

## CENTRAL FANS – COLASIT LTD

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Edition 04\_13

# INSTALLATION, OPERATION & MAINTENANCE MANUAL



Valid for the following ranges:-

### CIV Fan Range

Sizes:-

160/160

180/180

250/200

250/225

250/250

315/280

315/315

400/400

500/500

# INSTALLATION, OPERATION & MAINTENANCE MANUAL

Central Fans – Colasit Ltd

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## 1. Safety Instructions

**Introduction** – As with all rotating machinery and equipment great care must be taken when carrying out the following procedures:-

1. When off loading the fan unit lift only by the flanges on both ends of the unit, **NEVER** lift the fan by its terminal box or motor vent pipes, larger units can be unloaded with a fork lift truck ensure you take care to position the fan so it doesn't topple off the forks, in some cases extended forks may be required. (Ensure they are safe to use).
2. After the fan has been connected to the appropriate electrical supply (see motor plate) by an approved contractor / electrician the fan can be started for a few seconds only to check impeller rotation is correct, (keep all objects & hands clear of the inlet / outlet), this is indicated by the direction arrows on the fan & motor, if incorrect change wiring accordingly.
3. After the fan has been installed and before any ductwork or other connections are made, check for any foreign matter of any description within the fan casing, if present remove it immediately or this could cause damage to the fan impeller, in the worst case this could cause complete destruction of the impeller, this could cause serious injury to anyone near to the fan (Check ductwork at the same time).
4. Never operate the fan in a free inlet / outlet mode for more than a few seconds especially on high pressure fan units as this may cause motor overload / burnout, if this occurs the motor will require replacement which is not covered by our warranty.
5. Always check the current when running against the motor full load current stamped on the motor rating plate to ensure there is no overload, if fan is overloading stop fan and contact our Technical Department immediately for advice.
6. We recommend that all fans which are openly accessible be protected with a scatter shield around the fan casing, this is to protect anyone from flying debris should the impeller fail.
7. All fans which are to be used with a free inlet or outlet must be fitted with a mesh guard.
8. During any maintenance of any kind the fan / motor must be isolated from the electrical supply before any work is carried out.
9. To avoid overheating of the plastic components a minimum air velocity of 5m/s must be maintained.
- 10. All fans fitted with motors over 7.5 kW must be started by means of a Star-Delta starter or inverter only.....not direct on-line.**

### **IF IN ANY DOUBT CHECK FIRST**

Don't put yourself or others at risk by ignoring the information contained with this manual.

## 2. Description

A fan is defined as a rotary bladed machine for moving a continuous flow of air and has a rotating impeller carrying a number of blades, these blades exert force on the air thereby maintaining flow.

The fan shown below is a centrifugal in-line ventilator (CIV), the air enters the impeller through the fan inlet, turns through 90° and then progresses radially between the blades, exiting the fan case axially through the discharge.



## 3. Installation

**Introduction** – Correct installation, operation and maintenance is essential to obtain the most efficient, dependable performance from your equipment, the following instructions are intended to assist you in installing, operating and maintaining the fan unit supplied by Central Fans – Colasit Ltd, reducing down time and lowering expenditure on repairs and replacements.

### Handling

1. The equipment should always be handled carefully to prevent damage, our fans are normally despatched fully assembled and manufactured using Thermoplastic materials that can be easily damaged especially in cold conditions, therefore it is particularly important to avoid dropping or jarring these units.
2. Always lift by the flanges this will reduce straining of the unit to a minimum, should the fan unit be dropped or damaged it must be checked and if found necessary inspected by one of our engineers before being installed or operated.

### Installation

1. All ductwork connected to our fans must be supported by separate means, under no circumstances should any ductwork, stacks, silencers etc be supported from our fans. Flexible connections are available and should be used to isolate the fan from the ductwork to prevent straining of the fan case, which if occurs could foul the impeller causing serious damage to the impeller.
2. Only qualified electricians to carry out connections / wiring to our fans, all connections must be suitable for the application and must be weatherproof to IP55 as a minimum, please note that the motor is supplied with temporary glands only to prevent foreign objects from entering the terminal box, these must be replaced with the above before connections are made. Motors are labelled as such before leaving the factory.
3. If the fan unit is fitted with a drain point this must be positioned at the lowest point to prevent build up of liquor.
4. Before starting the fan double check that there are no foreign objects either in the casing or ductwork, otherwise when the fan is started this will be drawn into the fan causing complete destruction of the impeller putting yourself and others at risk of injury from flying debris.

**Remember be safe, check first**

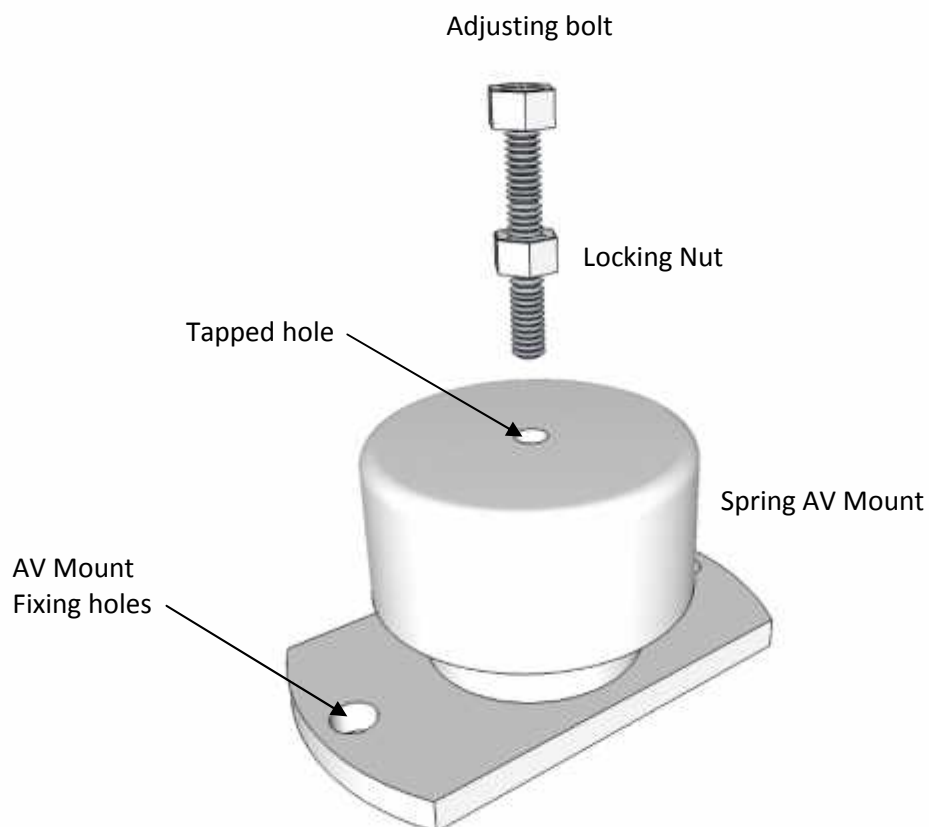
## 3. INSTALLATION

### AV Mounts (spring type)

#### Instructions

Position the mount beneath the fan base to be installed lining up the holes in the base with the tapped holes in the top of the spring mount, insert the adjusting bolt completely with locking nut into the tapped hole in the AV mount until finger tight, when all mounts are in position tighten each adjusting bolt until all mounts are the same height, this will also level the fan unit, don't forget to tighten the locking nut onto the fan base to prevent the adjusting bolt becoming loose.

**Note!** Do not fix the mount to the floor or steel support before fixing to the fan base, as this may cause distortion of the mount if misaligned.



## 3. INSTALLATION

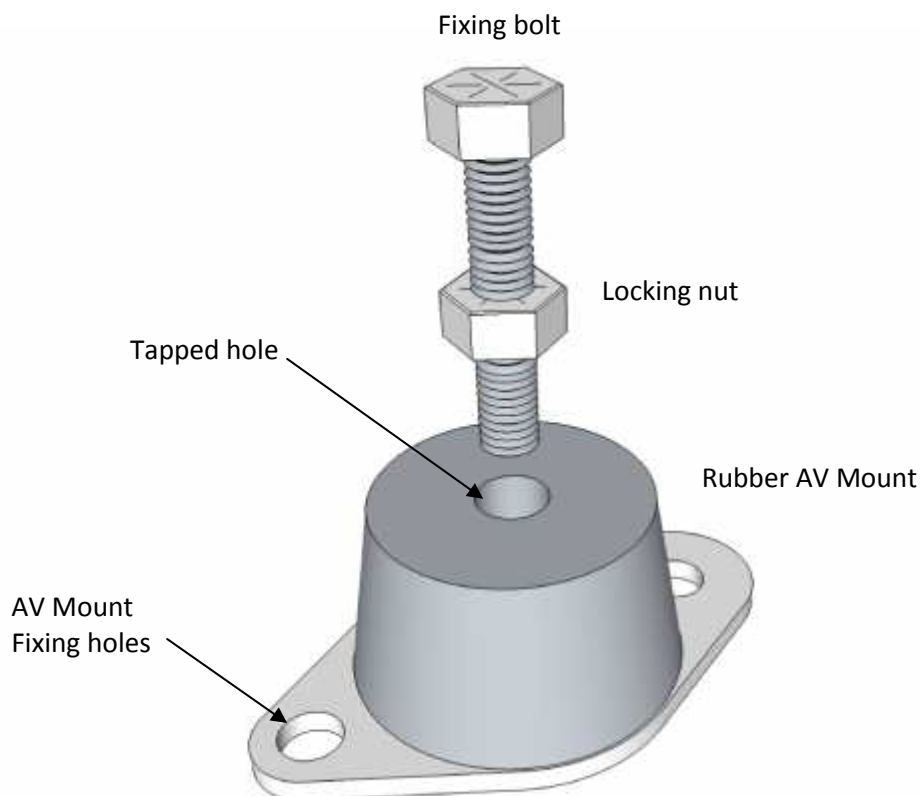
### AV Mounts (rubber type)

#### Instructions

Position the mount beneath the fan base to be installed, line up the holes in the fan base with the tapped hole in the top of the mount and inset the fixing bolt into the mount and fully tighten, the locking nut should then be tightened to prevent mount becoming loose.

Each mount can now be fixed into position as further adjustment is not required.

**Note!** Do not fix the mount to floor or steelwork before fixing to fan unit as this may cause distortion of the mount.



## 4. OPERATING INSTRUCTIONS

1. Install fan unit either in the vertical or horizontal position depending on the ductwork layout, it is important to check that a condensate drain is fitted to the latter to prevent possible damage from liquor build-up within the casing as this may cause impeller damage.

If the fan is provided with AV mounts these must be fitted on to mounting feet which can be ordered from Central Fans – Colasit Ltd.

2. Connect the motor(s) to an appropriate power supply as per the wiring instructions (section 5.0) of this manual. Wiring instructions can also be found in / on the motor.
3. If the fan is inverter driven there is a recommended minimum speed / frequency of 25Hz on 2 pole (3000rpm) motors and 20Hz on 4 pole (1500rpm) motors.
4. If the fan unit is fitted with an earthing node this must be connected to an appropriate earthing system.
5. Start fan for a few seconds only to determine the rotation is correct (if not already done so), if incorrect change wiring as appropriate.
6. Check motor running current against the motor rating plate to ensure the motor is not overloading, if this is the case check wiring, rotation, voltage and system pressure drop ( $\Delta p$ ), if fault cannot be found contact our Technical Department for further advice.
7. Deposits on the impeller can lead to unbalanced running especially if some of these fall off when running, this will eventually damage the fan / motor bearings and could in severe cases cause impeller failure, therefore if the fan should start to vibrate investigate immediately and rectify.
8. After the above checks have been carried out the fan unit should only require an annual service, belt tensioning, greasing bearings and keep the motor vents clear of any debris.
9. All **ATEX** rated fans must be evaluated annually to conform to current regulations.



## 5. Maintenance – Motors

- Before any motor is connected to a power supply it must be checked for any damage that may have occurred during transportation, particular attention should be made to the fan cowl, terminal box and cooling fins, if there is any damage contact our Technical department for advice.
- After the above visual checks have been made then the motor can be connected to the appropriate power supply, details of the voltage/phase/frequency can be found on the motor rating plate and fan label.
- All cable terminations should be tightly secured, mains lead terminal lugs should be in face to face contact, there should be no nuts, washers fitted between the mains and motor lugs.
- Wiring should be carried out or checked by a qualified electrician and must be earthed in accordance with current regulations.
- All motors must be correctly fused and isolated with terminal covers in place before running the fan.
- Terminal covers should never be left off while unattended, otherwise water or other foreign objects may get into the motor windings.
- The motor must be operated within its limit of design voltage and frequency, standard motors for use within the UK will operate without damage between 90 & 110% of rated motor voltage.
- Ensure all control gear any associated metering or protection devices have been checked.
- Motors should not be placed with their cowls closer than 50mm from any wall or obstruction as this may lead to overheating or burnout of the motor.
- When several motors / fans are installed in close proximity care should be taken to ensure that there is adequate ventilation and that there is no recirculation of exhausted warm air.
- Check that the motor runs up smoothly and within the permitted start-up time, repeated starting in quick succession may lead to a thermal overload of the motor, if this occurs leave motor to cool before attempting restart.

## 5. Maintenance – Motors (cont'd)

- All motors supplied with our fans are weatherproofed to IP55 (minimum), all connections made to the motor must be to this minimum standard or water ingress may occur.
- If AC heaters are fitted then these should be checked for continuity prior to connection to the control circuit.
- If Thermistors are fitted it is recommended that they be connected to the control circuit as they provide good thermal overload protection.
- If ATEX rated motors are fitted only fully qualified personnel are allowed to carry out any work on these machines.
- Induction motors by their very nature require very little maintenance, however regular inspections are recommended to ensure minor problems do not escalate to breakdowns, typical intervals would be 2000 hours of operation or 3 months, whichever is the sooner.

Check List – Isolate motor before carrying out any routine maintenance or cleaning

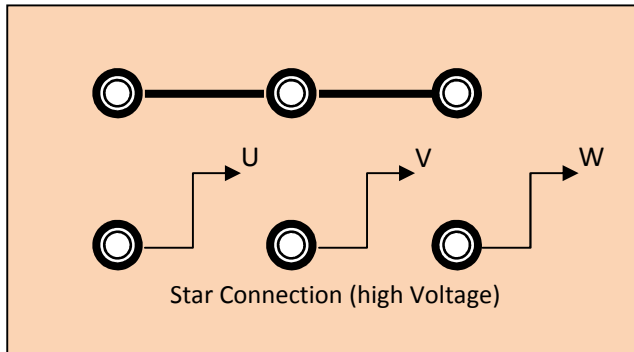
- No visible signs of damage.
- No accumulation of dust, fibres or foreign matter on the frame or around the cowl.
- No excessive vibration.
- Excessive heat.
- No loose fixings.
- Cables and earths are sound.
- Sealing of motor and glands are in good order.
- Insulation resistance adequate, imperative this is checked if motor has been shut down for long periods, should be above 10mΩ.
- Bearing condition should be checked.

**Remember: - ISOLATE BEFORE COMMENCING ANY MAINTENANCE**

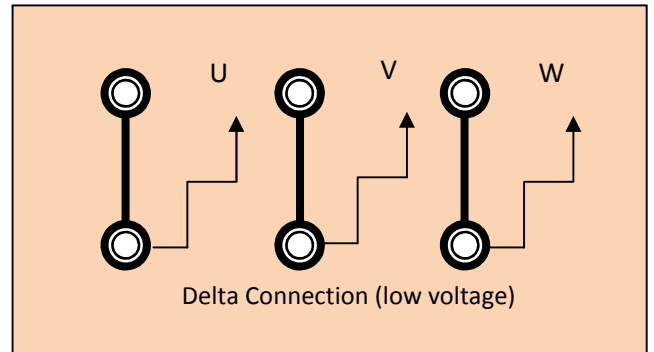
If any spares for the motor are required, then these can be ordered either directly from the motor manufacturer or Central Fans – Colasit Ltd, in either case the motor serial number or part name must be quoted.

## 5. Maintenance – Motors (Wiring diagrams) Typical

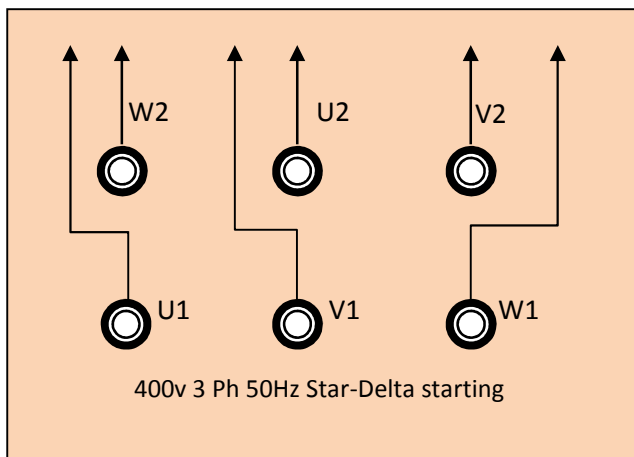
THREE PHASE DIAGRAMMS



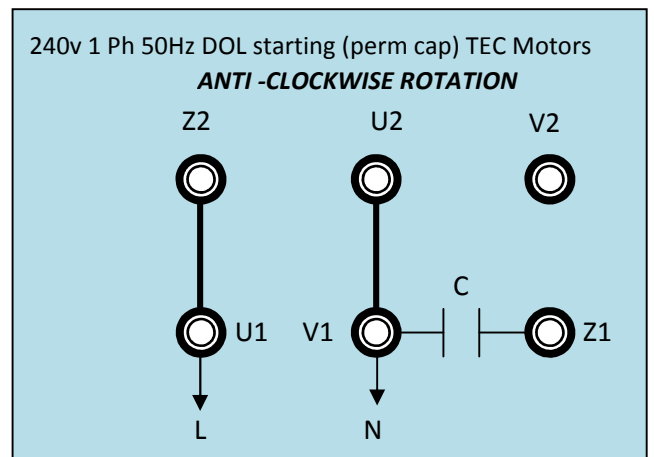
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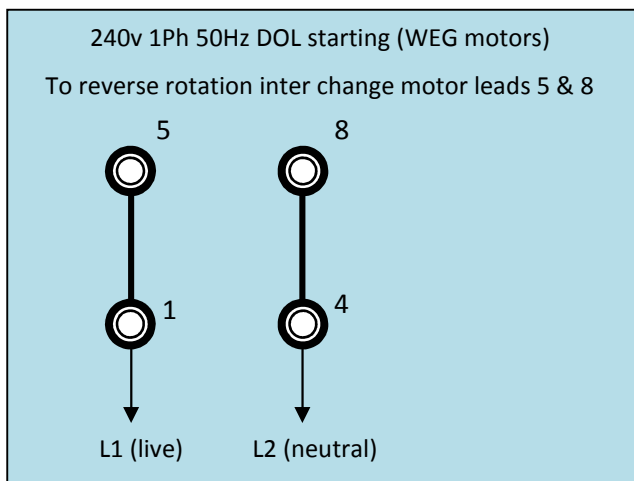
THREE PHASE DIAGRAMMS



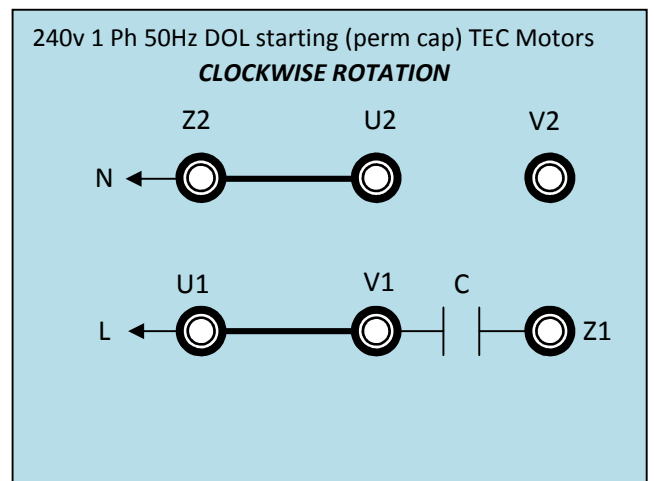
SINGLE PHASE DIAGRAMMS



SINGLE PHASE DIAGRAMMS



SINGLE PHASE DIAGRAMMS



## 6. Storage

### **Important – failure to follow these recommendations will invalidate your warranty**

If the fan unit is to be stored or installed for any length of time before being put into operation then special notice must be taken of the following:-

- Turn all rotating parts (by hand if necessary) at least once per month to redistribute the lubricant making sure that the impeller finishes approx 180° to its former position, this helps to eliminate possible vibration at a later time caused by the impeller, shaft and bearings settling in one position which could cause flat spotting of the bearings.
- Never position the fan unit next to other machinery for even a short period of time as any vibration from this equipment can cause serious damage to the fan / motor bearings, which may cause vibration problems in the future.
- Always cover both the fan inlet and outlet to prevent foreign objects falling or being placed within the fan casing, when the fan is required for use **CHECK** the fan casing for any objects that may be inside and remove, if the fan is started with objects inside the casing complete destruction of the fan will occur causing serious injury to any person close by.
- Cover motor vent pipes to prevent water / object ingress.
- Most of our fans are supplied with drain points which should be checked before installing as they may have become blocked.
- Although all our fans are fitted with an IP55 motor (minimum) as standard if the fan is stored where temperature changes are severe then condensation may occur inside the motor itself, this will cause premature failure upon start-up, therefore ensure fan is stored where this doesn't occur.
- If you have a spare motor ensure that it is stored in the vertical position to prevent bearing damage.

**Finally, general checks of all parts for any damage that may have taken place in storage, remember safety first.**

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## 7. Spares

When ordering spare parts for your fan unit it is important that the Fan Serial Number located on the fan casing is stated, together with the part description or number, these can be found on the appropriate assembly drawing in section 8 of this manual.

If the Fan serial Number has been removed or lost then contact our Technical Department giving as much information as possible, i.e original purchaser (Company), date of supply etc, photos can also be of help and can be emailed to [mail@central-fans.co.uk](mailto:mail@central-fans.co.uk).

Below is a table showing the recommended spares for your fan unit, items such as fan belts, bearings and motors can be ordered from the manufacturer or direct from Central Fans – Colasit Ltd, other items such as impellers, casings, cartridge bearing assemblies and steelworks can only be purchased from Central Fans – Colasit Ltd:-

Central Fans – Colasit Ltd  
Unit 12A, Palmers Road,  
East Moons Moat,  
Redditch,  
WORCS.  
B98 0RF

Tel: 01527-517200

Fax: 01527-517195

Email: [mail@central-fans.co.uk](mailto:mail@central-fans.co.uk)

Other email addresses can be found on our contacts page on our web site [www.central-fans.co.uk](http://www.central-fans.co.uk)

Although our fans are designed to last for a minimum of 20 years to keep your fan unit working to its optimum condition and reduce shutdown periods the table below lists the parts that will require periodic maintenance, items such as casings, impellers and steelworks should last the life time of the unit.

R = replace

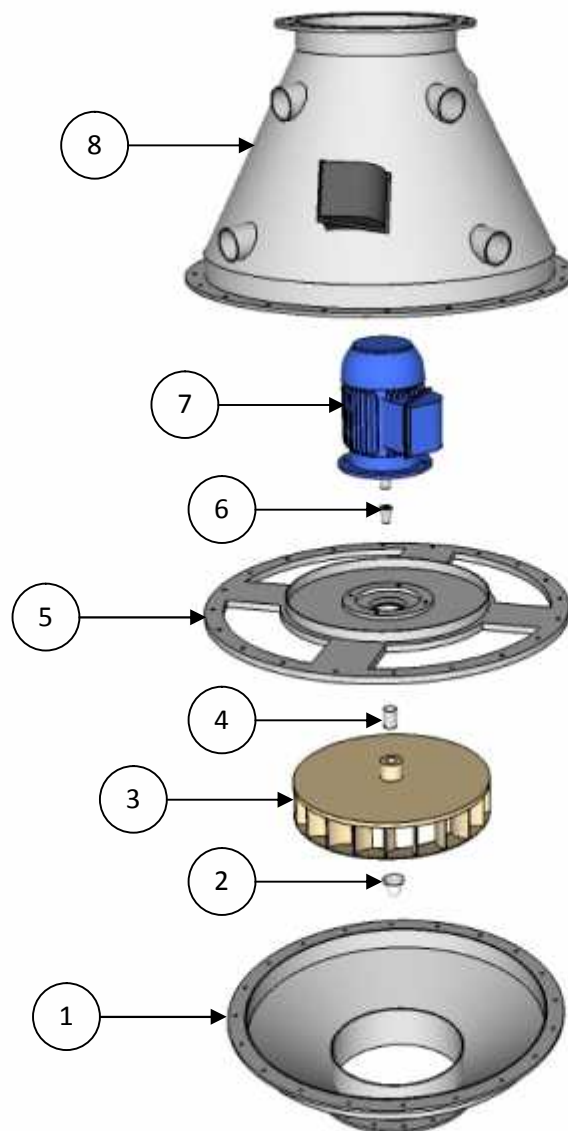
C = check

MNR = may need replacement

Part Ref	Time Schedule (years)					
	1	2	3	4	5	10
<b>Impeller</b>	C	C	C	C	C	C
<b>Motor</b>	C	C	C	C	C	MNR

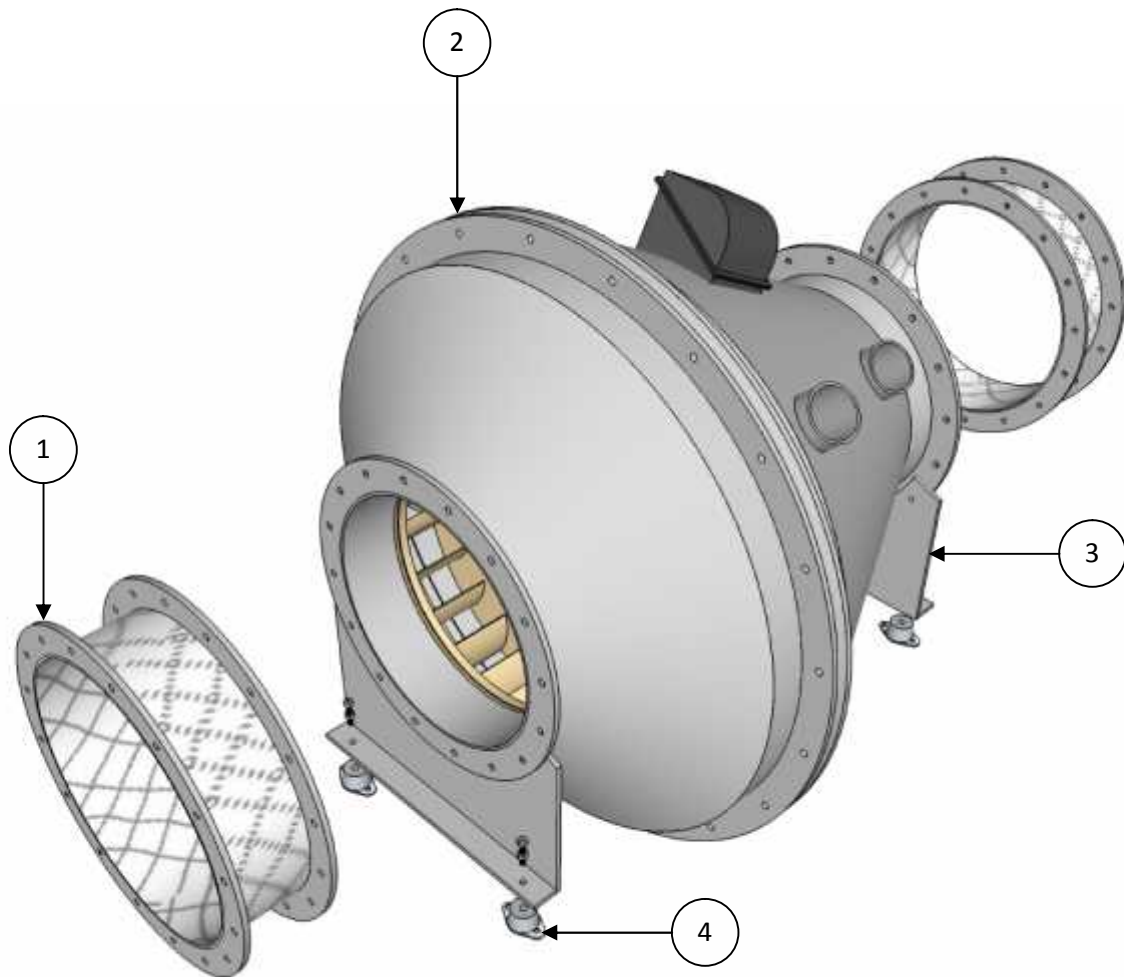
Spares for the CIV fan range are normally on a 1 week delivery depending on size and item required.

## 8. CIV Fan Direct Drive Main Components



Part No	Description	Material	No Required
1	Inlet section	PP, PPs, PPs-el, PVC	1
2	Impeller cap	Polypropylene	1
3	Impeller	PP, PPs, PPs-el, PVC, PVDF	1
4	Impeller bush	Alloy	1
5	Motor plate	PP, PPs, PPs-el, PVC	1
6	Motor bush	Alloy	1
7	Motor	Aluminium, cast iron	1
8	Discharge section	PP, PPs, PPs-el, PVC	1

## 8. CIV Fan Direct Drive – Accessories



Part No	Description	Material	No Required
1	Flanged Flexibles	PVC	2
2	Fan	PP, PPs, PPs-el, PVC	1
3	Mounting Feet	Polypropylene, PVC	2
4	AV mounts	Spring / Rubber type	4