Enterprise House, Blyth Road, Hayes, Middx. UB3 1DD

Telephone: 020 8848 3031 Fax: 020 8573 3605

QF6270/A1/MGR/CW

8th March 2010

Peter Deer & Associates,
South Point House
321 Chase Road
Southgate
London
N14 6JT

For the attention of Mr. Gareth Whinney

Dear Sir,

Re: 37 Queens Grove, London

We hereby acknowledge receipt of your e.mail of the 4th of march 2010 with regard to the above project and have pleasure in attaching herewith our quotation for the silencers required to achieve the following noise level criteria from duct borne fan noise:-

Externally: 25dBA at 1 metre from the windows of the next door property

Internally: NR 35 in swimming pool area

In selecting the necessary equipment we have used the following sound power level data as the basis of our calculations:-

Fan/Duty		Sound Power Level (db ref 10^{-12} watts) 63	125	250	500	1k	2k	4k	8k
Heatstar AHU	Fresh Air	68	67	68	64	66	66	63	52
Phoenix 3000	Exhaust	70	70	72	69	71	71	68	56
FA & Ex: 1.08 m^3/sec	Supply	70	71	69	70	67	69	66	57
S & R: 0.39 m^3/sec	Return	73	74	72	73	70	72	69	60

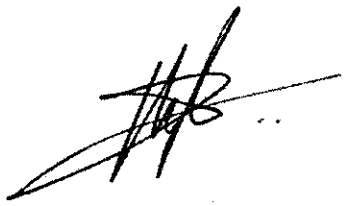
Note: The above data was taken from Heatstar's technical data sent with your e.mail of the 5th of March 2010.

The sound pressure level of the two small Xpelair XIM100 extract fans is stated, in their literature, as 55 dBA at 3 metres, presumably in free field conditions. We have selected silencers based upon this sound pressure level for these fans.

We attach herewith our data sheets No. 101/03; 102/03;103/03;104/03 and 105/03 for the silencers offered and also attach herewith our sketch No. QF/6270/S1 which details silencers S5 to S8.

We trust that the above is in line with your requirements, but should you have any queries with regard to our proposals, please do not hesitate to contact the undersigned.

Yours faithfully,



M.G.Roberts
Managing Director

QF6270/A1/MGR/CW

Date: 8th March 2010

SILENCER SCHEDULE

Client: Peter Deer & Associates

Project: 37 Queens Grove, London

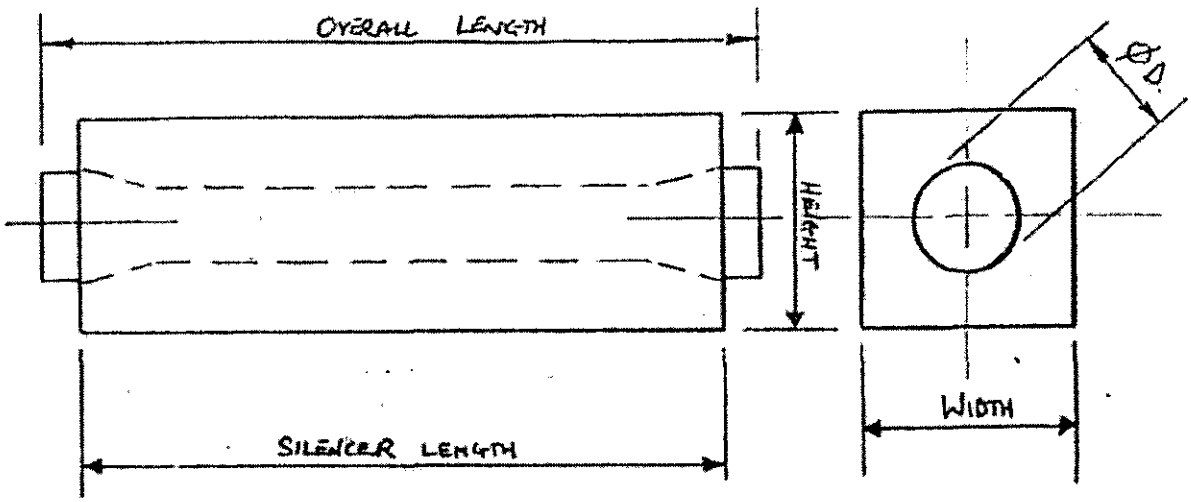
Ref.	Location	Type	Dimensions (mm) W x H x L			Vol (m^3/s)	P.D (Pa)	Dynamic Insertion Loss (dB) 63	125	250	500	1k	2k	4k	8k	No.Off	Price Each (£)	Total (£)
S1	Fresh air inlet to pool AHU	RAAC/38/1200	400	325	1200	0.39	20	5	10	19	32	39	38	31	20	1		£122.00
S2	Exhaust air outlet from pool AHU	RAAC/38/1500	400	325	1500	0.39	20	5	13	24	34	43	42	35	22	1		£135.00
S3	Supply air to pool	RAAC/38/1500	800	325	1500	1.08	35	5	13	24	34	43	42	35	22	1		£204.00
S4	Return air from pool	RAAC/25/1200	585*	665	1300	1.08	40	8	14	26	39	49	47	45	36	1		£336.00
S5 & S6	Changing and shower room extract (roomside)	RAAC/20/900CC	250	250	1000	0.021	2	9	16	24	37	48	50	50	38	2	£125.00	£250.00
S7 & S8	Changing of shower room exhaust (atmospheric)	RAAC/20/900CC	250	250	1000	0.021	2	9	16	24	37	48	50	50	38	2	£125.00	£250.00
	Total price (supply only, ex works)															...		**£1,297.00**

Notes: - Silencers S1 to S4 to be supplied with Mez 20 flanges at either end.
- Silencer S4 to have 585mm wide connections and 745mm wide body as per our attached sketch No.QF/6270/S2
- Silencers S5 to S8 to have circular spigot connections as per our attached sketch No. QF/6270/S1.

Terms and Conditions of Quotation

Validity : Prices are fixed for acceptance for 60 days.
Delivery : 2-3 weeks from receipt of order.
Carriage : Extra at cost. (£60.00 to London)
V.A.T. : Chargeable extra at the appropriate rate.
Payment : Nett 30 days from date of invoice subject to credit clearance.

PHYSICAL DETAILS OF EMTEC · RAAC TYPE · SILENCERS

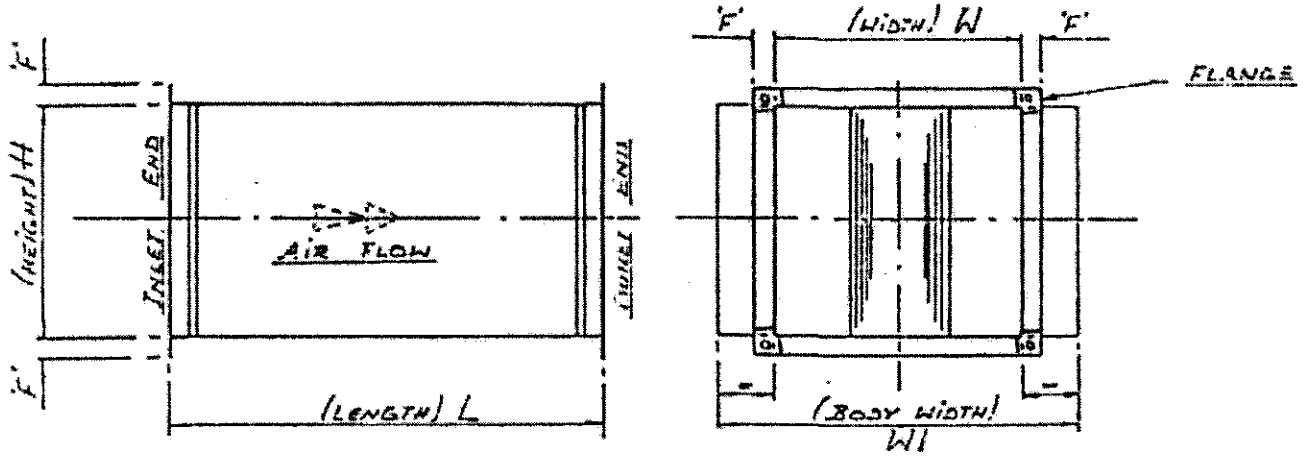


REF.	SILENCER TYPE	NO OFF	DUCT WIDTH (MM)	DUCT HEIGHT (MM)	SILENCER LENGTH (MM)	OVERALL LENGTH (MM)	Ø D (MM).		
S5 TO S8	RAAC/20/ 900CC	4	250	250	900	1000	105ø		

SKETCH NO	PROJECT	CLIENT	W.O. NO.
QF/6270/S1	37, QUEENS GROVE	PETER DEER & ASSOCIATES	

Enterprise House, Blyth Road, Hayes, Middx. UB3 1DD
Telephone: 0181 848 3031 Fax: 0181 573 3605

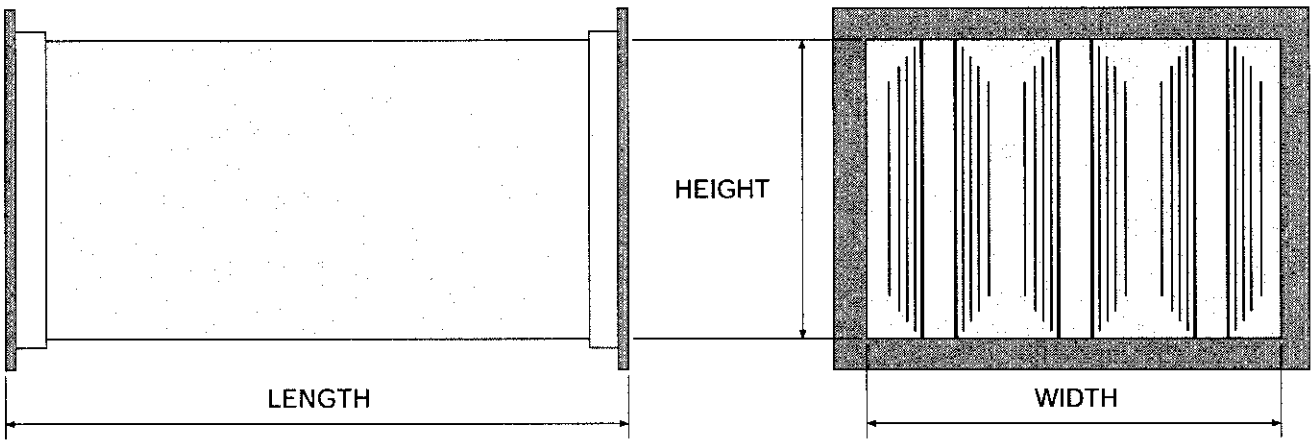
All dimensions in mm unless stated



REF	SILENCER TYPE	QTY.	CASING SIZE				FLANGE	
			W	H	L	W1	WIDTH 'F'	TYPE
S4	RAAc/25/1200	1	585	665	1300	745	20	ME2

TITLE: WIDE BODIED SILENCER DETAILS	ISSUE DATE: 5/3/10	DRAWN BY: MGR	A	B	C	D	E	F	G	H	EMTEC		
CLIENT: PETER DEER & ASSOCIATES	PF No.	APPROVED BY:	REVISION:								Emtec Products Ltd., Enterprise House, Blyth Road, Hayes, Middx. UB3 1DD. Tel: 0181-848 3031 Fax: 0181-573 3605		
PROJECT: 37, QUEENS GROVE.	STATUS: O A M I	DESIGN AUTH: MGR	SK No. QF/6270/S2										

Rectangular Duct Silencer Type RAAC 20



Usage

The EMTEC RAAC 20 Rectangular Duct Silencer is an absorptive baffle attenuator which converts duct-borne noise energy into thermal energy within the acoustic media contained in the baffle elements.

The RAAC Rectangular Duct Silencer range has been specifically designed for use in ducted ventilation and air conditioning systems. The main applications of RAAC silencers are the reduction of mechanical noise generated by the primary air circulation fan and the elimination of secondary regenerated noise from terminal units, mixing chambers or pressure reducing devices.

EMTEC RAAC Rectangular Duct Silencers are also used to reduce the level of external noise (aircraft, traffic etc.) entering a building, to control and contain the noise of enclosed machinery (pumps, compressors, generating sets etc.) and the elimination of speech interference, transferred by interconnecting ducting, across office walls and partitions.

Selection of the correct RAAC silencer is by subtraction of the Dynamic Insertion Loss from the source sound level with corrections being made for the natural attenuation of the duct system to obtain the established space noise criteria. EMTEC engineers are available on request to assist you in the proper selection of silencers for your particular requirements.

Construction

The EMTEC RAAC 20 Rectangular Duct Silencer has inter-baffle separation of 60mm and the individual baffle elements are 190mm wide. This gives a modular width of 250mm and with this combination gives high attenuation over a short silencer length. An increase in duct cross sectional area will probably be required to optimise the silencer's pressure loss and self noise.

RAAC 20 Silencers are supplied with duct widths equal to any multiple of 250mm, with duct heights to suit the customer requirements and in any one of nine standard lengths (600, 900, 1200, 1500, 1800, 2100, 2400, 2700 and 3000mm).

EMTEC RAAC Standard Rectangular Duct Silencers are constructed from high quality galvanised sheet steel. The casings are lockformed and comply with the latest HVCA ductwork standard. All joints are sealed with a suitable mastic sealant and the baffle elements and end flanges are retained by sealed fixings. In this standard form EMTEC RAAC Silencers can withstand duct static pressures up to 1250 pascals. For higher static pressures the casing of the silencer is constructed from mild steel sheet, all joints being continuously seam welded.

The baffle elements contain inert, non-flammable, tissue faced mineral wool retained in a galvanised sheet steel casing. The inlet profile of the baffle is aerodynamically shaped to minimise pressure losses and the side faces of the baffle are formed from stiffened perforated metal to ensure stability and integrity of the acoustic media even under adverse airflow conditions. The acoustic media can be further protected for special applications such as supplying air to clean rooms or operating theatres or extracting from kitchens, laboratories or highly contaminated industrial process areas. For such special applications an EMTEC engineer should be consulted to establish the most appropriate treatment.

Typical Specification

EMTEC RAAC Rectangular Duct Silencers shall be installed in the positions indicated on the drawings to maintain the acoustic criteria shown in the specification. The silencers shall have galvanised sheet steel casings with drilled, mild steel end flanges. The inlet section of the baffle elements shall be aerodynamically shaped. The acoustic media shall be inert, non-flammable, tissue faced mineral wool. The acoustic media shall be retained in position by perforated, galvanised steel face sheets stiffened to maintain the integrity of the baffle element even under adverse airflow conditions.

Acoustic

Length (mm)	Dynamic Insertion Loss (dB) at Octave band centres (Hz)							
	63	125	250	500	1K	2K	4K	8K
600	8	14	21	32	41	43	43	33
900	9	16	24	37	48	50	50	38
1200	11	21	31	49	50	50	50	44
1500	14	25	39	50	50	50	50	49
1800	16	29	46	50	50	50	50	50
2100	18	33	50	50	50	50	50	50
2400	20	37	50	50	50	50	50	50
2700	22	41	50	50	50	50	50	50
3000	24	44	50	50	50	50	50	50

Duct Velocity (m/sec)	Corrections to D.I.L. in dB for duct velocities greater than 4 m/sec							
	63	125	250	500	1K	2K	4K	8K
+4	-1	-2	-5	-5	-5	-4	-4	-5
+8	-4	-4	-5	-5	-6	-6	-5	-5
-4	+1	+1	+2	+2	+3	+2	+1	0
-8	+2	+3	+3	+4	+4	+3	+2	+2

+ve velocities are for noise and airflow in the same direction and -ve velocities where noise and airflow are in opposite directions

Duct Face Velocity (m/sec)	Silencer Self Noise in dB ref 10^{-12} watts for different velocities							
	63	125	250	500	1K	2K	4K	8K
1	36	34	33	31	34	32	30	26
2	41	39	38	36	39	37	33	29
3	51	49	47	46	45	47	45	39
4	60	56	56	57	57	56	54	48

The silencer self noise levels given in the table opposite are for a face area of 0.5m². For areas greater or smaller the dB corrections shown below should be applied.

Face area (m²)	0.1	0.25	0.75	1	3	5	10
Corrections to PWL (dB)	-7	-3	+2	+3	+7	+10	+13

Aerodynamic

It may be necessary to establish the correct size of silencer knowing that a certain pressure loss is required across the silencer for a given volume of air. In this case the duct face velocity is read off the chart opposite and the silencer dimensions established from the formula below:

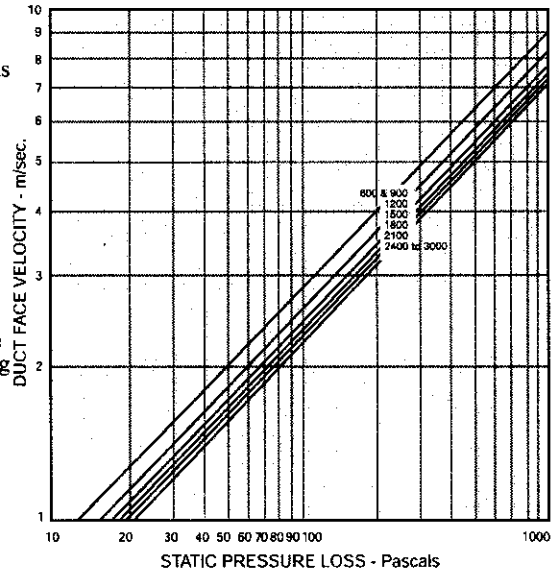
Airflow(Q)=Duct Area (A) x Duct Face Velocity (v)

Conversely for a known duct size and airflow the pressure loss across the silencer can be obtained from the chart opposite.

Selection Example:
Assuming the airflow is 5m³/sec and the maximum allowable pressure loss is 100 pascals. Assuming also that a 1200mm long silencer will meet the acoustic requirements by entering the chart opposite on the horizontal axis at 100 pascals, for a 1200mm long silencer, a duct velocity of 2.5m/sec is obtained. The duct area is then given as A=Q/v=5/2.5=2.0m². If a width of 1500mm is now selected (being 6 x modular width) the height will be 1350mm and the final selection will be as shown below.

EMTEC RAAC/20/1200 Silencer -
1500mm x 1350mm x 1200mm long.

PRESSURE LOSS CHART FOR EMTEC RAAC 20 SILENCER



Physical

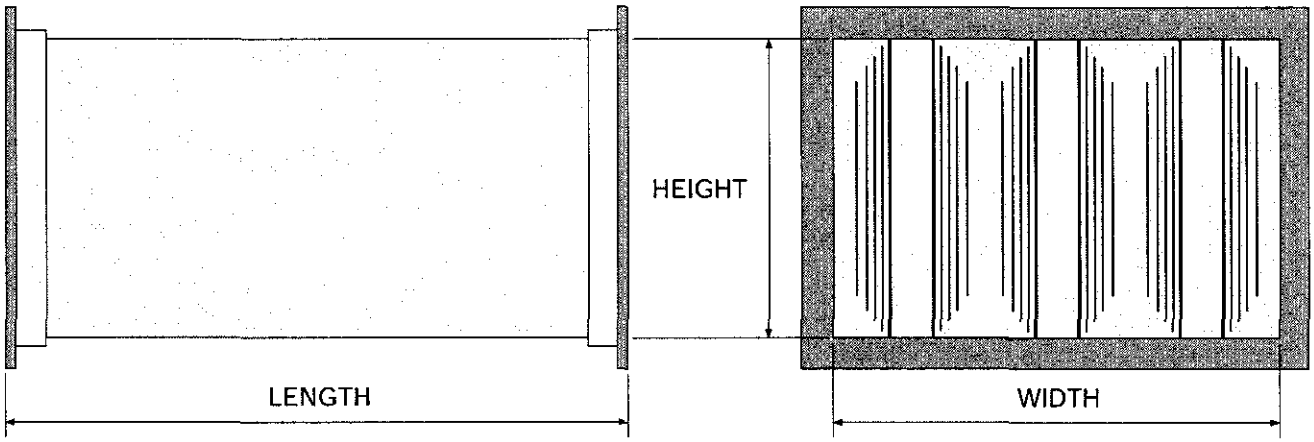
EMTEC RAAC Rectangular Duct Silencers can be positioned at any point in a ductwork system consistent with good airflow and acoustic design considerations. The silencer performance may be compromised if the flow conditions immediately before or after the silencer location are excessively turbulent. For this reason it is recommended that a minimum length of straight ducting on both sides of the silencer be allowed equal to three times the largest duct dimension. When plantroom arrangements do not allow this minimum condition then it is advisable to incorporate turning or guide vanes into the duct design to ensure that the airflow is uniform across the silencer face area.

The EMTEC RAAC 20 Rectangular Duct Silencer has an approximate volumetric weight of 190 Kg/m³. Silencers should be installed onto angle or channel supports placed at right angles to the baffle elements across the width of the silencer. When lifting an EMTEC RAAC 20 Rectangular Duct Silencer into position on site it is important to ensure that the slings used are placed around the outside of the silencer casing and the silencer lifted with the baffle elements vertical. It is imperative that silencers not be lifted by their end flanges or by slinging through the internal airway passages.

Silencers of large dimension (above a face area of 1.5m²) can be supplied in modules for on site assembly. For individual requirements please consult an EMTEC engineer.

Emtec Products Ltd., Enterprise House, Blyth Road, Hayes, Middlesex, UB3 1DD. Tel: 020 8848 3031. Fax: 020 8573 3605.
Email: sales@emtecproducts.co.uk

Rectangular Duct Silencer Type RAAC 25



Usage

The EMTEC RAAC 25 Rectangular Duct Silencer is an absorptive baffle attenuator which converts duct-borne noise energy into thermal energy within the acoustic media contained in the baffle elements.

The RAAC Rectangular Duct Silencer range has been specifically designed for use in ducted ventilation and air conditioning systems. The main applications of RAAC silencers are the reduction of mechanical noise generated by the primary air circulation fan and the elimination of secondary regenerated noise from terminal units, mixing chambers or pressure reducing devices.

EMTEC RAAC Rectangular Duct Silencers are also used to reduce the level of external noise (aircraft, traffic etc.) entering a building, to control and contain the noise of enclosed machinery (pumps, compressors, generating sets etc.) and the elimination of speech interference, transferred by interconnecting ducting, across office walls and partitions.

Selection of the correct RAAC silencer is by subtraction of the Dynamic Insertion Loss from the source sound level with corrections being made for the natural attenuation of the duct system to obtain the established space noise criteria. EMTEC engineers are available on request to assist you in the proper selection of silencers for your particular requirements.

Construction

The EMTEC RAAC 25 Rectangular Duct Silencer has inter-baffle separation of 75mm and the individual baffle elements are 200mm wide. This gives a modular width of 275mm and with this combination gives high attenuation over a short silencer length. An increase in duct cross sectional area will probably be required to optimise the silencer's pressure loss and self noise.

RAAC 25 Silencers are supplied with duct widths equal to any multiple of 275mm, with duct heights to suit the customer requirements and in any one of nine standard lengths (600, 900, 1200, 1500, 1800, 2100, 2400, 2700 and 3000mm).

EMTEC RAAC Standard Rectangular Duct Silencers are constructed from high quality galvanised sheet steel. The casings are lockformed and comply with the latest HVCA ductwork standard. All joints are sealed with a suitable mastic sealant and the baffle elements and end flanges are retained by sealed fixings. In this standard form EMTEC RAAC Silencers can withstand duct static pressures up to 1250 pascals. For higher static pressures the casing of the silencer is constructed from mild steel sheet, all joints being continuously seam welded.

The baffle elements contain inert, non-flammable, tissue faced mineral wool retained in a galvanised sheet steel casing. The inlet profile of the baffle is aerodynamically shaped to minimise pressure losses and the side faces of the baffle are formed from stiffened perforated metal to ensure stability and integrity of the acoustic media even under adverse airflow conditions. The acoustic media can be further protected for special applications such as supplying air to clean rooms or operating theatres or extracting from kitchens, laboratories or highly contaminated industrial process areas. For such special applications an EMTEC engineer should be consulted to establish the most appropriate treatment.

Typical Specification

EMTEC RAAC Rectangular Duct Silencers shall be installed in the positions indicated on the drawings to maintain the acoustic criteria shown in the specification. The silencers shall have galvanised sheet steel casings with drilled, mild steel end flanges. The inlet section of the baffle elements shall be aerodynamically shaped. The acoustic media shall be inert, non-flammable, tissue faced mineral wool. The acoustic media shall be retained in position by perforated, galvanised steel face sheets stiffened to maintain the integrity of the baffle element even under adverse airflow conditions.

Acoustic

Length (mm)	Dynamic Insertion Loss (dB) at Octave band centres (Hz)							
	63	125	250	500	1K	2K	4K	8K
600	6	9	15	27	34	34	31	28
900	7	11	18	32	40	40	36	33
1200	8	14	26	39	49	47	45	36
1500	9	18	30	48	50	50	50	50
1800	10	20	36	50	50	50	50	50
2100	12	24	42	50	50	50	50	50
2400	14	27	47	50	50	50	50	50
2700	16	29	50	50	50	50	50	50
3000	18	31	50	50	50	50	50	50

Duct Velocity (m/sec)	Corrections to D.I.L. in dB for duct velocities greater than 4 m/sec							
	63	125	250	500	1K	2K	4K	8K
+4	0	-1	-2	-3	-3	-2	-2	-2
+8	-3	-3	-3	-4	-4	-5	-6	-6
-4	0	+1	+1	+2	+2	+1	+1	0
-8	+2	+2	+3	+3	+3	+3	+2	+2

+ve velocities are for noise and airflow in the same direction and -ve velocities where noise and airflow are in opposite directions

Duct Face Velocity (m/sec)	Silencer Self Noise in dB ref 10^{-12} watts for different velocities							
	63	125	250	500	1K	2K	4K	8K
2	39	36	37	36	36	35	33	27
3	49	45	46	43	43	42	42	38
5	58	55	53	55	53	54	53	45
8	66	60	61	61	63	63	60	61

The silencer self noise levels given in the table opposite are for a face area of 0.5m². For areas greater or smaller the dB corrections shown below should be applied.

Face area (m²)	0.1	0.25	0.75	1	3	5	10
Corrections to PWL (dB)	-7	-3	+2	+3	+7	+10	+13

Aerodynamic

It may be necessary to establish the correct size of silencer knowing that a certain pressure loss is required across the silencer for a given volume of air. In this case the duct face velocity is read off the chart opposite and the silencer dimensions established from the formula below:

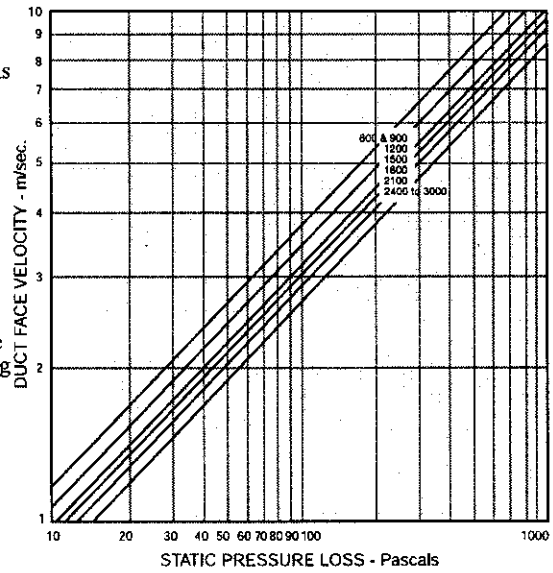
Airflow(Q)=Duct Area (A) x Duct Face Velocity (v)

Conversely for a known duct size and airflow the pressure loss across the silencer can be obtained from the chart opposite.

Selection Example:
Assuming the airflow is 5m³/sec and the maximum allowable pressure loss is 100 pascals. Assuming also that a 1200mm long silencer will meet the acoustic requirements by entering the chart opposite on the horizontal axis at 100 pascals, for a 1200mm long silencer, a duct velocity of 3.5m/sec is obtained. The duct area is then given as A=Q/v=5/3.5=1.43m². If a width of 1375mm is now selected (being 5 x modular width) the height will be 1050mm and the final selection will be as shown below.

EMTEC RAAC/25/1200 Silencer -
1375mm x 1050mm x 1200mm long.

PRESSURE LOSS CHART FOR EMTEC RAAC 25 SILENCER



Physical

EMTEC RAAC Rectangular Duct Silencers can be positioned at any point in a ductwork system consistent with good airflow and acoustic design considerations. The silencer performance may be compromised if the flow conditions immediately before or after the silencer location are excessively turbulent. For this reason it is recommended that a minimum length of straight ducting on both sides of the silencer be allowed equal to three times the largest duct dimension. When plantroom arrangements do not allow this minimum condition then it is advisable to incorporate turning or guide vanes into the duct design to ensure that the airflow is uniform across the silencer face area.

The EMTEC RAAC 25 Rectangular Duct Silencer has an approximate volumetric weight of 180 Kg/m³. Silencers should be installed onto angle or channel supports placed at right angles to the baffle elements across the width of the silencer. When lifting an EMTEC RAAC 25 Rectangular Duct Silencer into position on site it is important to ensure that the slings used are placed around the outside of the silencer casing and the silencer lifted with the baffle elements vertical. It is imperative that silencers not be lifted by their end flanges or by slinging through the internal airway passages.

Silencers of large dimension (above a face area of 1.5m²) can be supplied in modules for on site assembly. For individual requirements please consult an EMTEC engineer.

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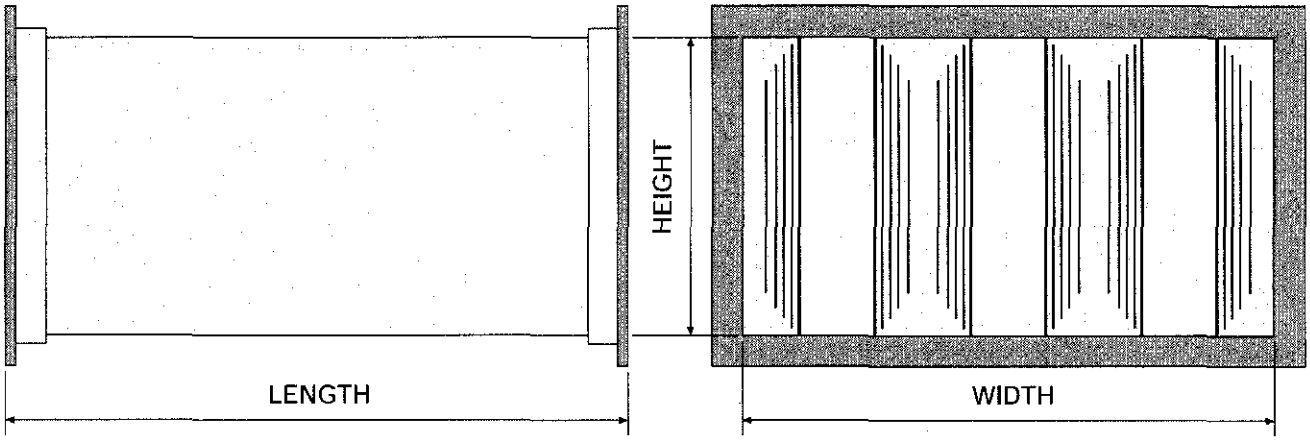
Email: sales@emtecproducts.co.uk

Rectangular Duct Silencer Type RAAC 38



Usage

The EMTEC RAAC 38 Rectangular Duct Silencer is an absorptive baffle attenuator which converts duct-borne noise energy into thermal energy within the acoustic media contained in the baffle elements.

The RAAC Rectangular Duct Silencer range has been specifically designed for use in ducted ventilation and air conditioning systems. The main applications of RAAC silencers are the reduction of mechanical noise generated by the primary air circulation fan and the elimination of secondary regenerated noise from terminal units, mixing chambers or pressure reducing devices.

EMTEC RAAC Rectangular Duct Silencers are also used to reduce the level of external noise (aircraft, traffic etc.) entering a building, to control and contain the noise of enclosed machinery (pumps, compressors, generating sets etc.) and the elimination of speech interference, transferred by interconnecting ducting, across office walls and partitions.

Selection of the correct RAAC silencer is by subtraction of the Dynamic Insertion Loss from the source sound level with corrections being made for the natural attenuation of the duct system to obtain the established space noise criteria. EMTEC engineers are available on request to assist you in the proper selection of silencers for your particular requirements.

Construction

The EMTEC RAAC 38 Rectangular Duct Silencer has inter-baffle separation of 125mm and the individual baffle elements are 200mm wide. This gives a modular width of 325mm and with this combination gives good attenuation over a reasonable silencer length. A slight increase in duct cross sectional area might be required to optimise the silencer's pressure loss and self noise.

RAAC 38 Silencers are supplied with duct widths equal to any multiple of 325mm, with duct heights to suit the customer requirements and in any one of nine standard lengths (600, 900, 1200, 1500, 1800, 2100, 2400, 2700 and 3000mm).

EMTEC RAAC Standard Rectangular Duct Silencers are constructed from high quality galvanised sheet steel. The casings are lockformed and comply with the latest HVCA ductwork standard. All joints are sealed with a suitable mastic sealant and the baffle elements and end flanges are retained by sealed fixings. In this standard form EMTEC RAAC Silencers can withstand duct static pressures up to 1250 pascals. For higher static pressures the casing of the silencer is constructed from mild steel sheet, all joints being continuously seam welded.

The baffle elements contain inert, non-flammable, tissue faced mineral wool retained in a galvanised sheet steel casing. The inlet profile of the baffle is aerodynamically shaped to minimise pressure losses and the side faces of the baffle are formed from stiffened perforated metal to ensure stability and integrity of the acoustic media even under adverse airflow conditions. The acoustic media can be further protected for special applications such as supplying air to clean rooms or operating theatres or extracting from kitchens, laboratories or highly contaminated industrial process areas. For such special applications an EMTEC engineer should be consulted to establish the most appropriate treatment.

Typical Specification

EMTEC RAAC Rectangular Duct Silencers shall be installed in the positions indicated on the drawings to maintain the acoustic criteria shown in the specification. The silencers shall have galvanised sheet steel casings with drilled, mild steel end flanges. The inlet section of the baffle elements shall be aerodynamically shaped. The acoustic media shall be inert, non-flammable, tissue faced mineral wool. The acoustic media shall be retained in position by perforated, galvanised steel face sheets stiffened to maintain the integrity of the baffle element even under adverse airflow conditions.

Acoustic

Length (mm)	Dynamic Insertion Loss (dB) at Octave band centres (Hz)							
	63	125	250	500	1K	2K	4K	8K
600	3	6	13	21	28	29	25	15
900	4	7	15	24	32	33	29	18
1200	5	10	19	32	39	38	31	20
1500	5	13	24	34	43	42	35	22
1800	6	16	28	44	47	44	38	24
2100	7	19	33	47	50	49	41	28
2400	8	20	36	49	50	50	43	30
2700	9	21	38	50	50	50	45	32
3000	10	23	40	50	50	50	47	34

Duct Velocity (m/sec)	Corrections to D.I.L. in dB for duct velocities greater than 8 m/sec							
	63	125	250	500	1K	2K	4K	8K
+8	-1	-2	-4	-5	-5	-4	-4	-5
+12	-3	-3	-4	-6	-6	-5	-5	-6
-8	+1	+1	+2	+3	+3	+2	+1	0
-12	+2	+2	+3	+3	+3	+3	+3	+2

+ve velocities are for noise and airflow in the same direction and -ve velocities where noise and airflow are in opposite directions

Duct Face Velocity (m/sec)	Silencer Self Noise in dB ref 10^{-12} watts for different velocities							
	63	125	250	500	1K	2K	4K	8K
3	39	37	37	35	37	36	32	27
5	49	47	46	45	42	44	43	37
8	58	55	53	56	54	55	54	46
10	63	60	60	62	63	61	60	54

The silencer self noise levels given in the table opposite are for a face area of 0.5m². For areas greater or smaller the dB corrections shown below should be applied.

Face area (m²)	0.1	0.25	0.75	1	3	5	10
Corrections to PWL (dB)	-7	-3	+2	+3	+7	+10	+13

Aerodynamic

It may be necessary to establish the correct size of silencer knowing that a certain pressure loss is required across the silencer for a given volume of air. In this case the duct face velocity is read off the chart opposite and the silencer dimensions established from the formula below:

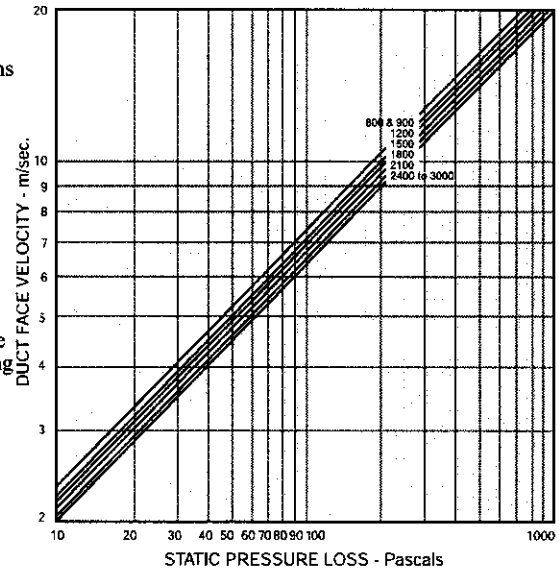
Airflow(Q)=Duct Area (A) x Duct Face Velocity (v)

Conversely for a known duct size and airflow the pressure loss across the silencer can be obtained from the chart opposite.

Selection Example:
Assuming the airflow is 5m³/sec and the maximum allowable pressure loss is 100 pascals. Assuming also that a 1200mm long silencer will meet the acoustic requirements by entering the chart opposite on the horizontal axis at 100 pascals, for a 1200mm long silencer, a duct velocity of 7.1m/sec is obtained. The duct area is then given as A=Q/v=5/7.1=0.70m². If a width of 975mm is now selected (being 3 x modular width) the height will be 720mm and the final selection will be as shown below.

EMTEC RAAC/38/1200 Silencer -
975mm x 720mm x 1200mm long.

PRESSURE LOSS CHART FOR EMTEC RAAC 38 SILENCER



Physical

EMTEC RAAC Rectangular Duct Silencers can be positioned at any point in a ductwork system consistent with good airflow and acoustic design considerations. The silencer performance may be compromised if the flow conditions immediately before or after the silencer location are excessively turbulent. For this reason it is recommended that a minimum length of straight ducting on both sides of the silencer be allowed equal to three times the largest duct dimension. When plantroom arrangements do not allow this minimum condition then it is advisable to incorporate turning or guide vanes into the duct design to ensure that the airflow is uniform across the silencer face area.

The EMTEC RAAC 38 Rectangular Duct Silencer has an approximate volumetric weight of 165 Kg/m³. Silencers should be installed onto angle or channel supports placed at right angles to the baffle elements across the width of the silencer. When lifting an EMTEC RAAC 38 Rectangular Duct Silencer into position on site it is important to ensure that the slings used are placed around the outside of the silencer casing and the silencer lifted with the baffle elements vertical. It is imperative that silencers not be lifted by their end flanges or by slinging through the internal airway passages.

Silencers of large dimension (above a face area of 1.5m²) can be supplied in modules for on site assembly. For individual requirements please consult an EMTEC engineer.

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