Woods
AIR MOVEMENT

HT ROOF UNITS

Installation guide & technical specifications

CONTENTS

PAGE

1. SAFETY

The following symbols refer to dangers or give advice for safe operation

Attention! Danger! Safety advice!

Danger from electric current or high voltage!

Crush danger!

Danger! Do not step under hanging load!

Important information

Fans are produced in accordance with the latest technical standards and our quality assurance programme, which includes material and function tests, ensuring that the final product is of a high quality and durable. Nevertheless, these fans can be dangerous if they are not used and installed correctly, according to the instructions.

Before installing and operating this fan please read these instructions carefully!

- Only use the fan after it has been securely mounted and fitted with protection guards to suit the application (tested guards can be supplied for all fans).
- Installation, electrical and mechanical maintenance and service should only be undertaken by qualified workers.
- The fan must only be used according to its design parameters, regarding performance (type plate) and mediums passing through it.
- The fans cannot be used in hazardous areas for the transfer of gas, mist vapours or mixtures. Nor can they be used for the transfer of solid components in the transfer medium.
- The thermal contact (TC) build in the motor winding serve as motor cut-out switches and must be connected.
- The operating instructions are part of the product and must be safely stored.

Do not make any additions or modifications to the equipment without the manufacturer's approval.

2. INSTALLATION AND MAINTENANCE INSTRUCTION MANUAL

- ROOF FANS HIGH TEMPERATURE 'HTC'

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

2.1 IMPORTANT F400

All F400 fans (400°C/2h) manufactured by Woods Air Movement and described in this manual are approved 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 specifically recommended for emergency smoke extraction in case of fire.

The selected model can be installed either inside the risk zone (IMMERSED DUTY MODELS with F400 motors), or used to carry high temperature gases (EXTERIOR DUTY MODELS); in this case, they must be installed outside the risk zone. The exterior models are equipped with normal-serial motors and other elements which are not suitable for use in the fire zone.

F400 FAN SERVICE MUST ALWAYS BE VERIFIED IN THE FAN LABEL F400- IMMERSED // F400 EXTERIOR DUTY.

ALL F400 WOODS AIR MOVEMENT FANS ARE SUITABLE FOR EXTERIOR DUTY ONLY.

3. EC APPROVAL AND CORRECT USE OF THE FAN

All fans manufactured and supplied by Woods Air Movement have been manufactured in accordance with the 98/37/CE (MAQUINAS-MACHINES) safety standard and according to the safety standard for low voltage materials 73/23/CE. is also extended to each particular range in compliance with the required specific standards.

UNE 100250 (ISO 12499)	Industrial fans. Fan 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	Machine 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 vibration evaluation.

In general, all the fan applications where an electronic velocity regulation system is needed require consultation and authorisation by Woods Air Movement and should comply with the electromagnetic compatibility 89/336/CEE standard.

The unauthorised use of any type of electronic controller with the fan can be very dangerous and render all security devices useless, and does not comply with F400 requirements.

For maximum safety in fan maintenance, Woods Air Movement recommends the installation of a SAFETY STOP/ START SWITCH, with manual disconnection. These devices must also be accredited to F400.

IMPORTANT: THIS PARTICULAR FAN MAY NOT BE SUITABLE 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 CHARACTERISTICS PLATE ARE COMPATIBLE WITH THOSE REQUIRED BY THE INSTALLATION.

4. APPLICATIONS

The requirements and characteristics of each fan model are always determined by the general and local standards and regulations to which every application may be subject. Therefore, in some cases, the selected standard units may not be adequate for certain applications, and special characteristics should be incorporated. For example, units to be installed in surroundings with fire or explosion risks should comply with the ATEX 94/9/CE standard and therefore with the D.C.89/106CEE directive. Other characteristics such as raised work temperature or corrosive surroundings may also require special models to guarantee compliance.

THE FAN LABEL WILL ALWAYS INDICATE THE APPARATUS COMPLIANCE WITH ANY SPECIFIC STANDARD. FOR VERIFICATION, PLEASE CONTACT US.

The selected fan model should never be used to convey gas of a composition or temperature other than that specified by Woods Air Movement, nor should it operate in surroundings with different conditions to those indicated IN THE ATEX RANGE OF FANS. THE TEMPERATURE REACHED BY ANY OF THE SURFACES HAS BEEN CALCULATED TO ENSURE THE PRESENCE OF THE SPECIFIED GASES WILL NOT POSE A RISK OF IGNITION. ANY UNSUITABLE USE OR OVERLOAD OF THE FAN CAN POSE A SECURITY RISK.

5. FAN RECEPTION AND VERIFICATION

Fans are carefully packed for transport, but their delivery is at the risk of the buyer. It is therefore recommended that merchandise is carefully checked on arrival for damage that may have occurred during transport. Any claim for damages should be made immediately by the buyer to the transport company, or to the insurance company

6. TRANSPORT AND STORING

Transport companies and intermediate suppliers who have been involved in the transport and storage of fans until final delivery will be responsible for any damage caused to the apparatus during this period; which covers both inadequate transport or storage. They are also responsible for pursuing, with the end client, any damages not covered by the manufacturer's guarantee.

Knocks or sudden movement may damage the more sensitive components of the fan, such as roller bearings and motors, transmission components or rotating parts "turbines or propellers" (elements that can become stuck or deformed and therefore unbalanced).

During the storage of the apparatus, before its installation, it must be protected against anything that may cause damage. This includes dust, rain, ultraviolet radiation (direct exposure to the sun) high humidity and sudden changes of temperature. These potentially harmful elements are the principal causes of the deterioration of the fan, causing serious damage through oxidation of the components or deterioration of its paint.

The fan must be carefully handled in compliance with the detailed instructions provided. Every fan, depending on its weight and construction, will be delivered in individual cardboard boxes or pallets. They may also be provided with bracing points placed to anchor them so they may be moved with a crane or pulley.

7. QUALITY CONTROL

7.1 OPERATION

Before delivery, all fans are submitted to electrical safety and operating tests. This ensures that, if the apparatus has not suffered any damage during transport and it is correctly installed as indicated in these instructions, it will operate correctly.

7.1 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.

However, we recommend a thorough assessment is carried out before installation; rotating the element by hand to ensure it does not scrape, and to check there is no damage caused during transport. Do not install or turn on the fan if there is any damage. Please contact our technical service in this instance

8. OUR PRODUCT GUARANTEE

Woods Air Movement will always deliver fans in accordance with the service or installation requirements. Therefore all components used in the fan will only be suitable for the flow to be conveyed and the operating conditions specified by the customer.

IMPORTANT: Woods Air Movement will not be responsible for accidents caused by incorrect handling of the fan and omission or non-compliance of any of the recommendations and safety regulations stated in this manual.

8.1 WARRANTY PERIOD

Woods Air Movement fans have a 1-year guarantee from date of purchase (always keep the invoice). The stated warranty period will expire after a year, even if the fan has not been installed or used immediately after its purchase from Woods Air Movement. This guarantee excludes any marks, damage or breakdown caused to the fan itself, or to third parties affected by the incorrect or careless use of the apparatus, normal wear, overload or handling by anyone not authorised by Woods Air Movement to carry out technical service. This guarantee includes 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 a trained specialist. During the warranty period, repairs may only be carried out with previous authorisation by Woods Air Movement and by authorised workshops and personnel. WOODS AIR MOVEMENT WILL ALWAYS DECIDE WHERE REPAIRS OF THE APPARATUS UNDER WARRANTY ARE CARRIED OUT, AND THE TRANSPORT COMPANIES USED FOR THEIR TRANSPORT SHOULD THIS BE NECESSARY. THIS GUARANTEE DOES NOT COVER THE COST OF TRANSPORT OF SMALL APPARATUS TO THE RECOMMENDED TECHNICAL SERVICE.

9. FAN INSTALLATION AND OPERATION

9.1 VERIFY

For fans due to be installed directly onto a roof, correct horizontal and vertical levelling of the apparatus must be carried out, even if a support system or an additional structure is being used, Horizontal bases must be perfectly level and set in a concrete base. Adequate supports with sufficient resistance and rigidity to support the fan weight should also be installed. For roof fan products, special attention should be paid to reinforce the loading point of the fan and ensure that the roof water tightness is not affected by possible vibrations of the apparatus. Normal vibrations of the apparatus during its operation depend mainly on the rigidity of the structure where the fan is to be installed.

If dampers are necessary to avoid vibrations and noise, only metal springs should be used. F400 - approved 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 security compliance of the installation.

In rigid installations on cement bases or walls which are not correctly aligned, never force the fan structure by tightening the screws. Before installation, any gaps should be filled with small strips of metal or with washers, or by filling them with quick drying cement.

9.2 ELECTRICAL CONNECTION AND INSTALLATION

Each fan's wiring diagrams are available inside the connection box of the motor. PLEASE READ THE INSTRUCTION MANUAL FOR F400 CAREFULLY. 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 suitable for 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 achieve more gentle start-ups. In some models in the middle and high voltage centrifugal fans, a regulation shutter or valve completely closed during the fan's start-up to reduce consumption will be enough.

The cable or cables used should be properly protected to avoid any damage to the fan's structural components or their backups, and must comply with the pertinent F400 technical requirements.

IN INTERMEDIATE CONNECTIONS, BOXES THAT COMPLY WITH THE F400 DEMANDS MUST BE USED (CAREFULLY READ THE F400 MOTOR MANUAL INSTRUCTIONS). CABLES CATALOGUED AS “FLAME RESISTANT” WHICH DON’T GUARANTEE A F400 SERVICE ARE NOT SUITABLE FOR THIS FUNCTION. WOODS AIR MOVEMENT 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 F400 STANDARDS. SPECIAL ATTENTION MUST BE PAID TO ALL METAL STRUCTURAL PARTS, WHICH MUST REMAIN CORRECTLY CONNECTED TO THE GROUND TO PREVENT ANY ELEMENT FROM GETTING ELECTRICALLY LOADED AND TO AVOID ELECTROSTATIC DISCHARGES.

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

9.3 VOLTAGE AND FREQUENCY

Carefully read the F400 motor manual instructions. The motor power supply should be made in accordance with the voltage and frequency shown on the fan plate. Variations of 5% in the electrical network for the nominal voltage indicated are permitted. If the connection used cannot support this level, there may be a danger of the motor burning out. Therefore, ensure the selected Y-? disposition in the motor corresponds to the network voltage and frequency by using a tester.

9.4 CONSUMPTION:

Once the fan has been installed, and the load does not exceed that shown on the plate, you can control the consumption. The fan’s capacity and the installation load should be correctly adjusted (SEE THE OPERATING SECTION). In case of non-compliance, consult the manufacturer.

9.5 GROUNDING

If the fan is a Class I machine that complies with the current standard, it is vital to correctly carry out 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 greater than 0,l?

9.6 ENVIRONMENTAL CONDITIONS

It is very important for normal service (not in an emergency), to never exceed the specified maximum gases continuous temperature specified in every model. The temperature of the fluid itself should never exceed 60^0C. In high pressure fans, heating of the gas inside the fan due to compression should also be considered and verified by calculation. Verify first that the fan is labelled with the correct temperature class “Tl to T6”. Make sure that the same, or a higher temperature, class is specified on the motor plate. All motors for external F400 fans supplied by Woods Air Movement are generally CLASS F.

However, there may be exceptions. In the EXTERNAL models (during normal service of DUAL application), but independently of the motor’s thermal class, it is recommended that the air temperature does not exceed 40°C, and to keep the humidity below 60% in the cooling surroundings of the motor. This will ensure the motor is kept cool and, at the same time, prolong its duration. The maximum air temperature in a continuous service should range from 40^0C to 55^0C.

In each case it is recommended that users consult the information in the technical catalogue to establish the particular detailed characteristics of each fan range and model. 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.

9.7 ROTATION DIRECTION

This is shown by the arrow on the fan’s casing. To invert the three-phase rotation of a one or two velocity motor, interchange the two phases. In single phase motors, this can only be changed in some models. Consult the diagrams in each case.

9.8 SOUND LEVEL

Depending on the fan model, its voltage size and revolutions, this may oscillate between 37 and l00dB (A). The sound level corresponding to each concrete model is specified in its technical sheet. If the fan does not comply with the permitted local limitations of maximum noise level, other alternative solutions should be considered in order to reduce this sound level by installing silencers, barriers or soundproofing cases.

9.9 CONNECTION DUE 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 should be requested separately from the fan, meet with F400 technical requirements and specifications. The duct network should never lean on the fan, but be self-supporting.

9.10 PROTECTION AGAINST INVOLUNTARY ACCIDENTS

Through Woods Air Movement, products (accessories) are available that protect the rotating body (propeller or turbine) in every fan model, according to UNE EN 294. The installer or end user must request and install these products to protect accesses to the interior of the fan that remains open, accessible and not connected to a duct.

IMPORTANT: The turbine or propeller may not be visible when it is rotating in poorly lit conditions.

9.11 IP20 PROTECTION FOR AIR INLETS AND OUTLETS OF THE FAN

In ATEX applications, an IP20 protection is recommended. In ducted installations, the installer is responsible for ensuring this protection. In a free inlet or outlet installation, the end user must ensure that the protection guard (accessory) for the fan is mounted.

9.12 START-UP

Once all the checks have been done, start-up of the fan can be carried out. Before proceeding with the first start-up, it is recommended that another thorough inspection is made to ensure that there is no friction in any of the rotating elements caused by deformation. It is also vital to check that there is nothing contained within the ducts.

The first start-up should be short and carried out only to check that the rotating direction is correct according to the specifications, and if there are any strange or friction noises in the interior. In case of an incorrect rotation, connection changes should be carried out as previously stated. During the second start-up, the fan should be allowed to reach its target velocity. If regulation shutters are used, these should be open so that the fan can adapt itself to the required installation conditions.

IMPORTANT: AT THIS TIME, 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. IF THIS CONSUMPTION IS EXCEEDED, STOP THE APPARATUS IMMEDIATELY.

An excessive consumption may be due to a motor failure, to the friction of some element, or an error in the electrical connection. In most cases, however, it is due to incorrect installation, with an excessive or defective load. If the problem occurs in a centrifugal fan, the air flow should be reduced, either through the regulation shutter, or by adding some kind of metal strip that closes part of the discharge or suction duct of the fan.

IMPORTANT: Do not mount any part directly onto the fan, as it could alter the fan’s non sparking characteristics.

In this instance, ensure no poorly anchored elements are used, as they could be sucked into the fan once it is turned on. Once the installation has been readjusted, make sure the consumption is adequate. The fan should operate properly once this adjustment has settled

10. FAN MAINTENANCE

10.1 GENERAL CARE

A complete revision of the fan and its installation after the first 24 hours of operation is recommended. Disconnect it from the electrical network to avoid any possible accidents. F400 APPROVED SAFETY SWITCHES ARE RECOMMENDED for this service. Make sure no parts have come loose, and completely retighten all parts: motor supports and axles, etc. Also, check the condition of the motor or transmission bearings by turning the propeller or the turbine with your hands. If you notice any abnormality or noise, consult the manufacturer.

In wIn installations, where the fan is generally switched off, inspections should be carried out at least every 6 months.

An inspection of the fan's components will ensure it remains in good condition, as long as there is no evidence of bearings sticking, or noise. It is also recommended that a complete start-up is carried out, allowing the fan to operate for one hour.

With wIn dual and only in emergency applications: It is recommended that the motor is replaced every 16,000 hours of operation.

F400 MOTORS USED FOR REPLACEMENT IN APPROVED FANS MUST BE AUTHORISED BY WOODS AIR MOVEMENT. EVEN IF THE REPLACED MOTOR IS APPROVED, IT MAY HAVE NO VALIDITY WITH THIS PARTICULAR FAN.

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 APPROVED FOR F400.

IMPORTANT: Some models have a thermal protector incorporated which can temporarily stop the motor operation. Therefore, 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 contact.

10.2 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 from vibrations.
2. Consumption in amperes "Ia(A)" measured through an ammeter or multi-meter should never exceed consumption "In(A)" specified on the motor plate.
3. Make sure all the elements joined with screws are tight.
4. In applications where fans convey gases with a high content of dust or grease, particles may become stuck to the propellers, leading to a lack of equilibrium of the turbine or propeller and resulting in the deterioration of the bearings. AVOID THE ACCUMULATION OF DUST ON THE MOTOR SURFACE TO AVOID INADEQUATE COOLING AND OPERATION. Frequent cleaning of the rotating body should be done during pauses in installation, and every time the fan develops light vibration and is not operating correctly. Never leave loose dust inside the fan.
5. In other applications with abrasive dust accumulations, the propeller may become worn. If there is lack of equilibrium caused by wear, these should be replaced.
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, ball bearings should be replaced if they have been affected by oxidation, or by dried out grease.

10.3 CLEANING

Attention, maintenance and cleaning of all the installation components should be carried out on a regular basis by the personnel responsible for the installation. Whenever possible, the accumulation of dirt, dust, grease, etc. should be avoided, as this is the main cause of fire.

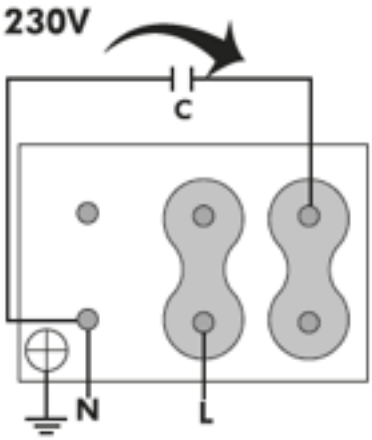
10.4 GREASING

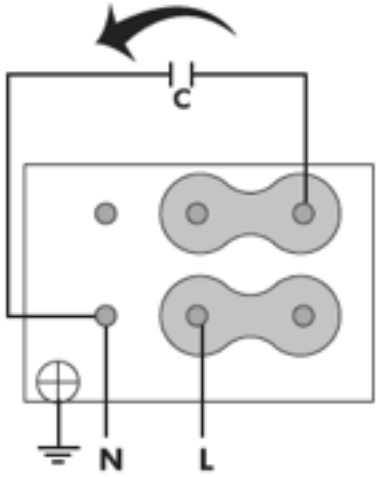
The greasing instructions for different elements of the fan should be clearly distinguished: The greasing instructions for different elements of the fan should be clearly followed:

1. Generally, the electric motor bearings do not need maintenance; but the number of hours recommended in the manufacturer's manual should not be exceeded; (15,000 to 20,000h according to the brand). In this case, the motor should be replaced.
2. Transmission groups of the axial ranges and the bearings used in the centrifugal range BV do not need greasing, but they should be replaced every 10,000 a 15,000h, depending on the temperature and humidity of the air to be conveyed.

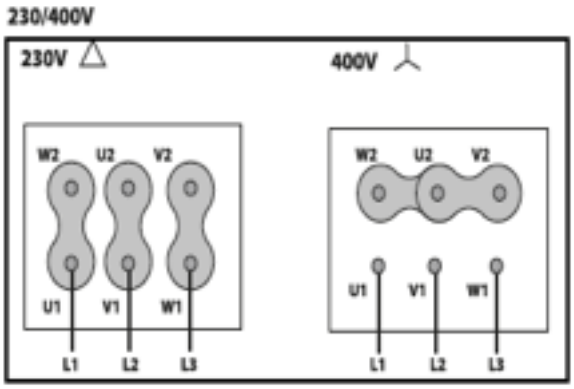
11. WIRING DIAGRAM

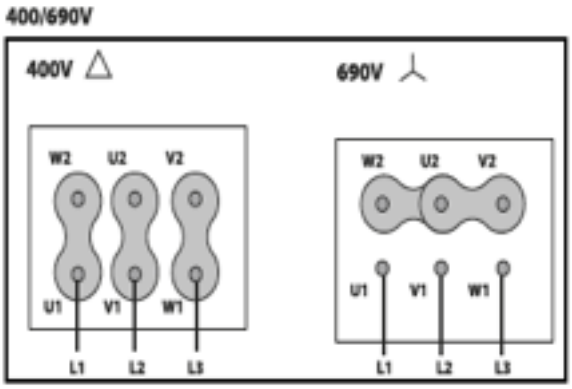
1 PHASE





3 PHASE





12. CE MARKING

12.1 DECLARATION OF CONFORMITY

We hereby declare under our sole responsibility that Woods Air Movement products comply with the requirements of the applicable EC / EU directives.

The declaration of conformity for compliance with the applicable EC / EU directives exclusively refers to fans that are connected according to the operating instructions and operated independently with sinusoidal power supply.

The Declaration of Conformity for compliance with the ErP Directive and associated regulations is only valid in conjunction with the ErP-related data in the product information and nameplate.

12.2 DECLARATION OF INCORPORATION

These products fall under the terms of an incomplete machine. For this reason, the following declaration of incorporation has been prepared. The declaration of incorporation applies only to products mentioned in this manual.

These operating instructions are considered assembly instructions in the sense of the Machinery Directive Annex VI.

EC Declaration of Conformity

Manufacturer Woods Air Movement
Axial Way
GB-Colchester CO4 5ZD

Herewith we declare that the incomplete machine

Designation of the machine:	Model or type of machine:	Since year of manufacture:
HT Roof fan	HTC	2019

meets the basic requirements of the guideline 2006/42/EC, in particular:

Artical 1.1.2, 1.1.5, 1.3.2, 1.4.1, 1.5.1, 1.7.3

Furthermore, in accordance with the requirements of the following directives:

Low voltage directive (2014/35/EU)
EMC-Directive (2014/30/EU)
ErP-Directive (2009/125/EC)

The following harmonized standards were applied:

EN60204-1	EN60034-1	EN61000-6-2	EN61000-6-3
EN61800-5-1	EN12101-3		

Moreover, we declare that the relevant technical documentation according to Appendix VII, Part B, has been issued, and we commit ourselves to forwarding the documents on request to the market regulators as written documents, or electronically.

The commissioning of the incomplete machine is prohibited until the incomplete machine has been installed in a machine which then meets the requirements of the EC Machinery Directive 2006/42/EC.

Name of representative for documentation:

Address of the nominated Person: see manufactures address

EC-declaration of Incorporation was issued:

Colchester, 10.10.2019

Place, Date

Simon Chapman
R&D Director Woods Air Movement

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Notes

Notes

Woods
AIR MOVEMENT

Woods Air Movement delivers smart and energy efficient Air Movement and Fire Safety solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than fifty years of accumulated industry application experience.
The widest range of Air Movement and Ventilation products in the market, and strong market presence with over 100 years of experience and manufacturing of products, guarantees that we are always by your side, ready to deliver Excellence in Solutions.

Contact our friendly sales team today for more information

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