Operation Manual

AirMaster EM50

Code No. 99-97-2341

Edition: 03/2015 GB

These instructions are the original instructions!

CE DECLARATION OF CONFORMITY

(complies with Subparagraph A Annex II Directive 2006/42/EC)

Munters Italy S.p.A.
with registered offices in Strada Piani 2 – 18027 Chiusavecchia (IM) – Italy
(Company registration nr. 00081050080)

DECLARES ON ITS OWN RESPONSIBILITY THAT THE APPARATUS

Designation	Fan designed for moving air to control temperature and humidity in greenhouses or rearing sheds.
Model	EM52 - EM/EMS50 - ED/EDS36HE - ED/EDS30HE - ED/EDS24HE - EC52 - EC50
Year of manufacture	2013

CONFORMS WITH THE ESSENTIAL SAFETY REQUIREMENTS STATED
BY APPARATUS DIRECTIVE 2006/42/EC,WITH PARTICULAR REFERENCE TO THE FOLLOWING PRO VISIONS:
UNI EN 953:2009, UNI EN ISO 12100:2010, UNI EN ISO 12499:2009,
UNI EN ISO 13857:2008, IEC EN 60204-1:2006, AND BY THE ERP ECO DESIGN DIRECTIVE 2009/125/EC.

Chiusavecchia, 1st April 2013

Marco Scomparin
Legal representative

CE-KonformitätserklärungAbsaug-/UmluftventilatorModelle:
Em52 - EM/EMS50 - ED/EDS36HE - ED/EDS30HE - ED/EDS24HE - EC52 - Ec501.

CE-ERkLäRuNGCE-KONFORMITÄTSERKLÄRUNG (entspricht Unterabsatz A, Anhang II, Richtlinie 2006/42/EG) - Munters Italy S.p.a. mit eingetragenem Geschäftssitz in Strada Piani 2 – 18027 Chiusavecchia (IM) – Italien
(Firmenbuchimmatrikulationsnummer Imperia 00081050080) erklärt in eigener Verantwortlichkeit, dass das Gerät:

Bezeichnung: Ventilator zur Verwirbelung von Luft zum Zwecke der Regelung der Temperatur und Luftfeuchtigkeit in Gewächshäusern oder Viehställen

Modell: EM52 - EM/EMS50 - ED/EDS36HE - ED/EDS30HE - ED/EDS24HE - EC52 - Ec50

Fertigungsjahr: 2013

den wesentlichen Sicherheitsanforderungen entspricht, die im Rahmen der Maschinenrichtlinie 2006/42/EG vorgegeben sind.
Besonders wird dabei auf folgende, Bestimmungen verwiesen: UNI EN 953:2009, UNI EN ISO 12100:2010, UNI EN ISO 12499:2009, UNI EN ISO 13857:2008, CEI EN 60204-1:2006 (CEI 44-5), sowie auf die ErP Eco Design Richtlinie 2009/125/EC

Chiusavecchia, 1 April 2013 Marco Scomparin Geschäftsführer

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1 Basic instructions

	Please take care of this manual and always keep it in the same place close to the installation for quick reference. All persons working with the system, assembling, cleaning and servicing have to be familiar with the contents of these instructions. Please observe the contained safety instructions! If this manual is damaged or lost, request a new copy from **Big Dutchman**.

1.1 Basics

The **Big Dutchman** installation has been constructed according to the current state of the art and all acknowledged regulations regarding technical safety. The installation is reliable. Upon operation, however, dangers to life and limb of the user or third persons or impairments of the system or other material property are still possible.

The system may only be mounted, attended, repaired and used:

- for due use
- in an excellent state from the safety and technical point of view
- by persons who are familiar with the safety regulations

In the event of special problems which are not described in detail in this manual, we recommend to contact us for your own safety.

1.2 Designated use

The **Big Dutchman** fans must only be used according to their designated use. The **Big Dutchman** fan EM50 serves the purpose of moving or circulating exhaust air in livestock facilities.

Every other use is considered improper use. The manufacturer is not liable for any damage caused by improper use. The user bears the sole risk. The designated use also includes the exact adherence to the operating, maintenance and assembly requirements of the manufacturer.

1.3 Prevention of reasonably predictable incorrect uses

The following uses of this **Big Dutchman** system are not permitted and are therefore deemed a misuse:

- Utilising the system with aggressive and/or corrosive materials in quantities that do not constitute good professional practise.
- The use in explosive environments
- The use for gas, substances, sprays, fumes, fluids, solids, particulate matter or any mixtures thereof.

A non-designated use will lead to a liability exclusion by **Big Dutchman**.

The operator of the system exclusively bears the risk resulting from misuse!

1.4 Explaining the symbols

1.4.1 Safety symbols in this manual

Upon reading this **manual** you will come across the following symbols

	**WARNING** This symbol indicates risks possibly leading to personal injury resulting in death or to severe injuries.
	**CAUTION** This symbol indicates risks or insecure procedures possibly leading to injuries or material damage.
	**NOTE** This symbol indicates notes leading to an effective, economic and environmentally-conscious handling of the installation.

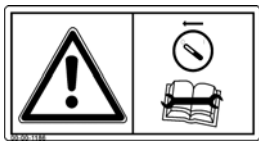
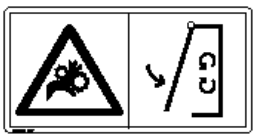
1.4.2 Safety symbols in the manual and on the installation

These safety symbols illustrate remaining dangers when handling the system. They are supplements to the above-mentioned symbols:

	Warning against dangerous electrical voltage
	Warning against the cold
	Warning against slippery surface

1.4.3 Safety symbols and notes on your installation

Depending on the type of installation you will find the following safety symbols. They indicate technically remaining dangers when handling the system and give information on how to avoid these dangers.

	**GENERAL DANGER!** Installation automatically starts working. Before starting repair, maintenance or cleaning work, put main switch to ”OFF”.
	**Danger of bruising due to rotating machine parts!** Close protective devices each time before taking the system into operation. Opening protective devices is only allowed when the system is in a standstill and by authorised persons.
	**RISK OF INJURY due to operating auger, chain or cable discs!** Never reach into or climb into a feed container or trough while the motor is running.

DANGER OF SKIN CORROSION due to purifying agents!

Always wear protective clothing when repairing, maintaining and cleaning the installation. Always observe the manufacturer's instructions when using acids!

Observe the instructions attached to the installation, such as the arrow on the motor indicating the direction of rotation.

The signs and safety instructions always have to be visible and must not be damaged. If they are soiled by dust, manure, feed remains, oil or grease, clean them by means of a water-detergent mixture.

If a safety symbol or instruction is fixed to a part to be replaced, ensure that it will be fixed to the new part as well.

1.5 Scope of deliverables

After removing the packaging, check for completeness and integrity of the product.

Contact the supplier immediately in case of missing or damaged components.

Caution:

Never install a damaged or incomplete device.

1.6 Ordering spare parts

Operational safety is the prime necessity!

For your own safety only use original **Big Dutchman** spare parts. For foreign products that have not been released or recommended or for modifications carried out (e.g. software, control units) we cannot judge whether there is a safety risk in connection with the **Big Dutchman** systems.

You can find the exact description (Code no.) of the parts for ordering spare parts by means of the position numbers in the spare parts lists (see appendix).

Indicate the following for ordering spare parts:

- Code no. and description of the spare part or
- Invoice no. of original invoice
- Current supply, e.g. 230/380 V 50/60 Hz

1.7 Obligations

Closely adhere to the instructions in this manual.

A basic condition for safe operation and trouble-free handling of this system is the knowledge of the basic safety instructions and regulations.

These mounting and operating instructions, particularly the safety instructions, have to be observed by everyone working with this system. Moreover, the regulations and instructions for the prevention of accidents valid at the respective place of use have to be observed.

The manufacturer is not responsible for any damages to the machine resulting from changes done by the user.

1.8 Warranty and liability

Warranty and liability claims regarding personal and material damage are excluded if they result from one or several of the following causes:

- non-designated use of the installation
- inappropriate mounting and operating of the system
- operating the system with defective safety equipment or not duly fixed or not functioning safety and protective devices,
- non-observance of the instructions in this manual regarding transport, stock keeping, mounting, maintenance, operating and upgrading of the system
- unauthorised modifications on the system
- inappropriate repairs
- in the event of disasters caused by foreign matters or force majeure.

1.9 Disorders due to power failure

We recommend the installation of warning systems for a better monitoring of your production units and the installation of an emergency power-generating set for adequate supply with power in case of power failure. With this, you protect the animals and thus your own economical health. For further information please contact your property insurance.

1.10 First aid

In the case of an accident, a first-aid kit must always be available at the place of work, unless specified otherwise. Material taken out and used is to be replaced immediately.

If you need help, describe the accident as follows:

- where it happened
- what happened
- the number of persons injured
- what type of injury
- who is reporting the accident!

1.11 Pollution abatement regulations

All works on and with the installation have to be carried out in compliance with the legal requirements concerning waste prevention and proper recycling / disposal of waste.

Special care has to be taken when carrying out installation, repair and maintenance works, as water pollutants like lubricating grease and oils, as well as solvent-containing cleaning solutions are not to pollute the soil or get into the canalisation! These materials have to be kept, transported, collected and disposed of in appropriate containers!

1.12 Waste disposal

After finishing the assembly or repair of this installation, dispose of the packing material and remains which do not need to be further used according to the legal provisions for recycling. The same applies to the component parts after putting the installation out of service.

1.13 Notes for use

We reserve the right to modify the construction and technical data for reasons of further development.

Therefore, no claims can be derived from the information, pictures, drawings and descriptions. Errors and omissions excepted.

Inform yourself about mounting, adjusting, operating and maintaining before taking the system into operation.

Apart from the safety-relevant instructions in this manual and the safety precautions valid in the country of use, also observe the generally acknowledged technical regulations (safe and appropriate working according to UVV, VBG, VDE etc.).

1.14 Copyright

This manual is subject to copyright. The information and drawings included in this manual shall not be copied without the manufacturer's consent, nor shall they be used for anything other than the designated use. Neither shall they be disclosed to third parties.

If you find mistakes or unclear information in this manual, please do not hesitate to let us know.

All trade marks mentioned or shown in the text are trade marks of their respective owners and are recognised as patented.

For further information please contact:

Big Dutchman International GmbH · P.O. Box 11 · D-49360 Vechta · Germany

Phone +49 (0) 4447-801-0 Fax +49 (0) 4447-801-237

E-Mail: big@bigdutchman.de, Internet: www.bigdutchman.de

2 Safety instructions

These mounting and operating instructions, particularly the safety regulations, have to be observed by all persons working on this system. Moreover the regulations for accident prevention valid for this place have to be observed!

2.1 General safety instructions

All established safety precautions and other generally accepted safety regulations and medical references have to be observed. Please check safety and function control devices to ensure safe and accurate operation:

- before putting into operation
- at adequate time intervals
- after modifications or repairs.

Check the proper functioning of the system after any kind of repair works. You may only take the device into operation when all protective systems have been put into place again. Follow the directions of the electric and water supply company.

2.2 Safety instructions when operating electrical appliances

You have to ensure that the system with the electrical appliances is operated and maintained according to the electro-technical regulations.

 	Installation and work on electric components/structural groups may only be carried out by qualified personnel according to electro-technical regulations (e.g. EN 60204, DIN VDE 0100/0113/0160). Dangerous electric tensions are bare in case of open control equipment. Be aware of the danger and keep workers of other professions away from the danger zone!
	Do not install control devices directly in the house, but in the service room to prevent corrosion caused by ammonia gas.

 	**Warning** **Never repair or bypass the fuses!** Damaged fuses have to be replaced with new fuses!

Immediately switch off the installation in the event of malfunctions of the power supply units. Use a bipolar voltage probe to make sure that the electrical equipment is not alive.

Check the electrical wiring and cables for recognisable damage before putting the device into operation. Replace damaged wiring and cables before taking the device into operation.

Only use the fuses indicated in the circuit diagram. Immediately replace damaged fuses. Never repair or bypass the fuses!

Never cover the electrical motor. This can cause high temperatures resulting in fire and a break-down of the equipment.

The control box as well as the terminal and connector boxes of the installation must always be kept shut.

Let damaged or broken plugs be replaced by an electrician.

Do not pull the plug from the socket at the flexible cable.

For the respective connections please see the enclosed connecting plan of the system parts delivered.

2.3 System safety instructions

2.3.1 Danger zone

	Never reach into the running installation. Before reaching into the installation, turn the system off and secure it against unintentional actuation. Assure yourself beforehand that the main switch is in the OFF position and can not be put in the ON position without your knowledge.

The different areas of the **Big Dutchman** installations are characterised by different types of construction.

There are several system parts that run out, rotate or slide that can increase the risk of an accident when you are unaware of the type of construction.

There are hazard areas where a risk of injury exists

- due to rotating parts
- due to electrical current in case of non-reliable or defective switching-off of overload current.

2.3.2 Entire system

- Parts lying about on the system and in its vicinity can cause persons to stumble and/or fall and thus risk injuring themselves by contact with system components.
- Lack of knowledge about the structural design of the system can lead to injury.
- Parts lying about in or on the components can lead to serious damage of the system.

	After repair or maintenance work, never place any objects (e.g. spare parts, replaced parts, tools, cleaning implements etc.) in the accessible areas of the system or around it! Make sure that all loose or replaced parts have been removed from the system components **before** the system is taken into operation again! Make yourself familiar with the construction of the system in sufficient light! If this is not possible at site, get all available information on the remaining dangers in connection with this system! When working **under** the installation, always wear a safety helmet!

2.3.3 Individual components

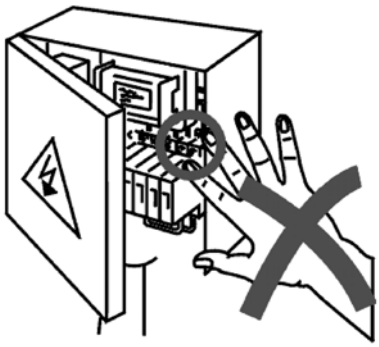
2.3.3.1 Ventilation system

- Rotating fans can lead to severe injuries.
- Fans can start due to their automatic control units.

	Never reach through the protective grills or blade flaps into a fan, even if it is not in operation!

	Before carrying out repair or maintenance work, disconnect power supply and indicate this by a sign fixed to the main switch!

2.3.3.2 Electrical components



 	**High electric tension!** Touching live parts might lead to severe injuries caused by electric shock! During repair or maintenance work, live parts may be bare! Never touch bare electrical components. Equipment with bare electrical components must not be used by the farm staff.

2.4 Personal safety instructions

These safety instructions are intended to make you familiar with all information regarding the system that are important for your safety and that of the system.

Maintenance may only be carried out by specially trained and briefed users.

Keep with the safety instructions in this manual.

	Lack of knowledge about the structural design of the system can lead to injury. Make yourself familiar with the design and construction of the installation under sufficient lighting! Inform yourself and your colleagues about the remaining dangers in connection with this installation!

2.4.1 Clothing for personal safety

	Wear close-fitting clothes when carrying out mounting, maintenance and cleaning work at the installation. Do not wear rings, necklaces, watches or other items which could get caught at parts of the installation.
	Never work with long hair that is not tied together. Your hair could get caught in moving devices or system parts and thus cause serious injuries.
	During all mounting, maintenance and cleaning work at the installation, wear protective clothes and shoes as well as safety glasses and gloves if required.

2.4.1.1 Clothing and footwear

- Wide, fluttering clothes increase the risk of an accident.
- Wide pieces of clothing, ties, scarves etc. can get caught in the moving or rotating system parts.
- High heels are a safety risk.
- If you stumble, you can knock against sharp-edged, moving or rotating system parts and get severely injured.

	Secure wide, fluttering clothes or take them off! When working at or on the system, only wear slip-free footwear and safety shoes when replacing heavy system parts!

2.4.1.2 Jewellery

- Loose or large jewellery increases the risk of an accident.
- The large or loose parts of jewellery can get caught in components of the installation.

	Take off all jewellery, particularly necklaces, bracelets and rings!

2.4.1.3 Hair

- Long hair increases the risk of an accident.
- Long hair can get caught in moving or rotating system parts.

	Secure long hair by tying it back or wearing a bandanna or cap!

2.5 Safety contrivances

It is strictly forbidden to remove or put out of operation any safety contrivances. This leads to risk of injury and danger of life! Should the safety devices be damaged, the system has to be put out of operation immediately. The main switch has to be locked in zero position.

2.6 Dangers resulting from non-compliance with the safety instructions

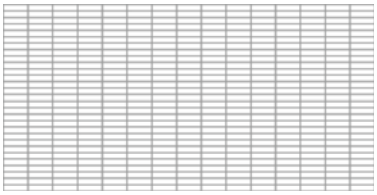
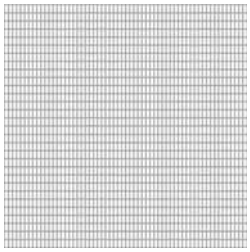
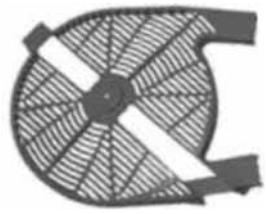
Non-observance of these instructions can cause severe danger for life and health of people or can lead to material or environmental damages and to the forfeiture of any claim for damages. To be precise, the non-observance of these instructions can lead to:

- Failure of vital functions of the installation
- Failure of prescribed maintenance methods
- Dangers for people owing to electrical and mechanical influences.

2.7 Safety component parts

The system described in this manual may only be operated if the listed safety component parts have been mounted and installed correctly and have been checked for correct functioning!

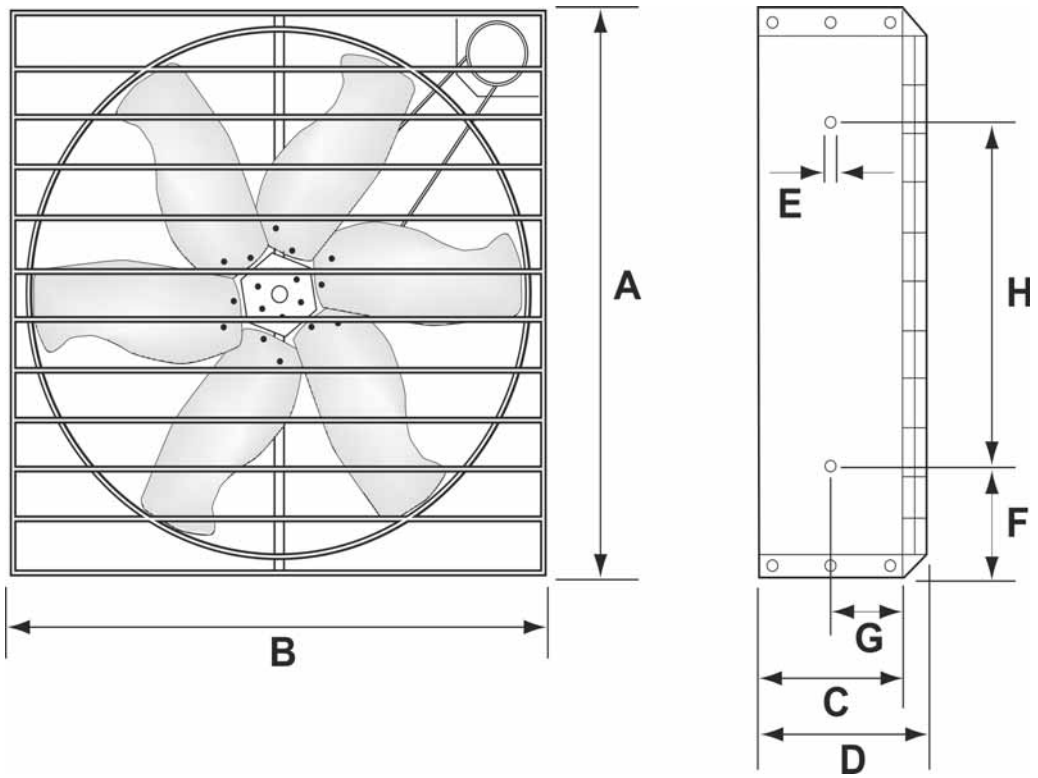
If safety component parts are missing or defective, the original part must be ordered from **Big Dutchman** and replaced immediately!

Pic	Description	Code no.
	Wire mesh guard half EM48/50	60-20-1108
	Wire mesh guard f/ shutter EM50	60-20-1093
	Safety-Kit included: Plastic safety protection for central pulley Plastic safety protection for belt Plastic safety protection for motor Self tapping hex screw 6.3x 19	 2267301 2267401 2467350 2278800

If there are movable parts of the fan (e.g. fan blade) below a height of 2.7m (measured from the floor to the lower edge of the fan) install a stable shielding according to EN-ISO 13857.

3 Mounting instructions

3.1 Dimensions:



Dimensions (mm)							
Main				For mounting			
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
1380	1380	450	530	M8	270	308	830
D depth refers to the fan with supple-mentary CE shutter safety mesh.							

3.2 Scope of delivery

Please check the delivery for completeness and intactness after opening. Contact the supplier in case components are missing or damaged.

Caution!

Do not install damaged or incomplete fans!

3.3 Assembly / mounting / installation

- Mounting, electrical connection and initial operation may be executed exclusively by qualified personnel in accordance with EN 50110-01 and EN 1010-1.
- The installer is responsible for ensuring that the installation and safety instructions correspond with current standards and provisions in accordance with EN-ISO 13857 and EN-ISO 12100.
- All fans must be earthed in accordance with the valid standard EN 50178.
- The fan may not be used as load-bearing part of the building. Fixing other equipment to the fan or its parts, depositing heavy objects on the fan or stabilising heavy objects by means of the fan is prohibited.
- Protect the wire mesh guard, the shutters and the cone against snow and ice loads.
- If moving parts of the fan (the impeller) are situated less than 2.7 m high (measured from the floor to the lowest point of the fan), install a protective wire guard in accordance with EN-ISO 13857.
- The water outlets must always be open.
- Do not anchor the fan in its mounting position using cement or construction foam. Instead, use the optional mounting set.

Caution!

The fan may vibrate during speed control when mounted/installed incorrectly. This should be checked before completing the installation.

Caution!

The fan must always be installed and mounted securely before it is put into operation.

3.4 Storage and transportation

- Only transport and store the fan in its original packaging.
- Storage temperature: -40 °C to +60 °C
- Avoid impacts to and unnecessary loads on the packaging and/or the fan.
- Check the fan for damage in case the packaging is damaged.

3.5 General cleaning

Caution!

Never clean fans while they are running / rotating! Always disconnect the fan from the mains power supply before cleaning.

- Loosen the wire mesh guard on the side facing the house and open it.
- Clean the fan housing, the blades, all existing wire mesh guards at the inside and the outside of the fan as well as the motor using a dry brush, a damp cloth or by applying compressed air. Do not use aggressive cleaning agents!
- Make sure that no water enters the motor or other electrical parts.
- **Using a high-pressure cleaner may damage the motor, bearings and gaskets of the fan and is therefore not permitted!**
- Run the fan for at least two hours at full speed to evaporate any humidity inside and to avoid corrosion of the bearings.

3.6 Complaints / questions

Our products are manufactured in accordance with valid international standards. Please contact your dealer or installer regarding questions on the use of our products and specific areas of use.

4 Maintenance schedule

Caution!

Never carry out maintenance works on running / rotating fans! Always disconnect the fan from the mains power supply before carrying out maintenance works.

The following applies for any maintenance works on the fan:

- The fan must be at zero potential.
- The electric circuit must be disconnected secured against reconnection.
- All moving parts must have stopped completely.
- All safety and working instructions in accordance with EN 50110-1 and EN 1010-1 must be observed.
- All works must be carried out by qualified personnel in accordance with EN 50110-1 and EN 1010-1.

Regular maintenance:

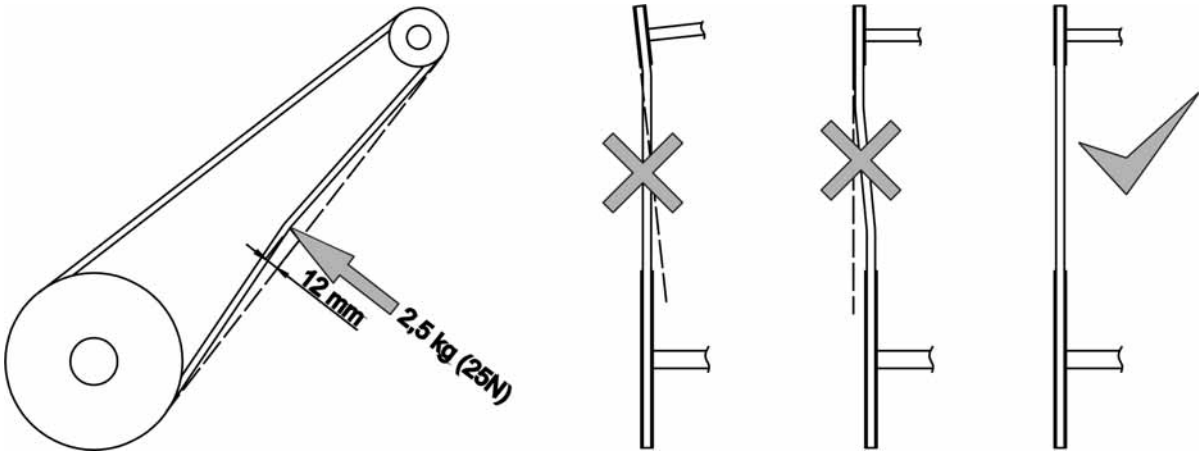
- Regular maintenance extends the service life of the fan and prevents failures.
- Run the fan once a month for at least two hours at full speed to evaporate any humidity inside and to avoid corrosion of the bearings.
- Carry out the following tasks (general cleaning, checking the bearing, the V-belt and the shutter) every six months.
- Reduce the maintenance interval to three months if the fan is used to circulate extremely polluted air. This is the case when poultry is managed in aviaries, when the fan is used in connection with manure drying tunnels, during moult, etc. In case of doubt, check the dust layer on the motor. It should not be thicker than 1-2 mm anywhere.

Bearings:

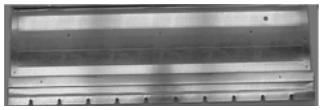
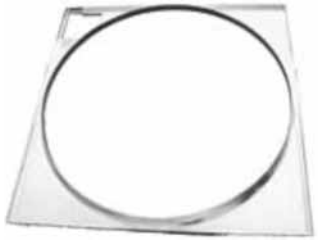
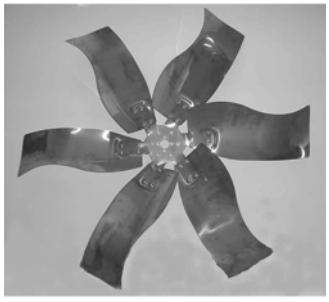
- The bearings are maintenance-free. The service life of the bearings amounts to approx. 30,000 operating hours for normal use. The bearings must be replaced after this time.
- Check the condition of the bearings regularly by rotating the impeller manually. It must run smoothly and quietly and there may be no play in the bearing.

V-belt:

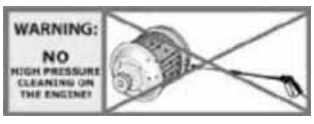
- Check the tension of the V-belt after the fan has been operating for three days and during every maintenance session afterwards (see drawing below).
- For tensioning the V-belt, loosen both screws of the motor bracket by means of a 13-mm-wrench (see drawing at the bottom of page 36). Move the motor and tighten the screws again.
- Make sure that the V-belt pulleys are in line after tensioning.
- Replace the V-belt when it can no longer be tensioned or has been damaged.
- For replacing the V-belt detach the motor bracket first. Tension the V-belt as described above.
- Only use original parts.



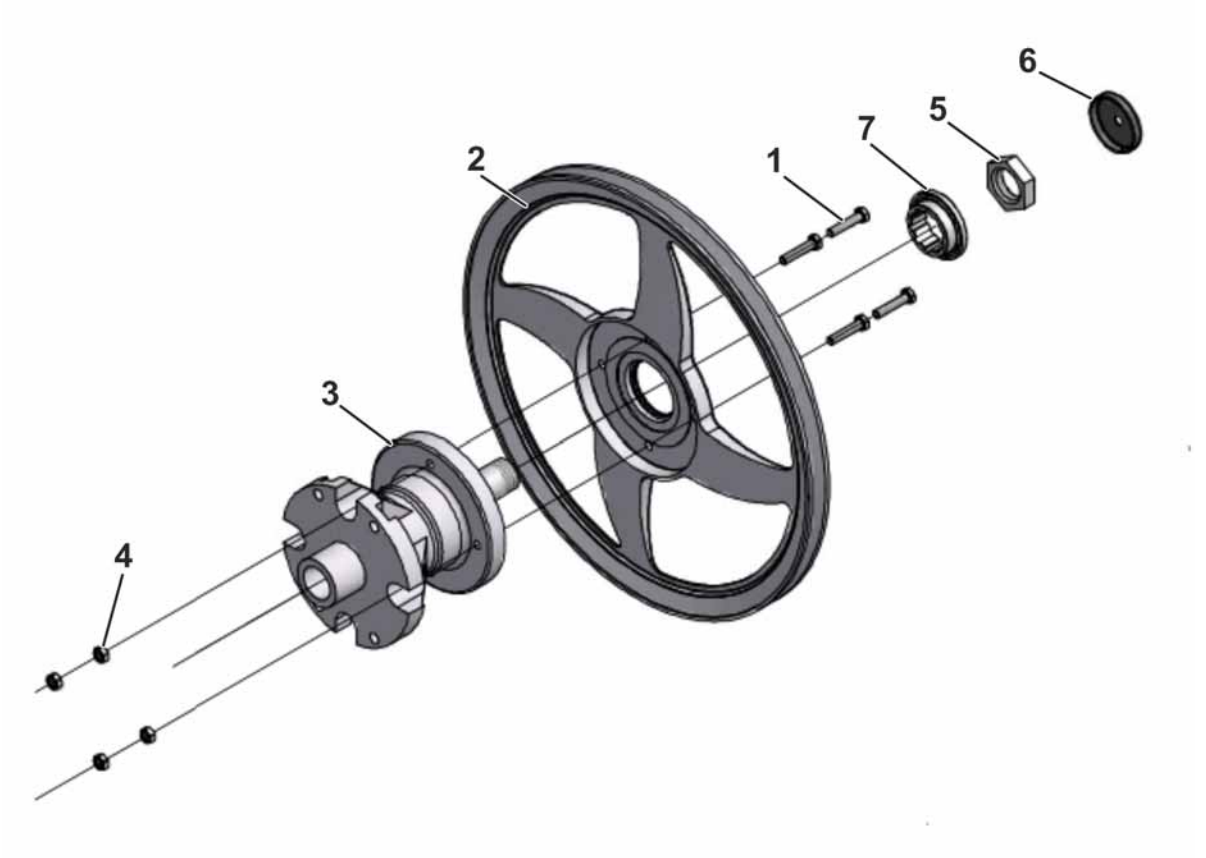
5 Spare parts list for EM50

Ref.	Q.ty	Pic.	Description		Code-Nr.
1	1		Bottom panel for EM50		60-20-1120
2	2		Side panel for EM50		60-20-1123
3	1		Top panel for EM50		60-20-1119
4	1		Venturi-plate for EM50		81-04-2064
5	1		Complete propeller (available as assembled part only)	Stainless steel	60-25-3047
				Pre-coated	81-30-1745
				Galvanized	81-34-4260
6/A	9		Shutter blade 6/10 for EM50/EMC50		60-20-1136
6/B	1		Shutter blade central 12/10 for EM50/ EMC50		81-02-7340
7	2		Wire mesh guard half EM48/50		60-20-1108
8	1		Centrifugal system (available as assembled part only)	multispeed motor EM50	81-30-9758
				singlespeed motor EM50	60-20-1099

8/A			Curved plastic connecting rod for centrifugal system EM48/50	81-01-8562
9	1		Complete electric motor (available as assembled part only: Motor + pulley +motor slide)	see chapter 5.4 ”Assembled Motors”
9/A			Electric motor (not assembled)	see chapter 5.5 ”Motors Code Table”
9/B			Motor pulley	see chapter 5.6 ”Pulley Codes Table”
9/C			Motor slide EM36/EM50	81-31-0858
10	1		V-belt pulley cpl. for impeller EM50	60-25-3049
10/A	1		Central pulley for EMC50/EM50/EM36	60-20-1114
10/B	1		Hub cpl for EM36/EM50	60-20-1141
10/C	1		V-belt 13x8-2240 DIN 2215 A88 for EM48/50	60-20-1249
11	2		Tie rod PVC 10 holes for EM50	81-04-5523

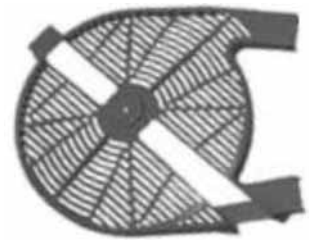
12	1		Central support for pulley EM50	60-20-1121
13	2		Cover plate for EM50	60-20-1122
14/A	9		Bearing right for shutter blade EM36/ 50 SMT50 AirMaster	60-20-1138
14/B	9		Bearing left for shutter blade EM36/50 SMT50 AirMaster	60-20-1137
14/C	1		Bearing right with spring for shutter blade EM36/50	60-20-1140
14/D	1		Bearing left with spring for shutter blade EM36/50	60-20-1139
15/A	1		Short warning sticker	2262600
15/B	2		Long warning stickers	2262500
15/C	2		Warning on the shutter	2262095

5.1 Complete central pulley - exploded View

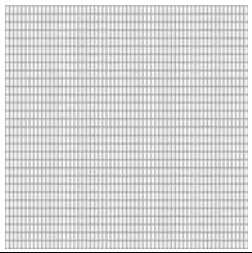
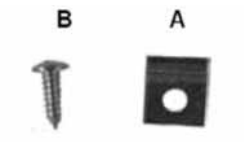


Ref.	Q.ty.	Code-Nr.	Description
1	4	99-10-1257	Hexagon head screw M6x30 DIN 933 8.8 galv
2	1	60-20-1114	Central pulley for EMC50/EM50/EM36
3	1	60-20-1141	Hub cpl for EM36/EM50
4	4	60-20-1142	Hexagon nut M6 w/geared collar galv f/V-belt pulley
5	1	60-20-1111	Nut M25x10mm EM
6	1	81-03-3949	Calott cover nut EM50
7	1	81-01-7960	Waterproof distance piece EMC50, EM50, EM36

5.2 Spare parts list for protection (option)

Ref.	Q.ty	Pic.	Description	Code-Nr.
16/A	1		Plastic safety protection for entral pulley	2267301
16/B	2		Plastic safety protection for belt	2267401
16/C	1		Plastic safety protection for motor (pulley + fixing clip)	2467350
16/E	4		Self tapping hex screw 6.3x 19	81-33-5979

5.3 Spare parts list for pyramidal shape mesh for CE-protection

Ref.	Q.ty	Pic.	Description	Code-Nr.
17	1	**contains 17/A + 17/B**	Wire mesh guard CE cpl for shutter EM50	60-20-1092
17/A	1		Wire mesh guard f/ shutter EM 50	60-20-1093
17/B	6		A - Spacer for mesh fixing B - Drilling screw 6.3x 19 DIN 7504-K-galv	60-20-1107 99-10-3998

5.4 Assembled Motors

Nominal Power		Type Phases	Speed	Fre-quency [Hz]	Voltage [V]	Current [A]	Rpm	Motor-code
[W]	[hp]							
735	1,0	1	Single	50	230	5	1380	2523700
735	1,0	1	Multi	50	230	5	1380	2523700
735	1,0	1	Single	60	220-240	5,7	1700	81-22-7790
735	1,0	3	Single	50	230/400	3,5/2	1400	2523200
735	1,0	3	Single	60	230/400	3,5/2	1700	2522700
880	1,2	3	Multi	50	230/400	4,3/2,5	1380	2523300
880	1,2	3	Multi	60	230/400	4,3/2,5	1600	2523302
1100	1,5	1	Single	50	230	7,3	1400	60-20-3074
1100	1,5	1	Single	60	220-240	7,3	1700	2524000
1100	1,5	3	Single	50	230/400	5,2/3	1400	81-23-1173
1100	1,5	3	Multi	50	230/400	5,2/3	1380	2523400
1100	1,5	3	Single	60	230/400	5,2/3	1700	2522900
1100	1,5	3	Multi	60	230/400	5,2/3	1670	2523401

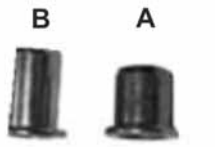
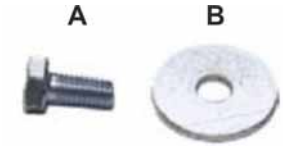
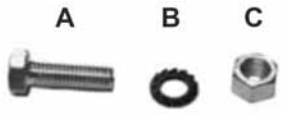
5.5 Motors Code Table

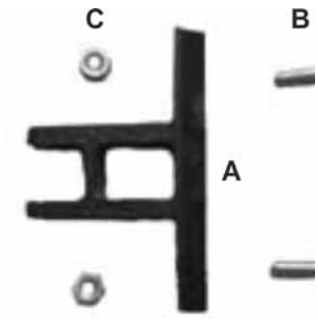
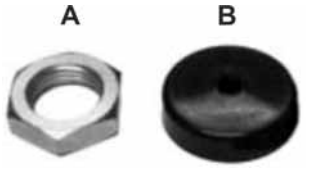
Nominal Power		Type Phases	Speed	Fre-quency [Hz]	Voltage [V]	Current [A]	Rpm	Motor-code
[W]	[hp]							
735	1,0	1	Single	50	230	5	1380	2202805
735	1,0	1	Multi	50	230	5	1380	2202805
735	1,0	1	Single	60	220-240	5,7	1700	2202905
735	1,0	3	Single	50/60	230/400	3,5/2	1400/ 1700	60-20-1072
880	1,2	3	Multi	50/60	230/400	4,3/2,5	1380/ 1670	60-20-1071
1100	1,5	1	Single	50	230	7,3	1400	81-03-3113
1100	1,5	1	Single	60	220-240	7,3	1700	2203705
1100	1,5	3	Single	50/60	230/240	5,2/3	1400/ 1700	60-20-3075
1100	1,5	3	Multi	50	230/400	5,2/3	1380/ 1670	60-20-3071
Capacitor for electric motor 1,50HP 1PH for EM50 (40MF)								81-21-1152

5.6 Pulley Codes Table

Nominal Power		Frequency	Type Phases	Speed	Pulley description	Motor-code
[W]	[hp]	[Hz]				
735 or 880	1,0	50	3	Single	DP85 M41 F19 C6	2247010
735 or 880	1,0	50	3	Multi	DP80 M41 F19 C6	2247050
735 or 880	1,0	50	1	Single or Multi	DP80 M41 F19 C6	2247050
735 or 880	1,0	60	3	Single	DP70 M41 F19 C6	2248810
735 or 880	1,2	60	3	Multi	DP65 M41 F19 C6	82-90-0157
735 or 880	1	60	1	Single or Multi	DP65 M41 F19 C6	82-90-0157
1100	1,5	50	3	Single	DP100 M51 F24 C8	60-20-3073
1100	1,5	50	3	Multi	DP95 M51 F24 C8	81-22-7102
1100	1,5	50	1	Single or Multi	DP95 M51 F24 C8	2249050
1100	1,5	60	3 or 1	Single or Multi	DP80 M51 F24 C8	81-04-3933

5.7 Bolts and nuts description

Ref.	Q.ty	Pic.	Description	Code-Nr.
18	20		Pop rivets ø6.4x8mm (Purpose: for housing and Venturi assembling)	2271600
19	2 2		A: Threaded bush M8 short (Purpose: to insert on the top panel) B: Threaded bush M8 long (Purpose: to insert on the housingl)	81-03-8130 81-03-8131
20	2 2		A: Bolts M8x16mm B: Spacer washer 8 x 32 (Purpose: to fix the motor to the top panel)	2280200 60-20-1106
21	4 4 4 2		A: Bolts M10x30mm B: Washer ø 10mm C: Nuts M10 D: Oval plate 170x40x8 mm for EM36/ EM50/EC50 (Purpose: to fix the propeller central support to the housing)	2282000 2275300 2274000 82-90-0199
22	1		Rubber grommet f/EM50 2200706 (Purpose: to avoid cable damage)	81-31-7072
23	4 4		A: Bolts M6x30mm 8.8 B: Hexagon nut M6 w/geared collar galv f/V-belt pulley (Purpose: to fix the central pulley to the hub)	99-10-1257 60-20-1142
24	4 4 4		A: Bolts M8x25mm B: Washer ø 8mm C: Nuts M8 (Purpose: to fix the propeller to the hub)	2280600 2275100 2273700

25	2 2 2		A: Bolts M8 x 55 B: Washer ø 8mm C: Nuts M8 (Purpose: to fix the centrifugal system to the propeller)	- - -
26	1		Waterproof distance piece EMC50, EM50, EM36 (Purpose: to distance the hub from the propeller central support)	81-01-7960
27	1 2 2		A: Fork for central shutter B: Bolts M6x16mm C: Nuts M6x5mm (Purpose: to fix the central shutter blade fork to the central shutter blade)	81-02-7342 2279100 2270700
28	1 1		A: Nut M25x10mm EM B: Calott cover nut EM50 (only w/o CE-Kit) (Purpose: to fix the hub to the propeller central support)	60-20-1111 81-03-3949
29	2 4		A: Bolts M6x30mm B: Nuts M6x6mm (Purpose: to fix the two springs of central shutter blade to the side panel)	99-10-1257 2273400
30	1		Axle for fan EM 50 knurled (Purpose: to fix the tie-rod to the central shutter blade fork)	81-05-4148
31	2		Stop collar 7x17mm (2268400) (Purpose: to fix the two pvc tie-rod with ten holes to left and right shutter blade fork)	81-02-5180

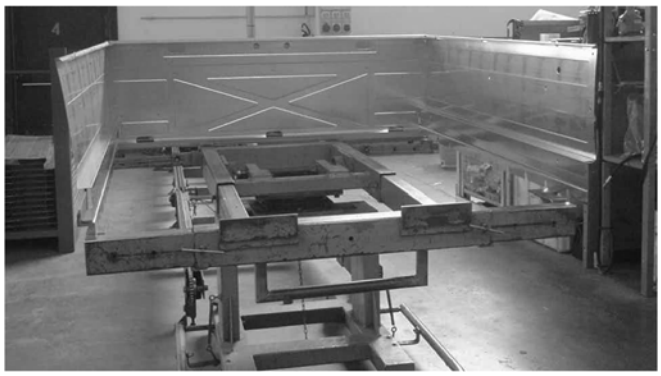
32	19 1		A: Self tapping hex screw 6.3x 19 B: Washer ø6.7x24mm (Purpose: for cover plate and wire meshes assembling)	81-33-5979 2277010
33	2		Central clips for meshes (Purpose: to fix the safety meshes guard to the housing)	2449100

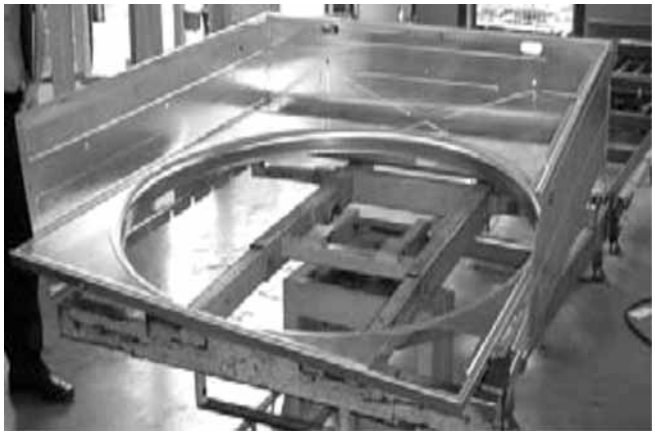
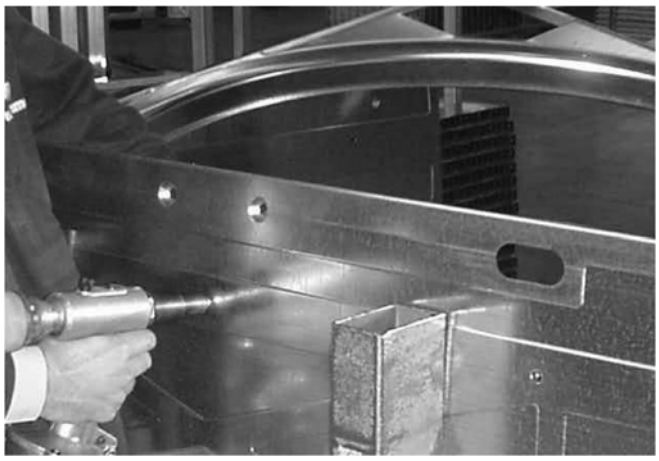
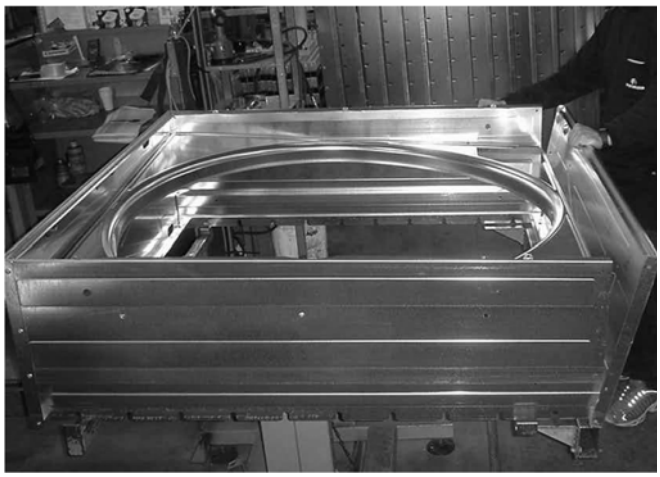
5.8 Assembling tools

Ref.	Q.ty	Pic.	Description	Code-Nr.
34	1		Riveting machine RAC 171	81-30-7730
35	1		Inserting machine KJ 45	81-21-8870

6 Assembling Guideline

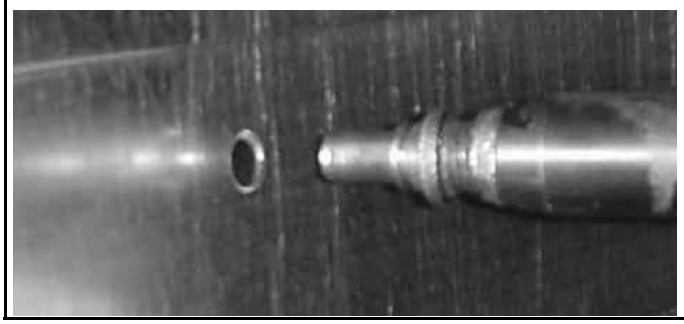
6.1 Housing Assembling

	Take the bottom panel (ref. 1), the side panels (ref. 2) and place these taking care that slot for the plastic bearing is downward.
	Before fixing the bottom and the side panels make sure that these pieces are in the right position as in the picture.
	Join bottom panel to side panels and fix qty. 4 pop rivets (ref. 18) for each edge by using riveting machine (ref. 34).

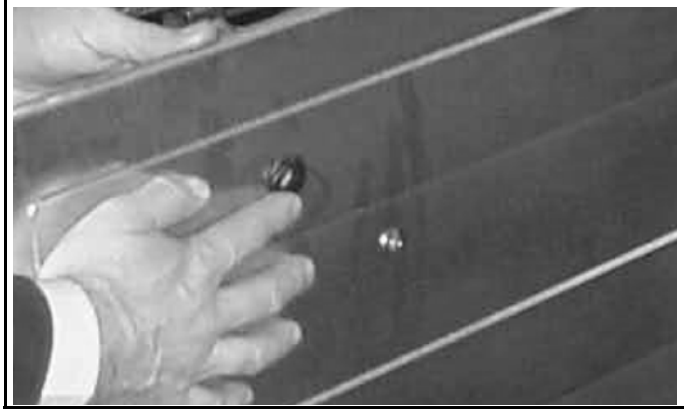
	Insert Venturi (ref. 4) into the housing on the right side as in the picture.
	Fix Venturi to bottom panel and then to side panels with qty. 1 pop rivets for side.
	Place the top panel (ref. 3) with motor support in correspondence with motor slot on the Venturi. Then fix it to side panels with qty. 4 pop rivet for side and to Venturi with qty. 1 pop rivet.

Place the qty. 2 short threaded bushes (ref. 19/a) on the top panel by using inserting machine (ref. 35).

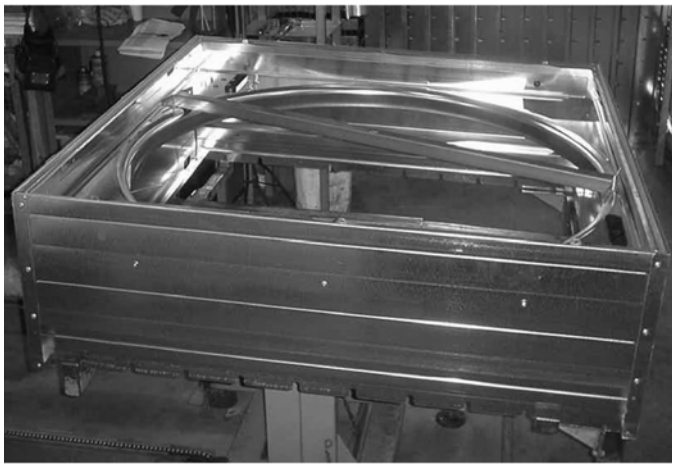
Place long threaded bushes (ref. 19/b) in correspondence of proper holes around the housing. Qty. 2 long threaded bushes for each panel.

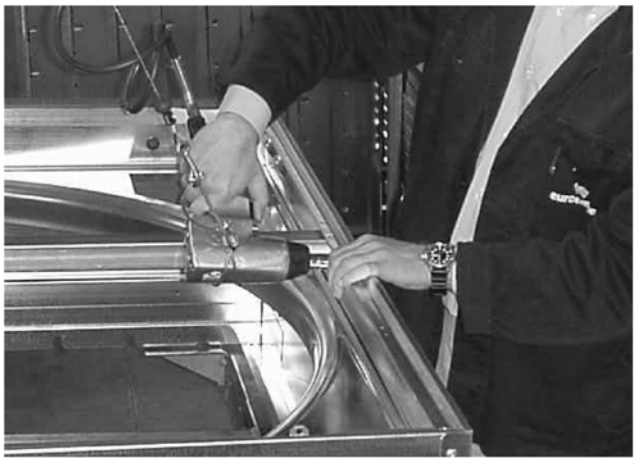


Make sure that Venturi and each panel are joined by the long threaded bushes.

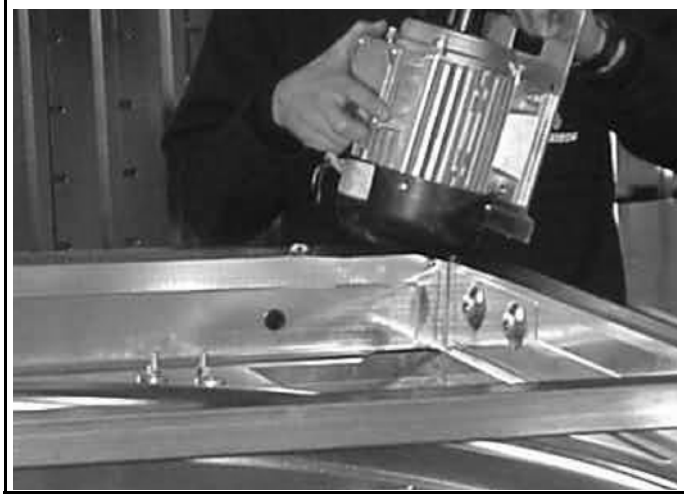


Place the rubber grommet (ref. 22) for electric cable protection on the side panel in correspondence with the motor slot.

	The propeller central support (ref. 12) shall be fixed to housing by means of qty. 4 bolts (ref. 21/a), qty .4 washes (ref.21/b), qty. 4 nuts (ref.21/c) and qty. 2 oval plates (ref. 21/d).
	Place the oval plates between propeller central support and panels.
	Place the oval plate over support frame and then start to screw the nuts.



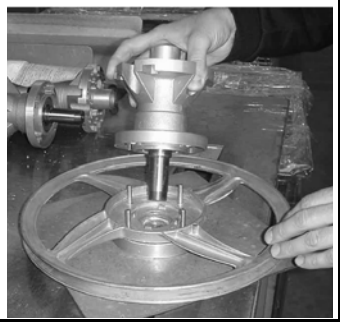
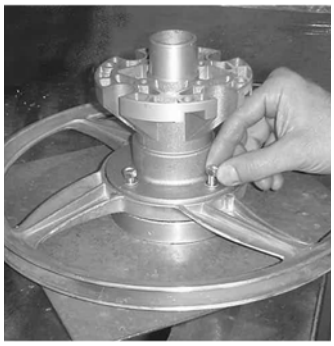
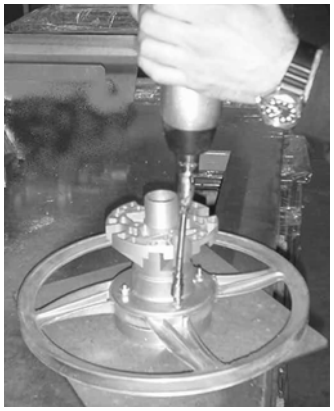
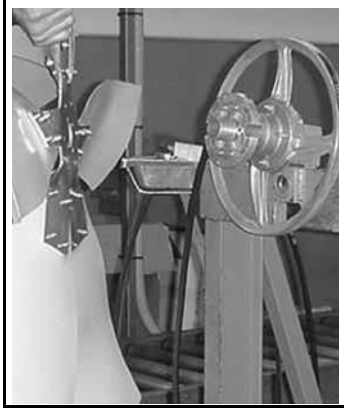
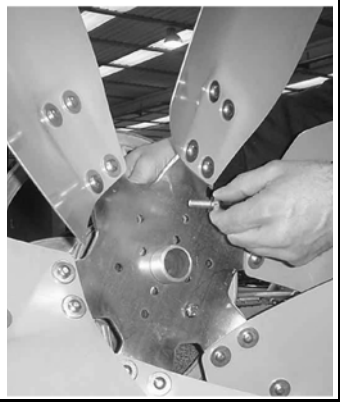
Tighten the nuts with pneumatic screw-driver (ref. 36/a) in order to fix the propeller central support to the top and bottom panels.

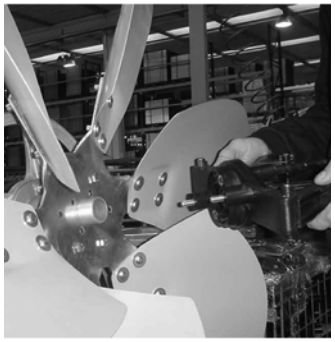


For mounting of electric motor (ref. 9) insert this into its slot taking care to fix it over proper track fixed on the top side.

Fix motor slide to top panel by means qty. 2 bolts (ref. 20)and qty. 2 washers (ref. 20). Tighten bolts by using 13 mm spanner (ref. 37).

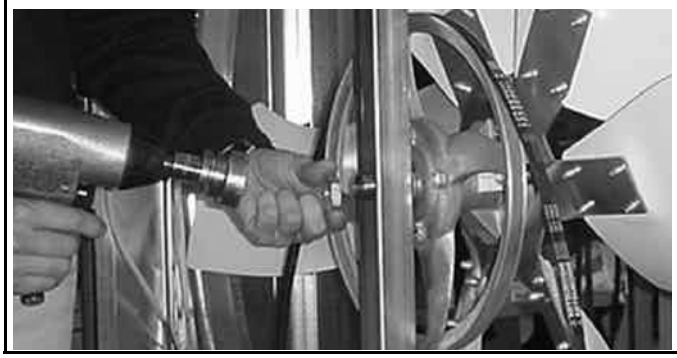
6.2 Centrifugal System and Pulley to Propeller Assembling

		Take the pulley (ref. 10/a) and insert the bolts (ref. 23/a) from the external side of it. Turn the pulley up side down and place the hub (ref. 10/b) on it.
		Fix the nuts (ref. 23/b) over the bolts. Tighten the nuts by using pneumatic screw-driver (ref.36/b).
		Place the waterproof distance piece (ref. 24) on the axle and then place the axle on a support. After that place the v-belt (ref. 10/c) on the central pulley.
		Place the propeller (ref. 5) on the central pulley assembly. Fix the bolts (ref.24/a), the washers (ref. 24/b) and nuts (ref. 24/c) in order to fix the propeller.

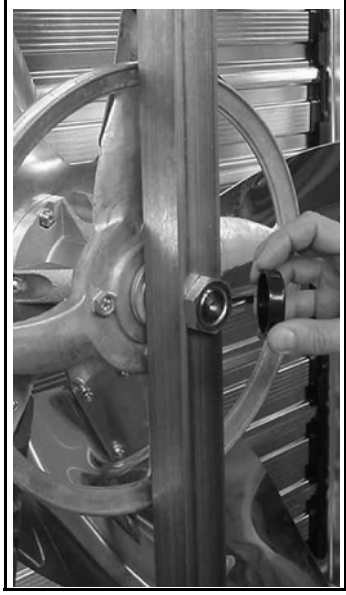


Tighten the nuts by using pneumatic screw-driver (ref. 36/c). Place bolts (ref. 25/a) on the centrifugal system (ref. 8) and then place it on the propeller.

Tighten bolts , washers (ref. 25/b) and nuts (ref. 25/c) in order to fix the centrifugal system to the propeller by using pneumatic screw-driver (ref.36/ d). Place the complete assembly you have obtained on the fan, inserting the axle trought the central support hole.



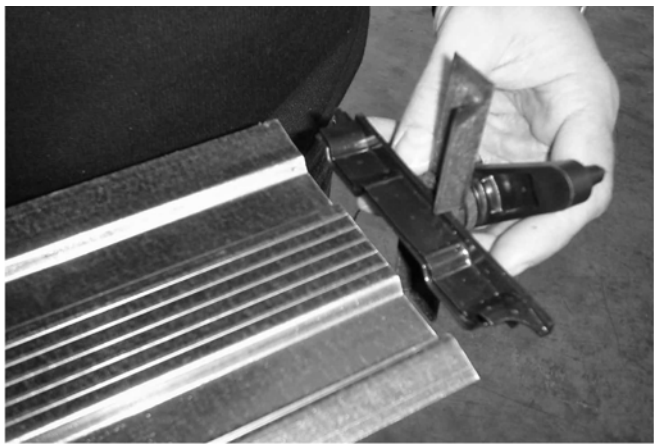
Place M 25 nut (ref.28/a) on the axle and then tighten it by mean of pneumatic screw-driver (ref. 36/e).



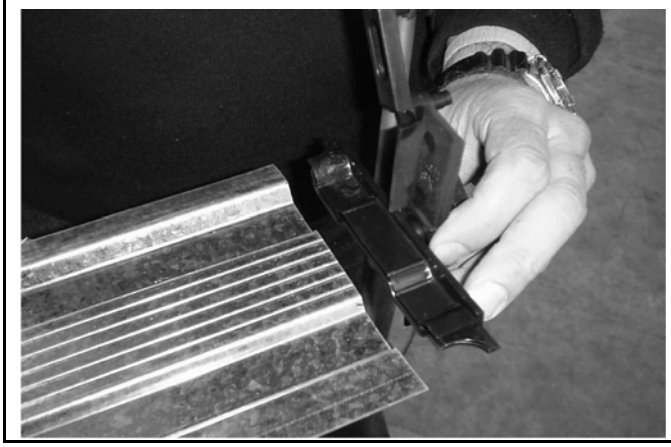
Put cap cover nut (ref. 28/b) over M 25 nut (only for fan without CE kit). Place v-belt on the pulley and then rotate the propeller clock-wise in order to tighten the v-belt on the pulley.

CHECK TENSIONING :

right tensioning is obtained when maximum deflexion on one side only (half-way from motor and central pulley) is about 15 mm.

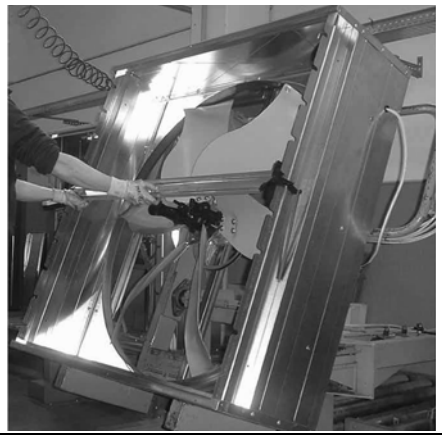


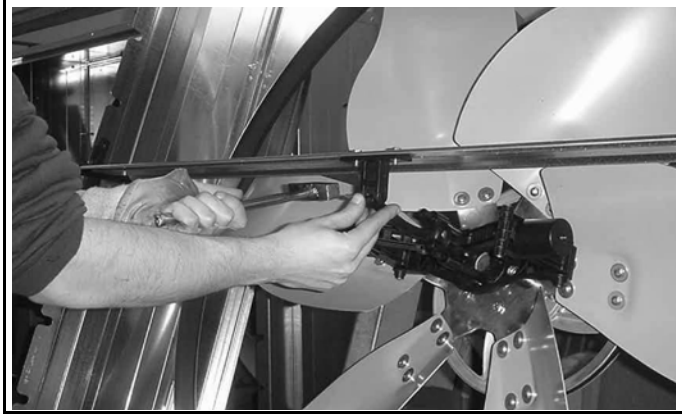
Insert plastic bearings (ref. 14/a , 14/ b) without spring on shutter blades (ref.6/a). Plastic bearings marked with “SX” are for left side, plastic bearings with “DX” are for right side.



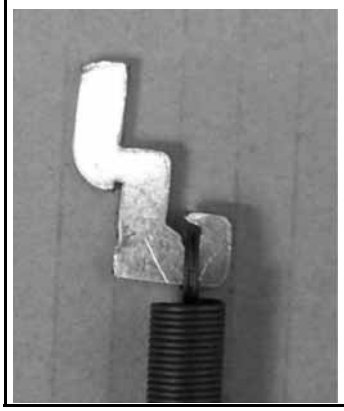
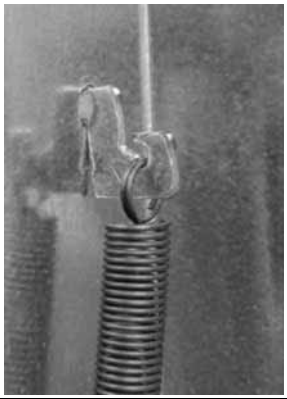
Insert plastic bearing with spring (ref. 14/c , 14/d) on central shutter blade (ref.6/b).”SX” is for left side, “DX” is for right side. Fix the plastic fork (ref.27/a) with qty. 2 bolts (ref.27/b) and qty. 2 nuts (ref. 27/c)

on the central shutter blade.

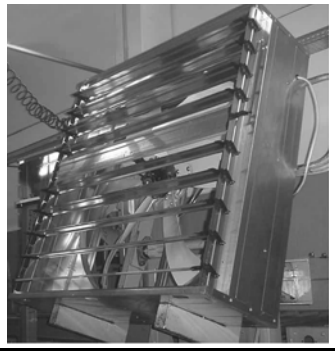
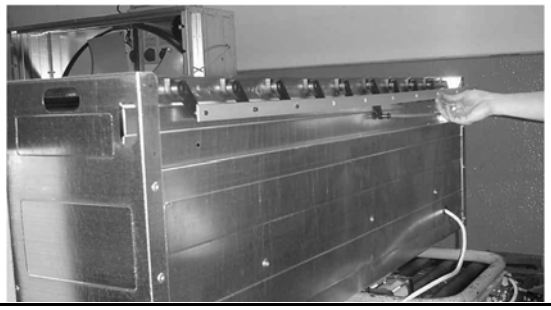
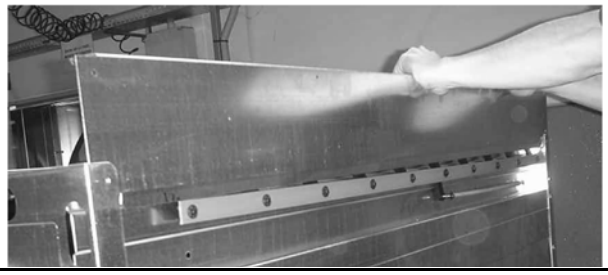
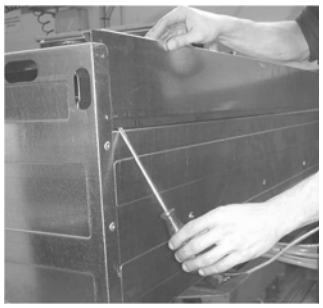
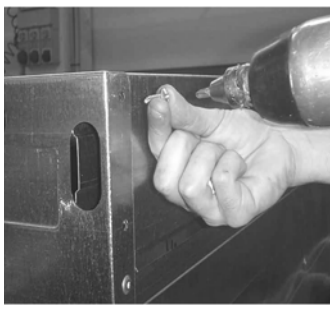




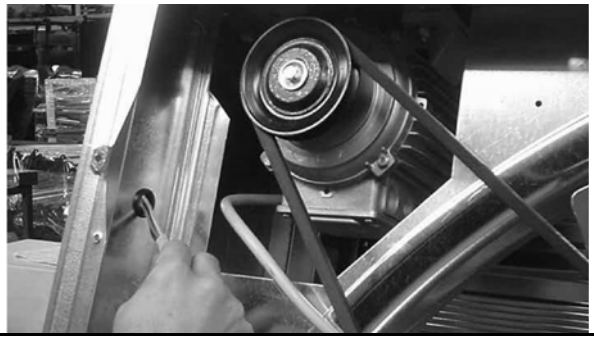
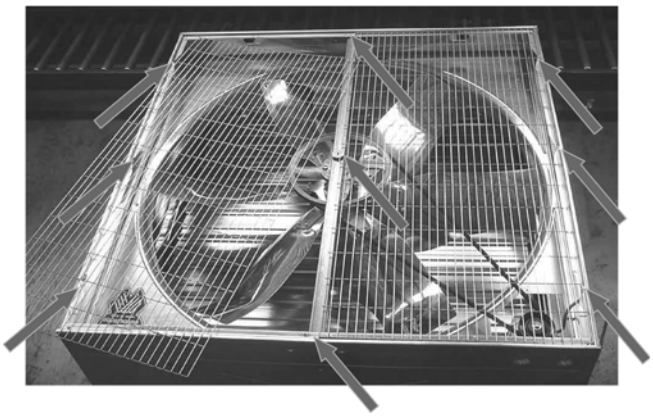
Fit central shutter blade on the central slot on the housing. Insert knurled axle (ref. 30) by the smooth side on the plastic fork, then take plastic shutter rod on the centrifugal system and fix them together by using a small hammer (ref. 38).

		Insert free looped-end of spring on bolt (ref. 29/a), then place a nut (ref.29/b) and leave about 10 mm of space between the nut and the bolt head. Insert the bolt into hole of the side panel and then fix it by means of a second nut (ref. 29/b). Tighten the nuts by using two 10 mm spanners (ref. 39). Repeat this operation for the other side.
		In certain versions two hooks are used instead of the screws.

6.3 Shutter Blades Assembling

		Insert all the shutter blades (qty. 9 normal + qty. 1 central) on the fan housing and then place the fan horizontally. .
		Place the pvc tie-rod (ref.11) on plastic bearing pivots.
		Insert all stop collars (ref. 31) on plastic pivots.
		Put cover plate (ref. 13) over the plastic bearing mechanism.
		By means of a screw-driver (ref. 40) insert cover plate over the fan housing. Fix the cover plate on each side by using the screws (ref. 32/a) with pneumatic screw-driver (ref. 36/f). .

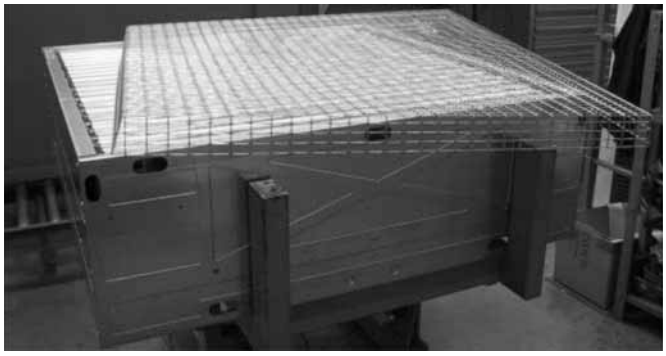
6.4 Safety Meshes Guard Assembling

	Turn the fan upside down and insert the electric cable into the proper hole placed on the side panel.
	Put the qty. 2 safety meshes guard (ref. 7) on the inlet side of the fan.
	Fix the qty. 6 screws (ref.32/a) on the fan side (qty. 3 for each are required).
	Fix the screws (ref. 32/a) with the central clips (ref.33) in correspondence of the propeller central support on the top panel and the bottom panel.
	Fix the screw (ref. 32/a) with the washer (ref. 32/b) into the central pulley axle. Fix all the components by using the pneumatic screw-driver (ref. 36/f).

6.5 Safety-Kit Assembling

	Before assembling the safety meshes complete the Safety-Kit. Join the plastic safety protection for central pulley (ref.16/a) with plastic safety protection for the v-belt (ref.16/b).
	Place the plastic safety protection for the motor pulley in the motor corner. Make sure that the plastic square pins are inserted in the proper housing holes.
	Join the plastic safety protection for the motor pulley.
	Put the assembled Safety plastic kit protection as in the picture. Make sure that the groove of the plastic safety protection for the v-belt are centered along the v-belt.
	Follow the safety mesh guard assembling procedures and then fix the complete assembled you have obtained by mean of qty.1 screw (ref. 32/a).

6.6 Pyramidal Shape Mesh Assembling

	Put the pyramidal shape mesh (ref. 17/a) on the fan as in the picture. The rectangular holes must be positioned horizontally.
	Fix it to the bottom and top panels by means of qty. 6 metal clips (ref. 17/b) and qty. 6 screw (ref. 17/b). The metal clips must be fixed in the position as in the picture.
	Fix it by using a pneumatic screw-driver (ref. 41).