

# **Bifurcated Axial Fans**

## **Maintenance and Operation Manual**

## 1) **Bifurcated Fan (Adjustable pitch type)**

### **1.1) Disassembly of the motor and impeller**

- a) Dismantle the taper lock bush of the impeller as in Appendix A explanation
- b) Remove complete impeller
- c) Replace impeller where necessary
- d) Dismantle mounting screws of the motor from the motor base bracket
- e) Replace motor where necessary

### **1.2) Assembly of the motor and impeller**

- a) Place the motor on the motor base and adjust till it is sitting in the center
- b) Tighten the motor to the base properly
- c) Put on the impeller and insert in the taper lock bush as in appendix A explanation
- d) Adjust the impeller properly so that the impeller is not touching the casing
- e) Make sure that tip clearance is correct if impeller is changed
- f) Check that running ampere is same as original to ensure that angle is correct

### 1.3 Adjustment of Angle for Bifurcated Axial Adjustable Impeller

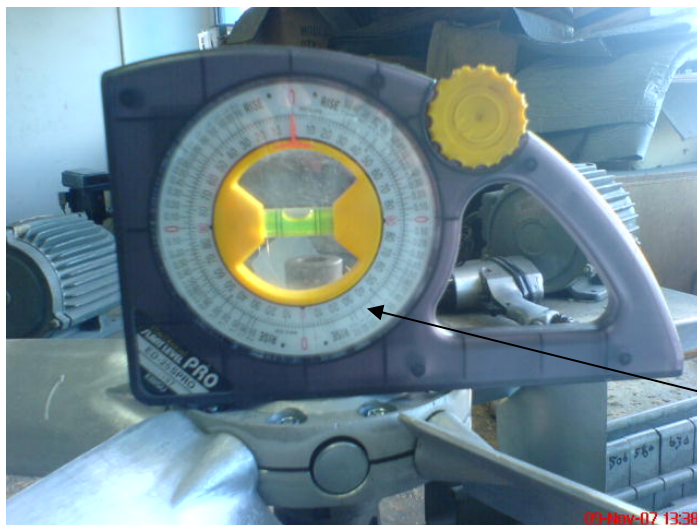


Bolts and nuts holding the blade to the hub

- 1) After dismantling the impeller, place them on a flat surface.
- 2) Use a digital or analogue protractor and make sure the hub level is zero.



- 3) Now, by placing the protractor on the edge of the blade, the angle of the blade can be recorded.
- 4) In case, we need to adjust the angle of the blade, loosen all the bolts and nuts holding the blade to the hub.
- 5) Using a mallet, tap the leading edge (thicker side) of the blade to the angle required.
- 6) Use the same method to adjust all the blade angle.
- 7) Make sure that all angle are +/- 0.5 degree tolerance.
- 8) Balance the impeller and fix the impeller back to the motor.
- 9) Make sure that there is no abnormal vibration and ampere of the motor does not exceed the full load ampere of the motor.

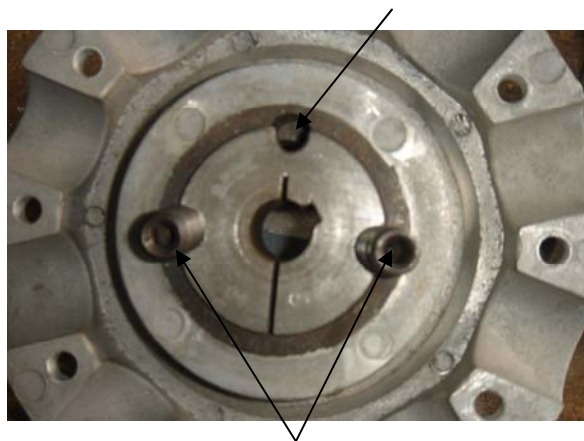


Analogue Protractor with leveling gauge

## **2. Dismantling of Taper Lock Bush**

### **Appendix A**

**Jacking holes for removing bush**



**Locking screws**

### **Removal of taper lock bush**

- a) Using a hexagon allen key, slacken and remove both the locking set screws
- b) Use one of the set screw and screw to the jacking holes
- c) Tighten screws until taper lock bush is loosened in hub and free on the shaft.
- d) Remove the bush and then the impeller

### **Installing the taper lock bush**

- a) Clean, polish and grease the motor shaft before putting on the key
- b) Put the impeller on the motor shaft
- c) Insert the taper lock bush and tap lightly till it seat squarely on the shaft and impeller hub
- d) Align the holes of the screw and tighten the two locking screws till the hub is in firm position

## 10. Replacement of motor bearings



**Figure 1**

Remove fan cover screws  
Remove fan cover



**Figure 2**

Loosen cooling fan clamping screw



**Figure 3**

Use a big screw driver to jack out the  
cooling fan



**Figure 4**

Remove the cooling fan



**Figure 5**

Unscrew the nut of the 4 studs holding the motor cover



**Figure 6**

Remove all 4 studs



**Figure 7**

Tap the end motor cover lightly



**Figure 8**

Remove both the front and end cover completely



**Figure 9**

Remove the stator and use a bearing puller to remove the bearing



**Figure 10**

The bearing is dismantled completely by jacking the screw on the puller



**Figure 11**

Replace a new bearing  
Use a proper tool to that fit the inner race of the bearing



**Figure 12**

Use a mallet and tap the bearing in till it seat fully



# Maintenance Manual

## Fault troubleshooting



## **Common Faults and Answers**

### **1. What to do if fan running current is higher than specified**

#### **a) Check electrical**

- Make sure supply voltage are as accordance to what is specified in the name plate
- Make sure all electrical phases have constant supply for 3 phase motor
- Make sure all electrical terminals are tightened
- Make sure capacitor is correct and functioning for single phase motor
- Make sure resistance of motor winding is constant [measure (U1,U2), (V1,V2), (W1,W2)] for 3 phase motor
- Make sure all connection are as per our electrical diagram given

#### **c) Check for fan vibration**

- Check that fan is running smoothly and not shaken vigorously
- Check that fan blade is not rubbing against the casing

#### **d) Make sure inlet or outlet air passage is not blocked**

### **2) What to do if fan cannot run**

#### **a) Check that there is incoming electrical supply to the motor**

- ❖ If no supply voltage across the motor
  - Check the MCB, overload, thermistor is not open circuit
  - Electrical panel circuit is functioning properly

#### **b) Check that termination is correct at the motor**

#### **c) Check that capacitor is correct and is in working condition for single phase motor**

#### **d) Check that fan impeller is not stuck**

#### **e) Check that motor windings is OK as mentioned above**

### **3) What to do if fan has abnormal normal noise and vibration**

- a) Stop fan immediately
- b) Check that fan rotation is correct
- c) Check that fan blades are not touching casing or inlet cone
- d) Check that no foreign materials are stuck at the fan blades
- e) Check that fan blades are not broken
- f) Check that all fasteners are tightly secured
- g) Check that fan is isolated completely
- h) Check that inlet and outlet air passage is not blocked

#### **If non of the above,**

- ❖ Fan balancing is required
- ❖ Motor bearing may be faulty
- ❖ Fan may be running in unstable stage