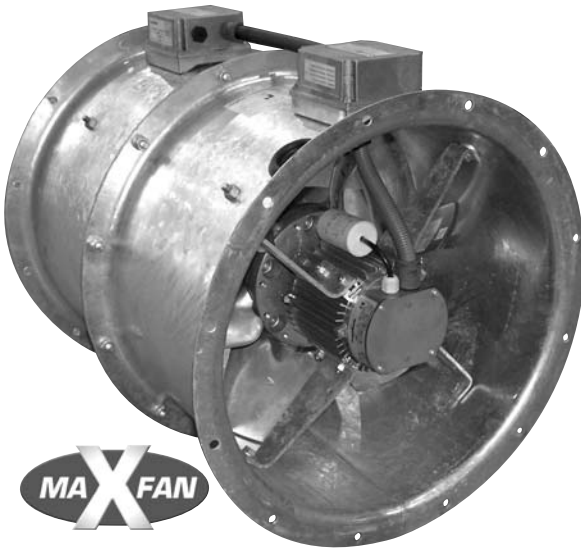


www.flaktwoods.com/oandm

JM Aerofoil - MaXfan



Safety, Installation, Operation and Maintenance Instructions

Part No. 415020

FläktWoods

Introduction and purpose

The Max Fan is a highly efficient two stage fan developing high air pressure, it is designed to operate in an ambient temperature range of -40°C to $+50^{\circ}\text{C}$ (-20°C on starting). When operating at low temperatures ice formation on the fan assembly must be prevented.

The fan assembly is manufactured specially to fulfil the requirement of the installation for which it was designed. No deviation from the original requirement should be implemented without referring to Flakt Woods Ltd. Head Office. When referring please quote the details from the fan master nameplate.

Any queries regarding safety or operating problems should be referred to the local Flakt Woods office.

When used with a speed controller or Flakt Woods drive the controller must be sized to accommodate the current drawn by both motors.

When fans are retained in storage, access by unauthorised persons must be prevented with the use of guards barriers or secure premises, so that impellers that are rotating (windmilling) do not present a hazard.

When the fan is delivered in a crate, the crate should be considered as a protective device not used as a lifting aid unless otherwise indicated. When unpacking take care to avoid injury from sharp edges, nails and splinters etc.

If the fan has been stored for 12 months or more an inspection by Flakt Woods service centre is advised before commissioning.

Mechanical Installation

It is recommended that suitable safety guards form part of the installation and advice on safety devices is available from Flakt Woods Ltd.

Always wear personal protective equipment when working in the vicinity of the fan such as eye & ear protection, safety footwear and hard hat.

During lifting, all personnel must be clear of the area below the suspended fan.

Note: before installing the fan it should be checked for any damage that may have occurred during transit.

Check that the impeller spins freely when spun by hand.

Check the winding resistance to earth if the fan has been stored for any length of time, this can be measured with a MegOhm tester and the reading should be greater than ten MegOhms. If the reading is less than ten MegOhms the motor should be dried and re-checked before it is switched on.

The motors are fitted with drain holes in the end shields with plastic plugs fitted.

The drain holes should be positioned at the lowest point when the fan is installed and the plastic plugs periodically removed to allow any condensation to drain away.

The frequency of drain plug removal will be dictated by the environmental conditions, a record should be kept.

Electrical Installation and operation.

No work should be undertaken before completely isolating the fan assembly and anti-condensation heaters if fitted plus any other controls.

Always allow the fan impeller to come to a stop.

Always wear personal protective equipment when working in the vicinity of the fan such as eye & ear protection, safety footwear and hard hat.

The Max Fan is essentially two fans linked together to produce a higher air pressure than can be achieved by with a single fan.

The fan has two terminal boxes that are linked together; all customer termination should be made through the master terminal box.

Over heat protection thermostats should be wired back to a re-settable device such as a direct on line starter.

Anti-condensation heater

Anti-condensation heaters (when fitted) are terminated in a terminal box on the fan and must be wired so that they receive an appropriate supply voltage when the motor is switched off, and the supply is removed when the motor is running.

A warning label will be fitted to the terminal box lid when heaters are fitted.

Infrequent use

If the fan assembly is to be used less than once a month the following procedures should be carried out.

The resistance of the windings to earth should be measured (at 500 Vdc) each month and a record kept, the reading should be greater than ten MegOhms.

If the reading is less than ten MegOhms the motor should be dried and re-checked before it is switched on.

The motor should be run for at least two hours each month to ensure correct lubricant conditions in the bearings.

If anti-condensation heaters are fitted check that they are automatically switched on when the motor is switched off.

Switch-on

Before switching on confirm that the electrical supply is fully compliant with the requirement of the motor as detailed on the motor nameplate, and that the fan is correctly installed, all component parts and fixings are secure, safety guards are in place and no loose articles are present in the vicinity.

Immediately on switch-on check the assembly for smooth, low-vibration running, and check that the current consumption is within the full load current specified on the nameplate. For a three phase unit a trial connection of the three-phase supply should be made to check that the fan rotates in the required direction. If the rotation is incorrect interchange any two phases of the incoming supply at the motor terminal block.

For a single phase unit, if after correctly connecting to the supply the fan is found to be rotating in the wrong direction, the motor winding leads U1 and U2 should be interchanged at the motor terminal block. The fan must not be switched on and off in a repeated manner that could cause overheating of the motor or its wiring.

MAINTENANCE

NOTE: The maintenance procedures are designed to keep the unit safe, operational and fault-free.

General

Maintenance must be carried out on the fan assembly by appropriately qualified personnel using the correct tools and equipment. A regular routine maintenance schedule should be established, and a record kept. Where the environment is particularly dirty, a reduction in the intervals may be necessary.

Internal and external fan surfaces may be cleaned with low pressure clean water and non-abrasive additives. Direct application of water from any direction to the motor drain plugs must be avoided. It is essential to ensure that all fixings on the fan assembly are secure. When examining and checking the security of fixings during routine maintenance those fixings that have locking devices fitted or are painted over, need not be disturbed if they can be seen to be secure.

Any locking devices that are disturbed during maintenance must be discarded and replaced with new identical devices.

Thread forming screws must have locking compound applied when being re-used.

Those fixings that have no locking devices fitted and are not painted over, should be checked at 95% of their original setting to ensure no unnecessary disturbance of the fixing. If in doubt about the torque of a particular fixing contact Fläkt Woods Limited for advice.

WARNING: No maintenance work should be attempted before switching off and completely isolating the fan assembly, its anti-condensation heater (if fitted), and its controls, from all electrical supplies and allowing the rotating parts of the fan to come to rest. Before entering the area ensure that all fumes, dust, toxic emission, heat etc., have dispersed from the local environment, and the fan blades are not likely to windmill. All lifting aids used during maintenance, and all lifting points utilised, should be adequately certified to carry the weight of the equipment being lifted. Always wear appropriate protective clothing (including hard hats, eye protectors and ear defenders) when working in the vicinity of the fan assembly.

In addition to routine maintenance, motor bearings will in the longer term require attention. After maintenance ensure that no loose articles are present in the vicinity of the fan, that all safety guards, chains or steel ropes, etc., are properly secured into their original location, and that any temporary device used to stop the fan blades windmilling has been removed.

OVERHAUL/EXTENDED MAINTENANCE

Advice on motor overhaul procedures, bearing/seal replacement, motor replacement, motor rewinding, spare parts, condition monitoring, vibration analysis, refurbishment, etc. is available from Fläkt Woods Limited service centre in Colchester. It is recommended that the motor shaft seals and bearings are replaced after 20,000 hours or 5 years of normal operation which ever comes sooner, and that the motor is rewound to its original specification after 40,000 hours of normal operation to ensure that adequate insulation life is available should the fan be required for emergency operation. The motor manufacturer's specification sheets are available through Fläkt Woods Limited.

After overhaul/extended maintenance the fan assembly must be correctly installed back into its original position in accordance with this document. Before switching on refer to Switch on section

FAULT FINDING

NOTE: The routine maintenance procedures detailed in this document are designed to keep the fan operational and fault free.

Electrical

Check that the electrical connections to the unit are secure.

Check that the voltage applied to the unit is as specified on the motor nameplate, and is balanced.

Connect an ammeter in line with each phase (one phase in the case of single-phase motors) of the motor in turn and check that the current consumption is within the full load current specified on the motor nameplate

Check that the voltage is the same as that specified on the fan nameplate.

Measure the resistance of each motor winding to earth, and between each winding, using a 500V d.c insulation tester. If

the reading is less than ten megohms the reason is liable to be dampness in the motor. To dry the motor, place it in a warm (typically 40 degrees centigrade) dry airstream and regularly monitor the motor until the insulation reading is restored to ten megohms or greater. If the reading remains less than ten megohms, a break-down in the motor winding insulation could be the reason, and a motor rewind/overhaul may be necessary. Determine if there is a smell of burnt insulation in the vicinity of the motor which would indicate winding insulation breakdown.

Mechanical

Check that there is no obstruction to the motor impeller blades, that the blades are clean, and that there are no loose articles or debris in the vicinity. Rotate the motor shaft by hand. Investigate any sound of internal chaffing, rubbing or stiffness. Any stiffness may indicate that the bearings require lubrication or replacing. Ensure that all fixings are secure.

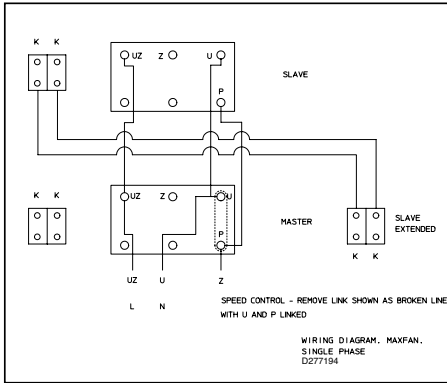
Disposal

The metal components of the fan/motor should be segregated and separately recycled. The following items of material should be safely disposed of in accordance with local health and safety regulations:

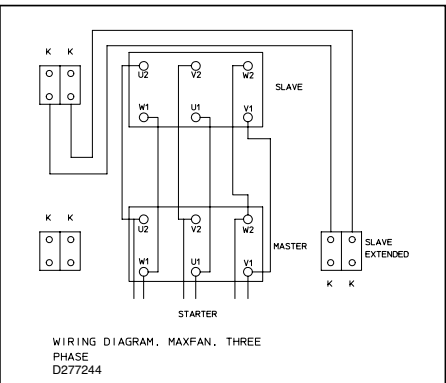
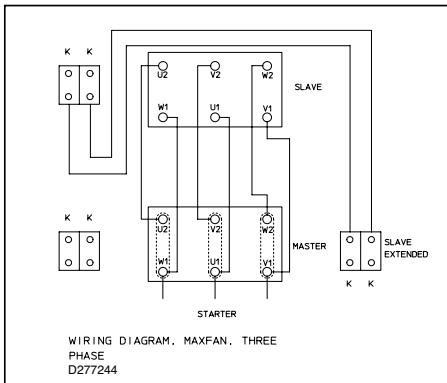
- electrical lead coverings,
- motor winding insulation materials,
- bearing lubricant,
- motor/fan terminal block,
- paintwork,
- plastic parts,
- packing materials.

Wiring Diagrams

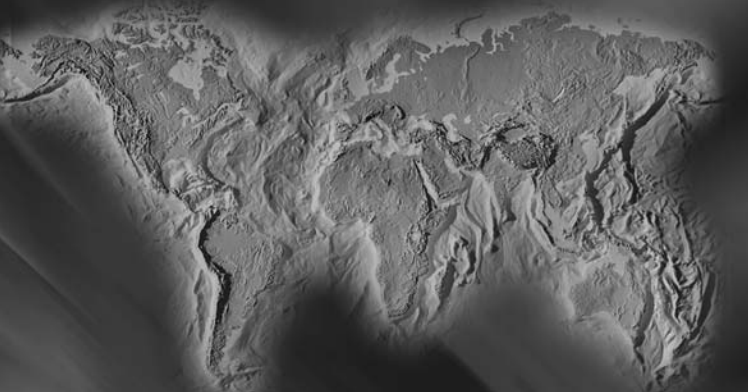
Single Phase



Three Phase



We Bring Air to Life



Fläkt Woods Group provides a full range of products and solutions for buildings ventilation, air treatment and industrial air movement

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www.flaktwoods.com/uk

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