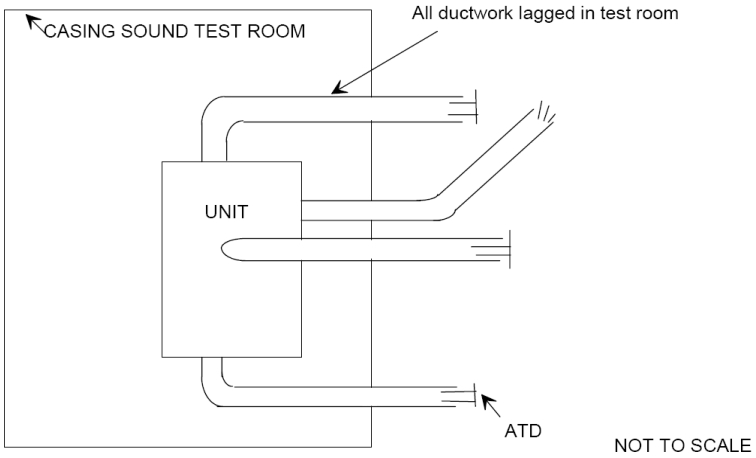


CME – Installation set up used during testing

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). Titon 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 if 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.