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United Kingdom
SK4 3EJ

Our Reference

125489/99/1/19

Subject

Sandilands Primary School

06 February 2025

For the attention of William Tatterton,

Please find attached our attenuator technical submittal.

- Unless detailed otherwise, attenuators are based upon our standard constructional specification, available at

<https://caice.co.uk/wp-content/uploads/2022/12/Product-Specification-for-Standard-Attenuators.pdf>

We trust this meets with your approval, however if you require any further details or clarification then please do not hesitate to contact us.

Yours faithfully,

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RG41 5QS

Registered office and
head office

Company Registration Number
2790667
VAT Registration Number
GB614683632

DESIGN APPRAISAL

Project: Sandilands Primary School

Enquiry Data

Our product selections are based on the following information:

- Specification sections : SRP1034-AEC-XX-XX-T-J-0001 Rev D
 - Schedule numbers : SRP1034-DGL-ZZ-XX-SH-M-5707 P03
 - Drawing numbers :
SRP1034-DGL-ZZ-00-D-M-5713 Rev C04
SRP1034-DGL-ZZ-RF-D-M-0501
- Noise data : As attached schedule

Please ensure that this is the correct data and advise of any subsequent revisions as this may affect the performance of our products.

Project Design Criteria

The following noise criteria has been used as the basis of our design appraisal:

Internal:

- As per Table 2.1 in SRP1034-AEC-XX-XX-T-J-0001 Rev D

Measured in fully furnished rooms at a distance of 1.5 metres from any grille, diffuser or wall structure, or 1.5 metres above floor level in rooms exceeding 3.0 metres in height.

External:

- 34dB(A) at a distance of 67 metres from intake and discharge openings or to control noise break in back through openable windows.

In the absence of a specified external noise criteria we have used the above as a provisional criteria, enabling us to undertake preliminary calculations. We would recommend that you seek approval of this criteria from your client and the local Environmental Health Department.

Plant Noise Data

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Our calculations are based on the fan manufacturer's sound power level data excluding their stated measurement tolerance. If required we can reselect the attenuators taking into account this tolerance but our price will increase accordingly.

Attenuator Selection

The attenuators have been selected to achieve the design criteria as listed previously. The following noise paths have been taken into account:

- Primary fan noise transmission through the ductwork distribution system to internal occupied areas via grills/diffusers.
- Fan noise transmission through the ductwork distribution system to external areas, via the intake and discharge openings (where attenuators are proposed).

Attenuator Location

To comply with BS EN ISO7235:2009, all our attenuator pressure losses are stated assuming laminar inlet and outlet airflow. Where unfavourable inlet and outlet conditions exist, allowance should be made in the system pressure for increased attenuator resistances. Please be aware that actual resistances measured across attenuators installed in poorly designed ductwork arrangements can be 3-4 times higher than that shown on our schedules.

Where attenuators are located outside the building, we would suggest that they are treated to the same specification as any associated external ductwork.

Acoustic Treatment to ductwork

Where attenuators are located in plantroom areas, it is good design practice to acoustically lag the ductwork from the attenuator to the point at which the duct penetrates and exits the plantroom structure. This is particularly appropriate in noisy plantrooms, to reduce the possibility of noise re-entry into the duct on the "quiet" side of the attenuator.

It is not recommended that main plant attenuators be installed in or above areas with specified noise design criteria. If this situation is unavoidable, then additional acoustic treatment (such as double skinning of attenuators) may be required in order to achieve a satisfactory noise climate.

Radiated Noise from Equipment Casings and Ductwork

Where mechanical equipment is located in or above areas with specified noise criteria, it is essential that the level of noise radiated from the equipment casings is controlled to an appropriate level.

As radiated noise levels from plant and equipment are not affected by in-duct attenuation, additional acoustic treatment (such as bulkheads or enclosures) may be required in order to achieve a satisfactory noise climate.

The responsibility for achievement of criteria due to noise radiation from equipment casings should be placed upon the relevant manufacturers. The manufacturers should be issued with sufficient design information to enable them to underwrite the acoustic performance of their products relative to this particular application.

Attenuators will only reduce duct borne fan noise via the distribution grilles, which is the extent of our responsibility and therefore acoustic lagging maybe required between the equipment casing and attenuators. Any such lagging should also include the casing of the attenuator.

Ductwork Systems

To reduce the possibility of airflow generated noise exceeding the specified design criteria, good design practice (with reference to DW/144, HVAC and CIBSE recommendations) should be adopted when considering ductwork



geometry and fittings.

Ductwork configurations that promote turbulent airflow must be avoided, particularly in close proximity to acoustically critical components such as attenuators, grilles, diffusers, dampers etc. In some cases, excessive resistances arising from poor ductwork design may prevent ventilation systems from achieving their full design duty.

Dampers should be installed as far away from air terminals as possible, and used only for fine trimming. Where major reductions in airflow or pressure are required, then fan speed reduction or system design should be considered.

Ductwork Velocities

With consideration to acoustics, the following guide duct velocities (m/s) should be adhered to where possible:

Description	NR40	NR35	NR30	NR25
Riser	9.0	7.5	6.0	5.0
Main Branch (above ceiling)	6.0	5.0	4.0	3.0
Grille	3.0	2.5	2.0	1.5
Diffuser	2.5	2.0	1.5	1.0
Stub duct (above ceiling)	4.0	3.0	2.0	1.5

Attenuator Schedule

Sandilands Primary School

Schedule Date
30/01/2025
Caice Reference
125489/Q00005

Notes

1. All products shall be supplied by Caice or equal and approved, as per their file reference 125489, contact James Tingey on james.tingey@caice.co.uk or call 07557 275745.
2. The Contractor shall order the attenuators scheduled below, and shall send finalised drawings and equipment noise levels to the attenuator supplier to check the selections prior to manufacture.
3. The attenuator supplier shall then undertake acoustic calculations to ensure that the attenuators achieve the specified noise criteria, based upon the finalised information.
4. A Technical Submittal comprising acoustic calculations and a finalised schedule of attenuators shall then be issued to the Consultant for final approval.
5. If an alternative attenuator supplier is proposed then the Contractor shall allow for them to undertake witnessed tests to prove their claimed insertion loss performance in a UKAS accredited BS EN ISO 7235: 2009 test facility, for two sample units. This shall be undertaken prior to order.
6. Pressure losses are stated in accordance with ISO 7235, which is based on laminar airflow conditions. The system designer shall make allowance for increased attenuator pressure losses where turbulent airflow conditions exist on the attenuator entry or exit.
7. Unless stated otherwise all attenuators shall be constructed as follows: Galvanised sheet steel casings with 30mm profile flanges that are fully compliant with DW/TM1 at a high pressure rating (+2000/-750Pa). Profile flanges shall be compatible with Doby, Mez & Metu flanging systems. Elements shall be installed in the vertical plane, with side elements provided as standard, and all elements shall have aerodynamic inlet and outlet fairings. Element facings shall be constructed from expanded galvanised steel mesh with fibre glass tissue bonded to the inner face. Mineral wool infill shall be overpacked to minimise voids due to settlement. Attenuator ends shall be protectively wrapped, and all attenuators shall be delivered to site on pallets and individually labelled.

Product Reference	Product Description	Product Code	Width	Dimensions (mm) Height	Length	Volume (m³/s)	Pressure Loss (Pa)	Quantity	Features
ATT-RF-01	KEF-01 Exhaust	Rectangular LG01H/3C/L/SM	550	300	900	1.06	36	1	Rectangular attenuator & Horizontal elements
ATT-RF-02	KEF-01 Extract	Rectangular LG01V/3C/L/SM	575	750	1200	1.06	30	1	Rectangular attenuator
ATT-AHU-01	AHU-01 Fresh Air Intake	Rectangular SG01V/3C/L/S	540	540	600	0.90	22	1	Rectangular attenuator
ATT-AHU-02	AHU-01 Supply	Rectangular SG01H/3C/L/S	575	575	1200	0.90	30	1	Rectangular attenuator & Horizontal elements

Product Code Definitions

Sandilands Primary School

Quotation Date
30/01/2025
Caice Reference
125489/Q00005

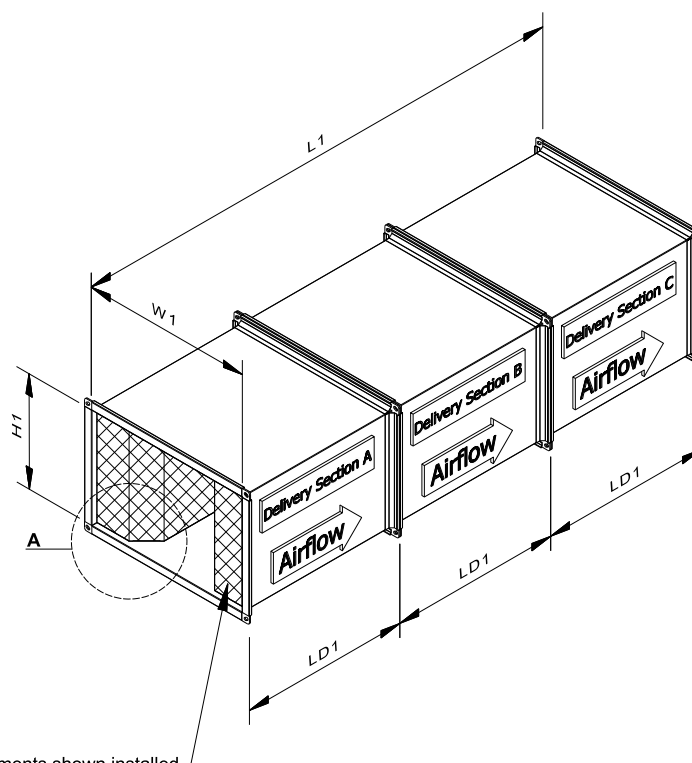
Attenuator



Code Section	Code	Definition
Model	L	Rectangular attenuator with LINING elements
	S	Rectangular attenuator with SPLITTER elements
Material	G	Standard gauge galvanised sheet steel
Delivery Sections	01	Number of sections delivered to site
Element Type	V	Elements installed in the vertical plane
	H	Elements installed in the horizontal plane
Pressure Rating	3	High pressure (+2000/-750Pa)
End Connections	C	30mm profile flanges (profile flanges are compatible with Doby, Mez & Metu flanges)
Packing	L	Lightweight pallet wrapping on casing ends (EG/IG units are palletised and wrapped on the pallet)
Optional Features	S	Side elements (for EG/IG units these are supplied with steel backing)
	M	Infill protected by Melinex polyester film



Sandilands Primary School (125489/Q00005)



Lining elements shown installed in the vertical plane. Refer to item Product Code for actual orientation.

Assembly of multiple piece items must be in accordance with the delivery section and airflow label layouts, typically as shown opposite. Assembly by others.

Where LD1 exceeds 1250 each delivery section has an intermediate central flange.

See NDL in table below for number of delivery sections in length per item.

Nuts, bolts, flange clamps and gasket between flanges by others.

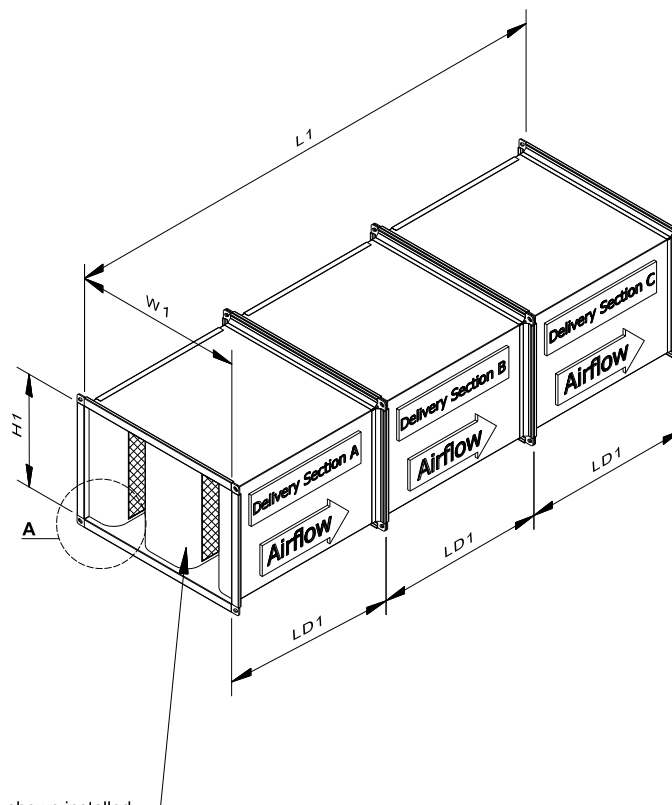
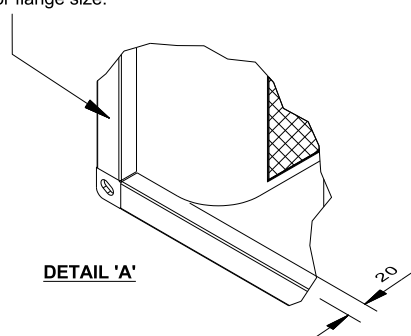
Tolerances on W1 & H1 +/- 2mm.

All dimensions in mm.

Delivery section and airflow labels only provided on multiple piece items.
W1 and H1 dimensions are inside case.
Tolerances on LD1 +/- 3mm.

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Splitter elements shown installed in the vertical plane. Refer to item Product Code for actual orientation.

All dimensions in mm.

Tolerances on LD1 +/- 3mm.

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Equipment Noise Data Schedule

Sandilands Primary School

Schedule Date
30/01/2025
Caice Reference
125489/Q00005

Roof - Plant

Product Reference	Product Description	Noise Data Source	Vol (m³/s)	Total Static Pressure (Pa)	Octave Band Mid Frequency (Hz)								Noise Data Type
					63	125	250	500	1k	2k	4k	8k	
ATT-RF-01	KEF-01 Exhaust	Manufacturer	1.06	-	83	86	85	86	80	81	81	67	Manufacturer
ATT-RF-02	KEF-01 Extract	Manufacturer	1.06	-	82	92	88	81	76	79	79	70	Manufacturer
ATT-AHU-01	AHU-01 Fresh Air Intake	Manufacturer	0.90	-	26	75	78	65	59	47	43	31	Manufacturer
ATT-AHU-02	AHU-01 Supply	Manufacturer	0.90	-	26	88	88	79	75	73	66	63	Manufacturer

