



BLOWER ASSEMBLY
MODELS BA-300 & BA-310

OPERATION MANUAL

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INSTRUCTION BOOK PART NUMBER 920-BA-300/310 REV. G

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Safety Precautions

The following are general safety precautions that are not necessarily related to any specific part or procedure, and do not necessarily appear elsewhere in this publication. These precautions must be thoroughly understood and apply to all phases of operation and maintenance.

WARNING

Keep Away From Live Circuits

Operating Personnel must at all times observe general safety precautions. Do not replace components or make adjustments to the inside of the test equipment with the high voltage supply turned on. To avoid casualties, always remove power.

WARNING

Shock Hazard

Do not attempt to remove the RF transmission line while RF power is present.

WARNING

Do Not Service Or Adjust Alone

Under no circumstances should any person reach into an enclosure for the purpose of service or adjustment of equipment except in the presence of someone who is capable of rendering aid.

WARNING

Safety Earth Ground

An uninterruptible earth safety ground must be supplied from the main power source to test instruments. Grounding one conductor of a two conductor power cable is not sufficient protection. Serious injury or death can occur if this grounding is not properly supplied.

WARNING

Resuscitation

Personnel working with or near high voltages should be familiar with modern methods of resuscitation.

WARNING

Remove Power

Observe general safety precautions. Do not open the instrument with the power applied.

Safety Symbols

WARNING

Warning notes call attention to a procedure which, if not correctly performed, could result in personal injury.

CAUTION

Caution notes call attention to a procedure which, if not correctly performed, could result in damage to the instrument.



The caution symbol appears on the equipment indicating there is important information in the instruction manual regarding that particular area.



This symbol indicates that a shock hazard exists if the precautions in the instruction manual are not followed.

Note: Calls attention to supplemental information.

Warning Statements

The following safety warnings appear in the text where there is danger to operating and maintenance personnel and are repeated here for emphasis.

WARNING
The vent plug must be used at all times when the load is operating or cooling. Failure to do so could result in an explosion or severe burns.

See page 3

WARNING
Disconnect the unit from all power sources before servicing. The unit may be energized from multiple sources. The potential for electric shock exists.

See pages 3, 5, 8, 9, and 10

WARNING
Never attempt to connect or disconnect RF equipment from the transmission line while RF power is being applied. Leaking RF energy is a potential health hazard.

See pages 6 and 8

WARNING
Do not operate with side panel removed.

See pages 5 and 9

WARNING
Turn off ac power and RF power when attaching the power cable.

See page 5

Caution Statements

The following equipment cautions appear in the text whenever the equipment is in danger of damage and are repeated here for emphasis.

CAUTION
The BA system is designed for operation in a horizontal position only, with the load's vent plug up. Do not use in any other manner.

See page 3

CAUTION
If installed, connect optional interlock before applying RF power.

See page 4

CAUTION
Check the local electrical code for proper ac hookup prior to operation of the unit. Make sure the neutral or return hookup is only used for that purpose.

See page 5

CAUTION
The Bird BA-300/310 Blower Assembly will derate a load's specified power by 50% when installed and not running. If the indicator light should turn off, immediately reduce RF power by at least 75%.

See page 6

Safety Statements

USAGE

ANY USE OF THIS INSTRUMENT IN A MANNER NOT SPECIFIED BY THE MANUFACTURER MAY IMPAIR THE INSTRUMENT'S SAFETY PROTECTION.

USO

EL USO DE ESTE INSTRUMENTO DE MANERA NO ESPECIFICADA POR EL FABRICANTE, PUEDE ANULAR LA PROTECCIÓN DE SEGURIDAD DEL INSTRUMENTO.

BENUTZUNG

WIRD DAS GERÄT AUF ANDERE WEISE VERWENDET ALS VOM HERSTELLER BESCHRIEBEN, KANN DIE GERÄTESICHERHEIT BEEINTRÄCHTIGT WERDEN.

UTILISATION

TOUTE UTILISATION DE CET INSTRUMENT QUI N'EST PAS EXPLICITEMENT PRÉVUE PAR LE FABRICANT PEUT ENDOMMAGER LE DISPOSITIF DE PROTECTION DE L'INSTRUMENT.

IMPIEGO

QUALORA QUESTO STRUMENTO VENISSE UTILIZZATO IN MODO DIVERSO DA COME SPECIFICATO DAL PRODUTTORE LA PROIZIONE DI SICUREZZA POTREBBE VENIRNE COMPROMESSA.

SERVICE

SERVICING INSTRUCTIONS ARE FOR USE BY SERVICE - TRAINED PERSONNEL ONLY. TO AVOID DANGEROUS ELECTRIC SHOCK, DO NOT PERFORM ANY SERVICING UNLESS QUALIFIED TO DO SO.

SERVICIO

LAS INSTRUCCIONES DE SERVICIO SON PARA USO EXCLUSIVO DEL PERSONAL DE SERVICIO CAPACITADO. PARA EVITAR EL PELIGRO DE DESCARGAS ELÉCTRICAS, NO REALICE NINGÚN SERVICIO A MENOS QUE ESTÉ CAPACITADO PARA HACERLO.

WARTUNG

ANWEISUNGEN FÜR DIE WARTUNG DES GERÄTES GELTEN NUR FÜR GESCHULTES FACHPERSONAL.

ZUR VERMEIDUNG GEFÄHRLICHER, ELEKTRISCHER SCHOCKS, SIND WARTUNGSARBEITEN AUSSCHLIEßLICH VON QUALIFIZIERTEM SERVICEPERSONAL DURCHZUFÜHREN.

ENTRETIEN

L'EMPLOI DES INSTRUCTIONS D'ENTRETIEN DOIT ÊTRE RÉSERVÉ AU PERSONNEL FORMÉ AUX OPÉRATIONS D'ENTRETIEN. POUR PRÉVENIR UN CHOC ÉLECTRIQUE DANGEREUX, NE PAS EFFECTUER D'ENTRETIEN SI L'ON N'A PAS ÉTÉ QUALIFIÉ POUR CE FAIRE.

ASSISTENZA TECNICA

LE ISTRUZIONI RELATIVE ALL'ASSISTENZA SONO PREVISTE ESCLUSIVAMENTE PER IL PERSONALE OPPORTUNAMENTE ADDESTRATO. PER EVITARE PERICOLOSE SCOSSE ELETTRICHE NON EFFETTUARE ALCUNA RIPARAZIONE A MENO CHE QUALIFICATI A FARLA.

About This Manual

This instruction book covers the following models:

BA-300-115	BA-310-115
BA-300-230	BA-310-230

Changes to this Manual

We have made every effort to ensure this manual is accurate. If you discover any errors, or if you have suggestions for improving this manual, please send your comments to our Solon, Ohio factory. This manual may be periodically updated. When inquiring about updates to this manual refer to the part number and revision on the title page.

Chapter Layout

Introduction — Describes the features of the blower, lists equipment supplied and optional equipment.

Theory of Operation — Describes the blower.

Installation — Provides mounting and installation instructions for the blower assembly, and instructions

Operating Instructions — Describes the unit controls and provides power-up instructions.

Maintenance — Lists routine maintenance tasks as well as troubleshooting for common problems. Specifications and parts information are also included.

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Bird Blower Assemblies supply forced air cooling to Bird Loads, including Termaline 8890 Series terminations and Tenuline 8329 Series attenuators.

The Bird BA-300 consists of two high efficiency fans, with vertical side baffles to direct air over the load's radiator fins. The blower doubles the normal RF input rating of the installed load, e.g. a 2.5 kW load can dissipate 5 kW.

The Bird BA-310 is identical to the BA-300 except that it has a thermoswitch wired in parallel with the power switch. When a load equipped with a fan-control thermoswitch is properly connected, the blower will automatically turn on in response to a rise in load temperature. This system provides automatic operation suitable for reject load service.

Items Furnished

- Blower Assembly
- Detachable 3-wire power cable (without male plug for 230 VAC power cable)
- Nuts and screws
- Load resistor mounted in place (when ordered with a load)
- Instruction manual (when ordered without a load)

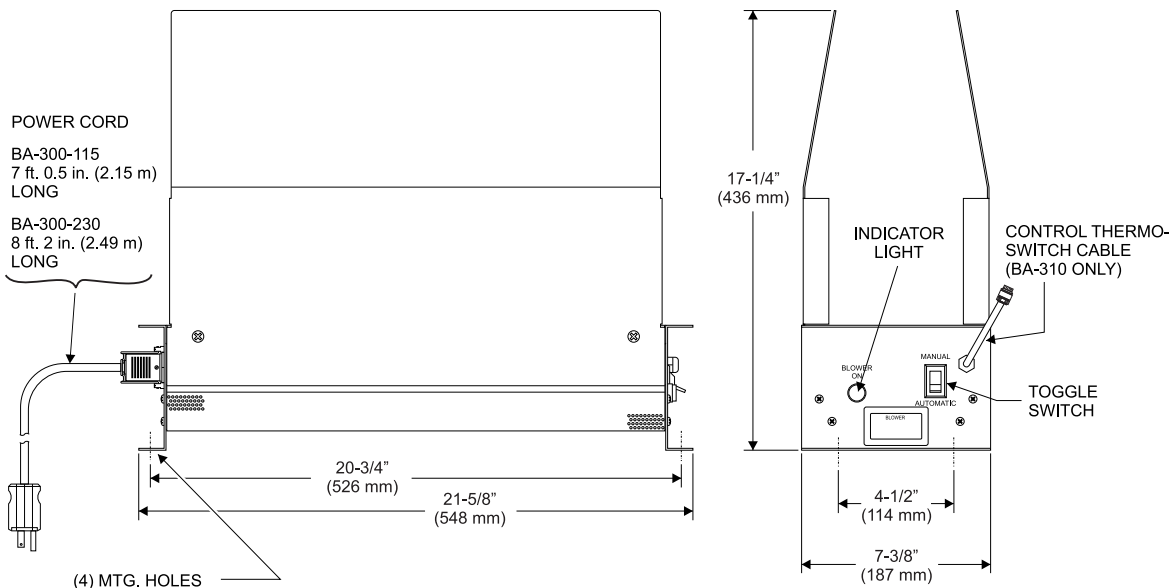
Items Required but Not Supplied

- Male plug for the power cable (230 VAC only)

Optional Accessories

- Control thermoswitch (BA-310 only)

Figure 1 Outline Drawing



Loads convert RF energy into heat. This heat must be quickly transferred to the surrounding environment to prevent damage to the load. The coolant fluid surrounding the resistor transports the heat to the radiator walls by convection. There, air passing over the radiator fins carries the heat away.

When a load or attenuator is mounted on the Bird Blower Assembly, baffles cover the radiator fins so that the high airflow generated by two blower fans is confined to passing over the fins. Up to twice as much RF energy can be dissipated by this forced draft air flow as compared to normal convection air currents. Thus, a 2.5 kW load will safely dissipate 5 kW using the Bird BA-300/310.

Power Rating Reduction

The baffles interfere with the free flow of normal air currents, causing a 50% reduction in heat transfer efficiency if the forced airflow is stopped. Thus, a 2.5 kW load will have its maximum power dissipation reduced to 1.25 kW.

This chapter provides information for on-site requirements, unpacking, inspection, and preparing the unit for use.

Unpacking and Inspection

1. Carefully inspect shipping container for signs of damage.
 - If the shipping container is damaged, do not unpack the unit. Immediately notify the shipping carrier and Bird Technologies.
 - If the shipping container is not damaged, unpack the unit. Save shipping materials for repackaging.
2. Inspect unit for visual signs of damage.

Note: *If there is damage, immediately notify the shipping carrier and Bird Technologies.*

Mounting

Place the Blower Assembly in a dry, dust and vibration free environment. Do not use outdoors or in areas of condensing humidity. Allow at least 3" (7.6 cm) of clearance above and on all sides of the unit.

CAUTION

The BA system is designed for operation in a horizontal position only, with the load's vent plug up. Do not use in any other manner.

Bird Blower Assemblies are equipped for either portable use or fixed installation. The mounting brackets on the front and rear faces have four mounting slots arranged in a $4\frac{1}{2}$ " x $20\frac{23}{32}$ " rectangle (114.3 x 526.3 mm). Use a screw with a $\frac{3}{8}$ " (9.53 mm) diameter max.

Installing Thermoswitch (BA-310 Only)

The Bird BA-310 requires a control thermoswitch, P/N 2450-085, for automatic operation. It is normally open, closing at 155 °C (311 °F), with a rating of 10A @ 120Vac and 5A @ 230Vac.

WARNING

Disconnect the unit from all power sources before servicing.
The unit may be energized from multiple sources.
The potential for electric shock exists.

WARNING

The vent plug must be used at all times when the load is operating or cooling. Failure to do so could result in an explosion or severe burns.

To install the thermoswitch on the load, proceed as follows:

1. Replace the vent plug in the load with the shipping plug.
2. Stand the load on its back with the connector end up. In this position there is no danger of the coolant pouring out through the socket plug hole.
3. Remove the top socket plug using a $\frac{9}{16}$ " hex wrench.
4. Replace the plug with the thermoswitch. Sparingly apply pipe sealing compound to the external threads, only, of the thermoswitch. Do not contaminate the coolant with pipe sealant.
5. Check for coolant leaks upon completion.

Thermoswitch Connection (BA-310 Only)

Connect the thermoswitch to the Bird BA-310 as follows :

CAUTION
If installed, connect optional interlock before applying RF power.

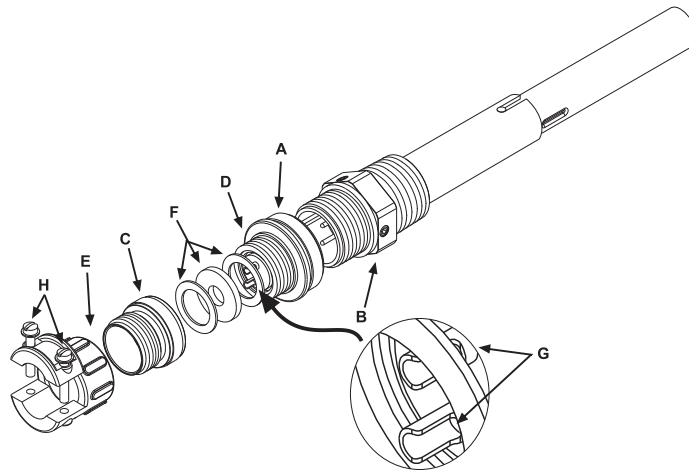
Note: If your unit has a connector already attached to the thermoswitch cable, you do not need to perform Step 1 through Step 4.

1. Unscrew the large knurled ring-nut (A) at the lower end of the coupling jack assembly (See [Figure 2](#) below). Pull it off the thermoswitch jack (B). Unscrew the small knurled cover fitting from the base plug (D) of the connector to release the base.
2. Thread the control switch wires through the clamp (E) with the washers (F) inside and with its threaded fitting in place. Service the control switch wire with short tips and put spaghetti sleeves over the wire ends if necessary.
3. Securely solder the control switch leads to the lugs (G) of the connector base.

Note: The ring-nut (A) must be in place over the base plug (D) with the knurled end facing out.

4. Screw on the cover ring, then fasten the cable clamp (E) in place and tighten both yoke screws (H).
5. Put the plug back on the thermoswitch and tighten the nut (A).

Figure 2 Thermoswitch Assembly



Load Resistor

To connect the Blower Assembly to a load, follow these instructions:



WARNING
Disconnect the unit from all power sources before servicing.
The unit may be energized from multiple sources.
The potential for electric shock exists.

WARNING
Do not operate with side panel removed.

- Remove one of the vertical panels by unscrewing both 10-32 truss head screws.
- Place the load on the blower assembly against the remaining vertical panel. Be sure that the RF input connector faces the same direction as the blower control panel.
- Line up the base holes and loosely screw the load and blower together with the nuts and screws provided.
- Remount the side panel and loosely replace the truss head screws.
- Line up the holes on the side panel tabs with those on the front and rear faces of the load. Secure with four 10-32 truss head screws.

Note: It may be necessary to temporarily loosen the two screws in the unremoved vertical panel.

- Tighten all the side panel and base mounting screws securely.
- Push the power cable's plug into the socket at the rear of the blower, then lock it in place with the clamp.

AC Power Hookup

CAUTION
Check the local electrical code for proper ac hookup prior to operation of the unit.
Make sure the neutral or return hookup is only used for that purpose.

WARNING
Turn off ac power and RF power when attaching the power cable.

The ac power supply required is 115/230 VAC, depending on the model, @ 50/60 Hz, 1 ϕ . The blower is equipped with an IEC 320 "cold" (65 °C) ac inlet.

CAUTION

The Bird BA-300/310 Blower Assembly will derate a load's specified power by 50% when installed and not running. If the indicator light should turn off, immediately reduce RF power by at least 75%.

WARNING

Never attempt to connect or disconnect RF equipment from the transmission line while RF power is being applied.
Leaking RF energy is a potential health hazard.

All Bird Blower Assemblies are equipped with a control switch and a indicator light. No initial adjustments are required.

BA-300 Controls

On the Bird BA-300, the switch is labeled "ON/OFF". When the switch is set to ON, the indicator light will turn on and the fans will run continuously. When set to OFF, the indicator light will turn off and the fans will not run.

BA-310 Controls

On the Bird BA-310, the switch is labeled "MANUAL/AUTOMATIC". When the switch is set to MANUAL, the fans will run continuously. When set to AUTOMATIC, the fans will be turned on when the coolant reaches a preset temperature. The indicator light will turn on whenever the unit is connected to ac power.

Normal Operation

- Turn the blower on. Check that the indicator light is on.
- Set the Bird BA-310 to MANUAL momentarily to check that the fans are working properly.
- Apply RF power.

Operation Under Abnormal Conditions

If the indicator light turns off or the fans stop unexpectedly, immediately turn off the RF power or reduce it by at least 75% (half of the load's original power rating). Refer to "[Troubleshooting](#)" on page 8 to correct the problem. The load can be subjected to higher power levels for short intervals; refer to the load manual for details.

Shutdown

- Turn off RF power at the source.
- Wait approximately 15 minutes, or for the BA-310 fans to stop running. This will allow the load to cool without causing heat stress.
- Turn off the blower.

Emergency Shutdown

Turn off RF power at the source.

If the load is equipped with an interlock thermostitch, RF power will be automatically turned off when the coolant temperature reaches an unsafe level. Use of an interlock thermostitch is especially recommended when using the blower assembly.

This chapter covers cleaning, inspection, troubleshooting, and specifications for the Bird BA–300/310 Blower Assemblies.

WARNING
 Never attempt to connect or disconnect RF equipment from the transmission line while RF power is being applied.
 Leaking RF energy is a potential health hazard.

WARNING
 Disconnect the unit from all power sources before servicing.
 The unit may be energized from multiple sources.
 The potential for electric shock exists.

Troubleshooting

For corrections requiring repair or replacement of components see the appropriate section. Only those functions within the scope of normal maintenance are listed. This manual cannot list all malfunctions that may occur, or corrective actions. If a problem is not listed or is not corrected by the listed actions, notify a qualified service center.

Problem	Possible Cause	Possible Correction
No air flow from blowers; indicator light off	Unplugged power cable	Connect the power cable
	Fuse burnout	Replace fuse after checking and correcting the burnout cause. (See " Fuse " on page 9)
	No ac power	Make sure ac power is properly connected and turned on
No air flow from blowers; indicator light on	Fan obstructed by bent grill	Straighten the grill
	Fan motors overheated	Clean the grill and fan blades (See " Cleaning " on page 8)
	Fan motors burnt out	Replace the fan motors (See " Fan " on page 10)
Air flow from blowers; indicator light off	Lamp burnt out	Replace the lamp (See " Indicator Light " on page 10)

Maintenance

Cleaning

The intake grills, fan, and inside surface of the baffles should be wiped free of dust and dirt when necessary with a clean soft cloth. Excessive dust will interfere with the efficient dissipation of heat. If the BA–300/310 has been standing without an installed load, check for objects that may have entered the blower openings.

When a load is installed on the blower assembly, it will be necessary to partially disassemble the blower to clean the load’s radiator fins. Follow the instructions below:

WARNING
Disconnect the unit from all power sources before servicing.
The unit may be energized from multiple sources.
The potential for electric shock exists.



WARNING
Do not operate with side panel removed.

- Remove one of the side baffles by unscrewing both 10-32 truss head screws.
- Clean the load.
- Screw the baffle back into place.

Inspection

The only regular inspection required is to check for the accumulation of dust in locations that might impede the free flow of air, i.e., intake grill and fan blades. If the blower assembly is attached to a load, clean the radiator fins regularly.

Repair

WARNING
Disconnect the unit from all power sources before servicing.
The unit may be energized from multiple sources.
The potential for electric shock exists.

Fuse

The fuse is located in the AC module on the back of the blower.

To replace the fuse:

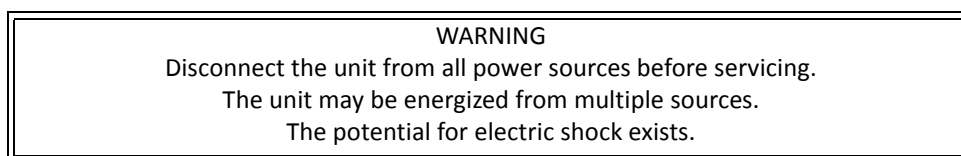
- Correct the fuse burnout cause.
 - Note:** Common causes include stuck or blocked fans or a short circuit in the motor or blower wiring.
- Press the locking tab on the fuse drawer and remove the drawer.
- Replace the fuse. See "[Specifications](#)" on [page 12](#) for fuse type and current rating.
- Push the drawer into the AC module until it locks into place.
- If the fans still do not run or if the fuse burns out again, return the blower assembly to the factory.

Indicator Light

1. Remove the four 8-32 pan head screws from the front and back of the base frame.
2. Pull the fan guard straight off the bottom.
3. Remove the quick disconnects on the light and unscrew the retaining sleeve.
4. Remove the light unit.
5. Remove the lens while pressing both locking tabs.
6. Press the housing's center slot with a small screwdriver to release the lamp.
7. Push the new lamp into the housing until it snaps into place.
8. Replace the lens, then put the light unit back in place.
9. Replace the fan guard and screw in the 8-32 pan head screws.

Fan

To replace a fan assembly:



1. Remove the four 8-32 pan head screws from the front and back of the base frame.
2. Pull the fan guard straight off the bottom.
3. Carefully unsolder the color coded connecting wires. Note the connections for resoldering.
4. Remove the four fan mounting screws and remove the defective fan. Be careful not to lose the lipped retaining washers.
5. Insert the replacement fan with the fan blade assembly facing down, towards the fan guard grill.
6. Insert the mounting screws and retaining washers into the mounting holes. Turn the washers so that the lipped portion fits over the rim of the fan frame. Tighten the screws.

Note: If the fan replaced is the one closest to the power socket, reattach the green ground wire to the closest mounting screw.

7. Solder the connecting wires to the solder lugs on the motor unit according to the color coding.
8. Replace the fan guard and screws.

Note: Before reattaching the blower assembly to the load, check the fans for free and unimpeded movement of the blades.

9. Connect the unit to ac power. Set the switch to MANUAL or ON momentarily to check that the fans work properly.

Figure 3 BA-300 Schematic

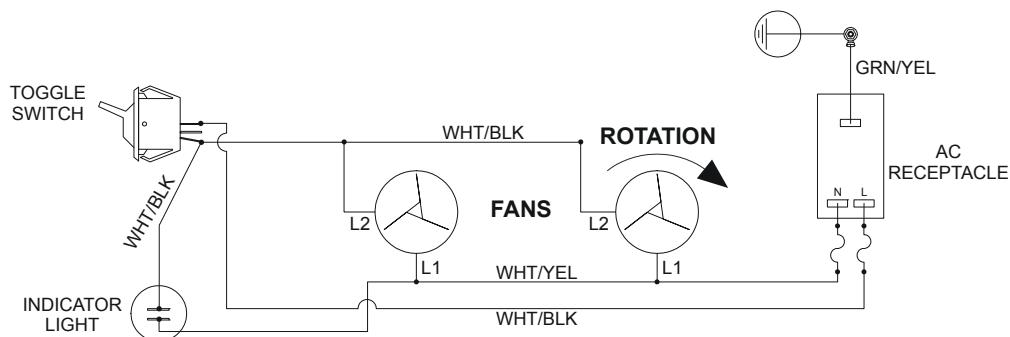
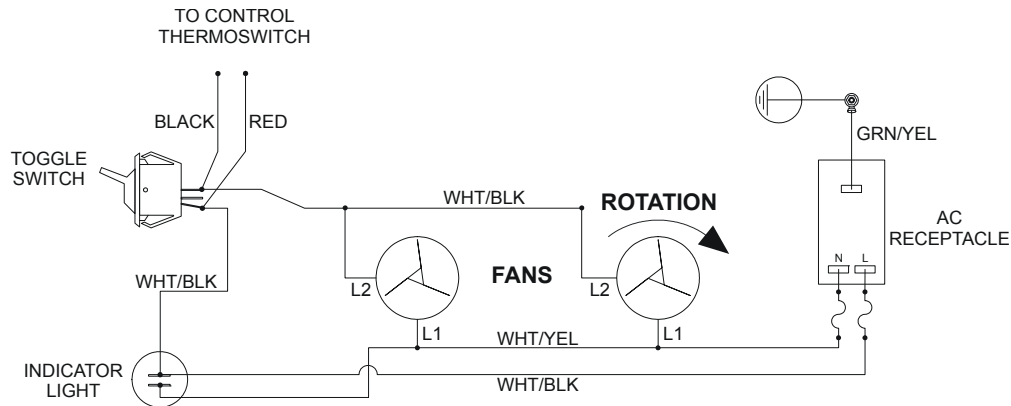


Figure 4 BA-310 Schematic



Storage and Shipment

Cover the Bird BA-300/310 before storing to keep out dust and dirt. Store in a dry, dust-free environment where the ambient temperature will remain between -40 and $+45$ °C (-40 to $+113$ °F).

To ship the blower assembly, take the following precautions:

- Detach the power cable and tape it securely to the housing.
- To ship the blower assembly by itself, pack it in a sturdy corrugated paper shipping carton. If it is attached to a load, a wood crate is recommended because of size and weight.

Customer Service

Any maintenance or service procedure beyond the scope of those in this chapter should be referred to a qualified service center.

If the unit needs to be returned for any reason, request an Return Material Authorization (RMA) through the Bird Technologies website. All instruments returned must be shipped prepaid and to the attention of the RMA number.

Bird Service Center

30303 Aurora Road
Cleveland (Solon), Ohio 44139-2794
Fax: (440) 248-5426
E-mail: bsc@birdrf.com

For the location of the Sales Office nearest you, visit our Web site at:

<http://www.birdrf.com>

Specifications

AC Power Requirements:	
115 VAC	0.6 A @ 50/60 Hz
230 VAC	0.3 A @ 50/60 Hz
Fuse Rating	IEC (5 x 20 mm) Type T
115 VAC	1 A
230 VAC	500 mA
Thermoswitch	Normally open. Closes at 155 °C (311 °F)
Thermoswitch Rating	
115 VAC	10 A
230 VAC	5 A
Temperature	-40 to +113 °F (-40 to +45 °C)
Humidity	95% non-condensing max
Dimensions ¹	21 ⁵ / ₈ " L x 7 ³ / ₈ " W x 17 ¹ / ₄ " H (548 x 187 x 436 mm)
Weight, Nominal	13.5 lb (6.1 kg)
Finish	Grey Powder Coat

1 22" H (560 mm) with load in place

Replacement Parts

DESCRIPTION	QTY	PART NUMBER
Control Thermoswitch (BA-310 only)	1	2450-085
Side Panel Screws (10-32 x ³ / ₈ " Phillips truss head)	4	1120-0619-00
Radiator Base Mounting Screws (³ / ₈ -16 x ³ / ₄ " hex head)	4	1124-1207-00
Fuse 5x20mm Type T		
1 A, 115 VAC	2	5A2257-16
500 mA, 230 VAC		5A2257-13
Fuse Drawer	1	5A2310
Power Cable		
115 VAC	1	5-1286
230 VAC		5A2416
Lamp		
115 VAC	1	5A2409-1
230 VAC		5A2409-2
Fan Guard	1	8950-306-1
Fan		
115 VAC	2	5A383
230 VAC		5A381
Toggle Switch	1	5A2312

LIMITED WARRANTY

All products manufactured by Seller are warranted to be free from defects in material and workmanship for a period of one (1) year, unless otherwise specified, from date of shipment and to conform to applicable specifications, drawings, blueprints and/or samples. Seller's sole obligation under these warranties shall be to issue credit, repair or replace any item or part thereof which is proved to be other than as warranted; no allowance shall be made for any labor charges of Buyer for replacement of parts, adjustment or repairs, or any other work, unless such charges are authorized in advance by Seller.

If Seller's products are claimed to be defective in material or workmanship or not to conform to specifications, drawings, blueprints and/or samples, Seller shall, upon prompt notice thereof, either examine the products where they are located or issue shipping instructions for return to Seller (transportation charges prepaid by Buyer). In the event any of our products are proved to be other than as warranted, transportation costs (cheapest way) to and from Seller's plant, will be borne by Seller and reimbursement or credit will be made for amounts so expended by Buyer. Every such claim for breach of these warranties shall be deemed to be waived by Buyer unless made in writing within ten days from the date of discovery of the defect.

The above warranties shall not extend to any products or parts thereof which have been subjected to any misuse or neglect, damaged by accident, rendered defective by reason of improper installation or by the performance of repairs or alterations outside of our plant, and shall not apply to any goods or parts thereof furnished by Buyer or acquired from others at Buyer's request and/or to Buyer's specifications. Routine (regularly required) calibration is not covered under this limited warranty. In addition, Seller's warranties do not extend to the failure of tubes, transistors, fuses and batteries, or to other equipment and parts manufactured by others except to the extent of the original manufacturer's warranty to Seller.

The obligations under the foregoing warranties are limited to the precise terms thereof. These warranties provide exclusive remedies, expressly in lieu of all other remedies including claims for special or consequential damages. SELLER NEITHER MAKES NOR ASSUMES ANY OTHER WARRANTY WHATSOEVER, WHETHER EXPRESS, STATUTORY, OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS, AND NO PERSON IS AUTHORIZED TO ASSUME FOR SELLER ANY OBLIGATION OR LIABILITY NOT STRICTLY IN ACCORDANCE WITH THE FOREGOING.