SO.ERRE

tecnologia dell'aria

Say it "OH AIR"

GENERAL CATALOGUE 13 • ENGLISH

SO.ERRE
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A view of the new factory complex in Trezzano Rosa (Milan) - Italy

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O.ERRE

tecnologia dell'aria

O.ERRE was founded in 1950 and the 26th January 2000 celebrated its 50 years anniversary.

The company is still controlled by the family founder and is managed by Elido de Paoli, who carries on the work started by his father Riccardo.

During the last decennary O.ERRE has strongly contributed to the technological innovation in the ventilation field and has forwarded all around the world that tipical Italian touch in the product design, which has brought today's export share to a very important quote of total sales.

In 1991 the Italian Institute "Marchio di Qualità" gave O.ERRE an award stating their holding IMQ approval for more than 25 years.

In 1995 O.ERRE achieved the quality certification ISO 9001: 2000 from the famous CSQ institute wich is a member of IQNET network, well know all around the world.

In 2004 a large range of explosion proof fans got the Atex certification through CESI institute.

In 2004 O.ERRE improved an interactive web site for order placement.

In 2007 O.ERRE achieved the UL certification for a line of centrifugal duct fans.

In 2007 O.ERRE launched a new and innovative range of energy recovery fans.

In 2008 O.ERRE moved in a new headquarter located in Trezzano Rosa (MI) with a larger production area to better satisfy the customers' requirements.

CERT. N° 9130.OERR

CSQ IQNet CERTIFIED QUALITY SYSTEM

ISO 9001 : 2000

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GUIDE TO AIR EXTRACTION

Room Ventilation

The rooms in which people live and carry out their various activities must be ventilated for health and hygiene reasons.

Lungs need air that, even though not as pure as that in the country, is at least free from dense smoke, steam, carbon dioxide, toxic fumes etc.

Moreover our sense of smell requires that the air does not smell bad.

In addition polluted air ruins all that is found in a room, including furniture, coverings, wall paint, and so forth.

People pollute the air in the rooms in which they live via:

- *their body: sweat, physiological necessities, breath (production of carbon dioxide), etc.*
- *their personal and domestic activities: smoking, cooking, etc.*
- *their work activities: production and handling of toxic substances, such as paint, use of ammonia, etc.*

All pollution produced in this way remains in the rooms that people and their families live in.

Polluted air must be expelled to let in the clean air.

A natural instinct would be to open windows and doors, if there are any, however this also lets in the wind, rain and cool outside temperature.

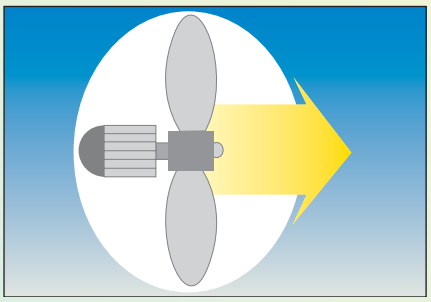
It would then be necessary to wrap up well, prevent papers flying and doors from banging.

However the extractor fans change air gradually, withdrawing the polluted air without encountering the problems associated with the external weather conditions.

In the case of stagnant air, it is the only means of ventilation.

How to choose your extractor fan

The ventilation subdivides themselves in three large categories, differentiating themselves for Power. Formal procedure of installation and Type of application.



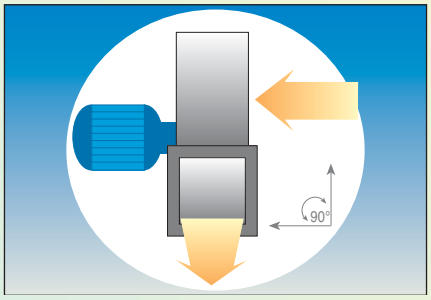
Helicoidal ventilator

Helicoidal ventilators

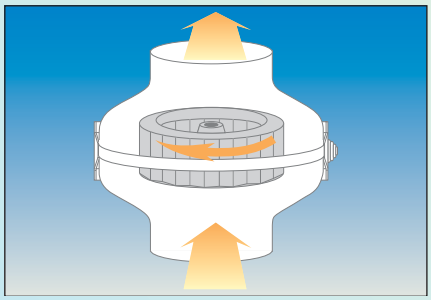
Axial bladed ventilators that move large volume of air at low pressure. They can be installed on glass and on wall when the duct is short and directed to outside.

Centrifugal ventilators

Radial bladed ventilator that moves limited volumes of air at high pressure. They can move columns of air through long ducts.



Centrifugal ventilator



Centrifugal axial ventilator

Centrifugal axial ventilators

Centrifugal axial ventilators uses a turning centrifugal where the air is conveyed in axial way and not radial, air is push from the same structure that contributes as the body of the product.

In a position to develop raised pressure, the extractor therefore can be installed in very long ducts.

To obtain a correct ventilation results, it is essential to choose the correct extractor in connection with the features of the premises, and from the request and type of application. The following table on the next page indicates the criteria for the determination of the necessary cause in every environment. In matter of installation in duct, it is necessary to take account of losses, of load, and referring to the table B the criterial restored, and the necessary course.

GUIDE TO ENERGY RECOVERY

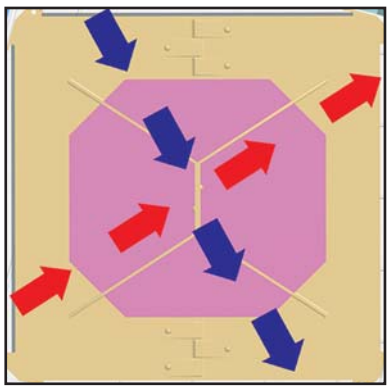
Energy conservation is an important subject which influences the choices of Producers engaged in the research and development of innovative solutions.

This trend is accelerated by the growing consumer requirements for innovative solutions which are respectful for the environment and that could bring real energy conservation.

In this context, the combination between ventilation and energy conservation allows to control the temperature of the room avoiding expensive heating losses with economic advantages and better indoor comfort.

Domestic fans with energy recovery system offer real interesting advantages for the consumers thanks to fast installation and low cost of the appliances.

The standard operation of the extractor fan consists in changing the air in rooms giving indoor comfort.
The quantity of extracted air is equivalent to the fresh incoming air through proper grilles or through draughts.



When extracting air from a heated or air-conditioned environment all the thermal energy disperses outside.
During winter season, the extracting heated air lets cold external air into the room thus requiring the room to be heated, generating energy consumption.
With an energy recovery fan system, real advantages such as indoor comfort and energy saving could be granted.
The flow of extracted air transfers thermal energy to the incoming air, avoiding waste of energy and saving money.
An energy recovery system with an efficiency equal to 70% allows to transfer to the incoming air a more comfortable temperature resulting in the 70% of heat of the extracted air granting lower waste of energy for a good indoor comfort.
Example: if the room temperature is 20 °C and the outside temperature is 0 °C, the incoming air will be heated up to about 14 °C.

GUIDE TO AIR EXTRACTION

The recommended air changes here below have to be understood as an approximate indication only. For further information pls refer to the local country rules.
The following values are drawn from Prospect 111 contained in UNI 10339:95 standard.
In function from the type of premises, its possible to extract the air reciprocation (m^3/h) necessary for every individual environment found in chart.

- *The calculation in base to the "crowd", it is carried out multiplying the exchanges per person (m^3/h) for the number of persons that normally are presented in the referred premises.*
- *The calculation in base to the "surface", it is carried out multiplying the changes ($m^3/h \times m^2$) for the surface of the same premises.*
- *The calculation in base to the "volume", it is obtained by multiplying the value in table for the cubic of the premises in (m^3). The air that is being extracted from the premises, such as kitchens, bathrooms, services.*

Recommended air changes per hour

		ROOMS' CATEGORY	Flow rate				
			Ref. No. People		Ref. mq		Ref. mc
			Air changes per person		Air changes per mq		Air changes per hour
			l/s	m^3/h	l/s	m^3/h	
Building	Houses	Bed rooms + Living rooms	11	40			
		Bathrooms + Kitchens					4
	Flat	Meeting rooms	9	33			
		Bed rooms	11	40			
		Bathrooms + Kitchens			16,5	60	
		Bathrooms + Toilets					4
		Hall	11	40			
	Hotel	Meeting rooms	9	33			
		Bed rooms	11	40			
		Bathrooms + Kitchens			16,5	60	
		Bathrooms + Toilets					4
		Hall	11	40			
Office		Office	11	40			
		Open space	11	40			
		Meeting rooms	10	36			
		Toilets					8
Hospital		Hospitalization	11	40			
		Ward	11	40			
		Sterile enviroment	11	40			
		Toilets					8

Ref. prospect III UNI 10339:1995 UNI Ente Nazionale Italiano di Unificazione. www.uni.com http://www.uni.com/it/mondo_uni/punti_uni.htm).

GUIDE TO AIR EXTRACTION

		ROOMS' CATEGORY	Flow rate				
			Ref. No. People		Ref. mq		Ref. mc
			Air changes per person		Air changes per mq		Air changes per hour
			l/s	m^3/h	l/s	m^3/h	
Building	Cinema	Meeting room	5,5	20			
		Toilets					8
		Waiting room					8
	Museum, library, church	Show room	6	22			
		Reading room	5,5	20			
		Church	6	22			
		Toilets					8
	Bar, restaurant, dancing	Bar	11	40			
		Dining room	10	36			
		Dancing	16,5	60			
		Kitchen			16,5		
		Toilets					
Commercial building	Hypermarket	Basement	9	33			
		Flat	6,5	24			
	Shops	Barber's shop	14	51			
		Clothes shop	11,5	42			
		Grocery	9	33			
		Public zone	10	36			
Sport building	Swimmin-pool	Swimming room			2,5		
		Changing room					8
		Sauna			2,5		
	Gym	Bowling	10	36			
		Playground	16,5	59			
		Spectator zone	6,5	23			
		Dressing room					8
		Toilets					8
Schools		Nursery school	4	14			
		Primary school	5	18			
		Junior school	6	22			
		Secondary school	7	25			
		University	7	25			
		Toilets					8
		Library	6	22			
		Music room	7	25			
		Laboratory	7	25			
		Teachers' room	6	22			

How to choose your extractor fan

The following three cases represent the majority of common situations illustrating the choice of extractor fans.

The following controls are recommended for each installation as it is important not to fit an appliance that is either too small, therefore ineffective, or too big, therefore excessively noisy.

CASE 1

Duct: hole leads directly outside.
Household kitchen for 2-4 people
Flow rate necessary: 130/150 m³/h.

Axial- flow fans with around 200 m³/h rate are used when the hole leads directly outside. Various appliances suitable for this type of room can be found in the catalogue: Standard 12 and Minimatic 12 (130 m³/h) wall mounted, or Ventil 15 (195 m³/h) window mounted.

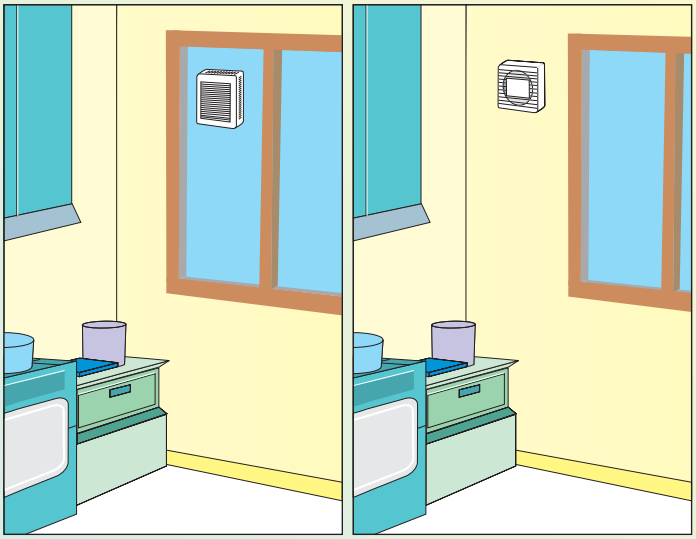
CASE 2

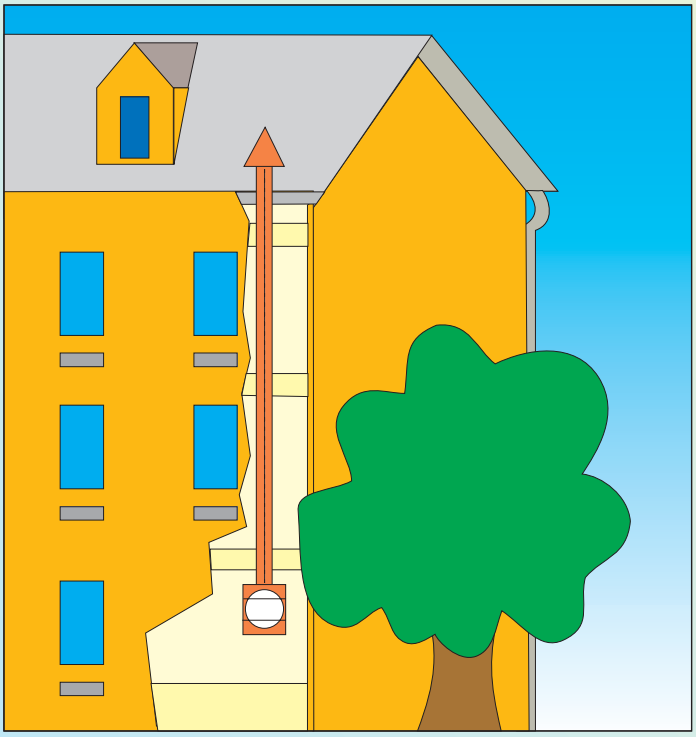
Duct: 15 m long pipe Ø 100 mm
Public toilet 2x2x3 m on ground floor of a block of flats
Room volume: 12 m³
Air changes: 15/hour
Flow rate necessary: 180 m³/h

Firstly a centrifugal fan(Compact or Aspirodor) with a flow rate slightly above 180 m³/h must be used with a long duct.
For example, the Compact 200 has a flow rate of 156 m³/h and therefore is insufficient.
The Aspirodor 200 which can deliver a flow rate of 200 m³/h could be suitable in this case.
However certain corrections must be made to the flow rate beforehand.
Table B shows resistances data per metre of duct, in relation to its section, and the flow rate necessary is shown for this purpose.

By referring to the right side of the diagram along the flow rate axis find the 180 m³ flow rate and the intersection where it cuts through the diagonal line showing the 100 mm diameter ducting.

Case 1





Case 2

At this point, a vertical line corresponds to the point of intersection leading to the resistance value expressed in mm H_2O per metre of duct: 0,7 mm H_2O.
By multiplying 0,7 X 15 m of pipe you obtain 10,5 mm which is the pressure loss of all the pipe.
Referring back to the static performance-pressure, shown on the product pages, you will see which product with a flow rate of 180 m^3 given an equal or higher pressure than 10,5 mm H_2O.

1- The Aspirodor 200 has 7 mm H_2O.
2- Aspirodor 300 has 18 mm H_2O.
3- Compact 300 has 22 mm H_2O.

Therefore only the last two models would be suitable for this application.

Pressure losses for bends and elbows

Speed	Pressure loss for bend	Pressure loss for elbow
m/sec	(mm H_2O)	(mm H_2O)
1	0,01	0,1
2	0,05	0,35
3	0,1	0,8
4	0,2	1,4
5	0,3	2
6	0,4	3
7	0,5	4
8	0,7	5,5
9	0,9	7
10	1,1	9
15	2,5	20
20	4,5	35
30	10	65

Table A

Case 3

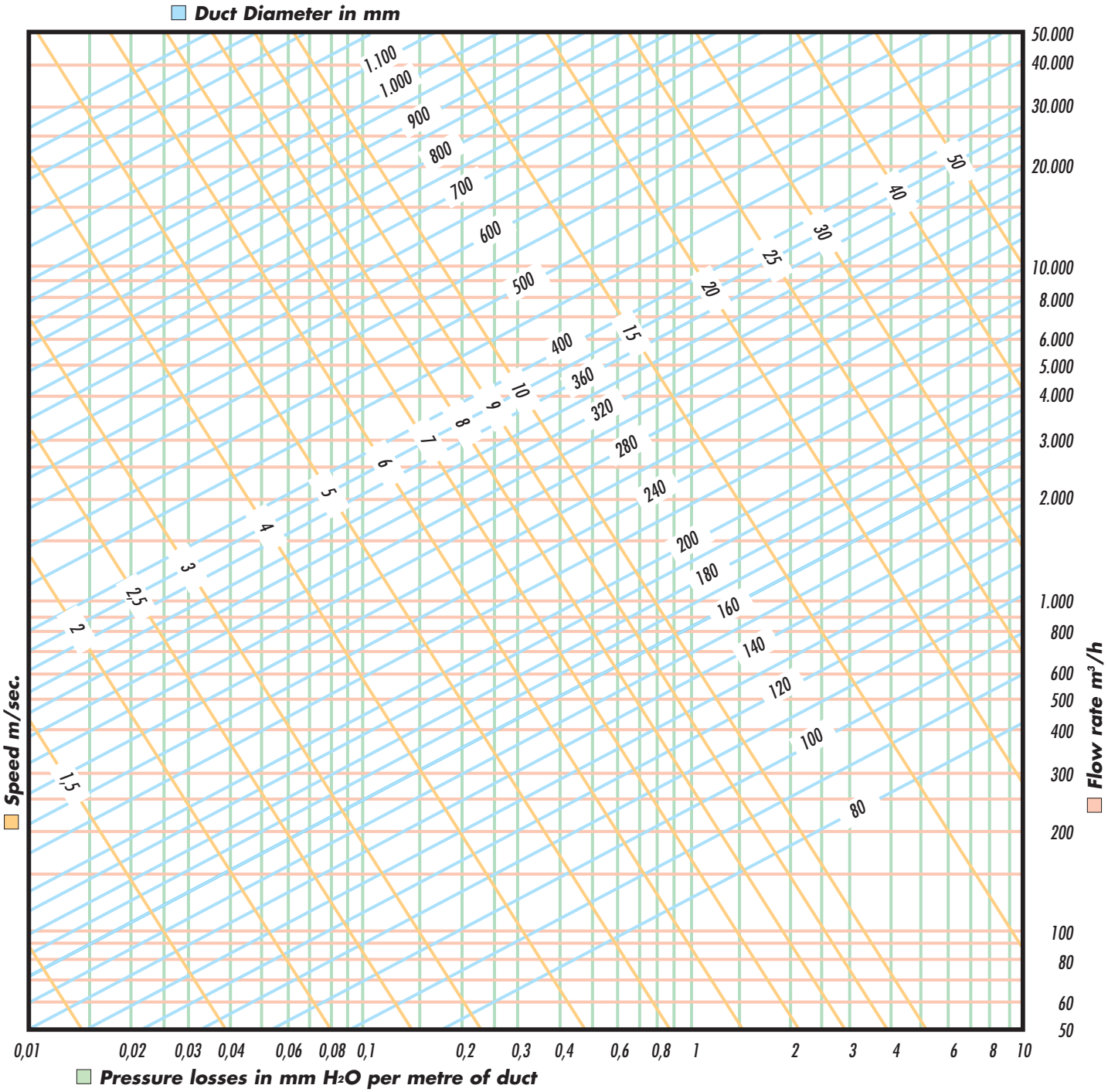
CASE 3
An office area, with false ceiling, ducting of 120 mm diameter, for 2 meters in horizontal position, between ceiling and soffit, and 8 meters in vertical with one bend between the two features. For this type of premises, the extraction air capacity is determined by multiplying the air capacity for every person then is brought back in the table of the air reciprocations, for the number of normally present persons in the office. Suppose that in our office 6 persons normally are present.
Necessary capacity = 40 x 6 = 240 m^3/h.

If it is necessary now to calculate, of course taking in such consideration, the losses of load of the ducting. From table B, left to right side, entering from 240 m^3/h value, and continue until you cross the blue line in diagonal of diameter 120 mm. Coming down to intersection strut frame in vertical way, it is found a 0,4 mm H_2O for every meter of ducting and besides the diagonal of velocity of the air value of 6 m/s (rounded off if exceeded).

Multiplying the total lenght of the duct (10 meters) for the value of 0,4, you obtain 4 mm H_2O.
To this, you have to add the load of each bend, that is taken from the table A. A value of velocity of 6 m/s is found on bends that individualizes to a loss of load of 0,4 mm H_2O.
The total loss is 4 + 0,4 = 4,4 mm H_2O.

That's serves as an individualize extractor that to a course of 240 m^3/h gives a pressure of 4,4 mm H_2O. Such a combination of values, are searched on the diagram of the characteristic curve of the product, that is restored on pages of the centrifugal extractors.
As it can be verified, for the type of indicated installation, the product Turbo 125 can be applied.

Table B: Diagram for fan choice



How to use the Diagram:

1) Start with the flow rate value (m^3/h). Refer to the right side of the diagram.
2) Proceed horizontally until you cross the diagonal line giving you the diameter of the duct you need.
3) Descend vertically to find the value of the pressure loss expressed in mm H_2O per each metre of duct.
Multiply this value with the required lenght of pipe and you will find the total pressure loss value.
4) At the intersection of the flow rate and duct diameter values, follow this line upwards until it intersects with the recommended air speed (m/sec). Once you have this value refer to Table A.

Installation System

a) Air suction through extraction

This is the most widely used method owing to its simplicity.
The polluted air is not channelled into the adjacent rooms but carried outside by one or more extractor fans.
Fresh air enters the rooms through cracks in the doors and windows and, if necessary, through appropriate air intakes covered with grilles.

These last ones are recommended when the room is airtight and powerful extractor fans are installed. It is better that air intakes and windows or doors that are often left open, are as far away as possible from the extractor fan, so that the incoming air does not become outgoing air immediately and vice-versa.

b) Pressure extraction

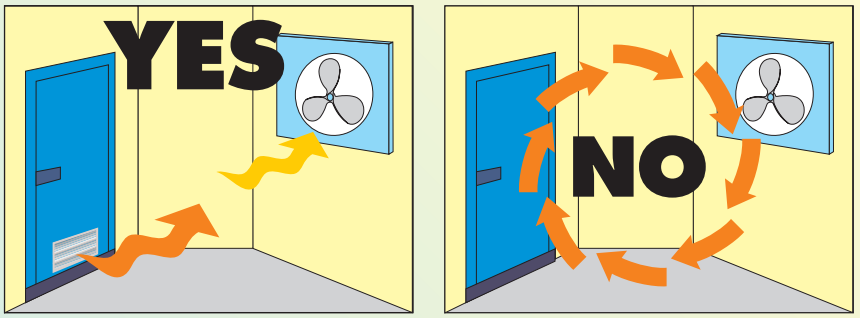
This fan lets new air go into the room by taking it from the outside and creating a higher pressure inside that forces the polluted air through the provided openings.
This system must see that the polluted air is carried outside and not into other rooms. Air currents are not created as the inside pressure is higher than that outside.

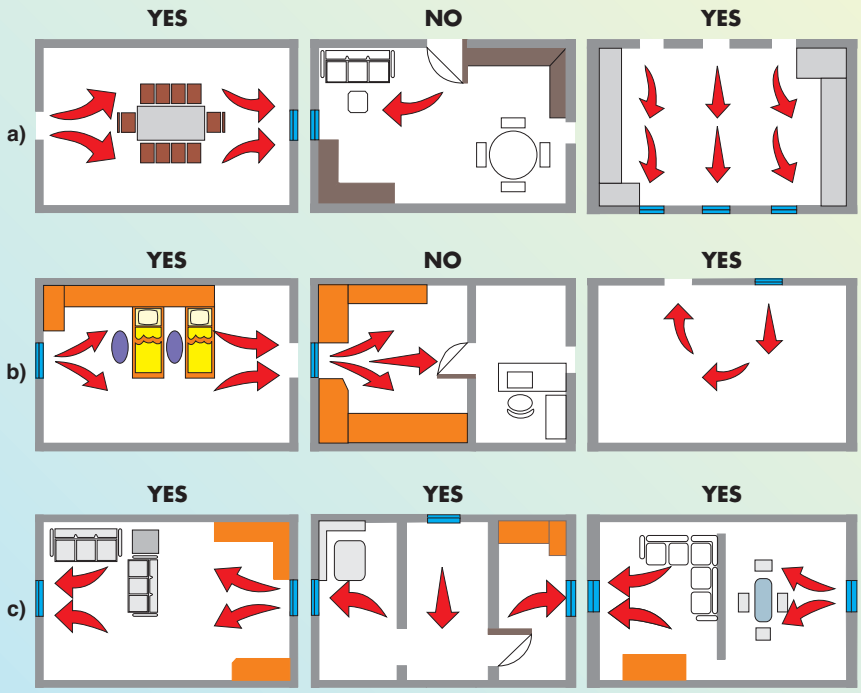
c) Air suction through extraction and pressure

This guarantees greater ventilation, air emission and expulsion must be studied so as not to leave air pockets. The incoming air volume must be higher than that the outgoing, so that the environment is slightly pressurised (15%).

General warnings

If there is an appliance in the room that uses solid, liquid or gas fuel (eg. water heater, heater, boiler, etc.), that is not of the "balanced flue" type and that is airtight, sufficient air must be let into the room in oder to assure a proper working of the fuel appliance and to compensate the air extracted by the electric fan. The air taken in must not be let into existing ducts that are equipped to expel hot air when using ducted extractor fans. For example, combustion outlets of water and gas heaters.





Maintenance

Maintenance consists of periodically cleaning the impellers and all other parts in contact with the flow of air created by the extractor fan. Polluted air deposits grease and dust on the impeller and grille. This layer of dirt unbalances the impeller making the motor less efficient, putting it under excessive pressure and making it more noisy.
Cleaning consists in removing the grease with a damp sponge (not wet) and soap, after disconnecting the appliance and taking care not to wet and damage the electric parts of the extractor fan.

Grilles

It is better to have one or two grilles to protect the extractor fan when it is not in operation.

One inside, for manual or automatic operation, that does not allow air changes with the outside when the extractor fan is turned off. This grille is a part of the appliance and therefore should be obtained when purchasing.

The outside grille is generally of the gravitational type. It protects the mechanism and circuits of the appliance against external atmospheric conditions, and prevents air changes when there is not an internal grille.

Abbreviations

= *Product I.M.Q approved. (Istituto Italiano del Marchio di Qualità)*

= *Product in accordance with applicable EEC Directives*

= *Explosion proof*

= *Keymark*

= *Double insulated product*

IPX4 = *Splash proof (EN 60529)*

O.ERRE's technical assistance is at customer's service for any application or installation problem.

DOMESTIC FANS

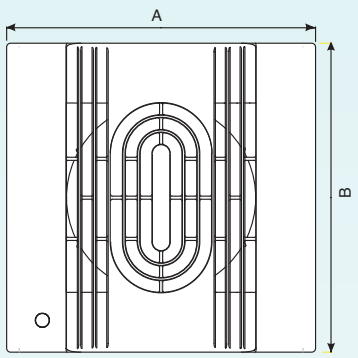
The "talking" packaging

"LOW PROFILE" FANS *in* SERIES

"LOW PROFILE" FANS *in* SERIES

• Axial fans to extract air directly outside or through ducting.
Suitable for wall, ceiling and window (through window kit accessory) installations.
• "Slim grille" with original and innovative design.
• Quick and functional installation through "click assembly" of the fan.
• All models are supplied with "operating warning light".
• Two fixing screws to allow easy installation on the wall.
• Reduced internal wall dimensions to allow installation where the bend of ducting is close to the outlet of the product.
• The range is composed of 22 models in 100-120-150 mm, standard, Timer, PIR, HT, 12Volt version and motor with ball bearing in some models.
• Very high performances in terms of flow rate, low dB (A) and low power consumption due to a precise study of optimisation of motor-impeller combination.
Performance tests in accordance with Standard UNI 10531
Noise tests in accordance with Standard UNI EN ISO 3741

Dimensions



CE
IPX4
IMQ
03

Model	A	B	C	D	E
SERIE IN 10/4	160	160	53	18	Ø100
SERIE IN 12/5	180	180	53	19	Ø120
SERIE IN 15/6	210	210	66	20	Ø150

• Performance and noise tests on product samples (IN 10/4, IN 12/5, IN 15/6 models) carried out by IMQ laboratory.
• Careful selection of components: ABS + filled polypropylene.
• Protection grade: IPX4 in accordance with Standard EN 60529.
• Double insulated product, electric ground is not necessary.
• Voltage: 220-240V, 50Hz.
• In accordance with Standard EN 60335-2-80
• International Approval Keymark, issued by IMQ.
• Working temperature 45°C.

Technical Data

Model	Rif.	Hole diameter mm	Flow rate m^3/h	W	Nominal voltage and frequency	Max.Press. mm H_2O	dB (A) 3m	Weight Kg
IN 10/4	OW 501 9	100	105	13	220-240 V 50Hz	2,8	35,6	0,5
IN 10/4 T	OW 507 6	100	105	13	220-240 V 50Hz	2,8	35,6	0,5
IN BB 10/4	OW 525 8	100	105	13	220-240 V 50Hz	2,8	35,6	0,5
IN BB 10/4 T	OW 528 2	100	105	13	220-240 V 50Hz	2,8	35,6	0,5
IN 10/4 HT	OW 543 1	100	105	13	220-240 V 50Hz	2,8	35,6	0,5
IN 10/4 PIR	OW 546 4	100	105	13	220-240 V 50Hz	2,8	35,6	0,5
IN 12/5	OW 502 7	120	180	18	220-240 V 50Hz	4,6	38,8	0,6
IN 12/5 T	OW 508 4	120	180	18	220-240 V 50Hz	4,6	38,8	0,6
IN BB 12/5	OW 526 6	120	180	18	220-240 V 50Hz	4,6	38,8	0,6
IN BB 12/5 T	OW 529 0	120	180	18	220-240 V 50Hz	4,6	38,8	0,6
IN 12/5 HT	OW 544 9	120	180	18	220-240 V 50Hz	4,6	38,8	0,6
IN 12/5 PIR	OW 547 2	120	180	18	220-240 V 50Hz	4,6	38,8	0,6
IN 15/6	OW 503 5	150	330	30	220-240 V 50Hz	6,2	42,2	0,8
IN 15/6 T	OW 509 2	150	330	30	220-240 V 50Hz	6,2	42,2	0,8
IN BB 15/6	OW 527 4	150	330	30	220-240 V 50Hz	6,2	42,2	0,8
IN BB 15/6 T	OW 530 8	150	330	30	220-240 V 50Hz	6,2	42,2	0,8
IN 15/6 HT	OW 545 6	150	330	30	220-240 V 50Hz	6,2	42,2	0,8
IN 15/6 PIR	OW 548 0	150	330	30	220-240 V 50Hz	6,2	42,2	0,8

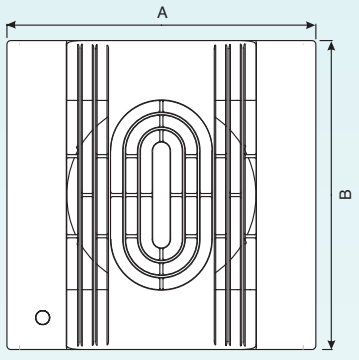
FANS WITH "AUTOMATIC SHUTTER" *in* A SERIES

FANS WITH "AUTOMATIC SHUTTER"
in A SERIES

Axial fans to extract air directly outside or through ducting.
Suitable for wall, ceiling and window (through window kit accessory) installations.

- *Grille provided with internal automatic shutter.*
- *Original and innovative design*
- *All models are supplied with "operating warning light".*
- *Quick and functional installation through "click assembly" of the fan.*
- *Two fixing screws to allow easy installation on the wall.*
- *Internal wall dimensions have been reduced to allow easy installation when using ducting and bends.*
- *The range is composed of 24 models in 100-120-150 mm, standard, Timer, Humidistat and PIR version and motor with ball bearing in some models.*
- *Very high performances in terms of flow rate, low dB (A) and low power consumption due to a precise study of optimisation of motor-impeller combination.*

Dimensions



IPX4

IMQ

03

Model	A	B	C	D	E
SERIE IN 10/4 A	160	160	53	42	Ø100
SERIE IN 12/5 A	180	180	53	43	Ø120
SERIE IN 15/6 A	210	210	66	44	Ø150

- *Careful selection of components: ABS + filled polypropylene.*
- *Protection grade: IPX4 in accordance with Standard EN 60529.*
- *Double insulated product, electric ground is not necessary.*
- *Voltage: 220-240V, 50Hz.*
- *In accordance with Standard EN 60335-2-80.*
- *International Approval Keymark, issued by IMQ.*
- *Working temperature 45°C.*

Technical Data

Model	Rif.	Hole diameter mm	Flow rate m^3/h	W	Nominal voltage and frequency	Max.Press. mm H_2O	dB (A) 3m	Weight Kg
IN 10/4 A	OW 504 3	100	110	16	220-240 V 50Hz	2,8	35,6	0,6
IN 10/4 A T	OW 516 7	100	110	16	220-240 V 50Hz	2,8	35,6	0,6
IN 10/4 A HT	OW 519 1	100	110	16	220-240 V 50Hz	2,8	35,6	0,6
IN 10/4 A PIR	OW 522 5	100	110	16	220-240 V 50Hz	2,8	35,6	0,6
IN BB 10/4 A	OW 531 6	100	110	16	220-240 V 50Hz	2,8	35,6	0,6
IN BB 10/4 A T	OW 534 0	100	110	16	220-240 V 50Hz	2,8	35,6	0,6
IN BB 10/4 A HT	OW 537 3	100	110	16	220-240 V 50Hz	2,8	35,6	0,6
IN BB 10/4 A PIR	OW 540 7	100	110	16	220-240 V 50Hz	2,8	35,6	0,6
IN 12/5 A	OW 505 0	120	185	21	220-240 V 50Hz	4,2	38,8	0,7
IN 12/5 A T	OW 517 5	120	185	21	220-240 V 50Hz	4,2	38,8	0,7
IN 12/5 A HT	OW 520 9	120	185	21	220-240 V 50Hz	4,2	38,8	0,7
IN 12/5 A PIR	OW 523 3	120	185	21	220-240 V 50Hz	4,2	38,8	0,7
IN BB 12/5 A	OW 532 4	120	185	21	220-240 V 50Hz	4,2	38,8	0,7
IN BB 12/5 A T	OW 535 7	120	185	21	220-240 V 50Hz	4,2	38,8	0,7
IN BB 12/5 A HT	OW 538 1	120	185	21	220-240 V 50Hz	4,2	38,8	0,7
IN BB 12/5 A PIR	OW 541 5	120	185	21	220-240 V 50Hz	4,2	38,8	0,7
IN 15/6 A	OW 506 8	150	340	33	220-240 V 50Hz	6,2	42,2	0,9
IN 15/6 A T	OW 518 3	150	340	33	220-240 V 50Hz	6,2	42,2	0,9
IN 15/6 A HT	OW 521 7	150	340	33	220-240 V 50Hz	6,2	42,2	0,9
IN 15/6 A PIR	OW 524 1	150	340	33	220-240 V 50Hz	6,2	42,2	0,9
IN BB 15/6 A	OW 533 2	150	340	33	220-240 V 50Hz	6,2	42,2	0,9
IN BB 15/6 A T	OW 536 5	150	340	33	220-240 V 50Hz	6,2	42,2	0,9
IN BB 15/6 A HT	OW 539 9	150	340	33	220-240 V 50Hz	6,2	42,2	0,9
IN BB 15/6 A PIR	OW 542 3	150	340	33	220-240 V 50Hz	6,2	42,2	0,9

Easy click assembly of components

Timer, HT, PIR

Timer

When switched on, the fan has a delay of 5 seconds and remains on after being switched off according to the preset time on the electronic timer.
The preset time on the electronic timer is approx 15 minutes and is adjustable from 2 to 20 minutes.

Presence infra red sensor PIR

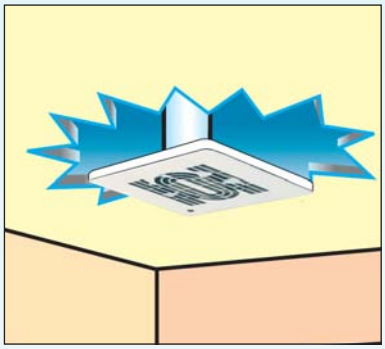
The fan starts automatically when the infra red sensor detects a presence in the room.
When the room is vacated the timer takes control keeping the fan operating for a preset time.

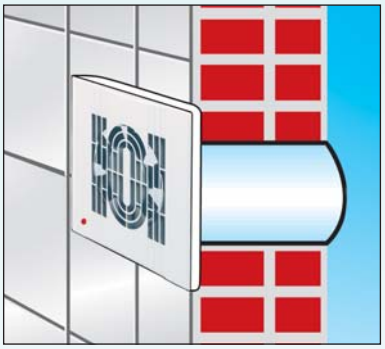
HT (humidistat and electronic timer)

The fan starts automatically when the humidity level in the room is higher than the pre-determined humidity level on the potentiometer which allow to adjust from 40% to 90%.

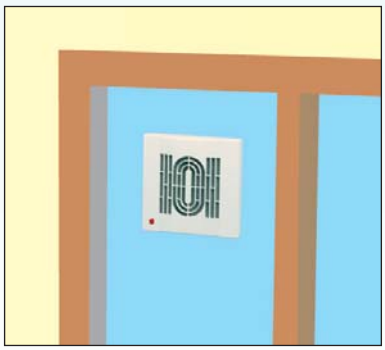
Through manual adjustment the fan will be operating for all preset time on the potentiometer.

Applications





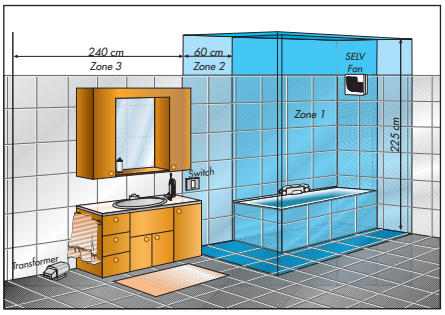
The reduced (internal) dimensions of the product allow installation on every kind of ducting.



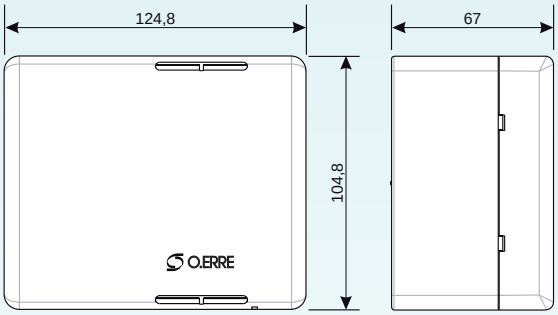
Quick installation on window through kit accessory.

SELV 12V *in* SERIES FANS

• *This is the SELV (Safety Extra Low Voltage) version working at 12V AC. of the axial fan model IN 10/4, designed to convey air and fumes directly outside.*
• *This fan can be installed within the saftey zones 1 and 2, as defined by the norm IEC 364-7 part 7, where the risk related to electrical connections is very high.*
• *The very low power voltage of the IN 10/4 SELV, in combination of a dedicated transformer supplied with the fan, permits the installation even in proximity of the bath tub or the shower, because the eventual direct contact with the fan does not pose any threat of electrical danger.*
The supply unit must be installed within zone 3.
Please refer to page 45 for a detailed explanation of the meaning of the different safety zones.



Transformer dimensions

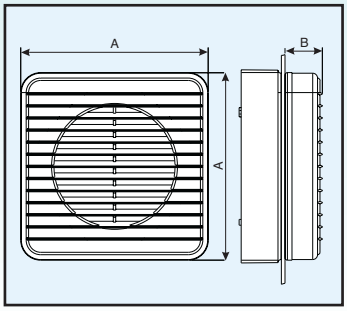


4 different versions available:
1) Basic: fan + supply unit.
2) Pull Cord: fan + supply unit equipped with a pull cord for ON/OFF operation.
3) Timer: fan + supply unit equipped with electronic control to change the delay before turning off the fan (delay adjustable from 2 to 30 minutes).
4) HT: fan + supply unit equipped with electronic control to turn ON/OFF the fan automatically depending on the level of ambient relative humidity, with adjustable delay before turn off.

Technical Data

Model	Rif.	Flow Rate m^3/h	W	Nominal voltage and frequency	Max.Press. mm H_2O	dB (A) 3m	Weight Kg
IN 10/4 SELV 12 V	OW 557 1	105	15	220-240 V 50Hz	2,8	35,6	0,5
IN 10/4 SELV 12 V Pull Cord	OW 560 5	105	15	220-240 V 50Hz	2,8	35,6	0,5
IN 10/4 SELV 12 V Timer	OW 558 9	105	15	220-240 V 50Hz	2,8	35,6	0,5
IN 10/4 SELV 12 V HT	OW 559 7	105	15	220-240 V 50Hz	2,8	35,6	0,5

Accessories IN series



Window kit

Kit accessory for window and panel application.
Window Kit is suitable for installation in a single, double glazing window glass or wood panel, from 3 to a thickness of 20 mm.

Model	Ref.	A	B	hole diameter
Kit Finestra 10/4	OW 591 0	155	31	132,5÷145
Kit Finestra 12/5	OW 592 8	175	31	152,5÷165
Kit Finestra 15/6	OW 593 6	211	31	186÷195

• ***Gravity Shutter*** • ***Grille*** • ***Electronic Controller:*** *See page 109.*

"LOW PROFILE" SMALL AXIAL FANS
in 9/3,5"

"LOW PROFILE" SMALL AXIAL FANS
in 9/3,5"

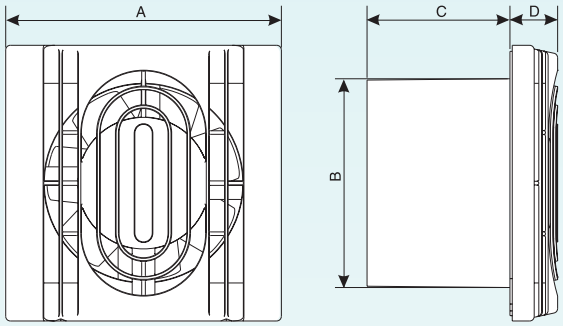
- *Axial fans to extract air directly outside or through ducting.*
- *Exit spigot diameter 92 mm.*
- *Installation allowed also on ducts with diameter less than 100 mm.*
- *Limited dimensions granting easy fitting in uncomfortable position.*
- *Ideally suitable for wall/panel and ceiling mounted installations.*
- *High performances/noise level ratio.*
- *Careful selection of components: ABS + filled polypropylene.*

in 9 T

- *When switched on, the fan has no delay and remains on after being switched off according to the preset time on the electronic timer.*

The time is adjustable from 3 to 25 minutes.

Dimensions



CE
IPX4
IMQ
03

Model	A	B	C	D
IN 9/3.5	121,5	ø 92	63	21
IN 9/3.5 T	121,5	ø 92	63	21

- *Noise tests on product samples carried out by IMQ laboratory.*
- *Careful selection of components: ABS + filled polypropylene.*
- *Protection grade: IPX4 in accordance with Standard EN 60529.*
- *Double insulated product, electric ground is not necessary.*
- *Voltage: 220-240V, 50Hz.*
- *In accordance with Standard EN 60335-2-80*
- *International Approval Keymark, issued by IMQ.*
- *Working temperature 45°C.*

Noise tests on product samples carried out by IMQ Clima Laboratory.

Technical Data

Model	Rif.	Hole diameter mm	Flow rate m^3/h	W	Nominal voltage and frequency	Max.Press. mm H_2O	dB (A) 3m	Weight Kg
IN 9/3.5	OW 555 5	92,5 ÷100	75	11	220-240 V 30Hz	2,8	31,6	0,4
IN 9/3.5 T	OW 556 3	92,5 ÷100	75	11	220-240 V 30Hz	2,8	31,6	0,4

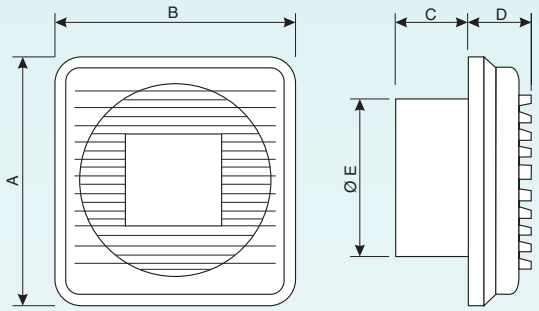
AXIAL FANS - IPX4
STANDARD

AXIAL FANS - IPX4
STANDARD

- *Axial fans to extract air and fumes directly outside.*
- *Can be wall, ceiling and panel mounted.*
- *Grille made in shining ABS material.*
- *In accordance with EN 60335-2-80.*
- ***Standard T (10-12-15)** - With electronic timer adjustable from 2 to 20 minutes approx.*
- ***Standard 8T** - With Timermatic (page 111).*
- *Standard models (10-12-15) can be installed on windows through an easy to use accessory window kit (further accessories see page 110).*

Standard 10 Pull Cord,
switching on/off of the fan through a pull cord.

Dimensions



CE
IPX4
IMQ
Except Standard Pull-Cord
03

Model	A	B	C	D	E
Standard 8 / 8 T	123	123	58	24	ø 75
Standard 10 / 10 T/ 10 Pull Cord	154	154	45	34	ø 98
Standard 12 / 12 T / 12 Pull Cord	174	174	45	34	ø 118
Standard 15 / 15 T	210	210	62	40	ø 146

Window kit including fixing screws for installation on window (5 mm).

Model	Ref.	hole diameter mm
Window kit 10	OW 874 0	135÷145
Window kit 12	OW 875 7	155÷165
Window kit 15	OW 876 5	186÷195

Technical Data

Model	Ref.	Hole diameter mm	Flow rate m^3/h	W	Nominal voltage and frequency	Max pressure mm H_2O	dB (A) 3 m	Weight kg
STANDARD 8	OW 847 6	80÷100	35	15	220-240V 50Hz		36	0,4
STANDARD 8 T	OW 848 4	80÷100	35	15	220-240V 50Hz		36	0,4
STANDARD 10	OW 157 0	100	88	21	220-240V 50Hz	2,5	39	0,5
STANDARD 12	OW 158 8	120	125	23	220-240V 50Hz	4	39	0,65
STANDARD 15	OW 161 2	150	230	36	220-240V 50Hz	4,2	44	1
STANDARD 10 T	OW 159 6	100	88	21	220-240V 50Hz	2,5	39	0,5
STANDARD 12 T	OW 160 4	120	125	23	220-240V 50Hz	4	39	0,65
STANDARD 15 T	OW 164 6	150	230	36	220-240V 50Hz	4,2	44	1
STANDARD 10 Pull-Cord	OW 175 2	100	88	21	220-240V 50Hz	2,5	39	0,5
STANDARD 12 Pull-Cord	OW 947 4	120	125	23	220-240V 50Hz	4	39	0,65

AXIAL FANS WITH AUTOMATIC SHUTTER - IPX4

STANDARDMATIC & MINIMATIC

AXIAL FANS WITH AUTOMATIC SHUTTER - IPX4
STANDARDMATIC & MINIMATIC

- *Axial fans to extract air and fumes directly outside with automatic opening of shutter.*
- *Can be wall, ceiling and panel mounted.*
- *In accordance with EN 60335-2-80.*
- *Grille made in shining ABS material.*
- *IPX4 protected for areas with high humidity.*

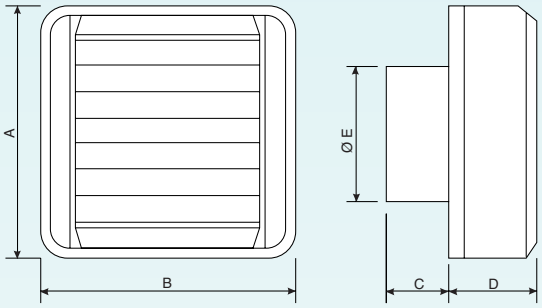
- ***Standardmatic T and Minimatic T,*** *with electronic timer adjustable from 2 to 20 minutes approx.*

- ***All Standardmatic and Minimatic 10 and 12*** *have threaded spigots to allow panel mounting by locking ring.*

- ***Minimatic range,*** *motor with ball bearings.*

Low motion and noiseless opening of shutter.

Dimensions



CE
IPX4
IMQ
03

Model	A	B	C	D	E
Standardmatic - Minimatic10/10T	154	154	45	51	ø 98
Standardmatic - Minimatic12/12T	174	174	45	51	ø 118
Standardmatic - Minimatic15/15T	210	210	62	54	ø 146

Window kit including fixing screws for installation on window (5 mm).

Model	Ref.	hole diameter mm
Window kit 10	OW 874 0	135÷145
Window kit 12	OW 875 7	155÷165
Window kit 15	OW 876 5	186÷195

Technical Data

Model	Ref.	Hole diameter mm	Flow rare m^3/h	W	Nominal voltage and frequency	Max pressure mm H_2O	dB (A) 3 m	Weight kg
MINIMATIC 10	OW 185 1	100	90	14	220-240V 50Hz	3	38	0,7
MINIMATIC 10T	OW 186 9	100	90	14	220-240V 50Hz	3	38	0,7
MINIMATIC 12	OW 187 7	120	130	21	220-240V 50Hz	4	39	0,85
MINIMATIC 12T	OW 189 3	120	130	21	220-240V 50Hz	4	39	0,85
MINIMATIC 15	OW 845 0	150	230	45	220-240V 50Hz	4,2	44	1,2
MINIMATIC 15T	OW 846 8	150	230	45	220-240V 50Hz	4,2	44	1,2
STANDARDMATIC 10	OW 166 1	100	90	21	220-240V 50Hz	2,5	38	0,7
STANDARDMATIC 10T	OW 167 9	100	90	21	220-240V 50Hz	2,5	38	0,7
STANDARDMATIC 12	OW 168 7	120	130	23	220-240V 50Hz	4,2	39	0,85
STANDARDMATIC 12T	OW 169 5	120	130	23	220-240V 50Hz	4,2	39	0,85
STANDARDMATIC 15	OW 170 3	150	230	36	220-240V 50Hz	4,2	44	1,2
STANDARDMATIC 15T	OW 171 1	150	230	36	220-240V 50Hz	4,2	44	1,2

LONG LIFE AXIAL FANS - IPX4

MINI

LONG LIFE AXIAL FANS - IPX4

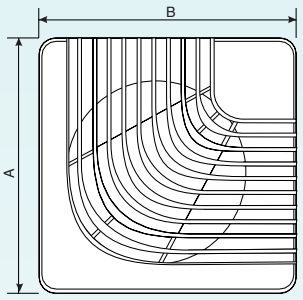
MINI

- *Axial fans to extract air and fumes directly outside.*
- *Can be wall, ceiling and panel mounted.*
- *Grille made in shining ABS material.*
- *Motor with ball bearings.*
- *In accordance with EN 60335-2-80.*

- ***Mini T** - With electronic timer adjustable from 2 to 20 minutes approx.*

- ***Mini Sensor** - The fan starts automatically when the infrared sensor detects a presence in the room. When the room is vacated the timer takes control keeping the fan operating for a preset time.*
- *Operates in either in the light or in the dark with a radius of 8 metres.*
- *Thanks to its completely automatic functioning is particularly suitable for rooms used by the general public.*

Dimensions



IPX4

Model	A	B	C	D	E
Mini 10 /10 T / 10 Sensor	154	154	45	36	ø 98
Mini 12 /12 T / 12 Sensor	174	174	45	36	ø 118

Splashproof fans for areas with high humidity.

***Mini Sensor,** it is extremely simple to install since it is connected to the electrical system with just two wires, thus eliminating the connections that normally need to be made to the light and the light switch.*

Threaded spigot to allow panel mounting by locking ring.
(See accessories page 110).

Technical Data

Model	Ref.	Hole diameter mm	Flow rate m^3/h	W	Nominal voltage and frequency	Max pressure mm H_2O	dB (A) 3 m	Weight kg
MINI 10	OW 137 2	100	85	14	220-240V 50Hz	2,8	38	0,5
MINI 12	OW 138 0	120	125	21	220-240V 50Hz	4	39	0,65
MINI 10 T	OW 141 4	100	85	14	220-240V 50Hz	2,8	38	0,5
MINI 12 T	OW 142 2	120	125	21	220-240V 50Hz	4	39	0,65
MINI 10 SENSOR	OW 121 6	100	85	14	220-240V 50Hz	2,8	38	0,5
MINI 12 SENSOR	OW 122 4	120	125	21	220-240V 50Hz	4	39	0,65

AXIAL FANS WITH MANUAL AND AUTOMATIC SHUTTER

VENTIL & VENTIMATIC

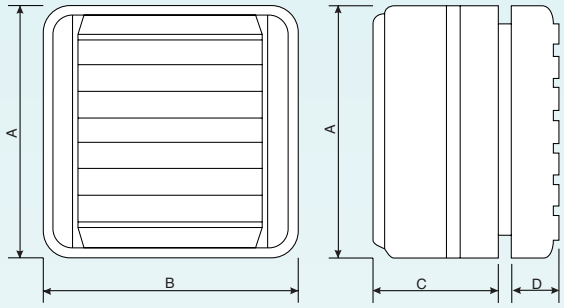
AXIAL FANS WITH MANUAL AND AUTOMATIC SHUTTER
VENTIL & VENTIMATIC

- *Axial fans to extract air and fumes directly outside.*
- *Window or panel installation with thickness up to 5mm.*
- *Grille made in shining ABS material.*
- *Rain proof external grille.*
- *In accordance with EN 60335-2-80.*

- ***For Ventil range,** manual opening and closing of shutter, throught a pull cord.*

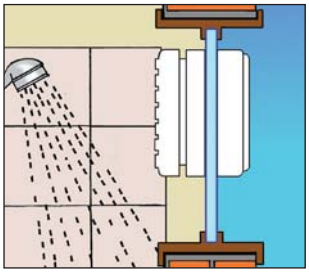
- ***For Ventimatic range,** automatic opening and closing of shutter.*

Dimensions



CE
IPX4
IMQ
03

Model	A	B	C	D
Ventil 10 - Ventimatic 10	154	154	77	29
Ventil 12 - Ventimatic 12	174	174	74	29
Ventil 15 - Ventimatic 15	210	210	99	29



Ventimatic range
Splashproof fans for areas with high humidity.

Low motion and noiseless opening and closing of shutter (Ventimatic range).

***All Ventil and Ventimatic range** are supplied with anti-vibration gasket.*

Accessories

Model	Ref.
Double glazing kit Ventil/Ventimatic 10	OW 877 3
Double glazing kit Ventil/Ventimatic 15	OW 879 9

Technical Data

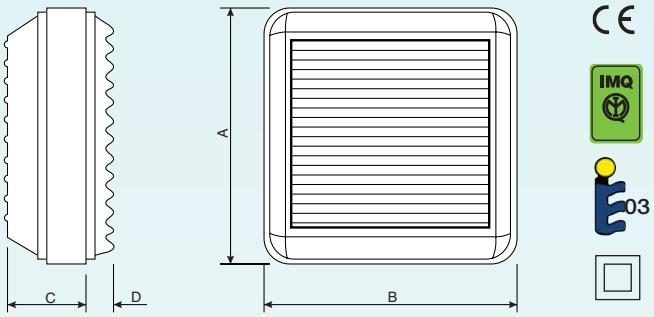
Model	Ref.	Window hole diameter mm	Flow rate m^3/h	W	Nominal Voltage and Frequency	dB (A) 3 m	Weight kg
VENTIL 10	OW 840 1	135÷145	68	20	220-240V 50Hz	42	0,9
VENTIL 12	OW 841 9	155÷165	100	21	220-240V 50Hz	42	1
VENTIL 15	OW 842 7	186÷195	155	30	220-240V 50Hz	43	1,6
VENTIMATIC 10	OW 110 9	135÷145	68	20	220-240V 50Hz	42	0,9
VENTIMATIC 12	OW 111 7	155÷165	100	21	220-240V 50Hz	42	1
VENTIMATIC 15	OW 112 5	186÷195	155	30	220-240V 50Hz	43	1,6

COMMERCIAL FANS
VENTILOR

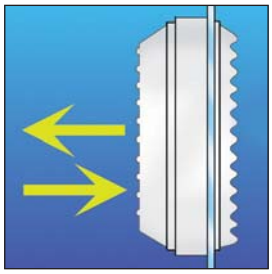
VENTILOR

- *Axial fans to extract air and fumes directly outside.*
- *For installation in windows, double glazing and panels up to 50 mm.*
- *Rain proof external grille.*
- *In accordance with EN 60335-2-80.*
- *In shining ABS material.*
- ***Ventilor 20/8 M** - Manual immediate opening and closing of shutter throught a pull cord.*
- ***Ventilor 20/8 AR - 25/10 AR***
- *Automatic and silent opening and closing of shutter.*
- *Warning operating light.*

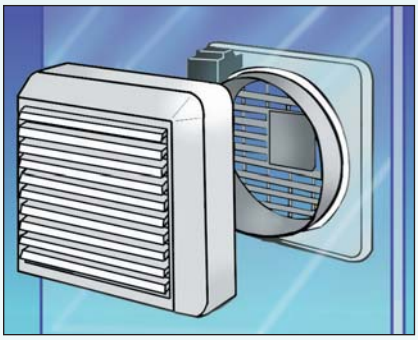
Dimensions



Model	A	B	C	D
Ventilor 20/8 M - 20/8 AR	280	280	94	30
Ventilor 25/10 AR	335	335	128	33



Air-flow reversibility extract and intake for models 20/8 AR and 25/10 AR.



Quick and simple installation and maintenance by locking ring which gives some tolerance on the hole size in the glass.

- ***Double glazing kit for Ventilor 20/8 and 25/10,** accessory for installation in double glazing, includes locking ring and spigot.*

- ***Wall fixing kit for Ventilor***
Hole diameter 250 mm (20/8) and 300 mm (25/10).

Model	Ref.
Double glazing kit Ventilor 20/8	OW 804 7
Double glazing kit Ventilor 25/10	OW 805 4
Built in kit for speed controller	OW 905 2
Wall fixing kit Ventilor	OW 191 9
RG 5 AR	OW 315 4
Kit for Radio Transmission	OW 913 6

Kit for Radio Transmission.

RG 5 AR

Technical Data

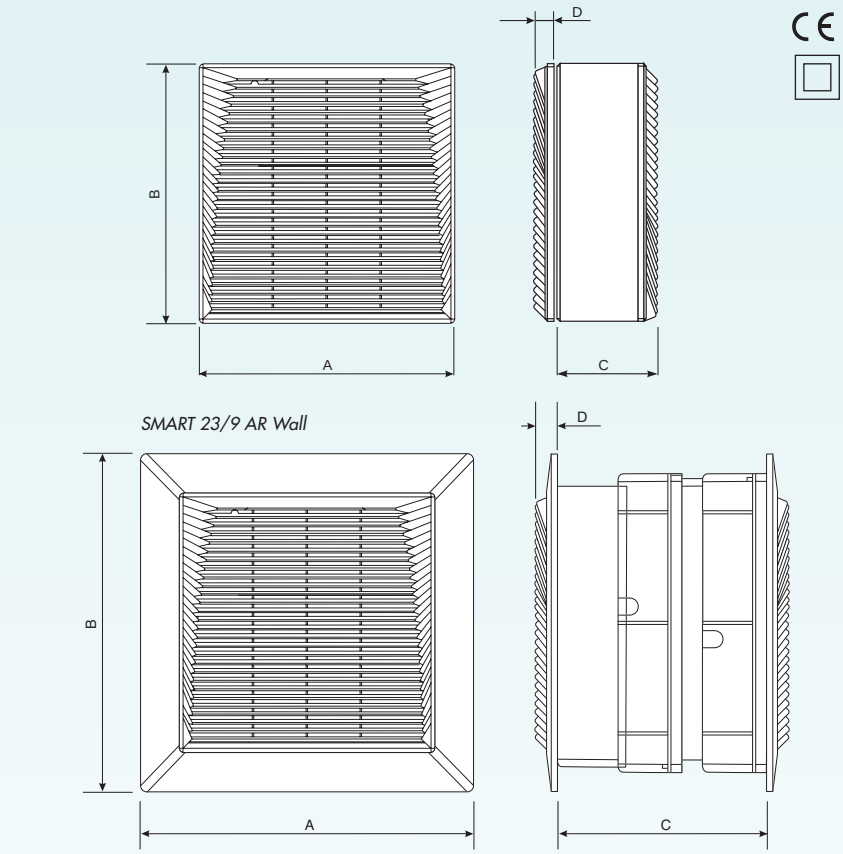
Model	Ref.	Hole diameter mm	Flow rate m^3/h	W	Nominal Voltage and Frequency	dB (A) 3 m	Weight kg
VENTILOR 20/8 M	OW 188 5	225÷235	450	50	220-240V 50/60Hz	58	2,4
VENTILOR 20/8 AR	OW 190 1	225÷235	450	50	220-240V 50/60Hz	58	2,4
VENTILOR 25/10 AR	OW 192 7	275÷285	750	60	220-240V 50/60Hz	59	5,6

SMART 15/6, 23/9 & 30/12

COMMERCIAL FANS
SMART 15/6, 23/9 & 30/12

- *Axial fan for windows, wall or panel installation for medium and big domestic and commercial requirements.*
- *Suitable for installation in a single, double glazing window glass, panel or wall.*
- *With a concealed integral automatic louver shutter to avoid unpleasant back draughts to the room when the fan is not operating.*
- *Including two special gaskets to prevent window glass vibrations and as a good tight seal against rain.*
- *Easy and fast assembly and installation thanks to the reduced number of fixing screws and with an original clicking and plug-in system.*
- *The M (Manual) version is provided with a manual shutter mechanism through pull cord.*
- *The A (Automatic) version is provided with an automatic shutter mechanism which is extremely silenced and reliable.*
- *The R (Reversible) version allows to reverse the impeller rotation to extract and intake the air-flow.*
- *The Wall version is suitable for application inside wall.*
- *The Wi-Fi version is provided with a radio transmitter for functions operation.*
- *In accordance with EN 60335-2-80.*

Dimensions



Model	A	B	C	D	ø window hole	Wall/window thickness
Smart 15/6 A-M	215	215	100	30	184÷195	3÷20
Smart 23/9 M-AR-Silent-Wi Fi	321	331	141	30	254÷262	3÷50
Smart 23/9 AR Wall	424	434	242-316	30		3÷50
Smart 30/12 AR	375	385	148	30	324÷337	3÷50

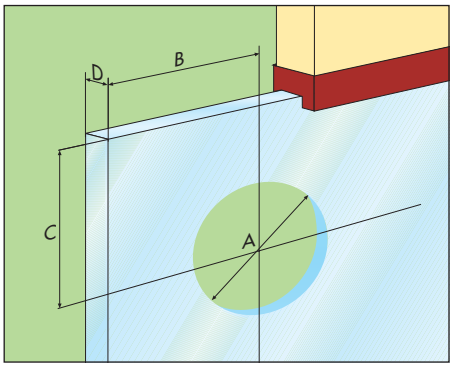
Technical Data

Model	Flow rate m^3/h	W	Nominal Voltage and Frequency	dB (A) 3 m	Weight kg	
SMART 15/6 M-A	230	30	220-240V 50Hz	40	1,3	NO
SMART 23/9 AR Silent	500	30	220-240V 50/60Hz	33	3,7	NO
SMART 23/9 M-AR	750	40	220-240V 50/60Hz	43	3,7	YES
SMART 23/9 Wi Fi	750	40	220-240V 50/60Hz	43	3,7	YES
SMART 23/9 AR Wall	750	40	220-240V 50/60Hz	43	7	YES
SMART 30/12 AR	1350	75	220-240V 50/60Hz	49	6,6	YES

Ref. - Codes

Model	A Automatic	AR Automatic Reversible	AR Silent	AR Wall	M Manual	Wi Fi
SMART 15/6	OW 727 0				OW 728 8	
SMART 23/9		OW 720 5	OW 725 4	OW 726 2	OW 721 3	OW 716 3
SMART 30/12		OW 714 8				

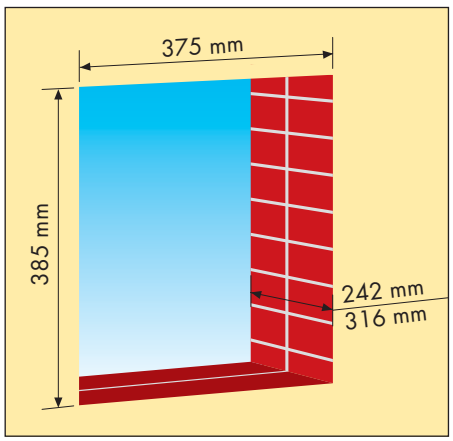
SMART 15/6, 23/9 & 30/12



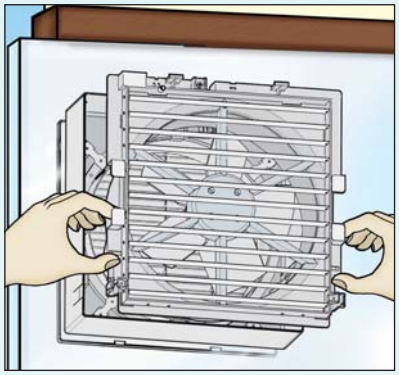
Model	ø A mm	B mm	C mm	D mm
Smart 15/6	184÷195	108	108	3÷25
Smart 23/9	254÷262	210	230	3÷50
Smart 30/12	324÷337	245	245	3÷50

Big tolerance on the window glass diameter hole, which allows to overcome to some cutting errors or adapt the fan to any existing hole.
All models from the SMART series are suitable for installation in a single, double glazing window glass or wood panel, up to a thickness of 48 mm.

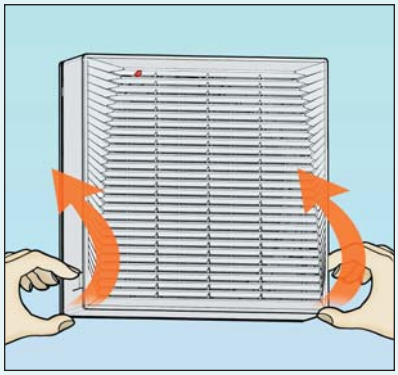
Smart 23/9 AR Wall.



SMART 23/9 - 30/12



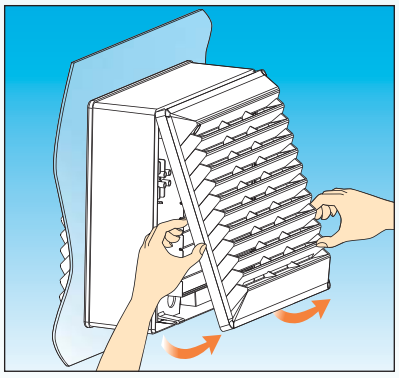
Easy and quick installation on window glass through a special assembly fixing system by click springs and final screw blocking.



Easy removal of the front grille by untightening the 2 safety screws and with a simple finger pressure on both fan sides.

	FLOW RATES m³/h (with RG5 AR controller)				
Model	**I° Speed**	**II° Speed**	**III° Speed**	**IV° Speed**	**V° Speed**
SMART 23/9 AR Silent	200	250	350	420	500
SMART 23/9 M-AR	280	370	510	640	750
SMART 30/12 AR	600	840	1050	1200	1350

SMART 15/6



Easy and fast installation on window thanks to two fixing screws only, with an original clicking and plug-in system.
No screws required to block the connection cable.

SMART Accessories

Model	15/6	23/9	30/12
Double window Kit	N.D.	OW 795 7	OW 799 9
Wall fixing Kit*	OW 794 0	OW 798 1	
RG 5 AR**	N.D.	OW 315 4	

**max wall thickness 350 mm*
*** See page 111*

SMART 23/9 Wi Fi

Model	Ref.
SMART 23/9 Wi-Fi	OW 716 3

The fan, operated by a wireless radio control (Wi-Fi) and only requires the connection to the electric systems (L-N).
The remote control (included) is supplied with 12V DC battery and fully operates the product's functions (on-off, reversibility and 3 speed regulation).
The remote control can easily be installed to the wall or panel with two small screws.
Being a radio transmitting control, it is not necessary to point it directly towards the fan and operates within a maximum range of 30 meters.
The polished design of the Wi-Fi radio transmitter perfectly integrates with the other elements of the electric installation.

IN-LINE AXIAL DUCT FANS - IPX4

TB

IN-LINE AXIAL DUCT FANS - IPX4

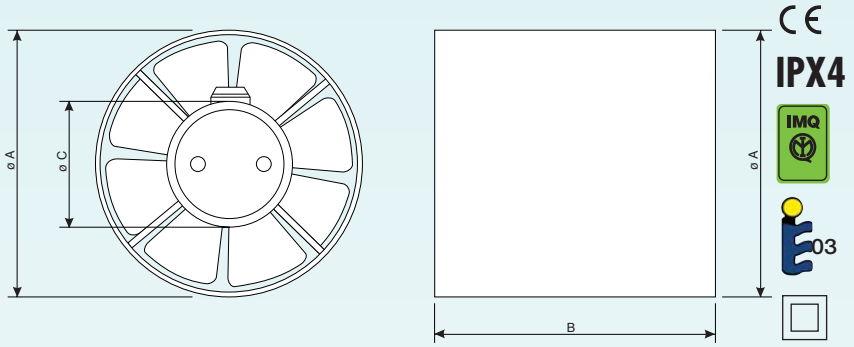
TB

- *In-line axial fans for installation into ducting with diameter 10, 12 and 15 cm.*
- *Can be used to extract air, to intake air or as a booster to increase airflow in an existing installation.*
- *Body in thermoplastic material.*
- *Impeller in polypropylene.*
- *Induction motor. Impedance protection on models TB 10 and TB 12, thermal protection on model TB 15.*
- *Protected against water splashes, IPX4.*
- *Low consumption and noise makes the fan suitable for any use.*
- *In accordance with EN 60335-2-80.*

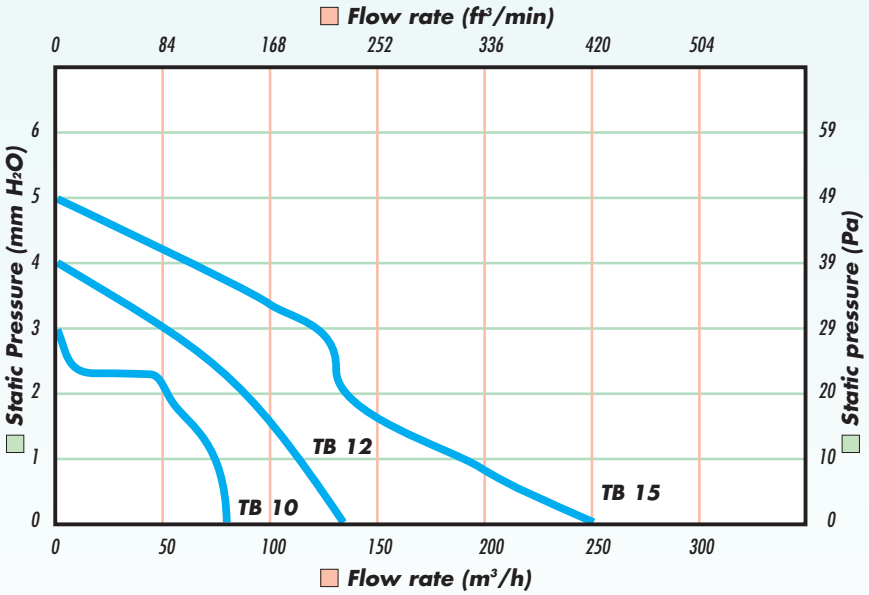
Accessories:

- *See page 110 and 111*

Dimensions



Model	ø A	B	ø C
TB 10	96	97	55
TB 12	116	97	55
TB 15	147	113	55



Technical Data

Model	Ref.	Tube diameter ø mm	Flow rate m³/h	Max Press. mm. H₂O	W	Nominal voltage and frequency	Nom. curr. Amp. at 230V	dB (A) 2 m	RPM	Weight kg
TB 10	OW 184 4	100	80	3	15	220-240V 50Hz	0,09	42	2500	0,5
TB 12	OW 194 3	120	130	3,5	15	220-240V 50Hz	0,1	43	2200	0,6
TB 15	OW 195 0	150	250	5,5	25	220-240V 50Hz	0,2	50	2400	0,7

ENERGY RECOVERY FANS

Tempero

ENERGY RECOVERY FANS
Tempero

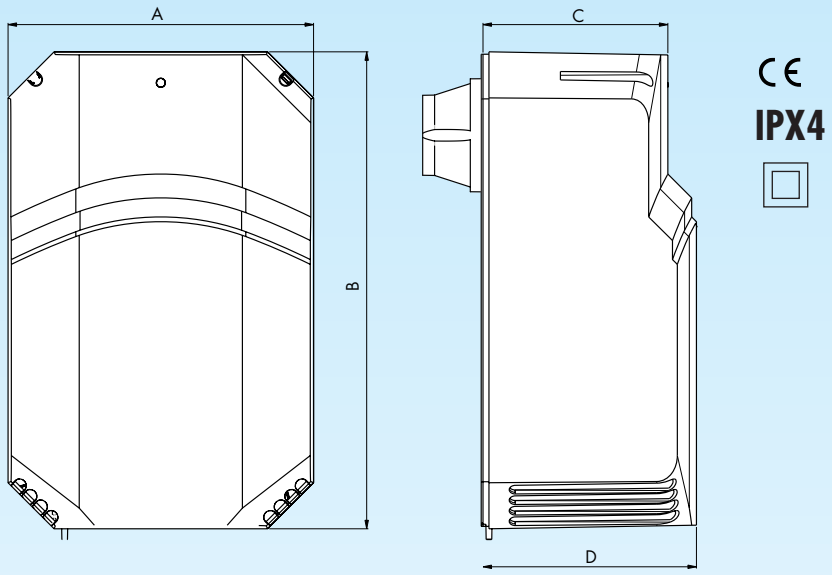
- *Fan provided with an energy recovery system*
- *Ideal for domestic applications*
- *Suitable for single room application*
- *Wall and/or panel application*
- *Body in white ABS with inner components in polypropylene*
- *Cross Flow Air Exchanger welded PVC plates*
- *Two centrifugal fans with sleeve bearings motors*
- *Filters in polyurethane to grant higher protection and longer function*
- *Every model equipped with "operating warning light"*
- *Pre-heating system (PH model only) consists of a 350 W coil with thermostat, fitted in a box of self extinguishing material.*
- *Single speed*
- *3 models available: Basic, Timer and Pre-heater for cold climates*
- *In accordance with EN 60335-2-80*
- *High performance in terms of balance between energy recovery, consumption, flow rate and noise level*

Tempero 100
"Basic version" suitable for climates and temperatures between –5° C and +35° C.

Tempero 100 T
Same main features of the basic version with added Timer control.

Tempero 100 PH
Suitable for outdoor minimum temperatures of: –25° C.

Dimensions



Model	A	B	C	D
TEMPERO 100	257	400	155	179
TEMPERO 100T	257	400	155	179
TEMPERO 100PH	257	400	155	179

Technical data

Model	Ref.	Flow rate "IN" m^3/h	Flow rate "OUT" m^3/h	dB(A) 3 m	Weight Kg	Hz	W	Effic (%)	Temp °C	Ø hole mm	Nom Volt
100	OW 684 3	60	70	34	3,3	50Hz	40	70	-5 +35	100/120	220/240
100T	OW 685 0	60	70	34	3,3	50Hz	40	70	-5 +35	100/120	220/240
100PH	OW 686 8	60	70	34	3,3	50Hz	400	70	-25 +35	100/120	220/240

ENERGY RECOVERY FANS
Tempero

Tempero *is an extractor fan provided with an energy recovery system ideal for single room domestic applications.*

It offers healthier and better indoor environment by moderating the temperature of the incoming air plus economic advantages due to energy saving.

The flow of extracted air transfers thermal energy to the fresh incoming air, first through the surface of the internal ducting pipe fitted into the existing duct and then through the "cross flow plates" heat recovery core located in the unit. During this process the incoming and outgoing air flows are completely separated.

During winter season, ***Tempero*** *guarantees an efficient energy recovery of up to 70%.*

During summer season, ***Tempero*** *reduces substantially the energy required for air conditioning.*

Suitable for wall applications, it can be easily fitted to 100 and 120 mm new or existing ducts, offering the opportunity to renovate, substituting old/non functioning axial fans without further invasive procedures to the building structure.

The heat recovery core of PVC cross flow plates is equipped with two easily removable filters for simple and regular cleaning.

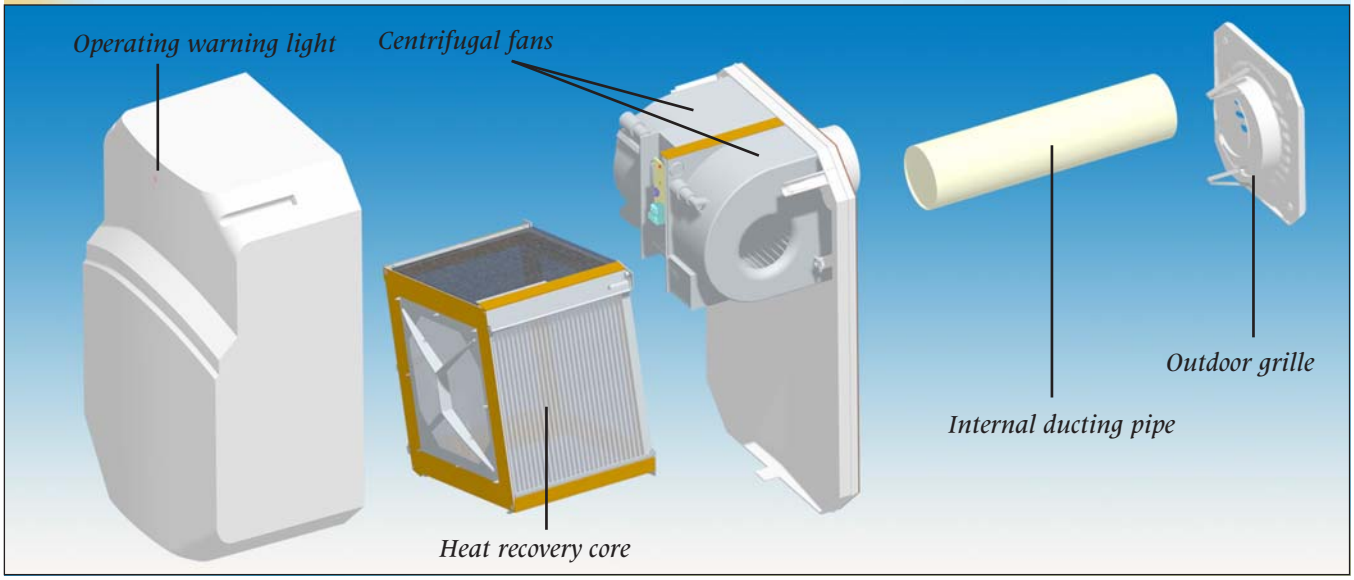
Tempero *has been conceived and designed to work as a usual air extractor fan with the advantage of added energy conservation.*

In normal conditions ***Tempero*** *will not produce enough condensation to require drainage.*

It has been equipped with a dedicated condensation drainage hole thus eliminating the build up of excess condensation related to the certain environmental conditions (temperature, humidity ...) and/or continuous use.

Tempero *has been designed to work also in cold climates of –25°C, thanks to a pre-heating coil available for the PH model only.*

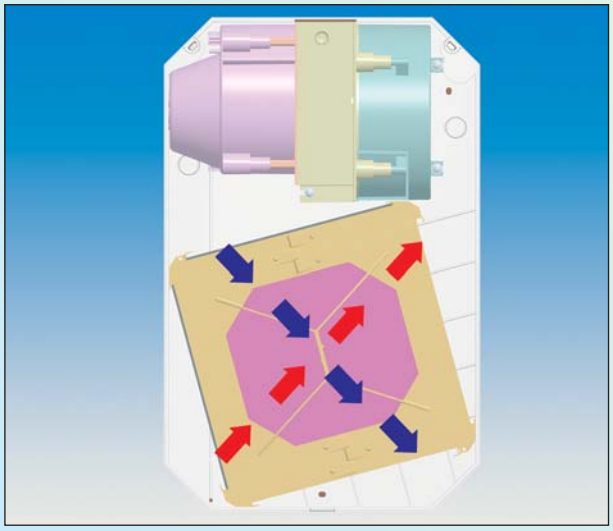
The ***Tempero*** *PH model pre-heater, is a 350 W coil fitted in the ducting pipe. When the outside temperature falls below –5°C a thermostat activates the coil thus heating incoming air to about 15-20°C avoiding ice build-up on the recovery module.*

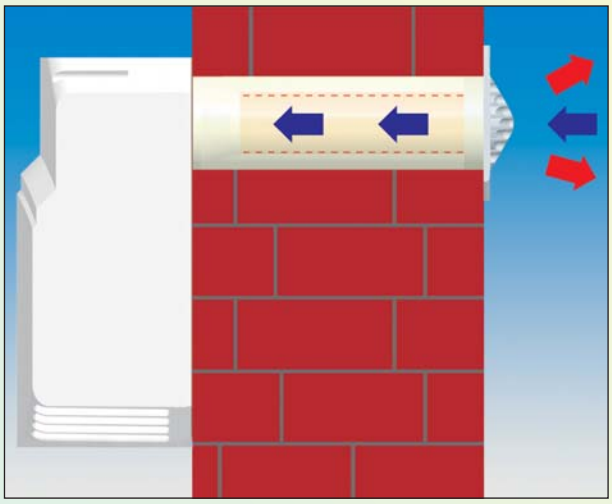


Tempero *can be easily installed on new or existing ducts (diameter 100/200 mm).*

Possibility of renovating old/non functional fans thus granting a healthier and better indoor environment with minimal or no invasive procedure to the building structure.

Extracted air stream transfers thermal energy to the fresh incoming air, first through the surface of the PVC ducting pipe and of the motors' heat and then through the "cross flow plates" heat recovery core located into the unit.





Tempero *is supplied with a PVC ducting pipe (diameter: 63mm), which should be fitted internally to the existing duct (diameter 100/120 mm) up to a maximum wall depth of 400 mm. If the depth of wall exceeds 400 mm a replacement pipe is required.*

Timer and (PH) operations

Timer

When switched on, the fan will start rotating after 5 seconds and will overrun after being switched off according to the pre-set overrun timer period. Adjustable overrun timer from 2 min. up to 30 min. Standard setting: 15 min.

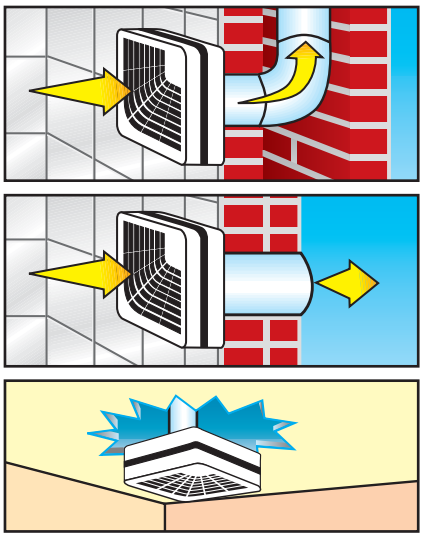
Pre-heater (PH)

The PH model is equipped with a pre-heating system, consisting of a 350 W coil fitted into the PVC ducting pipe and activated by a thermostat. Starting with an outside temperature lower than -5 °C incoming air will be heated-up to about 15-20° C thus avoiding ice build-up on the recovery module and granting the highest levels of efficiency.

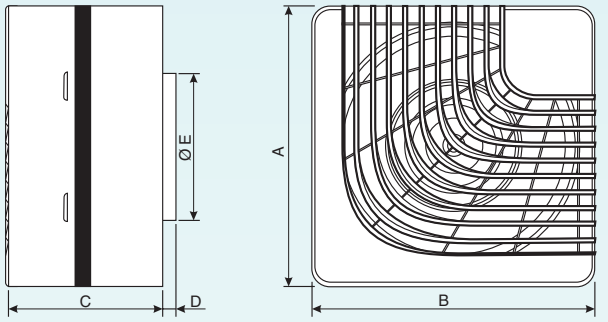
HELICO CENTRIFUGAL EXTRACTOR FANS
SILENTE

HELICO CENTRIFUGAL EXTRACTOR FANS
SILENTE

• *Centrifugal fans to extract air and fumes directly outside or through long ducts. Can be installed in holes with diameter 10, 12 and 15 cm. Low sound level with high performance. In ABS material.*
In accordance with EN 60335-2-80.
• ***Silente T*** *- With electronic timer adjustable from 2 to 20 minutes.*
• ***Silente HT*** *- The fan starts automatically when the humidity level in the room is higher than the pre-determined humidity level on the potentiometer which allow to adjust from 40% to 90%.*
• ***Silente Sensor*** *- The fan starts automatically when the infrared sensor detects a presence in the room, when the room is vacated the timer takes control keeping the fan operating for a preset time.*
• ***Silente 12 Volt*** *- In addition to the technical and functional features of the basic model it is manufactured with a very low power voltage (SELV).*
• ***Silente 12 Volt T:*** *With electronic timer adjustable from 2 to 20 minutes.*

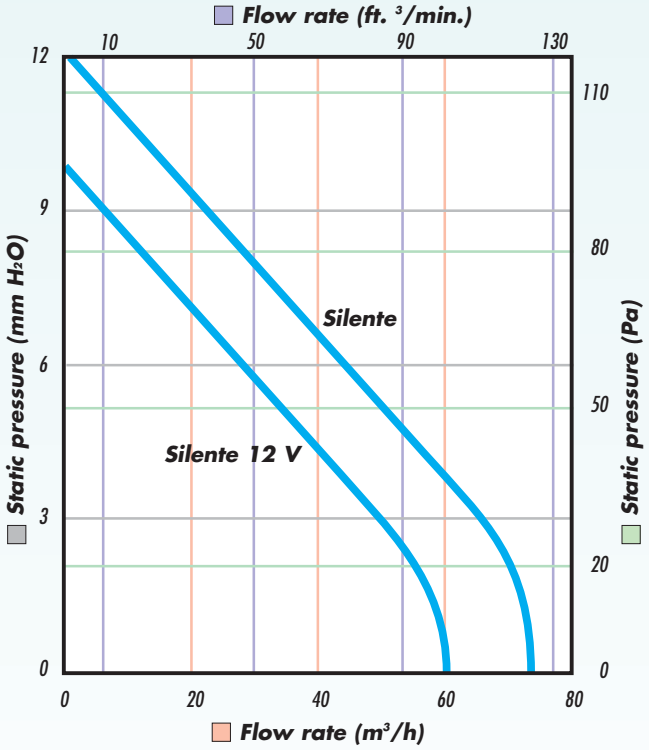


Dimensions



CE
IPX4
IMQ
03
CL III
(Silente 12 V)

Model	A	B	C	D	E
All SILENTE models	184	184	101,5	8,5	ø 98



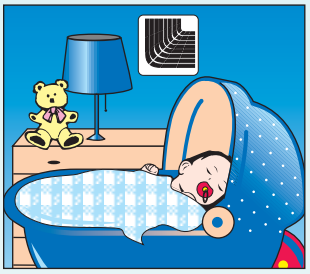
Technical Data

Model	Ref.	Hole diameter mm	Flow rate m³/h	W	Nominal voltage and frequency	Max pressure mm H_2O	dB (A) 3 m	Weight kg
SILENTE	OW 865 8	100÷150	75	19	220-240V 50Hz	12	36	0,9
SILENTE 12 Volt	OW 870 8	100÷150	60	15	220-240V 50Hz	10	36	0,9
SILENTE 12 Volt T	OW 871 6	100÷150	60	15	220-240V 50Hz	10	36	0,9
SILENTE T	OW 867 4	100÷150	75	19	220-240V 50Hz	12	36	0,9
SILENTE Sensor	OW 866 6	100÷150	75	19	220-240V 50Hz	12	36	0,9
SILENTE HT	OW 868 2	100÷150	75	19	220-240V 50Hz	12	36	0,9

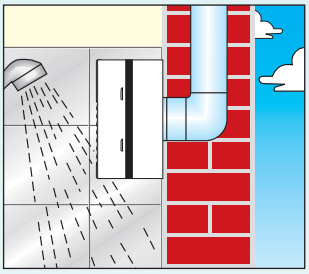
HELICO CENTRIFUGAL EXTRACTOR FANS
SILENTE

For all models

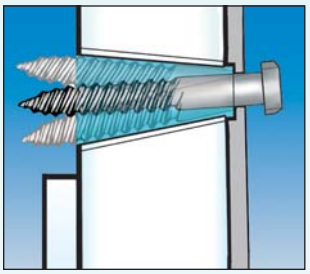
- *Supplied with washable filter assuring long life of the motor and remarkable protection to the impeller.*
- *With anti-vibration gasket made of elastomer which fits on uneven surfaces and allows installation in holes with diameter 10, 12 and 15 cm.*
- *Quick installation as all components are clicked together.*
- *The template inside packaging allows a precise mounting on wall.*
- *The reduced protrusion of the exit spigot allows you to install the unit into ducting with curves placed immediately behind the exit hole.*
- ***Silente T** - Easy timer adjustment by small control knob.*
- ***Silente H** - Humidity level adjustable from 40% to 90% and electronic timer adjustable from 2 to 20 minutes.*
Both controls are adjusted by small knobs.
- ***Silente Sensor** - It is extremely simple to install since it is connected to the electrical system with just two wires, thus eliminating the connections that normally need to be made to the light and the light switch.*
Easy timer adjustment by small control knob.



Low sound level.
36 decibel.



Splashproof fans for areas with high humidity.

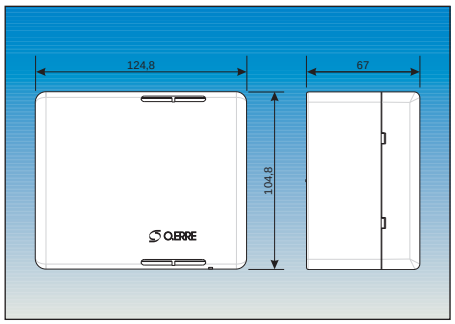


The captive fixing screws in special cone shaped housing to allow for any necessary adjustment during installation in walls or ceiling.

Integral back draught shutter.

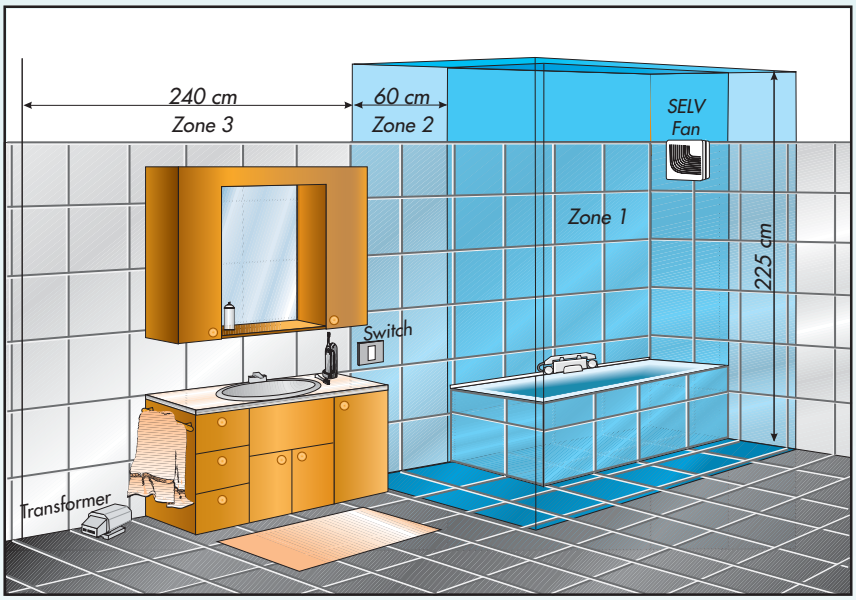
HELICO CENTRIFUGAL EXTRACTOR FANS
SILENTE SELV 12V

• *Can be installed in safety zones 1 and 2 as established by the IEC 364- 7 where risk of electrical contact is high.*
• *220÷240/12V~ transformer, in accordance with IEC 742 class II, IP22 protected with safety thermostat.*
• *The very low power voltage of the Silente 12 Volt, (SELV - Safety Extra Low Voltage), with the use of a special transformer supplied with the fan, permits installation even in proximity of the bath tub as the eventual direct contact with the fan does not pose any threat of electrical danger.*



• *The transformer can be even installed in zone 3.* *(see page 19)*

Installation example of SELV Fan.



IEC 364-7 standard, on Part 7 contains a section dedicated to "Locations containing a bath tub or shower basin" where, says the text " the risk of electric shock is increased by a reduction in body resistance and contact of the body with earth potential".
In order to avoid this high risk of electric shock the standard classifies in the room different zones and for each zone prescribes different installation limits of electrical components.

The standard describes the different zones as follows:

- *Zone 0: is the interior of the bath tub or shower basin.*
- *Zone 1: is limited by the vertical plane circumscribing the bath tub or shower basin, by the floor and the horizontal plane 2.25 m. above the floor.*
- *Zone 2: is limited by the vertical plane external to Zone 1 and the parallel vertical plane 0,60 m. external to Zone 1, by floor and the horizontal plane 2,25 m. above the floor.*
- *Zone 3: is limited by the vertical plane external to Zone 2 and the parallel vertical plane 2,40 m. external to Zone 2, by floor and the horizontal plane 2,25 m. above the floor.*

For each zone the standard makes a list of the prescriptions for the electrical equipment that may be or may not be installed as follows:

- *In zone 0, only electrical appliances specially intended for use in a bath tub are permitted.*
- *In zone 1, only water heaters or **SELV** type appliances (Safety Extra Low Voltage) may be installed.*
- *In zone 2 only water heaters, and Class II luminaires or SELV type appliances may be installed.*
- *In zone 3 there are no limits for installation of electrical equipment, but anyway the eventual " Switchgear and Controlgear" must be as follows: supplied individually by an isolating transformer, supplied by **SELV**, protected by a residual current protective device with a residual operating current not exceeding 0,03 A.*

*Hence, in zone 1 or 2 or 3 only a 12 V **SELV** fan should be installed.*

CENTRIFUGAL FANS - IPX4
COMPACT

CENTRIFUGAL FANS - IPX4
COMPACT

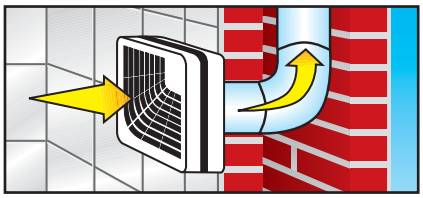
• *Centrifugal fans to extract air and fumes through ducting or pipes.*
• *Can be ceiling mounted and with an optional accessory (Window Kit) can be also glass mounted.*
• *In ABS material.*
• *In accordance with EN 60335-2-80.*

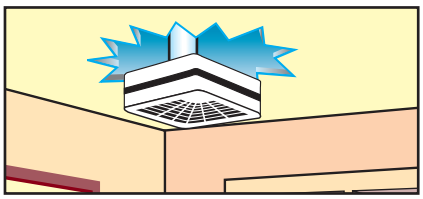
• ***Compact T** - With built-in electronic timer adjustable from 2 to 20 minutes.*

• ***Compact H** - With adjustable humidistat for automatic starting. The fan starts automatically at pre-determined humidity level.*

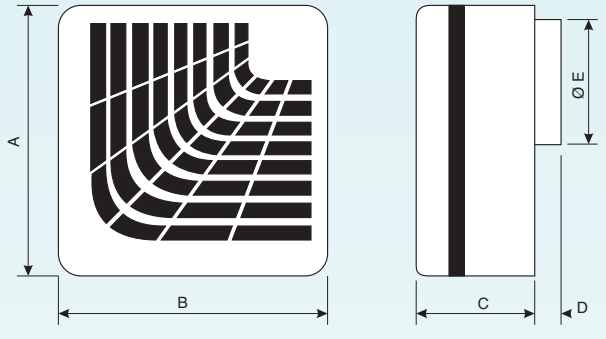
• ***Compact Sensor** - The fan starts automatically when the infrared sensor detects a presence in the room, when the room is vacated the timer takes control keeping the fan operating for a preset time.*
• *Operates in both the light and the dark with a radius of 8 meters.*
• *Thanks to its completely automatic functioning is particularly suitable for rooms used by general public.*

• *Further accessories (see page 108).*



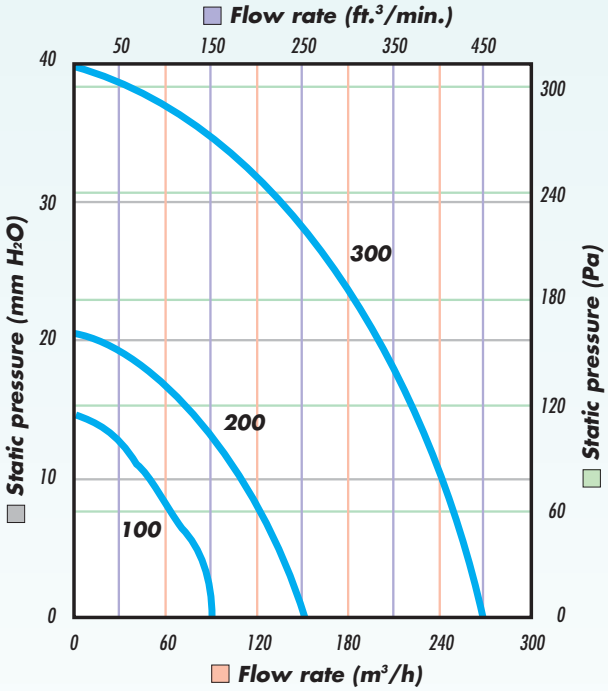


Dimensions



CE
IPX4
IMQ
Except 300T
03

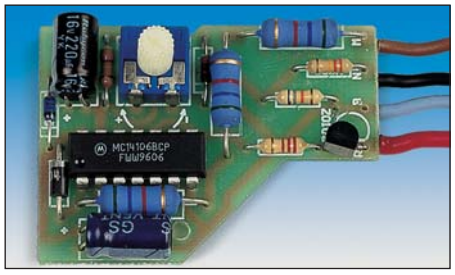
Model	A	B	C	D	E
Compact 100/100 T/100 H	210	210	95	20	ø 97
Compact 100 Sensor	210	210	95	20	ø 97
Compact 200/200 T/200 H/300/300 T/300 H	250	250	111	20	ø 97



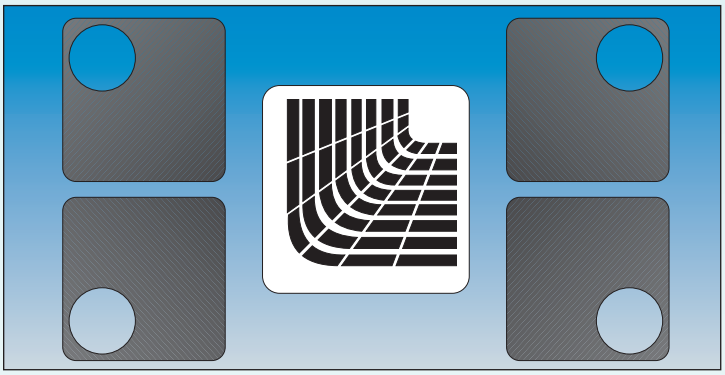
Technical Data

Model	Ref.	Hole diameter mm	Flow rate m³/h	W	Nominal voltage and frequency	Max pressure mm H_2O	dB (A) 3 m	Weight kg
COMPACT 100	OW 850 0	100÷120	85	45	220-240V 50Hz	12,5	40	1,3
COMPACT 200	OW 852 6	100÷120	156	76	220-240V 50Hz	20	45	1,8
COMPACT 300	OW 854 2	100÷120	250	95	220-240V 50Hz	40	54	2,3
COMPACT 100 T	OW 851 8	100÷120	85	45	220-240V 50Hz	12,5	40	1,3
COMPACT 200 T	OW 853 4	100÷120	156	76	220-240V 50Hz	20	45	1,8
COMPACT 300 T	OW 945 8	100÷120	250	95	220-240V 50Hz	40	54	2,3
COMPACT 100 H	OW 862 5	100÷120	85	45	220-240V 50Hz	12,5	40	1,3
COMPACT 200 H	OW 863 3	100÷120	156	76	220-240V 50Hz	20	45	1,8
COMPACT 300 H	OW 864 1	100÷120	250	95	220-240V 50Hz	40	54	2,3
COMPACT 100 SENSOR	OW 123 2	100÷120	85	45	220-240V 50Hz	12,5	40	1,3

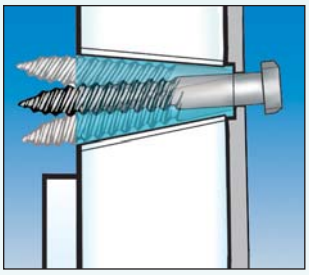
COMPACT



• ***Compact T,*** *easy timer adjustment by small control knob.*
• ***Compact Sensor,*** *it is extremely simple to install since it is connected to the electrical system with just two wires, thus eliminating the connections that normally need to be made to the light and the light switch.*



To allow fixing in difficult corners the front grille has four different fixing positions on all sizes excepts the Sensor version fitted with Sensor.



Two captive fixing screws in special cone shaped housing to allow every necessary adjustment during installation in walls or ceiling.

The position of outlet hole in the corner allows installation in difficult situations.
Integral back draught shutter.

Quick installation due to two part construction, base and front grille/filter.

With anti-vibration gasket made of elastomer which fits on uneven surfaces.

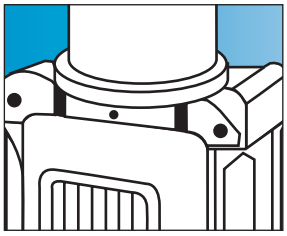
Supplied with washable filter assuring long life of the motor.

CENTRIFUGAL FANS - IPX4
COMPACT

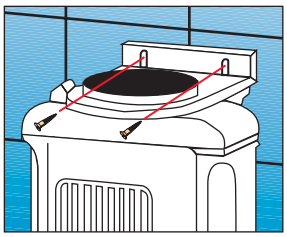
CENTRIFUGAL IN LINE FANS
ASPIRODOR 165

CENTRIFUGAL IN LINE FANS
ASPIRODOR 165

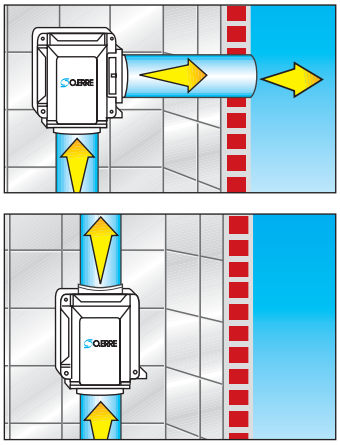
- *Centrifugal fans to extract air and fumes through ducts or pipes.*
- *Can be easily installed in-line (replacing a part of the pipe) or in angle (replacing a curve of the pipe) simply changing the position of the frame.*
- *Supplied with wall installation flange.*
- *In accordance with EN 60335-2-80.*
- *In ABS material.*



Dual purpose spigots suitable for 100 mm or 120 mm ducts.

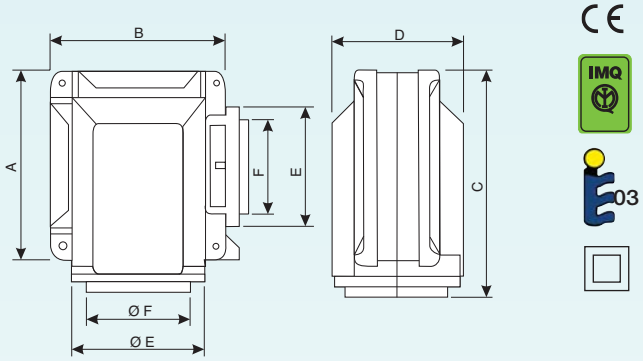


Fixing bracket with elongated fixing holes to allow positional adjustment.

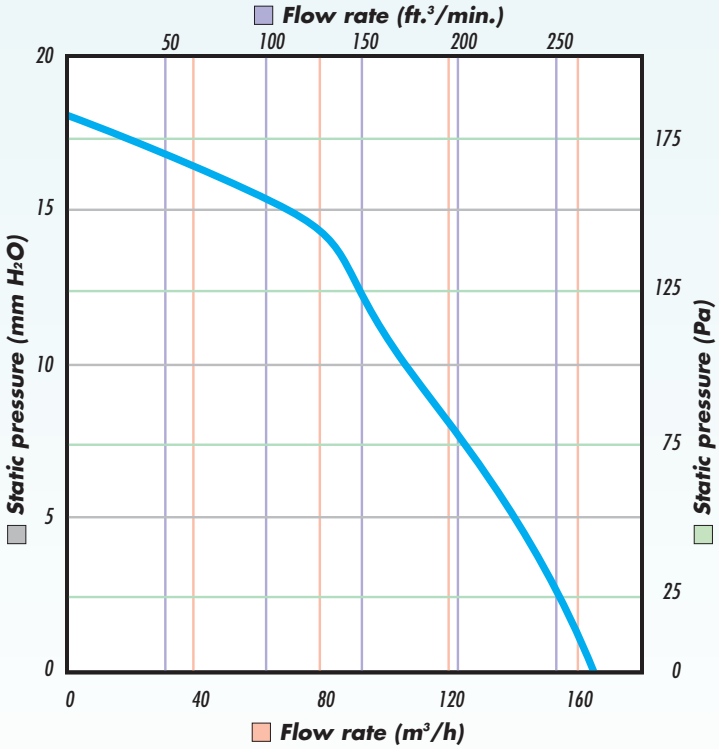


Can be used in-line or in angle, by a simple adjustment of the frame.

Dimensions



Model	A	B	C	D	E	F
Aspirodor 165 in line	205	205	263	148	ø 126	ø 102
Aspirodor 165 in angle	205	205	242	148	ø 126	ø 102



Technical Data

Model	Ref.	Hole diameter mm	Flow rate m³/h	W	Nominal voltage and frequency	Max pressure mm H₂O	dB (A) 3 m	Weight kg
ASPIRODOR 165	OW 165 3	100÷120	165	80	220-240V 50Hz	18	51	1,9

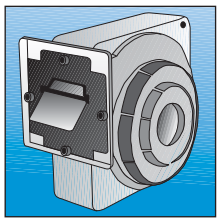
DOUBLE INLET CENTRIFUGAL FANS

ASPIRODOR 200-300-400

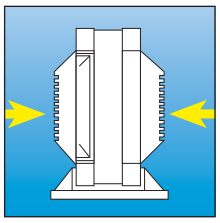
DOUBLE INLET CENTRIFUGAL FANS
ASPIRODOR 200-300-400

- *Centrifugal fans to extract air and fumes through ducts or pipes.*
- *Can be ceiling and wall mounted.*
- *Supplied with installation flange.*
- *Double inlet fans.*
- *In accordance with EN 60335-2-80.*
- *In ABS material.*

For all Aspirodor range



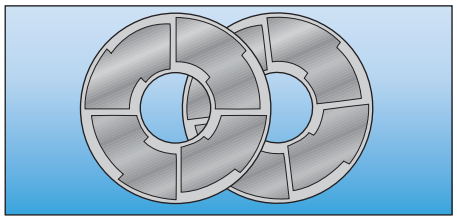
Gravity shutter to prevent the entey of air.



The double inlet combines silent operation with high performance.

Horizontal or vertical mounting.

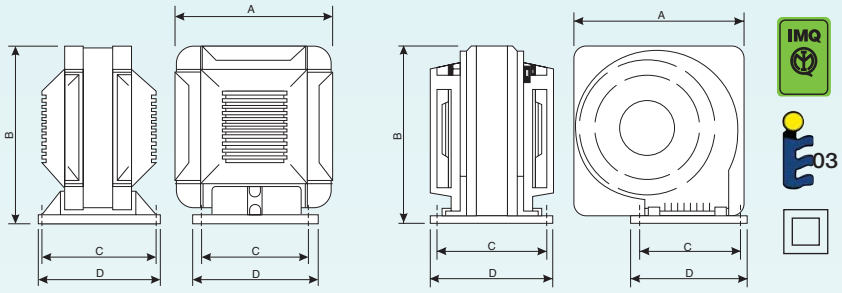
For all Aspirodor range, *simple main connection via external connector box.*



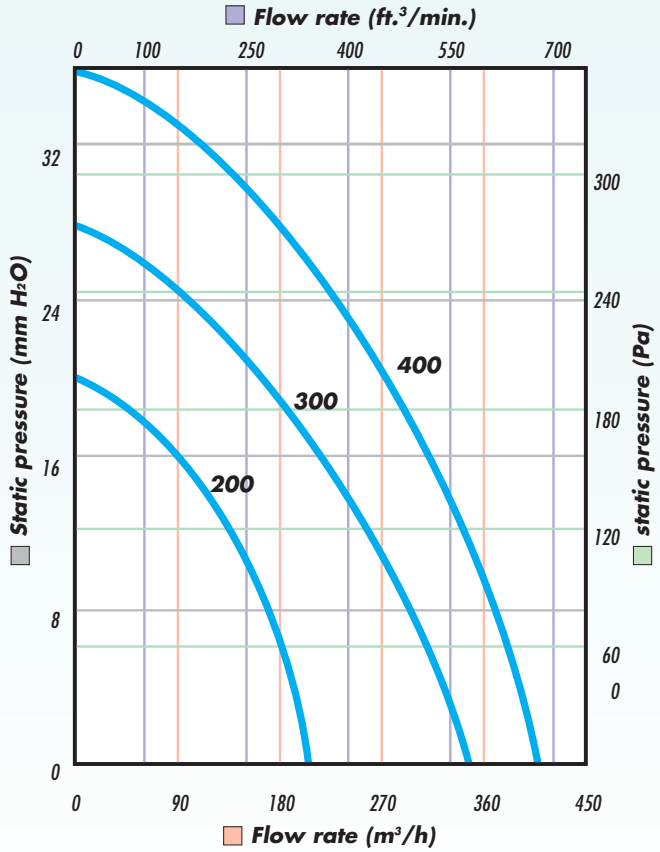
Aspirodor 300 and 400 *models only, with washable filters to protect moving parts, easily removed for cleaning.*

Dimensions

Aspirodor 200 *Aspirodor 300-400*



Model	A	B	C Mount. holes	D
Aspirodor 200	205	220	130	160
Aspirodor 300	227	245	130	160
Aspirodor 400	243	256	130	160



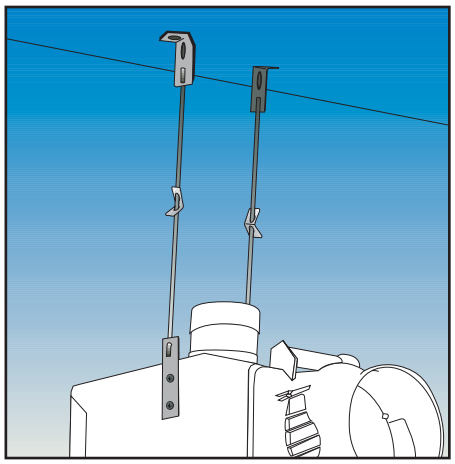
Technical Data

Model	Ref.	Hole diameter mm	Flow rate mm m³/h	W	Nominal voltage and frequency	Max pressure mm H₂O	dB (A) 3 m	Weight kg
ASPIRODOR 200	OW 145 5	100÷150	200	80	220-240V 50Hz	21	49	1,75
ASPIRODOR 300	OW 149 7	100÷150	350	80	220-240V 50Hz	27	53	2,2
ASPIRODOR 400	OW 151 3	100÷150	400	80	220-240V 50Hz	35	55	2,75

FALSE CEILING MOUNTED CENTRIFUGAL DUCT FANS
INTRA

FALSE CEILING MOUNTED CENTRIFUGAL DUCT FANS
INTRA

- *Centrifugal fan designed for installation in suspended ceilings and ceilings tiles, allowing ducted extraction to the outside wall.*
- *Equipped with integral back draugh shutters.*
- *Can be installed directly on the ceiling frame. In case the load bearing of the structure do not allow a direct installation, must be fixed on the ceiling wall.*
- *In accordance with EN 60335-2-80.*
- *White ceiling grilles in shining ABS material.*
- *Totally recessed, maintenance free, motor mounted on ball bearings.*



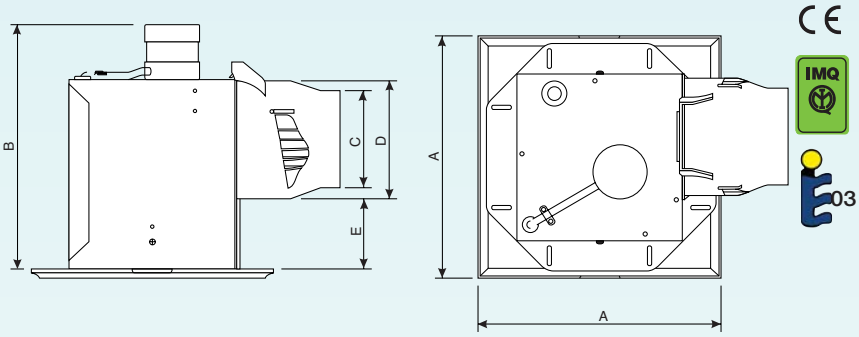
Kit with brackets for ceiling mounting Intra.

Modello	Ref./Cod. FNGDME
Staffe di fissaggio	OW 932 6

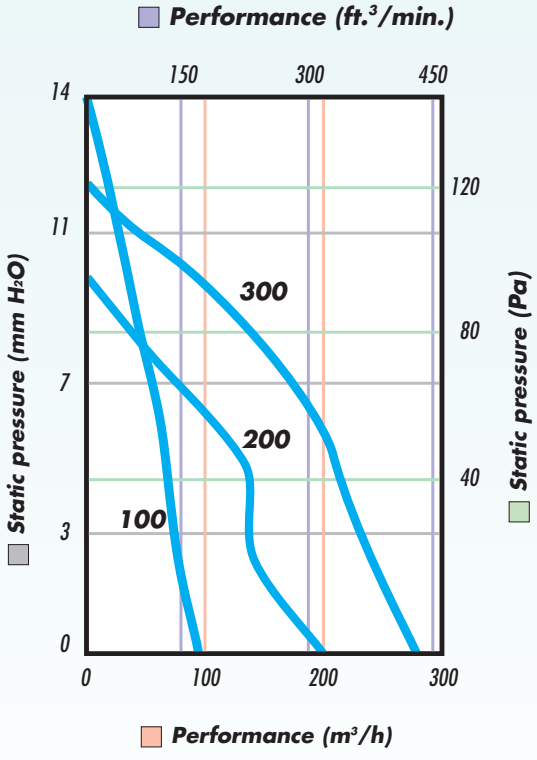
Accessory to fix the Intra fan directly to the ceiling in case the counter ceiling frame do not allow extra load.

• *Further accessories see page 110.*

Dimensions



Model	A	B	C	D	E	Aperture size
Intra 100	242	260	ø 97	ø 117	70	171 x 171
Intra 200	320	265	ø 97	ø 117	70	248 x248
Intra 300	320	270	ø 97	ø 117	70	273 x273



Technical Data

Model	Ref.	Flow rate m³/h	W	Nominal voltage and frequency	Max pressure mm H_2O	dB (A) 3 m	Weight kg
INTRA 100	OW 918 5	95	30	220-240V 50Hz	14	31	2,2
INTRA 200	OW 919 3	190	35	220-240V 50Hz	9	39	3,4
INTRA 300	OW 920 1	270	45	220-240V 50Hz	12	40	3,5

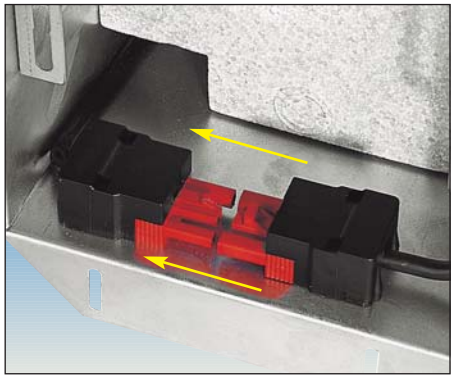
FALSE CEILING MOUNTED CENTRIFUGAL DUCT FANS
INTRA

Air replacement in closed rooms is quite important for a good comfort of the present people. Sometimes, in commercial or public buildings, offices or other working places, a correct air change is not easy to achieve.
But in case these premises are equipped with a false ceiling, we can then solve this problem in a very simple and rather cheap way: installing an INTRA into the false ceiling.

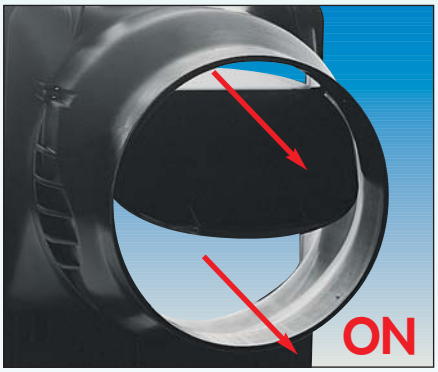
INTRA is the best and cheapest solution for a ceiling mounted fan.

Fan easily unhanged for cleaning or maintenance purposes, leaving the housing fixed to the ceiling and connected to the duct.

External grille made of shining ABS plastic material with a stylish and innovative design, suitable for installation in various ceiling depth sizes.



Fast plug-in electrical connection to guarantee a fast and safe installation.



Highly silenced, with a very low sound level due to the expanded polystyrene impeller housing, zinc plated steel structure and motor placed outside the fan housing.

INTRA

The fan should remain installed exactly at same level than the ceiling boards above one or various work stations and be connected with the outside wall through flexible and cheap ducting which can be fixed directly to the ceiling wall or layed on the ceiling boards if the structure is strong enough.

*The **INTRA** fan, totally hidden inside the false ceiling, can be installed in 2 ways: if the false ceiling has a strong bearing structure, the fan will be screwed directly to the frame (see pict. 1 & 2), otherwise the fan should be fixed directly to the ceiling wall with special brackets so that it may come exactly to the same ceiling board allignment (see pict. 3).*

In both the cases, the grille (sole visible part of the fan) will be fixed from bottom placing it on top of the board tiles. The external grill is removable to allow an easy cleaning and access to the filter.

The Intra fans do not create draught because the size and shape of the grille are designed for a maximum air flow speed of 0.015 mt/sec. at 1 meter distance.

Incoming air opening holes should be positioned far away from fan installation point, even in adjacent rooms, leaving enough space level under the comunication doors.

Another important point to keep in mind in working places is the sound and noise level of a fan.
To respect the worker's sound comfort level, the fan's noise should not exceed the 40 dB at 3 meters distance.

Because mounted inside the false ceiling and due to a particular construction design, INTRA allows to reach easily this ambitious target.

Positioning

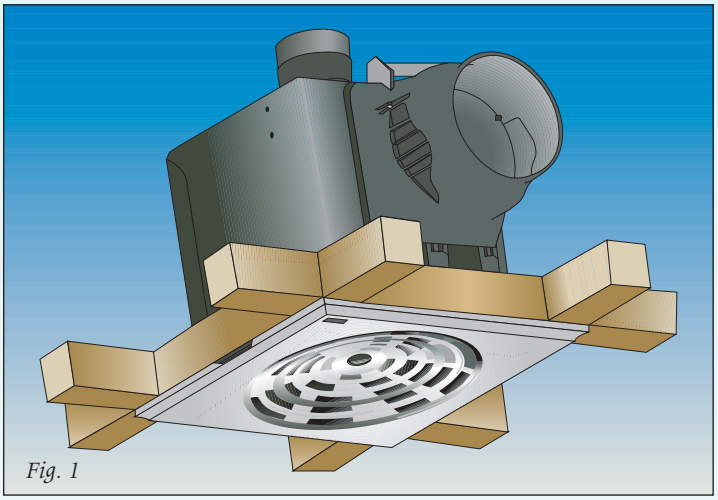


Fig. 1

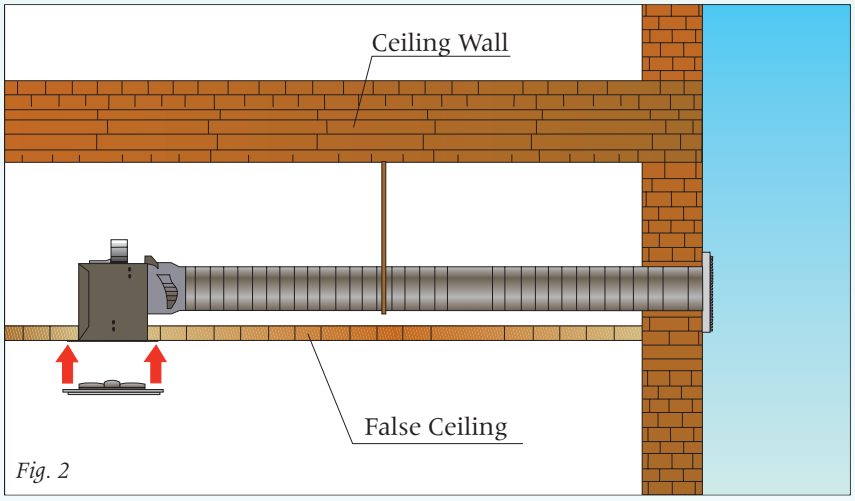


Fig. 2

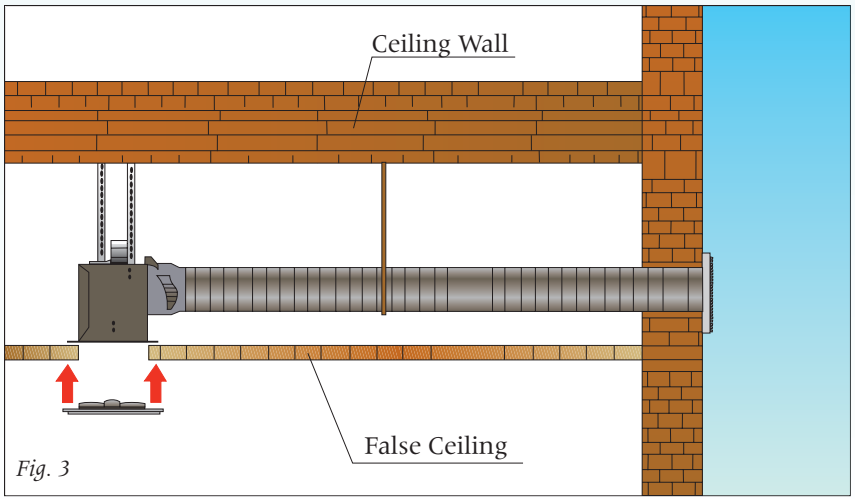


Fig. 3

INDUSTRIAL FANS

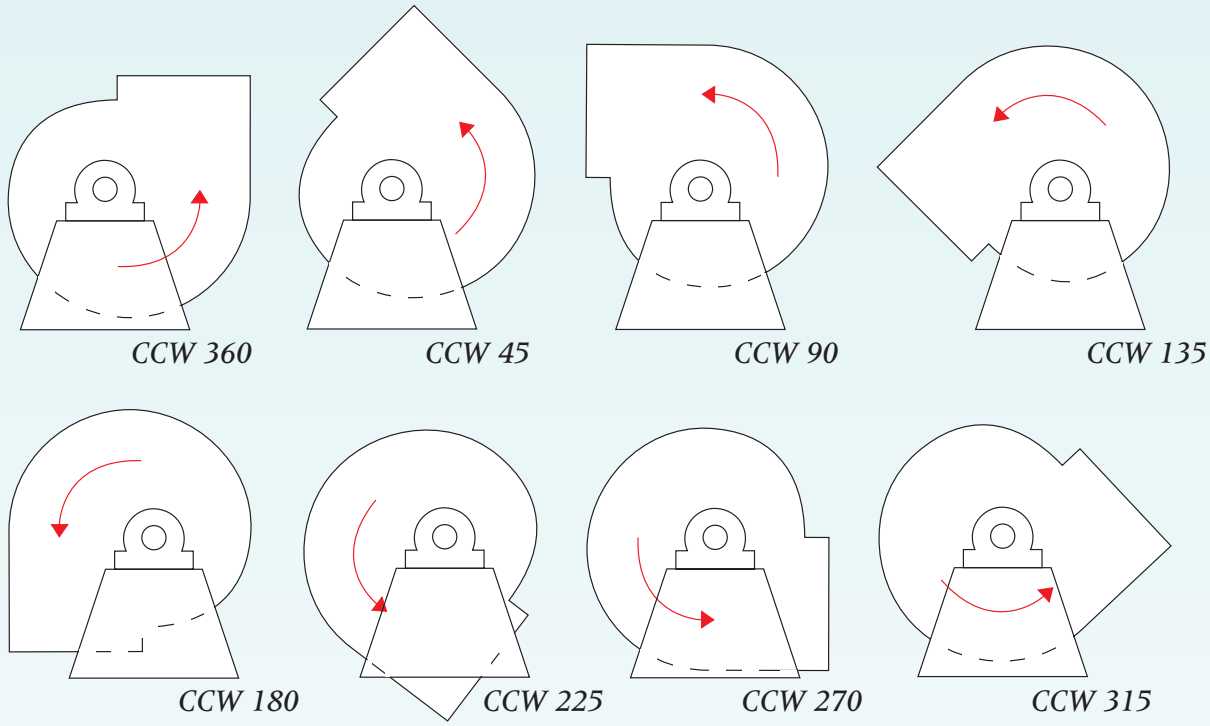
The "safe" packaging

IMPELLER HOUSING ROTATION

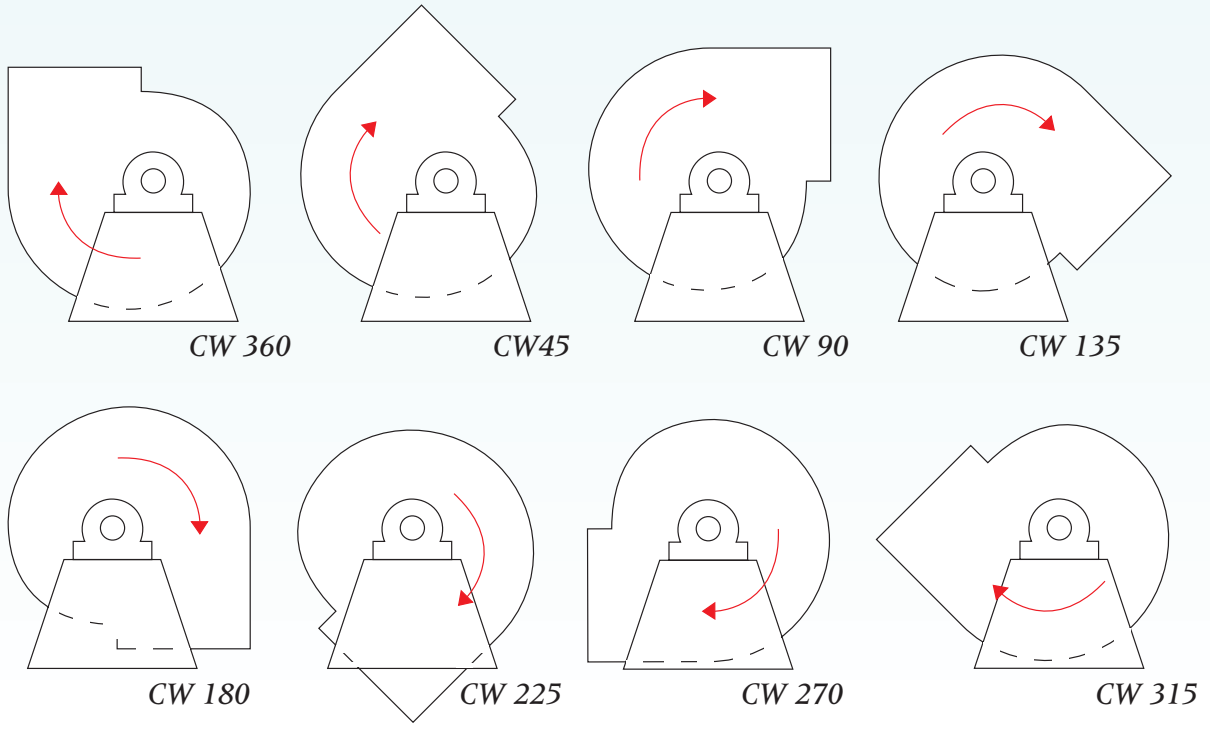
Exit direction and rotation viewed from the motor side

(Norm AMCA standard 99-2406-83)

Rotation anti clockwise CCW



Rotation clockwise CW (RD)



STANDARD AXIAL FANS
EB

STANDARD AXIAL FANS
EB

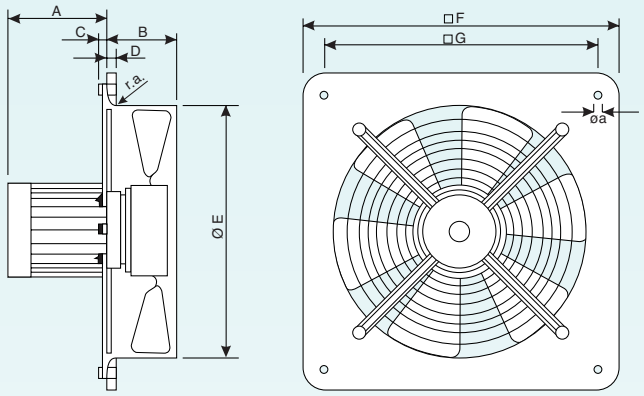
- *Axial fans for wall or panel mounting to convey air and fumes directly outside or through short ducts.*
- *Temperature 55 °C.*
- *Also suitable for application on machines where a forced ventilation or air suction is required.*
- *Safety protection grille.*
- *Body and grille in steel protected by an epoxy-based anticorrosive paint.*
- *Impeller in ABS material.*
- *Induction motor, class F, IP 44 protected.*
- ***Model EB 504**, IP54 protected.*
- *In accordance with the essential requirements of 89/392/CE directive concerning machines, and with European Standards EN 292 part I and II, UNI EN 294 and IEC 204-1 and 2.*
- *Industrial regulators available (see page 88).*

Reversibiliy:
- *Single-phase: only model EB 504 M.*
- *Three-phase: all the models.*

Accessories:
- *See page 113*

Dimensions

CE



Model	A	B	C	D	ø E	□F	□G	r.a.	ø a	Kg
EB 25 4M	96	70	9	8	260	340	290	12	7	3,4
EB 30 4M	111	70	9	10	312	390	340	15	9	4,5
EB 35 4M	98	90	10	12	365	460	410	15	9	5,2
EB 40 4M	108	90	10	12	415	510	460	15	9	6,4
EB 50 4M	145	90	10	15	515	630	580	15	11	8,5
EB 25 4T	125	70	9	8	260	340	290	15	11	4,0
EB 30 4T	125	70	9	10	312	390	340	15	7	4,6
EB 35 4T	125	90	10	12	365	460	410	15	9	5,5
EB 40 4T	125	90	10	12	415	510	460	15	9	6,0
EB 50 4T	145	90	10	15	515	630	580	15	11	8,4

Technical Data

Model	Ref.	Motor protection	Motor	Flow rate m^3/h	Max press. mm H_2O	N° Poles	W	Hz	Nominal curr. A. at 230V	Nominal curr. A. at 400V	dB (A) 2m	RPM
EB 25 4M	OW 450 9	IP44	single-phase	900	10	4	85	50	0,57	-	55	1300
EB 30 4M	OW 451 7	IP44	single-phase	1500	9	4	100	50	0,79	-	59	1300
EB 35 4M	OW 452 5	IP44	single-phase	2250	10	4	120	50	0,49	-	63	1300
EB 40 4M	OW 453 3	IP44	single-phase	2900	9	4	145	50	0,63	-	66	1260
EB 50 4M	OW 455 8	IP54	single-phase	4500	14	4	260	50	1,40	-	72	1300
EB 25 4T	OW 496 2	IP44	three-phase	900	10	4	45	50	0,20	0,12	55	1300
EB 30 4T	OW 497 0	IP44	three-phase	1500	9	4	60	50	0,24	0,14	59	1300
EB 35 4T	OW 498 8	IP44	three-phase	2250	10	4	95	50	0,39	0,23	63	1300
EB 40 4T	OW 499 6	IP44	three-phase	2900	9	4	130	50	0,47	0,27	66	1280
EB 50 4T	OW 456 6	IP54	three-phase	4500	14	4	230	50	1,00	0,57	72	1300

COMPACT AXIAL FANS
EC

COMPACT AXIAL FANS
EC

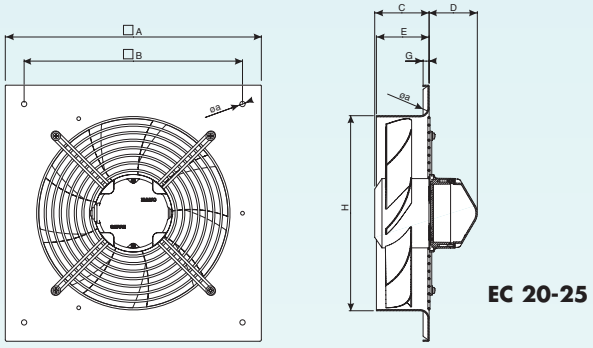
- *Axial fans for wall or panel mounting to convey air and fumes directly outside or through short ducts.*
- *Temperature 55 °C.*
- *Also suitable for application on machines where a forced ventilation or air suction is required.*
- *Safety protection grille.*
- *Body and impeller in steel protected by an epoxy-based anticorrosive paint.*
- *Zinc plated steel blade, statically and dynamically balanced.*
- *Induction motor with external rotor on ball bearings.*
- *Compact fans with low sound level compared with high performance.*
- *In accordance with the essential requirements of 89/392/CE directive concerning machines, and with European rules EN 292 part I and II, UNI EN 294 and IEC 204-1 and 2.*
- *Industrial regulators available (see page 88).*

Reversibility:
- *Single-phase: all the models except for EC 204 M - EC 254 M.*
- *Three-phase: all the models.*

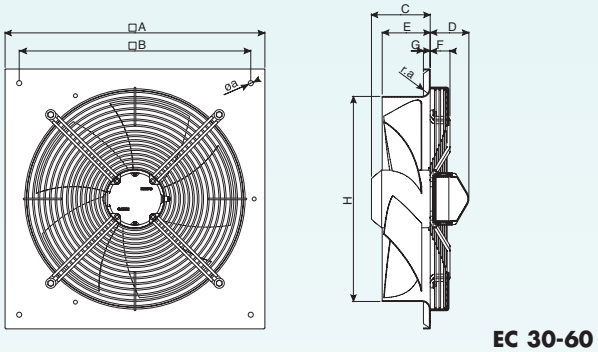
Accessories:
- *See page 113.*

Dimensions

CE



EC 20-25



EC 30-60

Model	□A	□B	C	D	E	F	G	ø H	r.a.	ø a	kg
EC 20 4M/T	280	230	64	64	54		8	207	15	7	2
EC 25 4M/T	340	290	72	64	70		8	259	15	7	3
EC 30 4M/T	390	340		93	70	57,5	10	311	15	9	4
EC 35 4M/T	460	410	104	67	85	35	12	363	15	9	5
EC 40 4M/T	510	460	117	67	85	35	12	413	15	11	8
EC 50 4T	630	580		138	90	96	15	513	15	11	17
EC 60 6T	815	765		138	100	96	15	640	25	11	22

Technical Data

Model	Ref.	Motor protection	Motor	Flow rate m^3/h	Max press. mm H_2O	N° Poles	W	Hz	Nom. current in A. at 230V	Nom. current in A. at 400V	dB (A) 2m	RPM
EC 20 2M	OW 459 0	IP44	single-phase	950	16	2	60	50/60	0,30	-	61	2740
EC 20 4M	OW 460 8	IP44	single-phase	400	8	4	40	50/60	0,30	-	48	1350
EC 25 4M	OW 461 6	IP44	single-phase	1000	10	4	70	50/60	0,50	-	54	1400
EC 30 4M	OW 462 4	IP44	single-phase	1900	12	4	90	50/60	0,60	-	58	1370
EC 35 4M	OW 463 2	IP44	single-phase	3200	10	4	150	50/60	0,60	-	64	1370
EC 40 4M	OW 465 7	IP44	single-phase	4300	16	4	180	50/60	0,80	-	63	1390
EC 20 4T	OW 490 5	IP44	three-phase	500	7,5	4	20	50/60	0,17	0,10	47	1450
EC 25 4T	OW 491 3	IP44	three-phase	1000	10	4	30	50/60	0,17	0,10	54	1420
EC 30 4T	OW 492 1	IP44	three-phase	1900	10	4	90	50/60	0,35	0,20	62	1370
EC 35 4T	OW 493 9	IP44	three-phase	3200	19	4	150	50/60	0,60	0,35	65	1400
EC 40 4T	OW 494 7	IP44	three-phase	4300	16	4	150	50/60	0,80	0,50	66	1400
EC 50 4T	OW 467 3	IP54	three-phase	8700	35	4	760	50/60	3,30	1,90	72	1440
EC 60 6T	OW 469 9	IP54	three-phase	11200	26	6	520	50/60	2,20	1,30	70	990