INSTALLATION & MAINTENANCE INSTRUCTIONS
Windmaster Model DC

RECEIVING AND INSPECTION
Immediately upon receipt of a shipment, carefully inspect for damage and shortage. Turn programmer by hand to see that it turns freely and does not bind. 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.

HANDLING
When handling fans and their accessories, always use equipment and methods that will not cause damage. Fans should be lifted using slings and padding or spacers to avoid damage.

CAUTION! Always make sure that all lifting and handling equipment and techniques conform to current safety standards.

Avoid lifting fans in a way that will bend or distort fan parts. Never pass slings or timbers through the orifices of fans.

CAUTION! Do not lift by the fan hood. Fans with special coatings or paints must be protected in handling to prevent damage.

STORAGE
Fans are protected against damage during shipment. If they cannot be installed and put into operation immediately upon receipt certain precautions are necessary to prevent deterioration during storage. Responsibility for integrity of fans and accessories during storage must be assumed by the user. The manufacturer will not be responsible for damage during storage. These suggestions are provided solely as a convenience to the user, who shall make his own decision as to whether to use any or all of them.

INDOOR: The ideal storage environment for fans and accessories is indoors, in a dry, clean, climate-controlled space with a relative humidity of 40% or less. Fans should be stored in a dry location, away from direct sunlight or condensation. Moisture should be removed from the storage area to prevent condensation and to maintain a clean, dry environment.

When storing fans outdoors, it is important to protect them from the elements. Fans should be covered with tarps or plastic sheeting to prevent moisture from entering the enclosure. Keep the storage area clean and free of debris to prevent the growth of mold or other contaminants.

OUTDOOR: Fans designed for outdoor use may be stored outdoors, if dry indoor storage is not available. It is important to keep fans covered and protected from the elements to prevent damage to the fan and accessories.

CAUTION! Do not store fans in areas where they will be exposed to strong winds or moisture. Fans should be stored in a dry location, away from direct sunlight or condensation. Moisture should be removed from the storage area to prevent condensation and to maintain a clean, dry environment.

INSPECTION AND MAINTENANCE DURING STORAGE
Inspect fans and accessories at least once per month, while in storage. Log results of inspection and maintenance performed. A typical log entry should include the following:

a. Date
b. Inspector’s Name
c. Name of Fan
d. Location
e. Condition of Paint or Coating
f. Is moisture present?
g. Is dirt accumulated?
h. Corrective steps taken?

If moisture or dirt accumulations are found on parts, the source should be located and eliminated. Fans should be rotated at each inspection by hand ten to fifteen revolutions to redistribute the motor and bearing lubricant.

If paint deterioration begins, consideration should be given to touch-up or repainting. Fans with special coatings may require special techniques for touch-up or repair.

Machined parts coated with rust preventive should be restored to good condition promptly if signs of rust occur. The most critical items are pulleys, shafts and bearing locking collars. At the first sign of rusting on any of the above parts, remove the original rust preventive coating with petroleum solvent and clean lint-free cloths. Polish any remaining rust from surfaces with crocus cloth or fine emery paper and oil. Do not destroy the continuity of the
surfaces. Wipe clean with lint-free cloths and recoat surfaces evenly and thoroughly with Tectly 506 (Ashland Oil Company) or equal. For hard to reach internal surfaces or for occasional use, consider using Tectly 511M Rust Preventive or WD40 or equal.

REMOVING FROM STORAGE

As fans are removed from storage to be installed in their final location, they should be protected and maintained in similar fashion, until the fan equipment goes into operation.

INSTALLATION

1. **CAUTION!** This unit has rotating parts and safety precautions should be exercised during installation, operation and maintenance.

2. **WARNING!** Do not use fans in hazardous environments where the fan’s electrical system could provide ignition to combustible or flammable materials, unless the unit is specifically built for that hazardous environment.

3. **CAUTION!** Guards must be installed when fan is within reach of personnel or within eight (8) feet (2.5 m) of working level or when deemed advisable for safety.

Installation With Slant Wall Housing

4. To install a fan mounted in a galvanized steel slant wall housing when the wall thickness is 4” or less, provide a rectangular opening in the wall equal to dimension in Fig. 1. It is preferable to frame the opening with 2 x 4 material, or a metal frame in metal building or greenhouses. When the wall thickness is more than 4", the height of the rectangular opening should be 1 inch less than the height shown in Fig. 1 and the opening should be slanted approximately 15° as shown in Fig. 2. Note: If wall thickness is less than 4” framed opening height can be reduced 1/4” for each inch less than 4” thick.

5. Slide the fan wall housing through the inside of the framed opening in the wall. Fasten with bolts or screws provided by the installer. Position box so the top panel slants down from horizontal. Caulk between the top flanges and the wall (see Fig. 2). Fan wall housing can also be attached to outside of framed opening utilizing the mounting flanges.

6. Mount automatic shutter to inside of fan wall housing by inserting bottom edge of shutter behind the bottom shutter angle with the top edge of shutter in front of the top shutter angle (see Fig. 3) and then securing with the snap clips on the top shutter angle. An optional inside guard can be mounted with the shutter in the same manner.

7. Continue with Step 22.

Installation With Square Wall Housing

8. To install a fan mounted in a galvanized steel wall housing, provide a square opening in the wall equal to the dimensions in Fig. 5. It is preferable to frame in the opening with 2 x 4 material, or a metal frame in metal buildings or greenhouses.

9. Slide the fan wall housing through the inside of the framed opening in the wall. Fasten with bolts or screws provided by the installer. Position box so the top panel, having both sides turned down, is on top. Caulk between the top flanges and the wall. Fan wall housing can also be attached to outside of framed opening utilizing the mounting flanges.

10. Mount automatic shutter to outside of fan wall housing with number 14 x 5/8” self tapping hex head cap screws furnished. Insert top edge of shutter frame under top flange of fan box (see Fig. 4).

11. Continue with Step 22.

Installation With Fan Shipping Crate

12. To install to inside of building wall using the shipping crate as a mounting frame, see Figure 7.
24. Before starting, check all fasteners for tightness particularly in the propeller hub. Turn the propeller by hand to make sure it rotates freely and that the blades do not strike the orifice.

25. **WARNING!** Check voltage being supplied to the fan to see that it corresponds with the motor nameplate voltage. High or low voltage can seriously damage the motor. On multi-voltage motors, check motor terminal connections to make sure motor is internally connected for voltage being supplied. Motor wiring diagram is located on the side of the motor or in the motor wiring compartment. Extra care should be taken when wiring two speed motors since improper connections will damage motor and void motor warranty. Leave enough slack in wiring to allow for motor movement when adjusting belt tension.

26. Apply power momentarily and compare the rotation of the impeller with the directional arrow on fan. In the case of three phase motors, the direction can be changed by interchanging any two of the three motor leads. In the case of the single phase motors, the reversing instructions will appear on the wiring diagram in the motor wiring compartment.

27. When supply type fans are used with motorized wall shutters, it is necessary that a time delay switch be used between the power source and the fan motor which will allow the shutter to fully open before the fan is activated.

### MAINTENANCE

1. Under normal usage, no spare parts are recommended for one year of normal service. Recommended spare parts are shown on page 5.

2. **CAUTION!** Before proceeding, make sure electrical service to fan is locked in “OFF” position.

**WINDMILLING:** Even when the power supply is locked out, fans may cause injury or damage if the impeller is subject to “windmilling” which is the turning of the impeller and drive components due to a draft in the system. To guard against this hazard, the impeller should be secured to physically restrict rotational movement.

3. Motor bearings are prelubricated. Consult information printed on motor for lubrication instructions.

4. Propeller shaft bearings are prelubricated, sealed and require no service.

5. On belt driven units, check belt tension after first 48 hours of operation and thereafter annually. Belt should depress its width when pressed firmly inward at midway point between the pulleys. Too much tension will damage bearings. The belt should be tight enough to prevent slippage. When replacing worn belt, replace motor pulley if “shoulder” is worn in groove. **WARNING!** Do not operate at higher speeds than that cataloged for this equipment. **Do not** replace motor pulley with a larger diameter pulley. **Do not** replace the fan pulley with one smaller in diameter. The pulley ratios are set so that the motor will not be overloaded.

6. If motor requires replacement, a comparable one to the original with the same service factor and enclosure must be used.

7. If propeller shaft bearings need replacement, replace with bearings comparable to original equipment. For die formed type support housing install new bearings into neoprene rings, check correct position of propeller with orifice, position bearings in die formed recess and tighten set screws. Replace die formed bearing cap and tighten four bolts. **NOTE:** If locking collar type bearing is used, collar must first be positioned against inner race on bearing nearest propeller and turned in direction of propeller rotation with drift pin and hammer until it locks. Locking collars must be on inboard (facing) sides of the bearing. Secure bearing to shaft with set screw. Lock and secure other bearing to shaft in same manner.

### Installation of Fan without Housing or Crate

13. Remove the boards nailed across the front and back of the fan.

14. Provide a square opening in the wall of the building equal to the inside “C” dimension of the fan crate, see Figure 8. It is preferable to frame in the opening with 2 x 6 material, see Figure 7.

15. Attach the fan crate securely to the wall.

16. Close up all cracks or openings between the fan crate and the wall of the building. In case the fan is mounted outside of the building wall to operate as an exhaust fan, it is absolutely necessary to enclose all 4 sides of the fan crate in order for the fan to draw air out of the building.

17. Continue with Step 22.

#### Table: Fan Sizes and Dimensions

<table>
<thead>
<tr>
<th>FAN SIZE</th>
<th>NOMINAL DIMENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
</tr>
<tr>
<td>DC24</td>
<td>26 1/2*</td>
</tr>
<tr>
<td>DC30</td>
<td>32 1/2*</td>
</tr>
<tr>
<td>DC36</td>
<td>38 1/2*</td>
</tr>
<tr>
<td>DC42</td>
<td>44 1/2*</td>
</tr>
<tr>
<td>DC48</td>
<td>52 1/2*</td>
</tr>
<tr>
<td>DC54</td>
<td>58 1/2*</td>
</tr>
</tbody>
</table>

Figure 8

13. Remove the boards nailed across the front and back of the fan.

14. Provide a square opening in the wall of the building equal to the inside “C” dimension of the fan crate, see Figure 8. It is preferable to frame in the opening with 2 x 6 material, see Figure 7.

15. Attach the fan crate securely to the wall.

16. Close up all cracks or openings between the fan crate and the wall of the building. In case the fan is mounted outside of the building wall to operate as an exhaust fan, it is absolutely necessary to enclose all 4 sides of the fan crate in order for the fan to draw air out of the building.

17. Continue with Step 22.

#### Table: Fan Sizes and Dimensions

<table>
<thead>
<tr>
<th>FAN SIZE</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>24*</td>
<td>28*</td>
<td>18 1/8*</td>
</tr>
<tr>
<td>30*</td>
<td>34*</td>
<td>19 3/8*</td>
</tr>
<tr>
<td>36*</td>
<td>40*</td>
<td>17 5/8*</td>
</tr>
<tr>
<td>42*</td>
<td>46*</td>
<td>18 1/8*</td>
</tr>
<tr>
<td>48*</td>
<td>54*</td>
<td>19 1/8*</td>
</tr>
<tr>
<td>54*</td>
<td>60*</td>
<td>22 1/8*</td>
</tr>
</tbody>
</table>
SET SCREW TIGHTENING SCHEDULE
1. Before initial operation of the fan, tighten set screws according to the procedure outlined below.
2. After 500 operating hours or three months, whichever comes first, tighten set screws to the full recommended torque.
3. At least once a year, tighten set screws to the full recommended torque.

PROCEDURE FOR TIGHTENING SET SCREWS IN BEARINGS AND HUBS

One Set Screw Application
Using a torque wrench, tighten the set screw to the torque recommended in Table 1.

Two Set Screw Application
1. Using a torque wrench, tighten one set screw to half of the torque recommended in Table 1.
2. Tighten the second set screw to the full recommended torque.
3. Tighten the first set screw to the full recommended torque.

<table>
<thead>
<tr>
<th>Set Screw Diameter</th>
<th>Torque (in-lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10</td>
<td>35</td>
</tr>
<tr>
<td>1/4</td>
<td>80</td>
</tr>
<tr>
<td>5/16</td>
<td>126</td>
</tr>
<tr>
<td>3/8</td>
<td>240</td>
</tr>
<tr>
<td>7/16</td>
<td>384</td>
</tr>
<tr>
<td>1/2</td>
<td>744</td>
</tr>
<tr>
<td>9/16</td>
<td>1080</td>
</tr>
<tr>
<td>5/8</td>
<td>1500</td>
</tr>
<tr>
<td>3/4</td>
<td>2580</td>
</tr>
<tr>
<td>7/8</td>
<td>3600</td>
</tr>
<tr>
<td>1</td>
<td>5400</td>
</tr>
</tbody>
</table>

VARIABLE FREQUENCY DRIVES AND MOTORS
There are occasions when a Variable Frequency Drive (VFD) will cause poor motor performance and possible damage. To avoid these problems, the Company recommends the following:
1. Select compatible motor and VFD inverter; if possible, the motor and the inverter should be from the same manufacturer or at least the inverter selected should be recommended by the motor manufacturer.
2. A motor shaft grounding system should be used to prevent motor bearing damage from eddy currents.

NOTE: The Company will not honor motor warranty claims if the customer fails to follow these recommendations.

OPTIONAL SAFETY GUARDS
Extruded aluminum framed guards model BA for back (motor side) and model FA for front of fan. Constructed of \( \frac{3}{4} \times 1 \) mesh heavy gauge welded galvanized wire. Open on all sides for maximum air flow. Guards are shipped knocked down, easily assembled with connecting clips. Bolts to fan frame. Easily removed for servicing fan. Guards are optional but should be installed when fan is within reach of personnel.

CAUTION! Guards must be installed when fan is within reach of personnel or within eight (8) feet of working level or when deemed advisable for safety.

OPTIONAL GUARDS:
Model GD for WB wall housing
Model GS for WS wall housing
Guards are galvanized heavy gauge welded wire in aluminum frames.
### WHEN ORDERING REPLACEMENT PARTS - LIST MODEL, DESCRIPTION AND QUANTITY

<table>
<thead>
<tr>
<th>FAN MODELS</th>
<th>CODE</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
<th>CODE</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC24</td>
<td>1</td>
<td>Frame &amp; Orifice Assembly</td>
<td>1</td>
<td>9</td>
<td>Fan Shaft</td>
<td>1</td>
</tr>
<tr>
<td>DC30</td>
<td>2</td>
<td>Propeller</td>
<td>1</td>
<td>10</td>
<td>Motor</td>
<td>1</td>
</tr>
<tr>
<td>DC36</td>
<td>3</td>
<td>1/4&quot; Roll Pin</td>
<td>1</td>
<td>11</td>
<td>Motor Pulley</td>
<td>1</td>
</tr>
<tr>
<td>DC42</td>
<td>4</td>
<td>5/16&quot; - 18&quot; x 3/4&quot; Whizlock Bolt</td>
<td>8</td>
<td>12</td>
<td>Fan Pulley</td>
<td>1</td>
</tr>
<tr>
<td>DC48</td>
<td>5</td>
<td>Bearing Cap</td>
<td>1</td>
<td>13</td>
<td>Fan Belt</td>
<td>1</td>
</tr>
<tr>
<td>DC54</td>
<td>6</td>
<td>5/16&quot; - 18 Whizlock Nut</td>
<td>8</td>
<td>14</td>
<td>3/16&quot; x 1&quot; Key</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Rubber Ring W/Staple</td>
<td>2</td>
<td>15</td>
<td>Square Key 1/4&quot; x 1/4&quot; x 1 1/4&quot;</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>1&quot; Bearings</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Recommended spare parts*
ACCEPTANCE. All orders and sales are subject to written approval and acceptance by an authorized officer of ACME ENGINEERING AND MANUFACTURING CORPORATION at Muskogee, Oklahoma, (the “Company”) and are not binding on the Company until so approved.

DELIVERY. All shipping and delivery dates are estimates and are made in good faith. Transportation costs and freight shall be borne by the Company to the point of shipment and the risk of loss or damage thereafter shall be borne by the Purchaser. The Company shall not be liable for delay due to causes beyond its control, including acts of God, acts of the purchaser, acts of civil or military authorities, priorities, fires, strikes, floods, epidemics, war, riot, transportation, and car shortages, and inability, due to reasons beyond its reasonable control, to obtain necessary labor, material, or manufacturing facilities. In the event of such a delay, the date of delivery shall be extended for a period equal to the time lost by reason of the delay.

TERMS OF PAYMENT. If, in the judgment of the Company, the financial condition of the Purchaser at any time does not justify continuation of manufacture or shipment on the terms of payment specified, the Company may require full or partial payment in advance.

SALES AND SIMILAR TAXES. The Company’s prices do not include the furnishing of technical advice or assistance, as may be required to meet the requirements of the Purchaser, and the Purchaser shall pay all present or future sales, use, excise, or other similar taxes applicable to the sale of the product herein referred to, and of any shipments or deliveries.

DISCLAIMER. All statements or representations made by the Company or any person acting for or on behalf of the Company, whether by word of mouth, advertisement, written or printed material, including all catalogs, brochures, and any sales literature, whether furnished in person or by mail or phone, shall be subject to change by the Company without notice.

WARRANTY AND DISCLAIMER: the Company extends this limited warranty to the original purchaser and warrants that products supplied by the Company shall be free from original defects in workmanship and materials for two years from the date of shipment (except for the warranty periods noted for products listed below). This warranty shall be null and void if the defective product has been tampered with, operated, altered, repaired or altered in any way so as to affect the performance, flow, reliability or life of the equipment, product or system. The company shall not be liable for any special, direct, indirect, or consequential damages or losses, including but not limited to, loss of profits or any incidental, special, or consequential damages which arise out of the use of the purchased products, including the products listed below.

LIMITED WARRANTY: The Company’s maximum liability is limited to the terms of the warranty and is subject to the following limitations.

The following products are warranted to be free of defects in materials and workmanship for a period of two years from the date of shipment provided same have been properly handled, stored, installed, serviced, maintained and operated. This warranty shall not apply to products which have been tampered with, operated, altered, repaired or altered in any way so as to affect the performance, flow, reliability or life of the equipment, product or system. The company shall not be liable for any special, direct, indirect, or consequential damages or losses, including but not limited to, loss of profits or any incidental, special, or consequential damages which arise out of the use of the purchased products, including the products listed below.

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 part or product.

The warranties set forth above do not apply to any components, accessories, parts or attachments manufactured by others, which are supplied by the Company to the Purchaser and any other persons.

The Company’s maximum liability is limited to the terms of the warranty and is subject to the following limitations.

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 part or product.

The Company is not responsible for any claims in any way relating to or arising out of the products, including, but not limited to, any cause of action arising in contract, tort, or strict liability, shall not exceed the total amount of the purchase price paid for the product or part which is subject to the manufacturer’s warranty, if any. To the extent not prohibited by applicable law, the Company’s warranty is limited to the repair or replacement of any product or part to or from the Company’s plant, or the installation of the repaired or replaced part or product. The Company shall not be liable for replacing, replacing or repairing any part or product purchased from or through the Company or any other person, including the Company, or any end user’s installation or use of the products. Any such claims or demands brought by the Purchaser or such other persons.

The Company’s maximum liability is limited to the purchase price paid for the product or part which is subject to the manufacturer’s warranty, if any. To the extent not prohibited by applicable law, the Company’s warranty is limited to the repair or replacement of any product or part to or from the Company’s plant, or the installation of the repaired or replaced part or product. The Company shall not be liable for replacing, replacing or repairing any part or product purchased from or through the Company or any other person, including the Company, or any end user’s installation or use of the products. Any such claims or demands brought by the Purchaser or such other persons.

The Company’s maximum liability is limited to the purchase price paid for the product or part which is subject to the manufacturer’s warranty, if any. To the extent not prohibited by applicable law, the Company’s warranty is limited to the repair or replacement of any product or part to or from the Company’s plant, or the installation of the repaired or replaced part or product. The Company shall not be liable for replacing, replacing or repairing any part or product purchased from or through the Company or any other person, including the Company, or any end user’s installation or use of the products. Any such claims or demands brought by the Purchaser or such other persons.

The Company’s maximum liability is limited to the purchase price paid for the product or part which is subject to the manufacturer’s warranty, if any. To the extent not prohibited by applicable law, the Company’s warranty is limited to the repair or replacement of any product or part to or from the Company’s plant, or the installation of the repaired or replaced part or product. The Company shall not be liable for replacing, replacing or repairing any part or product purchased from or through the Company or any other person, including the Company, or any end user’s installation or use of the products. Any such claims or demands brought by the Purchaser or such other persons.