

Part Number	410563
Bulletin	1164
Effective	8/1/98

# INSTALLATION AND OPERATION MANUAL FOR ROOF EXHAUST FANS

THIS MANUAL IS FOR THE INSTALLATION,  
OPERATION AND MAINTENANCE OF ALL  
CALDWELL MODEL RFR24-\_\_\_\_\_ ROOF EXHAUST FANS  
WITH SERIAL NUMBERS 98H \_\_\_\_\_ AND UP

## NOTICE

READ MANUAL THOROUGHLY BEFORE INSTALLING OR OPERATING FAN.  
KEEP THIS MANUAL IN A LOCATION FOR QUICK ACCESS AND REFERENCE.



A DIVISION OF CHIEF INDUSTRIES, INC.

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## CALDWELL ROOF EXHAUST FAN INSTALLATION AND OPERATION MANUAL

THIS MANUAL IS FOR THE INSTALLATION, OPERATION AND MAINTENANCE OF ALL ROOF EXHAUST FANS WITH SERIAL NUMBER 98H\_\_\_\_\_ AND UP. READ MANUAL THOROUGHLY BEFORE INSTALLING OR OPERATING THE FAN. KEEP THIS MANUAL IN A LOCATION FOR QUICK ACCESS AND REFERENCE.

### SPECIAL SERVICE NOTICE

If you are unable to remedy any service problem after thoroughly studying this manual, contact the dealer from whom you purchased the unit. OUR DEALER IS YOUR FIRST LINE OF SERVICE. GIVE HIM THE INFORMATION REQUESTED BELOW AND EXPLAIN YOUR PROBLEM. If he is unable to correct the problem, refer to the factory. When calling the factory for service, ask for the Customer Service Department. Give the information requested below and explain your problem. If adequate information relating to the problem is given, the Service Department should be able to pinpoint the problem and suggest an immediate solution. CHIEF INDUSTRIES, INC., AGRI/INDUSTRIAL DIVISION SERVICE POLICY IS INCLUDED AT THE END OF THE MANUAL.

- \*1. Fan Model Number \_\_\_\_\_
- \*2. Fan Serial Number \_\_\_\_\_
- 3. Bin Diameter \_\_\_\_\_
- 4. Grain Type \_\_\_\_\_
- 5. Grain Depth \_\_\_\_\_
- 6. Line Voltage (Measured) \_\_\_\_\_
- \*7. Dealer Purchased From \_\_\_\_\_
- \*8. Date Purchased \_\_\_\_\_

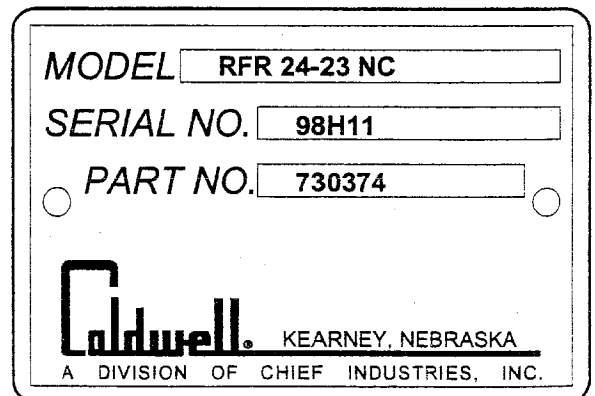


Figure 1. Typical Serial Number Plate

THE ABOVE INFORMATION MUST BE AVAILABLE BEFORE CONTACTING THE DEALER OR FACTORY FOR SERVICE. ASTERISKED (\*) ITEMS SHOULD BE FILLED IN AT DATE OF PURCHASE.

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## PACKING LIST

The shipment should contain the following items. Check carefully when unpacking and before installing. In case of any shortage, contact your dealer. In case of damage during shipment, file a claim with the carrier.

<u>QUANTITY</u>	<u>DESCRIPTION</u>
1	24" Roof Fan Package
Consisting of:	
1	Warranty Card
1	Authorized Service Center Bulletin (motor)
1	Roof Adaptor
1	Fan Assembly
1	Rainhood
1	Bottom Flange
1	Fan Support
1	Angle Brace
1	Rainhood Screen
1	Sealant Rope
1	Bolt Bag Assembly (w/ Installation Bulletin 1164)

**NOTE:** BEFORE STARTING THE ASSEMBLY AND INSTALLATION OF THE ROOF FAN, CHECK TO SEE THAT ALL ITEMS CALLED OUT ON THE PACKING LIST HAVE BEEN RECEIVED.

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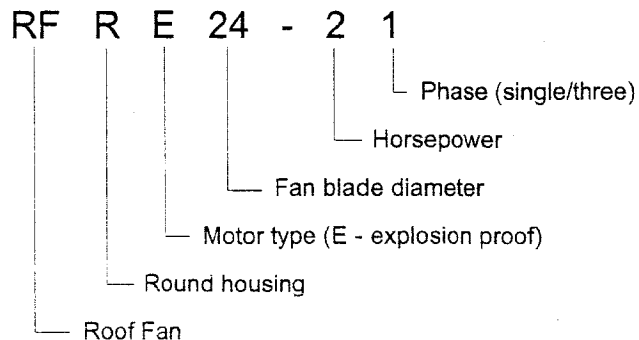
TABLE 1. FAN MODEL SPECIFICATIONS FOR ROOF FANS

FAN MODEL NUMBER	FAN HP	MOTOR PHASE & VOLTAGE	MOTOR TYPE	R.P.M.	BLADE DIAMETER	UNIT AMPERAGE (MAXIMUM)
RFR24-21 NC	2	Single - 115/230V	TEAO	1750	24"	23 / 11.5
RFR24-23 NC	2	Three - 230/460V	TEAO	1750	24"	8.2 / 4.1
RFR24-23NC-575	2	Three - 575V	TEAO	1750	24"	3.72
RFRE24-21 NC	2	Single - 115/230V	EX PRF	1750	24"	22 / 11
RFRE24-23 NC	2	Three - 230/460V	EX PRF	1750	24"	8.2 / 4.1
RFRE24-23NC-575	2	Three - 575V	EX PRF	1750	24"	3.72

NOTE: A) Motors rated as explosion proof (EX PRF) meet Class II Group F & G of the National Electric Code (NEC).

B) Model designation:

Example:



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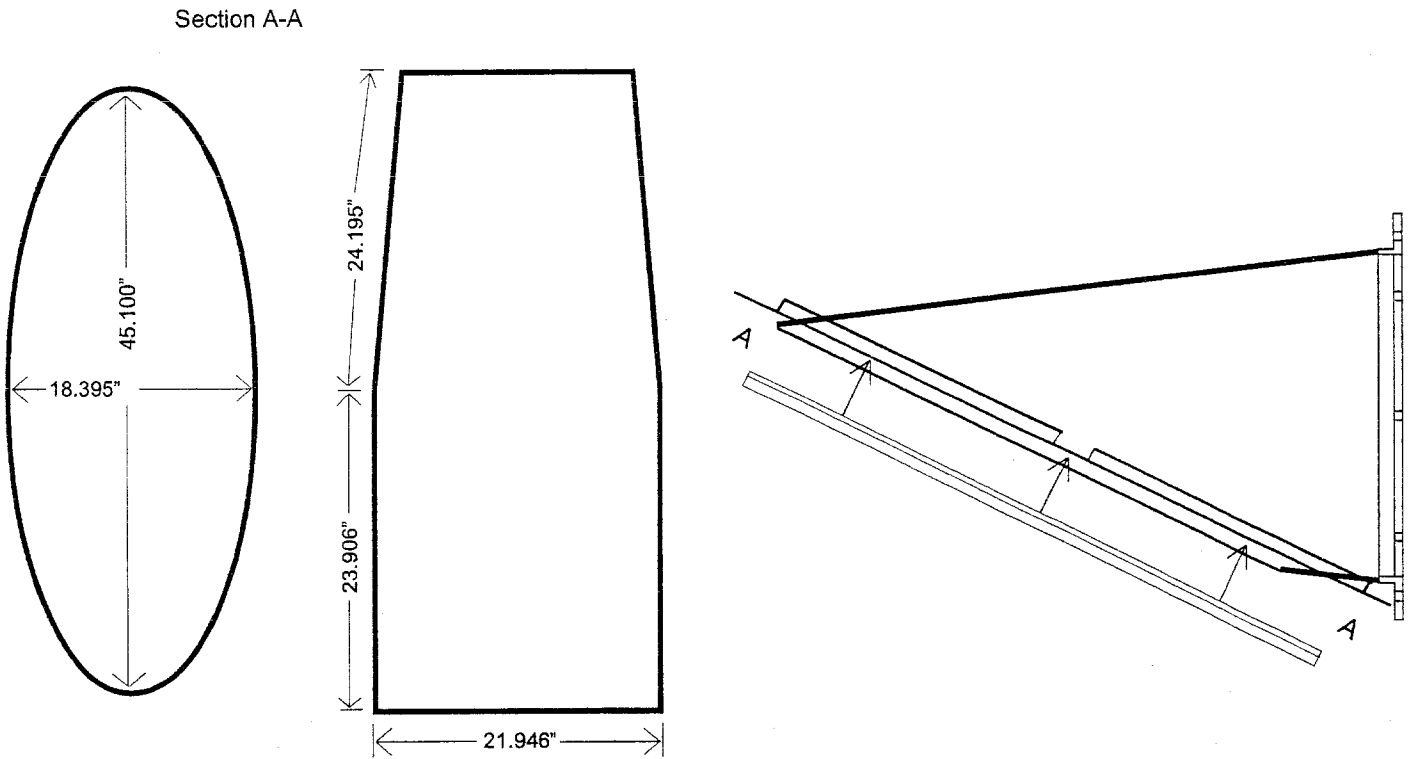


Figure 2. RFR24 Mounting Flange and Open Area Illustration



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## INSTALLATION INSTRUCTIONS

The Caldwell roof fans are designed to mount on structures with sloping roofs (minimum angle of 25 degrees) and with a flat roof surface at least as large as illustrated in Figure 2 on Page 8. The fans will mount between the ribs of standard tapered roof sheets on round steel bins without cutting the ribs, which keeps the strength of the roof sheet intact.

The RFR24 roof fan is shipped with the roof adaptor and rainhood components and is designed to mount on roof slopes from 25 to 35 degrees.

### INSTALLATION OF ROOF FAN

#### A. Location

The roof fans should be equally spaced on the bin roof circumference. When installed, the roof fan should be positioned as far up the roof slope as the tapered ribs of the bin roof sheet will allow. The roof fan location should be selected to provide a rigid mounting of the fan. For bins with an inner roof structure, the roof fan should be anchored to the inner roof structure.

#### B. Mounting of Fan

The roof fan can be installed in the bin roof sheet before assembling the roof or after the roof is assembled. NOTE that the fan is secured by bolts that must be fastened from the inside of the bin roof and, therefore, the assembly should be made before the sidewalls are erected. Fan parts are illustrated and labeled in Figure 9 and Table 2 on Page 12, and should be referred to when assembling the unit.

Step 1: Using the loose flange from the fan assembly as a template, position the desired roof fan location, allowing for 1/4" between the roof sheet rib and the flange and mark the 18 - 3/8" mounting holes and elliptical fan mounting hole. From point A (bottom of ellipse) to bottom of roof sheet, there must be at least 28" of clearance. (See Figure 3.)

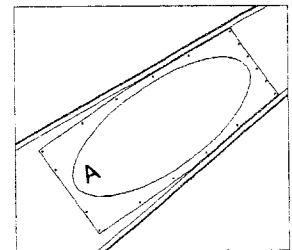


Figure 3. RFR24 Template Location

Step 2: Drill the 18 - 3/8" holes and cut out the elliptical hole.

Step 3: Use the sealant rope supplied and apply along the inside edge of the drilled holes on the bin roof sheet.

(See Figure 4.)

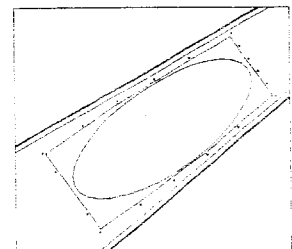


Figure 4. RFR24 Caulking Location

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Step 4: Place the roof fan adaptor into the elliptical hole from the outside of the roof sheet inward. On the side of the roof sheet that will be inside the bin, position the loose mounting flange over the fan adaptor. Using the 18 - 5/16" x 3/4" bin bolts with the neoprene washer head to the outside of the bin, secure roof fan adaptor and flange with the 5/16" nuts provided.  
(See Figure 5.)

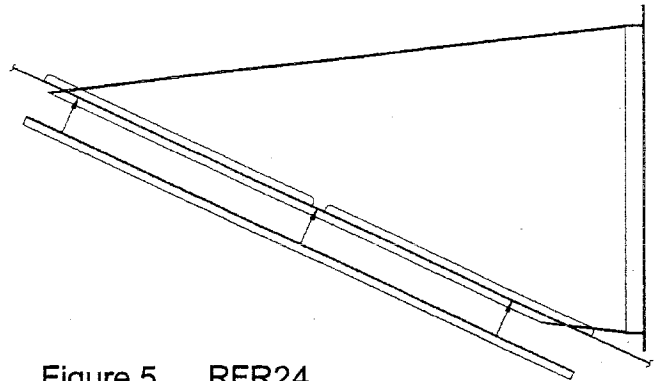


Figure 5. RFR24  
Roof Adaptor  
Installation

Step 5: Place sealant rope around the angle ring on the roof adaptor. Then align the motor housing holes up with the adaptor housing. Using the 8 - 5/16" x 3/4" bin bolts, secure the motor housing with the roof adaptor using 5/16" nuts provided.  
(See Figure 6.)

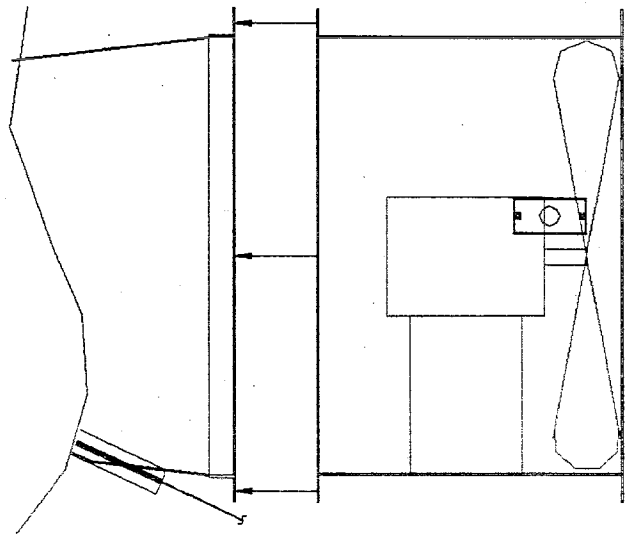


Figure 6. RFR24  
Fan Housing  
Installation

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Step 6: Align the rainhood as shown and bolt the rainhood to the fan housing using the upper 5 holes with the 5/16" x 3/4" bin bolts and nuts. Now align the fan support bracket as shown and bolt through the final 3 holes in the rainhood through the fan housing and then to the support bracket, using three 5/16" x 1-1/4" bin bolts, nuts and 6 flat washers. Place one washer each at the head and at the nut end of each bolt. (See Figure 7.)

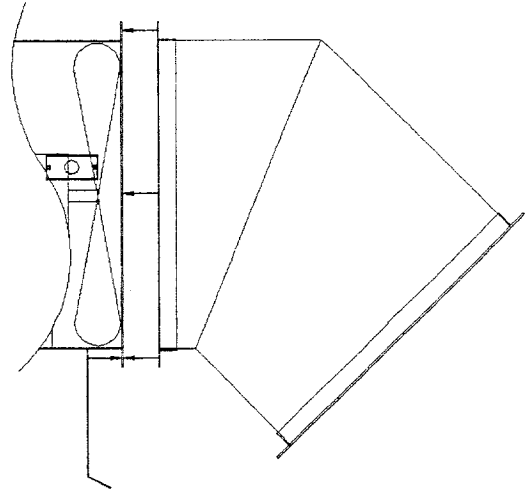


Figure 7. RFR24 Rainhood & Fan Support Installation

Step 7: **OPTION 1 (Preferred Method)**  
If applicable, bolt angle brace to the support as shown in Figure 8-①. Then field drill angle through sheet rib and bolt together. Field drill the 3 holes in the fan support and, using three 5/16" x 3/4" bin bolts with the neoprene washer head to the outside of the bin, secure the support to the bin sheet.

**OPTION 2 (Optional Method)**  
If unable to bolt to support as shown in Figure 8-①, field drill 3 holes in the roof sheet to match pre-drilled holes in the fan support. Using three 5/16" x 3/4" bin bolts with neoprene washer head to the outside of the bin, bolt angle to support from underneath roof sheet. (See Figure 8-②.)

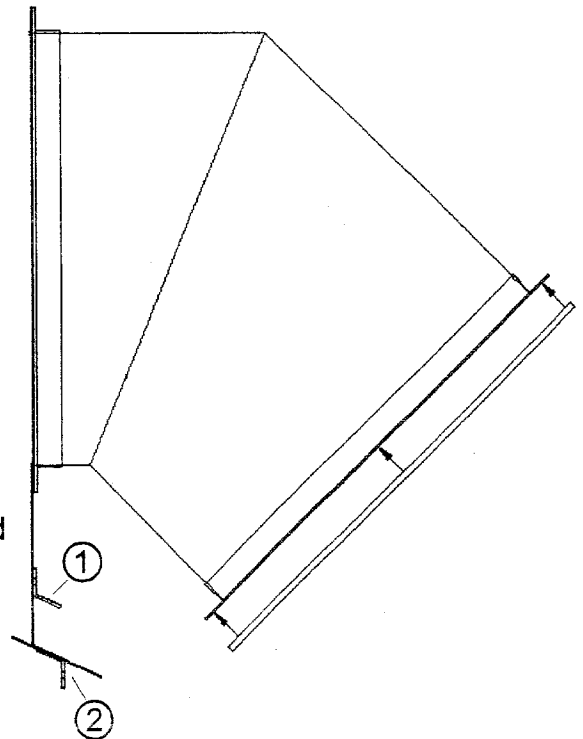


Figure 8. RFR24 Screen Guard Installation

Step 8: Align the screen guard with the holes in the rainhood and bolt together using the 1/4" x 3/4" bin bolt and nut. (See Figure 8.)

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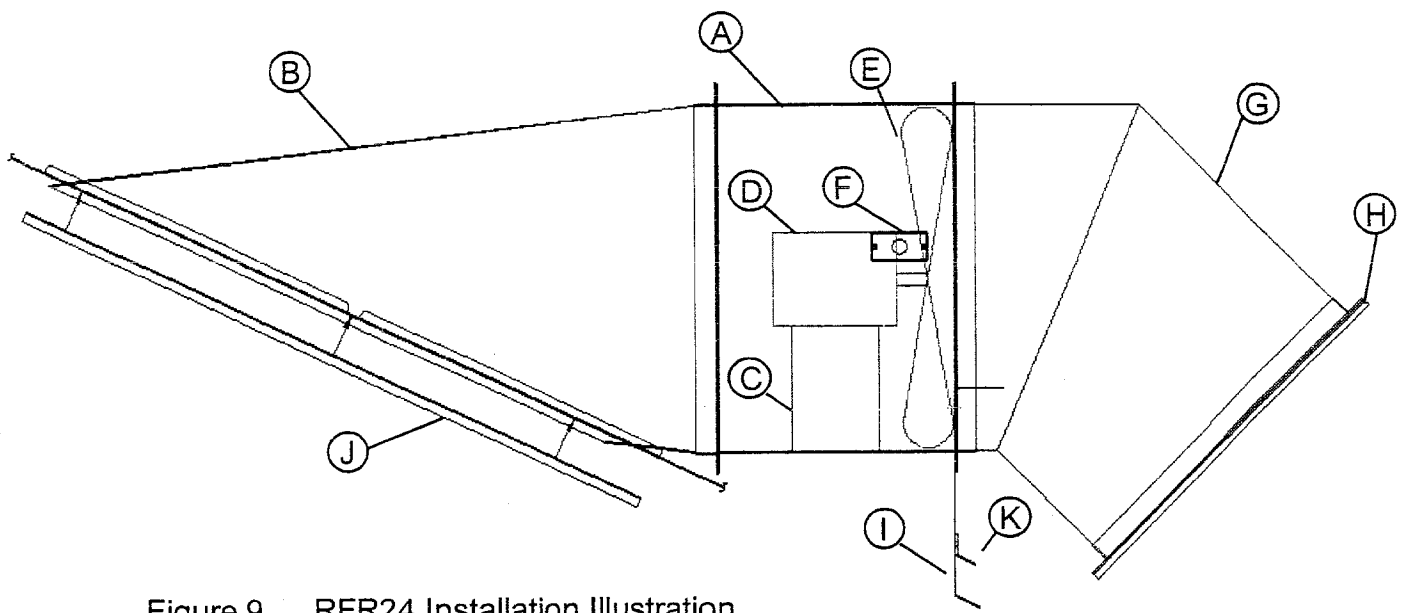


Figure 9. RFR24 Installation Illustration and Parts Breakdown

TABLE 2. RFR24 PARTS BREAKDOWN PER FIGURE 9

FAN MODEL	FAN HOUSING	ADAPTOR	MOTOR MOUNT	MOTOR	FAN BLADE	CONDUIT BOX	RAINHOOD	SCREEN	FAN SUPPORT	BOTTOM FLANGE	ANGLE BRACE
	A	B	C	D	E	F	G	H	I	J	K
RFR24-21NC	254201	410647	141153	784173	783472	410589	410621	777516	410597	410555	102045
RFR24-23NC	254201	410647	141153	783522	783472	410589	410621	777516	410597	410555	102045
RFR24-23NC 575V	254201	410647	141153	783605	783472	410589	410621	777516	410597	410555	102045
RFRE24-21NC	254201	410647	141153	784181	783480	410589	410621	777516	410597	410555	102045
RFRE24-23NC	254201	410647	141153	784199	783472	410589	410621	777516	410597	410555	102045
RFRE24-23NC 575V	254201	410647	141153	783936	783472	410589	410621	777516	410597	410555	102045

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## ELECTRICAL INSTALLATION OF THE- FAN

### A. General Instructions

The electrical installation must be performed by a certified electrician, in accordance with the appropriate national and local electrical codes.

**[!] CAUTION: ANY VIOLATION OF ELECTRICAL WIRING CODES COULD JEOPARDIZE THE CALDWELL STANDARD LIMITED WARRANTY.**

### B. Electrical Service Installation

Check the type of electrical service present, and make sure the fan to be wired is manufactured to operate on the electrical service. Table 1 on Page 7 titled "Fan Model Specifications for Roof Fans" indicates the electrical service the fan is designed to utilize in the column labeled "Motor Phase and Voltage." The electrical service must match this specification.

The components to connect the electrical service to the fan need to be sized for the electrical service present. Tables 3, 4, 5 and 6 located on page 16 illustrate the sizing information for single phase 230 Volt, three phase 230 Volt, 460 Volt & 575 Volt respectively. Use the appropriate information and size the following electrical service components:

#### 1. Transformer

The transformer size for the fan only, is indicated in a KVA rating. Example: for an RFR24-21 fan, Table 3 would be used. The KVA rating for the 2 HP motor is 3.5 KVA. This KVA rating is for the fan only. Your electrician will need to add the KVA requirements for the other electrical components of the system in sizing the transformer.

#### 2. Fan Disconnect

A disconnect for the fan needs to be sized to handle the recommended fuse size. Example: for an RFR24-21 fan, Table 3 would be used, and the fuse size is 30 Amp. Install the fuse recommended in the disconnect. NOTE that a circuit breaker can be used, however, the circuit breaker or any fuse used must be a time delay type to allow the initial starting in-rush current to the fan.

#### 3. Conductor Size for the Fan Disconnect to Fan Wiring

The conductor size for the fan needs to be sized according to the distance between the fan and disconnect. Example: For an RFR24-21 fan located 200' from the disconnect, use Table 3 to determine the conductor size to be a 14 AWG. The proper sized wiring must be used to make sure a voltage drop is not developed.

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#### 4. Fan Motor Controller

Size a fan motor controller according to the motor ratings for location at a convenient control location as follows:

- a. Motors with internal overload protection will require a magnetic contactor to control fan operation.
- b. Motors without overload protection will require a magnetic starter with overload protection to control fan operation.

#### C. Electrical Connection at the Fan

The electrical wiring of the fan is made directly at the motor as follows:

1. Single Phase -- A 3-wire system should be provided for fans to be operated on single phase power. The three wires consist of the two current conductors and a ground. The current carrying conductors are wired per the diagram on the motor. The ground is secured to the fan junction box. On 2 HP explosion proof motors, thermostat wires are provided with the motor and must be connected to the fan motor magnetic controls.
2. Three Phase -- A 4-wire system should be provided for fans to be operated on three phase power. The four wires consist of three current carrying conductors and a ground. The current carrying conductors are wired per the diagram on the motor. The ground is secured to the fan junction box. On 2 HP explosion proof motors, thermostat wires are provided with the motor and must be connected to the fan motor magnetic controls.

**NOTE:** When installing electrical service for explosion proof motors, make sure all conduit and connectors exposed to the conditions of the motor are rated for the Class II Group F and G location of the motor.

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## INSTALLATION CHECK

When the fan is completely assembled and wired, the unit will need to be checked for proper rotation. Turn fan blade by hand to make sure blade does not hit fan housing. If needed, adjust motor so blade no longer contacts fan housing. Provide power to the fan controls and start the fan momentarily. Make sure that the fan blade rotates to exhaust air from the bin. If the blade is rotating the wrong direction, have your electrician correct as follows:

### A. Single Phase System

With the power OFF at the fan disconnect, the motor lead wires at the fan motor will need to be changed as indicated on the motor to reverse the blade rotation. The unit will then need to be rechecked for proper rotation.

### B. Three Phase System

With the power OFF at the fan disconnect, exchange the location of the current carrying conductors at terminal L1 and L3 of the magnetic controls as illustrated in Figure 10. The unit will then need to be rechecked for proper rotation.

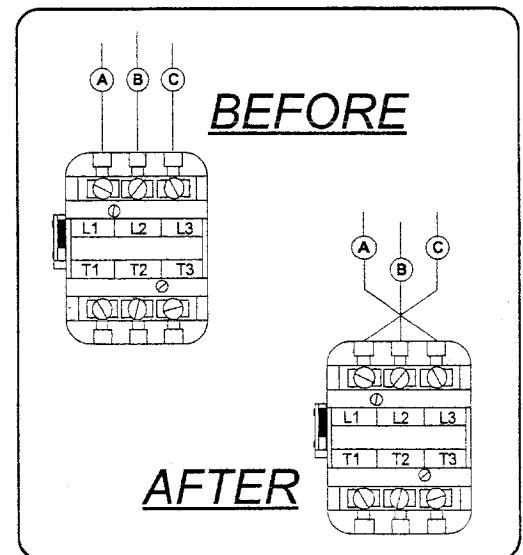


Figure 10. Correcting Fan Rotation  
Three Phase

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**TABLE 3. ELECTRICAL SERVICE FOR SINGLE PHASE OPERATION 230 VOLT**

MOTOR H.P. RANGE	TRANSFORMER SIZE (NOTE B) (MINIMUM)	COPPER WIRE SIZE FOR DISTANCE -- MOTOR TO DISCONNECT IN FT UP TO				FUSETRON OR EQUIVALENT TIME DELAY FUSE AMP
		0' - 50'	100'	200'	300'	
2.0	3.5 KVA	12	10	6	5	30

**TABLE 4. ELECTRICAL SERVICE FOR THREE PHASE OPERATION 230 VOLT**

MOTOR H.P. RANGE	TRANSFORMER SIZE (NOTE B) (MINIMUM)	COPPER WIRE SIZE FOR DISTANCE -- MOTOR TO DISCONNECT IN FT UP TO				FUSETRON OR EQUIVALENT TIME DELAY FUSE AMP
		0' - 50'	100'	200'	300'	
2.0	3.5 KVA	14	12	10	8	15

**TABLE 5. ELECTRICAL SERVICE FOR THREE PHASE OPERATION 460 VOLT**

MOTOR H.P. RANGE	TRANSFORMER SIZE (NOTE B) (MINIMUM)	COPPER WIRE SIZE FOR DISTANCE -- MOTOR TO DISCONNECT IN FT UP TO				FUSETRON OR EQUIVALENT TIME DELAY FUSE AMP
		0' - 50'	100'	200'	300'	
2.0	3.5 KVA	14	14	12	12	10

**TABLE 6. ELECTRICAL SERVICE FOR THREE PHASE OPERATION 575 VOLT**

MOTOR H.P. RANGE	TRANSFORMER SIZE (NOTE B) (MINIMUM)	COPPER WIRE SIZE FOR DISTANCE -- MOTOR TO DISCONNECT IN FT UP TO				FUSETRON OR EQUIVALENT TIME DELAY FUSE AMP
		0' - 50'	100'	200'	300'	
2.0	575 V	14	14	12	12	10

NOTE A: Always check current local, state, and national codes on electrical requirements before installing any electrical equipment.

NOTE B: Transformer size is based on the current draw from the fan only. Your electrician will need to add the KVA requirements for the other components of the system in sizing the transformer.

NOTE C: Copper wire (rated 75 degrees C) is sized for the fan service. The wire size from the transformer to the disconnect service will be determined from the fan and the other electrical equipment requirements.



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## SAFETY

In order to operate the roof exhaust fan safely, a complete understanding of the potential hazards present and the meaning of the warning decals is needed.

### GENERAL INFORMATION

A. The unit utilizes electricity as the source of energy. When the power is installed properly and protective covers are in place, the unit poses no direct hazard.

[!] WHEN INSTALLING OR SERVICING THE ELECTRICAL COMPONENTS, ALWAYS SHUT THE POWER OFF AT THE FAN DISCONNECT AND LOCK THE FAN DISCONNECT IN THE "OFF" POSITION, SO NO POWER CAN BE DELIVERED TO THE FAN WHILE YOU ARE SERVICING THE UNIT.

B. The unit, when operating, has a fan blade turning at high speed and, when guarded, poses no direct hazard.

[!] MAKE SURE THE LOUVER OR RAINHOOD IS SECURELY FASTENED IN PLACE.

[!] WHEN SERVICING THE FAN BLADE, MAKE SURE THE ELECTRICAL POWER IS SHUT OFF AT THE FAN DISCONNECT AND LOCK THE FAN DISCONNECT IN THE "OFF" POSITION.

### SAFETY DECALS LOCATED ON THE FAN

A. [!] Voltage

A voltage decal is included with the fan to be located on the fan indicating the presence of electrical power at the particular voltage of the unit. On single phase units a 230 Volt decal is already located on the fan. For three phase units locate the proper decal 230 Volt or 460 Volt at the conduit inlet.

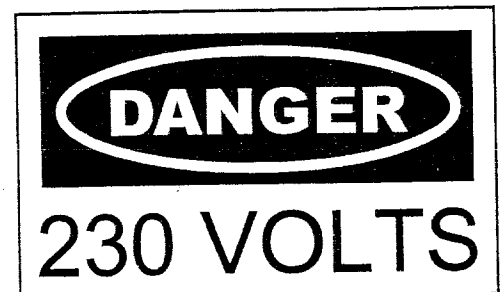


Figure 11. Typical Voltage Decal

B. [!] Disconnecting Power before Contacting Motor Wiring Connection

A caution decal on the fan indicates that the power must be disconnected before contacting the motor wiring connection.

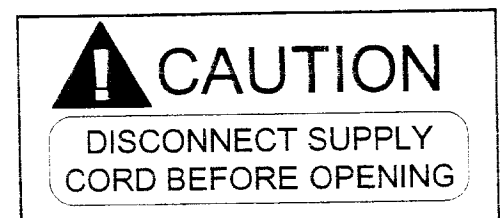


Figure 12. Disconnecting Power to the Fan (Decal)


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C. [!] Roof Vents Required

This decal is supplied loose with the fan, to be field installed at the location of the control enclosure to remind the operator to provide sufficient bin vents or fans, and make sure they are open or operational before starting the supply fans. The vents are necessary to provide an exhaust for moisture laden air (to reduce condensation), and to prevent pressurization of the bin above the grain mass causing added load on the bin.

[!] DO NOT OPERATE THE FANS WHEN CONDITIONS ARE SUCH THAT FREEZING OF THE VENTS COULD OCCUR.

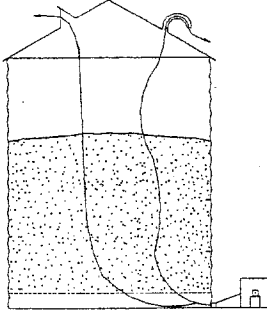
[!] HEED THE FOLLOWING WARNING [!]



# WARNING

TO PREVENT EXCESSIVE PRESSURE ON THE STRUCTURE:

- (1) MAKE SURE ALL ROOF VENTS ARE OPEN AND UNOBSTRUCTED.
- (2) IF USING ROOF EXHAUST FANS; WIRE ROOF AND SUPPLY FANS TO START SIMULTANEOUSLY OR MAKE SURE ROOF FANS ARE STARTED WHEN SUPPLY FANS ARE STARTED.
- (3) DO NOT OPERATE YOUR AERATION SYSTEM WHEN CONDITIONS EXIST THAT MAY CAUSE ROOF VENT ICING.



**CHART (A)**

BIN VENT	CFM
CBBV-16	2100
1.75 CHBV	2670
CBBV-19	3000

DETERMINE THE AIR FLOW FROM FAN PERFORMANCE CHARTS AND PROVIDE VENTS ACCORDING TO CHART (A).

CONSULT YOUR CALDWELL EQUIPMENT DEALER FOR AID IN SIZING POWER EXHAUST FANS AND/OR ROOF VENTS.

Figure 13. Roof Vent Requirement

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## OPERATING INSTRUCTIONS

### PRELIMINARY TO STARTING THE FAN

When the fan is to be started for the first time, the following checks should be made prior to starting the fan.

- A. With the power OFF, rotate the fan blade to make sure it revolves easily and does not rub on the fan tube.
- B. Check all the fasteners to make sure they are tight. If any are loose, check for proper clearance and retighten fasteners.
- C. With the power OFF, check all electrical connections to make sure they are tight. Inspect the current carrying wires to make sure they are not grounded. Make sure that the fan and disconnect are grounded. Make sure that all control enclosure covers and access doors are secured in place.
- D. Refer to the wiring diagram on the motor, and make sure the motor is wired correctly.

### STARTING THE FAN

The roof exhaust fans should be operated any time the supply fans are operated to remove air from the attic space above the grain. In addition, the roof fans can be operated independent of the supply fans to provide ventilation of the attic space. The operation of the roof fans by themselves requires that vents be used in the roof to provide an open area as follows:

RFR24 fan . . . . . 10 square feet per fan

**[!] WARNING: ROOF EXHAUST FANS AND SUPPLY FANS SHOULD NOT BE OPERATED WHEN CONDITIONS ARE SUCH THAT FREEZING OF THE VENTS OR EXHAUST FANS COULD OCCUR. (SEE PAGE 18)**

### SHUTTING THE FAN OFF

When shutting the fan down for the season, shut off the power at the fan disconnect rather than at the fan controls to provide additional protection from unauthorized personnel operating the fan and potential damage to the fan from a lightning strike.

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## MAINTENANCE

### FAN OPERATION IN OFF SEASON

During the off season, the fan blade should be allowed to turn freely. Also, during the off season, OPERATE THE FAN FOR APPROXIMATELY 30 MINUTES EVERY THREE WEEKS. The operation of the fan keeps the lubricant more evenly distributed within the bearing cavity and dries out any condensation that could be in the motor.

### FAN FLADE CLEANLINESS

Once a year, or if vibration develops, clean the fan blade so the unit runs smoothly. Also check the fan to make sure it is mounted properly.

## FAN SERVICE

When servicing the fan, switch power OFF at the fan disconnect switch. Activate power only when a check is made. The following items will help you to pin-point a possible malfunction of the fan unit and explain the corrective action to take.

**[!] CAUTION: BE CAREFUL WHEN WORKING WITH ELECTRICITY.  
USE A VOLTMETER TO MAKE THE NECESSARY CHECK.**

### SYMPTOM: TURN ON MOTOR CONTROLLER AND NOTHING HAPPENS.

- A. Make sure the power is available to the fan unit.
- B. Check the motor thermostat (if present) to determine if the thermostat is open or closed. (If the thermostat is open, take the motor to your local authorized service center.) When checking the thermostat, make sure the motor has time to cool, if hot.
- C. If power is available to the motor and the motor does not run, remove the motor and take it to an authorized motor service center for repair or replacement.

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SYMPTOM: THE FAN JUST HUMS WHEN TURNED ON.

- A. Check to make sure that all leads of your power source have voltage present. If fan unit is not receiving power on all leads, check for a blown fuse, broken wire, or loose connection.
- B. Check to see that all contact sets are closing. If one leg of the supply voltage is not available to motor, the motor will hum.
- C. If power is available at all motor leads and the motor still hums, the motor should be taken to an authorized service center for repair or replacement.

SYMPTOM: THE FAN STARTS AND OPERATES FOR AWHILE AND THEN SHUTS OFF.

- A. Check the supply voltage. Voltage should be within +/- 10% of rated voltage. For example a motor rated at 230 Volt should operate in a voltage range of 207 to 253 Volt.
- B. Check the supply wire size required for the fan unit, page 16.
- C. Check the load on the main circuit to make sure other items or the main circuit are not overloading the fan circuit.
- D. Check the amperage of the fan. If the unit is pulling above nameplate amperage, take the motor to an authorized service center.

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**PRODUCT SERVICE:** Our top priority is to assure customer satisfaction on all Caldwell products. If a dealer requires assistance from Chief, contact our Service Department. The dealer purchasing a product from Chief Industries, Inc., Agri/Industrial Division will be responsible for the installation, operation and service, in accordance with the Service Policy shown below. The dealer will also be responsible for all Standard Limited Warranty procedures in accordance with Chief Industries, Inc., Agri/Industrial Division.

## **WARRANTY/SERVICE POLICY**

**STANDARD LIMITED WARRANTY:** *DEALERS HAVE THE RESPONSIBILITY OF CALLING TO THE ATTENTION OF THEIR CUSTOMER THE FOLLOWING LIMITED WARRANTY, PRIOR TO ACCEPTANCE OF AN ORDER FROM THE CUSTOMER FOR ANY CHIEF INDUSTRIES, INC., AGR/INDUSTRIAL DIVISION PRODUCTS.*

Chief Industries warrants to the purchaser for use that is any part of the product is proven to be defective in material or workmanship within **2 years** from date of original invoice from factory, and Chief Industries is notified within 15 days after such defect is discovered, Chief will (at company option) either replace or repair said part. This standard limited warranty does not apply to damage resulting from misuse, neglect, material wear, accident or improper installation or maintenance. Said part will not be considered defective if it substantially fulfills performance specifications. ***THE FOREGOING LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR PURPOSE AND OF ANY OTHER TYPE, WHETHER EXPRESSED OR IMPLIED.*** Chief Industries neither assumes nor authorizes anyone to assume for it any other obligation or liability in connection with said part and will not be liable for incidental or consequential damages. ***THE REMEDIES STATED HEREIN SHALL BE THE EXCLUSIVE REMEDIES AVAILABLE UNDER THIS STANDARD LIMITED WARRANTY. CLAIMS UNDER THIS STANDARD LIMITED WARRANTY SHALL BE HANDLED UNDER THE STANDARD SERVICE POLICY.*** Chief will not be responsible for any charges incurred in repairing or servicing any Caldwell products except as such repairs are made at Chief or by Chief Field Service Personnel or as approved in writing from Chief Customer Service.

**IN WARRANTY REPLACEMENT:** The Standard Limited Warranty Policy will cover any defective part of the product covered by the Standard Limited Warranty. Equipment involved in a warranty claim under the above Standard Limited Warranty shall have the ORIGINAL WARRANTY REGISTRATION CARD on file in Kearney, Nebraska, and have been properly installed, maintained and operated according to the instructions provided by Chief Industries, Inc., Agri/Industrial Division.

**WARRANTY CLAIM PROCEDURES:** When a part failure occurs, that in your judgment meets the conditions of the above Standard Limited Warranty, contact your dealer to make arrangements for the shipment of a replacement item and the return of the defective equipment.

**ELECTRIC MOTOR WARRANTY:** The manufacturers of all electric motors used on Caldwell products carry a warranty for these items. If the motor fails under the conditions of the Standard Limited Warranty, and provided it was protected by the proper protective device, the motor manufacturer's nearest authorized service center will repair it. See catalog for motor manufacturers service centers. Any in warranty replacement motors not satisfactorily handled by motor manufacturer service centers and within the Standard Limited Warranty period and policy will be covered by Chief Industries, Inc., Agri/Industrial Division, Kearney, Nebraska. Contact Chief if you have any problems or questions.

**OUT OF WARRANTY SERVICE:** Products requiring Chief repair work will be repaired at the standard repair charge plus hourly charges after the first hour. Field service work will require a field service charge plus travel expenses. The repaired part will carry a 30 day limited warranty.

Your dealer will be responsible for warranty procedures in accordance with Chief Industries, Inc. (See Dealer Policy)