

Kit Concept

Air kits (or fan kits) are sold as sets of components such as wheels, housings, shafts, bearings, shaft coolers, cooler guards, recess cones, straightening vanes and shaft seals. Kits are installed and assembled by the purchaser in a plenum or oven. The wheel (or wheels) are supported on a shaft between two bearings.

The term "twin" is used to designate two wheels on a common shaft. Spacing of the housings and wheels in the plenum is done so that the inlet restriction is the same on all inlets. More information about performance and configuration specifics may be found in Catalog 150.

Support Structure

Air kits are normally installed as part of another structure. These structures must be designed to withstand both static and dynamic loading. The structural design should follow the same guidelines for foundations and supporting structures as found in ES-52. Proper design of supports and supporting structures are the responsibility of the purchaser.

Housing stiffeners or frame should provide rigidity and support to the housing. Adequate rigidity can be provided by positioning bracing as shown in Figure 1. Additional support may also be required. Supports should not block the inlet or discharge of the fan. For oven type applications the supports must be designed so that the housing inlets will be centered with the

wheel when hot. Connecting ductwork should have independent supports and have expansion joints or other allowance for thermal expansion.

Bearing supports should be rigid enough to support static and dynamic loads caused by belt pull and vibration. The bearing mounting surface should be flat and square with the shaft axis centerline so that the bearings are not subjected to loads from mounting misalignment. The supports should be free from thermal effects which can cause misalignment of bearings and designed so that the bearing is not heated by conduction through the pedestal or convection through the airstream. When recess cones are combined with shafts having turndowns, the bearing supports should be removable to allow for installation of the recess cone.

Air Kit Assembly and Installation

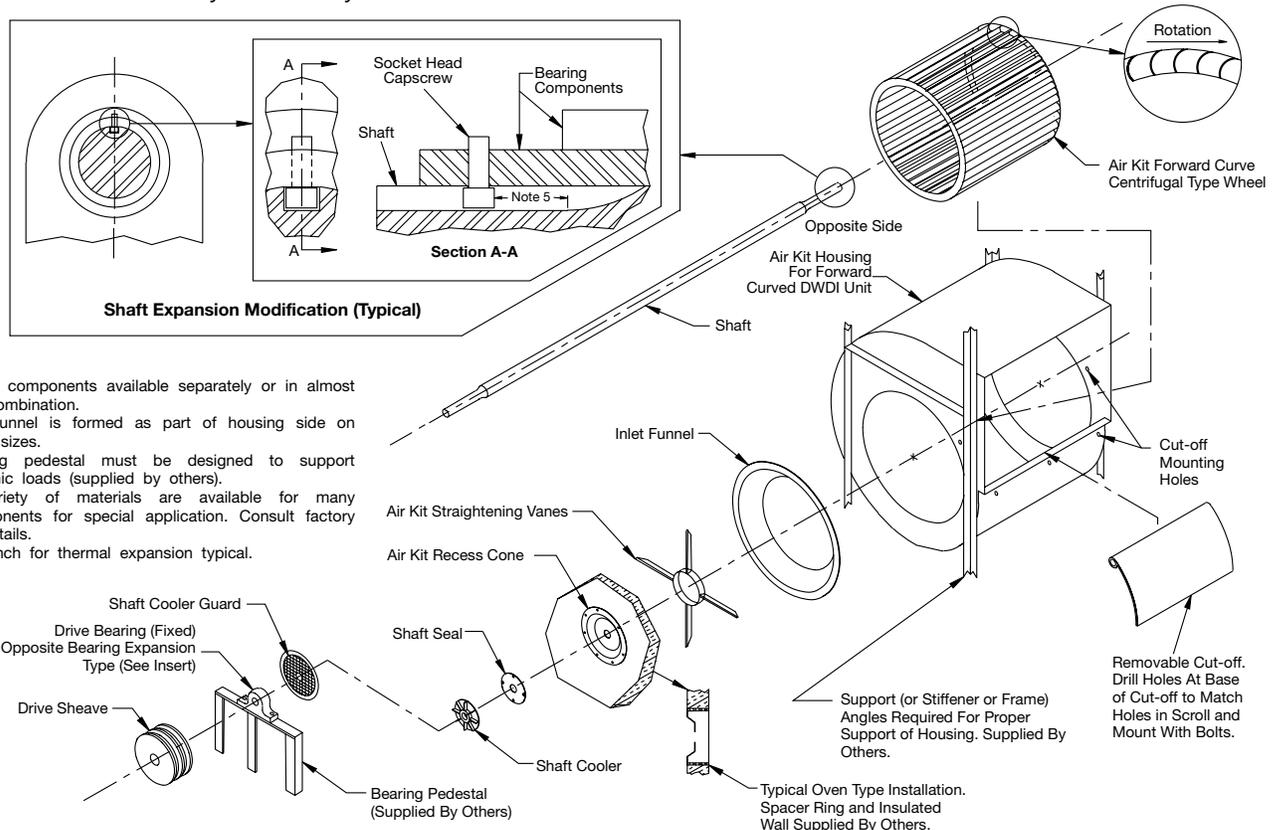
Components are assembled in order shown in Figure 1.

Since requirements vary, the purchaser assumes responsibility for the proper installation and operation of the unit.

Assembly Preparation

Housings are mounted so that the inlets are equally constricted. For twin fans, this means one-quarter of the total clearance is at the outer fan inlets and one-half of the total clearance is in the middle. Bearing pedestals

Figure 1. General Assembly of Twin City Fan & Blower Air Kit



Notes:

1. Air kit components available separately or in almost any combination.
2. Inlet funnel is formed as part of housing side on some sizes.
3. Bearing pedestal must be designed to support dynamic loads (supplied by others).
4. A variety of materials are available for many components for special application. Consult factory for details.
5. One inch for thermal expansion typical.

are installed so that the bearings can be shimmed for proper centerline height.

Provide for passage of shaft through the wall of the oven. Relief must be provided for recess cone mounting and shaft seal (see Figure 1). Installation of a recess cone may also require the use of a cylindrical section to restrain insulation and maintain proper depth of oven wall.

Clean the wheel bore with solvent and check for burrs, rust paint, or other obstruction. Use 80 grit emery cloth by hand to remove foreign particles. Flush any grit remaining and wipe clean. Place an even film of oil in the wheel bore.

Extra care should be taken with shafting. Shafts for air kits tend to be quite long and heavy and can be easily damaged. Clean the shaft with solvent and check for nicks, scratches, and burrs. Remove rough spots with emery cloth and clean again. Cover the shaft with a light film of oil.

Assembly

Fan housing and bearing supports are installed as previously described. Inlet funnels which may have been supplied separately should be mounted to the housing at this time.

1. Place wheel into housing through discharge of housing. Check wheel for proper wheel rotation before proceeding (see Figure 1). Block wheel so that wheel inlets are centered with housing inlets.
2. Insert the shaft through housing inlet and wheel bore. Kits which have the shaft extension modification will have keyways at both ends of the shaft. Identify the drive end from fan drawings to insure proper shaft orientation. Temporarily support the shaft and wheel assembly on blocks across the full length of wheel. Do not support on housing sides, inlet funnels, wheel end rings, or accessories.
3. The optional accessories are installed in this order onto the shaft: recess cone, shaft seal, shaft cooler, and cooler guard. These parts are installed outside the oven wall except the recess cone, which becomes part of the wall. All fasteners should remain loose until bearing mounting is complete.
4. Slip the bearings onto the shaft and pedestal and secure, making sure the following instructions are followed:
 - a. Mounting expansion bearings — no shaft expansion modification.
 1. Place bearing onto the shaft with bearing collar facing away from wheel.
 2. Adjust expansion capability of bearing so that the bearing is toward the wheel in the bearing housing. (When the shaft expands from heat, the bearing will be pushed away from wheel in the bearing housing.)
 3. With bearing properly aligned and shaft at the required centerline height, bolt bearing to the pedestal. Go to step 4c.
 - b. Mounting bearing with shaft expansion modification:
 1. Slide bearing onto shaft with bearing collar pointed away from the wheel and toward the end of the shaft. The head of the inverted

socket head capscrew will fit in the short keyway. Make sure that the shaft can expand without the end of the keyway hitting the screw head.

2. With shaft at the proper centerline height and bearing square with the shaft, bolt bearing into position.
 - c. Tighten all setscrews remaining in bearings. (If shaft expansion modification was used, do not use any other setscrews on expansion side bearing other than the inverted screw provided.)
5. Position wheel in housing so that it will be centered when hot. Shaft expansion must be allowed for high temperature applications. The wheel will move away from the drive (or fixed) bearing by an amount equal to the distance to the wheel from the drive bearing times the temperature rise times the coefficient of thermal expansion — about 0.000067/°F/inch for steel. Tighten Allen-head setscrews. (Allen-head setscrews are normally provided.)
6. Accessories may now be permanently mounted and bolted into position (recess cone, shaft seal, shaft cooler and cooler guard). Rotate shaft manually to insure adequate clearance.
7. Assemble drives as listed in ES-52.
8. Install cut-off in discharge of housing with bolts through sides and base of cut-off.
9. Check and tighten all screws, nuts and bolts.
10. The installer may need to fine-tune balance the final assembly. (All wheels are factory balanced. Low speed FC units will generally not require a final balance.)

Maintenance of Kit Fan

See ES-52 for normal maintenance instructions for bearings, drives, etc. High temperature applications should avoid heat soaking of shaft. Stationary (non-rotating) shafting should never be exposed to elevated temperatures or bending may occur. Shaft should always be rotating in an elevated temperature environment.

On high-temperature applications, check all fasteners (nuts, bolts, screws, and rivets) for tightness. Cyclic heating and cooling can loosen fasteners from thermal expansion and contraction. Check after the first few cycles of thermal change or 48 hours, whichever comes first. Then check on a monthly basis.

Performance Troubleshooting

See troubleshooting section of ES-52 to identify causes of problems normally encountered. In addition to those mentioned, on kit type installations check for:

1. Vibration — Bent shaft caused by exposure of shaft to high temperatures while not rotating.
2. Fan will not start or motor trips out after start-up — Motor was not sized for WR^2 required. Motor horsepower too low for cold start.



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