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INGEGNERE

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COMUNE di CORFINIO

**PREVISIONE di
IMPATTO ACUSTICO (Allegati)**

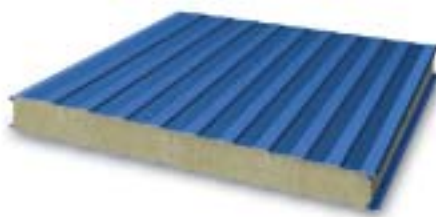
COMMITTENTE: Etex Building Performance SpA
Via Strada Santa Maria Loc.Impianata-67030 Corfinio

ELABORATO: Relazione Tecnica
Previsione di Impatto Acustico di un
impianto di COGENERAZIONE



Pannelli di parete acustici

Pannelli monolitici per parete con isolamento in fibra minerale con lamiera interna microforata



R.E.I. 90

Acoustic wall panels

Monolithic panels for walls with rock wool insulation and internal micro sheet

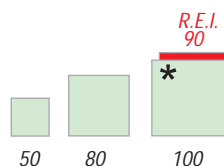
Akustische Wandpaneele

Monolitische Wandpaneele, isoliert mit Mineralwolle, mit inneren Mikrogelochter Stahlblechoberfläche

Panneaux de bardage acoustiques

Panneaux monolithiques de bardage avec isolation en fibre de verre avec tolet intérieure micro forée

Spessore mm
Thickness
Plattendicke
Épaisseur



* con aggiunta di guarnizione termoespandente nel giunto



SPESSORE PANNELLO mm	K COEFFICIENTE DI TRASMISSIONE TERMICA GLOBALE O TRASMITTANZA TERMICA		PESO PANNELLI CON SUPPORTI IN ACCIAIO EST. 0,6 mm INT. FORATO 0,5 mm kg / m ²
	Kcal / m ² h °C	Watt / m ² K	
50	0.65	0.76	13.10
80	0.41	0.48	16.10
100	0.33	0.38	18.10

TOLLERANZE DIMENSIONALI in mm
Lunghezza ± 10
Larghezza utile (passo) ± 2
Spessore pannello ± 2
Fuori squadra ± 3

Caratteristiche Lamiera Forata Characteristics of micro locked sheet		Eigenschaften des gelochten Stahlbleches Caractéristiques tôle micro forée		
Diametro fori	Holes Diameter	Durchmesser der Löcher	Diamètre trous	3 mm
Passo fori	Holes Step	Schritt der Löcher	Distance trous	5 mm
% lamiera forata	% micro locked sheet	% des gelochten Stahlbleches	% tôle forée	15 %


Carichi uniformemente distribuiti ammissibili in kg/mq (rapporto di conversione 1kg/mq = 0,00981 KN/mq). Le tabelle sono state sviluppate per pannelli con supporti in acciaio spessore mm 0,6 esterno, mm 0,5 interno imponendo la limitazione di deformazione: freccia f=1/200 L

Evenly distributed loads allowed in kg/ mq (conversion ratio 1kg/mq=0.00981 KN/mq). The tables have been developed for panels with mm 0.6 external thickness and mm 0.5 internal thickness of steel supports, imposing the deformation limit: deflection f=1/200 L.

Gleichmäßig verteilte Lasten Zulässig bei kg/mq (Umrechnungsverhältnis 1kg/mq=0,00981 KN/mq). Die Tabellen wurden für Platten mit dem Trägermaterial Stahl, der Stärke 0.6 mm außen und 0.5 mm innen erstellt unter Vorgabe einer Verformungsgrenze von: Durchbiegung f=1/200 L.

Charges uniformément réparties admissibles avec rapport de kg/mq (conversion 1kg/mq = 0,00981 KN/mq).

Les tableaux ont été établis pour des panneaux ayant des supports en acier de 0,6 mm tôle extérieure et 0,5 mm la tôle intérieure, avec limite de déformation de la flèche f=1/200 L.

SCHEMA STATICO							Due appoggi				MEC WA / TOP WA		
Spessore Lana M. mm	INTERASSE LIBERO cm												
	175	200	225	250	275	300	325	350	375	400	500		
	50	100	90	75	65	50	45						
	80	165	145	125	110	90	80	70	65				
	100	210	180	160	140	120	100	90	85	80	70		


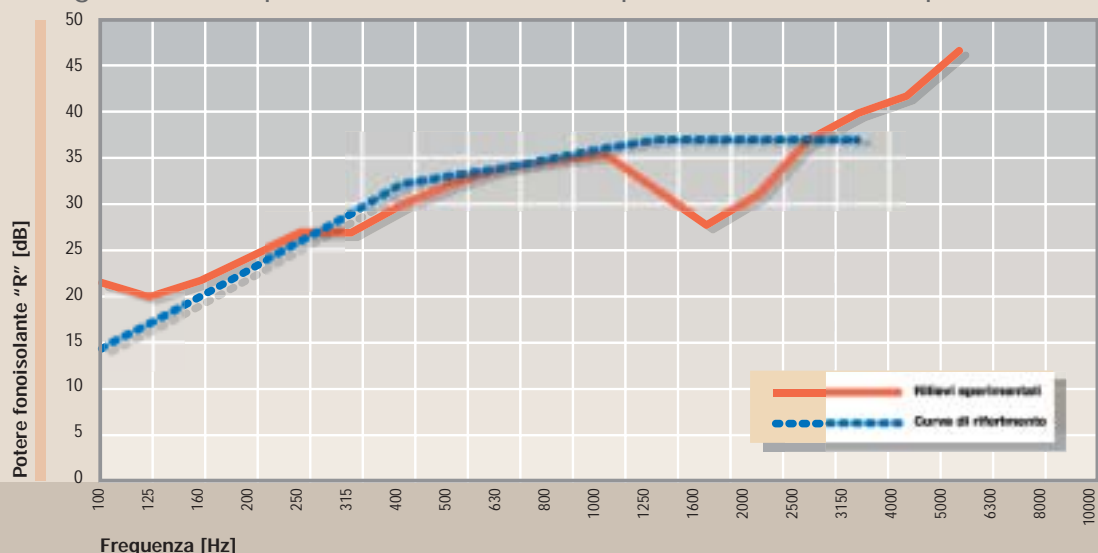
SCHEMA STATICO		Quattro appoggi										MEC WA / TOP WA	
Spessore Lana M. mm	INTERASSE LIBERO cm												
	175	200	225	250	275	300	325	350	375	400	500		
	50	110	99	83	72	55	50						
	80	182	160	138	121	99	88	77	72				
	100	231	198	176	154	132	110	99	94	88	77		

Diagramma del potere fonoisolante del pannello MEC W.A. sp. 100 mm.



Potere Fonoisolante:

Capacità del pannello di isolare acusticamente due zone.

Il pannello ha ottenuto un indice di valutazione del potere fonoisolante $R_w = 33\text{dB}$ (alla frequenza di riferimento di 500 Hz) per lo spessore 100 mm.

Potere Fonoassorbente:

Capacità del materiale di assorbire l'onda sonora incidente riducendo l'effetto eco.

Il pannello ha ottenuto un coefficiente di assorbimento acustico pesato $\alpha_w = 1.00$ (alla frequenza di riferimento di 500 Hz), cui corrisponde un indice globale a singolo numero $\Delta L_a = 15,4\text{ dB (A)}$.

Sound Insulation Power:

Capacity of the material to insulate acoustically two areas.

The panel has obtained an index of evaluation of the sound insulation power $R_w = 33\text{dB}$ (at the reference frequency of 500 Hz) for the thickness 100 mm.

Soundproofing power:

Capacity of the material to absorb the wave sound incident reducing the echo effect.

The panel has obtained a coefficient of acoustic soundproofing weighed $\alpha_w = 1.00$ (at the reference frequency of 500 Hz), to which corresponds a global index at single number $\Delta L_a = 15,4\text{ dB (A)}$.

Schallisolierung:

Fähigkeit der Paneele zwei Räume akustisch zu isolieren.

Das Paneel hat eine Schallisolierende Bewertung, für die Stärke 100 mm, von $R_w = 33\text{dB}$ (bei einer Bezugfrequenz von 500 Hz) erhalten.

Schallschluckend:

Fähigkeit des Materials die akustische Welle zu absorbieren und den Echoeffekt zu mindern.

Das Paneel hat einen akustischen Koeffizient von $\alpha_w = 1.00$ erhalten (bei einer Bezugfrequenz von 500 Hz), welchem einen globalen Index von $\Delta L_a = 15,4\text{ dB (A)}$ zuzuordnen ist.

Pouvoir phono isolant:

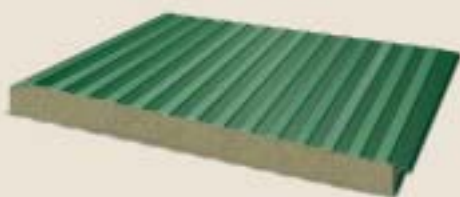
Capacité du panneau d'isoler acoustiquement deux zones.

Le panneau a obtenu un indice de évaluation du pouvoir phono isolante $R_w = 33\text{dB}$ (à la fréquence de référence de 500 Hz) pour un épaisseur de 100 mm.

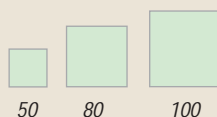
Pouvoir phono absorbant:

Capacité du matériel d'absorber l'onde sonore incidente en réduisant l'effet écho.

Le panneau a obtenu un coefficient de absorbement acoustique pesé $\alpha_w = 1.00$ (a la fréquence de référence de 500 Hz), auquel correspond un indice global à numéro single $\Delta L_a = 15,4\text{ dB (A)}$.



Spessore mm
Thickness
Plattendicke
Épaisseur



Per analogia dei componenti è possibile estendere i valori di fonoisolamento e fonoassorbimento anche al TOP W.A.

Intergen TCG2020 V12 NG

Technical data

1200 kWel; 400 V, 50 Hz; Natural gas, MN = 80

Design conditions

Comb. air temperature / rel. Humidity:	[°C] / [%]	25 / 60
Altitude:	[m]	100
Exhaust temp. after heat exchanger:	[°C]	120
NO _x Emission (tolerance - 8%):	[mg/Nm ³ @5%O ₂]	250

Fuel gas data: ²⁾

Methane number:	[-]	80
Lower calorific value:	[kWh/Nm ³]	10,17
Gas density:	[kg/Nm ³]	0,79
Standard gas:	Natural gas, MN = 80	

Genset:

Engine:	TCG2020V12	
Speed:	[1/min]	1500
Configuration / number of cylinders:	[-]	V / 12
Bore / Stroke / Displacement:	[mm]/[mm]/[dm ³]	170 / 195 / 53
Compression ratio:	[-]	13,0
Mean piston speed:	[m/s]	9,8
Mean lube oil consumption at full load:	[g/kWh]	0,15
Engine-management-system:	[-]	TEM EVO

Generator:	Marelli MJB 500 MB4	
Voltage / voltage range / cos Phi:	[V] / [%] / [-]	400 / ±10 / 1
Speed / frequency:	[1/min] / [Hz]	1500 / 50

Energy balance

Load:	[%]	100	75	50
Electrical power COP acc. ISO 8528-1:	[kW]	1200	900	600
Engine jacket water heat:	[kW ±8%]	632	486	349
Intercooler LT heat:	[kW ±8%]	110	73	42
Lube oil heat:	[kW ±8%]			
Exhaust heat with temp. after heat exchanger:	[kW ±8%]	613	506	382
Exhaust temperature:	[°C ±25°C]	415	441	469
Exhaust mass flow, wet:	[kg/h]	6829	5167	3565
Combustion mass air flow:	[kg/h]	6609	4998	3446
Radiation heat engine / generator:	[kW ±8%]	42 / 34	41 / 27	36 / 22
Fuel consumption:	[kW+5%]	2818	2175	1529
Electrical / thermal efficiency:	[%]	42,6 / 44,2	41,4 / 45,6	39,2 / 47,8
Total efficiency:	[%]	86,8	87,0	87,0

System parameters ¹⁾

Ventilation air flow (comb. air incl.) with ΔT = 15K	[kg/h]	31000
Combustion air temperature minimum / design:	[°C]	5 / 25
Exhaust back pressure from / to:	[mbar]	30 / 50
Maximum pressure loss in front of air cleaner:	[mbar]	5
Zero-pressure gas control unit selectable from / to: ²⁾	[mbar]	20 / 200
Pre-pressure gas control unit selectable from / to: ²⁾	[bar]	0,5 / 10
Starter battery 24V, capacity required:	[Ah]	430
Starter motor:	[kWel.] / [VDC]	15 / 24
Lube oil content engine / base frame:	[dm ³]	205 / -
Dry weight engine / genset:	[kg]	5080 / 11550

Cooling system

Glycol content engine jacket water / intercooler:	[% Vol.]	35 / 35
Water volume engine jacket / intercooler:	[dm ³]	111 / 20
KVS / Cv value engine jacket water / intercooler:	[m ³ /h]	42 / 30
Jacket water coolant temperature in / out:	[°C]	80 / 93
Intercooler coolant temperature in / out:	[°C]	40 / 43
Engine jacket water flow rate from / to:	[m ³ /h]	36 / 56
Water flow rate engine jacket water / intercooler:	[m ³ /h]	45 / 35
Water pressure loss engine jacket water / intercooler:	[bar]	1,1 / 1,4

1) See also "Layout of power plants".

2) See also Techn. Circular 0199-99-3017

Frequency band f [Hz]	25	31,5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	L _{WA} [dB(A)]	S [m ²]
Air-borne noise ³⁾																															
L _{W, Terz} [dB(lin)]	94,0	94,7	98,0	100,5	106,1	108,9	107,6	108,5	106,0	115,3	115,0	114,8	108,6	110,2	109,5	108,8	109,2	108,2	108,1	107,6	107,0	108,5	103,5	102,3	114,1	107,0	101,4	103,8	98,1	120,7	114
L _{W, Terz} [dB(lin)]																															
Exhaust noise ⁴⁾																															
L _{W, Terz} [dB(lin)]	114,2	116,0	124,6	115,9	120,0	129,0	125,3	134,1	125,3	130,0	128,4	128,2	126,4	125,8	125,0	119,0	117,8	116,6	117,7	117,6	116,3	115,5	114,6	113,7	114,9	113,9	113,4	112,9	111,1	132,1	15,5 ⁵⁾
L _{W, Terz} [dB(lin)]																															

3) DIN EN ISO 3746 (σ₉₀=±4 dB)

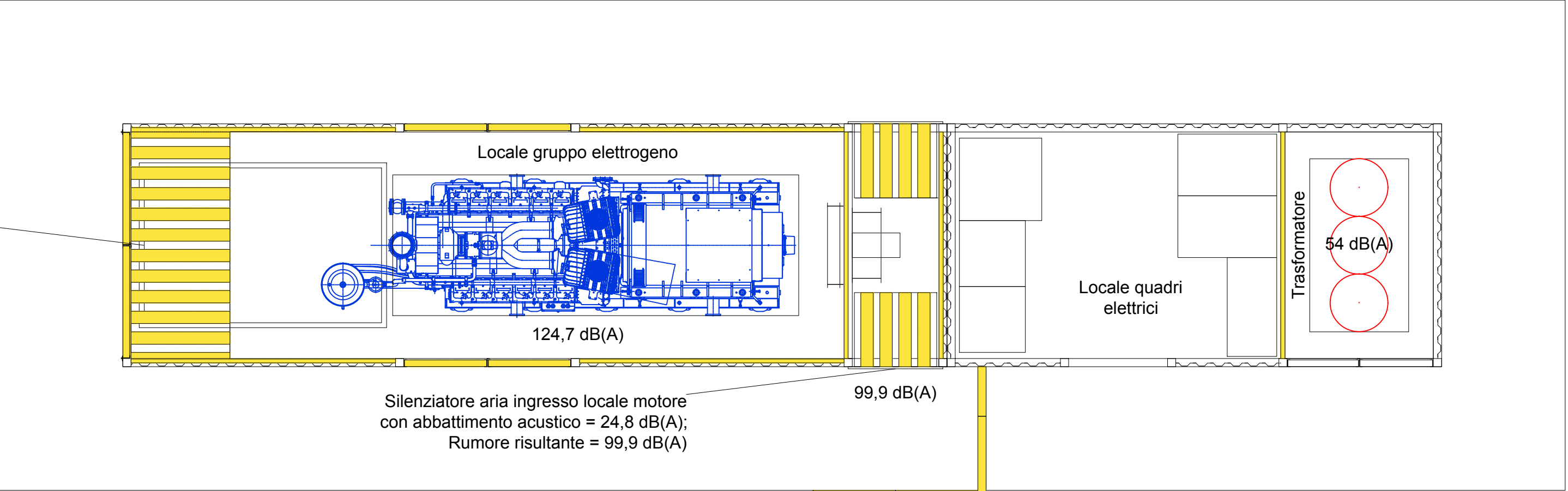
4) Measured in exhaust pipe (f ≤ 250Hz: ±5dB; f > 250Hz: ±3dB)

L_W: Sound power levelS: Area of measurement surface (S₀=1m²)

5) DIN 45635-11, Appendix A

VISTA IN PIANTA
INTERNO CONTAINER

Silenziatore aria uscita locale motore
con abbattimento acustico = 38,7 dB(A);
Rumore risultante = 86 dB(A)

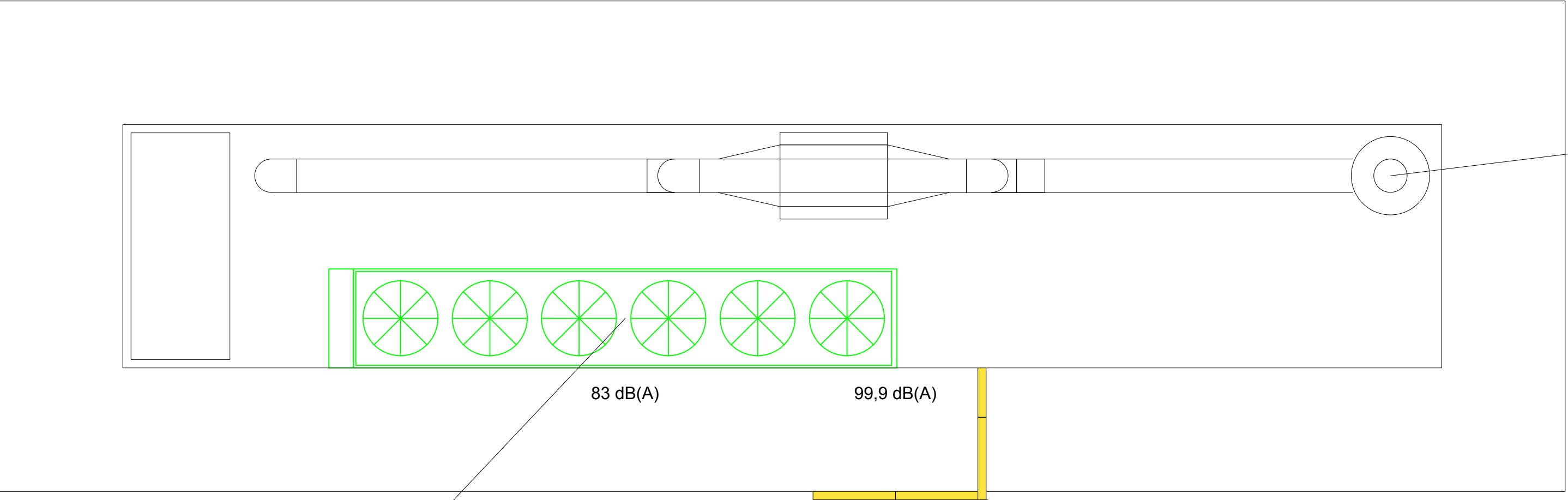


Silenziatore aria ingresso locale motore
con abbattimento acustico = 24,8 dB(A);
Rumore risultante = 99,9 dB(A)

Barriera per abbattimento acustico

Allegato 03

VISTA IN PIANTA
ESTERNO CONTAINER



Batteria di smaltimento calore;
Rumore risultante = 83 dB(A)

Barriera per abbattimento acustico

Silenziatore gas di scarico motore con
abbattimento acustico = 50 dB(A);
Rumore risultante = 85,1 dB(A)

IMPIANTO DI COGENERAZIONE

Allegato 03

COMMITTENTE



Etex Building Performnce S.p.A. - Località Impianata - Strada Santa Maria - Corfinio (AQ)

PROGETTAZIONE E REALIZZAZIONE



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66013 Chieti Scalo (CH) / Italia
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Fax: +39 0871.574117
www.almacis.it

PROGETTO:		PRELIMINARE		
OFFERTA: 4003		OGGETTO		
TAVOLA: 06		LAYOUT EMISSIONI ACUSTICHE IMPIANTO DI COGENERAZIONE MOD. AI M1200.1x1 POTENZA ELETTRICA PRODOTTA 1.200 kW _e		
SCALA: 1:50				
FORMATO: -				
AGGIORNAMENTI - DATA				
A	Prima emissione 08/05/2020	Elaborato n.: IM4003-06AAI000	Sostituisce il n.: IM-06A-Layout emissioni acustiche.dwg	Nome file:
B				
C				
D				
E				
F				
G				
Il Disegnatore		Il Progettista	ALMA C.I.S. s.r.l. IL RESPONSABILE TECNICO Dott. Ing. Emiliano Grande	

Il presente elaborato è di proprietà alma c.i.s. S.r.l. . E' vietata la riproduzione e divulgazione.
La Società tutelerà i propri diritti a termini di Legge

Allegato 04



Date: maggio 7 2020
 Company: -
 Contact: -
 Project: -
 Reference: -

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 Via Maestri del Lavoro, 12 - 25017
 Lonato del Garda (Brescia) Italia
 Tel. +39 030 9913575
 Fax. +39 030 9913766



Selection - CC 804 T 3kW VS-10-19

Product Code	1CC8310
Requested Air Volume	12.000 m³/h
Requested Pressure	250 Pa
Air Volume	13.942 m³/h
Static Pressure	337 Pa
Total Pressure	371 Pa
Velocity Pressure	33,6 Pa
Outlet Velocity	7,70 m/s
SFP	0,71 W/l/s
Fan Total Efficiency	52,3 %
Fan Static Efficiency	47,6 %
Air Properties	1,13kg/m³ / 35 °C / 0m/ 50% RH
Fan Absorbed Power	2,75 kW
Temperature Range	-15°C +50°C

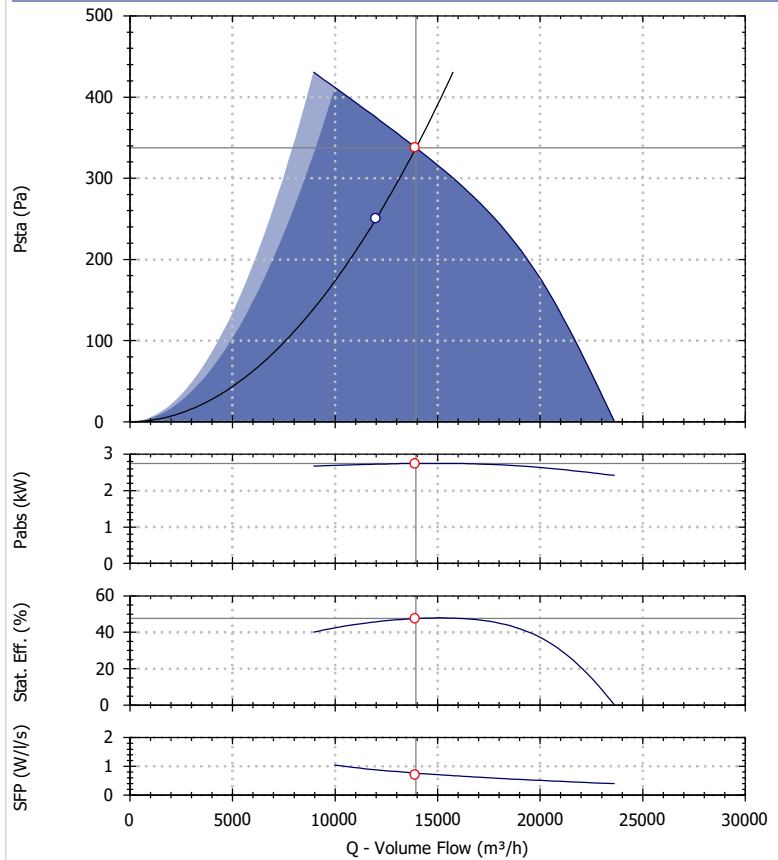
Motor Selection

Electrical Supply	400/3/50
Motor Rating	3.00 kW
Energy Class	IE2
Enclosure/Class	55 / F
Frame Size	D100L
Poles number	4
Motor Speed	1440 rpm
Full Load Current	6.39 A

ERP Information

Optimal Efficiency	47,92%
Installation Type	C
Efficiency Category	Static
N	44
Manufacturer	Maico
Reference	CC 804 T 3kW VS-10-19
Optimal Power	2,96 kW
Optimal Airflow	15.019 m³/h
Optimal Pressure	340 Pa
Optimal Speed	1440rpm
ERP Compliance	2015

Fan Performance



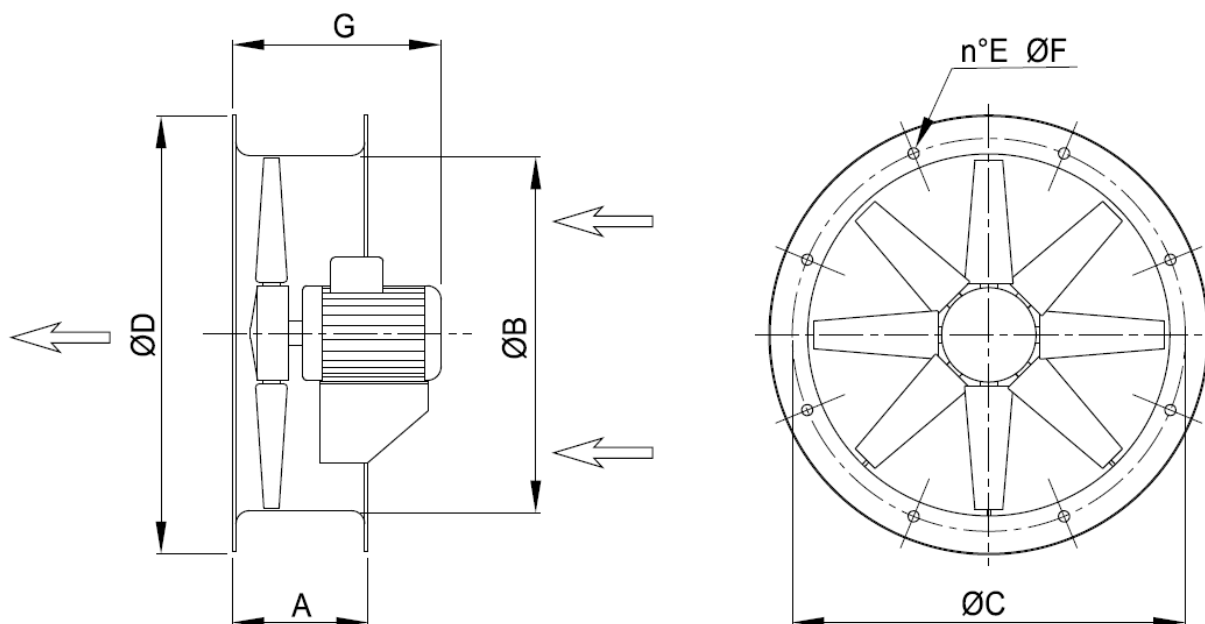
Performances refers to Maico Italia measures and may vary according to the installation type.

Sound Performance

Hz	63	125	250	500	1k	2k	4k	8k	Overall
Lw	60	71	78	86	89	88	88	81	94
Lw(A)	34	55	69	83	89	89	89	80	94
LpA @ 3m	13	34	49	62	68	69	68	59	74

Sounds spectra refers to Maico Italia measures performed in our laboratories. The values provided are just indicative of the situation and Maico Italia declines every responsibility in case different levels measured by our customers as the installation types and the environmental variables may increase/decrease these values.

Drawing and Dimensions - CC 804 T 3kW VS-10-19

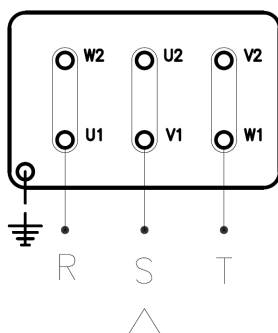


Key	A	E	G	Kg	ØB	ØC	ØD	ØF
Value [mm]	350	16	580	125	800	860	910	12

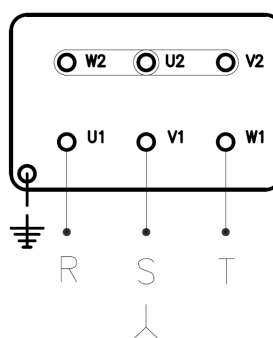
Drawings are indicative of the size of the selected fan. These dimensions may vary, even without any explicit advice. To have more accurate information contact your local agency.

Electric Wire Connections

230 V/3 Ph/50 Hz



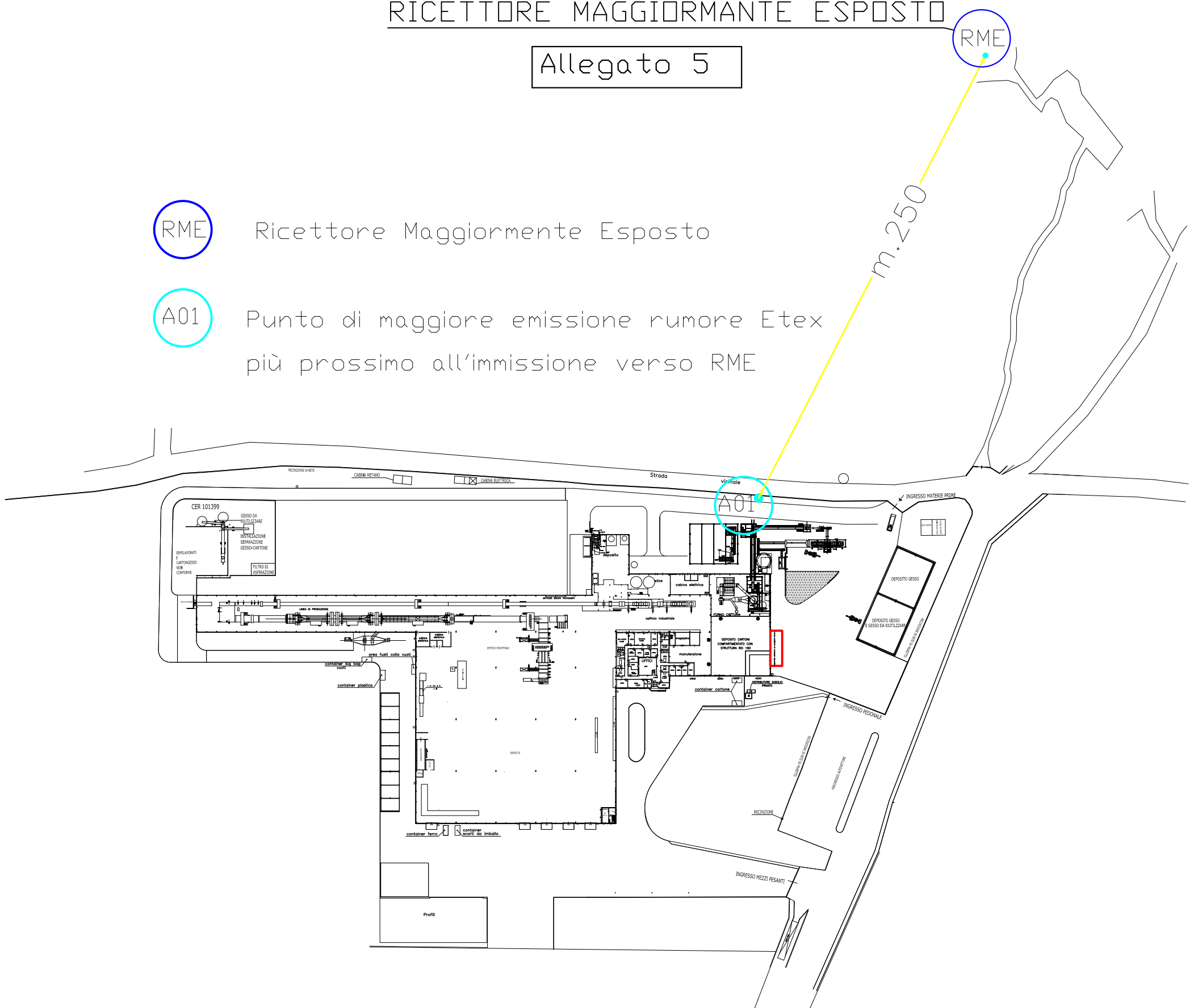
400 V/3 Ph/50 Hz

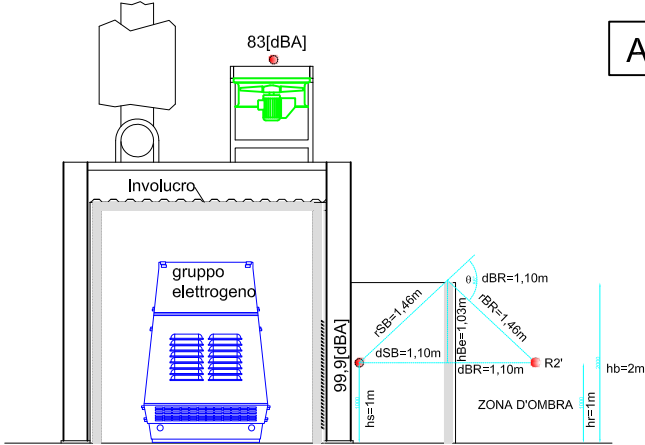


Allegato 5

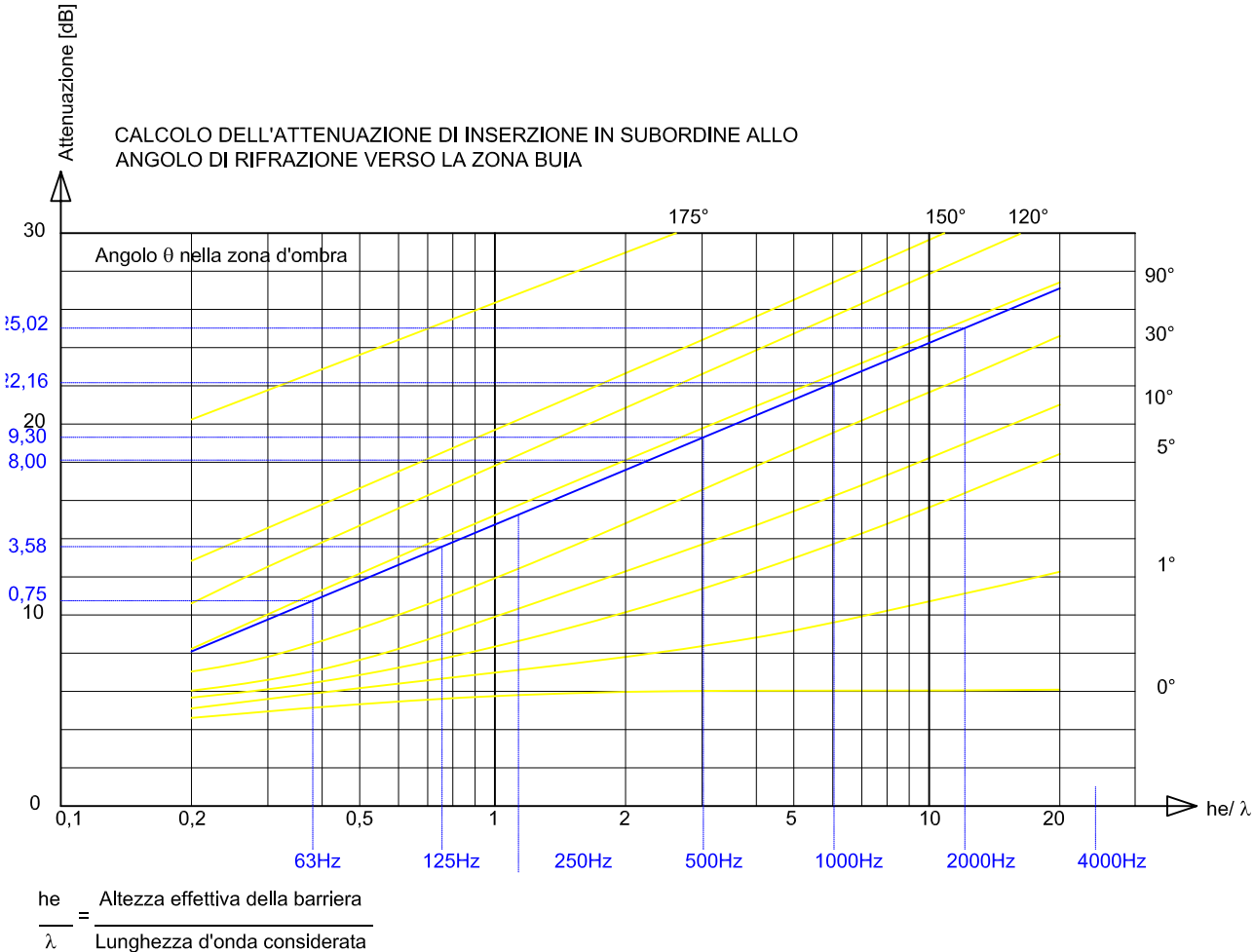
Ricettore Maggiormente Esposto

Punto di maggiore emissione rumore E_{tex}
più prossimo all'immissione verso RME

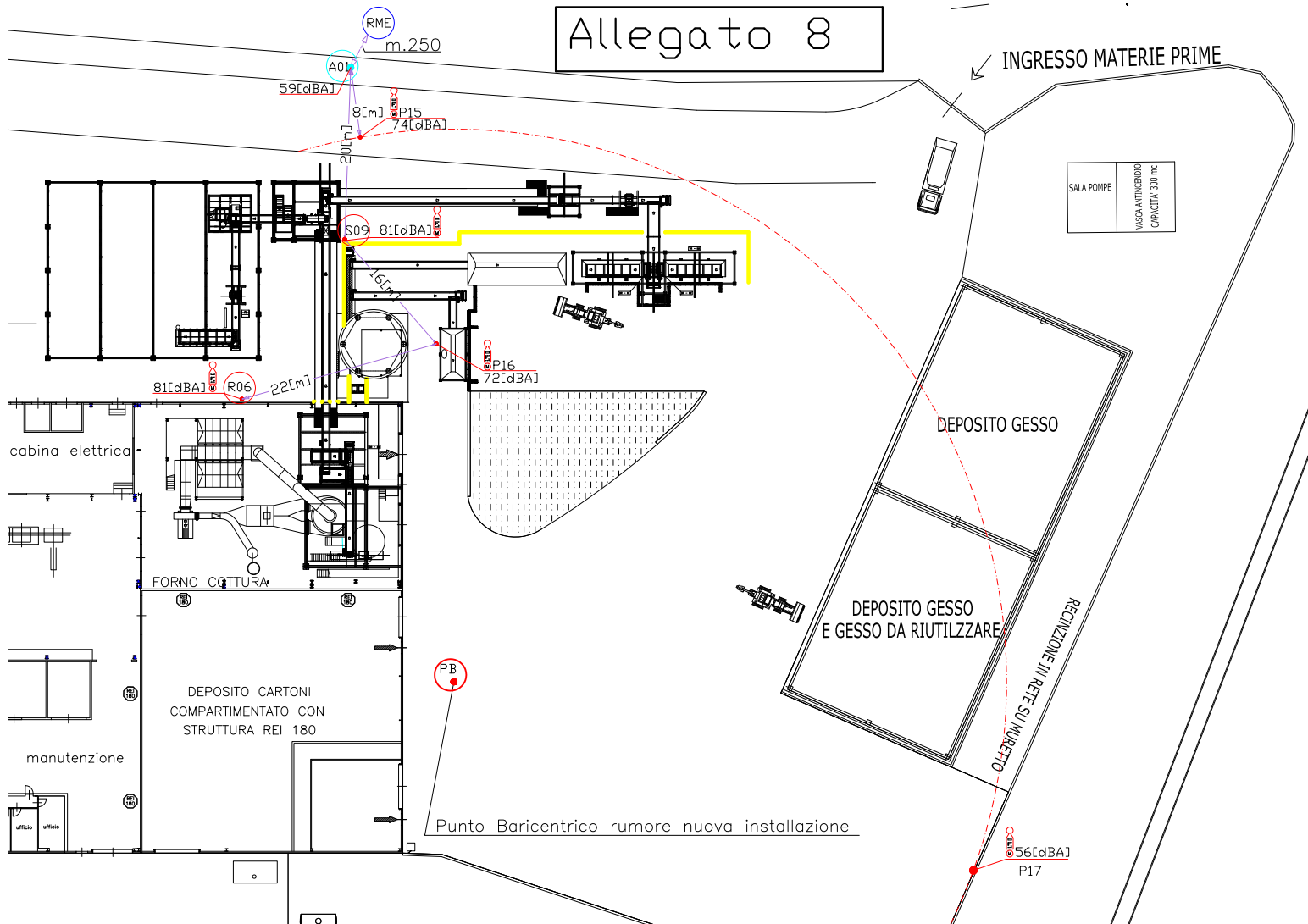




c	: Velocità di propagazione del suono	= 331 [m/s]
f	: frequeza propria di ciascuna componente spettrale	= 63; 125; 250; 500; 1000; 2000; 4000; 8000 [Hz]
λ	: Lunghezza d'onda di ciascuna componente spettrale	= c/f [m]
hb	: Altezza barriera	= 2 [m]
hs	: Altezza sorgente	= 1 [m]
hr	: Altezza riceitore	= 1 [m]
dSB	: distanza Sorgente-Barriera	= 1,10 [m]
dBR	: distanza Barriera-Sorgente	= 1,10 [m]
he	: Altezza efficace	= $hb+(hs+hr)/2$ = 3 [m]
N	: Nmero di Fresnel	= $(he/\lambda)*((1/dSB)+(1/BR))$ = numero associabile a ciascuna frequenza
θ	: Angolo di rifrazione verso il riceitore in zona buia	
Ai	: Attenuazione di inserzione di schermo naturale o artificiale	



Allegato 8



Allegato 9

59[dBA]

RME

m.250

A01

INGRESSO MATERIE PRIME

SALA POMPE	VASCA ANTINCENDIO CAPACITÀ 300 mc
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DEPOSITO GESSO

DEPOSITO GESSO
E GESSO DA RIUTILIZZARE

RECINZIONE IN RETE SU MUROTTI

P16
72[dBA]

P17
60[dBA]

