

# ROOF FANS, TUBE FANS, BOX FANS AND INLINE DUCT FANS

## Installation guide & technical specifications



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## 1. GENERAL NOTES

Before installing and operating this fan please read this operating manual carefully!

We emphasize that this operating manual applies to specific units only and is in no way valid for the whole system.

These operating instructions contain safety instructions that must be observed as well as information for trouble-free operation. It is to be seen as part of the device and to be included in the sale or transfer of the device.

Woods fans are manufactured according to the state of the art at the time of delivery!

Extensive material, functional and quality tests ensure a high benefit and long service life!

### 1.1 EXCLUSION OF LIABILITY

Woods Air Movement is not liable for damages of any kind due to misuse, improper or inappropriate use or as a result of unauthorized repairs or modifications, as well as errors resulting from the design of the end product / system.

#### 1.21 SCOPE

The scope of these operating instructions extends to the following fan designs:

Designation of the machine:	Model or type of machine:
Roof fan	HR / VR
Tube fan	ESPADA / ROPERA
Box fan	ESTOC / ESTOC-TARGE
Inline Duct fan	KATANA

## 2. SAFETY

Pay attention to the following warnings to avoid personal hazard or disorders.

### 2.1 SYMBOLS

#### ATTENTION! DANGER! SAFETY ADVICE!

Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death. Compliance with the measures is mandatory



Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death. Compliance with the measures is mandatory



Danger from electric current or high voltage!



Crush danger!



Danger! Do not step under hanging load!



Caution! Hot surface!

## 2.1 SYMBOLS Continued



Use hand protection.



Important information



Use a helmet.



Use a hearing protection.

## 2.2 BASIC SAFETY RULES



Do not make any additions or modifications to the equipment without approval of Woods Air Movement.

If parts are used which are not approved by Woods Air Movement (e.g. nozzles or motors), the system builder is responsible for the resulting hazard.



### Requirements for the staff

Installation, electrical connection, maintenance and servicing work, as well as disassembly must only be carried out by trained and qualified personnel and in compliance with the relevant regulations and directives!



### Before all work on the device:

- Switch off.
- Lock against reclosure.
- Check that lines and equipment dead.
- Ground and short circuit phases.
- Cover, partition or screen of adjacent line sections



### Risk of injury

- Wait until the device stops.
- Before and after working on the unit, remove any tools or other objects from the unit.

Danger from flying parts!



**Attention. During operation the motor housing can reach high temperature.**

### Rotating device

Long hair, loose items of clothing or jewellery could become entangled and pulled into the device. You could be injured.

- Do not wear any loose clothing or jewellery while working on rotating parts.

Protect long hair by wearing a cap.



Only use the fan after it has been securely mounted and fitted with protection guards to suit the application. The protection guards must be certified to EN ISO 13857 (suited, tested guards can be supplied for all fans from our program).



### Protective equipment

Make sure you have appropriate protective equipment. A helmet is recommended when working overhead.

## 2.3 INTENDED USE



Woods fans have been specially developed for use in modern ventilation and air handling units. Any other use beyond this, if not contractually agreed, is deemed to be improper use.

Intended use also includes compliance with the procedures described in these operating instructions during assembly and installation, commissioning and maintenance.

The switching frequency of the fans is dimensioned for continuous operation S1. Connected switchgear must not permit extreme switching operations.

### Intended Use

- Operation in clean air.
- Comply with the specified performance limits ( $\Rightarrow$  type plate).
- Operation with low dust and grease content in the air.
  - $\rightarrow$  the correct operation must be checked by the planner of the system (use prefilter if necessary).
  - $\rightarrow$  For fans with motor outside the air flow (KBA, Uno-ME, DV), also conveying of air containing dust and grease.
- Conveying of slightly aggressive gases and vapors.
- Mediums up to an atmospheric density of 1,2 kg/m<sup>3</sup>
- Mediums up to a max. humidity of 95% (no condensing).
- Airflow temperature at convection cooled continuous operation of -25°C (for motor size 2 and 3, -20°C) up to the temperature displayed on the data plate.

### Improper Use



The following uses of the device are forbidden and can lead to hazards. However, there is no claim to completeness. In case of doubt contact Woods Air Movement directly.

- Use in an explosive atmosphere.
- Conveyance of abrasive or adhesive media (Exceptions after consultation possible).
- Resonance mode, operation with strong vibrations. This also includes vibrations that are transferred from the customer system to the fan.
- Operate in impermissible characteristic range ( $\Rightarrow$  product documentation).
- Operate in the event of imbalance, for example due to dirt accumulation or icing.
- Painting the device.
- Operation with fully or partially dismantled or manipulated protective devices.
- Conveying of solids in the medium and heavily dusty air.
- Operation of the device as a safety-technical component or for the assumption of safety-relevant functions - Operation of the device close to flammable substances or components.

### 3. STORAGE AND TRANSPORT

#### Storage and transport conditions

- Protect the device from environmental impacts and dirt until the final installation.
- High humidity and condensate formation must be avoided in any case!
- Environmental conditions: dry at -30°C to +80°C.

#### Transport

- Lift the device only with suitable load handling agents. (eg lift trucks, crane)

Fix the device with suitable means (eg straps) to avoid slipping due the transport.

(⇒ weight as signed on the data plate)



- Use suitable safety shoes and safety gloves when handling.

#### Storage

- Store the device partly assembled as well as ready in its original packing on a dry, vibration-free, weather protected and clean place.
- For longer storage periods, it is recommended to move the ball bearings regularly (⇒ see Maintenance, service).



**Danger! Do not step under hanging load!**

### 4. ASSEMBLY AND INSTALLATION



The unpacked fan has to be checked for transport damages. Damaged fans must not be installed!

Prevent falling objects and foreign matter from entering inlet and outlet opening of the fan. The protection guards must be certified to EN ISO 13857.

#### Danger of cutting and crushing



- Carefully remove the unit from the packaging by the motor flange or the motor support plate or the frame. If necessary, use suitable holding devices.
- Please wear safety shoes and protection gloves.

#### Assembly instructions

- Sufficient space in the intake and outlet area should be taken with regard to the efficiency. (⇒ for example, installation recommendation)
- Use suitable assembling means as e.g. scaffolds conforming to specifications.
- Fix the device at the place of installation until all fastening screws are tightened.
- Do not install the fan braced!
- Use only the released elastic collars for outlet or inlet connection (⇒ accessories) Pipes on inlet or outlet must be stayed separately
- Do not apply force (levering, bending).
- Fasten at all fastening spots with suitable means of mounting.
- Drill cuttings, screws and other foreign objects must not penetrate inside the device.
- For outdoor installation, related accessories to be used for weather protection.

#### Risk of electric shock

- Only connect the device to circuits which can be switched off with an all-pole disconnecting switch, in accordance with EN 60204-1.
- Electrical connection according to technical connection conditions and the relevant regulations according to the attached circuit diagram (P Label on the housing).
- Insert the cable properly in the terminal box and seal it.
- Do not use cable glands with plastic terminal boxes.
- Connect the equipotential bonding system correctly.
- The cable should be positioned that they cannot touch any rotating parts.
- Use only cables that meet the specified installation requirements for voltage, current, insulation material, load etc.
- Insert cable properly in the electronic housing and seal (possibly "water bag"). Tighten the cable gland with tools.
- You must prevent the ingress of water through the cable gland! For this reason, the cable glands are to arrange always downwards.

Dimensions available in product information.



The system manufacturer or the machine builder is responsible that the inherent installation and security information are harmonized with the valid standard and guidelines.

#### 4.1 INSTALLATION RECOMMENDATION



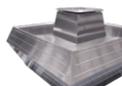
Fans with external rotor motor, are 100% variable voltage controllable (transformatory). The motor impellers, which are operated by a three-phase external rotor motor or IEC standard motor, can also be controlled continuously via frequency converters (see chapter Frequency Converters below).



- Only pick up the unpacked fan on base frame or on support brackets



- When the roof fan is placed on the roof base or the base silencer, the bearing surface must be sealed permanently elastic to the fan base plate. In the case of plinths provided by the customer, it is essential to ensure that their surfaces are flat. ⇒ An uneven surface will lead to deformation of the base frame so that the impeller cannot rotate free.



- For installation on roof socket or socket damper please use screws and seal rings for sealing against water.



If the degree of inclination is higher as 5°, is to use a custom build roof socket. Custom build products for any degrees can be ordered from the factory.

### 4.1.2 TUBE FANS



- A safe suspension must be guaranteed. Mounting brackets are available as accessories.
- To fix the assembly brackets at the steel tube fans, screws, which do not protrude more than 10 mm in the housing inside, may be screwed into it.

### 4.1.3 INLINE DUCT FANS



- As standard, the fan is to be mounted on brackets or suspended with suitable fasteners (angles, U-profiles).  
⇒ Weight according to fan type plate.
- The pipe system can either be fitted directly onto the connecting flanges of the fan or fastened with connecting sleeves.  
⇒ For sound decoupling, flexible connections must be selected on the pressure and suction sides.



Some inline duct fans have a fold-out fan section. There is mortal danger if the screws of the fold-out fan are removed (uncontrolled swing out of the fan part).

### 4.1.4 BOX FANS



- As standard, the ESTOC / ESTOC-TARG is to be mounted on brackets or suspended with suitable fasteners (angles, U-profiles).  
⇒ Weight according to fan type plate.
- The pipe system can either be fitted directly onto the connecting flanges of the ESTOC / ESTOC-TARG or fastened with connecting sleeves.  
⇒ For sound decoupling, flexible connections must be selected on the pressure and suction sides.

## 4.2 MOTOR PROTECTION



- Thermal contact: Attach thermal contact (TB) duly to an appropriate protective motor switching and/or speed controller (with voltage controllable motors only).  
The motors installed in Woods fans (up to 250) are partially protected by thermal contacts connected internally in series. A separate evaluation unit is not needed. Details on request.
- or PTC resistors: Attach PTC resistors duly to release equipment.
- Motor protection switch (only possible with not voltage controllable motors, e.g. IEC standard motors): Adjust the Bimetal relay (commercial) to the motor rated current (⇒ motor type plate).  
**Details on motor protection can be found on the allocated wiring diagram.**

## 5 COMMISSIONING



Commissioning may only be carried out after all safety instructions have been checked and a hazard has been excluded.



In the case of fans with a fold-out section (e.g. duct fan, folding roof fan, etc.), commissioning may only take place when the fan section is closed and secured.



### Emission

Depending on installation and operation conditions there can be a sound pressure level of higher than 70dB(A) (precise Information □ product catalogue)

### Danger of noise deafness!

Take appropriate protective measures (eg ear protection)

Prior to first commissioning check:

- Installation and electrical installation properly completed.
- Safety devices fitted  
⇒ protective guards
- The gap distances of rotating parts should be checked. Center inlet cone if necessary.
- Fan must not rub on fixed housing components. Turn impeller by hand to check smooth rotation.
- Assembly residue and foreign particles removed from fan area.
- Continuous protective conductor connection present.
- Cable entry and housing for sealing.
- Connection data correspond to data on type plate.
- Motor operating capacitor data (1~motors) complies with the specifications on the type plate.

### Commissioning

- Check the direction according to the direction of rotation arrow on the housing by switching briefly.
- Check smooth running.



Put into operation according local conditions. The regulations of the responsible power supplier are to be considered.

## 5.1 CHANGING THE DIRECTION OF ROTATION

### Three-phase motors

- Exchange two phases.

### Single-phase motors

- Exchange Z1 and Z2 (for color identification see connection diagram).

## 5.2 OPERATION ACCORDING TO ERP-DIRECTIVE



According to the regulation 1253/2014/EU the fans in the scope of application must be operated at least "3-Stage + OFF".

Depending on the assembled motor there are 3 variants possible for Woods Fans

- Fans with AC external rotor motor: optional control unit RTD.  
→ On type plate: "MSD to be used."
- Fans with EC external rotor motor: speed control integrated; no additional device necessary.  
→ On type plate: "VSD integrated"
- Fan with IEC standard motor: optional frequency converter.  
→ On type plate: "VSD to be used."

Responsible for the compliant, multi-stage operation is the operator. Appropriate switching device are available as accessory.

## 5.3 OPERATION WITH FREQUENCY CONVERTERS

Three phase Woods fans are suitable for operation with frequency converters when the following points are observed:

- Between the converter and the motor, sinusoidal filters should be incorporated which are effective for all phases (sinusoidal output voltage, phase against phase, phase against protective conductor) as offered by manufacturers.
- The attitudes on the frequency converter are to be made in accordance with the information on the data plate.
- Minimum frequency when operating with frequency converter = 10Hz.
- The external rotor motors used in this manual are equipped with a thermal contact (TB). By operation of the fan in combination with a frequency converter, the thermal contact must be applied to the frequency converter and evaluated.

At Woods external rotor motors of the thermal contact port is marked white. Please note the connection diagram of the respective motor.



Du / dt filters (also called motor or suppression filters) cannot be used in place of sinusoidal filters.

## 5.4 FANS WITH SHIELDED MOTOR CABLE

In order to comply with the EMC directive, a sinusoidal filter can be dispensed with in the case of fans which are supplied with a shield-ed motor cable at the factory

## 6 MAINTENANCE, SERVICE AND TROUBLE SHOOTING



All work on the fan must be carried out in compliance with the safety regulations in the chapter Safety.



All fans are statically and dynamically balanced as a composite unit in our factory.

### Ball bearings

The incorporated ball bearings are designed for a lifetime of 20.000 h to

40.000 h and maintenance free under ordinary operating conditions. For preventive maintenance the ball bearings shall be changed at least after 5 years due to the aging of the grease.

In case of longer periods of standstill, especially with higher humidity, fans should be operated by no one per month for minimum 1h.

The bearings should be checked at least semi-annually to ensure they are quiet, can move easily and are free of play. Manual check by turning the rotor when fan does not run.

⇒ Replace the ball bearing in case of noise, stiffness or bearing play.

For exchange of Ball bearings, contact our service department.

On 1~ motors, condenser rating can decrease with time. Life expectancy approx. 30,000 h.

In the event of any other damage (e.g. winding damage) please contact our service department.

### Cleaning

- Never use high pressure cleaning equipment ("steam cleaners")!
- Do not use acid, lye or solvent based cleaners
- Avoid any sharp or pointing objects for cleaning.

## 7 FAILURE

Any deviation from normal operating conditions of the fan is an indication of a fault and must be checked by service personnel.

The following table provides an overview of the possible causes of faults and actions to be taken.

### 7.1 TROUBLESHOOTING

Fault	Possible cause	Action
Fan is not rotating or stops after a various time.	Mechanical blockage	turn off, lay tension free, remove mechanical blockage.
	No supply voltage present or missing of a single phase.	Check the supply voltage directly on the fan. ⇒ If not all phases are measurable check the fuses and the wiring of the service switch.
	Motor overheated – thermal protection has triggered.	Check that airways are clear. Check the temperature of the conveying medium. For 1~ motors: Check capacitor.
Fan turns but there is no or not enough airflow.	Rotation speed of the fan too low.	Observe star / delta switching.
	Air flow interrupted.	Check duct system (e.g. suction, filter, sealing caps).
	Calculated pressure does not correspond to the real value.	Check fan selection. / Check pressure in the system.
	Unfavourable installation conditions.	Check the installation situation. (⇒ chapter installation recommendation)
	For 1~ motors: capacitor worn out.	Replace capacitor.
Vibrations / noises in fan	Impeller stripes.	Check impeller for dirt and clearance. Check mounting of Impeller and inlet cone.
	Deformation	Stop fan immediately. Contact Woods support.
	Dirty impeller.	Clean impeller.
	Damaged ball bearings.	Stop fan immediately. Contact Woods support.
	Wrong Operating point (only axial fans).	Operating point is in the forbidden area of the air curve. Reduce pressure losses
RCD-Switch or fuse trips.	Ground fault or short circuit.	Check if the cables are damaged or moisture is present.
	Defect of the motor and/or the electronic.	Contact Woods support.

## 8 DISPOSAL

Please note all the relevant requirements and regulations in your country when dis-posing the device.

### Ball bearings

The protection of the environment and the conservation of resources are important issues for Woods Air Movement. For this reason, environmentally friendly design and technical safety as well as health protection were already respected in the development of our fans:

In the following section you will find recommendations for environmentally friendly disposal of the machine and its components.

### 8.1 DISASSEMBLY

For the recycling and disposal of Woods products the local requirements must be followed.

#### Disassembly as follows:

1. Get in touch with a waste management company in your area. Clarify, how and in which quality the dismantling of the components should take place.
2. Disconnect the machine from the mains all and remove all cables.
3. If necessary, remove all liquids, such as oil and remove this according to the local requirements.
4. Transport the machine to a suitable location for disassembly.
5. Disassemble the machine according to general mechanics typical procedure.



The machine is made up of heavy parts. These can fall during dismantling. Serious injury and property damage may result.

Secure machine parts against falling before you remove this.

### 8.2 DISPOSE OF COMPONENTS

#### Components

The machine consists mainly of metallic materials. These are generally considered fully recyclable. Separate the components for recycling according to the following categories:

- Steel and Iron
- Aluminum
- Non-ferrous metal
- ⇒ (Insulation is incinerated during copper recycling)
- Insulating material
- Cables and wires
- If applicable electrical scrap
- Plastics

#### Materials and chemicals

Separate the materials and chemicals for disposal, e.g. according to the following categories:

- Grease
- Paint residues

Dispose the separated components according to the local regulations. The same goes for cloths and cleaning substances which work was carried out on the machine.

#### Packing material

- When needed, take contact with a waste management company.
- Wood packaging for sea transport consists of impregnated wood. Please note the local regulations.
- The foam packaging, packaging foils and cartons can be supplied readily to the material-recovery.

## 9 CE MARKING



### 9.1 DECLARATION OF CONFORMITY

Herewith, we declare under our sole responsibility that Woods products meet all the requirements of the applicable EC/EU directives.

A declaration of conformity has been created and is available for download on the Woods homepage.

The declaration of conformity for the compliance of the abovementioned EU/EG-directives is valid only for fans which are connected according to the operating instructions and operated independently in reference to sinusoidal current supply.

The declaration of conformity for compliance with the ErP Directive and associated the associated regulations is only valid in combination with the ErP-related data on the product information and nameplate.



## EU-Declaration of Conformity

as defined by the low voltage directive 2014/35/EU  
and the EMC directive 2014/30/EU

Manufacturer

**Fläkt Woods Limited trading as Woods Air Movement**  
**Axial Way**  
**GB - Colchester CO4 5ZD**

For the following machine

Designation of the machine:	Model or type of machine	Pertinent regulation
Roof fan	HR / VR	1253/2014/EU (Lot 6)
Tube fan	Espada / Ropera	1253/2014/EU (Lot 6)
Inline duct fan	Katana	1253/2014/EU (Lot 6)
Box fan	ePowerbox / Estoc Targe	1253/2014/EU (Lot 6)
Kitchen Exhaust unit	eDVC	1253/2014/EU (Lot 6)

We declare under our sole responsibility, that they meet the basic requirements that are laid down in the harmonization legislation designated below.

- **ErP Directive (2009/125/EC)**
- **ErP-Regulation (1253/2014/EU & 327/2011/EU)**

The following technical standards were applied:

EN ISO 5801:2017

This declaration of conformity related to the ErP Directive 2009/125/EC and regulations 1253/2014/EU and 327/2011/EU is valid only in combination with the ErP related data on the product information and the type of plate. The usage of multi-speed drive or variable speed drive is required according 1253/2014/EU and must be ensured, if necessary, provided by the customer.

Name of the representative for documentation:

Ashim Nath

Address of the nominated person:

see manufacturers address.

EC-Declaration of Conformity was issued:

Colchester, 21.02.2023  
**Place, Date**

**Simon Chapman**  
R&D Director Woods Air Movement

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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. 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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