



### OSNOVNI PODACI :

Jedinice za obnavljanje toplote iz serije REC ( u 8 veličina za normalni protok vazduha od 50 do 4500 m<sup>3</sup>/h) su planirane da rešavaju problem visoke potrošnje energije, koje su tipične za industrijske pogone, korišćenjem spoljašnjeg vazduha.

Zahvaljujući postojanju razmenjivača toplote, moguće je povratiti 50% energije koja bi inače bila izgubljena isterivanjem iskorišćenog vazduha.

REC uređaji integrisani u dodatni sistem ventilacije i održavanja, mogu raditi zajedno u letnjoj i zimskoj sezoni. Naročito su pogodni za plafonsku ugradnju i povezivanje na kanalne sisteme, omogućuju direktno izvlačenje i uvlačenje vazduha u prostoriju-okolinu.

### KONSTRUKCIJA :

-NOSEĆA KONSTRUKCIJA: je napravljena od tzv. ALUZINK panela sa jednim ili dvostrukim oklopom sa termalnom i akustičnom izolacijom od polyethylen- a i polyester- a debljine 10mm (Mod. 300-1200) i debljine 20mm (Mod. 1600-4500).

Na ulaznom otvoru je panel sa filterom koji se lako može postaviti u slučaju zamene. Sve komponente su ispitane i lako se uklanjaju sa osnove.

- VENTILATORSKI SEKTOR: Ovaj sektor se sastoji od ventilatora sa dvostrukim otvorom i unapred zakrivljenim lopaticama montirani na antivibracione držače.

Monofazni (220 V/50Hz), trobrzinski motor je direktno povezan na ventilator, (1200-1600-2000-2600-3500), dvobrzinski(300-600) , Trofazni dvobrzinski(4500) priključen je na upravljački panel mašine.

- NADOKNADA TOPLOTE: Statični tip obnavljača toplote sa poprečnim protokom, visoke je efikasnosti. Ploče od aluminijuma sa protocima - odvojeni odgovarajućim zaptivačima. Ispod obnavljačke jedinice je montirano kućište za skupljanje kondenzata ,odvodne cevi su od NERĐAJUČEG čelika.

-FILTER VAZDUHA: Filter je tipa rešetki sa valovitim pregradama i mogućnošću zamene od osnove, sa filterom u sredini od sintetičkog vlakna klase G3 ( Procenjena efikasnost 85%-EU3).

### DODATNI DELOVI :

- Grejač vode (bez REC 300 i 600)
- Električni grejač
- Menjač brzine (CV3)
- Jedinica kontrolne table (PC3)
- Pomoćna jedinica hlađenja
- Cirkularni adapter
- Regulaciona žaluzina

### NA ZAHTEV :

- Verzija sa duplim panelom (REC/D)
- Vertikalna verzija (REC/V)

### GENERAL DESCRIPTION

The heat recovery units of the REC series (8 sizes with range of nominal air flow from 50 to 4500 m<sup>3</sup>/h) were planned and realized to solve the problem of the high consumption of energy, typical of all the plants which use outside air. Thanks to the presence of a heat exchanger, it is possible to recover the 50% of the energy which would otherwise go lost with the expulsion of the spoiled air.

The REC units integrate to the additional systems of ventilation and conditioning and they can work both in the summer and winter seasons. They are particularly suitable for ceiling installations and ducting, allowing the withdrawal and the introduction of the air directly in the environment.

### CONSTRUCTION

CARRING STRUCTURE: the carrying structure is realized with panels in ALUZINK simple or double shell with thermal and acoustic insulation in polyethylene and polyester with a thickness of 10 mm (Mod.300-1200) and 20 mm (Mod. 1600-4500).

The inlet side filter housing panel can be easily replaced for installation exigences. All the components are examinable and can be easily removed from the bottom.

FAN SECTOR: the fan section is complete of double inlet forward bladed centrifugal fan mounted on antivibration supports. The electric motor is directly coupled to the fan and it is mono phase type 230V/50Hz 3 speed (1200-1600-2000-2600-3500) 2 speed (300-600) and three phase type 2 speed (4500) connected to the power module on the machine board.

HEAT RECOVERY: the heat recovery of the static type with crossed flow high efficiency. The plates are in aluminium with the flows kept separated by suitable sealing. Under the recovery unit is installed a condensate collection housing in STAINLESS steel with draining pipe.

AIR FILTER: the filters are of the cell type with wavy septum removable from the bottom and reusable, with filtering media in synthetic fibre class G3 (Pondered efficiency 85%-EU3).

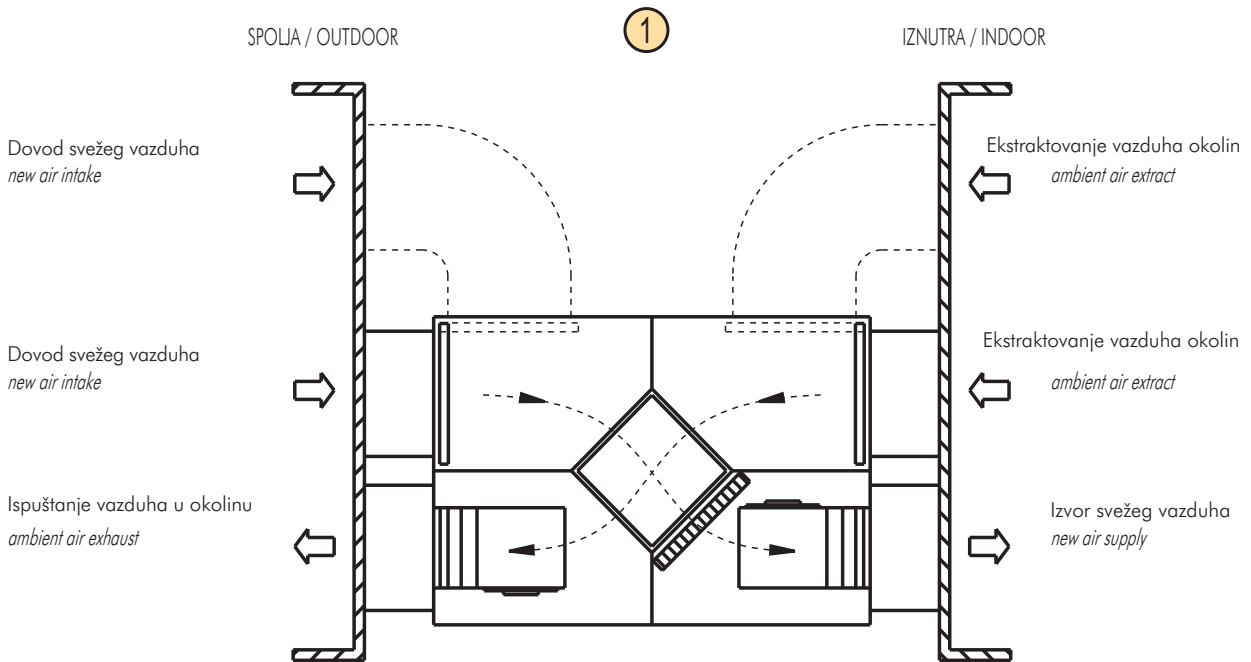
### ACCESSORIES

- Battery of hot water (without REC 300 e 600).
- Electric battery.
- Speed changeover (CV3).
- Unit control panel (PC3).
- Auxiliary cooling battery.
- Circular spigot adaptor.
- Regulation damper.

### UPON REQUEST

- Double panneling version (REC/D).
- Vertical version (REC/V).

Standardna orijentacija sa i bez baterije / Standard orientation with and without battery



Upozorenje:

Na unutrašnjem otvoru panela opremljenim sa filterom sa može otkloniti i zameniti kao što je prikazano na slici (unutrašnja isprekidana linija).

Note: The inlet side panels equipped with filter housing can be removed and reinstalled as showed in the diagram (dot line indoor)

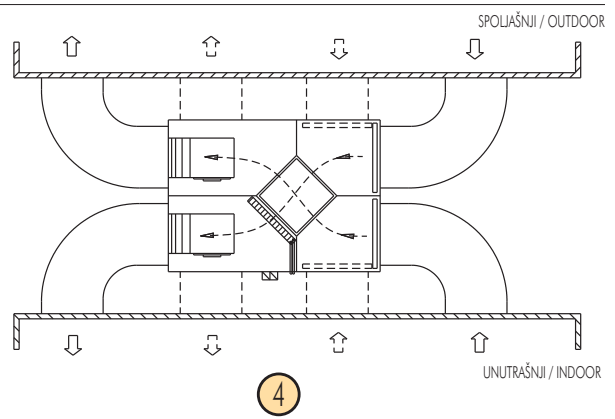
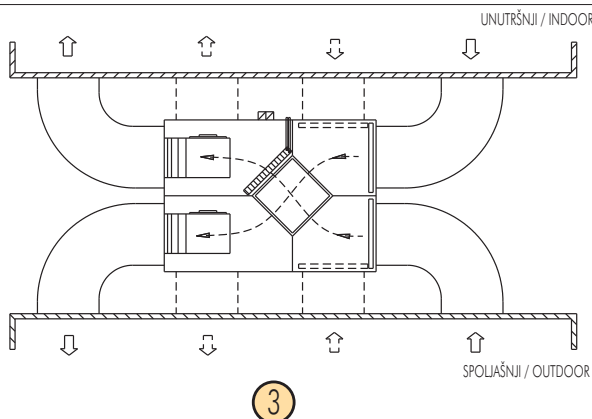
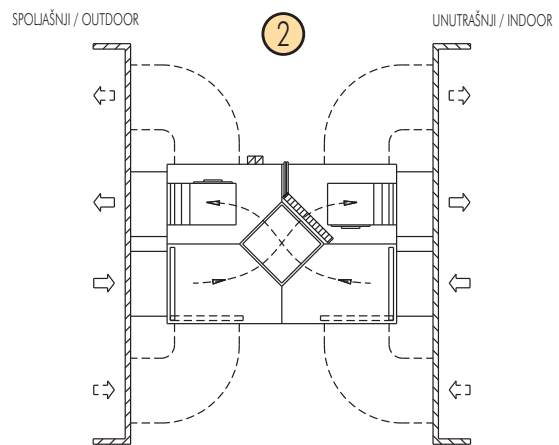
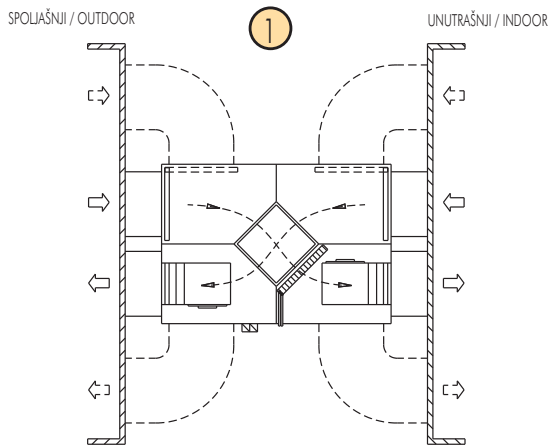
Orijentacija na zahtev sa isprekidanom linijom / dot line orientations upon request

Orijentacija sa baterijama / orientations with battery:

- ① ② ③ ④

Orijentacija bez baterija / orientations without battery:

- ① ③



Model Model	P <sub>m</sub> (kW)	Pol Poles	In Max (A)	IP	CL	U (V)	L <sub>p</sub> dB(A)*
REC 300	0,045X2	4	1,08	44	B	230/1	53
REC 600	0,065X2	2	1,6	44	F	230/1	54
REC 1200	0,147X2	4	3	44	F	230/1	53
REC 1600	0,350X2	4	5,8	55	F	230/1	60
REC 2000	0,350X2	4	6,2	44	F	230/1	59
REC 2600	0,350X2	4	6	55	F	230/1	56
REC 3500	0,550X2	4	11,4	20	F	230/1	59
REC 4500	0,750X2	4	6,2	55	F	400/3	62

PAŽNJA: Nivo vazdušnog pritiska je meren na otvorenom prostoru sa razdaljinom od 1,5m od središta ventilatora u svakom pravcu, sa priključkom kanala na unutrašnji i spoljašnji otvor.

\* ATTENTION: the sound pressure level is measured in free field at 1,5 m distance from the fan centre, in any direction, with inlet and outlet sides connected to duct.

Grejač vode H<sub>2</sub>O 70°C/60°C T = 8°C / Hot water battery 70°/60°C T=8°C

Model/Model	REC	300	600	1200	1600	2000	2600	3500	4500
Protok vazduha /Air flow		-	-	1000	1400	1900	2500	3200	3900
Redovi grejača		-	-	3	3	3	3	3	3
Toplotna moć /Thermal yeald (kW)		-	-	11,	16,3	20,4	29,7	35,1	44,3
Temp. toplog vazduha /Exhaust temperature (°C)		-	-	40,5	41,5	39	42,2	39,6	39,9
Pad pritiska sa vodene strane /Charge loss water sid		-	-	13	31	18	20	27	49

Grejač vode H<sub>2</sub>O 70°C/60°C T = 8°C / Hot water battery 70°/60°C T=8°C

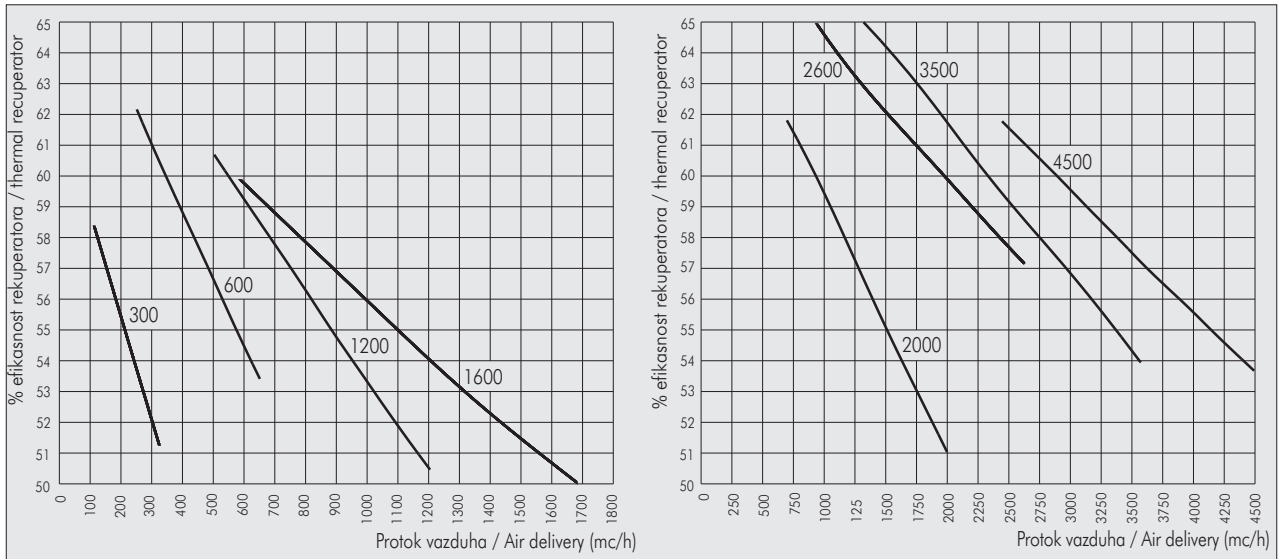
Model /Model	REC	300	600	1200	1600	2000	2600	3500	4500
Protok vazduha /Air flow		-	-	1000	1400	1900	2100	3200	3900
Redovi grejača		-	-	3	3	3	3	3	3
Toplotna moć /Thermal yeald (kW)		-	-	13,6	19,4	24,6	35,4	42	52,
Temp. toplog vazduha /Exhaust temperature (°C)		-	-	47,1	48	45,3	48,9	45,8	46,
Pad pritiska sa vodene strane /Charge loss water side (kPa)		-	-	19	42	25	27	37	67

Električni grejač vode / Electrical heater battery

Model/Model	REC	300	600	1200	1600	2000	2600	3500	4500
Električni otpornik 1. stepena / Electrical resistor 1 stage (kW)		2	4	4,5	6	9	12	12	12
Naponski izvor / Power supply (V)		230/	230/	400/	400/	400/	400/	400/	400/

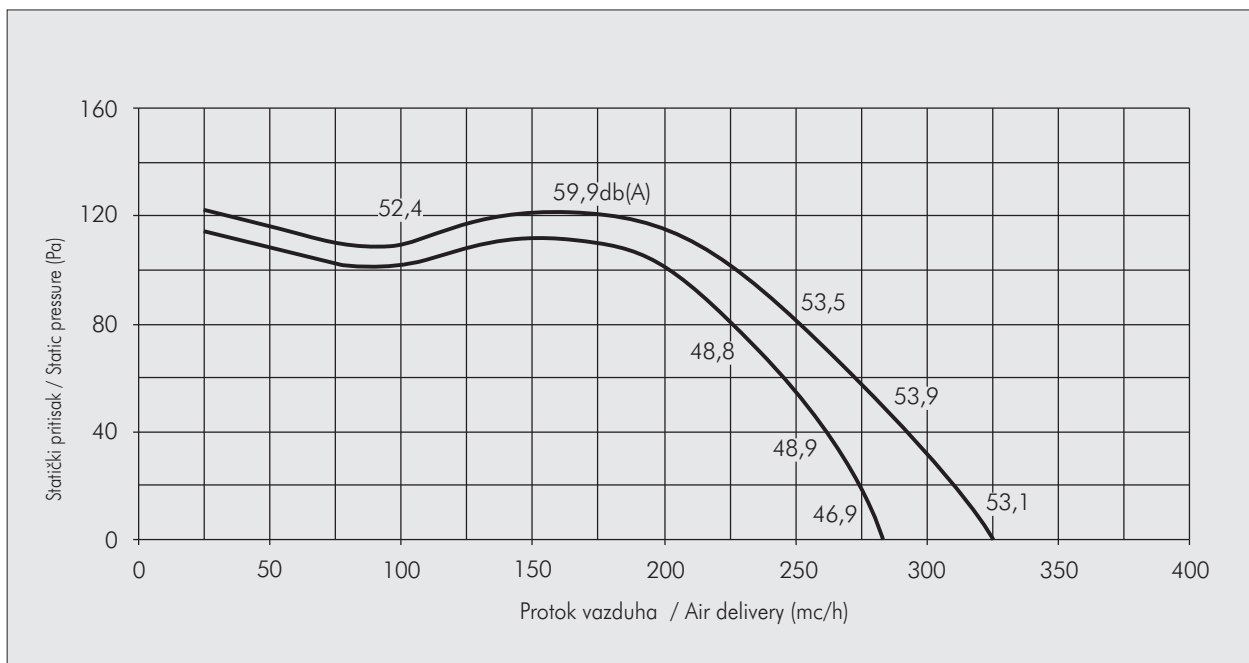
EFEKTIVNOSTI / EFFICIENCIES

Napomena: ispušten vazduh je 20°C, dovođen obnovljen vazduh -5°C. / Reference: exhaust air 20°C, air intake renewal -5°C



Frekvencija 50 Hz - Temperatura vazduha 15°C – Barometarski pritisak 760 mm Hg – Specifična težina vazduha 1,22 Kg/m<sup>3</sup>  
 Frequency 50Hz – Air temperature 15°C – Barometric pressure 760 mm Hg – Air specific weight 1,22 Kg/m<sup>3</sup>

REC 300

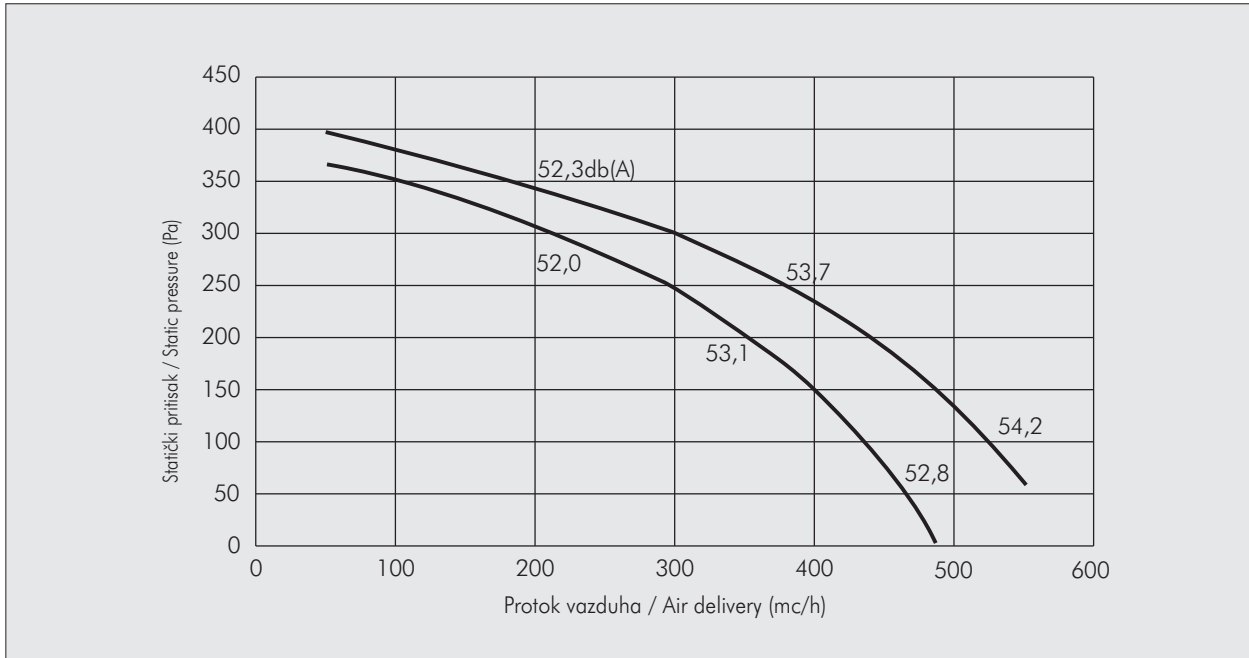


Pažnja: Nivo pritiska zvuka je meren u slobodnom prostoru sa 1.5m razdaljine od centra ventilatora, u bilo kom pravcu, sa izlaznom i ulaznom stranom povezanom na cevni sistem.

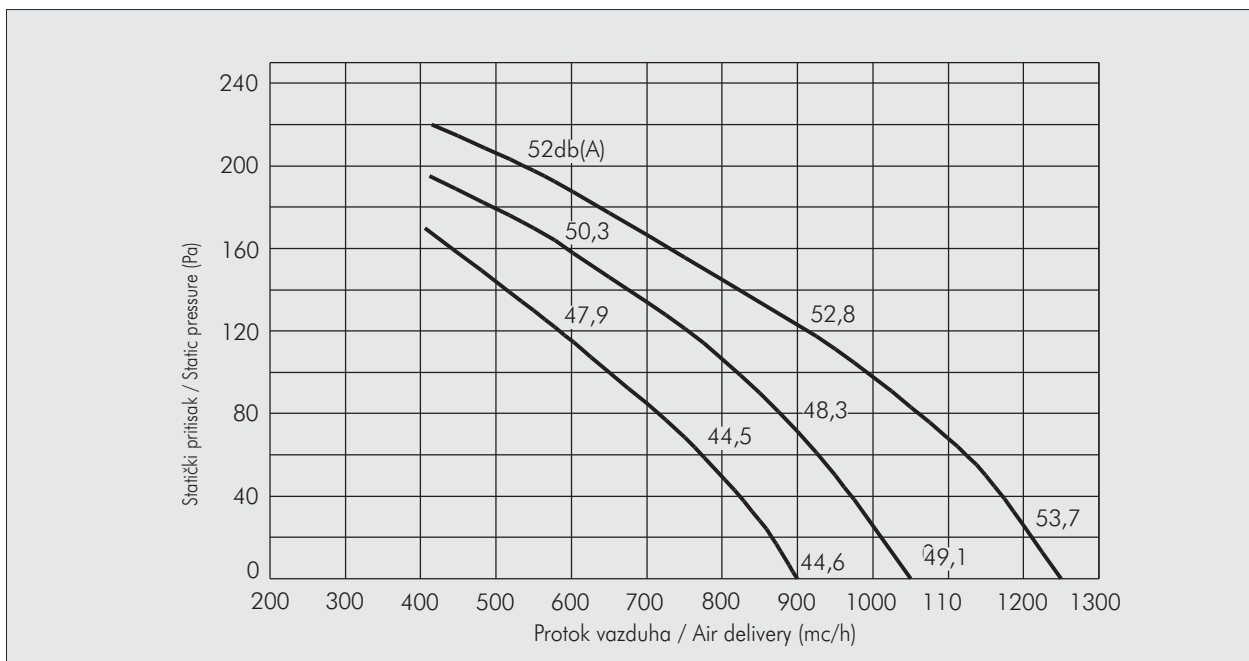
The sound pressure levels are measured in free field at 1,5 m distance from the fan centre, in any direction, with inlet and outlet sides connected to duct.

Frekvencija 50 Hz - Temperatura vazduha 15°C – Barometarski pritisak 760 mm Hg – Specifična težina vazduha 1,22 Kg/m<sup>3</sup>  
 Frequency 50Hz – Air temperature 15°C – Barometric pressure 760 mm Hg – Air specific weight 1,22 Kg/m<sup>3</sup>

REC 600



REC 1200

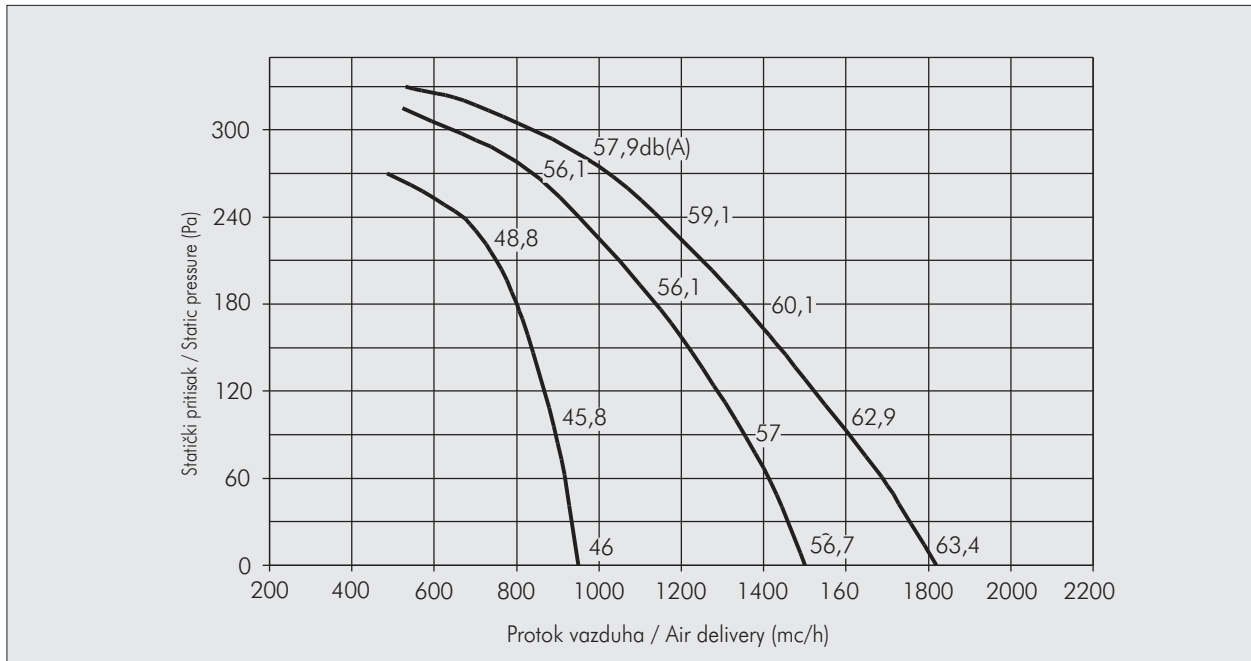


Pažnja: Nivo pritiska zvuka je meren u slobodnom prostoru sa 1.5m razdaljine od centra ventilatora, u bilo kom pravcu, sa izlaznom i ulaznom stranom povezanom na cevni sistem.

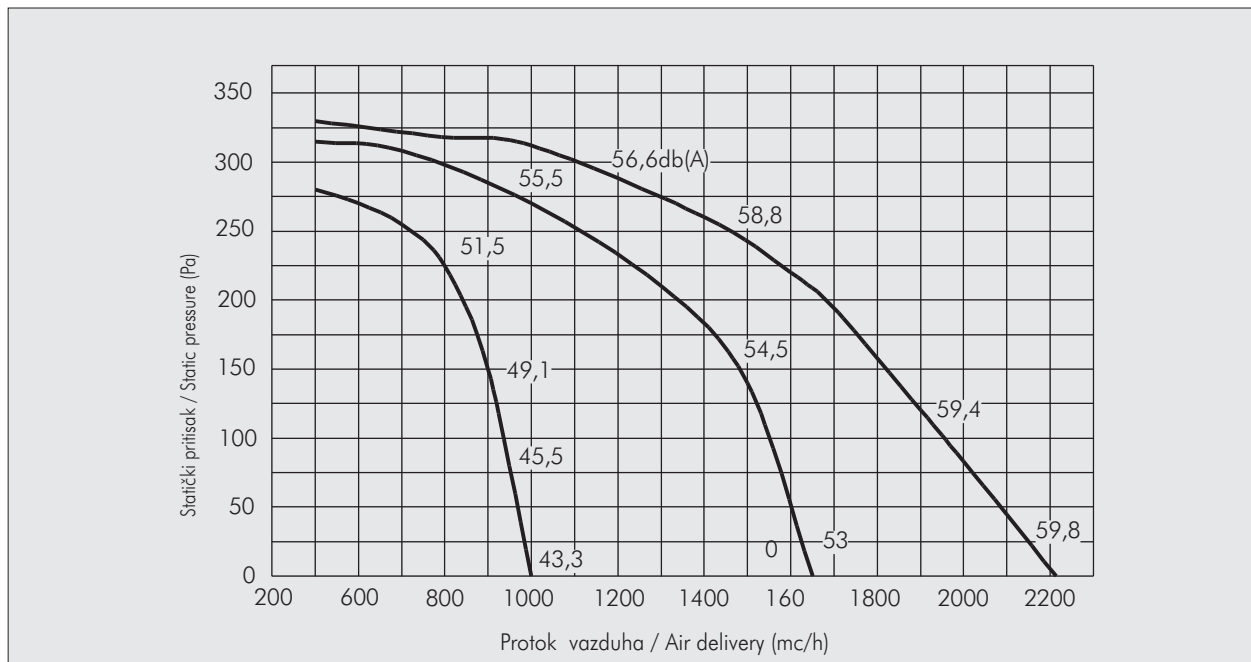
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 Frequency 50Hz – Air temperature 15°C – Barometric pressure 760 mm Hg – Air specific weight 1,22 Kg/m<sup>3</sup>

REC 1600



REC 2000

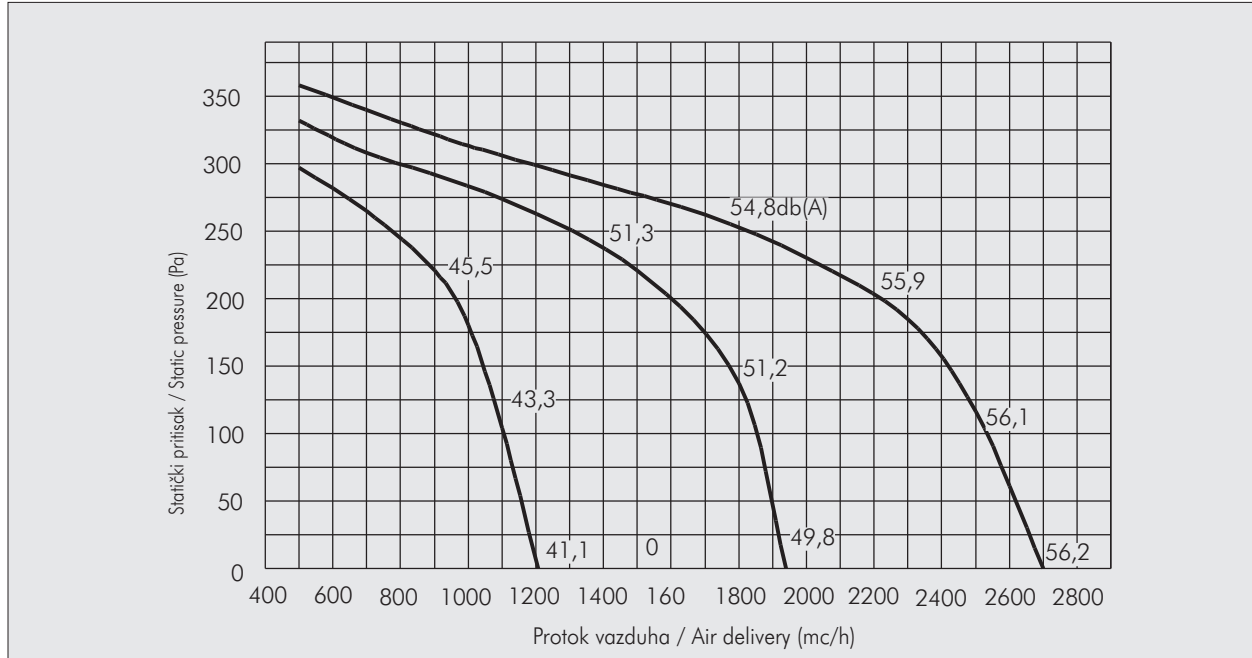


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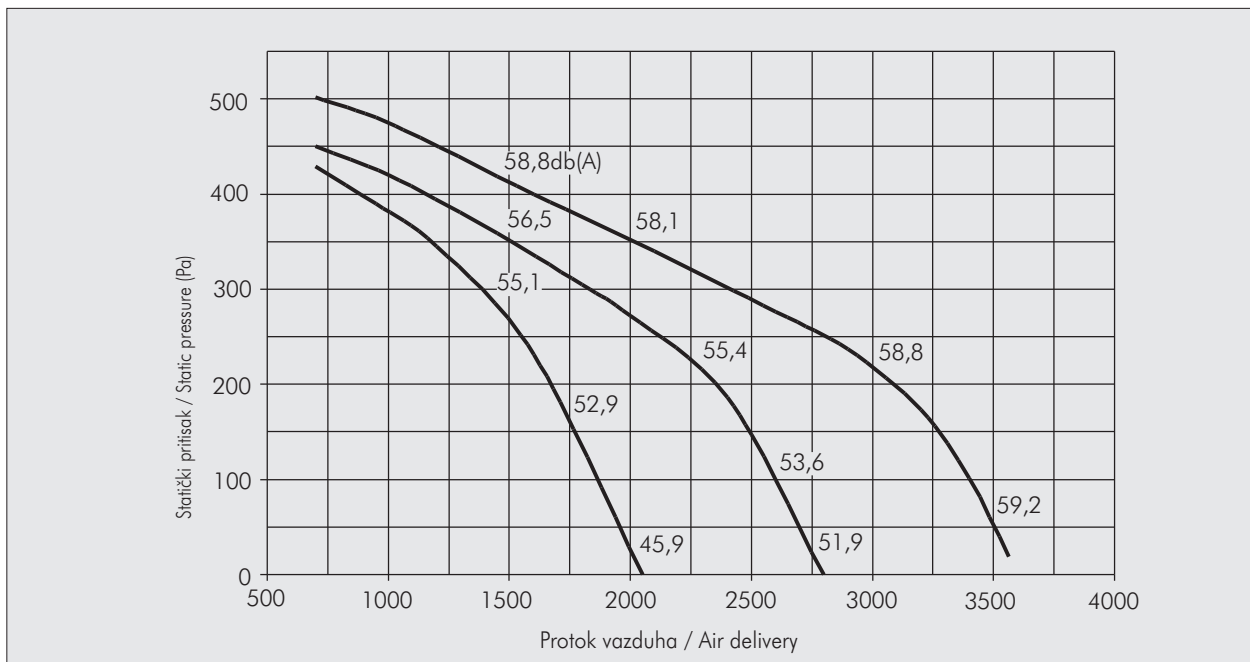
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Frekvencija 50 Hz - Temperatura vazduha 15°C – Barometarski pritisak 760 mm Hg – Specifična težina vazduha 1,22 Kg/m<sup>3</sup>  
 Frequency 50Hz – Air temperature 15°C – Barometric pressure 760 mm Hg – Air specific weight 1,22 Kg/m<sup>3</sup>

REC 2600



REC 3500



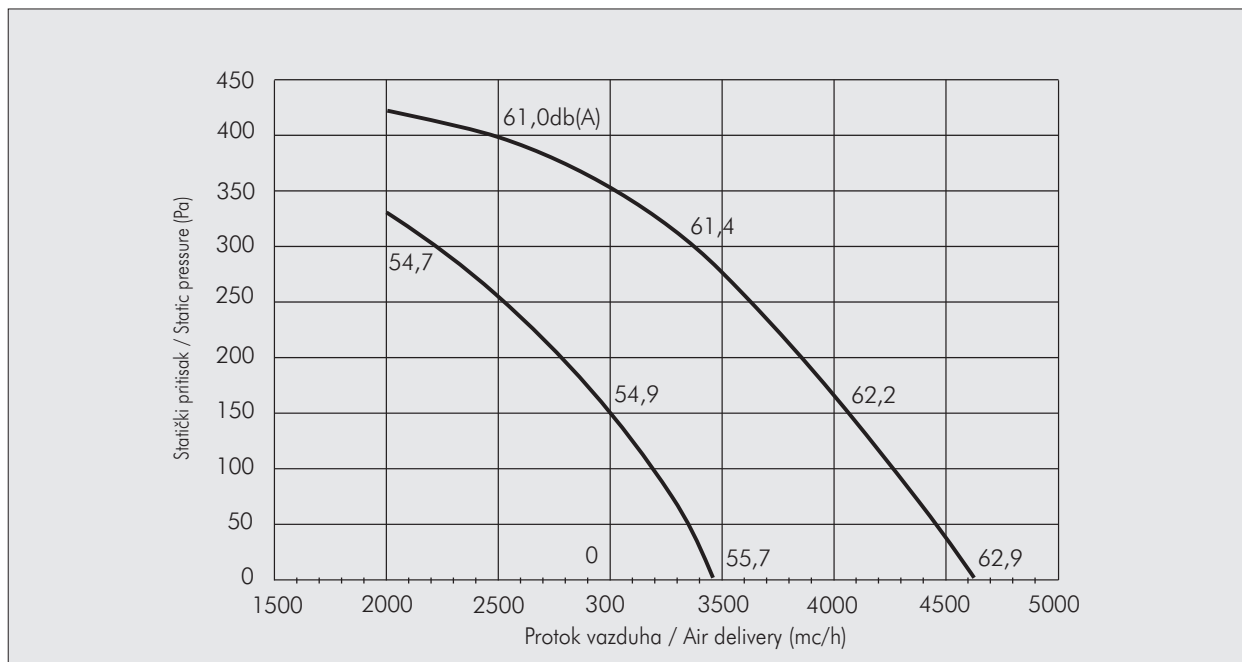
SEK. 13

Pažnja: Nivo pritiska zvuka je meren u slobodnom prostoru sa 1.5m razdaljine od centra ventilatora, u bilo kom pravcu, sa izlaznom i ulaznom stranom povezanom na cevni sistem.

The sound pressure levels are measured in free field at 1,5 m distance from the fan centre, in any direction, with inlet and outlet sides connected to duct.

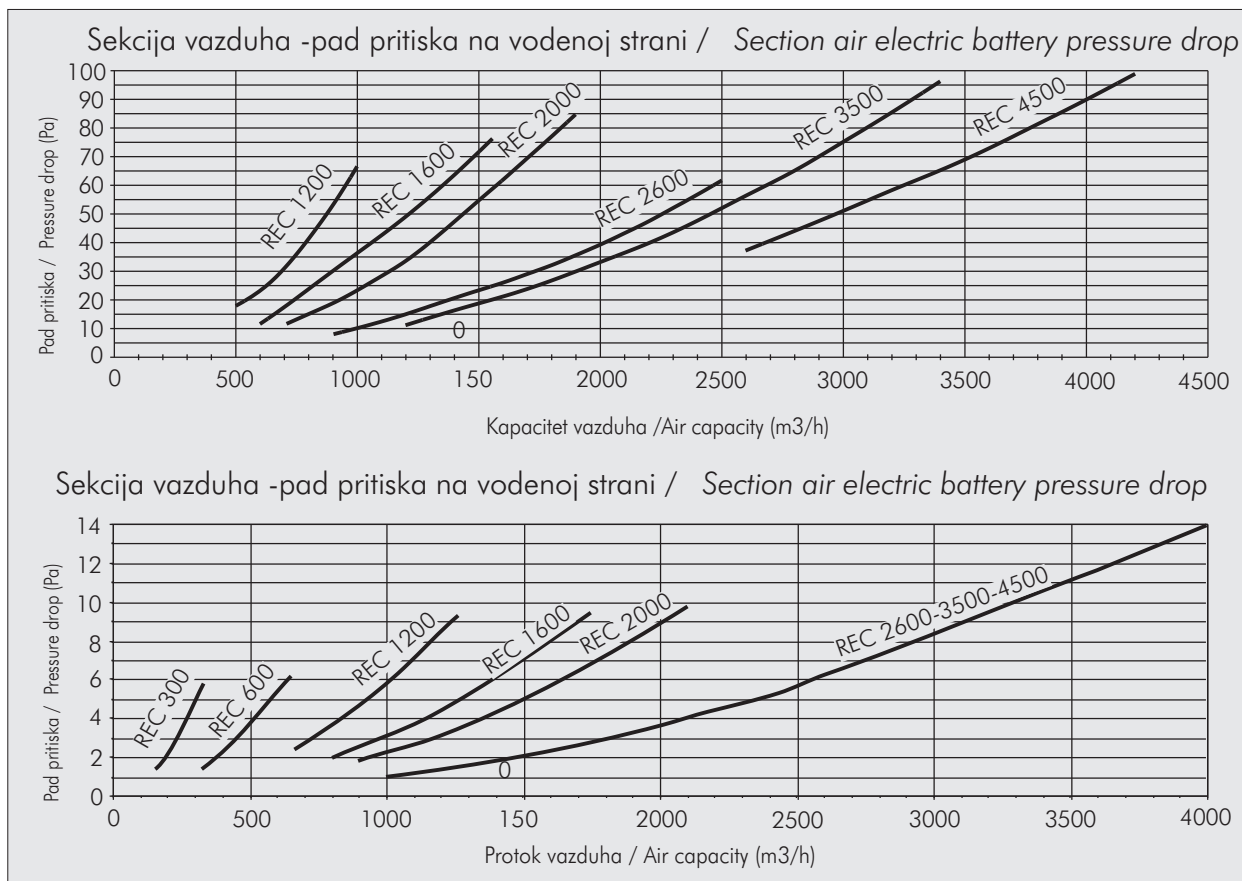
Frekvencija 50 Hz - Temperatura vazduha 15°C - Barometarski pritisak 760 mm Hg - Specifična težina vazduha 1,22 Kg/m<sup>3</sup>  
 Frequency 50Hz - Air temperature 15°C - Barometric pressure 760 mm Hg - Air specific weight 1,22 Kg/m<sup>3</sup>

REC 4500

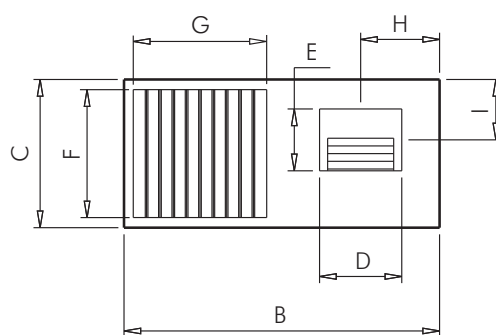
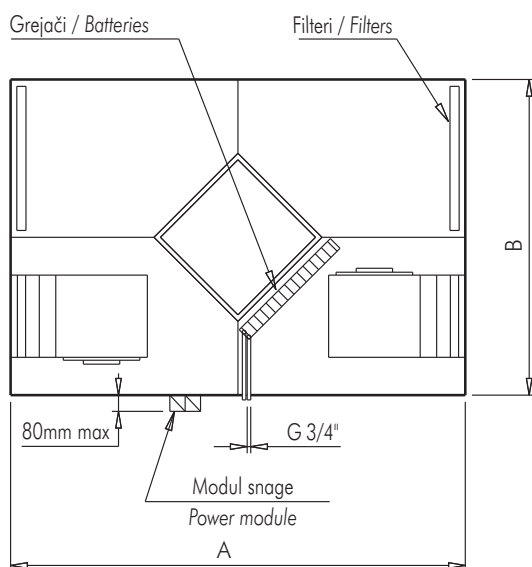


Pažnja: Nivo pritiska zvuka je meren u slobodnom prostoru sa 1.5m razdaljine od centra ventilatora, u bilo kom pravcu, sa izlaznom i ulaznom stranom povezanom na cevni sistem.

The sound pressure levels are measured in free field at 1,5 m distance from the fan centre, in any direction, with inlet and outlet sides connected to duct.



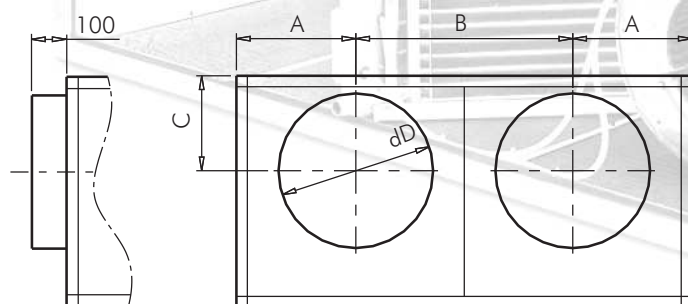




Tip/Type	A	B	C	D	E	F	G	H	I	kg.
REC 300	990	750	270	127	108	153	275	120	93	39
REC 600	990	750	270	164	100	153	275	197	99	41
REC 1200	1150	860	385	240	218	267	330	225	147	68
REC 1600	1350	900	410	240	270	267	337	241	186	91
REC 2000	1450	900	470	240	270	327	337	230	186	99
REC 2600	1700	1230	490	306	270	347	502	323	186	140
REC 3500	1700	1230	530	339	297	387	502	308	199	155
REC 4500	1700	1230	630	339	297	487	502	308	199	179

Dimenzije u mm/Dimensions in mm

KRUŽNI PRSTENASTI ADAPTER (NA ZAHTEV) / CIRCULAR SPIGOT ADAPTORS (UPON REQUEST)



Tip /Type	A	B	C	dD
REC 300	197	356	100	156
REC 600	197	356	118	196
REC 1200	224	411	179	312
REC 1600	241	418	193	312
REC 2000	230	440	192,5	312
REC 2600	323	583	213	351
REC 3500	307	616	235	396
REC 4500	307	616	260	396

Dimenzije u mm/Dimensions in mm

## KONTROLNE TABLE

## Kontroler brzine CV3

Pogodan za instaliranje na zid, dozvoljava selekciju jedne od tri brzine ventilatora. (dve brzine za modele 300 i 600).

Na kontrolnoj tabli se nalaze:

Prekidač uključenja-isključenja

Tropozicioni prekidač brzine

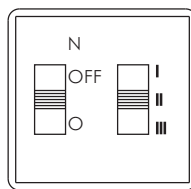
## SPEED CONTROL CV3

Suitable for wall installation, allows one of the three fan speeds to be selected. (two speeds for models 300 e 600).

On the control panel there are:

- on - off switch;

- three position speed switch.



## Tehničke karakteristike / Technical characteristics

Izvor struje / Power supply:	230 +/- 10% Vac ; 50/60Hz
Regulatori / Regulations:	Prostorni temperaturni čvor / Room temperature knob Manuelni prekidač /Off/Estate/ Manual switch Winter/Off/Summer Trobrzinski prekidač : Min/Med/Max/ Three speed switch: Min/Med/Max
Interventni relei / Intervention relays:	6A sa otporom opterećenja / 5A with resistive load
Temperaturni limit / Temperature limits:	0°C ; +50°C
Limit vlažnosti / Humidity limits:	10-90 U.R.% bez kondenzacije / 10-90U.R.% without condensation
Stepen zaštite / Protection grade:	IP 20
Boja / Colour:	Ledeno bela / Ice white
Spremnik / Container:	ABS mm. 90 x 65 x 30

## JEDINICA KONTROL TABLE PC3

Pogodna za montiranje na zid, zimi omogućuje aktivaciju električne -naknadne grejne jedinice u odnosu na sobnu temperaturu i omogućuje selekciju od tri brzine električnog ventilatora.

Na kontrolnoj tabli se nalaze:

Prekidač uključenja-isključenja (leto-zima)

Dugme za regulaciju temperature

Tropozicioni prekidač brzine.

## UNIT CONTROL PANEL PC3

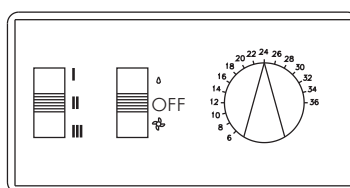
Suitable for wall installation, it allows, in winter, the activation of any electrical post-heating elements according to the room temperature and also allows the three speeds of the electrical fan to be selected.

On the control panel there are:

- on (summer -winter) - off switch;

- temperature regulation knob;

- three position speed switch.



## Tehničke karakteristike / Technical characteristics

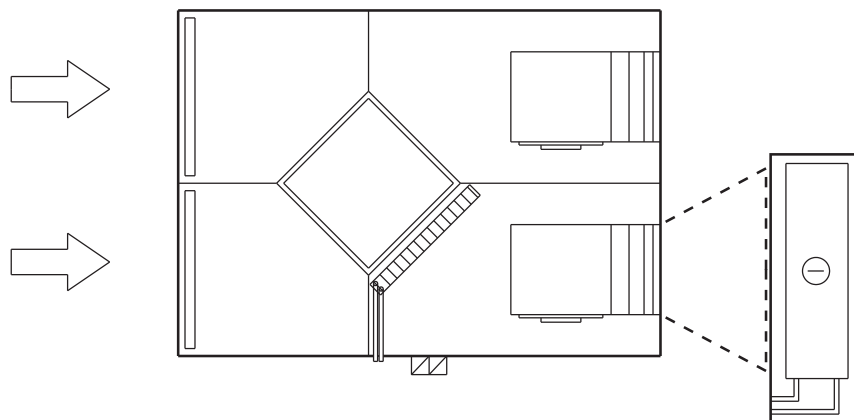
Izvor struje / Power supply:	230 +/- 10% Vac ; 50/60Hz
Regulatori / Regulations:	Prostorni temperaturni čvor / Room temperature knob Manuelni prekidač /Off/Estate/ Manual switch Winter/Off/Summer Trobrzinski prekidač : Min/Med/Max/ Three speed switch: Min/Med/Max
Interventni relei / Intervention relays:	5A sa otporom opterećenja / 5A with resistive load
Polje regulacije / Regulation field:	6 - 30°C
Senzor temperature / Temperature sensor:	NTC 4K7
Interventni diferencijal / Intervention differential:	0,5°C ; 0,1°C
Temperaturni limit / Temperature limits:	0°C ; +50°C
Limit vlažnosti / Humidity limits:	20-90 U.R.% bez kondenzacije / 20-90U.R.% without condensation
Stepen zaštite / Protection grade:	IP 40
Boja / Colour:	Ledeno bela / Ice white
Spremnik / Container:	ABS mm. 150 x 84 x 32

GREJAČ VODE

Omogućava tretman hlađenja sa odvlaživanjem vazduha koji napušta rekuperator. Ovaj deo sadrži bakarnu cev i jedinicu razmenjivanja od aluminijuma, kao i nerđajući čelični odvod.  
Oblikovan okvir omogućuje lako montiranje ove jedinice na pravougaoni deo vazdušnog kanala.

COLD WATER UNIT

Allows the cooling treatment with de-humidification of the air leaving the recuperator unit.  
The section includes the copper pipe and aluminium package exchange unit and the stainless steel drain tray.  
The shaped rim ensures an easy fixing of the unit to a rectangular section air duct line.

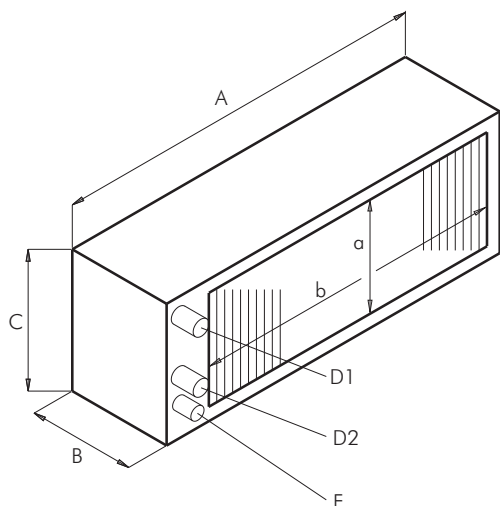


Skica sa linearnim pozicioniranjem.  
Layout with linear positioning.

Model /Model	REC	300	600	1200	1600	2000	2600	3500	4500
Protok vazduha /Air flow		-	-	1000	1400	1900	2100	3200	4000
Snaga rashlađivanja / Cooling power	(kW)	-	-	7,2	9,1	11,	15,	18,5	26,9
Temp.toplog vazduha / Exhaust temperature	(°C)	-	-	15	16,2	16,8	16,9	17,3	16
Pad vazdušnog pritiska /Air pressure drop	(Pa)	-	-	20	32	38	42	49	98
Kapacitet vode /Water capacity	(m <sup>3</sup> /h)	-	-	1,24	1,56	1,98	2,60	3,17	4,6

Referentno stanje : unutrašnja temperatura vazduha 29 °C db 50% ur  
temperatura vode 7/12 °C

Reference conditions: Input air temperature 29 °C db 50% ur  
Water temperature 7/12 °C



Tip /Type	A	B	C	D1	D2	E	a	b
REC 300	-	-	-	-	-	-	-	-
REC 600	-	-	-	-	-	-	-	-
REC 1200	1000	200	295	3/4"	3/4"	22	21	860
REC 1600	1000	200	295	3/4"	3/4"	22	0	860
REC 2000	1100	200	322	3/4"	3/4"	22	21	860
REC 2600	1340	200	322	3/4"	3/4"	22	0	1200
REC 3500	1340	200	372	1"	1"	22	23	1200
REC 4500	1340	200	372	1"	1"	22	5	1200

Dimenzije u mm/Dimensions in mm

ZAIBILAZNI ODMRZIVAČ ILI SLOBODNO HLAĐENJE

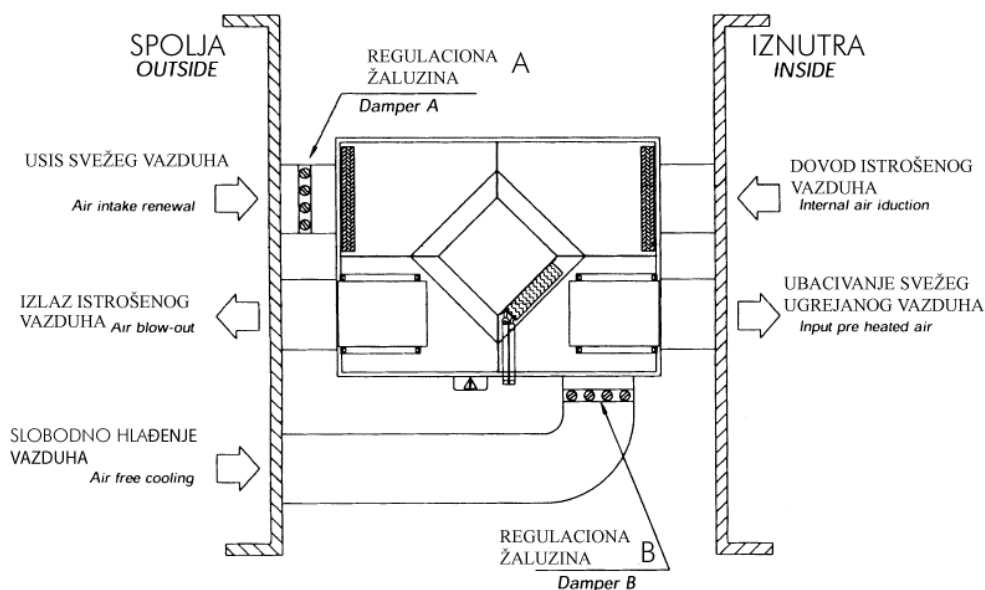
Modeli REC 600-1200-2000-4500 imaju razdvojenu strukturu omogućavajući sprovođenje zaobilaznog odmrzavanja ili slobodnog hlađenja.

**SLOBODNO HLAĐENJE :** Kada je spoljašnja temperatura blizu unutrašnje rekuperator može zaobići direktno insertovan obnovljeni vazduh u prostoriji. Ovo je moguće uraditi sa otvaranjem žaluzine B i u ist o vreme sa zatvaranjem žaluzine A.

DEFROSTING BY-PASS OR FREE COOLING

For REC 600-1200-2000-3500-4500 models the structure has a presplitting allowing defrosting by-pass or free cooling to be carried out.

**FREE COOLING:** When the external temperature is close to the internal temperature the recuperator may be bypassed inserting renewal air directly in the room. It is possible to do this by opening damper B and at the same time closing damper A.



ODMRZAVANJE I RECIRKULACIJA

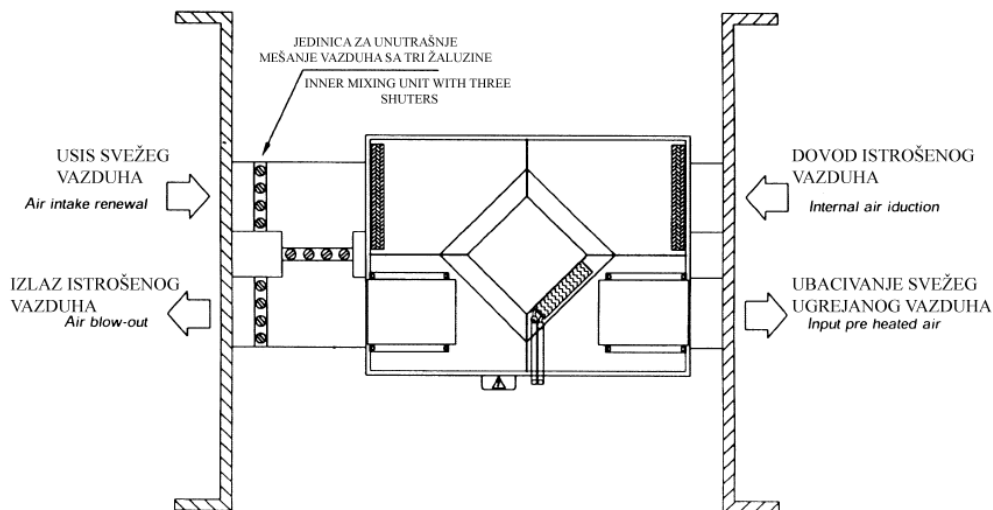
U periodima jake hladnoće često je potrebno sistemu omogućiti odmrzavanje omota rekuperatora ili ubrzati recirkulaciju unutrašnjeg vazduha.

Na drugoj šemi primera datog u prilogu ja naznačeno: Prikladno podešavanje kretanja povezanog žaluzinama C, D i E, moguće je prigušenje spoljašnjeg vazduha i mešanje sa vazduhom od recirkulacije.

U fazi odmrzavanja, pokretanjem jedinice povoljno je predvideti odloženo startovanje ventilatora i jako je bitna signalizacija u trenutku naredbe.

**DEFROSTING AND RECIRCULATION:** In the very cold periods, it is often necessary to force a system that allows a possible defrosting of the package recuperator or the recirculation of the inside air to accelerate the putting into regime of the plant.

In the scheme 2 an example of application is indicated : regulating opportunely the movement connected of the shutters C, D and E, it is possible to choke the external air and to mix it with that of the recirculation. In phase of defrosting, at the start of the unit, it is opportune to force the delayed start of the supply fan; it is very important that this is signalled at the moment of the order.

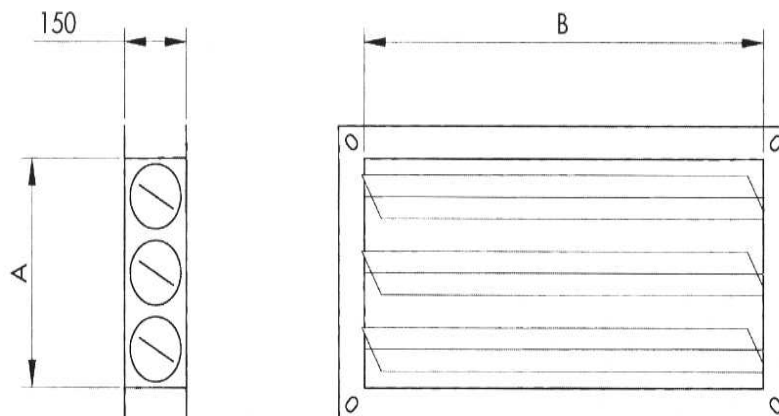


REGULACIONA ŽALUZINA

Izrada je od jednostavne grupe rebara, koji omogućuju zatvaranje protoka vazduha. Koriste se za realizaciju sprovođenja.

REGULATION DAMPER

Made from a single fin group, allows the air flow to be closed. They are used to carry out the bypass.



Tip/Type	A	B
REC 300	210	280
REC 600	210	280
REC 1200	310	330
REC 1600	310	330
REC 2000	410	330
REC 2600	410	500
REC 3500	410	500
REC 4500	410	600

Dimenzije u mm/Dimensions in mm

