INSTALLATION AND MAINTENANCE INSTRUCTION MANUAL

F300 (300ºC/1h)

• DIRECT MOTOR AXIAL FANS "VHD": RANGE HCF,JF, JFC, HMF, HBF AND BOX HBF.
• CENTRIFUGAL JET FANS (VCI): SYBILO F300.

DO NOT INSTALL THE FAN BEFORE READING THIS INSTRUCTIONS. KEEP THEM FOR FUTURE APPARATUS MAINTENANCE OR MANIPULATION.

IMPORTANT F300:
All F300 fans (300ºC/1h) described in this manual are homologated according to the UNE EN 12101-3/2002 standard in order to comply with the CTE.2006.D.C.B97106CEE directive (FORMER CPI196), and are therefore specially indicated for emergency services of smoke extraction in case of fire.

The selected model can either be installed inside the risk zone (with F300 motors).

F300 FAN SERVICE MUST ALWAYS BE VERIFIED IN THE FAN LABEL F300.

ALL F300 FANS ARE APT FOR DUAL SERVICE.

EC APPROVAL AND ADEQUATE USE OF THE FAN

All fans supplied by LINDAB have been manufactured in accordance with the directives 2006/95/EC (Low Voltage), 2006/42/EC (Machinery), 2004/10/CE (Electromagnetic compatibility), 2009/125/EC* (Ecodesign). It is also extended for each particular range in compliance with the required specific standards.

Standards:

UNE 100250 (ISO 12499)	Industrial fans. Fans mechanical safety.
UNE-EN ISO 12100-1	Machinery safety- Basic concepts, general principles for design-Part 1:Basic terminology , methodology.
UNE-EN ISO 12100-2	Machiney safety- Basic concepts, general principles for design-Part 2: Technical principles.
UNE-EN 294:1993	Machine safety. Safety distances to impede reach of dangerous zones with upper limbs.
UNE-EN1050	Machine safety. Risk evaluation principles.
UNE-EN ISO 3744	Acoustics. Risk assessment principles.
ISO 1940-1	Mechanical vibrations. Balancing quality.
ISO 10816-1	Mechanical vibrations. Machine vibrations evaluation.

The electric components and the different types of motor used in the ATEX models comply with the necessary security requirements. Additional structural modifications have been made in order to avoid the sparks that may be produced by the rubbing between the static and the mobile components or either by the electrostatic discharges. Do not manipulate or modify none of these elements.

In general, all the fan applications where an electronic velocity regulation system is needed should previously be consulted and authorized by LINDAB, and comply with the electromagnetic compatibility 89/336/CEE standard.
The not authorized use of any type of electronic controller with the FAN can be very dangerous and make all security devices useless, not fulfilling the F300.

For a major safety in the fan maintenance, LINDAB recommends to install a SAFETY STOP/START SWITCH. These devices must be also accredited to F300.

IMPORTANT: THIS PARTICULAR fan MAY NOT BE ADEQUATE FOR THE SAFETY REQUIREMENTS OF YOUR INSTALLATION. PLEASE VERIFY THAT THE CHARACTERISTICS SPECIFIED IN THE APPARATUS COMPLY WITH THE APPLICATION REQUIREMENTS BEFORE ITS INSTALLATION. VERIFY THAT THE GROUP, CATEGORY, AND CLASS TEMPERATURE SPECIFIED IN THE CHARACTERICS PLATE ARE COMPATIBLE WITH THOSE REQUIRED BY THE INSTALLATION.

APPLICATIONS

The requirements and characteristics of each fan model are always conditioned by the general and local standards and regulations to which every application may be subject. Thus in some cases the selected standard units may not be adequate for certain applications and special characteristics should be incorporated. Units that will be installed ventilation systems for emergency services in case of fire should be homologated according to UNE EN 12101-3/2002 standard and comply with the D.C.89/106CEE directive. Other characteristics such as elevated work temperature or corrosive surroundings may also require special models in order to guarantee a correct service.
THE FAN LABEL WILL ALWAYS INDICATE THE APPARATUS COMPLIANCE WITH ANY SPECIFIC STANDARD. IN CASE OF DOUBT, PLEASE CONTACT US.

The selected fan model should never be used to convey gas of a different composition or temperature other than the specified by LINDAB, nor should it work in surrounding with different conditions to those indicated. IN THE ATEX RANGE OF FANS, THE TEMPERATIRE REACHED BY ANY OF THE SURFACES HAS BEEN CALCULATED SO THE PRESENCE OF THE SPECIFIED GASES CAN NOT REPRESENT A RISK OF IGNITION. ANY UNSUITABLE USE OR OVERLOAD OF THE FAN CAN REPRESENT A SECURITY RISK.

FAN RECEPTION AND VERIFICATION

Fans are sent duly packed and their delivery is always carried out on the account and risk of the buyer. It is therefore recommended that upon receiving the merchandise, it is carefully examined to check that it has not suffered any damage or substraction during the transport. Any claim should be immediately made by the buyer to the transport company responsible of the delivery or to the insurance company.

TRANSPORT AND STORING

Transport companies and intermediate suppliers who have participated in the transport and the fan storing until its final delivery will be responsible of any damage caused to the apparatus during this period, be it for inadequate transport or storing. They are also responsible of the necessary procedures to attend and solve, with the end client, those damages not covered by the manufacturer's guarantee.

During the storing of the apparatus until the moment of its installation, its protection against external agents should be guaranteed. These may be dust, rain, ultraviolet radiation (direct exposure to the sun) high humidity and the brusque changes of temperature. These noxious agents are the principal causes of precipitated deterioration of the fan, whereby it can be seriously damaged through oxidation of the components or deterioration of its paint.

Careful and adequate manipulation of the fan in accordance with the detailed graphic orientations is recommended. Every fan, depending on its weight and constructive characteristics, will be delivered in individual card-board boxes or pallets. They may also be provided with bracing points placed adequately to anchor them and make displacement with a crane or a pulley.

QUALITY CONTROL

OPERATION: Before delivery, all fans are submitted to electrical safety and operating tests. Thus if the apparatus has not suffered any damage during transport and it is correctly installed as indicated in this instructions, the device will operate correctly.

BALANCING: The rotating element "propeller or turbine" of the fan has been dynamically balanced with a residual lack of equilibrium to not surpass the tolerances according to the ISO1940-1 and ISO10816-1 standard, quality Q 2,5 or Q 6,3 depending on the models.
Still, a verification before installation is recommended, whereby you should make the element rotate with the hand and check that it does not scrape or present any blow or deformation due to possible damage suffered during transport. Do not install or turn the fan on if you appreciate any damage; contact our technical service.

OUR PRODUCTS' GUARANTEE

LINDAB will always deliver the requested fan and in accordance with the service or installation requirements. Thus all the components used in the requested model will only be adequate for the flow to be conveyed and the operating conditions indicated by the customer.

IMPORTANT: LINDAB will not be responsible of accidents caused by incorrect manipulation of the fan and omission or non-compliance of any of the recommendations and safety norms exposed in this manual.

WARRANTY PERIOD: LINDAB fans have a 1-year guarantee period as of its purchasing date (always keep the apparatus' invoice). The mentioned warranty period will extinguish after a year even if the fan is not installed or used immediately after its purchase at LINDAB. This guarantee excludes any imperfection, damage or breakdown caused to the fan itself or to third parties affected due to the incorrect or undue use of the apparatus, normal wear, overload or manipulation by persons not pertaining to LINDAB or to its technical service. The obligation assumed through this guarantee is limited to the replacement of parts considered defective after examination by our specialists.

Maintenance, possible adjustment modifications and repairs of the fan should always be carried out by duly trained specialists. During the warranty period of the apparatus, repairs may only be carried out with previous authorization on behalf of LINDAB and by authorized workshops and personnel. LINDAB WILL ALWAYS DECIDE WHERE THE REPAIRS OF THE APPARATUS UNDER WARRANTY WILL BE CARRIED OUT AND THE TRANSPORT COMPANIES TO BE USED FOR THEIR DISPLACEMENT, SHOULD THIS BE NECESSARY. THIS GUARANTEE DOES NOT COVER THE COST OF TRANSPORT OF SMALL APPARATUS TO THE RECOMMENDED TECHNICAL SERVICE.

DEVOLUTION OF NON CONFORMITY MATERIAL: only devolutions of non conformity articles will be accepted with the client's request, be them due to any type of delivery confusion, change or error and previously accorded with our COMMERCIAL DEPARTMENT or our BRANCH OFFICES, and accompanied by the duly filled out devolution blank. The transport used should be arranged and agreed with LINDAB. No devolution will be accepted without the mentioned devolution permission.

FAN INSTALLATION AND OPERATION

VERIFY: In fans due to be installed directly on a wall or a roof, even though a support system or an additional structure is used, correct horizontal and vertical leveling of the apparatus must be assured. On horizontal bases, these will have to be perfectly plain and leveled and must perfectly set in the case of a concrete base. Adequate supports and with sufficient resistance and rigidity to support the fan weight should also be verified, as well as its inertia during the starting phase.
Normal vibrations of the apparatus during its operating depend mainly on the rigidity degree of the structural element where the fan will be installed.
The use of rubber dampers in IMMERSED fans is not recommended. If dampers are indispensable to avoid the vibrations and noise propagation, only metal springs should be used. Minimum F300 homologated elastic joins should be used both at inlet and outlet to effectively isolate the fan from the ducting. With this system, an effective isolation can be achieved. It is important that these isolation elements do not alter the correct fulfillment of the security demands of the installation.
In rigid installations on cement bases or walls which are not correctly aligned, never force the fan structure upon tightening the screws. Before installation, lacking spaces should be completed by using small strips of plates or washers, or by filling them with quick drying cement so that a correct support of the fan is guaranteed.

ELECTRICAL CONNECTION AND INSTALLATION: each fan's wiring diagrams are available inside the connection box of the motor. IT IS IMPORTANT THAT POWER SUPPLY LINES AND OTHER COMPONENTS USED IN THE INSTALLATION COMPLY WITH THE REGULATIONS ON INDUSTRIAL INSTALLATIONS ("Low voltage electrical regulation") and therefore protection systems adequate to the voltage of the apparatus should be used (motor protection system, differential protection, line limiter and grounding). For motors superior to 7,5 CV (5,5 kW) timed or electrically controlled start-ups are recommended in order to avoid excessive consumption points and to obtain more gentle start-ups.

The electric junction in IMMERSED FANS should be performed directly to the motor's terminal box avoiding interruptions that can not guarantee resistance and reliability during a service at 300ºC for 2 hours. The cable or cables used should be properly protected to avoid any damage by the remainder fan's structural components or their backups, and must comply with the pertinent F300 homologation. IN INTERMEDIATE CONNECTIONS, BOXES THAT COMPLY WITH THE F300 DEMANDS MUST BE USED (READ THOROUGHLY THE F300 MOTOR MANUAL INSTRUCTIONS). CABLES CATALOGUED AS "FLAME RESISTANT " WHICH DON'T GUARANTEE A F300 SERVICE ARE NOT APT FOR THIS FUNCTION. LINDAB RECOMMENDS VS OMERIN BRAND CABLES WHICH HAVE BEEN PROPERLY TESTED WITH OUR FANS.

EVERY FAN WIRING ELEMENT AND COMPONENT SHOULD BE CORRECTLY SELECTED AND INSTALLED TO COMPLY WITH THE F300 STANDARDS. SPECIAL ATTENTION MUST BE PAID TO ALL METAL STRUCTURAL PARTS, WHICH MUST REMAIN CORRECTLY CONNECTED TO GROUND TO PREVENT ANY ELEMENT FROM GETTING ELECTRICALLY LOADED AND TO AVOID ELECTROESTATIC DISCHARGES.

In the indicated models, connection should always be done by using the thermal protection incorporated in the motor (SEE THE FAN MAINTENANCE SECTION)

VOLTAGE AND FREQUENCY: Read thoroughly the F300 motor manual instructions. The motor power supply should be made in accordance with the voltage and frequency indicated on the fan plate. Variations of ± 5% in the electrical network with regard to the nominal voltage indicated are permitted. If the connection used can not support this level, there exist a danger of burning out the motor. Thus make sure the selected Y-? disposition in the motor corresponds to the network voltage and frequency through a tester.

CONSUMPTION: Once the fan is installed in the foreseen working conditions that do not surpass those indicated on the plate, control the consumption in (A). The fan's capacity and the installation load should be correctly adjusted (SEE THE OPERATING SECTION). In case of non compliance, consult the manufacturer.

GROUNDING: Since the fan is a Class I machine according to the current standard, it is obligatory to correctly carry out the connection of the grounding through the socket, which can be found inside the motor or the fan's terminal casing. Once this connection has been carried out, it is recommended that the resistance between the exterior conductor and the fan casing should not be superior to 0,1?.

ENVIRONMENTAL CONDITIONS: Very important: for normal service (not emergency), never exceed the specified maximum gases continuous temperature specified in every model.

ATTENTION: In high pressure fans, heating of the gas inside the fan due to compression shall also be considered and verified by calculation. Verify first that the fan is labeled with the correct temperature. Make sure that the same, or a higher temperature class is specified in the motor plate. Independently of the motor's thermal class, it is recommended not to surpass an air temperature of 40ºC and to keep the humidity inferior to 60% in the cooling surroundings of the motor so as to guarantee a correct refrigeration of the motor and, at the same time, prolong its duration. The maximum air temperature to be conveyed working on a continuous service basis is from 40ºC to 55ºC in models with the motor inside the air flow. In each case it is recommended to consult the information in the technical catalogue where the particular characteristics of each fan range and model in a detailed manner. For other more severe applications, some special characteristics may be applied. Always consult the technical sheet for each particular fan and for more information contact the manufacturer.

ROTATION DIRECTION: Same as indicated by the arrow situated on the fan's casing. To invert the three-phase rotation of a one or two velocity motor, interchange the two phases among themselves. In mono-phase motors, this can be changed only by some of the models. Consult the diagrams in each case.

SOUND LEVEL: Depending on the fan model, its voltage, size and revolutions, this may oscillate between 37 and 100 dB (A). The sound level corresponding to each concrete model is specified in its technical sheet. If the requested fan does not comply with the allowed local limitations of maximum noise level, other alternative solutions should be considered in order to reduce this sound level through the application of silencers, barriers or soundproofing cases.

CONNECTION TO DUCT INSTALLATIONS: In cases where the fan is connected to a duct network for air distribution, the suction and impulsion ducts should be connected to the corresponding fan nozzle using the adaptation flanges recommended by the manufacturer. Together with the flanges, elastic gaskets should be used whenever possible (both accessories should be requested separately from the fan, and should also be F300 homologated

PROTECTION AGAINST INVOLUNTARY ACCIDENTS: LINDAB has protection for the rotating body (propeller or turbine), according to the UNE EN 294, for every fan model. The installer or final user should request and install the necessary protection elements in order to protect the accesses to the inside part of the fan that remains open and accessible because it is not connected to a duct. IMPORTANT: The turbine or propeller may not be visible when it is rotating in deficient illuminative conditions.

IP20 PROTECTION FOR AIR INLETS AND OULETS OF THE FAN: In ducted installations, the installer is responsible of assuring such protection. In a free inlet or outlet installation, the final user has to assure that the suitable protection guard (accessory) for the fan is mounted.

START UP: Once all the previous verifications have been done, the start up of the fan can be carried out. Before proceeding with the first start-ups, it is recommended to make sure once more, either directly or through inspection registrations of the apparatus, that there is no friction on any of the rotating elements, because some installation element might have forced or deformed the fan. Also check that neither foreign bodies nor material proceeding from the installation of the fan are present in the ducts.
The first start-up should be of a short duration and only to verify that the rotating direction is correct according to the indications, and in order to check whether any strange or friction noises are present in the inside part. In case of an incorrect rotation, you should carry out the connection changes according to what is previously indicated. During the second start-up, the fan should be allowed to reach its nominal velocity completely once the controlled start-up is finished. If regulation shutters are used, these should be open so that the fan adapts itself to the required installation conditions.

IMPORTANT: AT THIS MOMENT A STRICT REAL CONSUMPTION CONTROL OF THE APPARATUS SHOULD BE CARRIED OUT THROUGH THE AMPEROMETRIC CLIP AND BY MAKING SURE THE USED NOMINAL CONSUMPTION "In" DOES NOT EXCEED THAT INDICATED ON THE VOLTAGE PLATE. IN CASE OF EXCEEDING THIS CONSUMPTION, STOP THE APPARATUS IMMEDIATELY.

An excessive consumption may be due to a motor failure, to the friction of some element or to an error in the electrical connection In most of the cases, however, it is due to a deficient adaptation of the installation, with an excessive or defective load. In axial fans, VHD group, it is very likely that an element excessively impeding the air flow has been installed.
IMPORTANT: do not mount any part directly on the fan, it could alter the fan's non sparking characteristics. In this case, you make no badly anchored elements are used; they could be sucked into the fan once it is turned on. Once the installation has been readjusted, make sure the consumption is adequate. Once this adjustment has been settled, the fan can operate properly.

FAN MAINTENANCE. GENERAL CARE
A complete revision of the fan and its installation after its first 24h of operation is recommended. Disconnect it from the electrical network to avoid any possible accident. F300 HOMOLOGATED SAFETY SWITCHES ARE RECOMMENDED for this service. Make sure no element has come loose. Verify also the motor or transmission bearings condition by turning the propeller or the turbine with your hands. Should any abnormality or noise be noticed, consult the manufacturer.
• In installations where the fan is generally switched off, carry out inspections at least every 6 months. An inspection of the fan's components condition will maintain its correct initial state, as long as no signs of bearings sticking or making noise are noticed. It is also recommended to carry out a complete start-up, allowing the fan to operate for one hour.
• In dual and only emergency applications where IMMERSED models equipped with F300 motors are used, bearings should be replaced at most every 8.500 h of operation. However, it is recommended to replace the motor completely (READ THOROUGHLY THE MOTOR MANUFACTURER INSTRUCTIONS). Never use radial tolerance bearings or conventional greases not specified by the motor manufacturer.
• F300 MOTORS USED FOR REPLACEMENT IN HOMOLOGATED FANS MUST BE AUTHORIZED BY LINDAB. EVEN IF THE REPLACED MOTOR HAS ITS OWN HOMOLOGATION, IT MAY HAVE NO VALIDITY WITH THIS PARTICULAR FAN HOMOLOGATION.
• FANS SUBMITTED TO AN EMERGENCY SERVICE IN CASE OF FIRE CANNOT BE REPAIRED. THEY MUST BE REPLACED BY A COMPLETELY NEW UNIT WITH THE SAME CHARACTERISTICS AND HOMOLOGATED AT F300.

IMPORTANT: Some models have a thermal protector incorporated which can temporarily stop the motor operation. Thus never manipulate the apparatus before disconnecting it from the electrical network In three-phase models, this protection activates the manoeuvre circuit on an electrical installation contactor.

CONSIDERATIONS DURING THE REVISION: Points to be taken into account during the revision in order to guarantee a correct operation of the fan:
1.- The operation of the fan has to be gentle and free of vibrations.
2.- Consumption in amperes "Ia(A)" measured through an ammeter or a multimeter should never exceed the nominal consumption "In(A)" specified on the motor plate.
3.- Make sure all of the elements joined through screws are not untightened.
6.- In fans which have been switched off or stored for two or more years, a complete revision of the ball bearings is recommended. Before starting up the fan, the replacement of the ball bearings should take place if you notice that they have been affected by oxidation or by dried out grease in a bad condition.

CLEANING: Attention, maintenance and correct cleaning of all the installation's components will be carried out periodically by the personnel responsible of the installation. Whenever possible, the accumulation of dirt, dust, grease, etc. should be avoided, since this is the main cause of fire and its propagations.

GREASING: The greasing instructions for different elements of the fan should be clearly distinguished: generally, the electric motor bearings do not need maintenance; however, it is recommended to not exceed the number of hours established and indicated in the manufacturer's manual of the motor (15.000 to 20.000h according to the brand; in this case, replacement should be carried out).