Fan troubleshooting

1. Electrical

Problem	Possible Cause	Action
Fan not running	No electrical supply	Check electrical supply and ensure correct match to motor requirement.
	Overload devices tripped	Reset overloads.
	Blown fuse or tripped circuit breaker	Check motor and wiring before resetting circuit breaker or replacing fuses.
	Loose electrical connections in junction box	Check all connections and tighten or replace terminal lugs.
Wrong rotation direction	Incorrect wiring	Check wiring against diagram in junction box or on fan datasheet and correct as necessary. For three phase fans, reverse any two supply cables.
Humming sound from motor	Incorrect electrical supply	Check motor plate matches electrical supply.
	Electronic speed controller	Replace with transformer type controller.
	Incorrectly installed VSD speed controller	Check installation of VSD against manufacturers specifications.
	Overloaded motor	Ensure correct motor is fitted for the impeller size and/or pitch angle (axials).
	Imbalanced phases in three phase supply	Check that supply phases are correct
Fan rotates in alternating directions	Capacitor faulty or not correctly wired	Check wiring and replace if faulty.
Excessive current draw	Undersized motor for required duty	Check motor plate and replace motor if required.
	Incorrect blade pitch angle (adjustable pitch axial fans)	Check and adjust pitch angles.
	Impaired rotation of impeller	Check for obstructions to impeller spinning freely.
	Incorrect electrical supply	Check that supply matches motor plate.
	Three phase motor operating with o ne phase disconnected	Check power supply or motor windings.
	Motor incorrectly wired for star or delta operation	Check motor plate and wiring diagram and correct as required.
Overheating	Frequent start ups	Check control system and adjust down number of starts per hour to eight or less.
	Dirty cooling fins on motor	Clean motor.
	Blocked cooling vents on motor shrouds	Clear dirt and obstructions from cooling vents.
	Cooling fan not fitted to motor out of airstream	Check fitment of cooling fan.
	Motor incorrectly wired for star or delta operation	Check motor plate and wiring diagram and correct as required.

2. General mechanical

Problem	Possible Cause	Action
Vibration	Damaged impeller	Check for chipped of broken blades and replace as necessary.
	Bent motor shaft	Replace motor.
	Out of balance impeller	Remove and re-balance impeller.
	Normal vibration not isolated from structure	Ensure correctly load rated anti vibration isolators are fitted.
	Dirty fan blades	Clean blades as required.
Bearing noise	Inadequate lubrication	Grease as required.
	Failed bearings	Replace as required.
Seal squeal	Dry shaft seals	Lubricate as required.
Air squeal or whistling	Poor seals at duct / fan joins	Re-seal as required.
Impeller / Fan excessively noisy	Bent blades	Remove and replace blades where required, note that impeller may need to be re-balanced as a complete assembly.
	Dirt build up on blades	Clean blades as required.
	Loose blades at hub	Check fitment of each blade at its root and ensure all hub nuts and bolts are tightened to correct torque settings.
	Impeller touching case	Motor may have moved out of alignment on its mounting plate. Loosen motor bolts and adjust position until blades are free.
	Fan running in stall	Check that the fan's rated performance is not selected too high on the published performance curve and replace or change duct / system design to reduce the load on the fan.
	Impeller loose on motor shaft	Check and tighten to specified torque setting.
	Inadequate blade tip clearance	Impeller may need to be trimmed and re-balanced.
	Impeller misaligned with inlet cone (centrifugal)	Check and adjust as required.
	Damage to inlet cone (centrifugal)	Repair or replace as required.

3. General performance

Problem	Possible Cause	Action
Air flow low	Air leakage in duct system	Check connections throughout.
	Ducting is undersized	Undersized ducting and fittings will increase system pressure and reduce flow accordingly. Unless changes can be made to the ducting a higher rated fan will need to be installed.
	Incorrect pitch angle (axial fans)	Check pitch angles against fan specification and correct as required.
	Wrong sized fan	Check against system requirements and replace as required.
	Fan running in reverse direction	Check fan rotation and wiring to correct.
	Dampers not adjusted correctly	Check position of all system dampers and correct as necessary.
	Turbulence in duct system	Install guide vanes to inlet side of axial fans to prevent air rotation. Install turning vanes in bends. Ensure transitions are designed with appropriate length and angle to prevent losses.
	Dirty filters	Remove filters and re-check performance, clean as required and reinstall.
	Low fan speed	Check motor plate for correct shaft speed and change if required. Check speed control device settings and correct as required.
	Ducting is oversized	Oversized ducting and fittings will reduce system pressure and increase flow. Install dampers or speed control devices to fans to bring system back to correct balance
	Wrong sized fan	Check against system requirements and replace as required.
	Incorrect pitch angle (axial fans)	Check pitch angles against fan specification and correct as required.
Air flow high	Ducting is oversized	Oversized ducting and fittings will reduce system pressure and increase flow. Install dampers or speed control devices to fans to bring system back to correct balance
	Wrong sized fan	Check against system requirements and replace as required.
	Incorrect pitch angle (axial fans)	Check pitch angles against fan specification and correct as required.

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