

# USER MANUAL



## Stainless Steel Ventilation Units

# **CENTRIFUGAL FANS INSTALLATION AND USER MANUAL**

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## 1. INTRODUCTION

This manual contains the necessary information for the installation, use, and maintenance of the equipment that makes up a heavy-duty **ETC Group SRL** fan. The maintenance procedures are designed to allow the equipment to operate effectively with minimal repairs and replacements.

The products must be used according to the information provided in this manual and the assembly drawings of the fan. Regular inspections must be carried out to ensure the safe and efficient operation of the fan. Failures due to improper use of the installation, usage, and maintenance procedures can lead to accidents causing damage to personnel or equipment.

## 2. SAFETY REGULATIONS AND CE MARKING

The standards and recommendations outlined below predominantly reflect the current regulations regarding safety and are therefore primarily based on compliance with such general standards. Therefore, we strongly recommend that all exposed individuals working near the machine strictly adhere to the accident prevention regulations in force in their country. We disclaim any responsibility for any damage caused to persons and property resulting from non-compliance with safety standards, as well as from any modifications made to the fan. The fan described in these instructions complies with safety standards and health requirements of the Machinery Directive 2006/42/EC. With proper installation, maintenance, and operation according to the standards, it poses no risks to the safety and health of individuals and the safety of goods. With this declaration from the manufacturer, pursuant to the Machinery Directive 2006/42/EC Appendix II B, it is stated that the fan described in these operating instructions is intended for installation within a machine, and its commissioning is prohibited until it is demonstrated that the machine or system in which this fan is incorporated complies with the provisions of Directive 2006/42/EC, including subsequent amendments.



A fan as described below is a machine subject to high dynamic stresses whose service is permitted exclusively to qualified personnel.

Before commissioning the fan, it is absolutely necessary to read the chapter on general safety regulations in these operating instructions. Even before commissioning and after carrying out inspection and maintenance work, it is necessary to ensure that the fan and the pipes connected to it are free from foreign bodies, tools, equipment and service vehicles. The various protective devices, such as emergency stop switches, shaft protection, coupling protection, etc. must be installed in a functional manner. It is necessary to make the danger area of the fan inaccessible to non-authorized personnel and to start the fan from a safe distance.

## 2.1 SAFETY WARNINGS

### 2.1.1 FUNDAMENTAL SAFETY

The fan has been constructed according to the current state of the art and the approved technical regulations on safety. Nevertheless, during use, there are imminent dangers for the user as well as for the machine; therefore, the fan must only be used under impeccable technical conditions, in a manner consistent with its intended purpose, with an awareness of safety and hazards, and in compliance with these operating instructions. In particular, any service anomalies that may compromise safety must be immediately addressed.

### 2.1.2 USE IN ACCORDANCE WITH INTENDED PURPOSE

The fan is intended solely for conveying the gases listed on the machine's data sheet, under the observance of the indicated service parameters. Any different or incorrect use of the machine is considered non-compliant and may be harmful to safety. The manufacturer will not assume any responsibility for damages resulting from non-compliant or unauthorized use. The risk is solely borne by the user. Compliance with the intended purpose also includes adherence to the service prerequisites, maintenance, and preventive maintenance prescribed by the manufacturer. The use of the fan and related routine and preventive maintenance work is permitted only for personnel familiar with the machine and trained regarding the hazards. The prescriptions for accident prevention, as well as the usual technical safety regulations, must also be strictly observed. Any modifications made to the machinery on one's own initiative exclude any liability on the part of the manufacturer for any resulting damages.

### 2.1.3 GENERAL SAFETY WARNINGS

- In addition to the warnings provided in these operating instructions, it is also necessary to observe the general safety and accident prevention regulations.
- The user is generally required to take the necessary measures to ensure the machine operates under impeccable conditions.
- It is not permitted to make modifications to what has been executed in the factory without written consent from the **ETC Group SRL**
- For errors caused by improper commissioning by the customer, ETC Group SRL does not assume any responsibility.
- During transport, the fans must be lifted with great care, taking care to protect the impeller and the shaft from blows and impacts.
- It is not allowed, even for short periods, to exceed the permitted temperatures and maximum RPM in accordance with the data sheet.
- Before making the electrical connection of the motor, it is necessary to first observe the safety warnings and commissioning instructions, as well as the IEC regulations prescribed by the motor manufacturer.
- It is necessary to ensure that no quantities of liquid can enter the fan, or,



of foreign substances, which could consequently be conveyed

by the impeller. Conveying liquid substances will destroy the impeller! except in the case of aspirators in

It is also necessary to ensure faultless evacuation of condensation from the

-fan casing. Deposits, corrosion and visible wear on the impellers are not permitted

- The bearings have been designed for an adequate duration: this data depends decisively

on correct maintenance.

- Only the pre-established lubricants may be used, or those with the same

- Fans may only be used under normal operating conditions.

- Vibration values, for alarm and disconnection conditions, must be established based on the limit values set in the operating instructions! Service above the alarm value is only permitted for a short period to locate the cause of the oscillations! Sudden deteriorations in oscillation values may indicate a malfunction of the machine or a component thereof, thus compromising the safety of the service! It is necessary to immediately locate the causes and take the necessary measures for remedy.

In order to achieve an excellent machine lifespan, it is necessary to limit vibrations to a value of 4.5 mm/s.


- Parts of the fan that may come into contact with people during normal operation must be protected, isolated, or marked with danger signs, as well as the drive and power supply systems, whose external surface temperature is greater than +70°C or less than -10°C.

- The base of the fan, which supports the electric motor, the electric motor itself, and all the electrical components mounted on the fan, must be grounded. The accumulation of electrostatic charges must be avoided by grounding the components for which this danger exists.

- Regular maintenance must be performed.

## 2.1.4 ELECTRICAL CONNECTION OF THE MOTOR

The indications on the performance label, the wiring diagram located in the terminal box, and the additional instructions provided by the manufacturer must be observed. In order to ensure a safe electrical connection over time, the relevant work must be carried out in accordance with the operating instructions provided by the motor manufacturer. Grounding must be performed according to the prescribed regulations.

	<p>The electrical connection must only be made with the system in a de-energized state! The system must also be protected from unintentional operation!</p>
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### 3. SHIPPING AND RECEIVING

The conditions of supply, regarding packaging and shipping, are those agreed with ETC Group SRL and reported in the order. All equipment is carefully inspected and prepared for shipment. Incorrect handling during transport may cause damage to the fan and the control mechanisms. The equipment, if supplied EXW, becomes the property of the purchaser upon loading onto the means of transport, at the risk of the recipient. The purchaser should therefore carefully inspect all equipment before accepting delivery from the carrier. Any missing parts, breakages or damage, notified at the time of delivery, should be indicated on the carrier's delivery note and countersigned by the driver or the carrier's representative. Damage notifications, made after delivery, should be reported immediately to the carrier and an inspection report should be compiled on the damage detected. Where possible, fans are shipped fully assembled

### 4. MANIPULATION

The fans are equipped with lifting brackets and, therefore, only these should be used for such operations. The safety of personnel and the protection of the fan from possible damage are of fundamental importance during the handling of equipment at the installation site. It is recommended to use only rope or fabric slings. However, in the event that chains or slings made of metal cables are used, appropriate padding should be placed at all contact points.

Some parts of fans, shipped unassembled, require special care. For lifting the shaft or the shaft-impeller assembly using a hoist or a crane, the straps' ropes should not be passed over ground surfaces for the installation of bearings or the impeller.

### 5. STORAGE

The builder recommends that the installation take place immediately after the receipt of the equipment. If this is not possible, the equipment should be stored in a protected and dry area to preserve it from dust and corrosion.

High humidity and strong variations in ambient temperature can cause condensation to form inside the bearings, potentially leading to oxidation, to varying degrees, and incipient corrosion, resulting in damage to them.

For machines awaiting installation, with rolling bearings, already assembled, it is essential, once every 2 or 3 weeks, to manually rotate, if possible, or in another way, the fan shaft for several dozen turns, so that the grease in the bearings covers the points of the bearings, possibly less protected, and also to avoid the accumulation of condensation inside them. In the case of machines with belt transmission, it is advisable to reduce the tension of the belts by slightly loosening the tensioners. The belts should be retightened correctly just before starting up. If the storage time extends for several months, particularly in humid environments, periodic inspection of the bearings themselves may be essential.

## 6. MACHINE ANCHORAGES

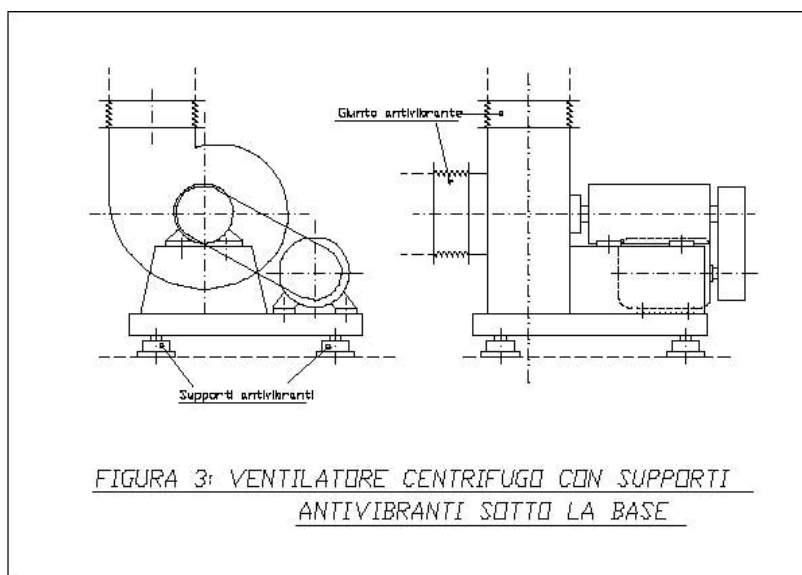
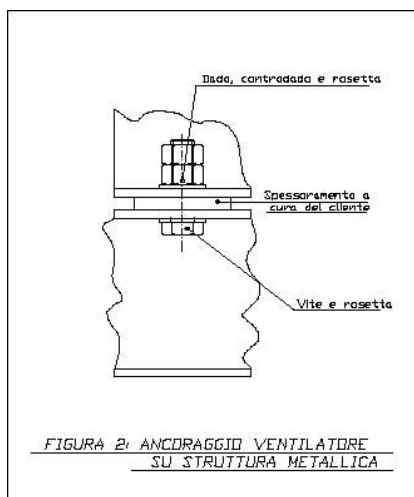
In order to allow for a permanent alignment of the transmission components and to avoid excessive vibrations, it is absolutely necessary to have rigid and well-leveled anchors. Due to the various possible loading conditions caused by wind, in the case of outdoor installations, the soil conditions of the sub-foundations, and the possibility of resonance vibrations, the manufacturer of the fan, ETC Group SRL, cannot be held responsible for the design of the anchors themselves. The anchors should be designed by competent technicians and be capable of ensuring sufficient stability, in addition to having the natural vibration frequency of the anchors themselves sufficiently distant from the rotation frequency of the fan and the motor. The assembly drawings, in the possession of the user, indicate the position of the fastening holes of the fan to the anchors. Inadequate anchors can represent one of the main causes of excessive maintenance costs.

### 6.1 RIGID ANCHORING ON METALLIC STRUCTURE

Structurally, steel foundations for PBN fans must be sufficiently rigid to ensure permanent alignment and be capable of supporting the weight of the equipment, as well as the dynamic loads imposed by operation with minimal deformation. Locating fans installed above ground level near or on a rigid wall or sturdy column, raised platforms or supports must be constructed so as to be rigid, balanced and strong in all directions. Figure 2 shows a rigid fan anchorage on a metal structure.

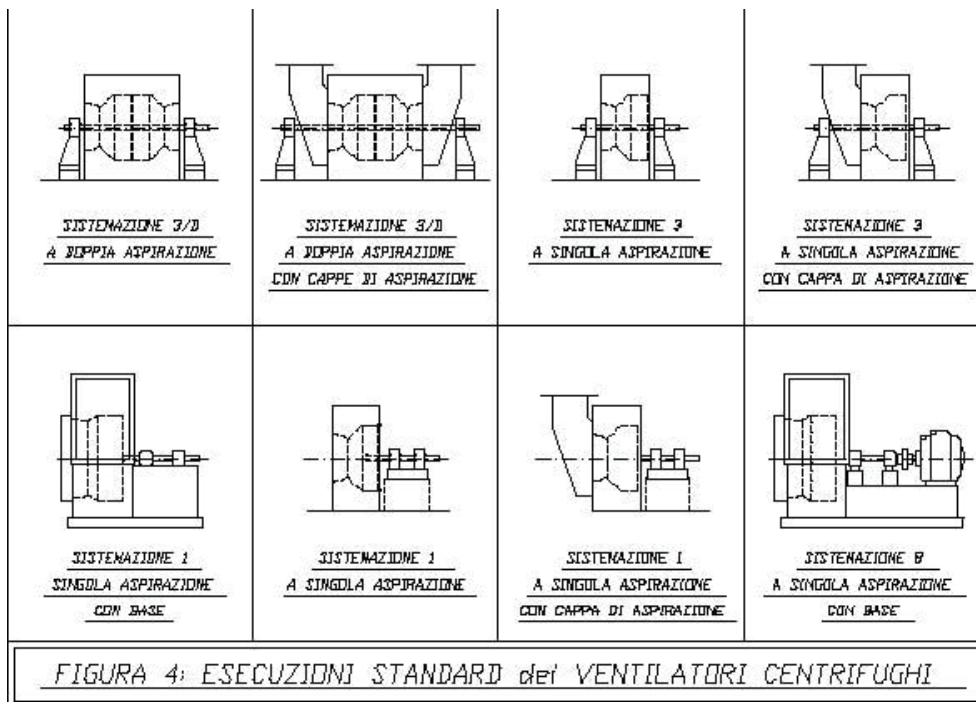
### 6.2 ELASTIC ANCHORING ON METALLIC STRUCTURE

Dal punto di vista strutturale, le fondazioni in acciaio per i ventilatori PBN devono essere sufficientemente rigide da assicurare un allineamento permanente ed essere in grado di sopportare il peso dell'equipaggiamento, oltre ai carichi dinamici, imposti dal funzionamento con minima deformazione. Sistemare i ventilatori installati sopra il livello del suolo vicino o sopra ad una parete rigida o ad una colonna robusta, piattaforme rialzate o supporti devono essere costruiti in modo tale da risultare rigidi, equilibrati e fortemente in tutte le direzioni. La figura 2 mostra un ancoraggio rigido del ventilatore su struttura metallica.



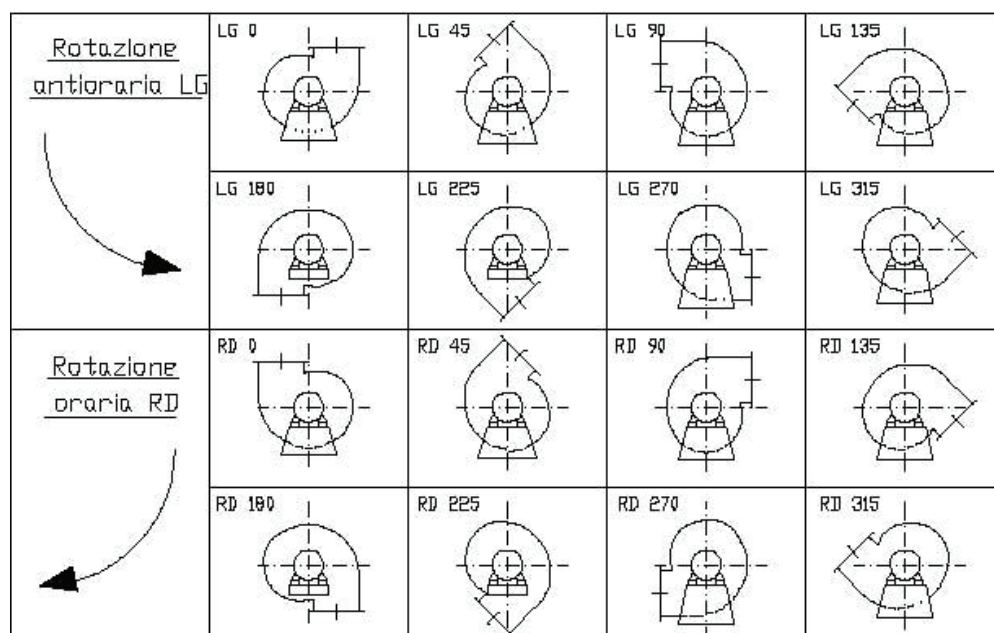
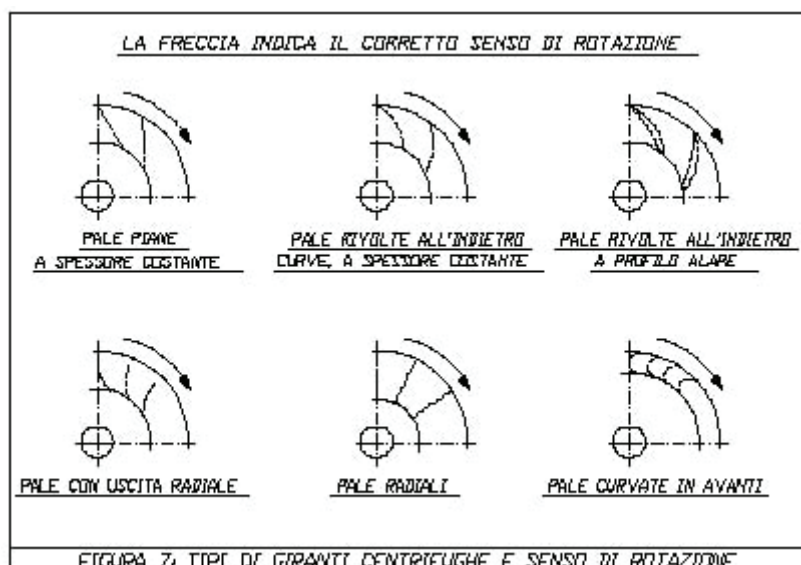
## 7. COMPONENTS OF FANS

This section describes the components and provides the standard nomenclature for the direction of rotation, the positions of the intake and discharge ducts, the most common executions, and the profile and direction of rotation of the impellers. The components of all types of fans are discussed; the drawings provided with the equipment show which components are part of your fan. Figure 4 shows the terminology used in the industry to describe the executions of fans.



### 7.1 IMPELLERS

All impellers, along with their shafts, are shipped assembled as a single component, with the surfaces painted or coated with a rust protective. Each rotor has already undergone static and dynamic balancing. Figure 7 shows the various types of the most common impellers of centrifugal fans and their direction of rotation.



## 7.2 SHUTTER ON THE SUPPLY AIR OUTLET AND/OR ON THE EXHAUST HOODS

The shutters are mounted in sections separate from the spiral and the hoods. To avoid damage, during The shutters are mounted in sections separate from the spiral and the hoods. To avoid damage, during installation the partializing blades must be closed. The leverages of the blades are adjusted in such a way as to achieve a good seal when the shutters are closed. At the time of assembly, the shutters must be checked to ensure that the blades and leverages operate without noise or jamming. Refer to the fan assembly drawing to ensure that the shutters are correctly installed. Do not proceed if you are not sure about this. If the supports of the partializer are of the relubrication type, proceed with the lubrication operation before putting the fan into operation. At the start-up of the fan, the shutters will normally be closed. Do not operate the fan for more than a few minutes with the partializing blades in this position (closed).

## 7.2 COOLING SYSTEMS OF THE SHAFT

For fans that handle very hot gases, heat shield discs are supplied. They consist of two half-cast aluminum centrifugal impellers, mounted on the fan shaft between the scroll or the suction hoods and the supports.

## 8.0 INSTALLATION

This section includes general procedures for installing heavy-duty fans, which are shipped unassembled. Installation of other types of fans may differ slightly from the following. Review the assembly drawing supplied with the equipment.

### **WARNING**

To ensure safety conditions during installation, make sure that it is used only qualified personnel suitable equipment.

## 8.1 IDENTIFICATION OF COMPONENTS

Before starting the assembly of the fan, familiarize yourself with all the individual components by using the assembly drawings and reading Section 7 of this manual.

### 8.1.1 SHAFTS WITH IMPELLERS

The shafts of the fans are coupled to the impellers at the factory, so you only need to ensure that there are no exchanges between them in the case of multiple identical machines.

### 8.1.2 SCREWS AND HOODS

The paired parts of all sections of the screw and hoods are marked with the identification number of the fan. The direction of rotation is indicated on all units by applying a sticker or a metal arrow or with paint on the casing.

## 8.2 POSITIONING OF THE LOWER PART OF THE SCREW

Transport the screw to the installation site. If it is divided into two or more parts, only position the lower part. Avoid transporting the screw with fork trucks or car lifts. During the positioning operations, ensure that the foundation fastening bolts are clean. Carefully lower the screw with the fastening bolts, taking care not to damage the threads. Temporarily place spacers under the screw that are approximately similar in size to the layer of mortar that will be poured. The spacers (about 100 mm wide) should be flat and aligned with the edges of the corners of the base, on both sides of each fastening bolt. Subsequently, connect the hoods to the screw. These can be welded or bolted to the screw itself.

### 8.3 INSTALLATION OF SUPPORTS

Depending on the type of application, a certain variety of ball bearings, roller bearings, and sliding bearings can be used. General information for each type of bearing is provided separately.

### 8.4 TRAPEZOIDAL BELT TRANSMISSION

This is a type of control used in fans in arrangement 1, 9 and 12 with limited power. It consists of two ribbed pulleys and a set of V-belts. The motor can assume 4 positions with respect to the position of the fan and the transmission. Figure 8 represents these possible positions. The motor must be mounted on belt tensioner slides or a "book" tensioner.

V-belt controlled fans, which are shipped already assembled, are aligned directly at the factory. Due to handling during transport, the alignment must be checked as follows:

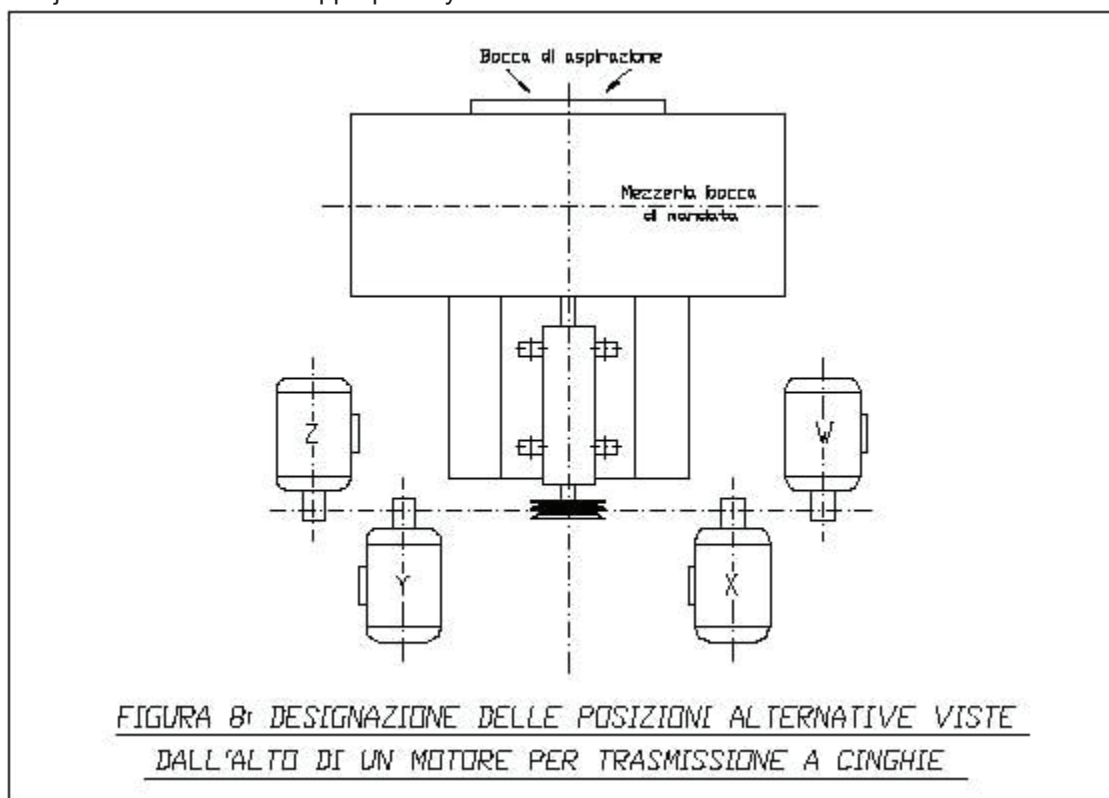
-- Make sure the pulleys are locked in their positions.

Check that the tab is firmly seated in its seat.

- Start the fan at the appropriate time and check that the direction of rotation is correct. Run the fan at maximum speed.

A slight bulge in the belts should appear on the slack end of the belts.

- Adjust the tension bolts appropriately



- To install a trapezoidal belt transmission:

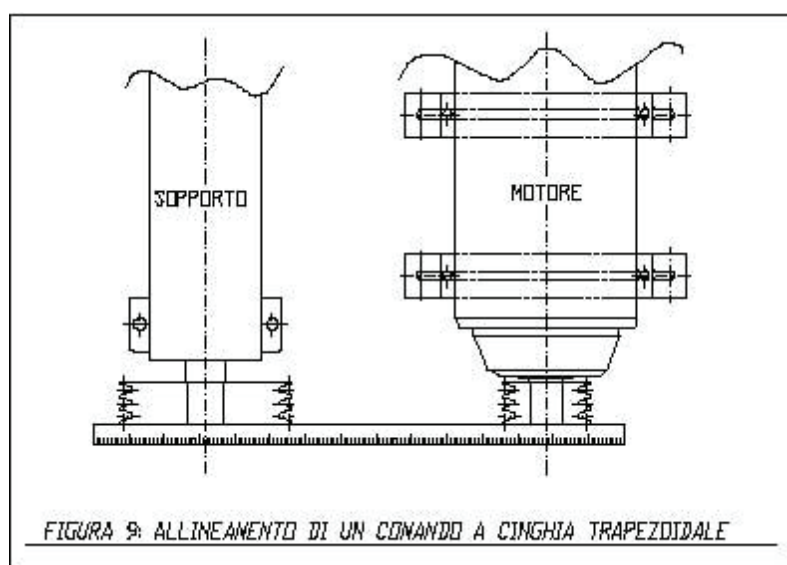
- Clean the shafts of the motor and the fan. Ensure they are free from corrosion. Clean the hubs of the pulleys and coat them with oil to facilitate the entry of the shaft. Remove oil, grease, rust, or burrs from the pulleys.

- Mount the fan pulley on its shaft and the motor pulley on its own shaft. Do not hammer the pulleys to avoid damaging the supports. Secure the pulleys in place.



Make sure that each pulley is as close as possible to its support, without the pulley or the belts hitting it.

- Move the motor so that the belts can be inserted without forcing. Do not force the belts or use tools to insert them into the pulley grooves.
- Arrange the motor and fan shafts so that they are parallel, using a rigid ruler or a taut string (see fig. 9). The belts should be at right angles to the shafts. Improper alignment can cause excessive wear of the belts.
- Before positioning the belts, check that the direction of rotation of the motor is correct.
- Tension the belts by sliding the motor on its base or by rotating the saddle like a book: for the control to be as efficient as possible, the belts must be subjected to correct tension. Excessive tension causes unwanted stress on the supports. Recheck the alignment. Use a belt tension gauge.
- Start the fan and run it at full speed. Adjust the belt tension until a slight bulge appears on the slack side of the belts. If the belts slip when starting, you will hear a squealing noise. Eliminate this by pulling the belts.
- Allow the belts to settle into the pulleys over a few days of operation, then adjust the tension again.



If the shafts have abrasions, carefully remove the burrs with fine emery cloth or a sanding tool. Avoid getting sanding dust in the bearings. Do not apply any products to increase the grip of the V-belts, as they have been specifically designed to operate on the basis of friction contact between the pulleys and the faces of the belts themselves. Such products are not recommended, because they reduce the friction coefficient at a later time. The tension of the belt with variable diameter pulleys must be obtained by moving the motor and not by varying the pitch diameter of the adjustable pulley.

## 8.5 INSTALLATION AND ALIGNMENT OF FLEXIBLE COUPLING COUPLINGS

A fan shipped with the coupling mounted has already undergone alignment at the factory. Since transport can cause displacements, check the alignment by following the appropriate procedure. After checking the alignment, but before closing the coupling, start the motor to ensure that the direction of rotation is correct.

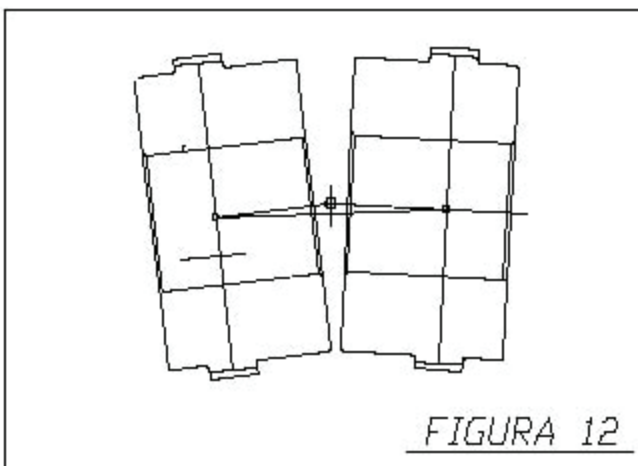
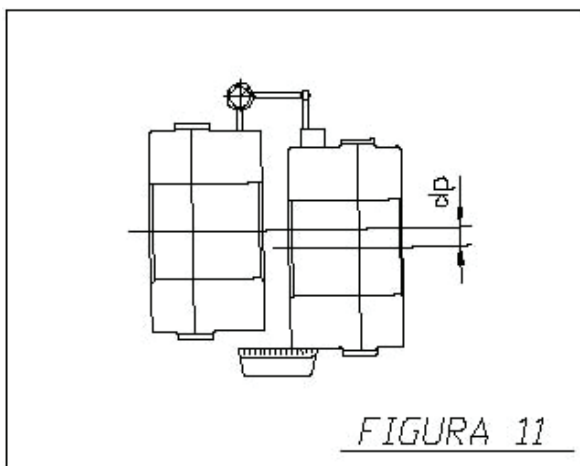
### 8.5.1 INSTALLATION OF THE COUPLINGS

If the parts of the coupling have not yet been mounted on their shaft, the following procedure can be used:

- Mount the flanged sleeves of the coupling, then the hubs on the ends of the shafts.
- The hubs must have faces flush with the end of the shaft itself. If the hubs are lightly struck with a lead hammer, thermally expand them to no more than 150°C in oil.

### 8.5.2 ALIGNMENT OF THE COUPLING

The alignment of the coupling must be done correctly, as the design does not account for shafts that are not properly aligned. The alignment of the coupling can be performed with the aid of laser beam equipment or a dial gauge. Since the position of the coupling part, placed on the fan shaft, is already determined, any necessary adjustment is made by moving the motor. When the alignment is correct, the coupled faces are parallel and the hubs are concentric. For fans, the tolerances are obtained based on the following empirical rule: 0.001 mm of parallel or angular misalignment for mm of shaft diameter with a maximum value of 0.125 mm. To accurately align the coupling, both parallel and angular alignment must be performed. Secure the indicator bracket on one of the two hubs, while the probe of the dial gauge is brought into contact with the alignment surface of the other hub, as shown in figure 11.



### 8.5.3 THERMAL EXPANSION

For turbines and engines (with a shaft diameter of over 30mm), during alignment, it is necessary to take thermal expansion into account. Thermal expansion during operation promotes a good coupling of the joints. For the thermal expansion of turbines, contact the manufacturer or position the joint on the turbine side lower by 0.001mm for every mm of turbine height, measured from the support bracket to the turbine shaft axis. On large engines, position the joint on the engine side lower by 0.001mm for every mm of shaft diameter, but not more than 0.1mm. For example, an engine with a 24mm shaft should be positioned lower by 0.025mm (see fig.13), while a shaft of 100mm would require a lowering of 0.1mm .

### 8.5.4 LUBRICATION

Lubricate the joint before starting, following the manufacturer's recommendations provided in the relevant documents.

### 8.6 EXPANSION JOINTS

For all connections between the fans and the ducts, the use of expansion joints is recommended. The purpose of such devices is to ensure that axial and radial loads are not transmitted to the fan.

i fans that operate at high temperatures or cryogenic temperatures, the presence of a joint

Expansion is an absolute necessity requirement. These joints allow for the thermal expansions of the ducts, without deformations for the fan. Remove any support from the joint before starting the fan. When positioning the fan scroll, take into account the possible thermal expansions. Do not use plugs, clamps, or anything else to force the connection of the ducts to the fan scroll or hoods.

### 8.7 TEMPERATURE PROBES

The resistance temperature sensors require an electrical power supply. Assemble and connect electrically, following the manufacturer's instructions. For most supports, the alarm temperature should be set to values between 80°and 90°C.

### 8.8 HEAT SHIELDS

Install the discs by mounting the two halves on the shaft, between the fan side support and the snail or the shaft nut; bolt them together. After assembly, check that they are secured to the shaft to avoid slipping. The stability of the cooling disc is essential for proper operation. If it is not guaranteed, the heat shield may detach from the shaft, compromising the proper functioning of the machine itself.

## 9.0 MESSA IN DELLA MACCHINA

Fans that are installed or operated improperly pose a risk to people and things. Fans should always be installed by qualified and experienced personnel. The installation must comply with all safety standards and current laws. The device in your possession has been designed to operate safely within certain maximum values of rotational speed and temperature. Do not exceed these limits.

### 9.1 CHECKLIST AND SAFETY

Most companies have good safety checklists. We suggest you also include the following points:

- Flexible joints must be equipped with guards. Do not start the device if the guards have been removed.
- Do not operate the fan with a trapezoidal belt drive without the presence of guards that completely protect the pulleys and the drive motor.
- Use intake grilles on all fans with free intake and discharge on fans without ducts at the outlet itself. Place grilles on the intake hoods in the absence of ducts at the entrance.
- Accessory equipment with moving parts, such as auxiliary fans for air cooling of supports, tachometric generators, or switches on high-temperature fans, must all be equipped with suitable guards.
- Cooling disc protections must be used whenever possible.
- When structural reinforcement brackets protrude from the fan housing, safety indications must be present.
- Before starting, ensure that all parts are secured, that all tools and materials have been removed, and that all personnel have been notified. The appropriate torque values for the bolts, listed below, are based on clean, unlubricated bolts.
- The maintenance and periodic lubrication procedures in Section 10 must be performed.
- A safety protection is essential to ensure that the fan cannot be started when personnel are performing maintenance work.
- The best starting protections involve removing the electrical supply from the drive motor and using specific locks or red signs to warn personnel that the device is off.

BOLT DIAMETER (mm)	TORQUE (kgm)	
5	0.38	0.58
8	1.40	1.7
10	2.80	3.10
12	4.80	5.30
16	12.00	13.40
20	23.50	25.80
22	29.00	32.00
24	37.00	40.50
30	73.00	81.00
36	116.00	129.00
42	210.00	252.00
48	305.00	337.00

## 9.2 PRE-START CHECKLIST

Before the initial start-up and immediately after operation, check the following checklist:

- Carefully review all points in Section 8 of the manual
- All anchor bolts, the impeller hub screws, and the support collars must be tightened.
- Factory-aligned fans may shift during transport or installation. Therefore, the alignment of the impeller with the inlet must be rechecked. If the fan impeller touches the scroll or the inlet when manually rotated, check for possible damage incurred during transport or misalignments on the anchoring structures. Any corrective actions must involve the impeller, the inlet, the flexible couplings, or the trapezoidal belt drive, the seals on the shaft, the seals of the supports, and the motor. Ensure that the scroll has not been distorted.
- Access doors must be properly sealed.
- All safety devices must be in place.
- The joints must be aligned and lubricated.
- The trapezoidal belt drive must be aligned with the properly tensioned belts.
- The connections between the fan and the ducts must not be distorted. The ducts should never be supported by the fan. Use anti-vibration joints at the connection points to the ducts when expansions may occur or when the fan is mounted on anti-vibration supports. All duct joints must be sealed to prevent air leaks. All debris, of any kind, must be removed from the ducts and the fan.
- The dampers and flow regulators must be able to operate freely and the blades must be tightly closed. Adjust the connections to close any blades that are still open. Close all dampers and flow regulators during startup periods to reduce power consumption. This is particularly important for a fan designed for high-temperature use, which is started at ambient temperature or at a temperature significantly lower than the design temperatures. When the fan has reached its operating temperature, the dampers or flow regulator are opened carefully, so as not to overload the motor. Complete closure of the regulators can cause abnormal operation of the fan.

### 9.3 INITIAL START-UP PROCEDURE

After checking the checklist in Section 9.2, follow this procedure:

- During the initial start-ups for the commissioning of the plant and then in the first operating period, it is essential to carry out recordings or measurements, closely spaced in time, of the following parameters:
- Vibrations of the supports (preferably in the horizontal plane normal to the axis of rotation).
- Temperature of the support at the bearings, simultaneously measuring the temperature of the gas, conveyed by the fan, and the ambient temperature near the supports.

It is preferable to make any balancing corrections under real operating conditions with the fluid at maximum temperature. Never stop machines that handle hot gases before the temperature of the gas and the impeller has dropped below 100°C. The impellers of the fans, which rotate alternately in both directions during operation, should not be accelerated in the opposite direction before they come to a stop.

- If the drive motor of a large fan (360 kW or more) has been inactive for an extended period, perform two/three short test starts, avoiding excessive vibrations during the final start-up. Check that the direction of rotation of the impeller is correct.
- Bring the fan to the operating speed. If the fan does not reach this speed within the expected time, disconnect it from the line and check the causes.

Perform checks in case of abnormal vibrations or overheating of the supports and motors. Multi-speed motors should be started at the minimum speed and brought to high speed only after the low-speed operations have been satisfactorily completed. Check the fan speed on units with trapezoidal belt drives and adjust the motor pulley, if it is of variable diameter, to achieve the expected number of revolutions. Balance the air circuit by adjusting the dampers or flow regulators.

- At the first sign of failure or vibration, turn off the fan and try to resolve the issue.
- After a period of operation, normally about 8 hours, recheck all alignments and inspect the supports. It is good practice to change the oil in oil-lubricated supports. Check that all bolts and adjustment screws are tightened. After 7-10 days of operation, check the alignment of the flexible joints and make necessary adjustments due to settling of the anchoring structures.
- After 30 days of operation, all structures and supports should have stabilized their position, so that the anchoring of the fan can be definitively verified, with a final check of the alignment.

- In the case of trapezoidal belt drives, the following conditions must be met:

- The trapezoidal belts must be checked after about 15 minutes of running-in, and if necessary, further tensioned.
- Check the condition of the trapezoidal belts after 3 days of operation; if necessary, further tension them.
- Check the condition of the trapezoidal belts after 10 days of operation.

## 9.4 GENERAL OPERATING CONDITIONS OF FANS

These general conditions contain the basic guidelines for the correct use of fans and, where necessary, are supplemented by the regulations contained in the machine manual.

The details of these conditions are as follows:

All maintenance instructions must be observed:

- All protective devices must be installed correctly.
- Modifications to factory settings are not allowed without our consent.
- Changes to the machinery on your own initiative exclude any liability on the part of the manufacturer for any resulting damages.
- Only the specified lubricants or those with the same characteristics may be used. Deposits of dirt are not allowed.
- In the fixed installation of the machine, suitable foundations must be made for securing the machine according to our recommendations.
- All mechanical stresses caused by the ducts must be kept to a minimum, for example during the installation of flexible connections (compensators). If a maximum support load has been specified in the general conditions, it must not be exceeded in any case.
- The company assumes no responsibility for errors caused by improper commissioning by the customer.
- It is not permitted, even for short periods, to exceed the maximum allowed temperatures and RPM.
- The introduction of foreign bodies into the rotating impeller is not allowed.
- Only the fluid (gaseous components) specified in the order should circulate through the fan. Damage resulting from the use of unspecified fluids is not covered by the warranty.
- Fans can only be used in operating conditions practically free of vibrations. The allowed vibrations at the supports are detected by vibration control devices, through preset alarm and shutdown values.
- Alarm and shutdown functions must be implemented based on the limit values specified in the operating instructions. Service above the alarm value is only permitted for a short period to locate the cause of the vibrations. Sudden worsening of vibration values may indicate a malfunction of the machine or a component of the machine itself, thus compromising service safety! It is necessary to immediately locate the causes and take necessary remedial actions.
- The operation of fans without the installation of vibration control devices is only permitted if the intensity of the vibrations at the supports does not exceed values indicated in the documentation (for fixed installation 4.5 mm/s; for the installation of dampers 7.1 mm/s).
- Continuous operation is only permitted for the operational points indicated in the order confirmation.



- For fans with free intake (absence of inlet ducts), the intake flow must not be disturbed or blocked. The minimum dimensions of the rectangular free area on the front of the fan are  $a=b=2.5*d$  ( $d$ =inlet diameter).
- Deposits, corrosion, and visible wear on the impellers are not allowed.
- Under any circumstances, it is necessary to avoid the penetration of liquids into the impeller and insufficient drainage of condensate from the fan housing.
- Fans can only be inspected with the machine stopped.
- All components with electrical parts must be grounded. Regularly check the tension of the belts at longer intervals.

## 9.5 STORAGE OF MACHINES FOR LONG PERIODS OF INACTIVITY

For proper storage of stationary fans installed in a system, it is good practice to cover the rotating parts of the fans, exposed to the elements and dust, with a plastic sheet, adding silica gel bags or similar inside, to absorb moisture and prevent oxidation of unprotected surfaces and damage to the grease.

It is also advisable to rotate, every 3 or 4 weeks, even by hand, the impeller of the fans, to prevent the load from always bearing on the same rolling elements of the bearings.

At the time of starting the system, it is necessary to carefully check that the rotating parts are perfectly clean, especially near the bearings, and do not exhibit abnormal noise.

## 10. PREVENTIVE MAINTENANCE AND LUBRICATION

**WARNING** Before performing any inspection, ensure that the switch controlling the fan motor is locked in the OFF position, so that the fan cannot start. Do not turn off fans with gas or high-temperature air until the air circuit has cooled down. Oil circulation lubrication systems, if the device is equipped with this option, must be left running for at least 30 minutes after the fan is turned off or until the heat accumulated in the supports has been dissipated.

### 10.1 MAINTENANCE

To ensure trouble-free operation and long life, a regular preventive maintenance and lubrication program must be followed. The frequency with which inspections and lubrication operations should be carried out depends on the operating conditions and the operating cycle of the fan. After the fan has been installed for the first time, we recommend conducting daily inspections. Do not carry out any repairs during the warranty period without the prior approval of the manufacturer.

### 10.1.1 PERIODIC PROCEDURE

Your periodic inspection should include:

FAN COMPONENT	CHECK:
Airflow	Obstructions, dirt, rags, etc. Inlet or outlet ducts. The intake grilles, filters, and dampers must be clean.
Housing, impeller	<p>Are all bolts tight? Is the impeller clean? Dirt can unbalance an impeller. Carefully cover the bearings with plastic sheeting and clean the impeller with steam, water jets, compressed air or wire brushes. Cracks in the impeller? The fan should be taken out of service until proper repairs have been made. (Consult the manufacturer.) Worn impeller blades, wear stripes or scoring on the blades? In most cases, worn areas can be repaired by welding. Contact the manufacturer for the correct welding process for your impeller. Be sure to ground the impeller before welding to avoid bearing damage. Be sure not to contaminate the welds with the impeller coating material or protective layers. Repair all structural welds with electrodes that meet general specifications. Grind and repair all cracks. <b>CAUTION After welding, the impeller balance should be rechecked and rebalanced if necessary. Always check the welding, otherwise repair with special silicone.</b></p>
Alignment of the fan supports, flexible joints, impellers, and nozzles	Regularly check the alignment of the fan supports, flexible joints, impeller, and nozzles. Misalignments cause overheating of the supports or motor, wear of the dust seals of the support, breakage of bearings, and imbalance.
V-belt drive	Check the wear of the belts, the alignment of the pulleys, and the tension of the belts. Replace the belts with a set of new belts, as the latter do not work well together with worn ones due to the difference in length. The belts should not be dirty with grease.
Dampers and flow regulators	Are all connections tight? Check the freedom of movement for all non-return dampers. The blades must be able to close precisely in the closed position. Make the necessary adjustments, monitor the operation of the motors for an entire cycle. Clean the dampers and flow regulators and check for any presence of corrosion and erosion.
	Lubricate all metal joints according to what

Flexible joints	reported in the instructions. Other types of flexible joints do not require lubrication, but must be inspected to check for wear of pins and bushings .
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### 10.1.2 VIBRATION CONTROL OF FANS

It is very important to monitor vibrations in rotating machines.

The lifespan of some components depends on their vibration state. As is known, the main causes can be:

- Imbalances of rotating masses.
- Resonance phenomena of the structure or foundation.
- Thermal expansions.
- Rigid connections between fans and piping .

Depending on the importance of the system on which the machine is installed, monitoring vibrations may be useful or essential.

In installations where the stopping of the machine can cause considerable production losses, permanent vibration monitoring is essential, consisting of one or more vibration detectors, usually placed on the supports, which transmit an electrical signal to a central control unit, normally equipped with two levels (one for alarm and one for shutdown), and with separate recording of the same, so that at any moment, its history can be known and its trend can be studied, with the possibility of scheduling preventive maintenance. For machines where an investment in these control devices is not justified, it is advisable to perform monitoring with portable equipment, preferably with recording of the measurements, which should be taken exactly at the same points, which must be marked with a punch or other means, or better, if the vibration detector is fixed with a permanent magnet.

In addition to the measured value and the corresponding execution date, all surrounding conditions must be noted, such as fluid temperature, time elapsed since startup, phase of the production cycle, etc., so that from the examination of the stored values valid comparisons can be made, and thus, preventive maintenance can be established.

For machines with rolling bearings, where the fundamental element is the monitoring of the operational conditions of the bearings, control equipment must be used that processes the acceleration spectrum in a frequency range where the characteristics of bearing defects fall. This is valid for machines operating at constant rotational speeds; for those with variable speeds, the frequency range must be chosen appropriately, and these measurements should be taken at equal rotational speeds of the fan and, preferably, near the maximum speeds of the operational conditions. The criterion for judging the state of the operational conditions is given by the trend of the processed signal, which allows for a program for preventive maintenance.

The main causes that can create high vibrations are now briefly examined:

- Imbalance of rotating masses that can be caused by:
  - 1) Dust deposits or encrustations on the impeller
  - 2) Corrosion or erosion of the impeller
  - 3) Distortion of the shaft and the impeller due to temperature effects

The cleaning of impellers, on which deposits of materials transported by gases occur, must be done very carefully on all surfaces; it is not uncommon that, after their apparent cleaning, the machine may have vibrations of a value higher than those before the operation.

**-PHENOMENA OF STRUCTURAL OR FOUNDATION RESONANCE** Must be eliminated by varying their stiffness, which is generally preferable to be increased, so that the machine operates decisively below the lowest resonance frequency.

**-THERMAL DISTORTIONS** Can mainly occur in machines that operate with hot gases. It is necessary, within the limits allowed by the process, to keep the thermal gradients over time towards the lowest values, because these, in turn, generate stresses in the materials, which are directly proportional.

Thermal shocks should be avoided as much as possible, as they can produce cracks or breaks in the impellers and deformations in the shafts.

Shafts with significant lengths, exposed to hot gases, and left stationary for too long, can undergo permanent deformations.

**-RIGID CONNECTIONS BETWEEN FANS AND PIPING** In principle, no external load on the fan should be borne by the machine. Anti-vibration joints must be inserted between the mouths and the piping.

### 10.1.3 CLEANING OF BEARINGS

When ball or roller bearings are disassembled for maintenance, it is recommended to remove the rolling elements of the bearings from the shafts, place them in a suitable container with oil or kerosene, and let them soak for a while; possibly move them by hand to facilitate the detachment of dirt particles. Remove all old traces of oil and grease from the housing and clean it with white kerosene or another suitable solvent. Thoroughly dry all parts with clean cloths to prevent the new lubricant from diluting in the solvent. When the bearing grease is heavily oxidized, soak it in light oil (SAE10) at 90 -110°C before proceeding with the cleaning operations already discussed in the previous points. Rotate the bearing in the clean oil to remove any solvent residue. Remove and add lubricant as required.

## 10.2 LUBRICATION

The lubrication of the fan bearings (ball, roller, or sliding), the motor, the joints, the regulators, the seals on the shafts, etc., is one of the most important operations for the efficient and safe operation of the components of a fan.

## 10.2.1 GREASE LUBRICATION OF ROLLING BEARINGS

### 10.2.1.1 GENERALITIES

The bearings of the fans shipped already assembled have been lubricated at the factory, but the lubrication state must be checked before the first start-up. The bearings of fans shipped unassembled or those shipped as spare parts or reserves are not normally lubricated. Before proceeding with lubrication, clean the bearing thoroughly. Remove any traces of rust and dirt using clean petroleum. Then dry the bearing thoroughly using air or clean rags. Remove any traces of rust from the shaft, bearing supports, or the bearings themselves before proceeding. The good quality of a lubricant is very important. From the table that follows, select the correct type of lubricant to use based on the type of bearing. These are the lubricants used on fans for heavy-duty service. To achieve the best results, use the same product even when re-lubricating, as not all greases are chemically compatible. When switching to another lubricant, remove all traces of the previous one before applying the new one.

### 10.2.1.2 GREASE LUBRICATION PROCEDURE

Ensure that no dirt can enter the bearing. Use a compressed air gun. Fill the bearing support for about 1/3. Excess grease can cause overheating of the bearings.

### 10.2.1.3 LUBRICATING GREASES BASED ON OPERATING TEMPERATURES

The temperature indicated in the table is the total bearing temperature related to the rolling elements. (Normally about 10°C higher than that of the outer ring surface). The total temperature is the sum of the ambient temperature plus the temperature increase of the bearing.

NOTE: The fact that a lubricant grease manufacturer states that a particular lubricant can be used up to a certain temperature (e.g. 150°C) does not mean that it is suitable for bearings. Often, bearings require a kinematic viscosity of the oil between 12 and 20 mm<sup>2</sup>/s. Special heaters can be used to bring low temperatures within the operational value range corresponding to a given lubricant.

BRAND AND TYPE OF LUBRICANT	RING TEMPERATURE OUTSIDE OF THE BEARING
SKF: LGMT2	from 30° to 80°C
SKF: LGHQ3	from 80° to 120°C

#### 10.2.1.4 LUBRICATION INTERVALS

How often to lubricate the bearings can only be determined by the operating conditions. Bearings for fans that handle clean air at room temperature require longer lubrication intervals compared to fans that handle dusty air at high temperatures. Replacing the lubricant frees the bearings from contaminated solids and liquids. Determine the correct lubrication interval for your fan according to the maintenance schedule and by visually inspecting the replaced lubricant. If the lubricant is clean, the time interval between two successive replacements can be extended. If the lubricant is contaminated, the interval should be shortened. The table below provides a guide for the initial service period of the fans. The information contained in the table is only indicative; also refer to the information contained in the drawings that are part of the provided documentation. The correct lubrication interval should still be established by trial during the operation of each machine.

Operating Conditions		Operating temperature of the bearing	Lubrication intervals
<b>Dirty</b>	<b>Humidity</b>		
fairly clean	Absent	0°C÷50°C 50°C÷70°C 70°C÷95°C	6-12 months 1-12 months 1-4 weeks
from moderate to extremely dirty	Absent	0°C÷70°C 70°C÷95°C	1-4 weeks 1 week
fairly clean	high humidity and direct contact of water with the support	0°C÷95°C	1 week

#### 10.2.2 OIL LUBRICATION OF ROLLING BEARINGS

When a fan must be left running and cannot be stopped to check the oil level, the operating level must be determined at the time of initial start-up. Mark the operating oil level on the indicator. The minimum operating level, to remain in safe conditions, is about 3mm below this limit. The oil must be changed periodically, as it deteriorates due to heat, oxidation, catalytic reactions, and contamination with dirt and water. Change it whenever it appears dirty or foamy. For unusual operating conditions, such as, for example, in particularly dirty or humid atmospheres, consult the lubricant supplier.

#### 10.2.6 LUBRICATION OF FLEXIBLE JOINTS

All flexible toothed joints require periodic inspections of the lubricant condition. The lubricant should be maintained in the right quantity and be free of contaminants. For more detailed information, refer to the machine's lubrication sheet. Joints with flexible elements made of laminates or rubber do not require lubrication. The documentation sent with the equipment contains the specific recommendations from the manufacturer of the flexible joints.

## FAN PROBLEMS AND POSSIBLE CAUSES

SYMPTOMS	CAUSE	SOLUTIONS
Flow or pressure lower than performance	<ul style="list-style-type: none"> <li>- Total resistance of the air circuit greater than that of the design.</li> <li>- Speed too low.</li> <li>- Dampers or flow regulators not installed correctly.</li> <li>- Poor inlet and outlet gas conditions from the fan curve</li> <li>- 90° in prossimità-</li> <li>- Air leaks in the system.</li> <li>- Damaged impeller.</li> <li>- Incorrect rotation direction</li> </ul>	<ul style="list-style-type: none"> <li>- Choose a larger fan</li> <li>- Check the drive system</li> <li>- Install correctly</li> <li>- Increase the fan speed, install guide vanes or deflectors in the ducts</li> <li>- Eliminate leaks</li> <li>- Repair or replace as indicated in Section 10</li> <li>- Reverse the electrical connections of the motor</li> <li>- Correct as indicated in Section 10 of the manual</li> </ul>
Vibrations and noises	<ul style="list-style-type: none"> <li>- Bearings and coupling not aligned</li> <li>- Unstable anchors</li> <li>- Foreign material in the fan causes an imbalance</li> <li>- Worn bearings</li> <li>- Damaged impeller or motor</li> <li>- Broken or loose bolts or screws</li> <li>- Bent shaft, worn joints</li> <li>- Unbalanced fan or motor impeller</li> <li>- The fan has a capacity greater than specified</li> <li>- Loose dampers</li> <li>- Speed too high or fan rotating in the wrong direction</li> </ul>	<ul style="list-style-type: none"> <li>- Realign as indicated in Sections 8 and 10</li> <li>- See Section 6</li> <li>- Clean as indicated in Section 10</li> <li>- Replace as indicated in Section 8</li> <li>- See Section 8 - Tighten or replace</li> <li>- Check the input line tension</li> <li>- Reduce speed or close the shutters</li> <li>- Tighten the shutters or replace them</li> <li>- Reduce speed, check the direction of rotation, replace the impeller</li> </ul>
Overheating of the bearings	<ul style="list-style-type: none"> <li>- Too much grease in the ball bearings or rollers</li> <li>- Poor alignment</li> <li>- Damaged impeller or motor</li> <li>- Bent shaft</li> <li>- Abnormal axial thrust</li> <li>- Dirt in the bearings</li> <li>- Excessive belt tension</li> <li>- Excessive fan temperature</li> </ul>	<ul style="list-style-type: none"> <li>- Clean and grease</li> <li>- Realign</li> <li>- Repair or replace</li> <li>- Replace the shaft</li> <li>- Clean the bearings</li> <li>- Reduce belt tension and realign it</li> <li>- Recheck the air circuit</li> </ul>
Drive motor overload	<ul style="list-style-type: none"> <li>- Speed too high</li> <li>- Too high load, as the circuit resistance is lower than the design one</li> <li>- Bent shaft</li> <li>- Poor engine alignment</li> <li>- Rubbing of the impeller or jamming against the nozzle</li> <li>- Wiring of the electric motor</li> <li>- Temperatura dei gas del ventilatore inferiore a quella di progetto</li> </ul>	<ul style="list-style-type: none"> <li>- Recheck motor</li> <li>- Reduce speed or close dampers</li> <li>- Replace shaft</li> <li>- Realign motor</li> <li>- Reinstall impeller or realign impeller</li> <li>- Rewire motor</li> <li>- Check circuit</li> </ul>



The Products must be used in accordance with the information specified in this manual and on the assembly drawings provided by the manufacturer. Regular inspections must be carried out to ensure the safe operation of the equipment.

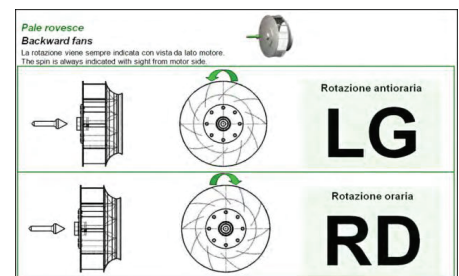
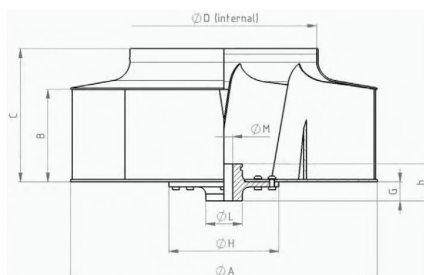
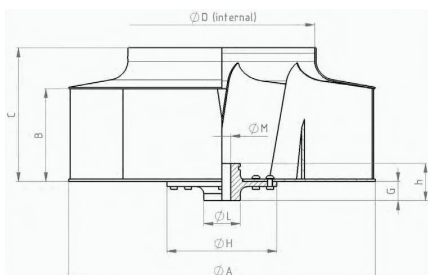
Strict observance of all safety and maintenance procedures is the sole responsibility of the user and is necessary for the safe and efficient operation of the fan.

Errors made in following these installation, operation and maintenance procedures of the fan may cause accidents with damage to personnel and equipment, for which ETC Group Srl cannot assume any responsibility.

## STAINLESS STEEL EXHAUST FANS

Stainless steel fan extractors with medium flow rates and medium-high prevalence. 304 stainless steel extractor in B5 LG rotation. Thickness of the bases 20/10, satin-finish 304 stainless steel, tig-welded, tin-plated, the entire casing. 2800 rpm motor, power 230/volt - 380 volts. Input with external 0 suitable for connection with round flues.

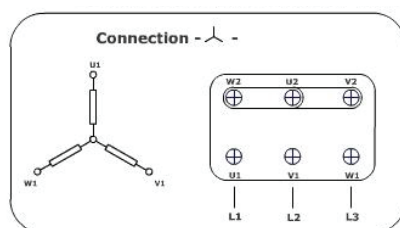
Centrifugal Extractors - single suction in AISI 304 Stainless Steel Features Centrifugal duct extractors In AISI 304 Stainless Steel Tig welded along the entire perimeter suitable for corrosive vapours with temperatures from -20 C to 5 C High-performance impeller with backward curved blades Standard models only with LG rotation in B5 Static and dynamic balancing according to ISO 140 standards All components in AISI 304 Stainless Steel adjustable orientation in 8 positions available in LG rotation IN B5 suction and expulsion nozzle supplied round suitable for round flues Three-phase asynchronous motor 230/400V suitable for continuous service IP55 motors are of the standard size NELMEC type, self-ventilated with ball bearings.



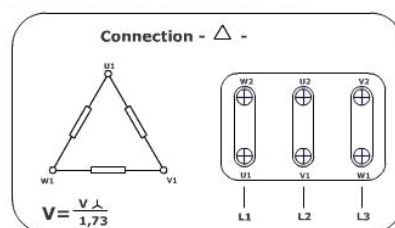
Model	Poles	Power [kW]	ØA [mm]	B [mm]	C [mm]	ØD [mm]	Ø Mxh [mm]	G [mm]	ØL [mm]	ØH [mm]	Blades number	Notes
INOX.4.EBR250	2	0.37	250	73	109	139	14x42	18	35	100	6	
INOX.4.EBR280	2	1.1	280	80	120	139	14x42	18	35	100	8	
INOX.4.EBR350	2	3.0	350	93	129	169	14x42	18	35	100	8	

INOX.4.EBR250	2	0.37	250	73	109	139	14x42	18	35	100	6	
INOX.4.EBR280	2	1.1	280	80	120	139	14x42	18	35	100	8	
INOX.4.EBR350	2	3.0	350	93	129	169	14x42	18	35	100	8	

### Standard Three-Phase Motor Connection Volt 230/400



400 Volt three-phase input



230 Volt three-phase input

## INOX.4.EBR250

### EBR.RM 250

Fan weight 25 Kg fPD2 and

GD2 = 0.10 Kg f m2

Maximum rotation speed

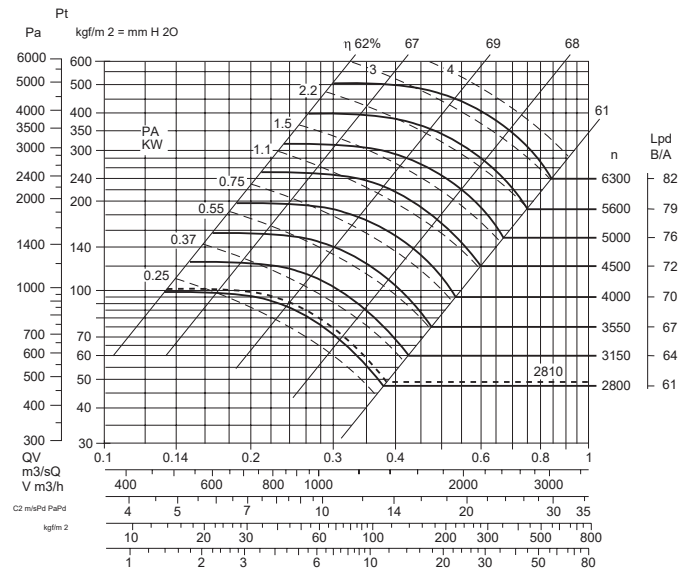
<100°C = 5600

100 ÷ 200°C = 5000 200 ÷ 300°C

= 4500 Tolerance on noise + 3dB

Tolerance on absorbed power ±

3%



## INOX.4.EBR280

### EBR.RL 280

Fan weight 41 Kg fPD2 and

GD2 = 0.195 Kg f m2

Maximum rotation speed

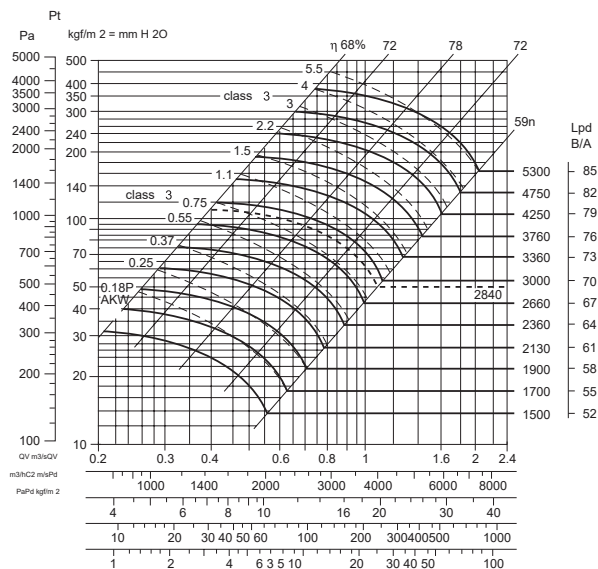
<100°C = 3950

100 ÷ 200°C = 3550 200 ÷ 300°C

= 3120 Tolerance on noise + 3dB

Tolerance on absorbed power ±

3%



## EBR.RL 350

Electric fan 72 Kg fPD2 and

GD2 = 0.52 Kg f m2

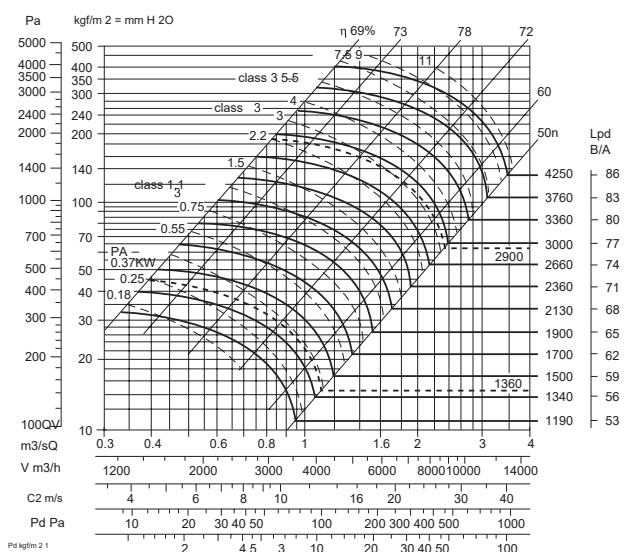
Maximum rotation speed

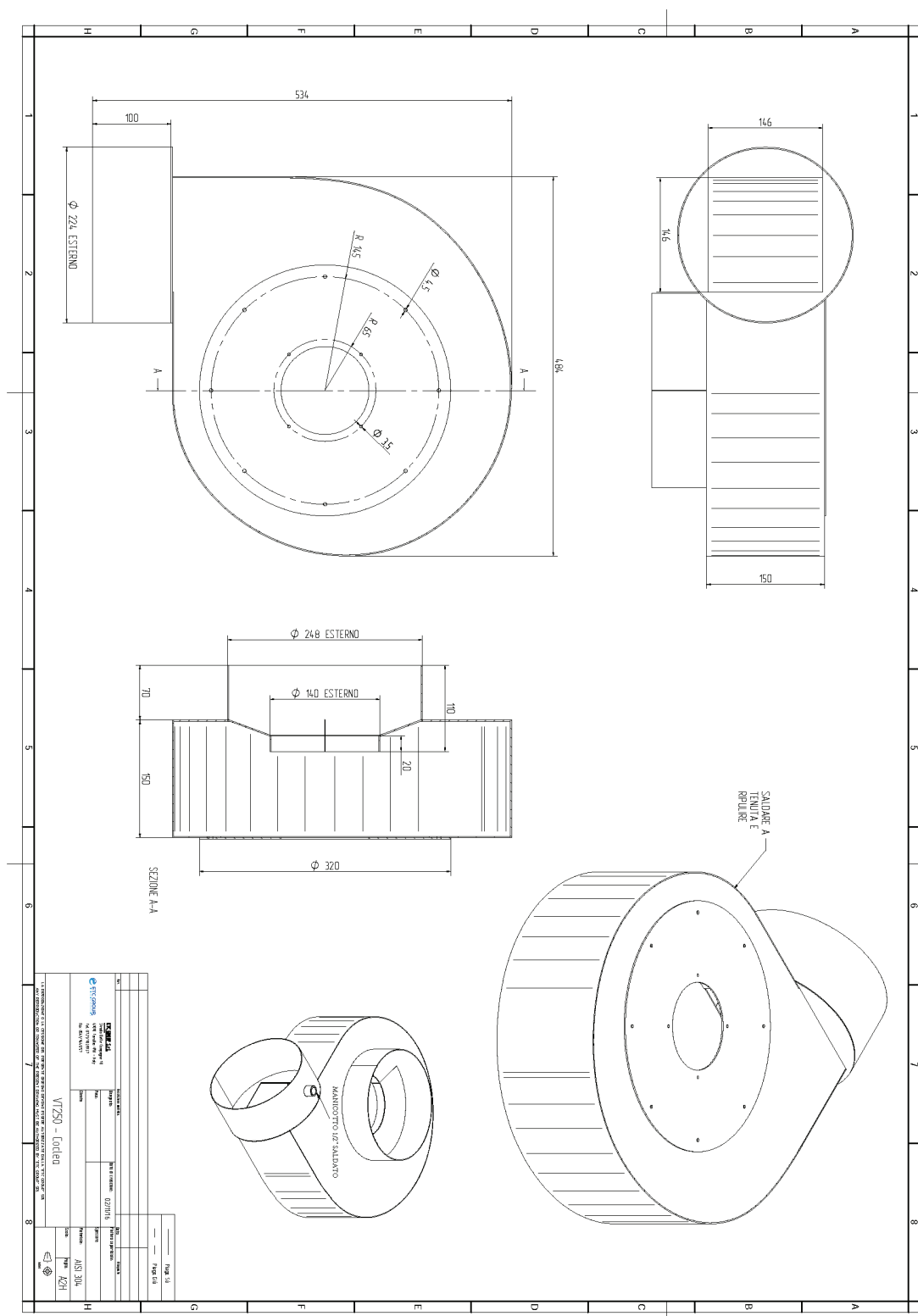
<100°C = 2800

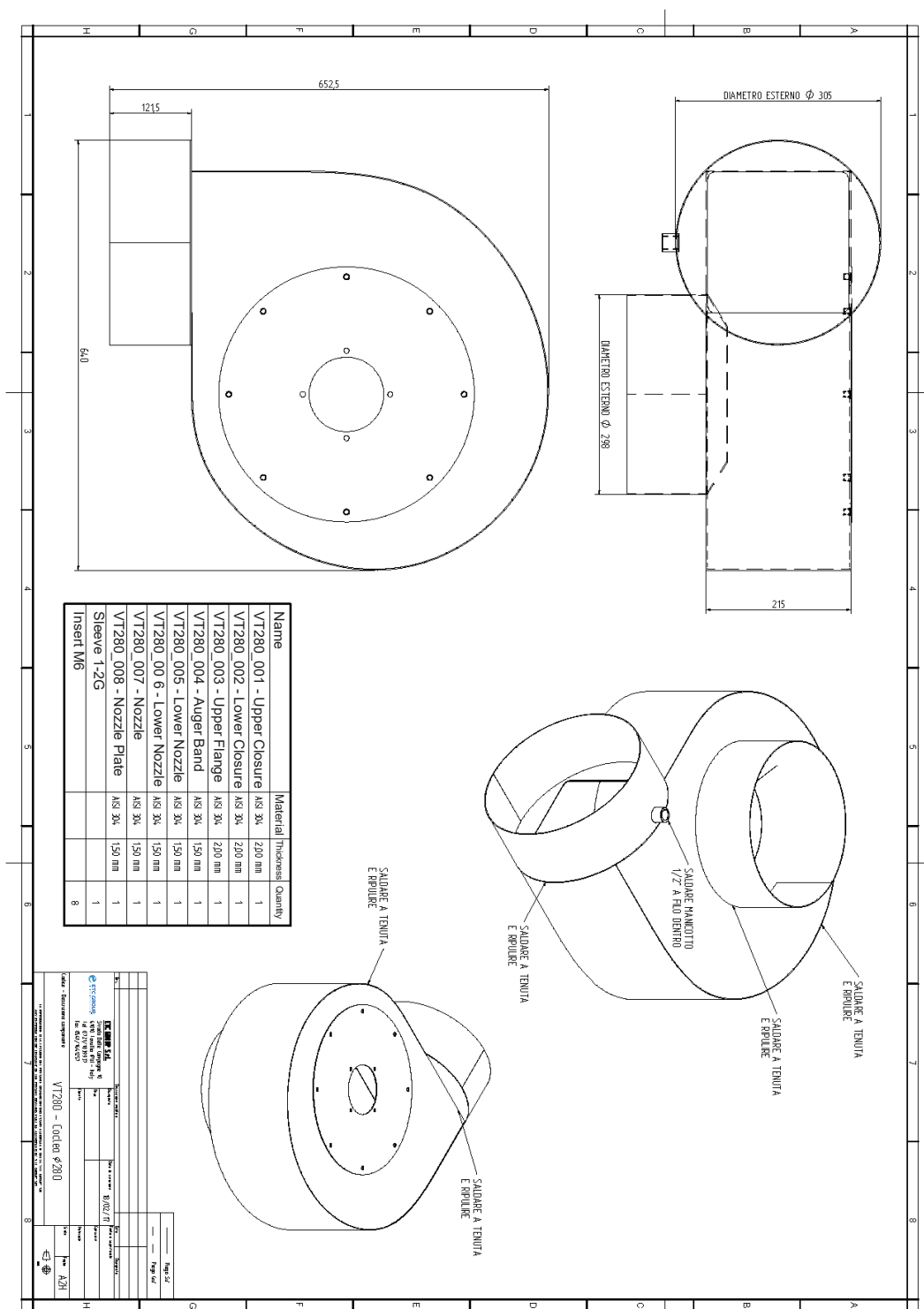
100 ÷ 200°C = 2500  
200 ÷ 300°C = 2250

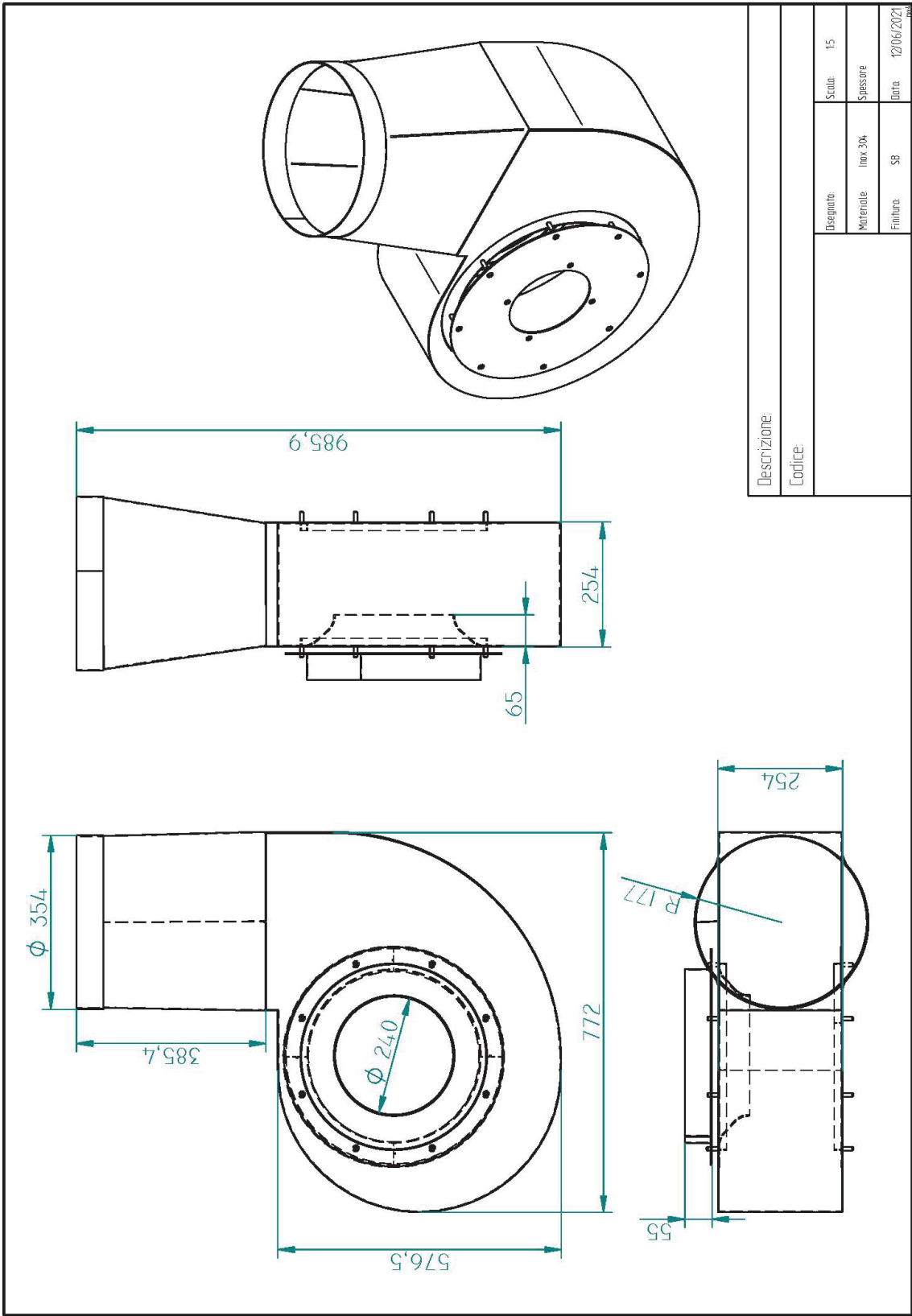
Tolerance on noise + 3dB

Tolerance on absorbed power ± 3%

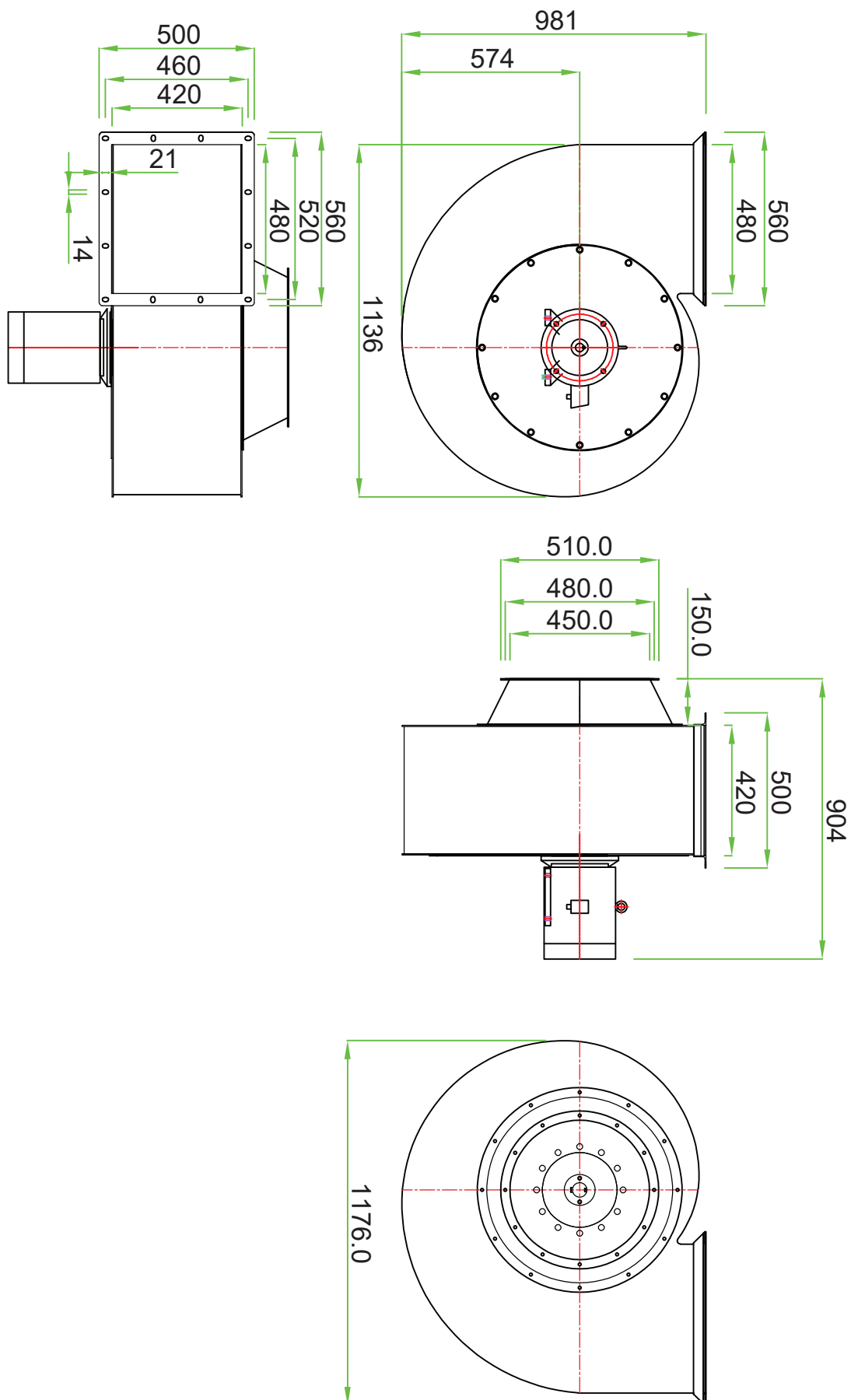












Engine side view

<div> <div>LG</div> <div>RD</div> </div>	0	45	90	135	180	225	270	315
	W	W	W	W	Z	Z	W	W
	H1				H2		H	



#### Code. INOX.2.EBR250

Stainless steel extractor fans INOX.4.EBM250 Stainless steel extractor fans with medium flow rates and medium-high prevalence Stainless steel 304 extractor in B5 LG rotation model INOX.4.EBR280 Thickness of the bases 20/10 satin-finish 304 stainless steel, tig welded tin the entire casing. Air flow rate from 1500 m3/h with 112 H2/O up to 3500 m3/h with final prevalence 64 H2/O Motor from 2800 rpm power 1.1 kw 230/volt - 380 volt Input with 0 298.00 external suitable for connection with round flues Output with 0 303 internal suitable for connection with round flues.



#### Code. INOX.2.EBR280

Stainless steel extractor fans INOX.4.EBM250 Stainless steel extractor fans with medium flow rates and medium-high prevalence Stainless steel 304 extractor in B5 LG rotation model INOX.4.EBR280 Thickness of the bases 20/10 satin-finish 304 stainless steel, tig welded tin the entire casing air flow rate from 1500 m3/h with 112 H2/O up to 3500 m3/h with final prevalence 64 H2/O Motor 2800 rpm power 1.1 kw 230/volt - 380 volt Input with 0 298.00 external suitable for connection with round flues Output with 0 303 internal suitable for connection with round flues.



#### Code. INOX.2.EBR350

Stainless steel extractor fans INOX.4.EBM250 Stainless steel extractor fans with medium flow rates and medium-high prevalence Stainless steel 304 extractor in B5 LG rotation model INOX.4.EBR350 Thickness of the bases 2/10 satin-finish 304 stainless steel, tig welded tin the entire casing. Air flow rate from 1500 c/h with 132 H2/O up to 6500 m3/h with final prevalence 64 H2/O Motor from 2800 g/m power 3 kw 230/volt - 380 volt Input with 0 350 external suitable for connection with round flues Output with 0 350 internal suitable for connection with round flues.



#### Code. INOX.4.EBM450

Modello INOX.4.EBM450: Aspiratore centrifugo in acciaio inox 304, rotazione B5 LG. Materiale: Acciaio inox 304 con spessore base 25/10 e finitura satinata. Portata d'aria: Da 14.000 m³/h con 132 H210 fino a 15.000 m³/h con prevalenza finale di 64 H2/O. Motore: 1400 g/m, potenza 4 kW, alimentazione 230/380 V. Ingresso: Diametro 450 mm esterno, adatto per collegamento a canne fumarie tonde. Uscita: Diametro 450 mm intern°, adatto per collegamento a canne fumarie tonde.

**DICHIARAZIONE DI INCORPORAZIONE QUASI-MACCHINA**

(conforme al punto B allegato II della direttiva 2006/42/CE)

DECLARATION OF INCORPORATION OF PARTLY COMPLETED (in accordance with annex II B of the 2006/42/CE)

DÉCLARATION D'INCORPORATION DE QUASI-MACHINE (conforme au point B annexe II de la directive 2006/42/CE)

ERKLÄRUNG ZUM EINBAU EINER UNVOLLSTÄNDIGEN MASCHINE (in Übereinstimmung des Punkt B Anhang II der Richtlinie 2006/42/EG)

**La sottoscritta / The Manufacturer / Le fabricant / erklärt der Hersteller****ETC GROUP S.r.l. socio unico**

Dichiara in qualità di fabbricante sotto la propria responsabilità che la quasi-macchina

Declares as manufacturer under its sole responsibility that the partly completed machinery / Déclare en qualité de fabricant sous sa responsabilité que la quasi-machine / Erklärt als Herstellerin unter eigener Verantwortung, dass die unvollständige Maschine

**Nome generico / Generic name / Dénomination générale**  
/ Allgemeine Bezeichnung**Ventilatore industriale / industrial fan / Ventilateur industriel / industrieller Ventilator****Funzione / Function / Fonction / Betriebszweck**

Generare un flusso d'aria aeriforme incrementando l'energia del fluido stesso / Generate airflow to increase energy of fluid itself / Générer un flux d'air aéiforme en augmentant l'énergie du fluide lui-même / Erzeugung eines Luftstroms bei Erhöhung der Fluidkraft

**Modello / Model / Modél / Modell:** INOX.4.EBM350/3**Rumore / Noise/ Ruido /Lärm** 70/dB**Tipo / Type / Type /Typ:** b5**Installazione / Installation/ Installation /Installationsart** D  
(UNI EN ISO13349-2011)**Matricola /Serial No. /Numéro de série /Serien-Nr.:** NR SERIE 2547**Codice (Denominazione commerciale) /Code /Code /Kode** Ventilatore inox**Anno di costruzione / Manufacturing** 2025  
year/ Année de fabrication /Baujahr**Elenco dei RES applicati / List of ESR applied /Liste des RES appliqués /Liste der anwendbaren RES:**

1.1.2 - 1.1.3 - 1.1.5 - 1.3.1 - 1.3.2 - 1.3.4 - 1.3.7 - 1.3.8.1 - 1.3.8.2 - 1.4.2.1 - 1.5.8 - 1.5.9 - 1.6.1 - 1.7.2 - 1.7.4.1 - 1.7.4.2 - 1.7.4.3

► **Il prodotto indicato** è destinato ad essere integrato/assemblato in un'altra macchina. E' fatto divieto alla quasi-macchina oggetto della presente dichiarazione di essere messa in servizio prima che la macchina/impianto/sistema in cui sarà incorporata o con cui sarà assemblata sia stata conforme alle disposizioni della direttiva 206/42/CE. La documentazione tecnica pertinente è stata compilata in conformità all'allegato VII B. Le istruzioni per l'assemblaggio sono state compilate in conformità all'allegato VI. Il fabbricante s'impegna a trasmettere, su motivata richiesta delle autorità nazionali, informazioni pertinenti sul Ventilatore. La modalità di trasmissione può essere sia in formato elettronico che cartaceo e sarà concordato con l'autorità richiedente.

► **The indicated product** is intended to be integrated / assembled with other machinery. It is prohibited to put the partly completed machinery covered by this declaration into service until the machinery / plant / system in which it will be incorporated or will be assembled has been declared in conformity with the provisions of the 206/42/EC Directive. The relevant technical documentation has been compiled in conformity with Annex VII B. The assembly instructions have been compiled in conformity with Annex VI. The manufacturer shall provide, upon reasoned request of the national authorities, relevant information on the Fan. The information may be provided either in electronic or paper format and will be agreed with the requesting authority.

► **Le produit indiqué** est destiné à être intégré / assemblé dans une autre machine. Il est défendu de mettre la quasi-machine faisant l'objet de cette déclaration en service avant que la machine / installation / système où elle sera incorporée ou avec laquelle elle sera assemblée ait été déclaré/e conforme aux dispositions de la directive 206/42 / CE. La documentation technique pertinente a été remplie conformément à l'annexe VII B. Les instructions pour l'assemblage ont été remplies conformément à l'annexe VI. Le fabricant s'engage à transmettre, sur demande motivée des autorités nationales, toutes les informations pertinentes sur le ventilateur. La méthode de transmission peut être électronique ou papier et sera convenue avec l'autorité requérante.

► **Das angegebene Produkt** ist zum Einbau in eine andere Maschine vorgesehen. Es ist verboten, die Quasi-Maschine, die Gegenstand dieser Erklärung ist, in Betrieb zu nehmen, bevor die Maschine / Anlage / Anlage, in die sie eingebaut ist oder in die sie eingebaut wird, den Bestimmungen der Richtlinie 206/42 / EG entspricht. Die entsprechenden technischen Unterlagen wurden gemäß Anhang VII B erstellt. Die Montageanleitung wurde gemäß Anhang VI erstellt. Der Hersteller verpflichtet sich, auf begründeten Antrag der nationalen Behörden relevante Informationen über den Lüfter zu übermitteln. Die Übermittlungsmethode kann entweder in elektronischer Form oder in Papierform erfolgen und wird mit der ersuchenden Behörde vereinbart.

- L'azienda firmataria della presente **DICHIARA** sotto la sua esclusiva responsabilità che la quasi-macchina a cui la presente dichiarazione si riferisce è conforme alle prescrizioni delle Norme.

- The company that signed this DECLARATION under its sole responsibility that the partly completed machinery to which this declaration refers complies with the requirements of the Standards.

- La société qui a signé ce DECLARATION sous sa responsabilité que la quasi-machine faisant l'objet de cette déclaration est conforme aux prescriptions des Normes.

- Die unterzeichnende Firma des vorliegenden Dokuments **ERKLÄRT** unter eigener Verantwortung, dass die unvollständige Maschine, auf die sich die vorliegende Erklärung bezieht, mit den Vorschriften nachstehender Richtlinien übereinstimmt.

**UNI EN ISO 13349-2011 UNI EN ISO 12499-2009 UNI EN ISO 12100-2010**relativamente solo ai RES applicati, **DICHIARA** altresì / only for ESR applied, Furthermore, it **DECLARES** that / relativement et uniquement aux RES appliqués, **DECLARE** aussi / im alleinigen Bezug auf die angewandten, RES **ERKLÄRT** sie ferner:**E' A CURA DELL'UTILIZZATORE FINALE LA VERIFICA E L'EVENTUALE ADEGUAMENTO DELLE MACCHINE E DELLE ATTREZZATURE NUOVE E/O USATE DI SUA PROPRIETÀ INSERITE E/O ACCESSORIE ALLA QUASI-MACCHINA OGGETTO DELLA PRESENTE DICHIARAZIONE.****THE END USER IS RESPONSIBLE FOR CHECKING AND, IF NECESSARY, ADJUSTING, NEW AND/OR SECOND-HAND OWNED INSERTED AND/OR WHICH MAY BE AN ACCESSORY OF THE PARTLY COMPLETED MACHINERY COVERED BY THIS DECLARATION.****L'UTILISATEUR FINAL DOIT SE CHARGER DE LA VERIFICATION DE L'EVENUELLE ADAPTATION DES MACHINES ET DES ÉQUIPEMENTS NEUFS ET/OU USAGES DE SA PROPRIÉTÉ INSERES ET/OU ACCESSOIRES A LA QUASI-MACHINE FAISANT L'OBJET DE CETTE DÉCLARATION.****ES IST AUFGABE DES ENDANWENDERS, DIE ÜBERPRÜFUNG UND EVENTUELLE ANPASSUNG DER MASCHINEN UND SEINER NEUEN UND/ODER GEBRAUCHTEN GERÄTE, DIE IN DIE DIESER ERKLÄRUNG, BETREFFENDE UNVOLLSTÄNDIGE MASCHINE EINGESETZT UND / ODER EINGEBUNDEN SIND, VORZUNEHMEN.**

**Il Modello**, il numero di matricola e l'anno di costruzione sono riportati sulla targa intestata del costruttore fissata alla quasi-macchina. In caso di smarrimento o deterioramento della targa è necessario richiederne una sostitutiva a **ETC Group S.r.l.**

**The Model**, the serial number and the year of construction are shown on the manufacturer's name plate attached to the partly completed machine. In the event of loss or deterioration of the nameplate it is necessary to request a copy to **ETC Group S.r.l.**

**Le modèle**, le numéro de série et l'année de construction sont indiqués sur la plaque signalétique du fabricant fixée sur la quasi-machine. En cas de perte ou de détérioration de la plaque, il est nécessaire de demander un remplacement à **ETC Group S.r.l.**

**Das Modell**, die Seriennummer und das Herstellungsjahr sind auf dem an der vom Hersteller der Maschine angebrachten Kennschild wie dargegeben. Bei Verlust oder Beschädigung des Schildes muss bei der **ETC Group S.r.l.** ein Ersatz angefordert werden.

**Rif. Documentazione tecnica pertinente** /Ref. Relevant technical documentation /Réf. Documentation technique pertinente / Bezug Betreffende technische Dokumentation

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