FläktWoods

FläktWoods

WE BRING **BETTER AIR**™ TO LIFE

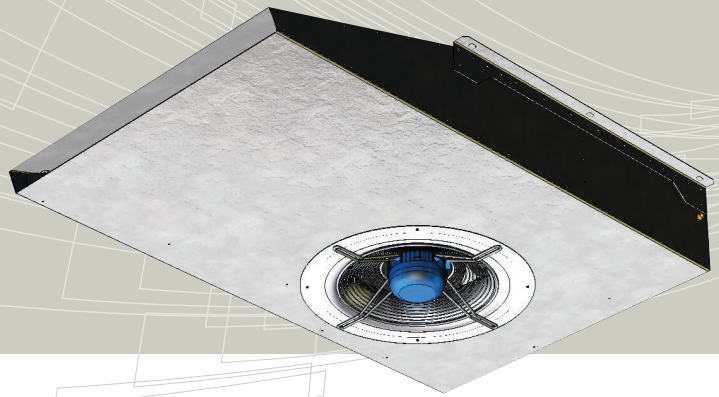
With over a century of innovation and expertise to share with our customers, Fläkt Woods is a global leader in Air Technology products and solutions. We specialize in the design and manufacturing of a wide range of products and solutions for Air Movement, Air Treatment, Air Distribution, Air Management and Air Diffusion with focus on two major benefits – **Air Comfort** and **Fire Safety**. With market presence in 65 countries we are in a unique position to be a local supplier and an international partner in our customer's projects.

Our product brands such as SEMCO®, eQ®, eQ Prime®, JM Aerofoil®, JMv Aerofoil®, VCC technology®, Econet®, Veloduct®, Optivent®, Optimix®, Econovent® and Cleanvent® are well-known and trusted by customers all over the world to deliver high quality and energy efficient solutions.

Fläkt Woods Limited, *Axial Way, Colchester, Essex, CO4 5ZD*
tel: 01206 222 555
website: www.flaktwoods.co.uk

» See global website for international sales offices www.flaktwoods.com

INDUCTION THRUST FANS



» SAFETY, INSTALLATION AND MAINTENANCE INSTRUCTIONS

PART NO. 401074

CONTENTS

1. ABOUT THIS MANUAL

These operating instructions are an integral part of the Induction Thrust Fan.
Fläkt Woods Limited shall not accept any liability or provide any warranty cover for primary damage or secondary damage arising as a consequence of disregarding these operating instructions.

1. Read operating manual carefully before use.
2. Retain operating manual for entire service life of the fan.
3. Keep operating manual accessible to personnel at all times.
4. Pass operating manual on to any subsequent owner or user of Induction Thrust Fan.
5. Insert any supplementary instructions received from the manufacturer in the operating manual.

1.1. VALIDITY

This operating manual applies to Induction Thrust Fan models ITF504801, ITF504802, ITF504804, ITF754801, ITF754802, ITF104801 only.

1.2. TARGET GROUP

This operating manual is intended for operators and qualified professionals trained in installation, commissioning, operation, maintenance and decommissioning.

1.3. OTHER APPLICABLE DOCUMENTS

In addition to reading these instructions, due notice should also be taken of the following documents and specifications on the Induction Thrust Fan:

- IEC 364/ DIN VDE 0100
- EN 60204-1 and VDE 0113-1
- EN 294 - EN ISO 12100-1; -2
- DIN EN 12101-3 - VDMA 24186-1
- Type plate - Technical catalogue

1.4. SYMBOLS AND MARKINGS

Use of Warning Signs Signal word

Nature, source and consequences of hazard!
> Steps required to avert danger

Signal word

SYMBOL / DANGER LEVEL	LIKELIHOOD OF OCCURRENCE	CONSEQUENCES OF NEGLECT
 DANGER	IMMINENT DANGER	DEATH, SERIOUS PHYSICAL INJURY
 DANGER	POTENTIAL DANGER	DEATH, SERIOUS PHYSICAL INJURY
 DANGER	POTENTIAL DANGER	MINOR PHYSICAL INJURY

NOTES
Note giving pointers for easier or safe work.
> Steps required for easier or safe work.

Other Symbols and Markings

SYMBOL	MEANING
4	Requirement for an operation
>	Operation with one step
1. ... 2. ... 3. ...	Operation with several steps
• .	Bullet point (primary list)
-	Bullet point (secondary list)
ACCENTUATION (BOLD)	For emphasis

2. DESIGNATED USE

2.1. OPERATING DATA / MAXIMUM RATINGS

Risk of injury! > Adhere to technical specifications and permissible limits.

Caution

For technical specifications reference should be made to the type plate, technical data sheet and technical catalogue.

In the event of fire, the Induction Thrust Fan is to operate with smoke and heat. The Induction Thrust Fan is also suitable for standard ventilation.

RANGE	PERMISSIBLE TEMPERATURE / TIME AT SMOKE EXTRACT	PERMISSIBLE TEMPERATURE AT CONT. OPERATION
ITF504801, ITF504802, ITF754801, ITF754802, ITF104801	+300 °C / 120 min	-20 °C up to +40 °C
ITF504804	+400 °C / 120 min	-15 °C up to +40 °C

Caution: After use in the event of fire replace the Induction Thrust Fan!

2.2. IMPROPER USE

Examples of improper use would be the conveying of:
- media with unacceptable high or low temperatures
- aggressive media
- humid media
- abrasive media

3. SAFETY

3.1. PRODUCT SAFETY

Fläkt Woods fans offer a high degree of operational safety and high quality standards guaranteed by a certified Quality Management System (EN ISO 9001).
Before leaving the factory all the fans are inspected and sealed with a mark of conformity.
Nevertheless, when operating Induction Thrust Fan supplied by Fläkt Woods Limited there can be a risk of death or injury for the user or third parties.

- Only use Induction Thrust Fans in perfect working order and as intended, having due regard for safety, an awareness of hazards and in due compliance with the operating instructions.
- Only fit components certified for smoke extract purpose!
- Arrange immediate repair of any faults which could compromise safety.

3.2. SAFETY INSTRUCTIONS

The Induction Thrust Fan may only be commissioned, operated and serviced in compliance with the following instructions:
- Operating instructions
- Warning and information signs on the Induction Thrust Fan.
- Any other operating and installation instructions pertaining to the Induction Thrust Fan.
- Terms and requirements relevant to the Induction Thrust Fan.
- Applicable national and local regulations, especially regarding health & safety and accident prevention.

3.3. SAFETY DEVICES

> Use appropriate safeguards to prevent contact with rotating parts (shafts, impeller, etc.).
> After installation (and before electrical connection) immediately refit any guards which have been removed during installation.

The following must always be observed in the event of free exhaust fans (even if an inlet guard grille is present):
• Keep people and objects away from the fan inlet side!
• Block off the appropriate area!

Danger

3.4. PROFESSIONAL STAFF

> Installation of the Induction Thrust Fan and any work on it is to be carried out by skilled professionals only with due regard to these operating instructions and any applicable regulations.
> Electrical connection to be carried out by qualified electricians only.

3.5. PROTECTIVE GEAR

Ensure that members of staff are wearing protective gear appropriate to their deployment and environment. The protective clothing is specified below!

Warning!

3.6. SPECIFIC HAZARDS
Noise Emission

The sound emission expected in normal use of the fan is documented in the technical lists and should be duly taken into account.

> Wear ear protection when working near to or on the running fan!

Heavy Loads
The heavy weight of the Induction Thrust Fan and its components entail the following risks in transit and during installation:

• Risk of being trapped, crushed or cut by moving or toppling machinery
• Danger of falling components

> **Do not stand or work under suspended loads.**
> **Wear a protective helmet, safety shoes and gloves.**

Rotating Shafts and Impellers
Objects falling onto rotating shafts and impellers can fly off at an angle and cause serious injury. Articles of clothing and hair can get caught in rotating shafts and impellers.

> **Do not remove guards during operation.**
> **Do not wear loose-fitting clothing when working near rotating shafts and impellers.**
> **Wear goggles.**

Hot Surfaces
There is a risk of sustaining burns or scalds on hot surfaces during operation.

> **Do not touch the motor during operation.**
> **When the Induction Thrust Fan has stopped wait until the motor has cooled down.**
> **Wear protective gloves.**

3.7. STRUCTURAL MODIFICATIONS, SPARE PARTS

Caution: Unauthorised structural modifications may not be made to the fan. Fläkt Woods will not accept liability for any damage arising as a result of any modifications. Use only genuine spare parts supplied by Fläkt Woods Limited.

3.8. INSTALLATION AND MAINTENANCE

The following steps should be taken before working on the fan:

Danger

1. Switch off the installation and take measures to prevent it from being switched back on accidentally.
2. Display the following message on a sign:

Do not switch on! Work currently in progress on the installation.

4. PRODUCT DESCRIPTION

4.1. INDUCTION THRUST FANS

The air intake of the induction fan is at the lower side. The air is conveyed over the motor and then directed towards a horizontal discharge nozzle. The impeller is pressed and formed galvanised steel sheet bolted to a cast iron control boss and the casing is also made of galvanised sheet steel.

The feed cable is specified for high thermal loads, protected against mechanical stresses, and leads to a metal connection box placed on the casing back side.

The units are designed for ceiling installation (hanging) and may only be fitted at the side channels with specially certified anchoring bolts.

5. TRANSPORT AND STORAGE

5.1. PACKAGING

Induction Thrust Fans are packaged in stacks on an open pallet and shrink wrapped for protection.

5.2. TRANSPORTATION OF INDUCTION THRUST FANS

Danger of injury from falling components!

Warning

> Use tested and appropriate load handling equipment only (see type plate or data sheet).
> Secure load at all times.
> Do not stand under suspended loads.

1. Select means of transport according to weight and dimensions of fan.
2. Lift the Induction Thrust Fan at the mounting feet points.
3. When transporting by crane, four point lifting is to be provided (2 slings)
4. If necessary screw lifting shackle to the unit.
5. Secure load using e.g. straps or other aids designed to prevent slipping.
6. Handle Induction Thrust Fans with care and avoid damage.

5.4. STORAGE OF INDUCTION THRUST FANS

Caution Risk of Corrosion!

- Store the fan in its packaging, adding additional protection in relation to the storage
- environment.
- Store Induction Thrust Fan in a well-ventilated room only at normal temperatures and in a
- non-corrosive atmosphere.
- Store Induction Thrust Fan at less than 70 % atmospheric humidity.
- Adhere to permissible temperature of –20 °C to +40 °C.

6. INSTALLATION

6.1. SAFETY INSTRUCTIONS FOR INSTALLATION

> Observe the safety instructions and preventive measures in Section 3 and the relevant local legal requirements.

6.2. INSTALLATION PREPARATION

1. Ensure place of installation suitable for the Induction Thrust Fan in terms of its category, condition, ambient temperature and environmental media (Check with certificate).
2. Base level and with sufficient load-bearing capacity.
3. Place of installation horizontal.
4. Unpack the Induction Thrust Fan carefully.
5. Remove all the packaging and dispose of it properly.

6.3. CARRYING OUT INSTALLATION

The fans are designed for installation below ceiling. Every fan is equipped with its own mounting feet.

- Please observe the arrow for flow direction on the unit for correct installation!
- Make sure that the air can flow into and out of the fan without being obstructed.
- For installation only specially certified plugs are to be used.

> Install the fan horizontally and without tension to the casing by using the mounting feet provided. Check:

- The fans has been fitted with certified plugs!
- The fan has been fitted without tension and distortions!
- The impeller is running idle and without touching the intake cone!

Caution: In emergency mode the Induction Thrust Fan must be operated directly from the mains. Frequency converter must be by passed in this operating condition.

6.4. INSTALLING SAFETY DEVICES

> NOTE!
Conformity with DIN EN 294 only relates to the safety guard installed insofar as it is supplied with the fan. The operator of the system is responsible for full compliance with DIN EN 294.

1. Ensure guards are fitted to protect exposed inlet openings (DIN EN 294).
2. Design safety devices in such a way that they prevent objects from being sucked in or from falling in.
3. Ensure that all the mechanical safety devices are fitted.

7. ELECTRICAL CONNECTION

7.1. SAFETY INSTRUCTIONS FOR ELECTRICAL CONNECTION

Caution: Danger of electric shock!

> Observe the safety instructions and preventive measures in Section 3 and all relevant legal requirements.

Warning

Caution: In order to prevent unexpected operation an isolator switch is provided.

Caution: When connecting the Induction Thrust Fan, special attention should be paid to cable routing!

- Protect cables from hot [40°C] air within the space
- For fire safety applications, suitably fire rated cables should be used. A minimum of FP400 is recommended
- Protect cables against hot fan surfaces, e.g. through metal tube with distance pieces.

Caution: In the case of fire, the Induction Thrust Fan require a secured electric supply. Securing of electric supply exceeding public mains supply by means of electric power generation units (equivalent current) depends on the respective public law requirements.

For electric supply of Induction Thrust Fan in buildings only use electric line systems whose function maintenance class was proved by a general test certificate issued by the building authorities. The electric line systems must be laid with protection against mechanical damage. They must not touch the fan housing at any point. The electric line systems must be laid up to the fan isolator switch - in case of installation in buildings - outside of the room to be extracted as well as outdoors. Please check the national regulations, and project requirements.

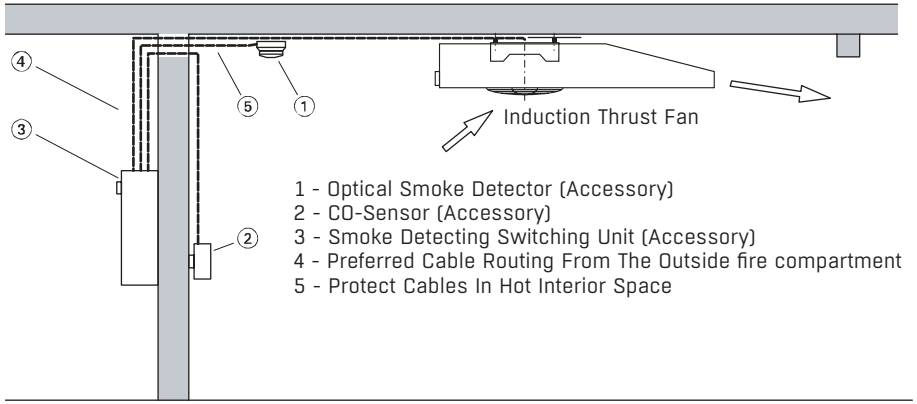
7.2. CONNECTING THE MOTOR

The wiring diagram is placed inside the connection box or affixed to the fan casing.

1. Current, voltage and frequency of mains supply checked for conformity with fan type plate and motor rating plate.
2. Motors are 4-8 pole, pole change [Dahlander] type.
3. These can be wired at a single speed and controlled via a Variable Frequency Drive or inverter.
4. The fan has been protected against an unexpected start!
5. Chapter 3. “Safety“ to be respected!
6. Fan to be connected in accordance to attached wiring diagram.
7. Ensure that all electrical safety devices are in place and correctly connected.

Caution: The motors are designed for S1 continual operation. With more than three starts per hour the suitability of the motor is to be confirmed by Fläkt Woods Limited.

Connection Example



7.3. MOTOR PROTECTION

Caution: No standard motor overheat protection has been provided by the supplier!

If overheat protection is fitted, in the event of fire all motor protection devices must be automatically by-passed and/or deactivated.

7.4. CARRYING OUT A TEST RUN

Risk of injury from rotating impeller!

> Never reach into the impeller when the fan is open

Danger

1. Disconnect motor from the mains.
2. Take measures to prevent Induction Thrust Fan from being accidentally switched on.
3. Clear the fan ducting system and fan of all foreign bodies (tools, small parts, construction waste, etc).
4. Close all the inspection openings.
5. Switch on fan and check direction of rotation of impeller by comparing it with the arrow on the fan indicating the direction of rotation.
6. If the direction of rotation is wrong, reverse the polarity of the motor having due regard to the safety instructions.
7. Once operating speed has been reached measure the current consumption and compare it with the nominal motor current on the roof fan type plate or motor rating plate.
8. If there is continuous overload switch the Induction Thrust Fan off immediately.
9. Check that the Induction Thrust Fan runs smoothly and quietly. Ensure that there are no unusual oscillations or vibrations.
10. Check the motor for any abnormal noises.

8. COMMISSIONING / OPERATION

8.1. COMMISSIONING THE FAN

Risk of injury from rotating parts and hot surfaces!

> Ensure that all the safety devices are fitted.

Danger

Material damage may be caused by overload from excessive starting currents!

> Adhere to the output limits imposed by the power supply company.

NOTE!
After the complete installation of a Induction Thrust Fan, a trouble free interaction of all components has to be stated by a commissioning acceptance check. The Induction Thrust Fan manufacturer may point out the necessity of this acceptance check. It has to be initiated by the owner of the installation. The result of the acceptance check has to be documented by the owner, and to be filed by the owner/user.

1. Check the working order of all control instruments connected.
2. Switch on the Induction Thrust Fan.

9. MAINTENANCE

9.1. SAFETY INSTRUCTIONS FOR MAINTENANCE

> Observe the safety instructions and preventive measures in Section 3 and all relevant legal requirements.
> Follow the directions of the motor supplier and the instructions specified by the manufacturers of the switches and control units.

Work on the impeller may only be executed after a safe cut off of the electrical feed!

Note The Induction Thrust Fan must be checked at regular intervals according to the instructions attached. The user has to document his checks. The documents are to be kept by the user of the Induction Thrust Fan installation.

Warning

Caution: Repair or major maintenance works have to be made in the works of the manufacturer or by staff persons from Fläkt Woods or by persons of companies which are authorised by Fläkt Woods.

9.2. MAINTENANCE PREPARATION

1. Disconnect motor from the mains.
2. Fans should be switched off by the isolator switch.
3. Take measures to prevent Induction Thrust Fan from being switched on by accident.
4. Wait until the impeller has stopped.
5. Wait until all hot surfaces have cooled down.

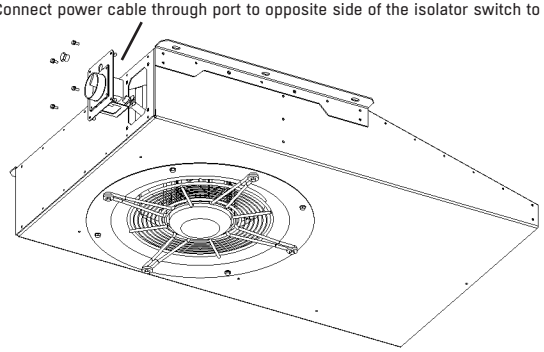
Remove any residues from the fan. Inspection is to be made by using the intake and discharge openings.

If the motor-impeller has to be dissembled for cleaning. The following procedures are recommended:

1. Motor connection cables to be disconnected at isolator switch.
2. Remove connection cable through open inspection door and disconnect cables inside the fan from the isolator switch.

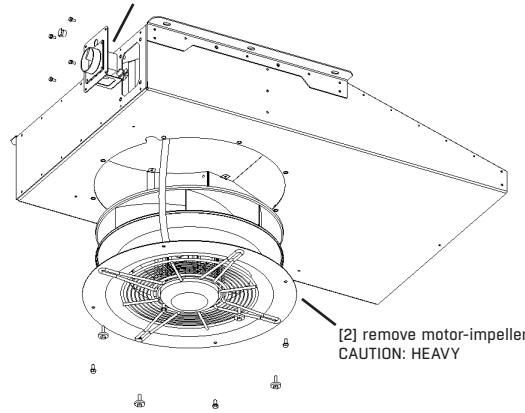
Installation: Wiring of Isolator

Connect power cable through port to opposite side of the isolator switch to the fan cable.



Servicing: Replacement of Fan Assembly (Disconnect conduit and wires form isolator first)

[1] disconnect fan cable from isolator



[2] remove motor-impeller-inlet assembly to allow for maintenance
CAUTION: HEAVY

Danger

> Before loosening the bolts that secure the motor impeller (3) ensure the unit is secure and will not fall.

1. Loosen the screws (3).
2. Remove the motor impeller unit (4) out of the housing by lowering.

Refit in reverse order. **To re commission fan follow instructions, chapter 7 and 8.**

9.3. OBSERVING REGULAR INSPECTION INTERVALS

In order to assure a safe operation we recommend fans are checked at regular intervals by qualified service personnel or by a specialised company and to document the result of these checks. The type, magnitude and interval period of these works is shown in the table below.

The recommendations for checks and maintenance acc. to VDMA 24186-1.

Caution The motor bearings are supplied permanently lubricated by the factory; It is recommended to replace the motor bearings after a period of approximately two years.

Pos	DESCRIPTION	MONTHLY	6 MONTHS	12 MONTHS
1	Tripping device (if provided at the fan control panel)	*		
2.0	**FAN**			
2.1	Check fan for function and readiness for service (trial run 2hr at full speed)		*	
2.2	Functional testing of the automatic bridging of all excess temperature and over current monitors (if fitted)		*	
2.3	Check for soiling, damage, corrosion and fastening		*	
2.4	Clean in order to maintain function		*	
2.5	Check impeller direction of rotation			*
2.6	Check connections for leaks or water ingress			*
2.7	Check impeller for unbalanced state			*
2.8	Check safety devices for correct operation			*
3.0	**MOTOR 1)**			
3.1	Check externally for soiling, damage, corrosion and fastening		*	
3.2	Clean in order to maintain function			*
3.3	Check bearings for noises 1)			*
3.4	Check terminal clamps for tight fit			*
3.5	Measure voltage			*

10. SPARE PARTS & ACCESSORIES

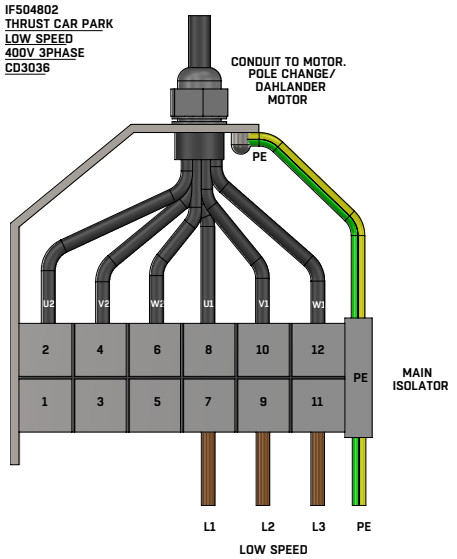
> Use only genuine spare parts supplied by Fläkt Woods Limited as featured in the list of spare parts. The use of spare parts supplied by other manufacturers may compromise the safety of the equipment.

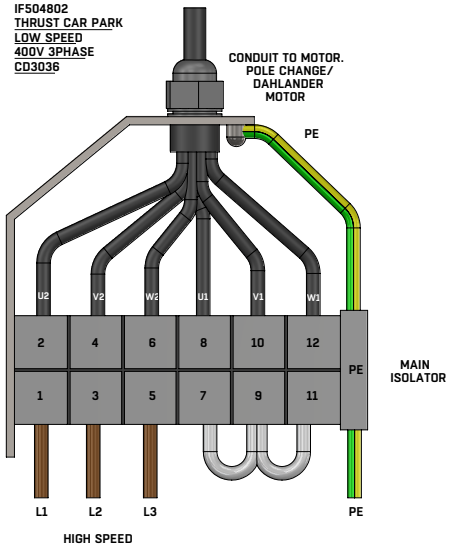
The requirements for CE conformity are no longer met if spare parts supplied by other manufacturers are fitted. Fläkt Woods Limited shall not accept any liability or provide any warranty cover in respect of primary or secondary damage arising as a consequence of using spare parts supplied by other manufacturers.

10. ANNEX

10.1. FURTHER DOCUMENTATION

Wiring Diagrams





10.1. FURTHER DOCUMENTATION

EC Declaration of Conformity to EC Machinery Directive (98/37/EC)

FläktWoods

EC DECLARATION OF CONFORMITY

Herewith we declare that the air movement equipment designated below, on the basis of its design and construction, in the form brought on to the market by us, is in accordance with the relevant safety and health requirements of the EC Council Directives on Machinery, Electromagnetic Compatibility. If alterations are made to the machinery without prior consultations with us, this declaration becomes invalid. We further declare that the equipment identified below may be intended to be assembled with other equipment/machines to constitute machinery, which shall not be put into service until the assembled machinery has been declared in conformity with the provisions of these EC Council Directives.

Designation of equipment:

Series/type:

Fläkt Woods Limited
Order/Stroke No:

Relevant EC Council Directives: Machinery Directive (98/37/EC)
Electromagnetic Compatibility Directive (2004/108/EC) where applicable (3)

Applied harmonized standards in particular: 1) EN ISO 12100:2010, EN 60204-1:2006, EN ISO 12499:2008
EN ISO 5801:2008, EN ISO 13350:2008, EN 61000-6-2:2005, EN 61000-6-1:2007
EN 61000-6-3:2007/A1:2011/AC:2012, EN 61000-6-4:2007/A1:2011

Applied national standards and technical specifications in particular: 2) BS 848-2-1:2004 (BS ISO 13347-1:2004)
BS 848-6:2003 (BS ISO 14695:2003)
BS 848-7:2003 (ISO 14694:2003)

Basis of self attestation: Quality Assurance to BS EN ISO 9001:2008
BSI Reg Firm Cert No. FM 155.

Technical File Compiled By: Iain Kinghorn
Axial Way, Colchester, CO4 5ZD, UK

Signature of Manufacturer: Place: Colchester
Date:

Position of signatory: Ian Morehouse
Managing Director

CE

Notes:
1) For the complete list of applied standards and technical specifications see Fläkt Woods documentation.
2) Where no relevant harmonized standards exists.
3) Woods fans are driven by AC induction motors which are inherently compliant if supplied with a truly sinusoidal AC supply. Where the fan motor is supplied via an inverter or other electronic control, verification of its compatibility together with cabling should be sought from the control supplier.

Fläkt Woods Limited
Axial Way
Colchester CO4 5ZD
United Kingdom
Tel: +44 (0) 1206 222555
Facsimile: +44 (0) 1206 222777
Email: info.uk@flaktwoods.com
Website: www.flaktwoods.com

Registered in London No. 233771
Registered office Axial Way, Colchester, CO4 5ZD, UK

10.2. BEARINGS WITHOUT RE-LUBRICATION DEVICE

The bearings are normally supplied greased for life with a high-performance grease that is resistant to ageing and does not require maintenance under normal operating conditions. When it is necessary to replace the bearings as a result of normal wear and tear, please contact our service department or a company authorised by Fläkt Woods Limited.