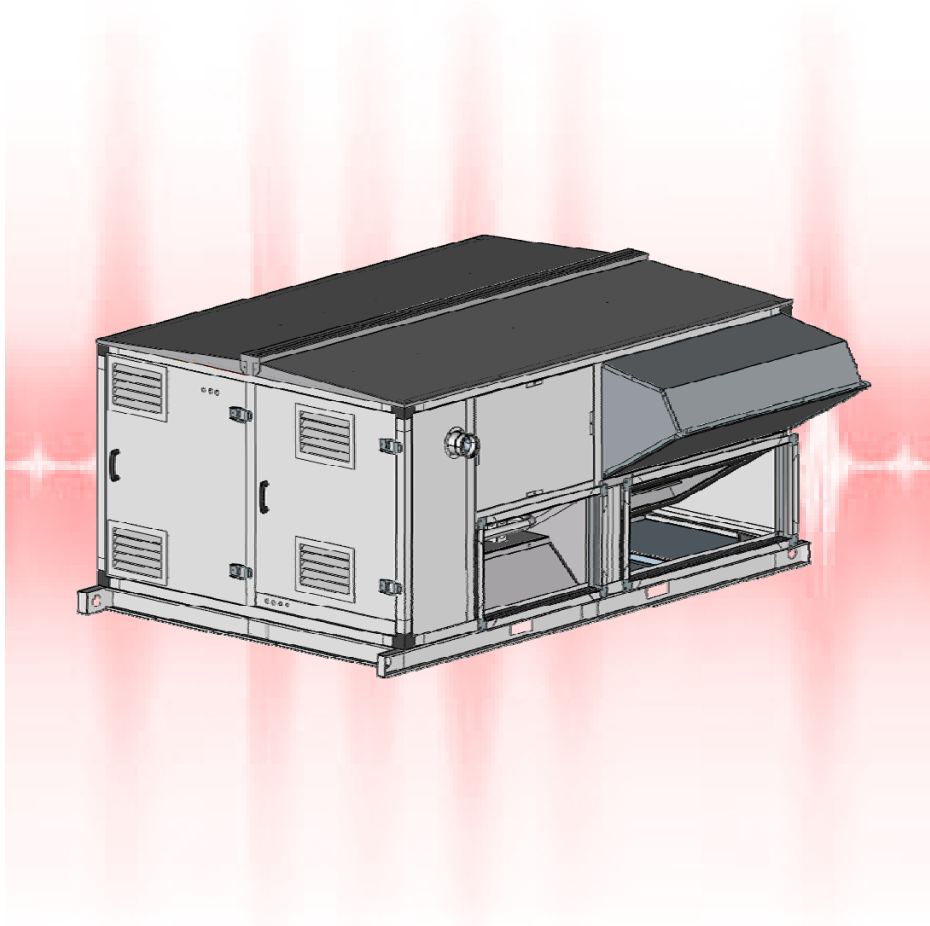


IDFBDX SOUND POWER LEVELS



WARNINGS

- 1 This appliance must only be installed by a competent person in accordance with the requirements of the Codes of Practice or the rules in force.
- 2 All external wiring **MUST** comply with the current IEE wiring regulations.

Date : 18 September 2012

PROJECT : Nordair Niche

SUBJECT : AHU Sound Power Level Calculations

1.0 Introduction

1.1 Following the completion of sound power level calculations for various configurations of air handling units, this design note sets out the basis and techniques employed in the calculations.

1.2 The accuracy of calculations of this nature cannot be determined but have generally been found to be quite conservative when verified against measurement but are, of course, dependent on the accuracy of the source noise data.

2.0 Fan Noise Data

2.1 The calculations are based manufacturer's fan sound power level data taken from data sheets supplied by Nordair Niche. The accuracy or provenance of this data is not known.

3.0 Inlet Sound Level Calculations

3.1 The inlet sound power and sound pressure level calculations have been completed using industry standard duct-borne noise transmission calculation procedures. The calculations include the effects of the following:

- AHU internal equipment such as coils and filters
- Plenum losses
- Bend losses
- End reflection (for sound pressure level only)
- Directivity (for sound pressure level only)

4.0 Casing Radiated Sound Power Level Calculations

4.1 The casing radiated calculations have been completed using casing sound reduction indices provided by Nordair Niche. This data is quoted to have been measured using **ISO 140-10**. This is not the appropriate part of **ISO 140** for testing the sound insulation of panels. This part of **ISO 140** is for the testing of small building elements such as transfer air devices, ventilators, cable ducts etc.

4.2 Each unit is divided into sections to account for which section is subject to fan inlet or fan outlet noise, and also to take into account internal losses within the unit. The total casing radiated sound power level is the logarithmic sum of the sound power level of each section.

Nordair Niche AHU Sound Data

York Replacement Units	Sound Power Level, dB re 10 ⁻¹² W								
	Sound Pressure Level, dB re 20 µPa								
	Octave Band Centre Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	dBA
IDF2DX90S1-EBM									
Inlet Sound Power Level	68	76	70	65	64	62	60	57	70
Casing Radiated Sound Power Level	68	76	71	58	50	45	38	33	65
Free Field Sound Pressure Level at 1 metre	56	67	66	61	61	59	58	55	67
IDF2DX120S1-EBM									
Inlet Sound Power Level	65	66	68	66	65	63	67	58	72
Casing Radiated Sound Power Level	65	68	68	58	51	46	45	34	62
Free Field Sound Pressure Level at 1 metre	53	58	63	62	62	61	65	56	69
IDF2DX150S1-EBM									
Inlet Sound Power Level	67	66	70	68	67	67	73	63	76
Casing Radiated Sound Power Level	66	67	69	61	54	50	49	38	63
Free Field Sound Pressure Level at 1 metre	55	57	65	64	64	65	70	61	73
IDF3DX180S1-EBM									
Inlet Sound Power Level	64	68	67	66	68	66	62	60	72
Casing Radiated Sound Power Level	65	70	69	61	54	50	42	37	64
Free Field Sound Pressure Level at 1 metre	53	61	62	62	65	64	60	58	69
IDF3DX200S1-EBM									
Inlet Sound Power Level	69	64	71	69	69	70	66	68	76
Casing Radiated Sound Power Level	69	68	71	64	57	53	45	44	66
Free Field Sound Pressure Level at 1 metre	58	57	66	65	66	68	63	66	73
IDF4DX240S1-EBM									
Inlet Sound Power Level	66	74	69	66	71	69	63	61	75
Casing Radiated Sound Power Level	69	76	70	64	62	54	45	39	67
Free Field Sound Pressure Level at 1 metre	56	66	64	62	68	66	61	59	72
IDF2DX90S1									
Inlet Sound Power Level	81	75	70	70	75	74	71	67	79
Casing Radiated Sound Power Level	77	73	68	57	54	52	47	41	64
Free Field Sound Pressure Level at 1 metre	68	66	65	66	72	72	69	65	77
IDF2DX120S1									
Inlet Sound Power Level	80	80	73	73	74	73	71	68	79
Casing Radiated Sound Power Level	76	79	71	61	53	51	47	42	67
Free Field Sound Pressure Level at 1 metre	67	71	68	69	71	71	69	66	76
IDF2DX150S1									
Inlet Sound Power Level	82	80	74	74	76	76	75	72	82
Casing Radiated Sound Power Level	78	79	72	62	56	54	51	46	68
Free Field Sound Pressure Level at 1 metre	69	71	69	70	73	74	73	70	79
IDF3DX180S1									
Inlet Sound Power Level	83	81	73	74	76	73	71	67	80
Casing Radiated Sound Power Level	81	82	73	63	56	53	49	43	69
Free Field Sound Pressure Level at 1 metre	71	73	68	70	73	71	69	65	77
IDF3DX200S1									
Inlet Sound Power Level	85	83	75	75	77	75	73	68	81
Casing Radiated Sound Power Level	83	83	75	64	57	55	51	44	71
Free Field Sound Pressure Level at 1 metre	73	75	70	71	74	73	71	66	78
IDF4DX240S1									
Inlet Sound Power Level	84	80	75	76	78	74	73	70	82
Casing Radiated Sound Power Level	82	80	75	65	58	54	51	46	70
Free Field Sound Pressure Level at 1 metre	72	72	70	72	75	72	71	68	79

Notes:

All data is calculated from fan manufacturer's fan sound power level data and casing SRI data.

All data excludes the contribution of noise from the heater and are for 100% Fresh Air Mode.

Total sound pressure level at 1m is a combination of inlet and casing radiated noise in front of inlet and excludes the effect of the weather cowl.

Radiated sound pressure levels calculated using conformal surface area in accordance with **ISO 3744:1995**.

Inlet sound power levels exclude end reflection.

Nordair Niche AHU Sound Data

In-line Units	Sound Power Level, dB re 10 ⁻¹² W								
	Sound Pressure Level, dB re 20 µPa								
	Octave Band Centre Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	dBA
IDF2DX90S11-EBM									
Inlet Sound Power Level	65	77	74	67	65	62	60	57	71
Casing Radiated Sound Power Level	65	75	68	52	43	39	35	30	63
Free Field Sound Pressure Level at 1 metre	53	68	69	63	62	59	58	55	68
IDF2DX120S11-EBM									
Inlet Sound Power Level	62	67	72	68	66	63	67	58	73
Casing Radiated Sound Power Level	62	66	66	53	44	41	43	31	59
Free Field Sound Pressure Level at 1 metre	50	59	67	64	63	61	65	56	70
IDF2DX150S11-EBM									
Inlet Sound Power Level	64	67	74	70	68	67	73	63	77
Casing Radiated Sound Power Level	64	65	67	55	46	45	48	37	60
Free Field Sound Pressure Level at 1 metre	52	58	69	66	65	65	70	61	74
IDF3DX180S11-EBM									
Inlet Sound Power Level	61	69	71	68	68	66	62	60	73
Casing Radiated Sound Power Level	63	70	67	55	48	46	39	35	61
Free Field Sound Pressure Level at 1 metre	50	62	66	64	65	64	60	58	70
IDF3DX200S11-EBM									
Inlet Sound Power Level	66	65	75	71	69	70	66	68	76
Casing Radiated Sound Power Level	68	65	71	58	49	49	43	43	63
Free Field Sound Pressure Level at 1 metre	55	58	70	67	66	68	63	66	73
IDF4DX240S11-EBM									
Inlet Sound Power Level	63	75	73	68	71	69	63	61	75
Casing Radiated Sound Power Level	66	75	69	56	51	48	40	36	63
Free Field Sound Pressure Level at 1 metre	53	67	68	64	68	66	61	59	72
IDF2DX90S11									
Inlet Sound Power Level	78	76	74	72	76	74	71	67	80
Casing Radiated Sound Power Level	78	74	68	57	54	51	46	40	63
Free Field Sound Pressure Level at 1 metre	66	68	69	68	73	72	69	65	77
IDF2DX120S11									
Inlet Sound Power Level	77	81	77	75	75	73	71	68	80
Casing Radiated Sound Power Level	77	79	71	60	53	50	46	41	66
Free Field Sound Pressure Level at 1 metre	65	73	72	71	72	71	69	66	77
IDF2DX150S11									
Inlet Sound Power Level	79	81	78	76	77	76	75	72	82
Casing Radiated Sound Power Level	79	79	72	61	55	53	50	45	67
Free Field Sound Pressure Level at 1 metre	67	73	73	72	74	74	73	70	80
IDF3DX180S11									
Inlet Sound Power Level	80	82	77	76	76	73	71	67	80
Casing Radiated Sound Power Level	81	81	72	62	55	52	47	41	68
Free Field Sound Pressure Level at 1 metre	69	74	72	72	73	71	69	65	77
IDF3DX200S11									
Inlet Sound Power Level	82	84	79	77	77	75	73	68	82
Casing Radiated Sound Power Level	83	83	74	63	56	54	49	42	70
Free Field Sound Pressure Level at 1 metre	71	76	74	73	74	73	71	66	79
IDF4DX240S11									
Inlet Sound Power Level	81	81	79	78	78	74	73	70	82
Casing Radiated Sound Power Level	83	81	74	64	57	53	50	45	70
Free Field Sound Pressure Level at 1 metre	70	73	74	74	75	72	71	68	79

Notes:

All data is calculated from fan manufacturer's fan sound power level data and casing SRI data.

All data excludes the contribution of noise from the heater and are for 100% Fresh Air Mode.

Total sound pressure level at 1m is a combination of inlet and casing radiated noise in front of inlet and excludes the effect of the weather cowl.

Radiated sound pressure levels calculated using conformal surface area in accordance with **ISO 3744:1995**.

Inlet sound power levels exclude end reflection.

Nordair Niche AHU Sound Data

Trane Replacement Units	Sound Power Level, dB re 10 ⁻¹² W								
	Sound Pressure Level, dB re 20 µPa								
	Octave Band Centre Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	dBA
IDF2DX120S1T									
Inlet Sound Power Level	76	78	77	70	75	75	73	70	81
Casing Radiated Sound Power Level	72	73	72	59	56	54	49	44	66
Free Field Sound Pressure Level at 1 metre	64	70	72	66	72	73	71	68	78
IDF2DX150S1T									
Inlet Sound Power Level	87	81	75	71	76	74	72	68	80
Casing Radiated Sound Power Level	84	76	70	60	56	53	48	42	66
Free Field Sound Pressure Level at 1 metre	75	73	70	67	73	72	70	66	77

Nordair Niche AHU Sound Data

Heat Recovery Unit - IDF1DXHXPL	Sound Power Level, dB re 10 ⁻¹² W								
	Sound Pressure Level, dB re 20 µPa								
	Octave Band Centre Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	dBA
Inlet Sound Power Level	66	64	79	68	63	64	60	56	73
Exhaust Sound Power Level	72	69	83	73	76	76	69	64	81
Casing Radiated Sound Power Level	64	59	69	49	43	41	32	26	61
Inlet Free Field Sound Pressure Level at 1 m	55	56	74	64	60	62	58	54	69
Exhaust Free Field Sound Pressure Level at 1 m	60	61	78	69	73	73	67	62	78

Notes:

All data is calculated from fan manufacturer's fan sound power level data and casing SRI data.

All data excludes the contribution of noise from the heater and are for 100% Fresh Air Mode.

Total sound pressure level at 1m is a combination of inlet and casing radiated noise in front of inlet and excludes the effect of the weather cowl.

Radiated sound pressure levels calculated using conformal surface area in accordance with **ISO 3744:1995**.

Inlet sound power levels exclude end reflection.



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