MMotors JSC®
long life systems

MANUFACTURER OF ELECTRIC MOTORS & AXIAL FANS

EXTRACTOR FANS

MAIN GATALOGUE

ABOUT COMPANY

Established in 1961 "MMotors" JSC is a leading Bulgarian manufacturer and supplier of electric motors and extractor fans. Our electric motor department manufactures over 100 types of motors and prides itself with several unique innovations which gives us the lead in electric motor performance and knowhow. Our extractor fan department backed up by the electric motor manufacturing provides wide range of ventilation fans with modern designs and guaranteed long life operation. Our high temperature resistant extractor fans are widely used in chimney applications, barbecue and fireplace designs.

The recently launched supply ventilation system is full with innovative solutions and modern electronics providing intelligent ventilation control.

Our designs and technical solutions are entirely aimed at achieving the highest degree of effectiveness and durability with products that are in line with the budget and lifestyles of our customers.


LRQA

CERTIFICATE OF APPROVAL

MMOTORS JSC
2 Malak Iskar Str., 2100 Etropole
Bulgaria

Manufacture of single and three-phase induction motors up to 6 kW

„ECO-FRESH 01"

Save Energy

HEAT RECOVERY VENTILATION UNIT

Many modern homes are heated with solid fuel systems. In most cases the heating system is designed unprofessional and without provided input of fresh entering the room. Despite popular belief – the regular opening of doors and windows is not an effective solution.

When the oxygen entering the premise is not sufficient, the result is incomplete combustion which forms carbon monoxide - a highly poisonous gas with no odor or color.

CO threatens our lives and health, and is the cause of accidents in heating with solid fuels.

To ensure healthy microclimate the solid fuel stove must get fresh air at least 4 m³/h for each kW of thermal capacity, while to fireplace with open fire, depending on the size, this value is many times greater.

Considering the need of positive pressure in the room with your fireplace, the use of airflow system that delivers clean air is both essential for good combustion of your heater and your health.

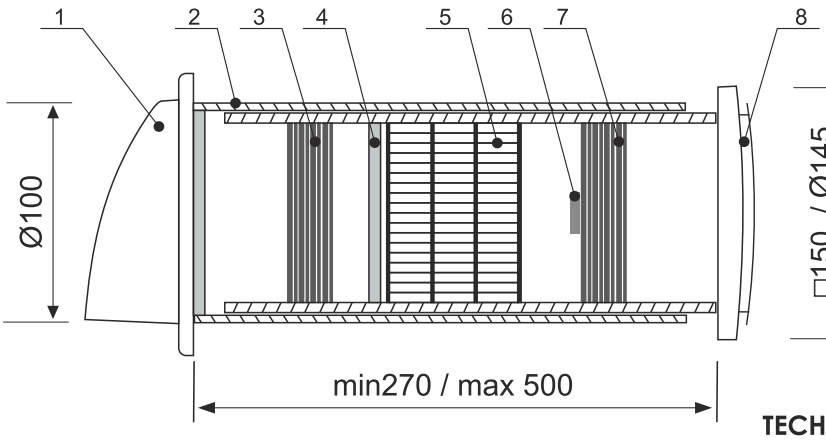
MMotors provides a solution for this problem through a series COMPACT VENTILATION SYSTEMS "ECO-FRESH 01"

Air-flow system Eco-Fresh purifies the air from odors, dust, bacteria and car exhaust gases.
The device has embedded hydrostat that controls the humidity in the room, keeping it in the range below 75% which prevents humidification and mold growth.

Emitted during unit's operation negatively charged ions that destroy the disease-causing microorganisms, prevent the spread of infections. Ionized air improves the work capacity, removes fatigue and helps the recovery after long and heavy illness. It also has a beneficial effect in cases of bronchial asthma, respiratory diseases, migraine, neurosis and cardiovascular problems.

CREATE CLEAN AND HEALTHY ENVIRONMENT

- ensures fresh air and healthy microclimate in the premises;
- stale air exhaust;
- creates an overpressure supporting the full combustion and flue gases removal;
- controls humidity and prevent mold growth;
- inlet of purified and ionized air;
- the use of " heat recovery" leads to significant energy saving and reductions of heat loss;
- easy for installation and maintenance. Release



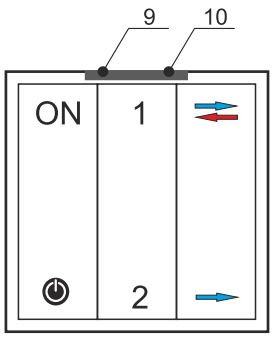


Fig. 1 /Control panel/

The airflow system "Eco-Fresh 01" is composed of:

1. Outer protective grille– protects the system from humidity even during heavy rains.
2. Extensible air funnel – allows regulation of the system length, depending on wall thickness.
3. Exhaust fan – two-speed, allows regulation of fan duty from 45m³/h in night silent mode, up to 70m³/h in day mode.
4. Filter with charcoal – guarantees the clean airflow even in strong polluted urban areas and industrial regions. Cleans the air from smells, dust, bacteria, soot, car exhaust gases and other.
5. Heat exchanger – contributes to a significant reduction of heat loss during ventilation.
6. Ionizer – filling up the air with negative ions.
7. Blast fan – two-speed, allows regulation of fan duty from 45m³/h in night silent mode, up to 70m³/h in day mode.
8. Decorative grille – does not take any space in the room, can be executed in different colors.
9. Humidity sensor – turns on the system when the humidity exceeds 70%.
10. CO (carbon monoxide) sensor: turns on the blast fan in mode AIR FLOW → 70 m³/h at detected CO leakage into the premise.

CONTROL PANEL (Fig. 1)

ON - switches on the system.

Standby ⏻
- stops the fan and ionizer, but keeping them in standby mode. The system monitors the air for CO presence and if it is detected the blast fan is automatically turned on at maximum speed. A positive pressure is formed which increases the draught. The atmospheric oxygen contributes to full combustion, in mean time the positive pressure insures the toxic gases disposal through the chimney.
The system monitors the humidity in the room and when it exceeds 75% automatically turns on the fan and ionizer. They stop 10 minutes after the room humidity falls below 75%

FAN SPEED – operate the fan speed. A selection between 5 speeds –
1. first speed – 45m³/h in night silent mode,
2. second speed – max. 70m³/h in day mode.

AIR FLOW →
- Mode "Air Influx" – the system is constantly blasting clean air from outside to inside.

AIR FLOW ⇄ (usage at non working fire place)
- Mode of reversible ventilation with thermal energy recovery
The system blasts clean air from outside to inside and disposes polluted air out of the room. A heat recovery is observed – process of recovering heat from outgoing warm but polluted air.
The warm air which is going out through exchanger is rendering its heat to the incoming clean air. This contributes to a significant reduction of heat loss during winter days. In summer the opposite process is observed – the cool air from air-conditioning which is going out through exchanger is chilling the incoming clean but warm air. In the exchanger is achieved efficiency of heat regeneration that exceeds 90%.

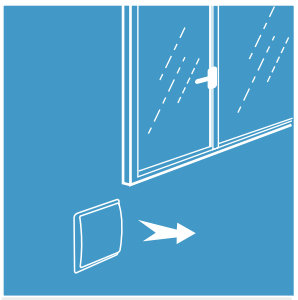
TECHNICAL CHARACTERISTICS

Model	Rated Voltage	Maximum Flow	Power Consumption fan	Maximum rotational speed	Protection Degree
	Hz/V	m^3/h	W	min^{-1}	IP
01	50/230	45 / 70	5,5 / 9,2	1350 / 2650	X4

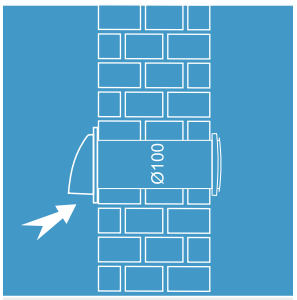
Dimensions /mm/

Minimal wall thickness 27 cm.
Maximal wall thickness 50 cm.

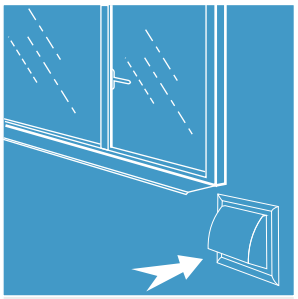
* The development of a ventilation system, adjusted to other than the above wall thickness is possible by a clients request.



Inside look



Mounting in the wall



Outside look

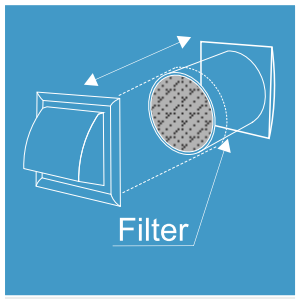


Fig.2

CAUTION: only AIR FLOW → must be used with working fireplace.
From producer:
With unlit fireplace "Eco-Fresh 01" is recommended to work in AIR FLOW ⇄ mode at first speed 24 hours a day.

„Eco-Fresh" Economic	„Eco-Fresh" Standard	„Eco-Fresh" Comfort
✓ Active charcoal filter ✓ Two speeds	✓ Reversible air flow ✓ Ceramic heat exchanger ✓ Hydrostat ✓ Active charcoal filter ✓ Fine filter	✓ Reversible air flow ✓ Ceramic heat exchanger ✓ Hydrostat ✓ Active charcoal filter ✓ Fine filter ✓ Ionizer ✓ CO monitoring system

Heat Recovery Ventilation Unit

ECO FRESH 07

Save Energy

GOLDEN MEDAL

IFP
Internacional
Technical
Fair
Plovdiv

PROVIDING CLEAN & HEALTHY INDOOR ENVIRONMENT

Clean air is an essential factor our health. Modern man does not even know how many of his health problems are caused by air in his own home or workplace.
It has been shown that the air quality in our well sealed and well-insulated homes and workplaces is not healthy, and this is where we spend 90% of our lives.
The heat recovery unit “Eco-Fresh” is designed for local ventilation of residential and commercial premises.
Creates healthy indoor climate by supplying fresh air. Passing through the system of filters the air is purified from dust, soot, bacteria, etc.

When needed in the cold winter days the incoming air is heated to room temperature.
Hydrostatic system controls humidity, keeping it in the range below 75%, which limits the humidification and aging of the premises, and prevents the formation of mold and mildew.
The built-in ionizer fills the air with negative ions, which has antiseptic effect, kills disease-causing microorganisms - viruses and bacteria, preventing infections and acute respiratory diseases.
Ionized air improves working capacity, eliminates the fatigue, and positively affects the overall health conditions

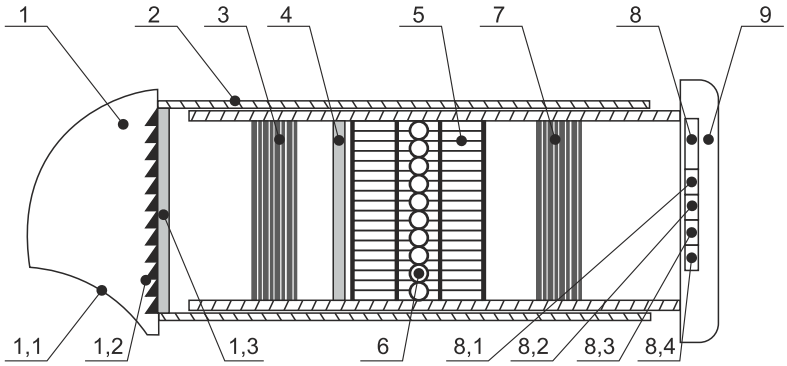
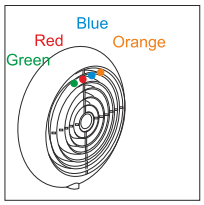


Fig. 1



The airflow system "Eco-Fresh 07" is composed of:

1. Outer protective grille– protects the system from humidity even during heavy rains. Consists of a housing (1.1); grate (1.2); grid (1.3).

2. Extensible air funnel – allows regulation of the system length, depending on wall thickness.

3. Exhaust fan – five-speed, allows regulation of fan duty from 30m^3/h in night silent mode, up to 120m^3/h in day mode.

4. Filter with charcoal – guarantees the clean airflow even in strong polluted urban areas and industrial regions. Cleans the air from smells, dust, bacteria, soot, car exhaust gases and other.

5. Heatexchanger – contributes to a significant reduction of heat loss during ventilation.

6. Heater 500W – economical, designed for pulse operation. Maintain the temperature of the incoming air 23°C.

7. Blast fan – five-speed, allows regulation of fan duty from 30m³/h in night silent mode, up to 120m³/h in day mode. Serves for blasting clean air from outside.

8. Control unit
8.1 Thermal fuse – protects the system from overheating.
8.2 Thermostat – manages the heater and ensures 23°C of incoming air.
8.3 Hydrostat - controls humidity, maintaining it in the range below 70%.
8.4 Ionizer – filling up the air with negative ions. Removes specific and unpleasant odors. Kills pathogenic microorganisms. Protects from fungus and mold.
9. Decorative grille – does not take any space in the room, can be executed in different colors.

Remote control (fig.1):

Start/Stop – switches on/off the system.

AIR FLOW
- Mode (reversible ventilation with thermal energy recovery).
The system blasts clean air from outside to inside and disposes polluted air out of the room. A heat recovery is observed – process of recovering heat from outgoing warm but polluted air. The warm air which is going out through exchanger is rendering its heat to the incoming clean air. This contributes to a significant reduction of heat loss during winter days. In summer the opposite process is observed – the cool air from air-conditioning which is going out through exchanger is chilling the incoming clean but warm air. In the exchanger is achieved efficiency of heat regeneration that exceeds 90%.

AIR FLOW
- mode "Air Influx" – the system is constantly submitting clean air from outside to inside.

AIR FLOW
- mode "Air Exhaust" – by protracted press over 10 seconds the system is working as a fan.

SLEEP
In sleep mode and without light in the room the system turns off automatically after 10 minutes.
At lightening the system will be in working mode after 2 hours retaining the previous settings.

STANDBY
Heater, fan and ionizer are stopped. But the hydrostatic system monitors the humidity and when it exceeds 75% the fan and ionizer are automatically switched on. They stop working 10 minutes after the humidity level drops below 75%.

FAN SPEED – operate the fan speed. A selection between 5 speeds – first speed – 30m³/h in night silent mode, and last fifth speed – max. 120m³/h in day mode.

ON/OFF - switch on/off the hydrostatic system
ON/OFF - switches on/off the ionizer
ON/OFF - switches on/off the mode "heating of incoming air"

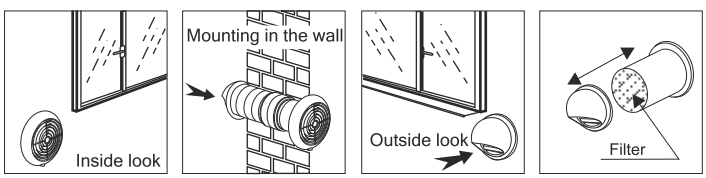


Fig. 2

LIGHT EMITTING DIODES

Green diode
* when is not lit the system does not work (or work as a fan) Air Flow
*when it is lit:
- the system is in mode Air Flow
- if flashes the system is in mode Air Flow

Red diode
* when is not lit the heater is off
* when it is lit:
- the system is in mode of heating the air, but the heater does not operate if the temperature of incoming air is over 23°C.
- if flashes the incoming air temperature is below 17°C.

Blue diode
* when is not lit the ionizer is off
* when it is lit the ionizer is on

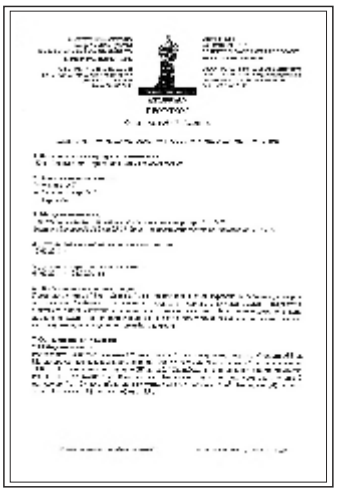
Orange diode
* when is not lit the humidity sensor is off
* when it is lit:
- the system is in mode of controlling the humidity
- when flashes the humidity level exceeds 70%

Features
- In Standby mode are lit green, blue and orange diodes, and the system is not working if the humidity is below 70%. When the humidity exceeds that level the ionizer and fan start working automatically on speed 3. The sensor monitors the humidity and 10 minutes after it is reduced below 70% the ionizer and fan stop working;
- The heater can be optionally switched on (red diode is lit), which guarantees warm air inflow when the system is working due to high humidity.
- Desired combination of functions can be chosen from the remote control.

Technical data

Min. wall thickness 32cm.

Model	Rated Voltage	Maximum Flow	Power Consumption		Maximum rotational speed	Protection Degree
			fan	heater		
	Hz/V	m^3/h	W	W	min^{-1}	IP
07	50/230	120	46	500	2650	X4



Demonstrated by research of National Center of Infectious and Parasitic Diseases - WHO Collaborating Centre, "In the room in which the system is installed, the average reduction of normal air microflora is 80%.
The system rapidly reduces the possibility of contamination with acute respiratory diseases, both in residential and commercial premises and in hospital rooms.
/Reference of Hospital Saint Marina – Varna Bulgaria/

MM
EXTRACTOR FANS

Series with double capsulated ball bearings NSK Japan which guarantee 30 000 hours of continuous operation.

LONG *life* **30 000h**

Trickle Impregnation Technology
- Sealed motor against dust and moisture
- High temperature resistant electric motor
- Maximum isolation characteristics
- Longlivity of the electric motor

The MM Series axial fans are suitable for a wide range of domestic applications including bathrooms, shower rooms, toilets, cloakrooms, including zones 1 & 2.
Also suitable for small to medium living, administrative or commercial premises.

All our MM series are fitted with noiseless high efficiency double insulated motors, which are totally maintenance free and sealed for life.

The embedded Long Life double capsulated ball bearings guarantee smooth running for over 30 000 hours of continuous operation.

The degree of protection IP X4 provides safe and reliable operation in high humidity and aggressive environment.
Stylish and easy to install, the MM series fans are available in a variety of operational specifications, while also our production process enables almost unlimited flexibility to adjust our products in compliance with the specific requirements of our customers.

If you need a fan for your sauna or steam room, please look at our High Temperature **MM-S** series.

MM **BASIC** MODEL

- With square or round grille;
- With anti-back draught shutter.

MM-C **WITH INTEGRATED** SENSOR CORD SWITCH

The fan will switch on/off each time the integrated sensor cord is being touched.

Options:
- With square grille;
- With anti-back draught shutter.

MM-IR **WITH INTEGRATED** INFRA-RED SWITCH

An infrared beam is directed vertically from the lower part of the fan.
The fan will switch on/off each time the infrared beam is intercepted.

Options:
- With square grille;
- With anti-back draught shutter.

MM-T **TIMER** MODEL

The fan will operate when the light switch is switched on or from a separate pull-cord switch. The built -in timer will ensure operation for 5 minutes after the light is switched off.

Options:
- Connects to the light switch or to a separate pull-cord switch;
- With integrated sensor cord switch;
- With integrated infra-red switch.

- With square or round grille;
- With anti-back draught shutter.

MM-H **WITH HUMIDITY CONTROL SYSTEM** AND TIMER

The fan will operate when its switched on or when the humidity in the premises reaches over 70%.
The timer ensures operation for 5 minutes after the humidity is reduced below 70%.

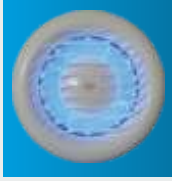
Options:
- Connects to the light switch or to a separate pull-cord switch;
- With integrated sensor cord switch;
- With integrated infra-red switch.

- With square grille;
- With anti-back draught shutter.

MM-L **WITH LIGHT RELAY** AND TIMER

The fan will operate when the room is lit while the built-in timer ensures operation for 5 minutes after the light is off.

Options:
- With square or round grille;
- With anti-back draught shutter.



ILLUMINATING
LED *Colours*

Short Spigot Series

	Hz / V	min^{-1}	m^3 / h	Pa	W	A	dB	IP
MM - 100	50 / 230	2500	60	55	16	0,095	36	X4
MM - 100	50 / 380	2500	60	55	15	0,055	36	X4
MM - 100	60 / 120	3200	70	60	17	0,160	37	X4
MM - 100	60 / 220	3200	70	60	17	0,090	37	X4

GOLD Series

	Hz / V	min^{-1}	m^3 / h	Pa	W	A	dB	IP
MM - 100	50 / 230	2750	105	62	17	0,110	39	X4
MM - 100	50 / 380	2750	105	62	16	0,063	39	X4
MM - 100	60 / 120	3200	120	75	19	0,210	40	X4
MM - 100	60 / 220	3200	120	75	19	0,110	40	X4

	Hz / V	min^{-1}	m^3 / h	Pa	W	A	dB	IP
MM - 120	50 / 230	2650	150	75	18	0,125	42	X4
MM - 120	50 / 380	2650	150	75	18	0,073	42	X4
MM - 120	60 / 120	3200	175	90	19	0,210	43	X4
MM - 120	60 / 220	3200	175	90	19	0,110	43	X4

	Hz / V	min^{-1}	m^3 / h	Pa	W	A	dB	IP
MM - 150	50 / 230	2650	240	110	46	0,385	51	X4
MM - 150	50 / 380	2650	240	110	46	0,224	51	X4
MM - 150	60 / 120	3320	275	130	54	0,714	53	X4
MM - 150	60 / 220	3320	275	130	54	0,385	53	X4

MM-LV (Low Voltage) Series

	Hz / V	min^{-1}	m^3 / h	Pa	W	A	dB	IP
MM100 LV	50 / 12	2790	105	62	17	2	39	X4

MM-OK Series WITH MEGA DEBIT

NEW

	Hz / V	min^{-1}	m^3 / h	Pa	W	A	dB	IP
MM100 OK	50 / 230	2050	**150**	67	17	0,110	41	X4

MM-UE (Ultra Economical) Series

NEW

	Hz / V	min^{-1}	m^3 / h	Pa	W	A	dB	IP
MM100 UE	50 / 230	2020	85	52	**5,5**	0,071	30	X4

MM-2S (Two Speed) Series

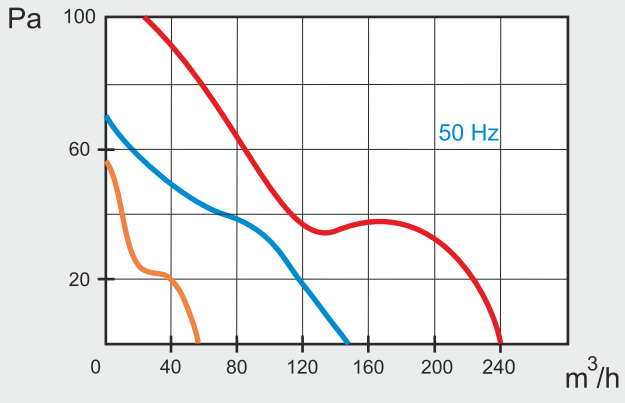
	Hz / V	min^{-1}	m^3 / h	W	A	dB	IP
MM100	50 / 230	2750	105	17	0,110	39	X4
MM100-2S	50 / 230	1380	50	3,3	0,048	28	X4
MM120	50 / 230	2650	150	18	0,125	42	X4
MM120-2S	50 / 230	1250	75	4	0,060	32	X4

Max Noise Level (dB) at **1m** distance

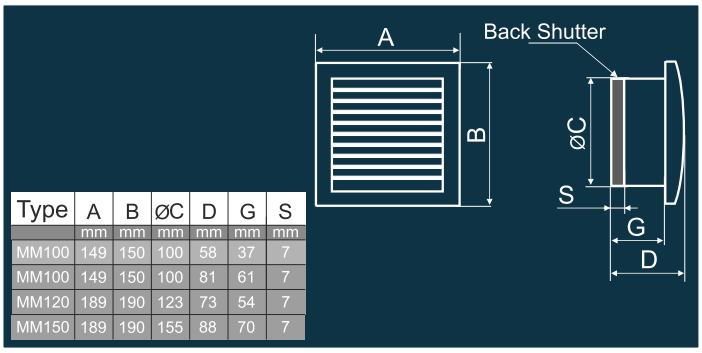
LUX series

MM-LUX Series

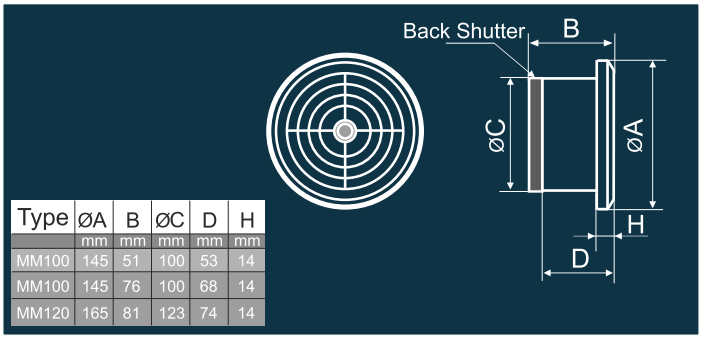
	Hz / V	min^{-1}	m^3 / h	Pa	W	A	dB	IP
MM100 LUX	50 / 230	2790	110	63	18	0,125	41	X4



Dimensions /mm/



Type	A	B	ØC	D	G	S
	mm	mm	mm	mm	mm	mm
MM100	149	150	100	58	37	7
MM100	149	150	100	81	61	7
MM120	189	190	123	73	54	7
MM150	189	190	155	88	70	7



Type	ØA	B	ØC	D	H
	mm	mm	mm	mm	mm
MM100	145	51	100	53	14
MM100	145	76	100	68	14
MM120	165	81	123	74	14

All fans can be manufactured on 60 Hz frequency while the remaining characteristics will change insignificantly.

ATTENTION: The temperature of the environment in which the aspirator operates must not exceed 80°C.

MM-S

FOR SAUNA & STEAM ROOM

Series with double capsulated ball bearings NSK Japan which guarantee 30 000 hours of continuous operation.

LONG *life* **30 000h +140°C**

Trickle Impregnation Technology

- Sealed motor against dust and moisture
- High temperature resistant electric motor
- Maximum isolation characteristics
- Longlivity of the electric motor

High Temperature Resistant

In a sauna, you expose yourself to a high temperature for a long enough time to cause perspiration.

This perspiration causes the release of skin impurities, bacteria's and toxins in the air, which are unpleasant and harmful to inhale.

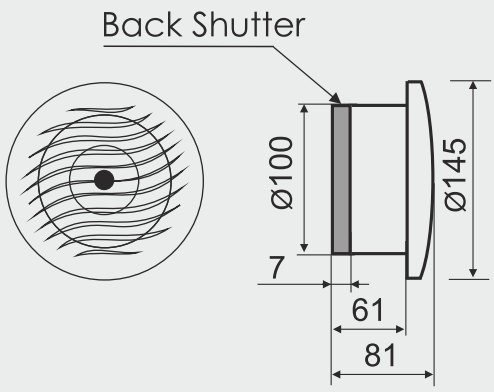
To ensure a healthy and enjoyable sauna you must have a good ventilation system in the place.
The efficient sauna ventilation speeds up the body's self curative system and its ability to regain energy.

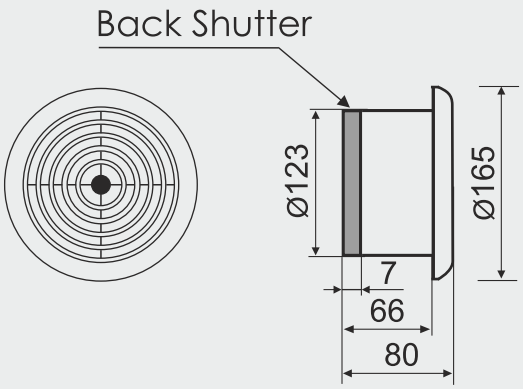
Our specially designed ventilators for sauna and steam room operate at temperatures up to 150°C and at 100% humidity.

The body, the vane and the back shutter are made from Glass Filled Polyamide resisting temperature of 200°C, which allows the fan to be mounted within the sauna or steam room.

The totally reliable double insulated electric motor and the special high temperature double capsulated ball bearings, guarantee 30 000 hours flawless operation of the fan whether mounted horizontally or vertically.

Dimensions /mm/





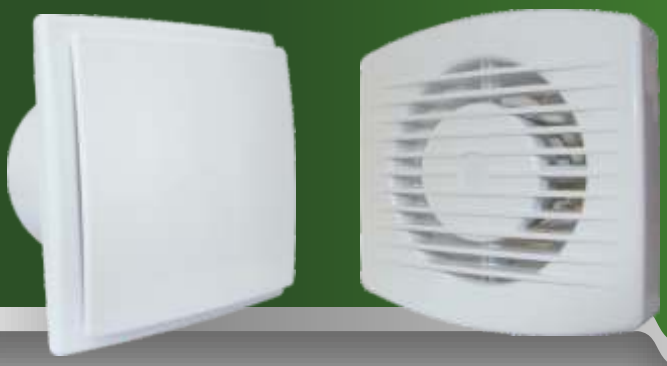
Models with **wooden grille**

Technical Data

MM-S	Hz/V	min^{-1}	m^3/h	W	IP	dB
100	50/230	2790	105	17	X4	39
100 LV	**50/12**	2790	105	17	X4	39
100	60/120	3200	120	19	X4	39

MM-S	Hz/V	min^{-1}	m^3/h	W	IP	dB
120	50/230	2650	150	18	X4	42
120 LV	**50/12**	2650	150	18	X4	42
120	60/120	3200	175	19	X4	42

Noise Level (**dB**) at **1m** distance



OK
EXTRACTOR FANS

Elegant tile design, quiet and efficient the OK Series axial fans are suitable for continuous or intermittent ventilation of bathrooms, shower rooms, toilets, cloakrooms, including zones 1 & 2.
The degree of protection is IP X4.
Upon customers request all fans can be produced in any RAL color code.

T TIMER MODEL

The fan will operate when the light switch is switched on or from a separate pull-cord switch. The built -in timer will ensure operation for 5 minutes after the light is switched off.

Options:

- Connects to the light switch or to a separate pull-cord switch;
- With integrated sensor cord switch;
- With integrated infra-red switch.

- With square or round grille;
- With anti-back draught shutter.

H WITH HUMIDITY CONTROL SYSTEM AND TIMER

The fan will operate when its switched on or when the humidity in the premises reaches over 70%.
The timer ensures operation for 5 minutes after the humidity is reduced below 70%.

Options:

- Connects to the light switch or to a separate pull-cord switch;
- With integrated sensor cord switch;
- With integrated infra-red switch.

- With square grille;
- With anti-back draught shutter.

L WITH LIGHT RELAY AND TIMER

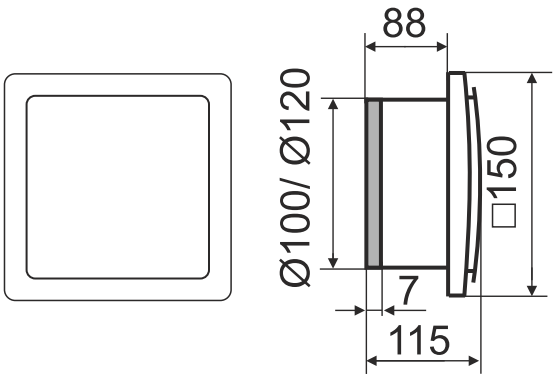
The fan will operate when the room is lit while the built-in timer ensures operation for 5 minutes after the light is off.

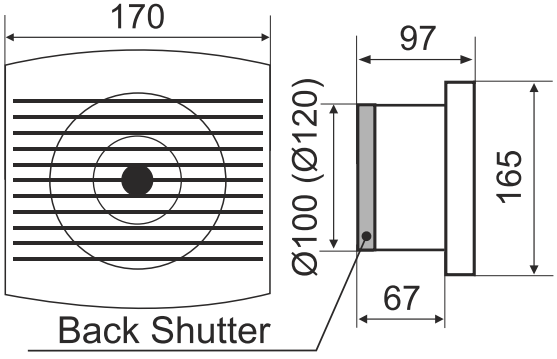
Options:

- With square or round grille;
- With anti-back draught shutter.

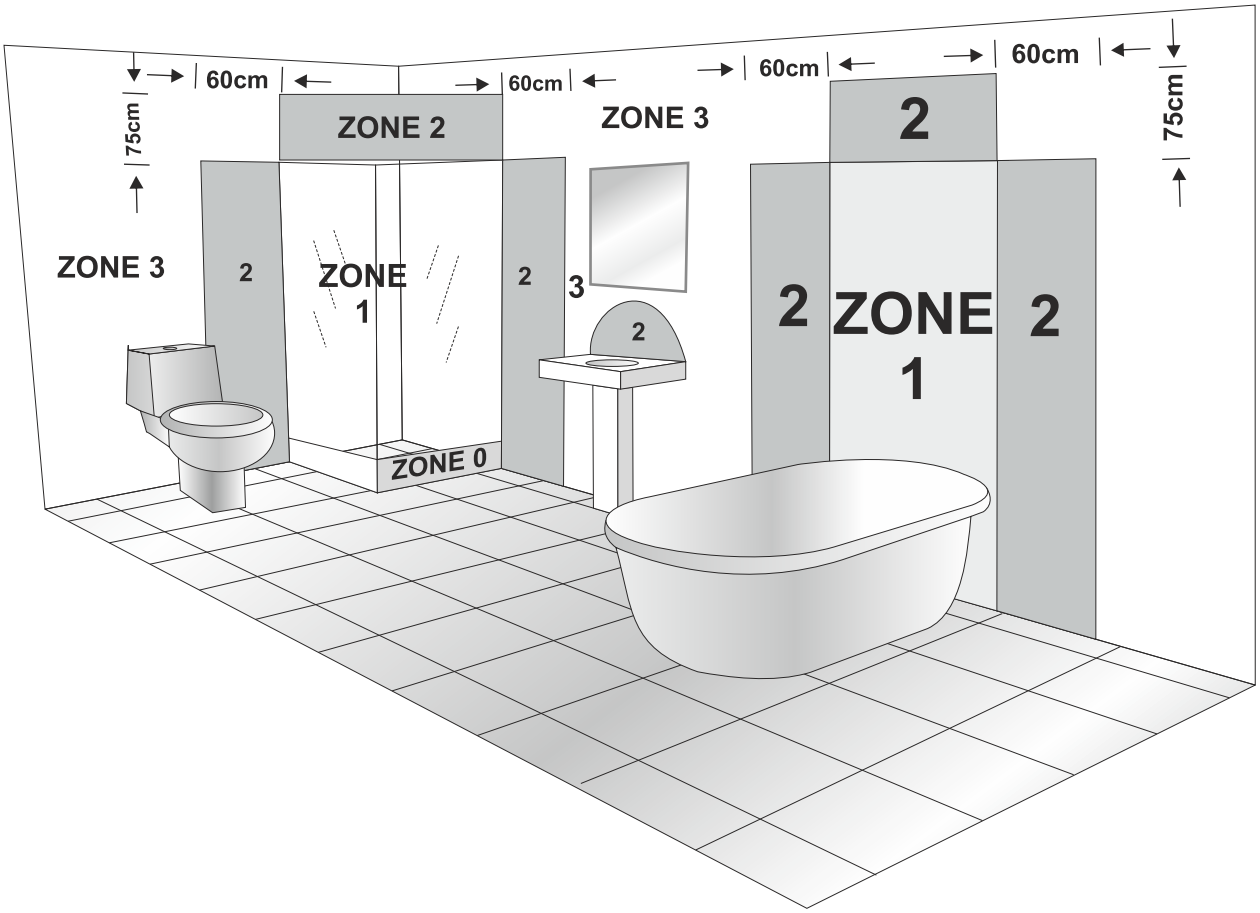
ILLUMINATING
LED *Colours*

Dimensions /mm/

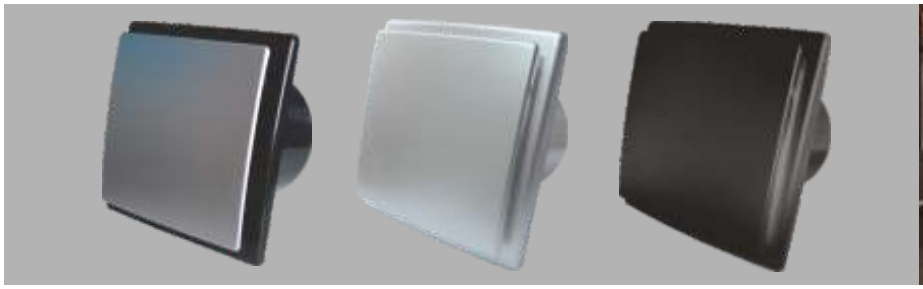




Bathroom Zone Regulations



Types	Hz/V	min^{-1}	m³/h	Pa	W	A	IP	Max Air Temp	Noise Level/dB at **1m** distance	Back Shutter	Timer	Humi distat & Timer	Illumina-ting
OK 100	50/230	2500	100	59	11	0,075	X4	60°C	33 dB	✔			✔
OK 100 T	50/230	2500	100	59	11	0,075	X4	60°C	33 dB	✔	✔		✔
OK 100 H	50/230	2500	100	59	11	0,075	X4	60°C	33 dB	✔		✔	✔
OK 100 LV	50/12	2500	100	59	11	0,075	X4	60°C	33 dB	✔			✔
OK 100 LVT	50/12	2500	100	59	11	0,075	X4	60°C	33 dB	✔	✔		✔
OK 100 LVH	50/12	2500	100	59	11	0,075	X4	60°C	33 dB	✔		✔	✔
OK 120	50/230	2500	100	59	11	0,075	X4	60°C	33 dB	✔			✔
OK 120	50/230	2520	170	72	32	0,190	X4	60°C	42 dB	✔			✔



WE
EXTRACTOR FANS

Elegant tile design, quiet and efficient the WE Series axial fans are suitable for continuous or intermittent ventilation of bathrooms, shower rooms, toilets, cloakrooms, including zones 1 & 2.
The degree of protection is IP X4.
Upon customers request all fans can be produced in any RAL color code.

T TIMER MODEL

The fan will operate when the light switch is switched on or from a separate pull-cord switch. The built -in timer will ensure operation for 5 minutes after the light is switched off.

Options:

- Connects to the light switch or to a separate pull-cord switch;
- With integrated sensor cord switch;
- With integrated infra-red switch.

- With square or round grille;
- With anti-back draught shutter.

H WITH HUMIDITY CONTROL SYSTEM AND TIMER

The fan will operate when its switched on or when the humidity in the premises reaches over 70%.
The timer ensures operation for 5 minutes after the humidity is reduced below 70%.

Options:

- Connects to the light switch or to a separate pull-cord switch;
- With integrated sensor cord switch;
- With integrated infra-red switch.

- With square grille;
- With anti-back draught shutter.

L WITH LIGHT RELAY AND TIMER

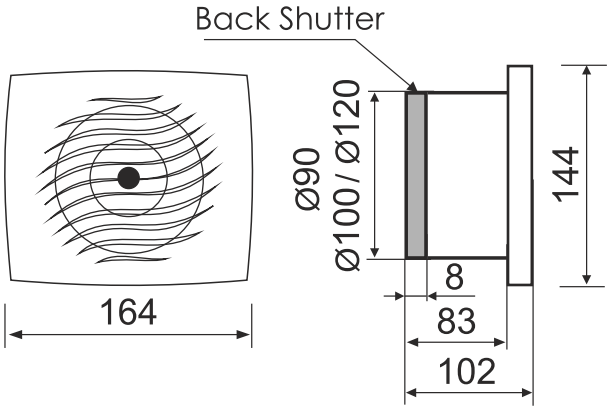
The fan will operate when the room is lit while the built-in timer ensures operation for 5 minutes after the light is off.

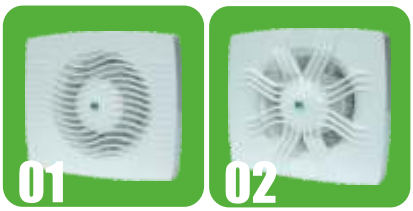
Options:

- With square or round grille;
- With anti-back draught shutter.

ILLUMINATING
LED *Colours*

Dimensions /mm/





Technical Data

WE	Hz/V	min^{-1}	m^3/h	W	A	dB
90	50/230	2500	65	11	0,075	29
100/120	50/230	2500	95	11	0,075	33,7

Max Noise Level (dB) at **1m** distance

MT & MT-2S EXTRACTOR FANS

MT SERIES

Elegant tile design, quiet and efficient the MT Series axial fans are suitable for continuous or intermittent ventilation of bathrooms, shower rooms, toilets, cloakrooms, including zones 1 & 2.
The degree of protection is IP X4.
Upon customers request all fans can be produced in any RAL color code.

MT-2S SERIES TWO SPEED

ULTRA QUIET TOP ECONOMICAL FAN

The MT-2S fan can be fitted in Ø100 mm vent opening in walls, ceilings, ceiling panels etc. It is designed for continuous or intermittent ventilation of small and medium-sized premises e.g. living rooms, bathrooms and lavatories or offices.
Suitable for use as a heat exchanger between neighboring rooms.

The MT-2S fan operates with a surprisingly low level of noise at less than 13 dB in moderate operation mode Its incredible low energy consumption of 4 Watts when in moderate operation mode, allows 24 hours' continuous operation to keep your premises fresh at all times.
Upon customers request all fans can be produced in any RAL color code.

T TIMER MODEL

The fan will operate when the light switch is switched on or from a separate pull-cord switch. The built -in timer will ensure operation for 5 minutes after the light is switched off.

Options:

- Connects to the light switch or to a separate pull-cord switch;
- With integrated sensor cord switch;
- With integrated infra-red switch.

- With square or round grille;
- With anti-back draught shutter.

H WITH HUMIDITY CONTROL SYSTEM AND TIMER

The fan will operate when its switched on or when the humidity in the premises reaches over 70%.
The timer ensures operation for 5 minutes after the humidity is reduced below 70%.

Options:

- Connects to the light switch or to a separate pull-cord switch;
- With integrated sensor cord switch;
- With integrated infra-red switch.

- With square grille;
- With anti-back draught shutter.

L WITH LIGHT RELAY AND TIMER

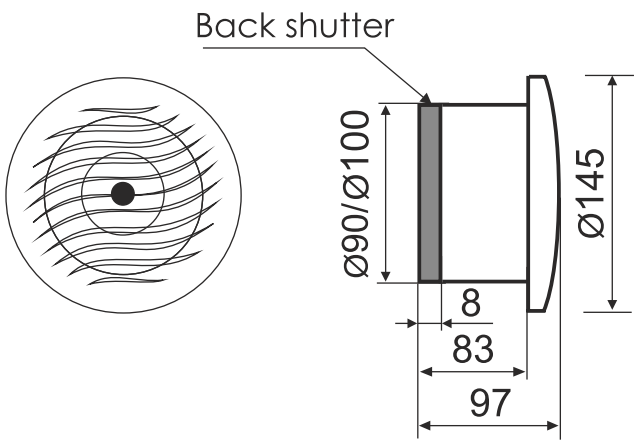
The fan will operate when the room is lit while the built-in timer ensures operation for 5 minutes after the light is off.

Options:

- With square or round grille;
- With anti-back draught shutter.

ILLUMINATING LED *Colours*

Dimensions /mm/



Technical Data

Type	Hz/V	min^{-1}	m^3/h	W	A	dB
MT 90	50/230	2500	65	11	0,075	29
MT 100	50/230	2500	95	11	0,075	33,7

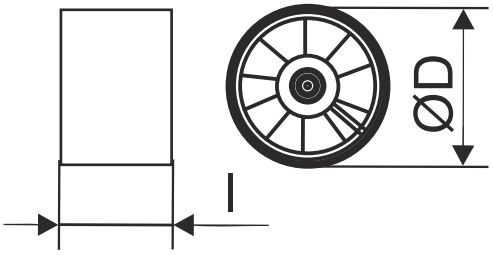
MT-2S	Hz/V	min^{-1}	m^3/h	W	A	dB
normal operation mode	50/230	2500	95	11	0,075	33,7
moderate operation mode	50/230	1700	47	4	0,039	13

Max Noise Level (dB) at **1m** distance

MT-VO
IN-LINE AXIAL FANS

They can be mounted on walls, ceilings, ceiling panels with Ø90, Ø100 and Ø120 vent openings.
The degree of protection is IP X4.
Including zones 1 & 2.

Dimensions /mm/



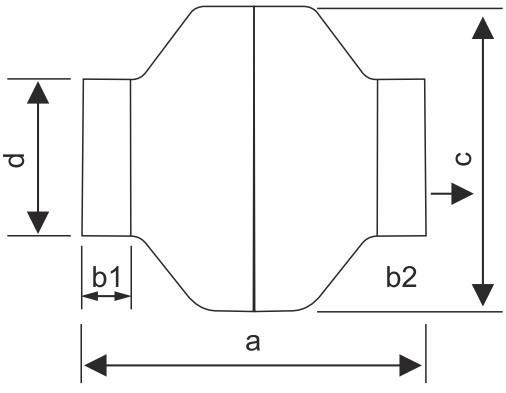
Type	l	ØD
	mm	mm
90	70	90
100	70	100
120	88	120

Technical Data

MT-VO	Hz/V	min^{-1}	m^3/h	W	dB	IP
90	50/230	2500	65	11	29	X4
100	50/230	2500	95	11	33,7	X4
120	50/230	2620	120	32	34,8	X4

Max Noise Level (dB) at **1m** distance

VOK-C
IN-LINE AXIAL FAN



TYPE	a	b1	b2	c	d
VOK-C-100	198	23	23	243	100
VOK-C-125	198	26	26	243	125
VOK-C-150	224	26	26	333	150
VOK-C-200	219	25	25	333	200
VOK-C-250	204	25	25	333	250
VOK-C-300	232	25	25	403	315

TYPE	m^3/h	rpm	W	Pa	A	dB
VOK-C-100	250	2500	50	324	65	60
VOK-C-125	405	2500	80	326	66	66
VOK-C-150	720	2500	130	379	72	70
VOK-C-200	1000	2500	170	583	70	70
VOK-C-250	1100	2500	180	625	70	70
VOK-C-315	1500	2500	210	750	75	75

VA
AXIAL FANS

Series with double capsulated ball bearings NSK Japan which guarantee 30 000 hours of continuous operation.

Axial fans fall into the following categories:
VA 9/2, VA 12/2, VA 12/2K, VA 14/2, VA 16/2.

LONG *life* 30 000h

Designed for:
- cooling of electronic control panels;
- ventilation of electrical panels;
- installation in devices in electronics, appliance construction and automation;
- cooling of welding machines and plasm cutting machines;
- installation in cooling and ventilation systems and air-conditioning devices;
- installation in household air heaters and heat exchangers.

All fans of this type have a built-in single-phase electric motors with shielded poles and a short-circuited rotor with double capsulated ball bearings. The fan is square in shape with internally located fins to which the stator is attached.

The VA series axial fans are suitable to be to fitted to apertures and air conduits with Ø90, Ø100, Ø120, Ø135 and Ø150.
They can be produce with supply voltages 220V, 115V, 36V or 24V, at frequency of 50Hz or 60Hz.

Isolation class: "H" - 180 degrees Celsius or "L" - 200 degrees Celsius.
Protection degree: IP 44.

Operating conditions:

The fans are designed to operate under normal climatic conditions where the ambient temperature can vary from -5 degrees Celsius up to +60 degrees Celsius and a relative humidity from 40% to 98% at 30 degrees Celsius.
Upon clients' request the fans can be manufactured to operate at higher temperatures, in tropical or coastal climatic zones.

"KOZLODUY Nuclear Power Plant" PLC

Tel.: (+359 973) 7 21 00, 7 28 30; Fax: (+359 973) 23 39
e-mail: info@kznpp.org web: www.kznpp.org

REFERENCE

FOR "MMOTORS" JSC PRODUCTION, ETROPOLE, BG

Nuclear Power Plant Kozloduy NPP PLC issues this reference to our exclusive supplier Mmotors JSC of VA Series extractor fans.

This reference is in assurance that MMotors VA series extractor fans have passed and all the nuclear plant operational and quality requirements for reliability and safe operation. The VA Series axial fans are installed in crucial safety electronic control and electrical equipment areas of the nuclear plant.
The company has always been precise, loyal, and professional with manufacturing our orders. All business contracts have always been completed with due quality and deadlines accuracy.
Mmotors JSC has proved to be one of our loyal and punctual suppliers for 12 years.

'KOZLODUY NPP' PLC, therefore, highly recommends 'MMOTORS' JSC as an exceptionally tolerant, and loyal partner.

This reference is issued to 'MMOTORS' JSC, Etropole to promote the company for participation in different competitions and sales auctions, and with no further obligations on our behalf.

Director of produce: Kiril Nikolov

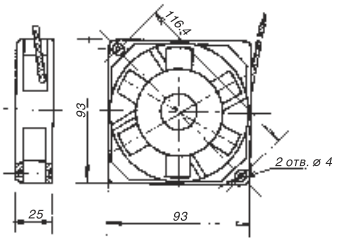
Kozloduy
28.04.2005

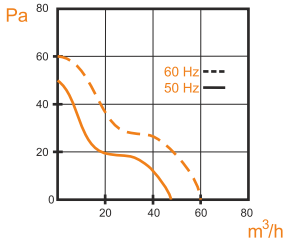
All VA series axial fans can be manufactured to resist up to 150°C

Trickle Impregnation Technology
- Sealed motor against dust and moisture
- High temperature resistant electric motor
- Maximum isolation characteristics
- Longlivity of the electric motor

VA 9/2

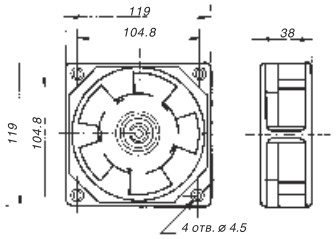
Supply voltage	Rotational speed	Maximum flow rate	Maximum static pressure	For maximum flow rate		Weight
				Consumed power	Consumed current	
Hz / V	***min^{-1}***	***m^3/ h***	***Pa***	***W***	***A***	***kg***
50 / 220	2500	60	50	16	0,095	0,4
50 / 115	2500	60	50	15	0,178	0,4
60 / 220	3000	70	60	14	0,090	0,4

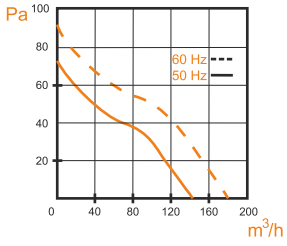




VA 12/2

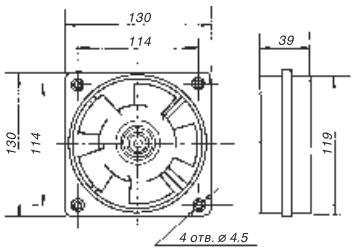
Supply voltage	Rotational speed	Maximum flow rate	Maximum static pressure	For maximum flow rate		Weight
				Consumed power	Consumed current	
Hz / V	***min^{-1}***	***m^3/ h***	***Pa***	***W***	***A***	***kg***
50 / 220	2650	150	75	18	0,125	0,8
50 / 115	2650	150	75	17	0,234	0,8
60 / 220	3200	180	90	16	0,115	0,8

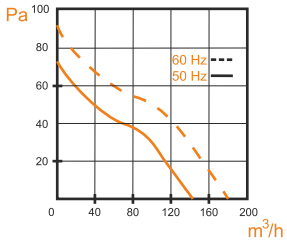




VA 12/2K

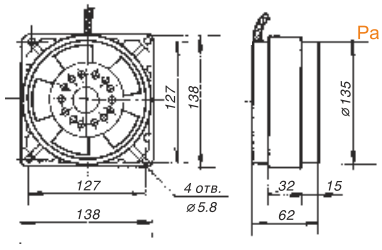
Supply voltage	Rotational speed	Maximum flow rate	Maximum static pressure	For maximum flow rate		Weight
				Consumed power	Consumed current	
Hz / V	***min^{-1}***	***m^3/ h***	***Pa***	***W***	***A***	***kg***
50 / 220	2650	150	75	18	0,125	0,525
50 / 115	2650	150	75	17	0,234	0,525
60 / 220	3200	180	90	16	0,115	0,525

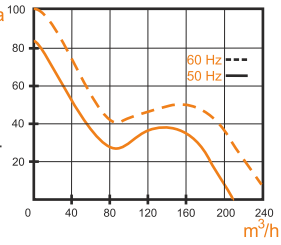




VA 14/2

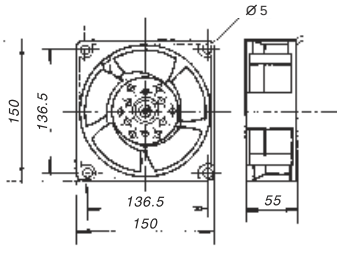
Supply voltage	Rotational speed	Maximum flow rate	Maximum static pressure	For maximum flow rate		Weight
				Consumed power	Consumed current	
Hz / V	***min^{-1}***	***m^3/ h***	***Pa***	***W***	***A***	***kg***
50 / 220	2650	205	85	42	0,34	1,4
50 / 115	2650	205	85	42	0,68	1,4
60 / 220	3200	250	98	38	0,32	1,4

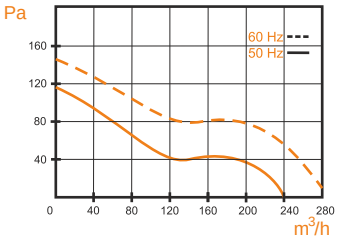




VA 16/2

Supply voltage	Rotational speed	Maximum flow rate	Maximum static pressure	For maximum flow rate		Weight
				Consumed power	Consumed current	
Hz / V	***min^{-1}***	***m^3/ h***	***Pa***	***W***	***A***	***kg***
50 / 220	2650	240	110	46	0,385	1,2
50 / 115	2650	240	110	45	0,721	1,2
60 / 220	3200	290	130	40	0,385	1,2





VOK & VO
IN-LINE AXIAL FANS

Series with double capsulated ball bearings NSK Japan which guarantee 30 000 hours of continuous operation.

LONG *life* **30 000h**

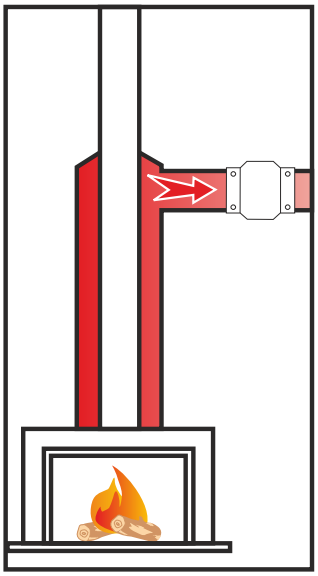
Trickle Impregnation Technology
- Sealed motor against dust and moisture
- High temperature resistant electric motor
- Maximum isolation characteristics
- Longlivity of the electric motor

Designed for ventilation of small and medium-sized living, bathroom or commercial premises. Suitable for walls and ceilings.

Our In-line axial fans are manufactured in two series - VO and VOK to fit vent openings with the following adjusting dimensions: Ø 90, Ø 100, Ø 110, Ø 120, Ø 130, Ø 135, Ø 150.

The VO series in-line fans have an equally sectioned cylinder shape, making it suitable to be fitted in air ducts or vent openings, while the VOK series cylinders have an outer rim making them ideal for connecting air ducts.

The VO and VOK series come with or without a back shutter.
The back shutter prevents inflow of cold air and insects when the fan is switched off.



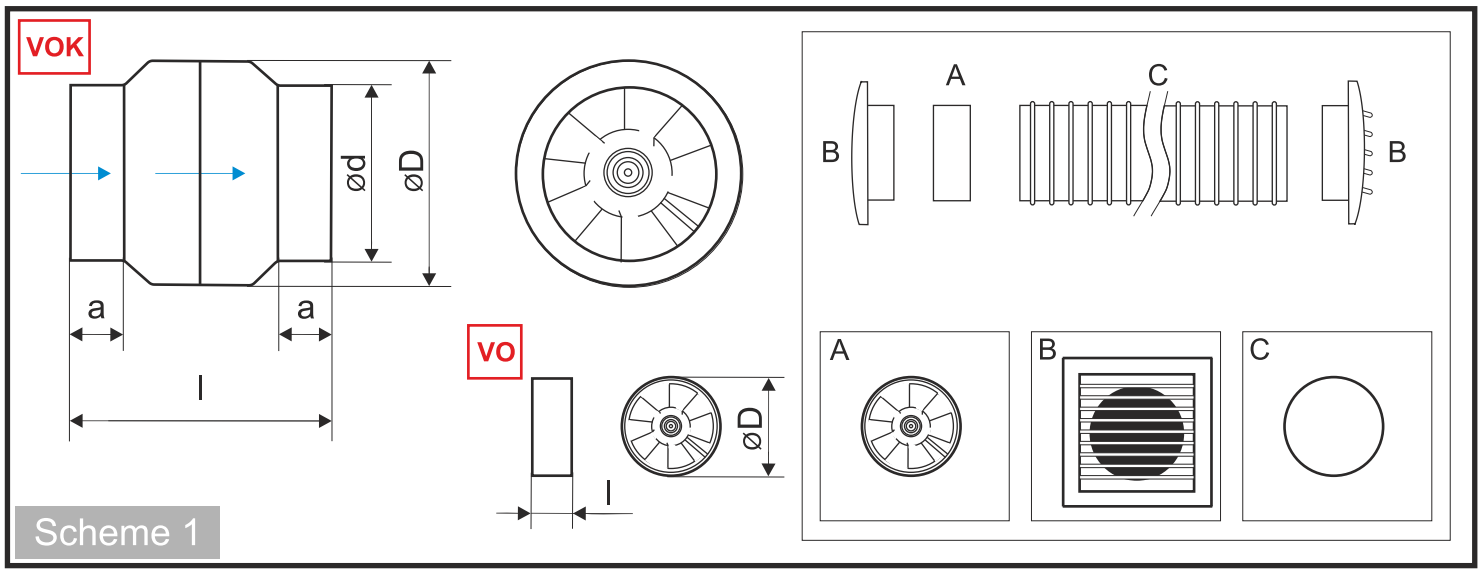
The noiseless and highly efficient electric motors in our fans are sealed for life and are totally maintenance free. The embedded Long Life double capsulated ball bearings guarantee smooth operation for over 30 000 hours of continuous usage.

The body, the turbine, and the back shutter are manufactured from aluminum alloy or **Glass-filled Polyamide** which guarantees efficient cooling and better fire safety.

The VOK & VO series extractor fans can be manufactured to resist up to 150°C

The in-line axial fans can be mounted in or between air ducts, in walls, ceilings and suspending ceilings.

They are perfect for use as extractor fans, as well as heat exchangers between neighboring premises.

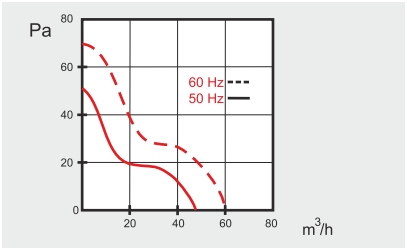


Scheme 1

All VO and VOK series fans can be produced with length “l” to suit most specific requirements of our customers.
The length “l” for the VO series indicated in the tables below is the minimum length possible to achieve.

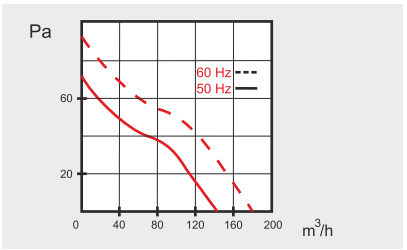
Type	a	l	ød	øD
VO 90	-	25	-	90
VO 100	-	70	-	100

Hz / V	min^{-1}	m^3/h	Pa	W	IP
50 / 230	2500	60	55	16	X4
50 / 115	2500	60	55	15	X4
60 / 120	3200	70	60	17	X4



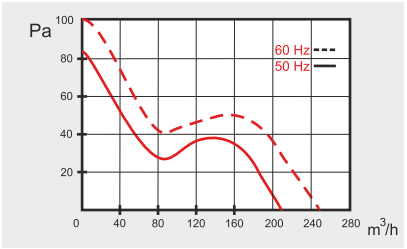
Type	a	l	ød	øD
VO 120	-	40	-	120
VOK 120/100	28	130	100	120
VOK 120/110	35	135	110	120

Hz / V	min^{-1}	m^3/h	Pa	W	IP
50 / 230	2650	150	75	18	X4
50 / 115	2650	150	75	17	X4
60 / 120	3200	175	90	19	X4



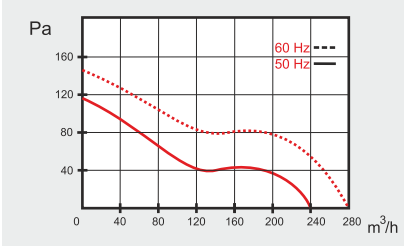
Type	a	l	ød	øD
VO 135	-	60	-	135
VOK 135/100	27	145	100	135
VOK 135/110	27	145	110	135
VOK 135/120	27	145	120	135

Hz / V	min^{-1}	m^3/h	Pa	W	IP
50 / 230	2650	205	85	42	X4
50 / 115	2650	205	85	42	X4
60 / 120	3360	250	100	51	X4



Type	a	l	ød	øD
VO 150	-	55	-	150
VOK 150/100	28	150	100	150
VOK 150/110	28	150	110	150
VOK 150/120	28	150	120	150

Hz / V	min^{-1}	m^3/h	Pa	W	IP
50 / 230	2600	240	110	46	X4
50 / 115	2600	240	110	45	X4
60 / 120	3320	275	130	54	X4



All fans can be manufactured to operate at 60 Hz frequency, without significant change in the remaining characteristics.

PVO
INDUSTRIAL FANS

Series with double capsulated ball bearings NSK Japan which guarantee 30 000 hours of continuous operation.

LONG *life* **30 000h**

THE PVO SERIES FANS FALL IN THE FOLLOWING CATEGORIES:

- High Flow Rate: PVO154/2; PVO 200/2; PVO 250/2; PVO 300/2
- Low Noise PVO:154/4; PVO 200/4; PVO 250/4; PVO 300/4; PVO 350/4; PVO 400/4
- Noiseless PVO 200/6; PVO 250/6; PVO 300/6; PVO 350/6

TECHNICAL DESCRIPTION

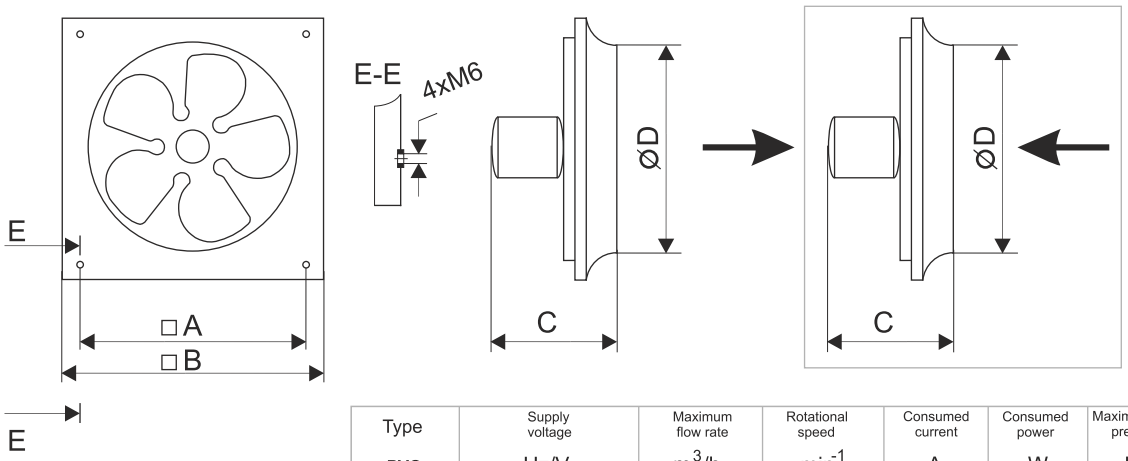
Designed for continuous or intermittent ventilation of medium to large sized living, administrative, commercial, industrial and agriculture premises.

Operating in conditions of normal fire risk, according to fire-safety building and construction regulations.
They can be mounted on walls, ceilings, ceiling panels etc. The PVO series fans are constructed with noiseless asynchronous motors with double capsulated ball bearings, which guarantee 30 000 hours of flawless operation, whether mounted in horizontal or vertical position.

The protection degree is IP 54, and upon a customer's request can be manufactured to IP 55, which allows the fan to operate not only in closed premises, but in outdoor high humidity environments.

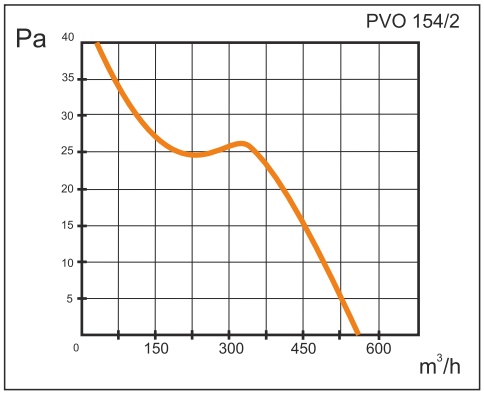
The measured level of noise is 70dB.

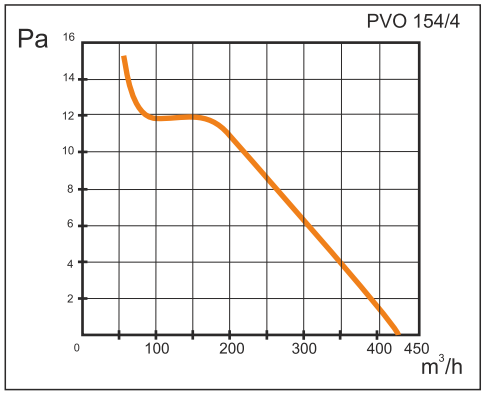
Dimensions /mm/

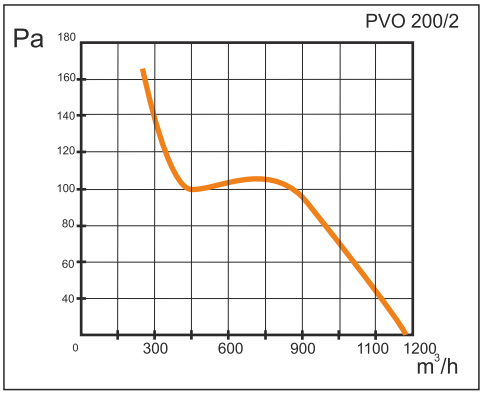


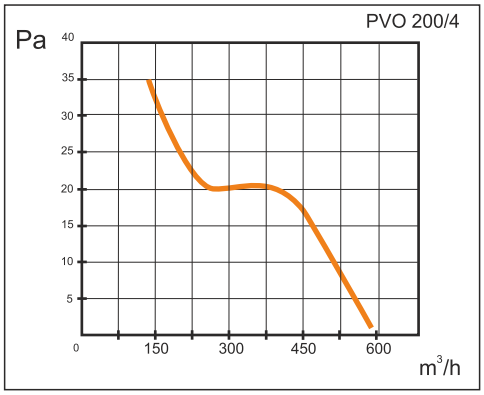
Type	A	B	C	D	E-E
154/2	200	256	104	166	M6
154/4	200	256	128	166	M6
200/2	222	270	130	204	M6
200/4	222	270	130	204	M6
250/2	284	340	132	258	M6
250/4	284	340	132	258	M6
250/6	284	340	142	258	M6
300/2	350	400	150	307	M6
300/4	350	400	150	307	M6
300/6	350	400	150	307	M6
350/4	400	470	150	360	M6
350/6	400	470	150	360	M6
400/4	436	505	216	410	M6

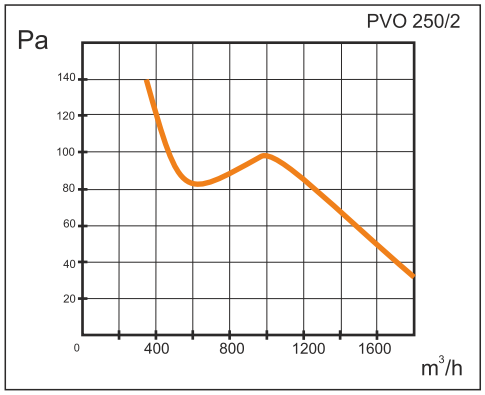
Type PVO	Supply voltage Hz/V	Maximum flow rate m^3/h	Rotational speed min^{-1}	Consumed current A	Consumed power W	Maximum static pressure Pa	Protection degree IP
PVO 154/2	50/220÷240	500÷550	2450	0,35	46	43	00
PVO 154/4	50/220÷240	375÷425	1320	0,25	32	20	54
PVO 200/2	50/220÷240	1050÷1170	2840	0,38	60	220	54
PVO 200/4	50/220÷240	550÷600	1300	0,45	58	43	54
PVO 250/2	50/220÷240	1600÷1700	2700	0,45	100	190	54
PVO 250/4 UE	50/220÷240	1000÷1100	1400	0,11	14	90	54
PVO 250/4	50/220÷240	1000÷1100	1400	0,30	50	90	54
PVO 250/6	50/220÷240	600÷700	930	0,30	50	42	54
PVO 300/2	50/220÷240	2000÷2100	2700	0,50	140	175	54
PVO 300/4	50/220÷240	1500÷1600	1400	0,60	80	135	54
PVO 300/6	50/220÷240	900÷1000	910	0,35	65	80	54
PVO 350/4	50/220÷240	2000÷2100	1400	0,45	85	195	54
PVO 350/6	50/220÷240	1400÷1500	900	0,50	90	90	54
PVO 400/4	50/220÷240	4000÷4500	1310	1,40	300	-	54

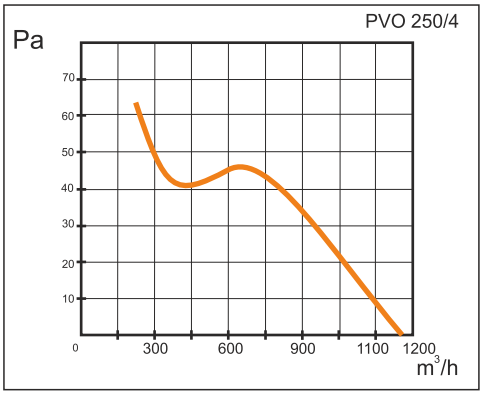


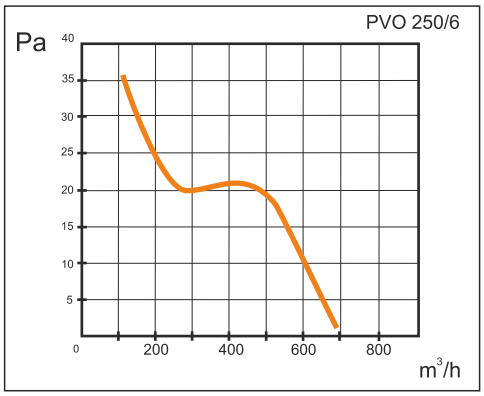


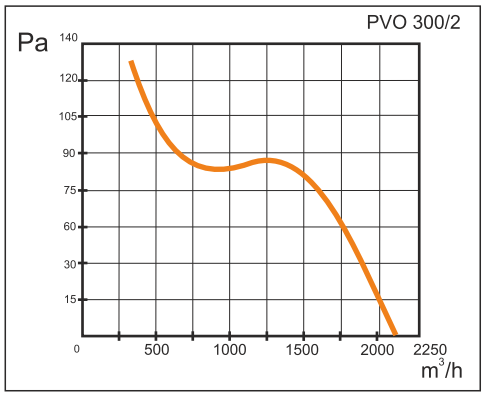


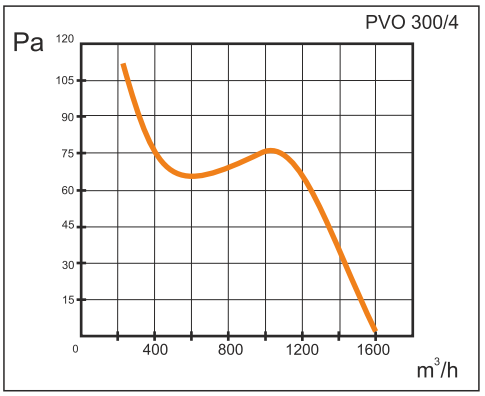


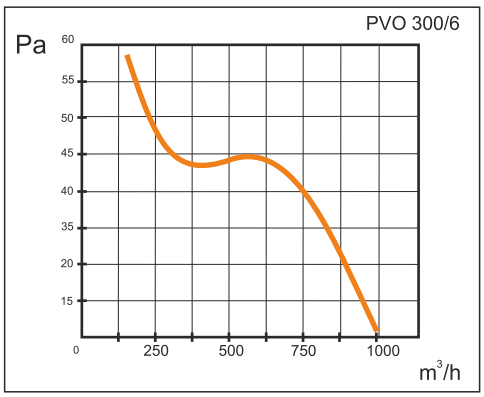


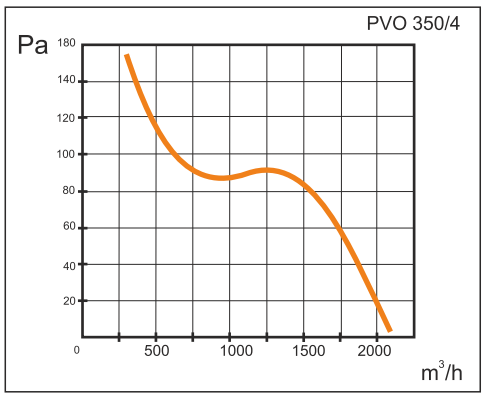


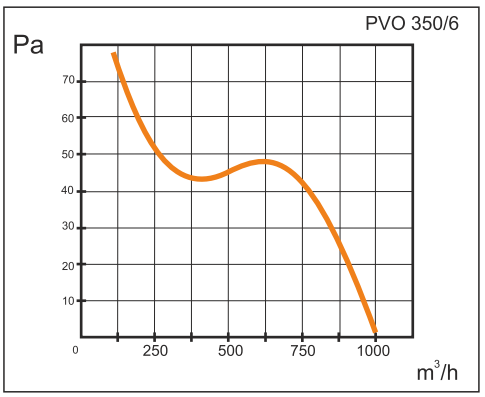












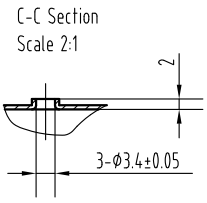
The PVO series industrial fans can be supplied with an electronic fan regulator.
The two pole type fan can be modified from 900 min^{-1} up to 2600 min^{-1} RPM and 500 min^{-1} up to 1400 min^{-1} for four pole types.
This allows the user to gradually change the rotational speed of the fan and adjust the flow rate and noise level to the required level.

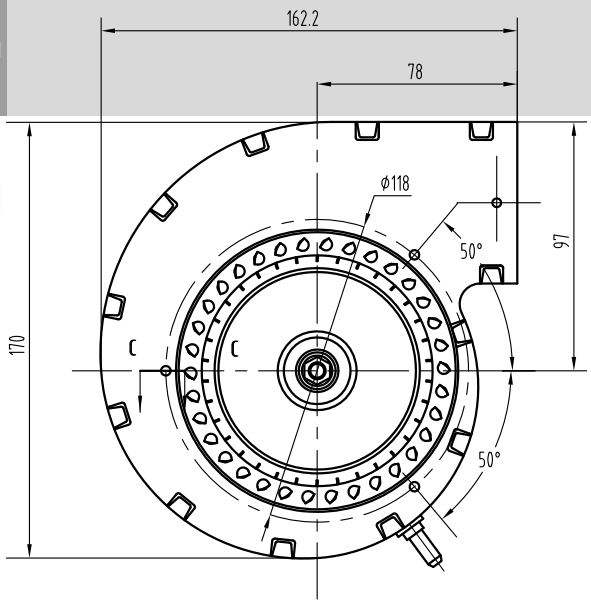
FE-T300

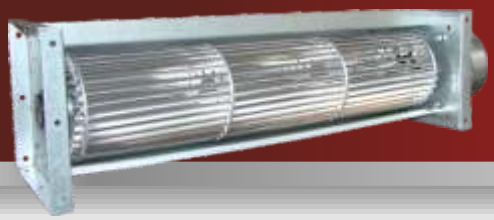
SMALL POWERFUL HIGH TEMPERATURE CENTRIFUGAL FAN

- Insulation class H
- Flue temperature: <180°C (continuous)
  <240°C (instantaneous)
- Motor anti-vibration mounted
- Housing & impeller aluminized sheet steel
- The motor must be placed off-airflow

Voltage	Frequency	Input powery	Current	Air Volume	Static pressure	W	m³/h
230	50	55	0,5	167	280	60	300



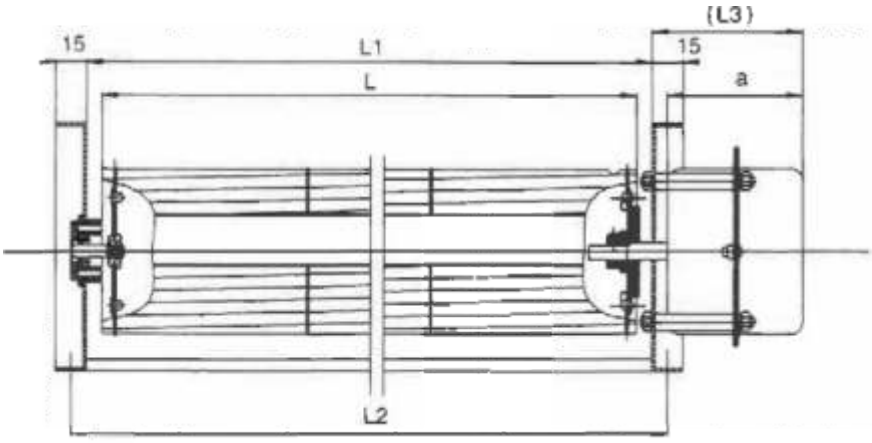


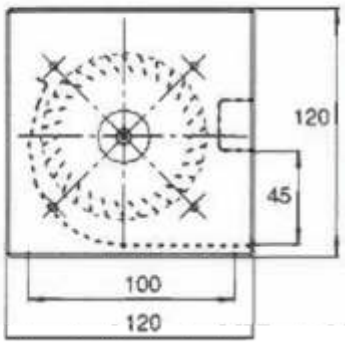


GL80

CROSS FLOW FAN
HIGH TEMPERATURE

Type	Hz/V	m³/h	r.p.m.	W
GL80-270	50/230	300	1400	20
GL80-300	50/230	330	1400	20
GL80-360	50/230	380	1350	20

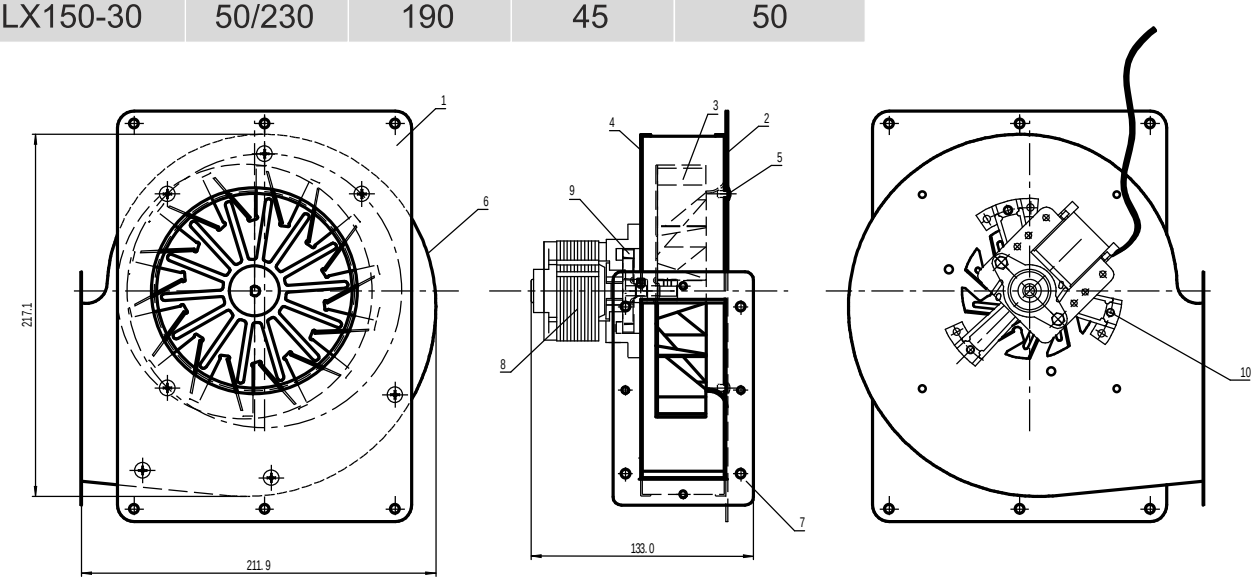




FX150-30

HIGH TEMPERATURE FAN

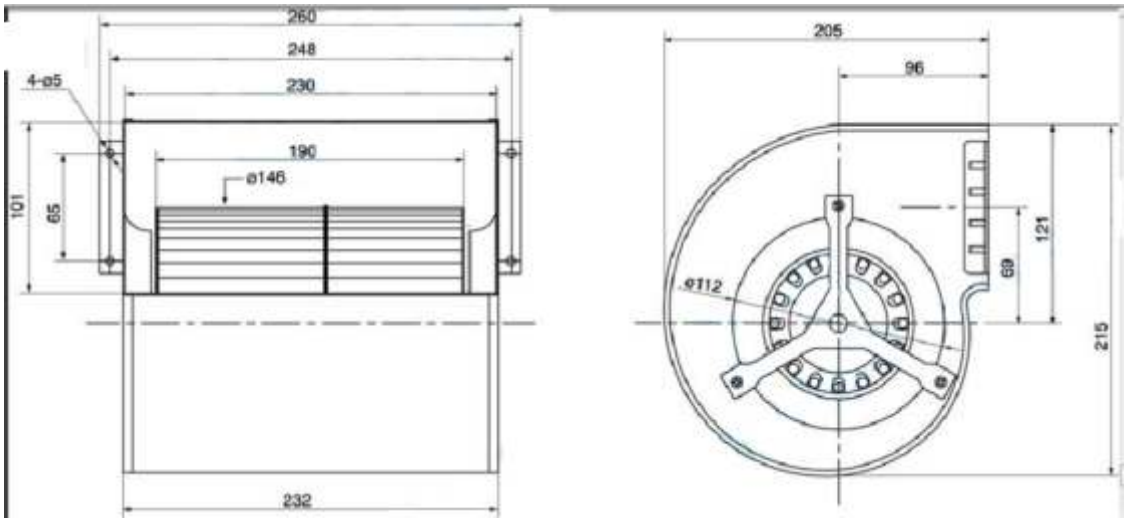
Type	Hz/V	m^3/h	W	dB
LX150-30	50/230	190	45	50



FLSW

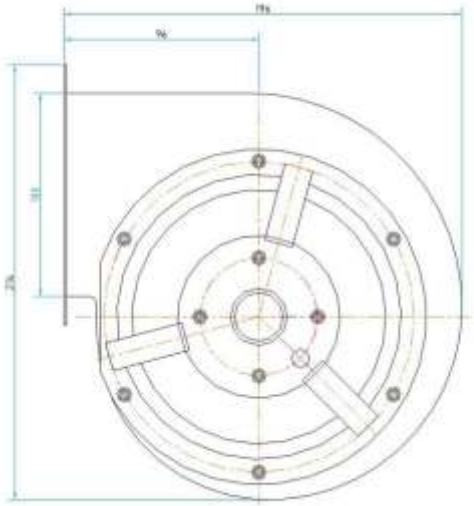
CENTRIFUGAL DOUBLE FAN **3 SPEED**

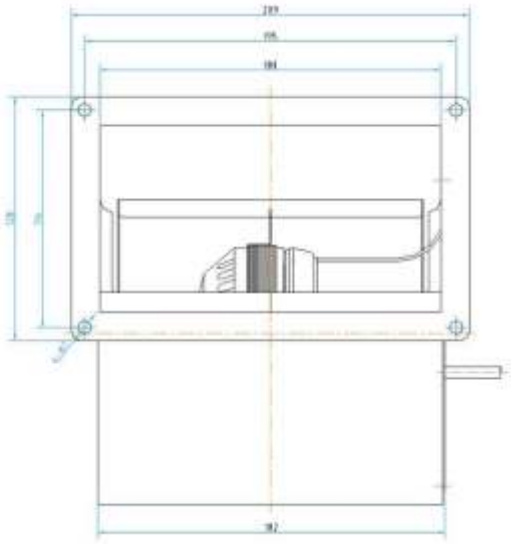
Type	Hz/V	m^3/h	r.p.m.	W	A
FLSW146	50/230	980/810/640	1560/1390/1070	245/210/182	1,12



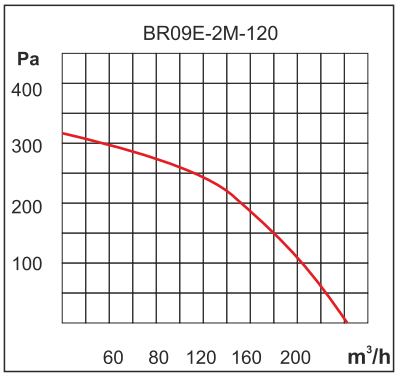
EM-140
CENTRIFUGAL FAN

Type	Hz/V	m³/h	r.p.m.	W	A	Pa
EM-140	50/230	610	950	64	0,32	100

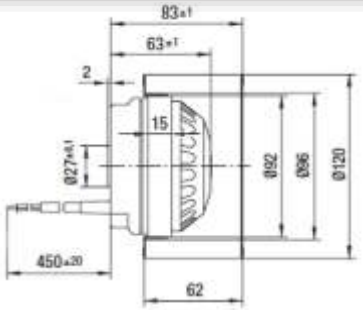


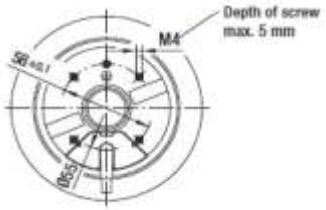


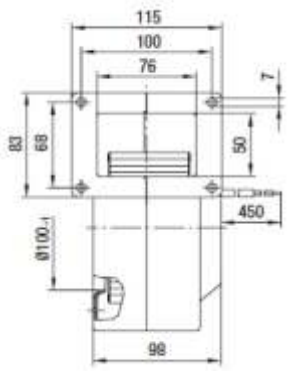
BRO9E
CENTRIFUGAL FAN
Sheet Metal Body

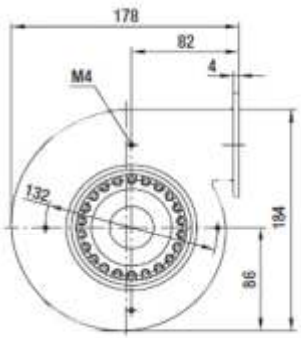


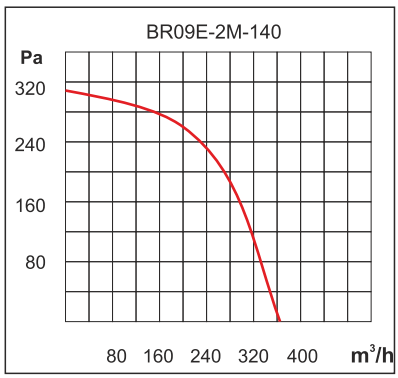
Type	Hz/V	m³/h	rpm	W	dB
BRO9E-2M-120	50/230	300	2500	80	55

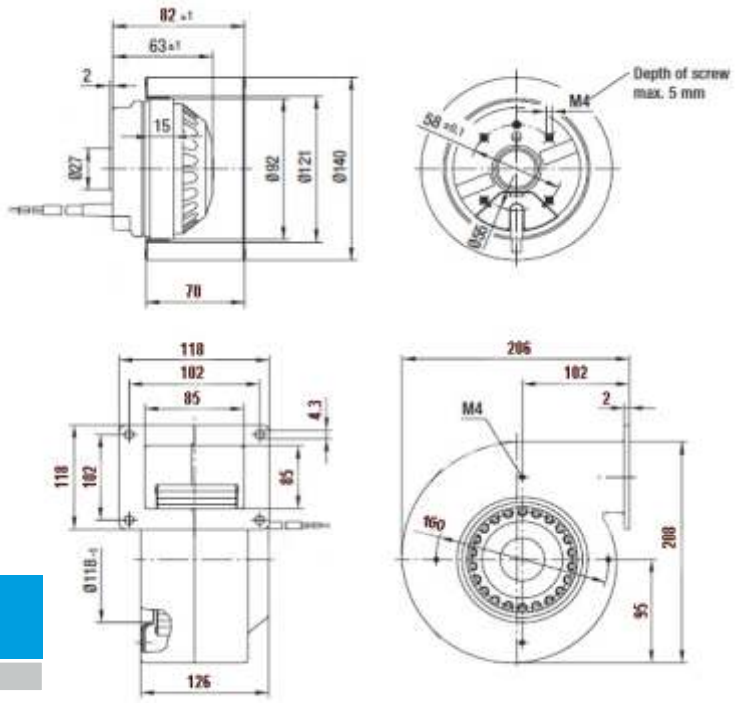




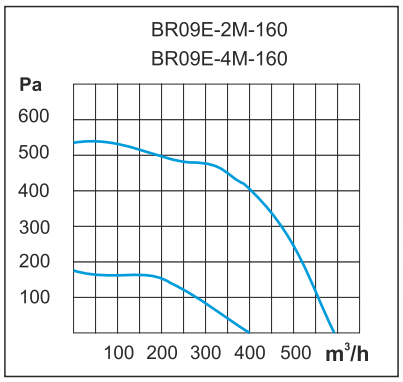


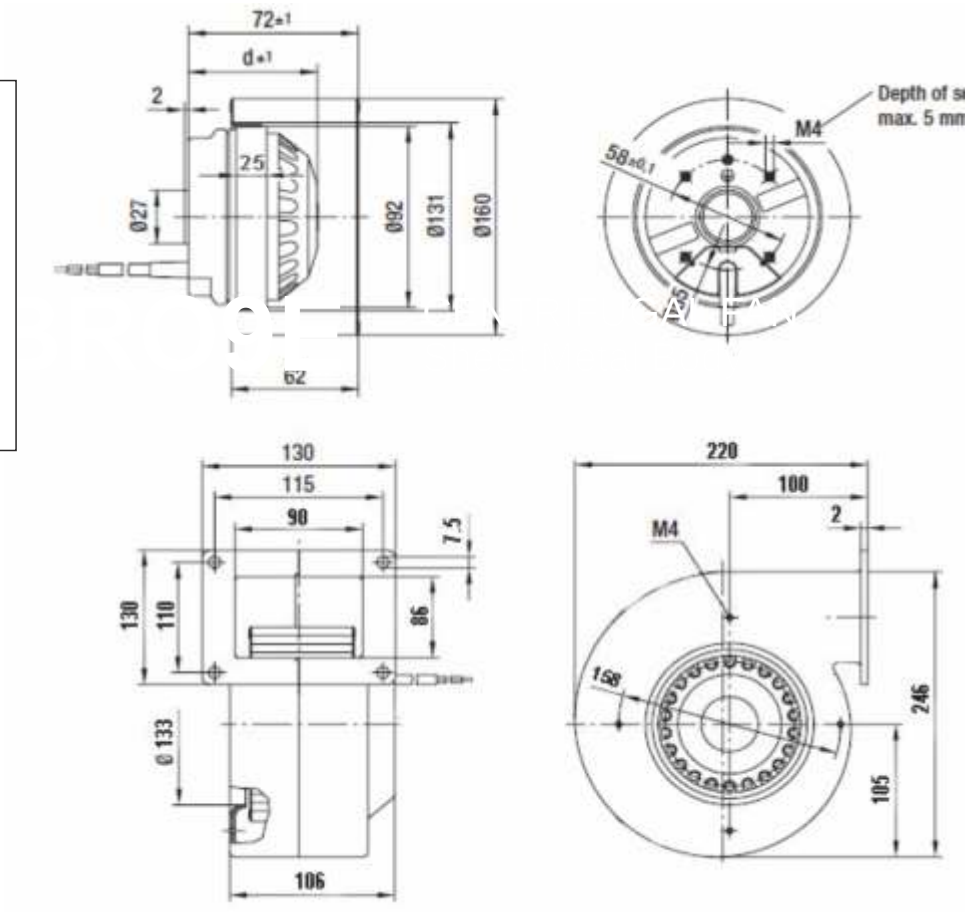






Type	Hz/V	m³/h	rpm	W	dB
BRO9E-2M-140	50/230	350	1850	125	59





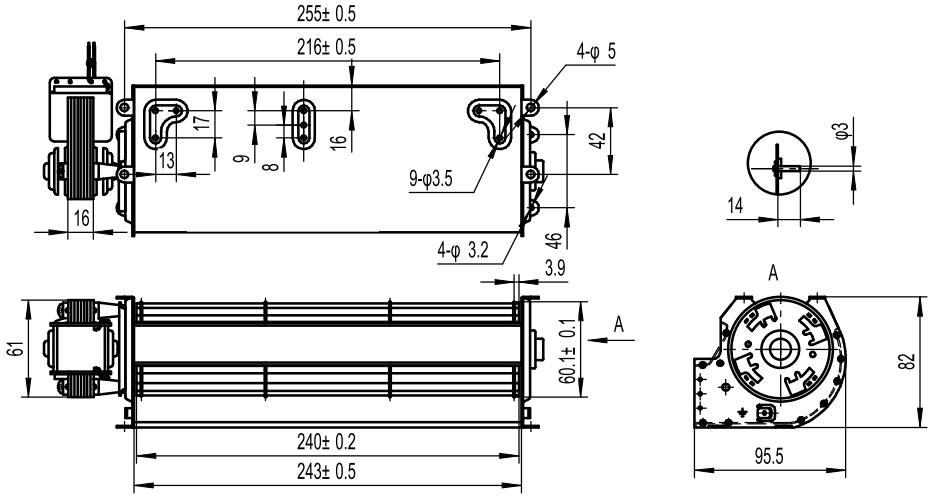
Type	Hz/V	m³/h	rpm	W	dB
BRO9E-2M-160	50/230	600	1500	250	70
BRO9E-4M-160	50/230	450	1320	175	63

GL60
CROSS FLOW FAN

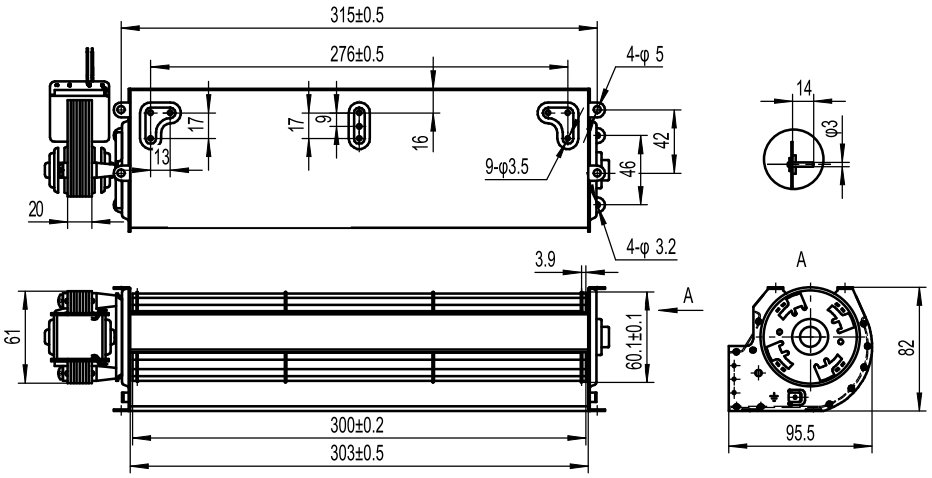
Technical Data

Type	Hz/V	m^3/h	r.p.m.	W
GL60-240	50/230	200	2150	40
GL60-300	50/230	240	21500	42
GL60-360	50/230	220	1400	20
GL60-420	50/230	360	2300	38

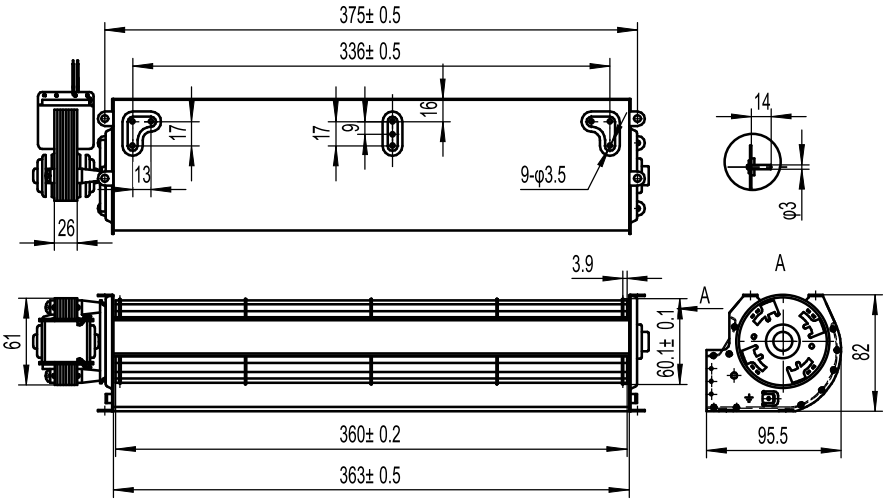
GL60-240



GL60-300



GL60-360



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