

# Centrifugal Smoke Extraction Unit

TSA - VAD

Not 04/001-2

INSTALLATION AND START UP





## IT IS CRITICAL TO ASSIGN THE HANDLING AND INSTALLATION OF THIS EQUIPEMENT TO PROFESSIONALS

This range of F400 centrifugal smoke extraction units is equipped with wheels made of forward curved blades and consists of 7 sizes: 12/6, 15/7, 18/9, 20/10, 22/11, 25/13, 30/24. The usual operating temperature when not extracting fire smoke (emergency cases)  $-20^{\circ}\text{C}$  et  $+85^{\circ}\text{C}$ .

### 1 DESCRIPTION

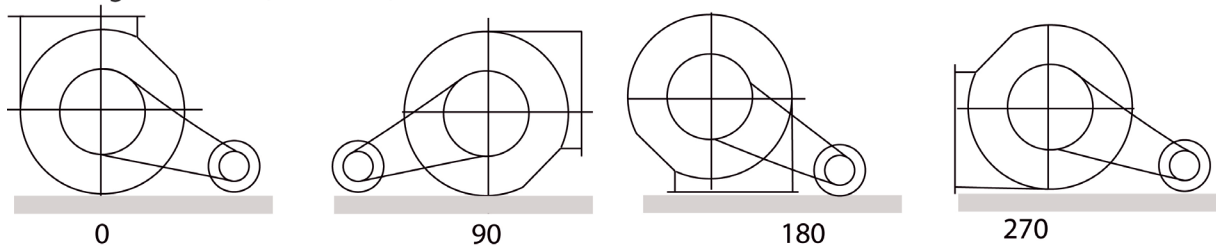
#### 1.A. CONSTRUCTION

Both the case and housing are manufactured in pre-galvanised teal. The wheels are statically and dynamically balanced and comply with the NF E 90-600 standard for G6.3 quality. The shaft are machined in steel and coated against stain with H8 tolerance.

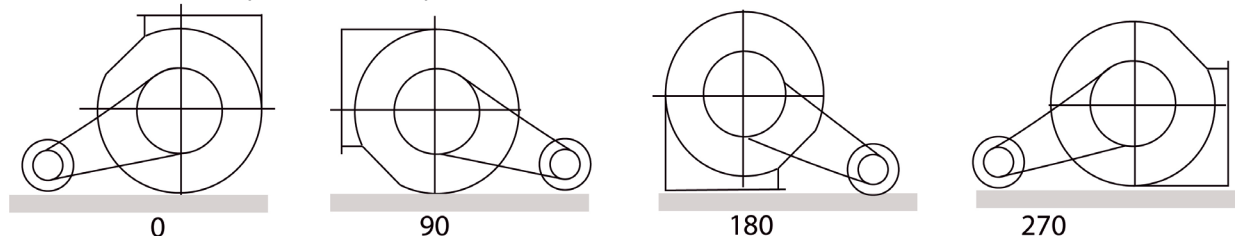
The bearings are C3 tip of clearance fitted and cast iron made.

These fans can be fitted onto 8 different positions: 4 working with a clockwise rotation ( $0^{\circ}$ ,  $90^{\circ}$ ,  $180^{\circ}$ ,  $270^{\circ}$ ) and 4 with a anti-clockwise rotation, both these positions looking from the driving side.

«RK» - Right rotation (clockwise)



«LR» - Left rotation (anti clockwise)



#### 1.B. BELT AND PULLEYS REMOVAL

**This operation must be performed by qualified people after verifying that the motor is not powered and ensuring that no-one can restore electrical power without the authorisation of the maintenance operation manager.**

- Release the belts by unlocking the motor.
- Remove the belts.
- Remove the TAPERLOCK<sup>®</sup> hubs
- Once modified, follow the opposite steps. Respect the tightening torque indicated (cf diagram at the document end).

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### 1.C. WHEEL ACCESS

To dismantle the wheel

- Remove the rings linking both the bearings and the shafts, unlock the screw and remove it.
- Unscrew the nuts securing the inlet mouth and remove it. Unscrew the securing nut keeping the wheel and the shaft together, remove it using a pea tool.
- To the wheel implementation, do the opposite and check that the pulleys are on the same line.



## 2 TRANSPORT

### 2.A. SHIPPING

The fan warranty begins at the collection or delivery dates and covers defects where it is possible to conclude that faulty materials or poor manufacturing are the cause. In case of long transportation or rough transportation conditions, it could be safe to lock the wheel rotating in order to avoid rotation vibrations damaging the bearings.

### 2.B. RECEPTION

After receiving the goods, check quantities and conditions of the different parts including all the ancillaries. Non conformities resulting from poor transportation conditions should be immediately specified on to the transport form and confirmed by registered letter with acknowledgement of receipt addressed to both us and the carrier.

### 2.C. STORAGE AND PROTECTION

Fans must be stored inside, safe from dust, shocks and weather conditions. Avoid any source of vibration would be preferable for the motors bearings life. In case of long-term storage, manage a frequent (twice a month) motor shaft rotation to reduce the wheel weight effect onto the bearing.

### 2.D. HANDLING BEFORE IMPLEMENTATION

Never handle the fan by the shaft, motor or wheel, use the available holes dedicated onto the metallic frame. Avoid any chock which could cause damage to the components and affect the wheel balancing.



## 3 INSTALLATION - CONNECTION

### 3.A. USUAL CHECKING

Before the implementation:

Check that the motor specification match with the power supply (V/Hz) .

Verify that the wheel spins effortlessly when manually turned. Check the tightness of all screw, special attention to the fixing of the wheel and shaft.

### 3.B. INSTALLATION - CONNECTION

Using vibration isolators between the frame and the ground support is recommended. Mounting should be rigid and flat. The ducting must never be supported by the units but rather by suitable clamps or fixations. Put in place the mechanical safety features required by the current regulations.



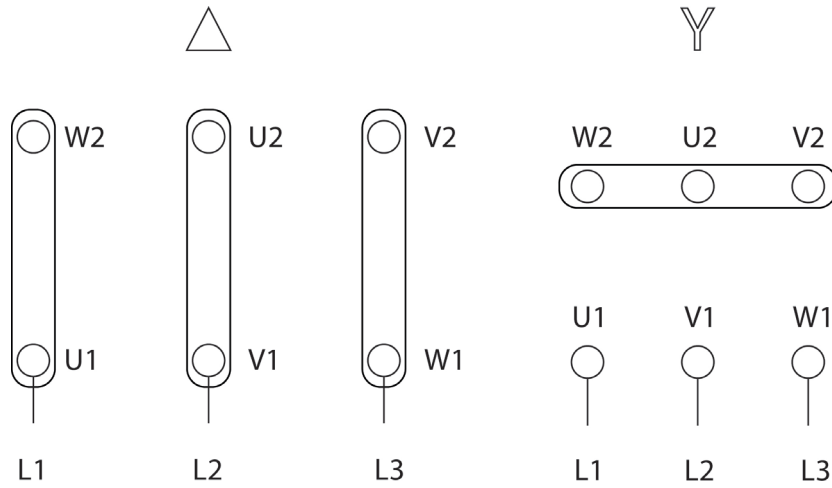
## 4 MOTORS

### 4.A. MAIN WIRING DIAGRAMS FOR TRI-PHASED MOTORS

1 speed motor - 230/400V

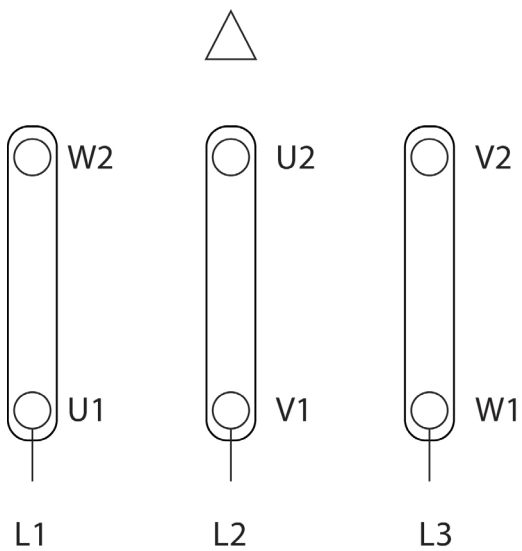
230V  $\Delta$

400V Y

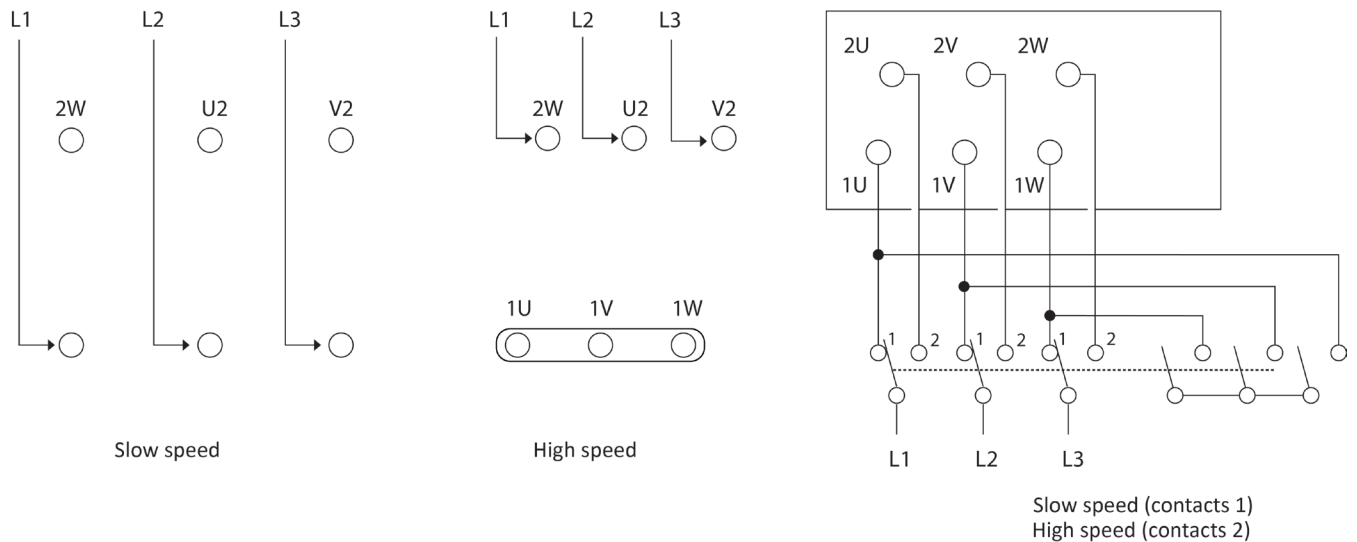


1 speed motor - 400/660V

400V  $\Delta$



## 2 speeds motor - DAHLANDER - 400V



## 5 MOTOR COUPLING



OPÉRATION À LA CHARGE DU CLIENT

! Usually managed by the customer.

To complete the electrical connection, perform the following operations:

- Open the connecting box.
- Refer to the wiring diagram located inside the box.
- Choose the way matching with the power supply.
- Do not use either nuts or washer between the terminal power cable.
- To avoid any water infiltration into the box use the adapted gland size and bend the cable into a loop.
- Check that no contact would happen between the terminals.
- Close the box, ensuring the correct seal position.

## 6 EARTHING

It is essential that the equipment is earthed.

## 7 ACCEPTABLE OVERLOAD

Motors are designed to accept 10 % more intensity than specified onto the rating plate. Be informed that as long as the motor has not reach the cruise temperature, the intensity would slowly go down to its cruise level.

## 8 OVERLOAD PROTECTION

Use a safety device to protect the motor & the installation against excess overload, such as a magneto-thermic calibrated at 10 % over the motor rating.

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## 9 PRECAUTIONNARY RULES

- Ensure the quality of electrical connections.
- In case of draining hole (optional), care to respect the position planned for in the order. Motor condensate drain plugs should be at the motor bottom.

## 10 BEARING - GREASING

### 10.A. MOTORS

The motors are usually supplied lubricated for life.

### 10.B. BEARINGS LUBRIFICATION

Driven bearings should be often checked and grease refilled if required, the grease quality and quantity needs to be adapted to the usage (temperature, dust...).

## 11 ROTATING PARTS PROTECTION

- If the fan is connected to the outlet, place a fan guard on the inlet side.
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## 12 INSPECTION DOORS

That ancillary could be optionally supplied in order to make easier the wheel checking and cleaning. The position should be determined before the order. Produced in pregalvanised steel, implemented at the case back with screws.

## 13 BELT TIGHTNESS AND PULLEYS LEVEL

Frequently check the tightness of the belts to avoid any problem due to frequent starting which could provoke a quickest weakness and a fast removal. Keep the pulleys on the same line is absolutely crucial to avoid any vibration effects. A correct tightness would be checked with the adapted tool.

## 14 BOLT TIGHTENING

The screw tightness could be modified due to excess vibration, so check the wheel an shaft notes.

## 15 START UP

That phase must be driven by trained people who will perform the following operations:

- Check the wheel rotation. In case of wrong direction, reverse the direction by reversing two motor phases.
- Check the absorbed power, the voltage and current frequency.
- Ensure the absence of any abnormal vibration.
- Check the noise level regarding the current standard.
- Check screw and belt tightness after a few operating hours.

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## 16 GENERAL INFORMATION

### 16.A. EURO STANDARD COMPLIANCE

The centrifugal fan complies with European regulations concerning machines safety, low voltage and EMC. As this equipment is integrated into an installation, the compliance of the entire device with regulations will be ensured and declared by the final installer.

### 16.B. FAN CLEANING

In case of dusty area (what is not the better usage way for that range), the wheel can be fast coated and unbalanced and both the performance and fan life duration would be reduced. So, it is important to check it and to clean the wheel.

## 17 DYSFUNCTIONS

### 17.A. EXCESS OR INSUFFICIENT FLOW

#### 1. Measuring devices.

- Check their power supply (battery), correct operation or calibration.

#### 2. Duct

- Check the network and ensure the installation complies with the expected data.
- Modify the pulley ratio to increase or decrease the fan speed, care to the mechanical speed limits and to the EN 12101-3 limits.
- Change the fan to a greater or smaller pattern.

#### 3. Wheel speed

- Check the supply connections.
- Check the motor rpm against the motor plate.
- Check the fan speed against the fan rpm onto the labels.
- Modify the pulley ratio to increase or decrease the fan speed, care to the mechanical speed limits and to the EN 12101-3 limits.
- Check the belt tightness accuracy.

#### 4. Dampers and valves

- Check if the opening correctly works.
- To increase or decrease the air flow, change the air flow section. (care of the motor intensity).

#### 5. Leaks

- Ensure proper duct connection

#### 6. Wheel rotation

- Check the wheel rotation direction against the labels, if it is wrong, reverse two motor phases.

#### 7. Network efficiency

Check that no thing is obstructing the duct network.

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## 17.B. ABNORMAL VIBRATIONS

That problem can come from the following items:

### 1. Wheel

- Disassemble, clean and/ or rebalance the wheel.

### 2. Motor Bearings

- Perform a standard exchange of the motor or defective bearing where appropriate and check the wheel balancing.

### 3. Shafts

- If the motor shaft is deformed, proceed to a standard motor exchange. If the wheel shaft is deformed, check the pulleys line, the bearings and the balancing before any shaft changing.

### 4. Belts and Pulleys

- Check the pulleys line with a laser or any other adapted tool. Correct if it is requested

### 5. Excess flow – Wheel speed – Wheel rotation

- See supra

### 6. Unsteady Floor

- Ensure the installation compliance through strengthen the devices base support.

## 17.C. UNUSUAL NOISES

### 1. Motos noises

- Find and cancel the magnetic perturbation (inverter – not ECM wiring...). Check the compliance between motor and electronic devices.

### 2. Motors Bearings noises

- Change the bearings or the motor, check the wheel balancing.

### 3. Other mechanical noises

- Check for unusual friction between the wheel and the inlet cone.
- Check the motor and the belts and pulleys guards fixation.

## 17.D. MOTOR OVERLOAD

This phenomen may be the direct result of the following events:

### 1. Excess flow

- Reduce the flow by increasing the network resistance.

### 2. Gas density

### 3. Frictions

- Remove the cause

### 4. Wheel rotation

- Cheek that the rotation direction is correct. If not, reverses two phases.

### 5. Electrical connection

Ensure the installation is compliant with the instructions.

- Check that the 3 phases are all correct.
- Both check the supply voltage and frequency against the motor plate.

