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Form 700000
Ref USIM000

USTB SERIES FANS
The Inline Airflow Centrifugal Fan with Airfoil Blading

INSTALLATION ● OPERATION ● MAINTENANCE

Typical USTB Series

I. INTRODUCTION

Your Series USTB Fan is a carefully engineered and constructed piece of machinery which will give long satisfactory service provided correct installation and proper maintenance practices are observed. These instructions, along with others for motors, parts or accessories which may be furnished as part of your fan, are supplied for your information and guidance. DO NOT DESTROY AFTER INSTALLATION - RETAIN WITH THE UNIT FOR MAINTENANCE. Preventative maintenance including periodic inspection, testing, cleaning, lubrication and replacement of worn parts will forestall equipment breakdowns and minimize equipment shut-downs.

In addition to this manual, all fans are shipped with the Air Movement and Control Association (AMCA) Publication 410-90, "Recommended Safety Practices for Users and Installers of Industrial and Commercial Fans". If you did not receive this booklet, immediately contact the factory to obtain a copy or contact AMCA directly. The AMCA Safety Publication 410-90 should be read before installing and operating the equipment to insure safety of personnel and equipment.

WARNING! The inner cylinder is not air tight and therefore, the fan should not be used where the escape of contaminated air would cause problems. The user must accept ultimate responsibility for the acceptability of the fan in his system.

II. RECEIVING AND HANDLING

Fans are prepared for shipment according to the Uniform Freight Classification Rules of the carriers. The equipment is carefully inspected before shipment and it is the responsibility of the carrier that it be in perfect condition upon arrival.

When the carrier accepts a shipment and signs our Bill of Lading, the carrier is responsible for any subsequent shortages or damage, evident or concealed, and claim must be against the carrier.

Immediately upon receipt of a shipment, carefully inspect for damage and shortage. If any damage and/or shortage is detected or suspected, the carrier must be asked to conduct an inspection. The consignee's representative should not accept shipment without a notation on the delivery receipt indicating items not delivered or apparent extent of damage.

When a shipment is opened and damage is found which was not evident externally (concealed damage), it is mandatory that the consignee request an immediate inspection by the carrier. Report damage to the carrier within 15 days. Failure to report damage within the above time limit will cause rejection of a claim.

Promptly file a claim against the final carrier. A claim will not be considered by a transportation company unless presented within nine (9) months from date of receipt of equipment.

WARNING! Fans should never be lifted by the shaft, motor or accessories. These are not designed to support total fan weight and may break causing personal injury or unit damage.

Even though USTB Fans are rugged in construction, some care must be taken in handling. Lifting lugs are built on to each end of the unit for handling purposes. In addition, rope slings may be used around the casing, or eye bolts can be set in the flange bolt holes. Some vertical units have mounting brackets which can be used. Do not lift by the fan wheel, drive shaft, motor or motor base as this could cause damage or misalignment.

Fan wheels and casings which are furnished with special coverings, such as rubber, phenolic enamels, or other protective coatings, should be handled with extreme care as many of these coatings are easily damaged and even a small chipped spot will break the continuity of the coating and destroy its value as a protective covering for the metal.

Fan wheels are carefully balanced to provide smooth operation. If the fan wheel is damaged during handling, it may result in an out-of-balance condition and require re-balancing. If a shaft is dropped or unduly strained, it may be bent which will also result in out-of-balance operation of the fan.

A fan wheel should never be lifted by or allowed to rest its entire weight on the side plates or blades. The fan wheel and shaft assembly can be lifted by slings around the shaft on each side of the wheel so the wheel is supported by its hub. If a chain is used there must be sufficient padding on the shaft and wheel to prevent the scoring of the shaft or injury to the wheel. The chain or cable should be spread with timbers, or braced by some other method to prevent damage to the wheel side plates. If the fan wheel is received separate from the shaft, a support should be placed through the hub for lifting, making sure not to injure the finished bore of the wheel.

III. STORING OR LONG TERM SHUTDOWN

Depending upon size, fan equipment may be shipped from the factory either assembled as a unit or as sub-assemblies. The fan manufacturer provides sufficient protection for shipping the equipment to the jobsite. However, if the equipment is not installed and operated within several days, additional precautions are necessary.

Specifications should identify any conditions associated with non-use or storage of the equipment. Precautions may include specifying added protection by the fan manufacturer such as special crating, rust preventative on bare metal parts, special wrapping using tarps, silica gel bags to limit moisture and special covers over the inlets/outlets.

Once the equipment has arrived at the jobsite, but is not installed and placed in operation, the rotor (impeller and shaft) should be rotated by hand periodically to re-coat all lubricated parts with grease and to minimize brinnelling in anti-friction bearings. For assembled fans located in a dirty/moist/cold location, the equipment should be covered and bearings filled with grease to minimize contamination from outside elements. Before start-up, make sure all excess grease is purged out. Stored motors should follow the specific instructions of the motor manufacturer.

The factory does not recommend use of any plastic to cover equipment. This type covering can cause excessive moisture, condensation, rusting and equipment damage.

In addition the factory recommends that wheels must be blocked to prevent their being rotated by the wind.

IV. INSTALLATION

WARNING! Open all disconnect switches, secure in that position and allow all rotating or revolving equipment to stop before removing belt guard, installing or servicing unit. Failure to do so may result in personal injury or death from electrical shock or rotating parts.

WARNING! The drive motor and V-belt drive components, when supplied with the centrifugal fan, have been carefully selected for this unit's operating conditions as specified. Changing the drive motor or V-belt drive components could result in unsafe operating conditions which could cause personal injury and/or any of the following:

1. Shaft failure
2. Fan failure
3. Bearing failure
4. Excessive belt wear
5. Motor overload

A. Types of Mounting Supports

Series USTB Fans are designed for horizontal or vertical operation and are so designated by the suffix letter H or V following the size number; i.e. Size 27V. Horizontal (H) units must be installed with the shaft *horizontal only.* Vertical (V) units can be installed with the shaft vertical to discharge air either up or down, or they can be used with the shaft horizontal.

The Arr. 1 unit can be floor or platform mounted or ceiling suspended by rods.

Arr. 1 fans can be furnished with optional vibration isolation, either rubber or spring type. The base should be securely fastened to a rigid foundation and care exercised to assure freedom of the isolation feature of the base. Flexible duct connections should be used with Arr. 1 units. When flexible mountings are used, it is very important to support the equipment so that its operation is not impaired. This is too frequently ignored and yet without rigid mechanical support the purpose and intent of the isolation is defeated. This is particularly true of belt driven Arr. 1 fans, where it is essential that the fan and its motor be mounted on a common rigid base which can then be isolated from the building structure, as a single unit.

Arr. 9 units can be side wall mounted, ceiling suspended by rods, supported upside down from the ceiling or duct supported if the duct work is sufficiently braced.

Arr. 9 fans furnished with a mounting base should be firmly bolted to the foundation or vibration mountings, if supplied. Fans not equipped with a mounting base may be supported by the casing flanges, or by brackets for a ceiling hung mounting. The ducts must be braced sufficiently to support the weight of the fan and motor and to prevent vibration during operation.

B. Elevated Temperatures

Standard steel and aluminum fan construction is good for -20°F (-29°C) to 150°F (66°C). Steel fans for handling air up to 300°F (149°C) draw outside air through the belt tube and inner cylinder. Therefore, care should be taken so as to not restrict entry to the belt tube. Ambient air should not exceed 100°F (38°C).

Special construction for USTB Series fans is available for higher temperatures using forced air cooling from an external cooling fan.

CAUTION! For application at elevated temperatures, the fan must operate after the process has been shut down until the exhaust air or gases are 150°F (66°C) or less to protect the shaft, bearings and drive from overheating.

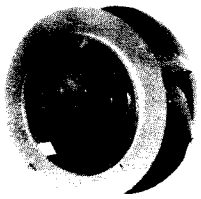
C. Access

Belts are readily accessible and can be inspected or replaced without disturbing the installation other than to remove belt guards or weatherproof hoods, if they are part of the unit. Access to bearings requires removable door or duct sections at the discharge end of the fan or removal of the unit from the duct system.

D. Fan Wheels

All fan wheels are balanced before shipment. They should fit the shaft snugly. The key should fit both the fan hub and shaft snugly, and the set screws should be tightened to the appropriate torque.

Rotation of the fan equipment and its corresponding fan wheel is always designated as clockwise viewing it from the drive side in accordance with AMCA Standards.



USTB Series Backwardly Inclined Airfoil Bladed

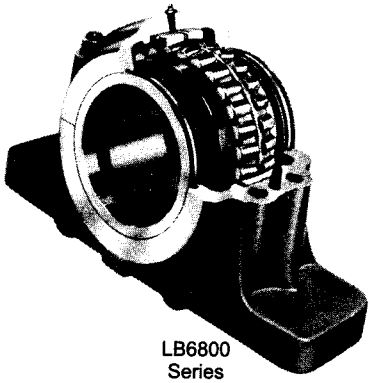
E. Bearings

Bearings for centrifugal fans whether mounted horizontally or vertically are carefully selected for load, speed, arrangement and other engineering considerations for which your fan will be used.

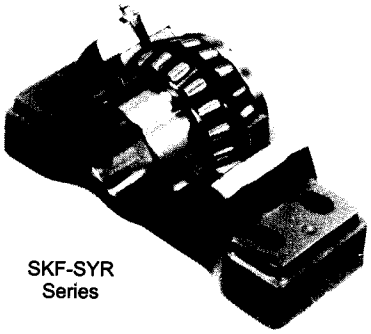
In general, all anti-friction bearings are grease lubricated at the factory before shipment. In some instances of high temperature operation, oil lubrication may be used, in which case bearings will be supplied with oil cups. One bearing is a fixed type with the bearing race held axially in the pillow block to limit end play. The other bearing is a floating type which allows for expansion. It is possible that very small fans handling ambient air could have two fixed bearings.

Separate bearing manufacturer's instructions for mounting, lubrication and maintenance are supplied in the instruction envelope for the bearings used.

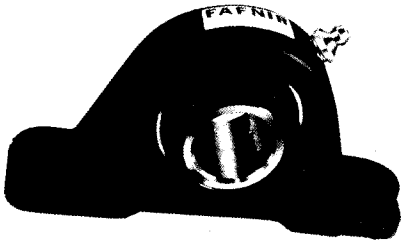
If the bearings are received separate from the fan or if they are removed from the fan for any reason, be sure to keep them clean and free from dirt or other contaminants.



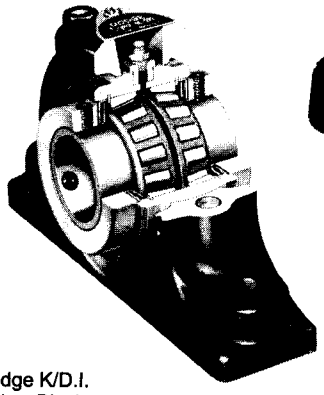
LB6800 Series



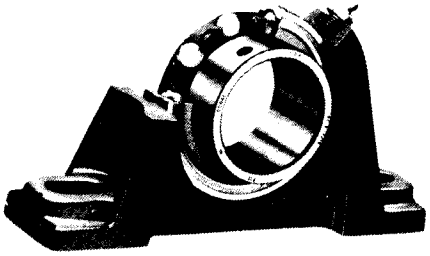
SKF-SYR Series



Fafnir RAS



Dodge K/D.I. Pillow Block



SKF-SY/SYM

F. Alignment

Bearing alignment is critical even on many ball and roller bearings designated as "self-aligning". On all bearings, if the dust and dirt seals are built into the bearing housing and not part of the race or journal assembly, alignment should center the shaft within one-half the normal radial clearance at the edge of the casing to prevent excessive dust seal wear and possible shaft scoring.

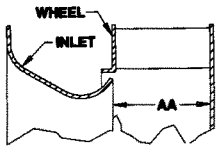
G. Locking Devices (Bearing Collars)

Most bearings have locking devices to insure against the shaft turning inside the inner bearing race and to limit end play. Eccentric type collars should be turned in the direction of shaft rotation until tight prior to tightening the set screws. Locking devices should be tightened only after the bearings have been properly aligned. The locking collars may be on the inside or outside of the bearings, depending on the design of the equipment. In all cases the collars must be both inside or both outside, to prevent movement of the shaft. Any replacements should be on the same side as with the original equipment.

H. Wheel/Inlet Installation

The wheel/inlet relationship on industrial fans is important if optimum performance is to be obtained. The correct factory placement of these parts can be disturbed by shipment and handling. The inlet should be centered within the wheel radially. Enlarged holes in the inlet bell allow for adjustment of radial clearance when necessary. It is unlikely that the wheel should require movement on the shaft to correct the overlap. On airfoil fans the inlet fit distance (AA) is measured from the inner edge of the inlet bell to the backplate of the wheel. This is a nominal dimension and may vary with the manufacture of the wheel and inlet.

I. Detail of Wheel/Inlet Installation



Series USTB

USTB Series					
Size	AA		Size	AA	
	in	mm		in	mm
15	5.28	134.1	37	12.54	318.5
18	6.34	161.0	40	13.82	351.0
20	6.97	177.0	45	15.25	387.4
22	7.68	195.1	49	17.06	433.3
24	8.54	216.9	54	18.45	468.6
27	9.42	239.3	60	20.56	522.2
30	10.46	265.7	66	22.64	575.1
33	11.50	292.1	73	25.12	638.0

J. Drives

Sheaves should be firmly locked in position and the key should fit tightly. Alignment is correct when the fan and motor shafts are parallel and belts are perpendicular to the shaft. A straight edge or taut cord may be used to line up the sheaves. Belts should be under light tension and should feel "live" when thumped. Belts should deflect slightly under light pressure. Excessive tension should never be applied since it will damage the cords and shorten the life of the belts. Never pry the belts over the rim of the sheave, but slack off on the take-up bolts until the belts can be slipped over the rim of the sheaves. Prying the belts over the rim of the sheave may break the cords and shorten the life of the belts and may possibly damage the fan.

For USTB fans with belt tubes, make sure belts are not rubbing against the internal belt guard. On these fans, belt stretch may be taken care of by re-positioning the motor base using the next higher base holes.

K. Fan Pre-Operating Checklist

Without exception, U.S. FAN INTERNATIONAL® recommends that all fans include applicable guards and safety devices. Equipment ordered without the applicable safety devices is clearly the responsibility of the purchaser. Further, the purchaser warrants that he has determined and acquired any and all safety devices required for equipment sold by U.S. FAN INTERNATIONAL®.

Before putting the fan into operation, remove any shipping wire or blocking holding the wheel and turn it by hand to be sure it is free and not rubbing against the casing or inlet. Check for tightness of the wheel on the shaft. Be sure bearings are lubricated and in alignment. Check tightness of bearing collars as they may loosen during shipment. Check coupling, belts or applicable drive for alignment.

It is advisable to check fan rotation before final duct connections are made. This is readily done by a momentary application of electrical current to the driving motor. The wheel should rotate clockwise when looking in the discharge in accordance with AMCA nomenclature.

Factory mounted motors on fans may shift during shipment requiring a check of the V-belt alignment and tension. Re-position the motor for proper alignment and belt tension if necessary. Re-position the motor on its base to take care of belt tension.

Check wheel rotation when starting the unit to be sure it conforms to the direction of the rotation arrow on the casing.

Check bearing hold-down bolts and the locking collars or other devices for tightness. Be sure to check the bearing for lubrication. See the included bearing instruction book for details.

The operation of the vane control should be checked before the fan is started to make sure that all links are free, that the operation is smooth, and that there is no distortion of the casing to cause any binding. See the vane control installation manual for details.

V. GENERAL OPERATION AND MAINTENANCE

Maintenance should always be performed by experienced and trained personnel. Do not attempt any maintenance of a fan unless the electrical supply has been locked out or tagged out and the impeller has been secured.

Provision should be made for periodic inspection of the interior of the unit and wheel. This may consist of an access door in the duct or an easily removable section of ductwork before and after the unit. Inspection is particularly important when fans are handling corrosive fumes, dirty or elevated temperature gases.

Fan wheels having badly worn blades should be replaced or rebuilt. Rebuilt or repaired fan wheels require careful balancing before being returned to service. Experienced personnel can give the wheel a running balance operating on its own shaft and bearings.

Standard fans handling corrosive fumes should have the internal parts cleaned and then painted with corrosion-resisting paint. Re-coating should be repeated when the paint film begins to show signs of deterioration. Be sure to follow the paint manufacturer's instructions for cleaning and coating.

When a V-belt must be replaced, replace the entire set of belts as new belts will not work properly in conjunction with used belts due to the difference in length.

Good fan maintenance consists of systematic and regular inspection, testing, care and adjustment, together with the repair or replacement of worn parts before failure occurs.

Experience will best determine the frequency of the various maintenance operations, since the requirements will vary widely, depending upon the severity of the application and local conditions. However, once a schedule of maintenance operations has been set up, it should be carefully adhered to for best results.

The successful operation of a fan depends to a large extent on the reliable operation of the bearings and the balance of the fan wheel.

A. Lubrication

Bearings require maintenance and attention whether in storage or operation. All assembled fan bearings are pre-lubricated at the factory according to the bearing manufacturer's instructions. All bearings should be inspected prior to start-up to insure the fan turns freely. Check the bearings after a short interval of operation to be certain they are not overheated.

A low pressure grease gun should be used for fan bearings and preferably either the gun or the fittings should be vented. Apply only a small amount of grease to prevent overfilling. This is especially important when extended lubrication piping is used and the bearing cannot be observed. All USTB fans are furnished with extended grease lines as standard.

Split pillow block ball or roller bearings are lubricated at the factory to the bearing manufacturer's instructions.

However, if fans are to be stored in a damp, dusty and/or corrosive atmosphere the bearings should be filled completely with grease to keep contaminants out of the bearing cavity. Before start-up be sure the bearings are cleaned and re-lubricated following the instructions of the bearing manufacturer. Oil lube bearings are lubricated at the factory. Clean the bearings with oil and lubricate according to the bearing manufacturer's instructions if the equipment has been stored.

Bearing manufacturer's instructions are provided with each assembled fan in the instruction envelope attached to the fan.

Motors should be lubricated in accordance with the manufacturer's instructions.

B. Vibration Causes

All wheels are statically and dynamically balanced at the factory and alignment is checked. If vibration is noticed, check the following:

1. Bearing and drive alignment
2. Shaft straightness
3. Wheel or sheave loose on shaft
4. Loose or worn bearings
5. Loose mounting bolts
6. Motor out of balance
7. Sheaves out of balance
8. Worn or corroded wheel
9. Accumulation of material on wheel
10. System design problems - One frequent system problem is too high a static pressure for the fan ordered. In other words, the actual system pressure turns out to be higher than the pressure assumed at the time the fan was ordered. This leads to the fan operating in the stall region, which can cause excessive vibration and eventual failure of the fan.

WARNING! Care must be taken when cleaning the wheel to remove grease and other foreign particles. Damage to the wheel can occur if it is hit or if pressure is applied causing the wheel to be distorted. Either case can cause serious vibration and damage to the fan.

In the case of accumulated paint spray, the wheel may be removed and cleaned in accordance with the paint manufacturer's instructions for both the coating applied and the underlying metal.

C. Renewal Parts

When continuous fan operation is vital, it is recommended that spare parts such as bearings, V-belts, and in some cases, wheels be kept on hand for emergencies.

Renewal parts should be ordered from the local sales office. All nameplate data should be provided, such as fan type, size, style and serial number. Describe the part accurately and if the equipment appears to be special, or if there is any doubt as to the description, include a dimensional sketch of the part required.

VI. INSTALLATION CHECKLIST

A. Read AMCA 410-90 which is shipped with the fan.

B. Comply with all Federal, State and local codes and regulations.

C. Always utilize trained and experienced personnel.

D. Always use safe and inspected tools and equipment.

E. Properly install all drive and inlet/outlet guards.

F. Confirm that fan accessories and motor are properly wired and fan is isolated from causing a shock.

G. Check that location for fan is completed and ready to accept fan upon arrival.

H. Check that cranes, tools and equipment needed for installation are available.

I. Confirm that properly trained personnel are available and prepared to handle fan.

J. Locate identifying paperwork such as Packing List and Bill of Lading.

K. Compare paperwork with items being received for proper items and quantity.

L. Inspect fan for damage such as dents, scrapes, bent shafts, broken parts, etc. Inspect carefully if signs of abuse during transit are obvious.

M. Immediately notify carrier in writing of any problems.

N. Notify your local representative of any discrepancies or damage and what has been done to correct it.

O. Read nameplate and identify fan and jobsite location. Compare with jobsite paperwork.

P. Verify all parts are present, properly assembled and in working order.

Q. Verify proper discharge and rotation.

R. If fan is assembled, verify that the wheel and shaft turn freely without noise and appear to be balanced.

S. Verify that bearings have been lubricated. Verify that coupling, if supplied, is lubricated.

T. Verify nameplate data once again. Be sure the correct fan is on the correct application.

U. Casing Interfaces

1. Verify that all tie-down mounting/hanging bolts are tight. Verify motor is tied down and adjusted.
2. Verify that access doors, drains and other accessories are attached and connected properly.
3. Verify that all guards and safety items are in place and adjusted.
4. Verify all ductwork is in place and is not being supported by the fan.

V. Wheel

1. Verify that the wheel is the correct rotation and in accordance with specifications.

2. Verify wheel is free to turn. Adjust if necessary. Check for inlet spacing around the wheel.

3. Check set screws in hub for tightness to shaft. Check wheel for looseness.

4. Check key for tightness.

W. Shaft/Bearings

1. Verify that the shaft appears straight and the key is in both ends.

2. Verify that bearings are lubricated, set screws or locking collars are tight. Check bearing mounting bolts for tightness.

3. Verify that seals are adjusted and properly assembled.

4. Verify fan is aligned properly.

X. V-Belt Drives

1. Verify that the fan sheave is on fan and motor sheave is on the motor and are not switched. Set screws are tight.

2. Verify that the fan and motor sheaves are parallel.

3. Verify that the fan and motor sheaves are aligned and adjusted to the proper diameters, if variable speed.

4. Verify belt tension according to specifications. All belts are to be equally loaded and matched.

5. Verify that all guards are in place and adjusted.

6. Insure belts are not rubbing against the internal belt tube.

Y. Accessories

1. Verify all dampers, inlet vanes or other controls are in working order.

2. Make sure all tools, personnel and debris are removed from fan/system.

3. Verify motor is wired to correct voltage. "Bump" to confirm that rotation is correct.

VII. START-UP OPERATION CHECKLIST

Before putting any fan into initial operation the above instructions must be followed. In addition, the following check list must be completed.

A. Lock out the primary and all secondary power sources.

B. A complete inspection shall be made of all of the ductwork and the interior of the fan. Make certain there is no foreign material which can be drawn into or blown through the fan or ductwork. Eyes should be protected against undetected foreign material with safety goggles or other appropriate means.

C. Make sure the mounting arrangement and the duct connections are adequately designed in accordance with the recognized acceptable engineering practices and with U.S. FAN INTERNATIONAL's® recommendations.

D. Check and tighten all hold-down/securing bolts.

E. Check the fan assembly and bearings for proper grounding to prevent static electricity discharge.

F. Spin the impeller to determine whether it rotates freely and is not grossly out of balance.

G. Inspect the impeller for proper rotation.

H. Check all set screws and tighten.

I. Check belt drive alignment; use recommended belt tension.

J. Check the belt drive for proper sheave selection and make sure they are not reversed (excessive speeds could develop).

K. Properly secure all safety guards.

L. Secure all access doors to the fan and ductwork.

M. Momentarily energize the fan to check the direction of rotation.

N. Switch on the electrical supply and allow the fan to reach full speed. Check carefully for:

1. Excessive vibration

2. Unusual noise

3. Proper belt alignment

4. Proper lubrication

5. Proper amperage and voltage values

If any problem is indicated, SWITCH OFF IMMEDIATELY. Lock out the electrical supply, secure the fan impeller if there is a potential for windmilling (impeller turning due to a draft through the system). Check carefully for the cause of the trouble and correct as necessary.

Even if the fan appears to be operating satisfactorily, shut down after a brief period and re-check items 1 through 4 shown below as the initial start up may have loosened the bolts and set screws.

The fan may now be put into operation, but during the first eight hours of running it should be periodically observed and checked for excessive vibration and noise. At this time, checks should also be made of motor input current and motor and bearing temperatures to ensure that they do not exceed U.S. FAN INTERNATIONAL's® recommendations or the motor/bearing manufacturer's recommendations.

After eight hours of satisfactory operation, the fan should be shut down to check the following items and adjust, if necessary (lock-out power and prevent windmilling).

1. All set screws and hold-down bolts

2. Belt drive alignment

3. Bearing housing temperature

4. Belt drive tension

After twenty-four hours of satisfactory operation the fan should be shut down (power locked out) and the drive belt tension should be re-adjusted to recommended tension.

Record fan nameplate information below for permanent records:

Size:

Fan Designation:

Max. RPM:

Max. Temp:

Serial #:

NOTES

TERMS AND CONDITIONS

DESIGN CHANGES U.S. Fan International® reserves the right to make changes in design, improvements and additions in and to its products any time without imposing any liability or obligations to itself to apply or install the same in any product manufactured by it.

TITLE The title and right of possession of the equipment sold herein shall remain with the Company and such equipment shall remain personal property until all payments herein (including deferred payments whether evidenced by notes or otherwise) shall have been made in full in cash and the Purchaser agrees to do all acts necessary to perfect and maintain such right and title in the Company.

SAFETY ACCESSORIES The Company manufactures equipment designed to serve multiple applications and offers a wide range of safety equipment, including guards and other devices, as may be required to meet customer specifications. Without exception, the Company recommends that all orders include applicable safety devices. Equipment ordered without applicable safety devices is clearly the responsibility of the Purchaser. Further, the Purchaser warrants that he has determined and acquired any and all safety devices required for equipment sold by the Company. Weather covers and guards for motor and V-belt drives, couplings, shafts and bearings, along with inlet and outlet screens, are optional accessories noted in the price list.

These instructions cover the usual installation, operation and maintenance methods for which the product(s) was designed. They do not purport to cover all details or variations in the product(s) nor to provide for every possible contingency that might be met in connection with the installation, operation and maintenance. For any departures from these instructions, or should particular problems arise which are not covered sufficiently for the purchaser's purpose, the matter should be referred to the Company.

WARNING U.S. Fan International® products are designed and manufactured to provide reliable performance but they are not guaranteed to be 100% free of defects. Even reliable products will experience occasional failures and this possibility should be recognized by the User. If these products are used in a life support ventilation system where failure could result in loss or injury, the User should provide adequate back-up ventilation, supplementary natural ventilation or failure alarm system, or acknowledge willingness to accept the risk of such loss or injury.

WARNING DO NOT use in HAZARDOUS ENVIRONMENTS where fan's electrical system could provide ignition to combustible or flammable materials unless unit is specifically built for hazardous environments.

CAUTION Guards must be installed when fan is within reach of personnel or within seven (7) feet (2.134 m) of working level or when deemed advisable for safety.

DISCLAIMER U.S. Fan International® has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions or dimensions.

LIMITED WARRANTY

WARRANTY AND DISCLAIMER: U.S. Fan International® extends this limited warranty to the original buyer and warrants that products manufactured by the Company shall be free from original defects in workmanship and materials for two years from date of shipment, provided same have been properly stored, installed, serviced, maintained and operated. This warranty shall not apply to products which have been altered or repaired without the Company's express authorization, or altered or repaired in any way so as, in the Company's judgment, to affect its performance or reliability, nor which have been improperly installed or subjected to misuse, negligence, or accident, or incorrectly used in combination with other substances. The Buyer assumes all risks and liability for results of use of the products. Warranties on purchased parts, such as but not limited to bearings, sheaves, belts, couplings, electric motors, pumps and controls are limited to the terms of warranty extended by our supplier.

Polyethylene tubing and cooling pads are warranted to be free of defects in material and workmanship for a period of 90 days from date of shipment and a like warranty applies to the cross fluted cellular type cooling cells for a period of two years from date of shipment provided same have been properly handled, stored, installed, serviced, maintained and operated. And further, not subjected to excessive heat, corrosive agents or chemicals, or mechanical abuse that may cause tearing, crushing or undue deterioration nor used on a system or in a manner other than that for which it was designed as explained in the product literature.

LIMITATION OF REMEDY AND DAMAGES: All claims under this warranty must be made in writing and delivered to P. O. Box 978, Muskogee, Oklahoma, 74402, within 15 days after discovery of the defect and prior to the expiration of two years from the date of shipment by the Company of the product claimed defective, and Buyer shall be barred from any remedy if Buyer fails to make such claim within such period.

Within 30 days after receipt of a timely claim, the Company shall have the option either to inspect the product while in Buyer's possession or to request Buyer to return the product to the Company at Buyer's expense for inspection by the Company. The Company shall replace, or at its option repair, free of charge, any product it determines to be defective, and it shall ship the repaired or replacement product to Buyer F.O.B. point of shipment; provided, however, if circumstances are such as in the Company's judgment to prohibit repair or replacement to remedy the warranted defects, the Buyer's sole and exclusive remedy shall be a refund to the Buyer of any part of the invoice price, paid to the Company, for the defective product or part.

The Company is not responsible for the cost of removal of the defective product or part, damages due to removal, or any expenses incurred in shipping the product or part to or from the Company's plant, or the installation of the repaired or replaced product or part.

Implied warranties, when applicable, shall commence upon the same date as the express warranty provided above, and shall, except for warranties of title, extend only for the duration of the express warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. The only remedy provided to you under an applicable implied warranty and the express warranty shall be the remedy provided under the express warranty, subject to the terms and conditions contained therein. The Company shall not be liable for incidental and consequential losses and damages under the express warranty, any applicable implied warranty, or claims for negligence, except to the extent that this limitation is found to be unenforceable under applicable state law. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

No employee, agent, dealer, or other person is authorized to give any warranties on behalf of the Company or to assume for the Company any other liability in connection with any of its products except in writing and signed by an officer of the Company.

REPLACEMENT PARTS If replacement parts are ordered, buyer warrants that the original components in which these replacement parts will be placed are in satisfactory working condition, and when said replacement parts are installed, the resultant installation will operate in a safe manner, at speeds and temperatures for which the original equipment was purchased.

TECHNICAL ADVICE AND RECOMMENDATIONS, DISCLAIMER: Notwithstanding any past practice or dealings or any custom of the trade, sales shall not include the furnishing of technical advice or assistance or system design. Any such assistance shall be at the Company's sole option and may be subject to additional charge.

The Company assumes no obligation or liability on account of any recommendations, opinions or advice as to the choice, installation or use of products. Any such recommendations, opinions or advice are given and shall be accepted at your own risk and shall not constitute any warranty or guarantee of such products or their performance.

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