

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

## Installation & Maintenance Manual

Supplementary notes supplied if ticked

Elta Fans Limited has taken every care in the preparation of these instructions to ensure their accuracy and compliance with relevant European legislation. However, it remains the overall responsibility of the end user or persons responsible for the specification and installation of any fan supplied, to ensure that it complies with applicable project specifications and laws both national and international.

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These instructions must be read fully before commencing installation.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

## Health & Safety

Elta Fans Limited manufactures air movement equipment and accessories in conformity to current British and European Health and Safety Regulations.

All Regulations and Legislation referenced within this document are current at time of publication.

All personnel associated with the installation, operation and maintenance of the supplied equipment should be aware of the associated dangers of working with such equipment and advised accordingly in line with relevant national and international laws.

The fan and its ancillaries must be both electrically and mechanically isolated before the commencement of any works to minimise the potential for injury to personnel or damage to the equipment.

Risk Assessment(s) should be carried out in line with the applicable Health and Safety Legislation and individual site requirements. Personal Protective Equipment (PPE) shall be worn / used in accordance with site safety requirements with consideration for:-

Hearing Protection (mandatory when in an environment where the noise level exceeds 85 dBA), Eye Protection, Toe Protection, etc.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

## General

It is important that the Installation & Maintenance Instructions are fully adhered to. When the fan requires additional instructions these will be supplied as loose supplementary notes and the front sheet will have the box ticked. If these cannot be found please contact Elta Fans.

Full details of the supplied product are shown on the product nameplate, if in doubt, contact Elta Fans or its distributors for clarification.

These Instructions shall apply only to the Elta Fans Limited product and do not consider further requirements for the installation of additional guarding or electrical isolation equipment that may be needed to conform to specific project specifications.

Any / all declarations made by Elta Fans Limited regarding product installation and safety, are dependent upon the supplied equipment being used within installations that meet the required Standards and Directives appropriate to the site.

The installer should provide adequate access to the fan to facilitate future maintenance.

The installer shall ensure that the fan assembly is adequately supported using suitable mounting arrangements, materials and fixings.

This product should not be operated by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are supervised and instructed by a competent person responsible for their safety.

Ambient / Operating temperature ratings for the fan shall be found on the fan name plate. Where un-stated, fans shall be considered suitable for use in the following ambient temperatures: -

Safe Area	-	-20°C to +54°C
Smoke Ventilation	-	-20°C to +54°C
Hazardous Area	-	-20°C to +40°C

## Receipt of Goods & Inspection

1. On receipt of goods, all delivery documentation should be checked against received items before removal of any packaging.
2. Packaging should be inspected for obvious signs of damage or mistreatment.
3. Goods should be handled taking into account the size, weight, shape and centre of gravity of the load.

**Note:** - Some goods may be designed or packed in such a manner as to have an offset centre of gravity. It shall be the responsibility of the receiving party to ensure that all necessary assessments of risk and appropriate methods are employed in any and all lifting operations.

4. Where possible, packaging shall be informatively marked to show potential hazards such as, offset C of G, Fragile or specific shipping orientations (This Way Up ↑)
5. After removal of packaging, the goods should be checked for signs of damage.
6. Particular attention should be given to the impeller, ensuring that it has not been subject to any damage during transportation. Check there is no contact between impeller and casing by spinning impeller by hand.
7. The insulation resistance between phases and earth should be checked. If resistance drops below 10MΩ, a drying out method is required – See motor manual. Do not carry out insulation test on thermistors or intrinsically safe sensors.

**Note:** - For products that have been galvanised – In accordance with BS EN ISO 1461:2009 the appearance of zinc oxide (white rust) shall not be cause for rejection.

8. Upon acceptance of goods, supplied manuals should be checked and the instructions within should be followed.
9. All accompanying documentation should be stored with the fan or in a safe place in accordance with site procedures.
10. Failure to follow instructions within this document could affect any warranty claim.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

## Storage Instructions

If it is not the intention to install the product immediately upon receipt, the following should be noted:-

1. The fan must be stored in a clean, dry and steady temperature area, free from corrosive fumes, vibration and dust.
2. Motor Anti-condensation heaters should be energized if a steady temperature cannot be maintained.
3. Motor Insulation Tests should be conducted every 3 months. The insulation resistance between phases and earth should be checked. If resistance drops below 10MΩ, a drying out method is required – See motor manual.
4. Resistances between windings should be balanced. This should be verified with the use of appropriate instrumentation.

**Note:** - Do not conduct insulation tests on Thermistors or intrinsically safe sensors

5. Rotate impellers monthly to prevent grease separation and damage to the bearings. Impeller must not be returned to the same position after rotation.
6. Fans stored for over 2 years - Bearings and grease lines (if fitted) should be flushed and repacked with fresh grease to avoid possible damage to the bearings. Where fitted with sealed for life bearings, replace bearing before unit comes into service.
7. Belt driven fans must be stored and transported with the belts slackened.
8. Check the operation of I.S. Proximity heads attached to dampers (if fitted)

## Installation

1. All mechanical installation must be carried out by suitably competent personnel in accordance with current local statutory requirements.
2. All electrical installation must be carried out by suitably qualified and competent personnel in accordance with current local statutory requirements.
3. Electrical installation shall comply with BS7671 and EN60079-0 (where applicable)
4. Cable glands and cables should be positioned to prevent moisture collecting on the gland seal – gland entry not facing vertically upwards.
5. If there are any queries concerning the fan equipment, Elta Fans Limited should be contacted prior to the installation.
6. The fan must be securely mounted in the desired position to suit the application, observing that the direction of airflow is correct.
7. Check the details on the motor rating plate to ensure that the correct power supply (voltage, frequency and phase) is available. An incorrect power supply may lead to permanent damage to the fan motor.
8. Refer to the appropriate wiring diagram.
9. Ensure that all earth connections are made.
10. Means for electrical disconnection must be incorporated in the wiring installation in accordance with the relevant wiring and electrical regulations.
11. The impeller should be restrained during installation to prevent “wind milling” of the fan causing injury.
12. Belt Driven fans are delivered with the belts slack therefore refer to Appendix IV to set the belt tension.
13. For hydraulic powered fans, refer to the hydraulic motor manufacturer’s manual for installation, start up and maintenance.
14. It is important there is no debris in the system or ductwork: e.g. nuts, bolts, cables offcuts, tools etc. If debris strikes the impeller or electrical cables then the fan is not safe to use.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

## Ancillary Installation

### Flexible Connections / Collars

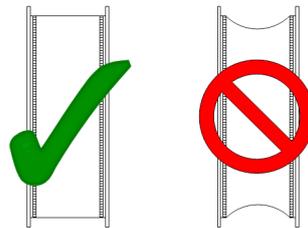
Flexible collars are intended to enable the mechanical isolation of a fan from adjoining ductwork.

Flexible Connections shall not be used to compensate for duct misalignment.

Maximum permissible duct misalignment:-

<Ø1000mm = 5mm axially  
>=Ø1000mm = 10mm axially

Flexible Connections must not be allowed to sag between flange rings. If the connector is too long, it should be trimmed to length.

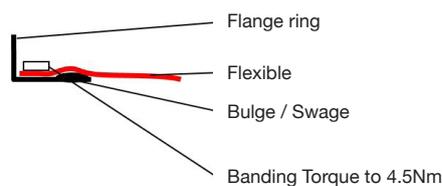


Flexible connections should be fitted so that the entire spigot length of the mating flanges are covered.

Fix using supplied banding:-

Duct diameter (Ømm)	Pressure	Number of bands / end	Number of buckles / band
>= Ø630	> 1000 Pa	1	3 (evenly spaced)
< Ø1000	< 1000 Pa	1	1
>= Ø1000	< 1000 Pa	1	2 (at 180° apart)

Flexible connections should be fitted so that the entire spigot length of the mating flanges are covered. Some spigots will have a bulge / swage. In these cases the flexible must go over the bulge / swage and the banding positioned between the flange and bulge / swage.



Fix using supplied banding:-

Banding buckles should be tightened to a torque of 4.5Nm. The use of a clamping mechanism may be required to prevent the banding from twisting whilst tightening the buckle.

The cut ends of the banding should be turned inwards once secured to prevent injury through contact.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

## Anti-Vibration Mounts – Spring (Compression)

AVMs should be installed in accordance with the following procedure:

1. The structure beneath the machine should be constructed to form a rigid and reasonably level seating for each group of AVMs.
2. The AVM should be examined to ensure they are of the correct size.
3. After the AVMs are in position, the machine base should be levelled and supported just clear of the AVM tops using jacks or blocks, ensuring alignment between isolator and machine fixing holes.

At this stage, hold down bolts can be loosely fitted to maintain AVM positions during final lowering of machine base, but it is important these do not strain the AVM in any direction (hold down bolts are supplied by others).

4. After removal of blocks, the machine base can be carefully lowered evenly across supported area transferring full weight to the AVMs.  
Adjusting screws should then be located through machine base into AVM tops, ensuring sufficient length for adjustment.
5. Tighten the adjustment screw after initial deflection to raise the upper spring cover until desired height of AVM is achieved or the machine is level, see Figure 1.

**DO NOT** adjust by more than the original deflection obtained when the load was applied to the mounting.

**IF NO** adjustment is required, adjusting screw must be wound down sufficiently so that the spring pressure is felt before tightening the locknut

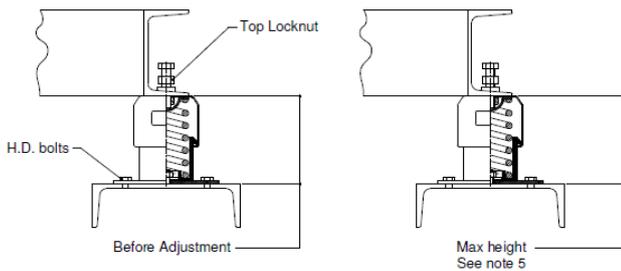


Figure 1.

6. Isolator hold down bolts and top locknuts should now be fully tightened.
7. Ribbed rubber seating pads should always be used when the mounting is seated on concrete or other rough surfaces.
8. Note: AVMs are not designed to accommodate angular misalignment, excessive horizontal or tensile forces and must not be used for tensile or shear loading applications.
9. The efficiency of an AVM system can be seriously impaired if the system is connected to rigid pipes, electrical conduits, ducts or shafts. It is essential that such external connections be as flexible as possible, not only to prevent transmission of vibration through the connections and allow the system freedom of movement, but also to avoid possible failure of the connections.

## Anti-Vibration Mounts – Rubber (Compression)

AVMs should be installed in accordance with the following procedure:

1. The structure beneath the machines should be constructed to form a rigid and reasonably level seating for each group of AVMs.
2. The AVMs should be examined to ensure they are of the correct size and rubber compound. If appropriate, the positions for different rubber compounds should be located in accordance with our recommendations or drawings.
3. Either bolt the isolators to the underside of the machine base or position them upon the prepared seating before lowering the machine into position.
4. Jacks or blocks should be used to support the machine in a level state with a small clearance above or below each AVM. The clearances must be measured and if they vary by more than 0.5 mm then steel or other rigid packing pieces should be fitted before transferring the machine weight onto the AVMs. These packing pieces may be fitted above or below the AVMs and should be of adequate size.

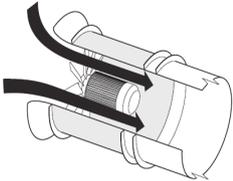
# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

- AVM hold down bolts should now be fitted (if applicable). These must not strain the isolator in any direction. The AVMs are not designed to accommodate angular misalignment, variations in level, excessive horizontal forces or tensile forces. (hold down bolts supplied by others).
- It is recommended that AVM top fixing bolts material grade 8.8 be tightened to their correct torque values.
- Note these AVMs are not designed for tensile or shear loading applications, and should only be installed in accordance with our recommendations.
- The efficiency of an AVM system can be seriously impaired if the system is connected to rigid pipes, electrical conduits, ducts or shafts. It is essential that such external connections be as flexible as possible, not only to prevent transmission of vibration through the connections and allow the system freedom of movement, but also to avoid possible failure of the connections.

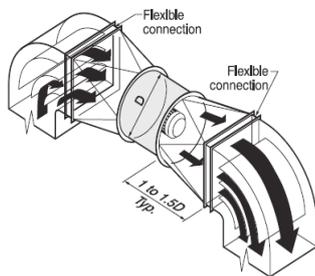
## Adjoining Ductwork & Attenuators

Adjoining duct work and attenuation should be adequately supported to prevent undue stresses on the fan casing / structure.

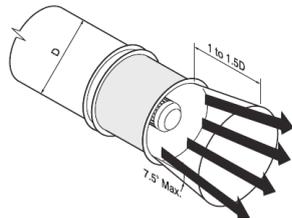
- By fitting a correctly designed inlet cone the air flow to the impeller will be uniform resulting in the performance being optimised and minimum noise level generated.



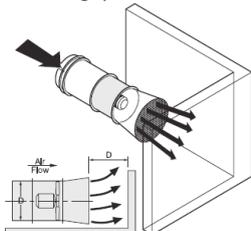
- Square-to-round transitions and turning vanes in elbows assist uniform airflow; this is a compromise only and is by no means ideal.



- With a correctly designed discharge diffuser the pressure recovery in the diffuser will reduce the system total pressure. Included angle of diffuser to be 15° or less. Discharge losses reduced substantially in this arrangement.



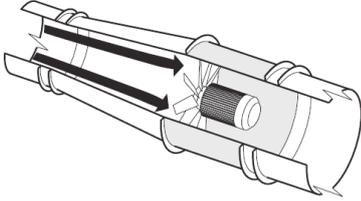
- Allow a gap of at least one fan diameter between fan outlet and obstruction and fit a diffuser on the discharge.



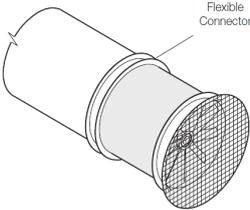
Allow a gap at least equal to one fan diameter between the fan intake and nearby obstructions; even then fan performance can be less than rated. Always fit an inlet cone on open axial fan inlets.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

5. Duct expansion on the inlet to axial flow fans should be avoided where at all possible. If essential the transition should have an included angle of not more than 15°.



6. Ensure open fan inlets are fitted with suitable guards. These should be designed to comply with local regulations and not only protect against injury but lessen the risk of a foreign object entering the fan and causing damage.



For further information of ducting system Do's and Don'ts please contact Elta Fans Limited for a copy of our "Give a Fan a Chance" brochure.

## Start-Up Procedure

1. Ensure that all electrical circuits are complete, tested and acceptable for use.
2. Ensure that the local isolator is turned to the ON position and that there are no obstructions or debris within the fan ducting that could cause damage to the impeller.
3. Initially, switch the unit on briefly in order to confirm that the rotation and airflow direction are as required.
4. Check that the current drawn (FLC) by the fan does not exceed that stated on the fan nameplate.
5. If contact is evident, stop the fan immediately and re-centralise the impeller maintaining equal tip clearances.
6. Once satisfied with the results of the test, the fan should be run for a further 30 minutes to ensure smooth and trouble free operation, should no problems occur, the fan unit may be considered ready for use.
7. Once all units have passed the above stated procedure, a full system test should be conducted in accordance with the control methodology.
8. Upon completion of the above procedure, the ventilation system shall be considered suitable for commissioning.
9. Reverse wind milling (reverse rotation) of the impeller as the impeller starts must be avoided. The use of non-return dampers or other means must be considered to prevent this.

Refer to Appendices for Fault Finding and Fan Commissioning Record.

## General Maintenance (Preventative)

1. Inspection of ventilation equipment should be carried out at regular intervals, not exceeding 6 months.
2. If the equipment forms part of a larger safety system. It is imperative that a site specific program for regular maintenance should be created indicating a scope of work against a specified period of time that complies with the requirement of the site or application.
3. Ensure that the fan has been locally isolated before commencing work on any part of the fan.
4. Ensure that the impeller has come to a complete stand-still before commencing work on the fan / motor assembly.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

5. Following electrical isolation of the fan, all electrical connections and interfaces are to be checked and repaired as required, then retested for effectiveness.
6. Ensure that no debris or dirt is attached to the fan assembly that may obstruct the effectiveness of the unit and a suitable method is available for the removal of any debris found inside. Fan accessories such as guards and dampers should be checked and cleaned as required.
7. Sealed for Life motor bearings do not require maintenance. Bearing L10 life is typically 25,000 to 30,000 hours. Should you require a more accurate figure then contact Elta Engineering Department or refer to motor manufacturer's details.
8. Fans with re-grease-bearings must be re-greased according to the instructions. The type of grease, time interval and quantity is shown on both the drawings and as a label on the Fan casing. If this is not available refer to motor manual. If it is safe, inject grease while fan is running. If not safe, then inject half the amount grease, run fan for 2 minutes then inject remaining grease. Bearing L10 life depends upon application, but is typically about 50,000 hours for re-grease-bearings. Should you require a more accurate figure than contact Elta Engineering Department or refer to motor manufacturer's details.

## Special Applications - Fan Specific

### Hazardous Area (ATEX)

1. The fan must be protected to IP20 as defined by EN60529 to protect against ingress of foreign particles.
2. The hazardous area for which the fan can be used is defined by the ATEX code, which can be found on the fan label, the GA drawing and EC Declaration of Conformity.
3. Zone separation - Zones inside and outside of the fan may only differ by one i.e. Zone 1 internal, Zone 2 External
4. For fan assemblies utilising flexible connections and/or large access doors, there can be NO zone separation.
5. For Bifurcated and Belt Driven fans, there can be NO zone separation.
6. The ignition minimising properties of the fan and fan accessories can only be retained if routine inspections, services and cleaning are carried out.
7. Fan operating temperature ranges are contained in the ATEX code; this can be found on the fan label and GA drawing.

### Hazardous Area (Non ATEX – NFPA 70 / NEC Art. 500 & 505)

1. Electrical installation shall comply with NFPA 70, National Electrical Code Article 500 or 505 in accordance with the classification scheme selected at point of purchase.
2. The hazardous area for which the fan can be used is defined by the construction code which can be found on the fan label, GA drawing and Declaration of Conformity.
3. Zone separation - Zones inside and outside of the fan may only differ by one i.e. Zone 1 internal, Zone 2 External.
4. For fan assemblies containing flexible connections and/or large access doors, there can be NO zone separation.
5. For bifurcated and Belt Driven fans, there can be NO zone separation.
6. The ignition minimising properties of the fan and fan accessories can only be retained if routine inspections, services and cleaning are carried out.
7. Fan operating temperature ranges can be found on the fan label and GA drawing.

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## Smoke Ventilation – EN12101-3

1. Full details of the unit supplied are shown on the product nameplate. The product CE nameplate must be checked to ensure that the stated Fire Class, together with the indicated temperature and time are equal to or greater than the installation into which the fan unit is being placed. If in doubt about any detail, contact Elta Fans Ltd or its distributor for clarification.
2. The Fan / Motor assembly is designed for use in ambient temperatures of -20°C to +54°C and up to 95% humidity in normal mode.
3. Designed for one off use only in Fire Mode at temperatures of 200°C, 300°C or 400°C for a period of 2 hours depending upon the product purchased. This information can be found on the fan label.
4. Smoke ventilation fans certified under EN12101-3 are not suitable for use in corrosive or hazardous atmospheres.
5. The installer shall ensure that the fan is installed using adequate supports using only tested and certified components and materials.

Elta Fans Limited' products certified under EN12101-3 are tested and certified by a recognised authority.

## Replacement of Parts / Spares

When ordering replacement parts, please ensure that all correspondence contains either the fan serial number or Elta Reference number. This will help ensure that the correct replacement parts are supplied.

Motor Bearings—it is recommended that motor bearings are replaced after 20,000 hours or 5 years of service in normal, ambient conditions, whichever is earlier.

Hazardous area and EN12101-3 motors can only be repaired by authorised repairers.

## Disposal of Fans and Ancillaries

Please ensure that all packaging is disposed of in accordance with local regulations having regard for its environmental impact by reuse or recycling as appropriate.

Please ensure that fans and ancillaries are dismantled by a competent person and that materials are segregated for recycling / reuse in accordance with local regulations.

The following major components may be separated for further treatment by specialist recycling facilities:- Electrical Cables, Motor Windings, Motor/Fan block, Plastic components, Packaging materials, Silencer infill, Fans and motor casings.

## Appendix I – Maintenance Schedule

For more arduous environments, for example transport, marine etc. where there is vibration and shock the Maintenance Schedule will need to be more frequent. If in doubt please contact Elta Fans.

### Storage Maintenance Schedule – Basic

Activity	Frequency
Rotation of shafts	Monthly
Insulation Test	3 Months
Refresh Grease (Grease Lines and Bearings)	2 Years
Replace “Sealed for Life” Bearings	2 Years

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## Operational Maintenance Schedule – Basic

Activity	Frequency
Inspect AV mounts for Corrosion or “Sag”	6 months
Prove Earth bonding	6 months
Grease motor	See Motor Manual, GA Drawing or Data Sheet
Grease internal fan carrier unit (Belt Drive units only)	
Dampers check and grease (lithium based grease) pivot points, by removing plastic caps (Counter Balance Damper only)	Yearly
Check tightness of fixings	26,000 hours / 3 years
Inspect and clean impeller	26,000 hours / 3 years
Remove dirt from motor cooling fins	26,000 hours / 3 years
Check operation of condensation heaters	26,000 hours / 3 years
Check even tip clearance between impeller and casing	26,000 hours / 3 years
Check motor running current	26,000 hours / 3 years
Any corrosion - treat with suitable chemicals	26,000 hours / 3 years
Check casing seals	26,000 hours / 3 years
Replace belts (Belt Drive units only)	26,000 hours / 3 years*
Remove Damper check security of all **fixings replace any per-ished rubbers	3 years
Fan: check security of all **fixings, except impeller bolts. If fitted visually check security of spark minimising track around the impeller for signs of looseness and corrosion	3 years
Replace pulleys (Belt Drive units only)	5 years*

\*This is subject to site conditions and stop / start intervals / frequency.

\*\*Fixings torque values are shown in Appendix V. Some fixings are secured using Heico washers and have a different torque value.

## Terminal Box / Enclosure Maintenance Schedule – Basic

Activity	Frequency
Check that lid gasket is in place and not damaged	Each time enclosure is opened
Check that lid fixing screws are in place and secured	Each time enclosure is closed
Check mounting fixings are tight and free from corrosion	Annually
Check security of all cable glands	Annually
Check that all screws, clamps and terminals are secure	Each time enclosure is opened
Check enclosure for damage	Annually

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

## Appendix II – Fault Finding

Observations	Potential Causes	Remarks
<b>Vibration at rotation X 1</b>	Impeller out of balance	Impeller mechanically damaged. Un-even build-up of contaminants on impeller. Hostile environment corroding or eroding impeller. Ice build-up in low temperature applications.
<b>Vibration at rotation X 1 and X2</b>	Pulleys misaligned	
<b>Belt flap vibration =&gt; rotation X1 sometimes random frequencies</b>	Belts not equal or correct tension Reaction to stray vibrations Inverter harmonics Hard spots on belts, cracks, etc... Pulley wear causing belts to ride up and down grooves Mechanical looseness	
<b>Vibration at impeller blade number X rotation</b>	Poor inlet or / and outlet conditions. Obstruction in duct	
<b>Generally very large vibrations less than rotation X 1</b>	Rotating aerodynamic stall	System pressure too high, results in blade fracture.
<b>Low vibrations impulsive inputs to fan's supports, strong acoustic effects.</b>	Mismatch between system and fan's capability causing surging	
<b>Ductwork resonates</b>	Organ pipe effect	Duct length is tuned to aerodynamic forcing frequency typically number of blades X rotation.
<b>Vibration rotation X 1</b>	Uneven heating of motor rotor causing out of balance	
<b>Vibration rotation X rotor bars</b>	Problem with stator bars	Vibration stops immediately power is removed
<b>Vibration rotation X stator bars</b>	Problem with rotor bars	Vibration stops immediately power is removed
<b>Motor current too high / Motor overheating</b>	Load too high Insulation problem Motor ventilation paths blocked Cooling fins clogged Dust and oil ingress	Dust, oil and moisture will shorten the motor's insulation life
<b>Knocking or rumbling noise from motor</b>	Worn bearings	Over greasing of bearings will generate very high temperatures causing the greases to break down and bearing failure.
<b>Variable Speed Application, fan vibrates at specific speed settings</b>	Speeds may be same as mount's natural frequency	Block out these speeds from the variable speed device and pass through them quickly

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## Appendix III – Lifting

### Rotation of individual Long Case Axial Fans from a resting vertical orientation to horizontal:

**NOTE:** - It is the responsibility of the site foreman or responsible persons of the lifting operations to ensure that suitable and adequate lifting equipment is made available for any lifting operations and to ensure that they are carried out in a safe manner. All lifts should be individually assessed on site and conducted in accordance with relevant Health & Safety Regulations.

1. Identification of lifting points for the purpose of rotation:-

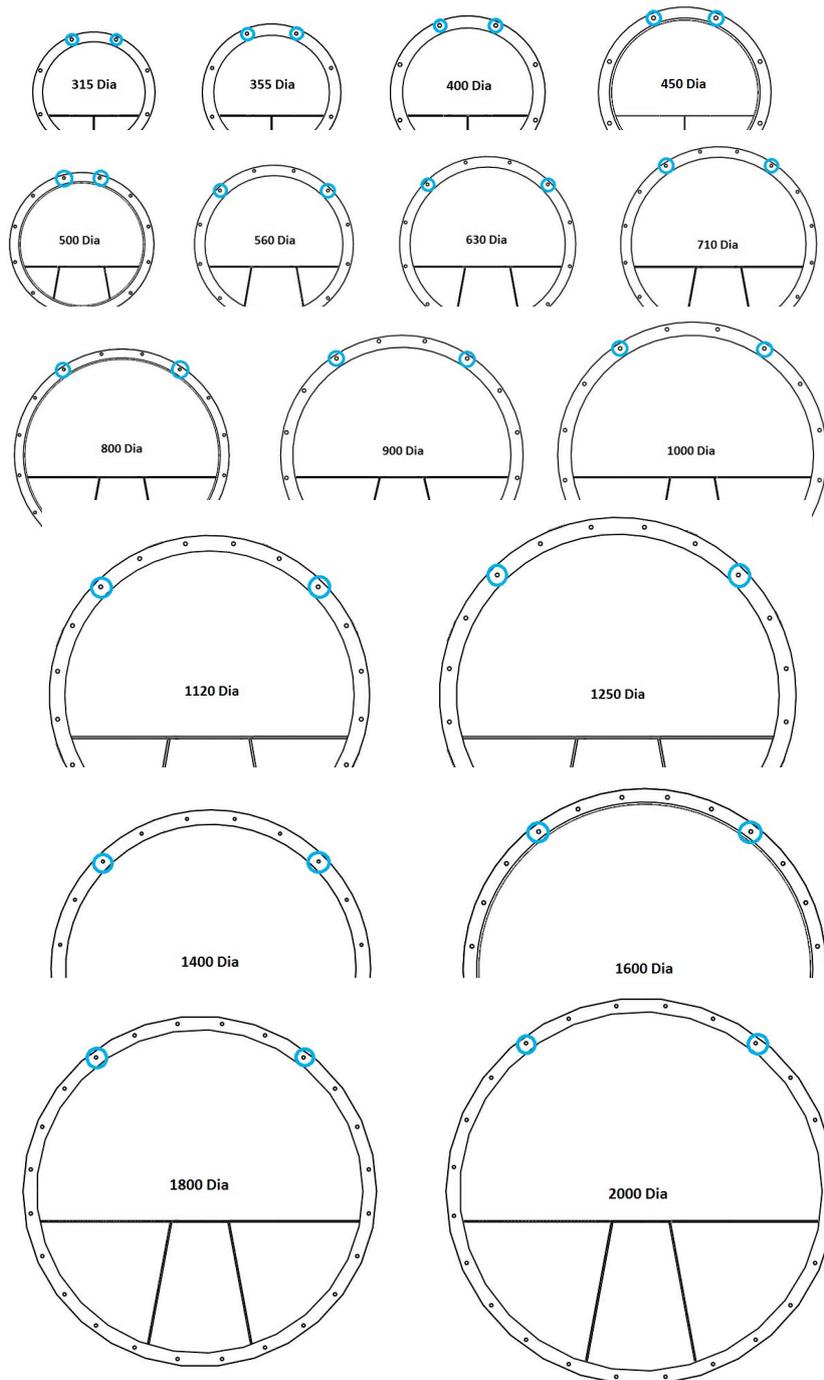


Figure 2.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

2. Strops, slings and shackles should be securely fitted to the lifting points.

**Note:** - Weight of fan unit can be found on either fan general arrangement drawing (GA) or shipping documentation. This stated weight should be used to select lifting equipment with a suitable Working Load Limit.

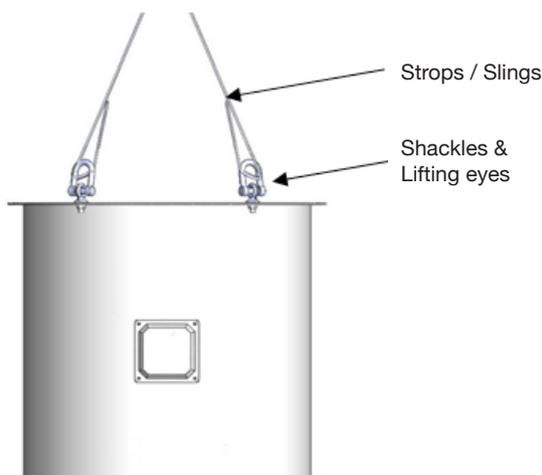


Figure 3.

3. The unit should be lifted slowly and smoothly using a crane or other mechanical lifting device (subject to assessment on site).

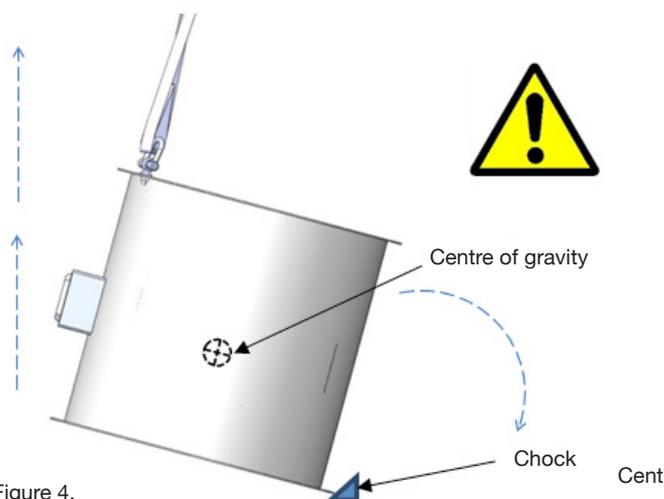


Figure 4.

**Caution is to be taken when rotating the fan as sudden weight shifts are possible.**

4. Once the unit is hanging from strops, the unit should be guided down slowly by hand or with the use of guide ropes (subject to assessment on site) to the horizontal position.
5. The point of rotation should be chocked or secured to prevent the unit from sliding.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

## Lifting of individual Long case Axial Fans from a resting Horizontal Position:

1. Sufficiently rated strops and shackles must be securely fitted to evenly spaced flange holes as per Figure 5. Allowing for even load distribution across all lifting points. Where provided, lifting Lugs must be used in conjunction with shackles, strops and slings. Appropriate spreader bars should be used to minimise lateral strain on lifting lugs. Manufacturer recommendations for strop and shackle angles should be taken into account.

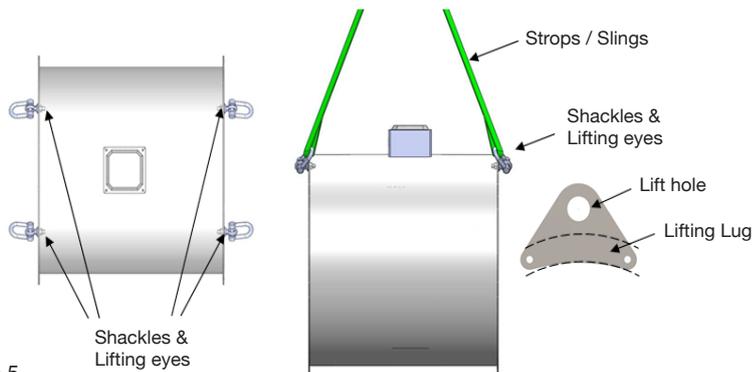


Figure 5.

2. Strops can also be secured around the fan casing as below, ensuring that the load is lifted evenly, that any appropriate de-rates have been applied to the strops or slings and that a spreader bar is used.

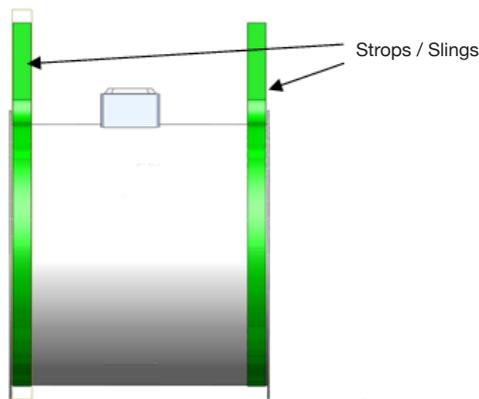


Figure 6.

## Lifting of individual Long case Axial Fans from a resting Vertical Position:

3. Sufficiently rated strops and shackles must be securely fitted to evenly spaced flange holes as per Figure 7. Allowing for even load distribution across all lifting points. Where provided, lifting Lugs must be used in conjunction with shackles, strops and slings. Manufacturer recommendations for strop and shackle angles should be taken into account.

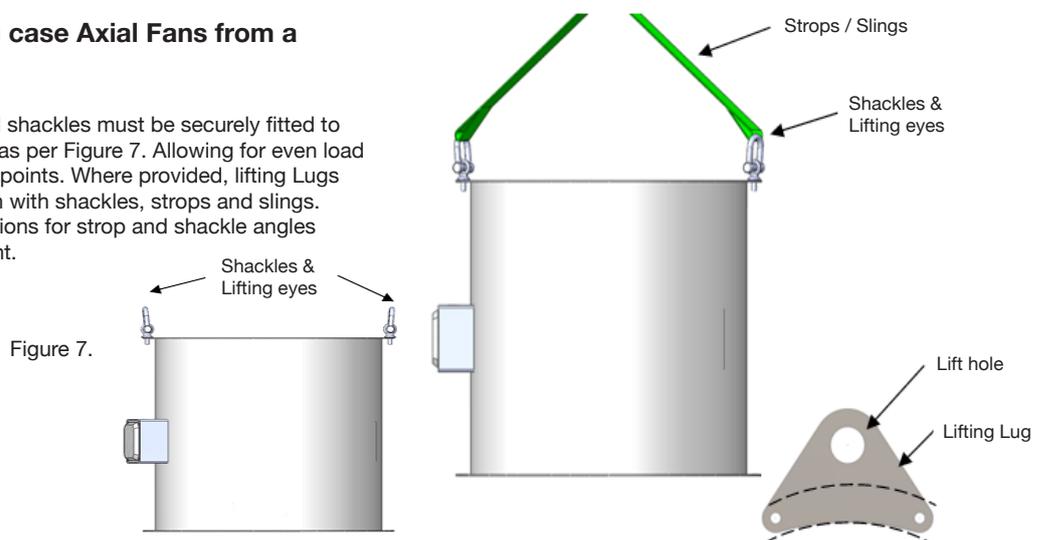
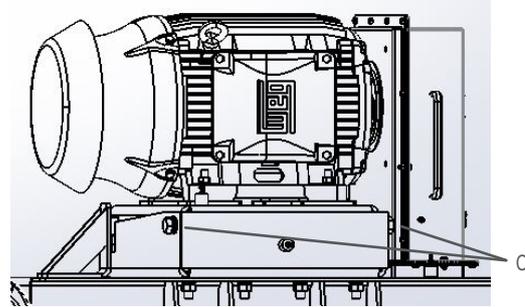
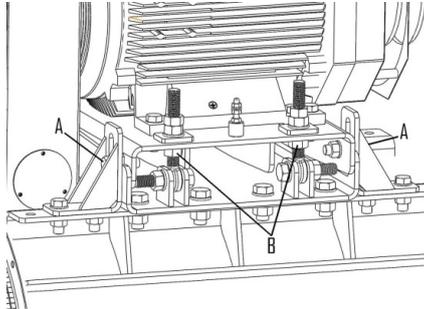


Figure 7.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

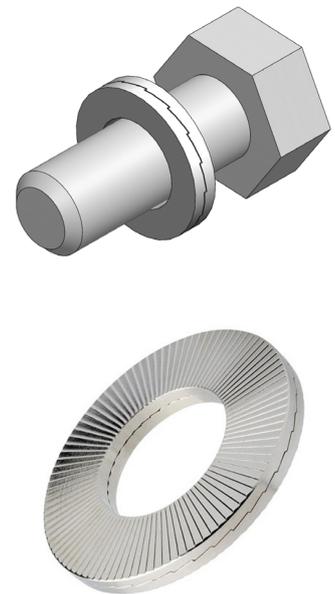
## Appendix IV – Belt Tensioning



The above is a typical belt drive adjustment arrangement. Belts will be slack on receipt. Remove belt guard or belt access panel. Slacken bolts A and the two scissor platform hinge bolts C. Tension belts by winding upwards nuts B and then lock with nuts on the other side. Belt tension values are on the side of the casing and on the drawing. They are in two forms, frequency (best used for limited access) or force displacement method. Tighten all slackened bolts ensuring the distance at both ends of the platform is even to the casing (keeping the motor axis parallel to the casing). Torque values are given in Appendix V. Run for 15 mins and re-check tension and adjust if required. Belts must not be exposed to any contamination especially oils.

## Appendix V – Bolt Torques

Screw Size	Torque (Nm)				
	Mild Steel, Zinc Plated			Austenitic Stainless Steel	
	8.8	10.9	12.9	A2/A4-70	A4-80
M6	8	12	14	10.4	13.9
M8	21	29	34	25.5	33.9
M10	41	57	69	51	69
M12	71	100	120	88	117
M14	113	158	188	141	188
M16	171	244	291	218	291
M18	235	333	402	380	411
M20	333	470	564	439	586
M22	453	637	761	582	776
M24	577	812	974	724	966
FIXINGS WITH HEICO WEDGE LOCK WASHERS Torque (Nm)					
Screw size	8.8	10.9	12.9	A4-70	A4-80
M6	11	15	18	7	9
M8	25	36	42	17	22
M10	50	70	84	33	44
M12	85	121	145	56	75



Note that Heico wedge lock washers come in pairs. All Heico wedge lock washers must be correctly torqued.

# SAFE AREA, SMOKEVENT & HAZARDOUS AREA

## Appendix IV – Fan Commissioning Record

Elta Ref No.: \_\_\_\_\_

Fan Serial No.: \_\_\_\_\_

Date of Installation: \_\_\_\_\_

### Pre-Installation Checks

**DO NOT CARRY OUT INSULATION CHECKS I.S CIRCUITS OR THERMISTORS**

Check Points	Notes
Transit damage	
Damage to casing and ancillaries	
Damage to wiring	
Fixings correctly tightened	
Impeller Tip Clearance is even	
Motor Insulation checks (windings and heaters)	M Ω
Motor Resistance checks (windings and heaters)	Ω
Correct Wiring Connection (DOL, Star/Delta, etc.)	
Free from Dust and Debris	
Correct CSA of supply power cables	
Correct Belt Tension – Belt Drive Only	
Adequate overload protection	
Correct AV “Sag” height – If Fitted	

### Post-Installation Checks

Check Points	Notes
Heaters automatically “on” when motor stationary – if fitted	
Correct Damper Operation – if fitted	
Running Amps	
Vibration Levels	mm/s

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

**PLEASE RETURN THE COMMISSIONING RECORD TO ELTA FANS LIMITED  
AS THIS WILL ASSIST IN THE RESOLUTION OF WARRANTY ISSUES.**





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