



ACF

INSTRUCTION BOOKLET (Translation of the original instructions)

ACF 21P 5000 - 6300 - 7400



since
1967

1.1 INTRODUCTION TO THE MANUAL

The Instructions Manual for use is the training reference document prepared by the Manufacturer, for specialized operators and technicians who will be in contact with the machine throughout its life cycle.

The purpose of the document is to provide information for proper use of equipment, from installation to disposal, highlighting the dangers that can result from improper use.

To obtain good results in the installation environment, you must carefully follow the instructions in this Manual, particularly avoiding, the occurrence of technical problems and worker exposure to health risks.

1.2 SAFETY WARNINGS

The following symbols are used in the User Manual to indicate the presence of danger and draw the reader's attention to important information:

NOTE

This area is included to highlight important notation.

CAUTION

Indicates a reference to the application of safety practices, or call attention to unsafe practices that could cause personal injury or damage to the equipment or components or the environment.

WARNING

Indicates the presence of a hazard that can cause serious injury if no appropriate precautions are taken.

1.3 PRESERVING THE INSTRUCTIONS FOR USE

There is an obligation to preserve the Owner's instructions manual and all publications attached. The operators and the maintenance personnel must be able to quickly find and consult this document and the annexes in any situation.

Outside the metal duct of the circulator, a special pocket is located for enclosing the User Manual and its annexes.

NOTE

The Instructions Manual for use is a safety device of the machine.

It must always stay with the machine throughout the intended life cycle, including changes in ownership.

The phases of the life of the machine are:

1. transportation and lifting;
2. installation;
3. use and operation;
4. decommissioning;
5. scrapping and disposal.

2.1 IDENTIFICATION DATA OF THE MACHINE

The EC marking certifies that the product conforms to essential safety requirements laid down by this Directive in the European Community.

The identification plate with the CE mark is applied to the metal structure on the air intake side of the circulator.

It gives the data identifying the Manufacturer, model, serial number and year of manufacture of the machine, in addition to the technical data of the circulator.

Circulator fan model	
Year of construction	
Serial number	
Motor power	kW
Nom. air displacement	m ³ /h
Specific power input	W/1000m ³ /h
Propeller revolution	RPM
Noise level at 7m.	dB (A)
Weight	kg
Efficiency ErP 2009/125/EC η _{is} - Cat. A/Static - N=	

2.2 INTENDED USE

ACF is a ventilator that puts air in circulation for agricultural and industrial applications, he is designed for ventilation of internal spaces for circulation of air with atmospheric pressure.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

CAUTION

It is absolutely forbidden to make changes to any component of the product or replace with non-original spare parts.

WARNING

Use of the products that do not conform to that described in this document is considered improper and therefore declared unsafe. These unintended uses can result in equipment damage and serious personal injury. Any other use of the product other than the intended purpose and described in this document is not appropriate; therefore, the manufacturer is not responsible.

NOTE

will not be held responsible for any damage to the machine and/or personal injury due to non-compliance with the safety requirements specified in this Manual.

3.1 SAFETY PRESCRIPTIONS

It's very important that the safety instructions are always followed and obeyed. Failure to do so could cause injury to persons and/or damage to the machine.

The air circulator must be installed and serviced regularly by qualified and authorized personnel only, since they are able to carry out the operations necessary for the purpose and since they are aware of safety regulations in force in the country of installation.

3.2 PERSONAL PROTECTION EQUIPMENT (PPE)

To avoid exposure to risk the personnel that operates the machine during the life cycle phases of the machine such as installation, lifting and transport, maintenance, are required to use the following personal protective equipment:



SAFETY HELMETS



PROTECTIVE CLOTHING



PROTECTIVE GLOVES



PROTECTIVE GOGGLES



ANTI-FALL EQUIPMENT

3.3 SAFETY NETS

The air circulator is equipped with propeller that, when in operation, moves with a rotary movement. The driving force is supplied by the electric motor.

To ensure a sufficient degree of protection against accidental contact with moving machine parts, metal safety nets have been provided.

WARNING

It is strictly forbidden to remove and/or tamper with safety nets!
Ensure that the fan is switched off from the supply mains before removing the guard!

WARNING

Safety nets are a safety device. In the event of damage to the nets, proceed with a rapid replacement only with original spare parts because only these are able to guarantee the level of security required by the guidelines and technical standards.

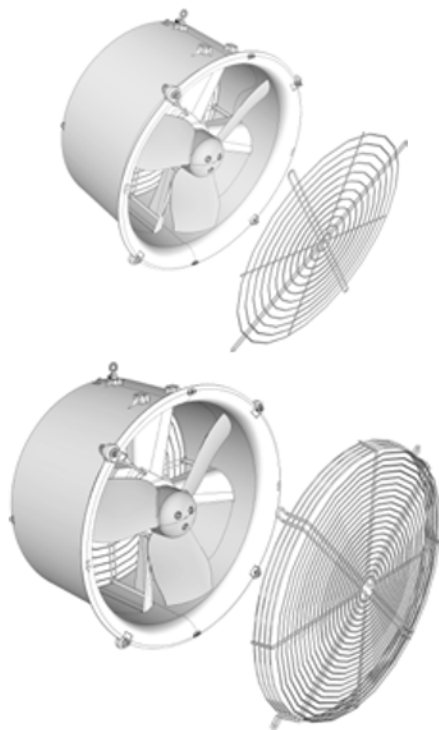
WARNING

Before putting the fan into operation, it is required to verify the presence and correct positioning of the safety nets provided.

WARNING

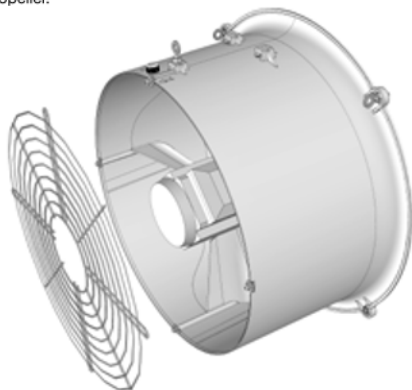
Ensure that the fan is switched off from the supply mains before removing the guard!

In the rear part of the circulator (air inlet side) a double metal safety net is positioned that prevents direct contact with the propeller.



AIR INLET SIDE (top standard net, bottom basket optional)

Just in front of the ventilator (air outlet side) is positioned as well a dual metal protection grid, avoiding direct contact with the propeller.



AIR OUTLET SIDE

3.4 SAFETY SYMBOLS

On the machine, in a visible location, pictorial danger warnings have been applied to draw attention to the presence of residual risks that can not be avoided or sufficiently limited by work organization measures, methods or systems or technical means of protection.

WARNING

The safety symbols applied to the circulator play an important safety function.

CAUTION

It is strictly forbidden to remove the safety symbols.

The following shows the position of safety symbols and their meanings.

SYMBOLS ON FRONT PROFILE

The icons below are located on the sides of the fan.

The purpose of the symbols is to inform the operator about the dangers arising from the rotational movement and suction of the propeller blades.

DANGER

Indicates a residual risk.

MOVING PARTS

Presence of moving parts such as such as propeller, pulleys and drive belt.

RISK OF CRUSHING

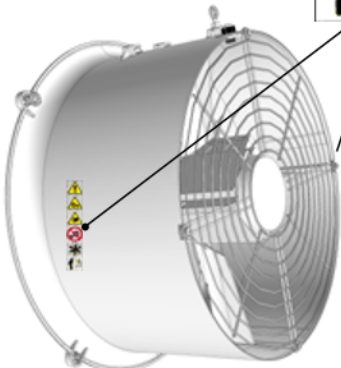
Risk of crushing and/or dragging due to moving parts.

PROHIBITION OF REMOVAL OF PROTECTIONS

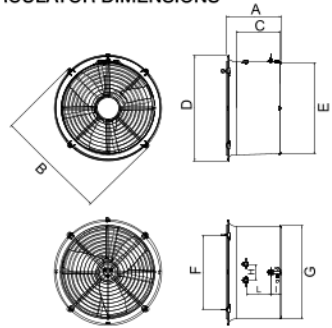
Prohibition of removal and/or tampering with safety protections (nets).

HEIGHT OF INSTALLATION

The user must install the fan at an height greater than 2,7m



4.1 CIRCULATOR DIMENSIONS



TECHNICAL DATA		21P
Dimension A	mm	306
Dimension B	mm	632
Dimension C	mm	251
Dimension D Ø	mm	600
Dimension E Ø	mm	523
Dimension F	mm	424
Dimension G	mm	532
Dimension H	mm	90
Dimension I	mm	54
Dimension L	mm	140
Sound pressure level (L _{pa})	dB	66,8
Net weight	kg	11
Gross weight	kg	13
Box dimension LxWxH	mm	610x610x320

4.2 SOUND EMISSIONS GUIDELINES

The noise levels are specified in the chart of par. 4.1.

CAUTION!

The employer is responsible for verifying the total sound pressure level at the working place. The employer should define in compliance with national laws whether the employee needs personal protection equipment.

Where the sound pressure level is very high appropriate PPE is required.

4.3 MOTOR INCORPORATED INTO THE CIRCULATOR

The electric motor installed inside the circulator provides kinetic energy to the propeller blades directly coupled.

NOTE

For specific information relating to extraordinary maintenance on the electric motor and related spare parts, please contact your local Distributor or Sales representative.

4.4 LIMITS OF USE OF THE CIRCULATOR

The machine has been designed to work in the following conditions:

- Environmental temperature between 0°C and +40°C.
- Maximum relative humidity 80% at a maximum temperature of +40 ° C.
- Maximum altitude 1000 m a.s.l

4.5 TECHNICAL DATA OF THE CIRCULATOR



Model	Diameter Ø	Voltage	Frequency	Thrust	Propeller Speed Rotation	Absorbed power	Thrust Efficiency Ratio	Air flow	Air flow*	Specific power input	Efficiency
ACF21P 5000	20 inch / 508 mm	220/240 V 380/420 V	50 Hz	2.43 lbf 1,10 kgf	966 RPM	157 W	15.5 lbf/kW	4.978 m³/h 2,930 ccfm	7.040 m³/h 4,144 ccfm	32 W/(1000 m³/h)	18.7 ccfm/W
		220/270 V 380/460 V	60 Hz	2.55 lbf 1,16 kgf	1155 RPM	139 W	18.4 lbf/kW	5.097 m³/h 3,000 ccfm	7.208 m³/h 4,243 ccfm	27 W/(1000 m³/h)	21.6 ccfm/W
ACF21P 6300	20 inch / 508 mm	220/240 V 380/420 V	50 Hz	3.94 lbf 1,79 kgf	1448 RPM	246 W	16 lbf/kW	6.337 m³/h 3,730 ccfm	8.962 m³/h 5,275 ccfm	39 W/(1000 m³/h)	15.2 ccfm/W
		220/270 V 380/460 V	60 Hz	3 lbf 1,36 kgf	1126 RPM	187 W	16.4 lbf/kW	5.590 m³/h 3,290 ccfm	7.905 m³/h 4,653 ccfm	33 W/(1000 m³/h)	17.6 ccfm/W
ACF21P 7400	20 inch / 508 mm	220/240 V 380/420 V	50 Hz	5 lbf 2,27 kgf	1426 RPM	441 W	11.3 lbf/kW	7.170 m³/h 4,220 ccfm	10.140 m³/h 5,968 ccfm	62 W/(1000 m³/h)	9.6 ccfm/W
		220/270 V 380/460 V	60 Hz	5.39 lbf 2,44 kgf	1691 RPM	364 W	14.8 lbf/kW	7.442 m³/h 4,380 ccfm	10.524 m³/h 6,194 ccfm	49 W/(1000 m³/h)	12 ccfm/W

*Using standard ANSI/AMCA method 230-99

AMCA 230-15 Bess LAB test n. c22334; c22330; c22336; c22335; c22339; c22340.

Note: tested with 2 safety nets.

Data relative to Directive 2009/125/EC ECO Design for fans*

Model ACF	ηe	Measurement Category	N	VSD	Pe	q	Psf	Rpm	Specific Ratio
	%				kW	m³/s	Pa		
21 - 5000	30,8	A - Static	41,9	NO	0,18	0,925	60	954	1
21 - 6300	37	A - Static	46,8	NO	0,284	1,05	100	1430	1
21 - 7400	37,2	A - Static	45,8	NO	0,442	1,468	112	1320	1

* Ventilators tested with settings pursuant to regulation (EU) No.327/2011, Attachment II – 1.5

5.1 TRANSPORT AND LIFTING

CAUTION

During the loading, unloading, transport, handling and assembly phases of the machine, there are mechanical type risks. Loss of stability problems may occur during transport phases for installation purposes.

Therefore, transport and lifting operations must be performed by qualified and properly trained personnel, equipped with suitable means for the purpose such as pallet trucks, lift trucks and aerial platforms.

CAUTION

To not be exposed to risk the personnel used for lifting and transport of the machine has prescribed the use of personal protective equipment (PPE).

NOTE

The weight of the machinery or each package is also indicated on the sticker specifications.

NOTE

In no event shall . be held responsible for damage to property and/or persons due to improper handling procedures of the machine or use of unsuitable equipment.

The circulator is delivered by . in one of the following ways, according to the supply contract:

1. PRE-ASSEMBLED PRODUCT

Single module packaged and placed on a pallet, in the case of multiple machines, the packaging may have different configurations on pallets.

2. PRODUCT TO BE ASSEMBLED

Various modules categorized according to content components and of various sizes, packaged and placed on pallets.

CAUTION

In the manual lifting phases, objects can pose risks to health caused by improper lifting technique.

Therefore, it is prescribed that the lifting of objects weighing more than 20 kg is carried out by 2 or more operators.

5.2 PACKAGING AND DISPOSAL CHECK

The machine must be delivered securely packed and in perfect condition. Despite the caution exercised, it is possible that both the packaging and its contents are damaged during transport.

Upon receipt of the equipment, examine the transport container to check for any visible damage.

Open the transport container and examine the contents for any signs of damage inside. If damage is found, contact to determine the appropriate type of intervention.

reserves the right to carry out an inspection.

The packaging must be disposed of with due respect for the environment. Recycling of packaging in the production cycle saves raw materials and decreases the amount of waste.

Refer to the requirements of standards in force in the country of installation of the machine.

6.1 INSTALLATION

WARNING

Only suitably trained personnel can carry out installation and maintenance on the circulator.

Failure to observe these instructions could cause product malfunction, equipment damage and serious personal injury.

CAUTION

The ventilator can be mounted in vertical or horizontal position.

Ensure an open area on the air inlet side, without obstacles and/or buildings, up to a distance of 10 m.

Do not obstruct in any way, even partially, the air inlet section of the circulator.

WARNING

The lifting of the machine for installation purposes to an elevated position must be carried out in safe conditions. Therefore, these operations should be entrusted to professionals.

Given its weight, the circulator will be lifted by self-propelled aerial platforms or forklift with sufficient elevation capacity.

The lifting means must have performance characteristics greatly exceeding what is required for the lifting of the circulator.

In the case of using ropes for lifting, these must have a bearing capacity of at least three times the weight of the circulator.

The use of individual safety devices is required, particularly:

- protective gloves and clothing resistant to cutting due to the presence of sharp materials such as metal profiles;
- Safety belts for high installation in case you do not have a self-propelled aerial work platform with safety railing.

WARNING

That precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other fuel-burning appliances.

6.2 INSTALLATION OF THE CIRCULATOR

The air circulator can be installed with chains (not included) using eyebolts (included).



If it is necessary to install the circulator directly to a support, it is possible to use all 3 fixing spots on the upper part, using the supplementary screws supplied (dome large head M8x15 screw + self lock M8 nut).

If it is necessary to use other screws, be careful not to penetrate the fan body.

NOTE

it is necessary to use all three hooks and not to exceed the tightening torque (10 Nm)

NOTE

The support to fix the circulator must have suitable resistance and stability characteristics to support the weight and vibrations induced of the circulator.

The determination of the characteristics of the support is delegated to the installer and only the latter can assess their suitability.

It is forbidden to install the circulator on movable supports, such as doors or shutters, with strength and rigidity, not fit for purpose.

In no event shall be held responsible for damage to property and/or persons caused by installation of one or more circulators on unsuitable supports.

E.g. installation of a support plate (optional), support plate can rotate:



E.g. installation on a pole (it and its screws not supplied)



E.g. installation with a hook (not supplied):



6.4 ELECTRICAL CONNECTION

WARNING

The power supply connection must be made by trained, qualified personnel in compliance with safety regulations currently in force in the country in which the equipment is being installed.

Before attempting to connect to the mains supply, power down the power supply line by opening the main switch.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

In case it is necessary to replace the cord please follow the connections shown in the wiring diagram in the end part of this manual.

- The fan is supplied with no electrical actuating and control devices.
- The label placed under the motor cable outlet indicates the type of supply voltage for which the motor has been configured.
- Check that the power supply available at the installation location, correctly provides the required voltage and frequency values.
- The installer must provide a control panel that complies with the requirements of International Electrotechnical Commission standard IEC 61439 and proper wiring that complies with IEC 60204 and IEC 60364.
- The following power system protection devices must be installed:
 - Safety lockable isolating switch
 - A Miniature Circuit Breaker (MCB) (correctly-sized referring to the motor nameplate data) and a possible Residual Current Device (RCD) (to be assessed depending on the system configuration).
 - A start/stop switch
 - An emergency stop button with mechanical lock and manual reset.
- It is necessary to correctly size the cables in relation to the motor nameplate data, their length and to the installation conditions.
- The machine shall be properly connected to Earth via a dedicated yellow/green cable in such a way as to create an equipotential bonding circuit that is effective against the risk of electrocution. The choice of whether to install an RCD which will intervene if there is a discharge to earth is left to the installer (reference standard IEC 64-8).

6.5 SPEED ADJUSTMENT (Only for 3-phase type motors)

The fan motor speed can be controlled by means of suitable frequency converters.

If frequency converters are used, in order to ensure that the machinery complies with Electromagnetic compatibility (EMC) requirements replace the cable and the cable gland supplied with shielded symmetrical cables and EMC cable glands (i.e. cable glands providing 360 ° bonding between the cable shield and the motor housing).

You also need:

- to use shielded symmetrical cables and EMC glands along the entire line between the frequency converter and the machine, for example on the converter, possible junction boxes, safety switches, motor etc...;
- do not exceed the motor/propeller rotation speed indicated in the technical data table;
- set the converter so that the speed can be regulated within the two limits:
 - maximum speed - indicated in the technical data table;
 - minimum speed - greater than or equal to 50% of the rated speed.
- the design and sizing of the electrical system are delegated to the installer or to a deputy; all work must comply with the rules in force in the destination country.
- Comply with the provisions laid down in the frequency converter manufacturer's installation manual.

6.6 INITIAL START-UP

Before starting the fan:

- make sure you have not left any object or tool inside the machine;
- ensure that cement or lime residues have not been deposited on the blades during installation work; the resulting fan imbalance would cause harmful vibrations causing rapid wear of the propeller bearing;
- ensure that the wire mesh safety guards are securely fitted to the machine;
- ensure that staff keep a safe distance (at least 30 metres) from the machine.
- check that the electrical protection and safety devices are operating correctly.

Once the fan has been started:

- verify that it has been correctly installed checking to see that there is no unusual vibration and/or noises. If there are any of these present then switch off the machine, identify the problem and rectify it;
- check that the fan rotation direction is anticlockwise when viewed from the fan air inlet side; if the rotation direction is clockwise and hence erroneous then invert the two wires in the power line (three-phase motors).

7.1 MAINTENANCE REQUIREMENTS

Air circulators made by **TRÄDGÅRDSTEKNIK** are designed and manufactured for long life even under the most severe service conditions.

Please remember however that this equipment HAS moving parts, and as such they need to be checked regularly.

It is therefore recommended to implement a preventive maintenance program, which will be entrusted to skilled and competent personnel.

The daily inspection must be performed to prevent any failure due to adverse effects of the working environment such as temperature, humidity, dust, dirt and vibration, and other factors.

WARNING

The maintenance of the circulator must be performed only by trained personnel in compliance with safety standards and requirements set forth in this Manual.

Before connecting to the mains, isolate the power line by opening the main switch.

WARNING

In the machine maintenance and inspection phases there is a risk of entanglement and cutting of clothes, limbs, hair or other parts of the body by the fan.

During these phases acquire the PPE, in particular safety clothing and gloves, tie long hair back and do not wear rings, bracelets or necklaces.

CAUTION

To ensure a high level of safety, use only original spare parts available from your supplier. In case of using non-original parts, full functionality and compliance with EC directives mentioned in the Statement of Compliance are not ensured.

WARNING

When working on the machine, it is necessary to make all personnel are aware of this.

In the event of maintenance work, affix a warning sign onto the power supply switch to inhibit accidental operation by a second operator.

Regularly carry out the following operations:

- Ensure that the inlet and outlet openings are clean and free of objects.
- Ensure the circulator is always dry. If the circulator appears wet, dry it immediately; identify the cause and remedy to prevent corrosion.
- Check the cable connections and connectors. In the event of loose connections, damaged cables, or other abnormalities, stop the circulator immediately and seek specialised assistance or technicians.
- Check for bolts or nuts that are loose or rusted because of environmental conditions. In this case, tighten or replace.
- Check for any deposits inside the equipment. In the case, remove the deposits by compressed air jets.

The following table specifies the periodic routine checks that the user must perform to maintain the machine in good condition.

INTERVENTION	FREQUENCY
LUBRICATION OF THE MACHINE	never
CLEANING OF THE MACHINE	weekly
SCREW TIGHTNESS CHECK	quarterly
GENERAL CHECK (look for any evidence of rupture, cracks or dents)	quarterly

7.2 MACHINE CLEANING

WARNING

Never perform cleaning operations with the circulator running.

Also for external cleaning of the machine, the safety nets and the shutter blades, prior disconnection from the mains supply required.

Observe the following provisions, to be performed regularly to ensure proper cleaning and proper operation of the product.

- Clean the motor casing regularly with a brush or compressed air (do not spray water or steam).

Regular cleaning of the motor is particularly important when the circulator operates in dusty or dirty environments, because the motor must be able to dissipate the heat generated.

On the motor models where they are present, use the plastic caps placed on the cover and on the drawer of the motor to discharge any condensate accumulated inside the motor itself; at the end of the operation, restore the initial conditions.

- The propeller blades do not require special maintenance because they are self cleaning.
- When using a high pressure cleaner for cleaning, do not direct the jet of water or steam directly on the motor.
- Do not use aggressive detergents

7.3 MACHINE LUBRICATION

The motor bearings are permanently lubricated (40.000 hours at 40°C) and requires no special care.

7.4 SCREW TIGHTNESS CHECK

Regularly check the torque of the bolts and nuts in the following points:

- M5 flange motor screw: 5 Nm + threadlocker.
- M6 screws between the motor and the fan body: 5 Nm + threadlocker.
- M6 screws between the propeller and the motor: 5 Nm + threadlocker.
- M6 inlet safety net screws + eyebolt M6: 5 Nm + self-lock nut.
- M8 screws on fixing spots + eyebolt M8: 10 Nm + self-lock nut.

CAUTION

Incorrect values in the torque can cause damage to the equipment!

7.5 TROUBLESHOOTING

WARNING

The repairing of the circulator must be performed only by trained personnel in compliance with safety standards and requirements set forth in this Manual.

Before any type of repair, isolate the power line by opening the main switch.

Problems of non-operation may be due to the following causes:

- the main switch is off;
- incorrect adjustment or failure of the automatic control;
- defective fuses;
- dirt in the propeller and/or the inner ring of the conveyor;
- open circuit in the connection box or outlet.

If assistance or service is necessary by technical personnel, contact your local sales representative or Distributor.

CAUTION

In the event of repair, exclusive use of original spare parts is required.

The original spare parts are guaranteed by the manufacturer for 12 months.

On any non-original spare parts used, there is no guarantee that they can withstand the stresses to which they would be subject during normal operation.

8. PROLONGED MACHINE INACTIVITY

If the circulator is placed out of service and kept inactive for an extended period, it must be protected from humidity and bad weather.

Disconnect the circulator from the mains power supply.

NOTE

For correct storage of mechanical parts and the electric motor, it is recommended to eliminate the humidity and conservation at a temperature not lower than -20°C .

9. DEMOLITION AND DISPOSAL

Any demolition of the machine must be done by qualified personnel who are trained for the job.

CAUTION

During the deinstallation and demolition of the machine, use of personal protective equipment (PPE) is required.

Strictly adhere to the same instructions and recommendations already presented in this Manual in the installation section.

During the demolition of the machine, particular attention must be paid to the disposal of the various components that it comprises of.

To dispose of the machine it is necessary to follow the different procedures provided for in the country of installation of the material for disposal.

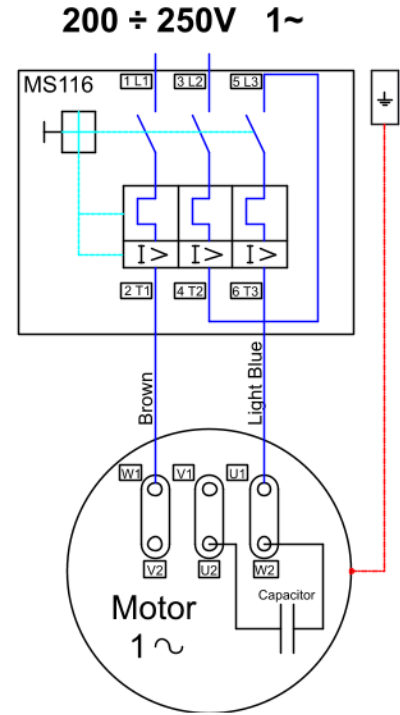
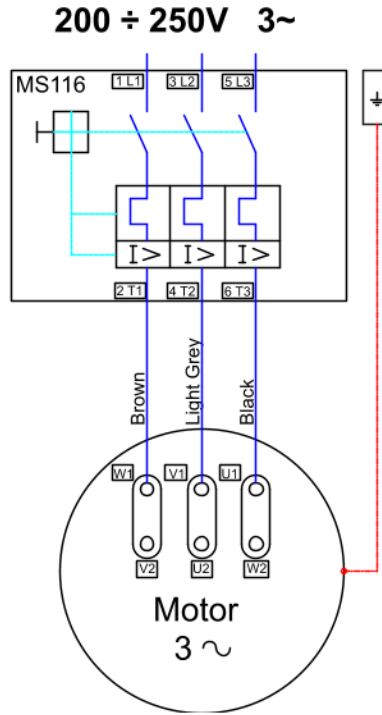
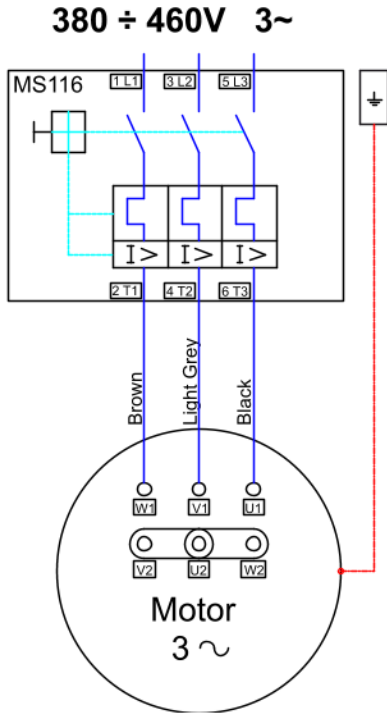
The materials used in the construction of the machine are mainly metal alloys, for the structural parts, and the electric motor.

The machine is not made with special materials which require any special disposal process. However, in case of destruction, the materials that make up the machine must be disposed of in a differentiated manner in the appointed collection centres.

For the majority of the metal mass, it is sufficient to subdivide the stainless steels parts and those in other metals and alloys, to correctly send to be recycled by melting.

To dispose of the electric motor, comply with that indicated by the manufacturer.

WIRING DIAGRAM





Postadress:

TRÄDGÅRDSTEKNIK AB
Helsingborgsvägen 578, Varalöv
262 96 ÄNGELHOLM

Telefon : 0431-222 90
Bg.nr : 5743-7980
Org.nr : 556409-6120

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