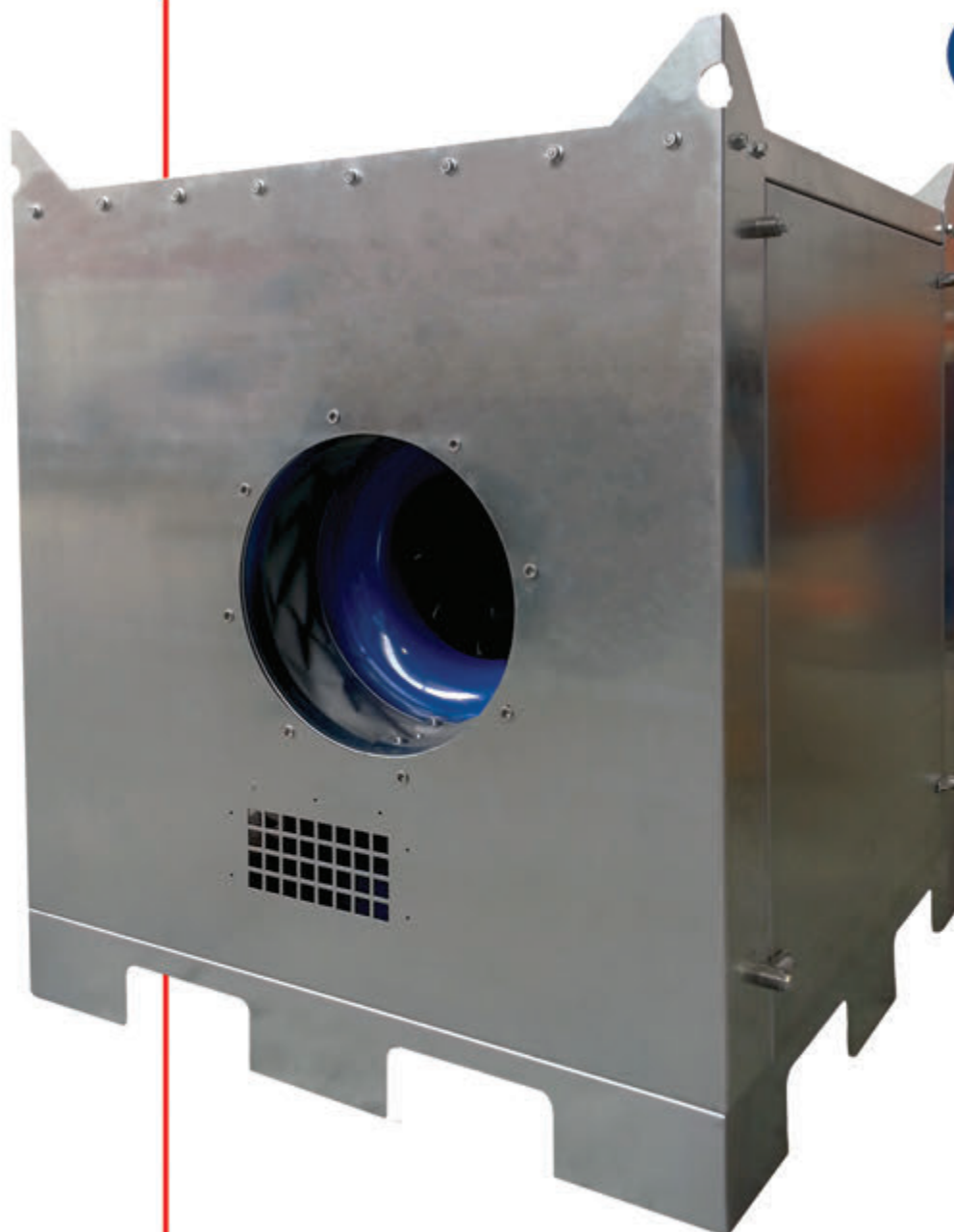


# castle



## descrizione description

- La serie CASTLE è particolarmente indicata per tutti gli impianti di aspirazione dove siano necessari bassissimi livelli sonori nell'utilizzo di ventilatori centrifughi semplice aspirazione.
- Idonei per convogliamento di aria pulita o per trasporto di materiali in sospensione alla temperatura massima di 60°C.
- Esecuzione gas caldi su richiesta
- The CASTLE series represent the ideal solution for the small exhausting plants where are required very low noise level and easy installation.
- Suitable to convey clean air or for transport of suspended matter with a maximum temp. of 140°F.
- High temperature execution on request

## caratteristiche tecniche technical features

- Ventilatori semplice aspirazione MZ ASPIRATORI SPA con pale curve in avanti/rovesce/aperte ad alto rendimento
- Telaio autoportante in lamiera zincata piana di spessore adeguato per il sollevamento dall'alto e antivibranti interni per lo smorzamento delle vibrazioni
- Pannellatura in lamiera zincata piana con taglio laser/plasma
- Motorizzazioni UNEL-MEC IP 55 Cl.F/H trifasi o monofasi con tensioni speciali a richiesta e grado di efficienza IE1 / IE2 / IE3 / IE4
- Afonizzazione interna **totalmente riciclabile** in fibre di poliestere termolegate con reazione al fuoco "Classe 1 (UNI 9177:1987) Euroclass B s1 d0" e di fumosità "F1 (AFNOR NF F16-101:1988)" certificato **CE** con lamina di protezione in alluminio di spessore 40 mm
- Servoventilazione interna monofase 230v Hz 50 o 230v/400v Hz 50 (cassonato "chiuso" per massima tenuta afonica)
- Giunti antivibrante aspirante e premente (cassonato NON in depressione per il mantenimento della pulizia interna)
- Temperatura massima del fluido aspirato -10°C / +60°C centrifugato-ambientale 40°C max. (Esecuzioni speciali a richiesta)
- Single inlet centrifugal fans MZ ASPIRATORI SPA with forward curved, backward and open high performance
- Self-supporting frame in galvanized sheet metal plain and antivibration interior for damping vibrations
- Paneling in galvanized flat with laser cutting / plasma
- UNEL-MEC motors IP55 Cl.F/H Three phase or single phase with special voltage under request and efficiency IE1 / IE2 / IE3 / IE4
- Aphonic internal **totally recyclable** polyester fiber with thermo reaction to fire "Class 1 (UNI 9177: 1987) Euroclass B s1 d0" and smokiness "F1 (AFNOR NF F16-101: 1988)" certificate **CE** with protective aluminum foil 40 mm thick
- Forced cooling internal 50 Hz single phase 230v or 230v / 400v 50 Hz (flatbed "closed" for good grip soundproof)
- Anti-vibration couplings suction and discharge (flatbed NOT in depression for the maintenance of internal cleansing)
- Maximum temperature of the fluid sucked -10 ° C / + 60 ° C centrifuged - environmental 40 ° C max. (Special features on request)

## accessori accessories

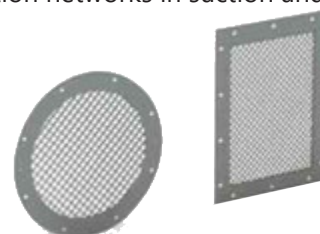
Quadro Control core Easy Digital - Easy Manual -  
Advanced con inverter  
Electrical panel Control core Easy Digital - Easy Manual -  
Advanced with inverter



Silenziatori a cartuccia filtrati con regolatore di portata interno per aspirazioni libere  
Silencers filter cartridge with flow control inside



Reti di protezione in aspirazione e in mandata  
Protection networks in suction and discharge



La determinazione del livello di potenza sonora è stata condotta secondo la norma UNI EN ISO 3746:1997 (Metodo di controllo con una superficie avvolgente su un piano riflettente). Le misure di livello di pressione sonora sono state eseguite su 5 punti posti su una superficie a forma di parallelepipedo che racchiude la macchina, ad una distanza di 2m dalle superfici della macchina stessa. Alle misure sono state applicate una correzione per il rumore di fondo  $K_{1A}$  ed una per la riverberazione dell'ambiente  $K_{2A}$ , ed è stato successivamente calcolato il livello di potenza sonora emessa

$$(L_wA=L_p+Curva A-K_{1A}-K_{2A}+10\log (\text{Superficie misura}).$$

Il margine di precisione del metodo per la determinazione di  $L_wA$ , espresso come scarto tipo di riproducibilità, risulta essere secondo la norma minore o uguale a 3 dB(A). Sulle curve del presente catalogo sono indicati i livelli di potenza sonora pesata A dove, per definizione, la potenza sonora  $L_w$  è la risultante della espressione a fianco:

$$L_wA[\text{dB(A)}]=10 \cdot \log \left( \frac{W_{eff}}{W_{ref}} \right) + weighting$$

dove  $W_{eff}$  è la potenza sonora effettiva mentre  $W_{ref}$  è quella di riferimento, pari a  $1 \cdot 10^{-12} Pa$ . Il valore del livello di pressione sonora medio ad 1.5m dalle pareti del ventilatore, in campo libero, è calcolabile partendo dal dato di  $L_wA$  fornita a catalogo attraverso la relazione:

$$L_pA_{1.5m}[\text{dB(A)}] = L_wA - 18$$

Poiché ogni macchina presenta diversa direttività, tale livello è da ritenersi medio e non il valore massimo puntuale (per tale valore si aumenti cautamente di 3 dB(A) il valore medio calcolato).

Il livello di pressione sonora della macchina installata dipende, oltre che dalla sua emissione sonora, anche dai seguenti contributi:

- rumore di fondo presente nell'ambiente (significativo se non inferiore di 10 dB(A) rispetto al livello di pressione sonora calcolato)
- riverberazione dell'ambiente, dipendente dalle sue dimensioni e dall'assorbimento acustico delle sue superfici
- posizionamento vicino ad un'altra sorgente sonora (è importante ricordare che raddoppiando o dimezzando la potenza sonora si ottiene una differenza di 3dB)
- posizionamento della sorgente in prossimità di superfici riflettenti: i valori riportati a catalogo tengono conto del solo posizionamento a pavimento (propagazione 1/2 sferica)

Per altri posizionamenti tenere conto dei seguenti fattori correttivi:

- posizionamento a fianco ad una parete riflettente (propagazione 1/4 sferica) + 3 dB(A)
- posizionamento in angolo a fianco a due pareti riflettenti (propagazione 1/8 sferica) + 6 dB(A)

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È perciò importante ricordare che i valori di rumorosità indicati sul catalogo sono stati rilevati secondo normative che prescrivono condizioni ben definite di ambiente e d'installazione.

L'impianto di prova prevede:

- canalizzazione in aspirazione completamente coibentata e collegamento al ventilatore mediante giunto antivibrante;
- canalizzazione in mandata completamente coibentata e collegamento al ventilatore mediante giunto antivibrante;
- posizionamento del ventilatore su supporti antivibranti.

Tali precauzioni sono state attuate al fine d'isolare completamente la rumorosità propria del ventilatore dall'influenza dell'attraversamento dell'aria nei condotti e di evitare la propagazione di piccole vibrazioni. I valori riportati sulle curve sono riferiti a ventilatori in conformazione standard per temperature comprese tra -20 e 40°C corredati di tenuta su passaggio albero. La mancanza della tenuta sul passaggio albero può incrementare la rumorosità fino a 3 dBA. La presenza della ventolina di raffreddamento può incrementare la rumorosità fino a 3 dBA. Nelle condizioni comuni d'installazione è dunque necessario, per confrontare i valori rilevati con quelli indicati nel presente catalogo, riprodurre condizioni simili a quelle prescritte dalla normativa, oppure utilizzare coefficienti correttivi che tengano conto delle condizioni d'installazione.

Measurement of the sound power level was carried out in compliance with UNI EN ISO 3746:1997 (Survey method using an enveloping measurement surface over a reflecting plane). The sound pressure level was measured at 5 points on the surface of a parallelepiped that encloses the machine at a distance of 2 metres from its surface. A correction was applied to the measurements to offset background noise  $K_{1A}$  and also an ambient reverberation correction  $K_{2A}$ , and the output sound power level was subsequently calculated

$$(L_wA=L_p+Curva A-K_{1A}-K_{2A}+10\log (\text{Measurement of the surface}).$$

The margin of accuracy of the method for the measurement of  $L_wA$ , expressed as the typical repeatability deviation, is less than or equal to 3 dB (A) in accordance with the prescriptions of standards. The curves given in the present catalogue show the A weighted sound power levels where, by definition, sound power  $L_w$  corresponds to the result of the equation shown alongside:

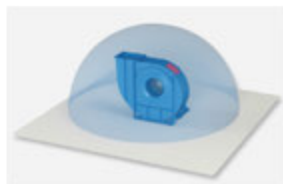
$$L_wA[\text{dB(A)}]=10 \cdot \log \left( \frac{W_{eff}}{W_{ref}} \right) + weighting$$

where  $W_{eff}$  is the effective sound power, while  $W_{ref}$  is the reference sound power,

equivalent to  $1 \cdot 10^{-12} Pa$ . The value of the average sound pressure level at 1.5 m from the fan walls, in free field conditions, can be calculated starting from the  $L_wA$  value supplied in the catalogue, by means of the following formula:

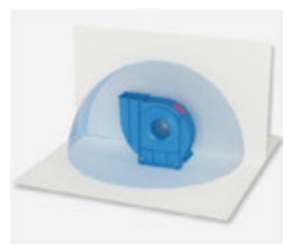
$$L_pA_{1.5m}[\text{dB(A)}] = L_wA - 18$$

Since each machine features different directivity, said level is the average and not the maximum peak value (for the peak value a prudent increase of 3 dB(A) is added to the calculated average value).



The sound pressure level of the installed machine depends on its sound emission and also on the following contributions:

- ambient background noise (significant if greater than 10 dB (A) with respect to the calculated sound pressure level);
- ambient reverberation, depending on the dimensions of the room and the sound absorption properties of its surfaces;
- positioning near another noise source (note that a difference of 3dB is obtained when either doubling or halving the sound power level).
- positioning of the source next to reflective surfaces: the values given in the catalogue take account exclusively of positioning on the floor (hemispherical propagation);



For other positions take account of the following corrective factors:

- positioning alongside a reflective wall (half hemisphere propagation) + 3 dB(A)
- positioning in corner between two reflective walls (quarter hemisphere propagation) + 6 dB(A)

For other positions take account of the following corrective factors:

- positioning alongside a reflective wall (half hemisphere propagation) + 3 dB(A)
- positioning in corner between two reflective walls (quarter hemisphere propagation) + 6 dB(A)

It is thus important to remember that the noise values shown in the catalogue were measured in compliance with standards that prescribe clearly defined ambient and installation conditions.

The test apparatus features:

- fully insulated inlet duct connected to the fan via an antivibration coupling;
- fully insulated outlet duct connected to the fan via an antivibration coupling;
- fan installed on antivibration mounts.



The above precautions were implemented in order to isolate the fan noise emissions from the effect of the air flowing through the ducts and to avoid the propagation of high frequency vibration. The values shown on the curves refer to standard configuration fans for temperatures of between -20 and 40°C, equipped with a shaft gland seal. If no shaft gland seal is fitted, noise levels may be up to 3 dBA higher. The presence of a motor cooling impeller can increase noise levels by up to 3 dBA. In normal installation conditions it is therefore necessary, in order to correlate the values measured with the values given in this catalogue, to reproduce conditions that are similar to those described by the standard, or to use correction coefficients to offset the installation conditions.

Tipo/Type	GR		GF		RH		RM		RL		CA		VM		VI	
	kW	Lwa	kW	Lwa	kW	Lwa	kW	Lwa	kW	Lwa	kW	Lwa	kW	Lwa	kW	Lwa
180/2	---	---	---	---	---	---	---	---	---	---	1,1	70	---	---	---	---
180/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
200/2	---	---	---	---	---	---	---	---	---	---	2,2	73	---	---	---	---
200/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
220/2	---	---	---	---	---	---	0,18	67	---	---	3	76	---	---	---	---
220/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
250/2	---	---	0,37	70	---	---	0,37	71	0,55	73	4	77	---	---	---	---
250/4	---	---	---	---	---	---	---	---	---	---	0,55	64	---	---	---	---
280/2	---	---	0,55	73	---	---	0,75	74	1,1	76	7,5	82	---	---	---	---
280/4	---	---	---	---	---	---	---	---	---	---	1,1	69	---	---	---	---
310/2	---	---	1,1	75	---	---	1,5	77	2,2	78	---	---	---	---	---	---
310/4	---	---	---	---	---	---	---	---	0,18	61	2,2	72	---	---	---	---
350/2	---	---	2,2	78	---	---	2,2	78	3	81	---	---	1,1	73	---	---
350/4	---	---	---	---	---	---	---	---	0,37	65	4	74	---	---	---	---
400/2	3	77	4	81	5,5	81	4	80	5,5	84	---	---	2,2	76	2,2	74
400/4	---	---	---	---	---	---	---	---	0,75	67	7,5	76	---	---	---	---
450/2	5,5	82	7,5	82	11	84	7,5	83	11	88	---	---	4	79	4	77
450/4	---	---	---	---	---	---	---	---	1,1	69	15	81	---	---	---	---
500/2	11	87	11	82	15	86	15	88	18,5	90	---	---	5,5	81	7,5	80
500/4	---	---	---	---	---	---	---	---	2,2	73	22	82	---	---	---	---
560/2	15	91	18,5	83	30	89	22	91	---	---	---	---	11	84	11	83
560/4	---	---	2,2	70	---	---	3	78	4	79	---	---	---	---	---	---
630/2	30	94	30	89	45	92	---	---	---	---	---	---	18,5	86	22	86
630/4	---	---	4	74	---	---	5,5	81	7,5	80	---	---	---	---	---	---
710/2	45	97	---	---	---	---	---	---	---	---	---	---	37	87	37	89
710/4	---	---	7,5	76	---	---	11	83	15	83	---	---	---	---	---	---

Tipo/Type	VC		VP		VG		VA		ZA		ZB		ZC		ZM	
	kW	Lwa	kW	Lwa	kW	Lwa	kW	Lwa	kW	Lwa	kW	Lwa	kW	Lwa	kW	Lwa
180/2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
180/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
200/2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
200/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
220/2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0,37	70
220/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
250/2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0,75	74
250/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
280/2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1,5	76
280/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
310/2	---	---	---	---	---	---	0,25	66	---	---	---	---	---	---	2,2	79
310/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
350/2	---	---	---	---	---	---	0,37	70	---	---	---	---	---	---	4	83
350/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
400/2	---	---	0,75	69	1,5	75	0,55	73	1,1	69	2,2	82	5,5	87	7,5	87
400/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
450/2	---	---	1,5	73	2,2	78	0,75	76	1,5	73	4	85	11	90	11	89
450/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1,5	76
500/2	1,5	76	2,2	77	4	81	1,1	76	3	77	7,5	88	18,5	95	22	92
500/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	78
560/2	2,2	79	4	79	7,5	83	1,5	82	4	80	11	91	30	98	---	---
560/4	---	---	---	---	---	---	---	---	---	---	---	---	4	81	5,5	81
630/2	5,5	82	7,5	82	15	86	2,2	84	7,5	84	18,5	93	---	---	---	---
630/4	---	---	---	---	---	---	---	---	---	---	---	---	7,5	86	11	84
710/2	11	85	15	85	22	88	4	87	11	89	37	96	---	---	---	---
710/4	---	---	---	---	---	---	---	---	---	---	---	---	15	88	15	87

		GR-ZC	GF-RM-ZM	RL-RH-CA	VC-VG-VI-VM-VP-ZA-ZB
250	0°	C100	C100	C100	C100
	90°	C100	C100	C100	C100
	270°	C100	C100	C100	C100
280	0°	C100	C100	C100	C100
	90°	C100	C100	C100	C100
	270°	C100	C100	C100	C100
310	0°	C100	C100	C100	C100
	90°	C100	C100	C100	C100
	270°	C100	C100	C100	C100
350	0°	C100	C100	C100	C100
	90°	C200	C200	C200	C100
	270°	C100	C100	C100	C100
400	0°	C200	C200	C200	C100
	90°	C200	C200	C200	C100
	270°	C200	C200	C200	C100
450	0°	C200	C200	C200*	C100
	90°	C200	C200	C200*	C100
	270°	C200	C200	C200*	C100
500	0°	C300	C300	C300	C200
	90°	C300	C300	C300	C200
	270°	C300	C300	C300	C200
560	0°	C300	C300	C300**	C200
	90°	C300	C300	C300**	C200
	270°	C300	C300	C300**	C200
630	0°	C400	C400	C300	C200
	90°	C400#	C400#	C400#	C200
	270°	C400	C400	C300	C200
710	0°	C400	C400	C400	C300
	90°	C400#	C400#	C400#	C300
	270°	C400	C400	C400	C300

\*RL-RH 450 asse 160 Castle C300  
 \*\*RH 560 asse 200 Castle C400  
 # speciale per orientamento 90°

Tipo-Type	Base-Base	Profondità-Depth	Altezza-Height
C100	940	900	1150
C200	1150	1100	1460
C300	1450	1350	1700
C400	1700	1700	1765

**Certificazione di prove sonore:**

Noise certification tests:



**Materiacustica s.r.l.**

Società spin-off dell'Università degli Studi di Ferrara Polo Scientifico Tecnologico dell'Università di Ferrara  
 Company spin-off of the University of Ferrara Polo Science and Technology, University of Ferrara



**M.Z. Aspiratori S.p.A.**

Misurazioni effettuate presso la sala prove  
 Measurements at the test room





**cimi**s.r.l.

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