REPUBLIC MANUFACTURING

# REPUBLIC TUBE AXIAL FAN SERIES
## INSTALLATION & OPERATING INSTRUCTIONS

**OM050 Rev.A**

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## Warning

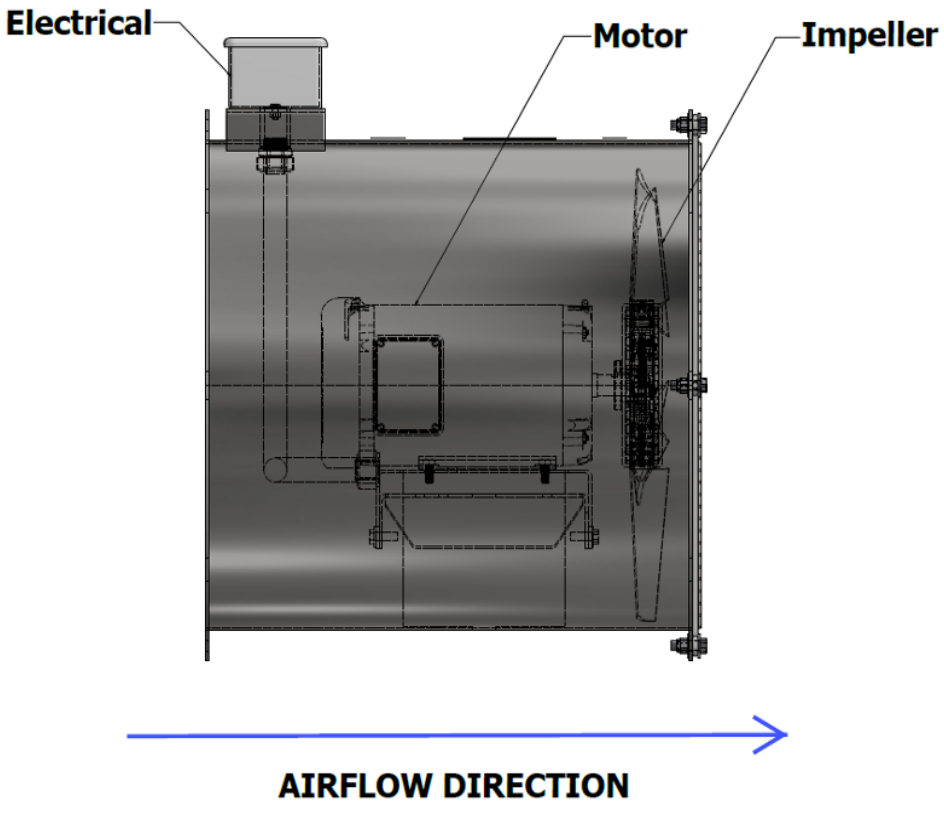
Service procedures beyond the scope of this manual should only be performed by trained service personnel at Republic Manufacturing.

## Important

Read the following safety instructions carefully. Disconnect fan from electrical source using an approved lockout/tagout procedure before attempting service

## Working Principle

When the motor spins the impeller, gas entering through the inlet of the drum is accelerated parallel to the motor shaft and drum due to the pitched blades essentially pushing the gas along while they rotate. As the gas is pulled in and accelerated, it then flows through the drum and out of the discharge.



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# Safety Instructions




To ensure safe operation, we have provided many important safety guidelines in this manual for Republic's Tube Axial Fans. Please read this manual carefully and pay particular attention to instructions with the following signs:

**DANGER:** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury

**WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**DEFINITION:** For the purpose of these instructions, "handling" of the tube axial fan means the transport, storage, installation, commissioning, influence on operating conditions, maintenance, troubleshooting and overhaul of the fan.

1. Always use qualified electrical and mechanical personnel for installation and maintenance of Republic Tube Axial Fans and motors.

2. Disconnect the electrical power at the motor starter, fuse box or circuit breaker before working on the system. Take special precautions to make sure the power cannot be turned on while you are working on the fan. **Use an approved lockout/tagout system.**

3. Make sure the motor is electrically grounded, the mounting bolts are properly secured, and all guards are in place before start-up.

4. Wear safety glasses and earplugs when working on the fan or components within a Republic Tube Axial Fan.

5. **Check the final installation for proper voltage and amp loads**.

6. Keep all tools, loose clothing and hands away from rotating or moving parts while the unit is running.

7. Inspect the fan at regular intervals for damaged or worn parts. **Replace damaged parts immediately! Do not connect or turn on a damaged fan!**

8. Use only genuine Republic Manufacturing brand replacement parts.

9. Refer to Troubleshooting section of manual.

10. Water, other liquids, aggressive or flammable gases and vapors may not be handled. Handling of flammable or aggressive gases and vapors is only possible with special versions.

11. Improper use of the unit can result in serious or even fatal injuries. Only operate the fan for the purposes indicated under "Intended Use", with the gases indicated under "Intended Use".

12. **Usie of fan guard while operating is highly recommended.**

## Lockout/Tagout Procedures


1. Notify all affected employees that a lockout or tagout is about to occur on a specific piece of equipment or machinery. The authorized employee to use the lockout/tagout system shall know the type and magnitude of energy that the machine or equipment utilizes and the hazards that exist with the energy source before preparing to shutdown.
2. If the machine or equipment is operating, please use normal stopping or rundown procedures for that machine.
3. Operate the switch, valve, or other energy isolating devices so that the equipment is isolated from its energy source. Isolating the equipment from its energy source may involve turning off such items as the operating control, a line valve, or an electrical circuit breaker.
4. Apply the lockout/tagout isolating device with assigned individual locks or tags.
5. Release any potentially hazardous stored or residual energy. In order to do so, this may mean to return springs to a normal position, or bleeding down. Since the machine must be in a zero-energy state, if there is any chance the stored energy may reaccumulate, verification of isolation must be continued until the servicing or maintenance is complete.
6. The machine or equipment is now locked out or tagged out.

## Model Identification

Republic Tube Axial Fans have a nameplate containing the serial and model number located on the auxiliary electrical box. When placing a service call, please provide the Republic serial number. Call us at (800) 847-0380 or e-mail *info@republic-mfg.com*

## Equipment Arrival & Inspection

Inspect the fan at time of receipt to ensure that all components and accessories, as noted in the packing slip, were received and in good condition. Verify that the serial number on the packing slip matches the serial number shown on the fan nameplate. Inspect the fan and motor assembly to ensure that the motor horsepower and voltage are correct.

**If any equipment was damaged in transit, you will need to make a claim against the freight carrier immediately.** If you have any shortages, discrepancies, or damage please call your Republic Manufacturing Distributor or Republic Manufacturing at (800) 847-0380.

**Danger:** Possible danger to health and or the environment. Personal protective equipment must be worn.

## Storage Conditions

1. Fan must be stored in a place that meets the following conditions: clean, dry, and dust free.
2. The temperature during storage must be between 0-40 degrees Celsius.

### Long term storage

The fan may initially be stored following delivery.

1. Under advantageous storage conditions (specified above) – 1 year.
2. Under disadvantageous storage conditions (e.g. high humidity, salty, sandy or dusty air) – Inquire with Republic Manufacturing regarding service at (800) 847-0380.

### Commissioning After Longer Standstill

Before recommissioning after a longer standstill, measure the insulation resistance of the drive motor. With values $\leq$ 1kΩ per volt of nominal voltage, the winding is too dry.

## Suitability & Environmental Conditions

The units are suitable for use in the industrial field.

Use only clean, dry air. Do not use explosive gases or atmosphere that contains such gases.

The ambient and suction temperatures must be between 0 and 40 degrees Celsius. For temperatures outside this range please contact your supplier.

In all applications where an unplanned shut down of the fan could possibly cause harm to persons or installations, a corresponding safety backup system must be installed.

Ensure no contaminant or foreign object enters the airstream, as this could cause serious damage and harm to operators and surroundings.

Fan must be installed with proper plumbing and flange fixtures to ensure performance is not adversely affected.

When using a fan at high altitudes or high temperatures, please consult with Republic Manufacturing prior to use.

# Intended Use

## This operating manual

- Is intended for tube axial fans.
- Contains instructions regarding transport, handling, installation, commissioning, operation, shut-down, storage, service, and disposal of these units.
- Must be completely read and understood by all operating and servicing personnel before beginning to work with or on the fans.
- Must be strictly observed.
- Must be available at the site of operation.

## The RTAF Series

- Are motor-driven units for generating airflow at low pressures.
- Are used to move the following:
    - Air.
    - Non-flammable, non-aggressive, non-explosive gases or gas-air mixtures.
    - For differing gases/gas-air mixtures, inquire with Republic Manufacturing.
- Are equipped with one of the following motors:
    - 3-phase AC drive motor .
    - General purpose or Washdown.
- Operating Instructions (only applies to units with standard design)
    - Are intended for industrial applications.
    - Are designed for continuous operation. With increased switch-on frequency (6x per hour with equal pauses and operating times) or with increased gas inflow and ambient temperature, the excess temperature limit of internal components could be exceeded. Consult with Republic Manufacturing under such conditions.

Any unauthorized modifications of the fan are prohibited for safety reasons. The operator is only permitted to perform maintenance and service work described in these operating instructions. Maintenance and servicing work which goes beyond this may only be carried out by companies or personnel authorized by Republic Manufacturing.

# Installation

Fan may be lifted manually or utilizing lifting equipment based on the instructions below:

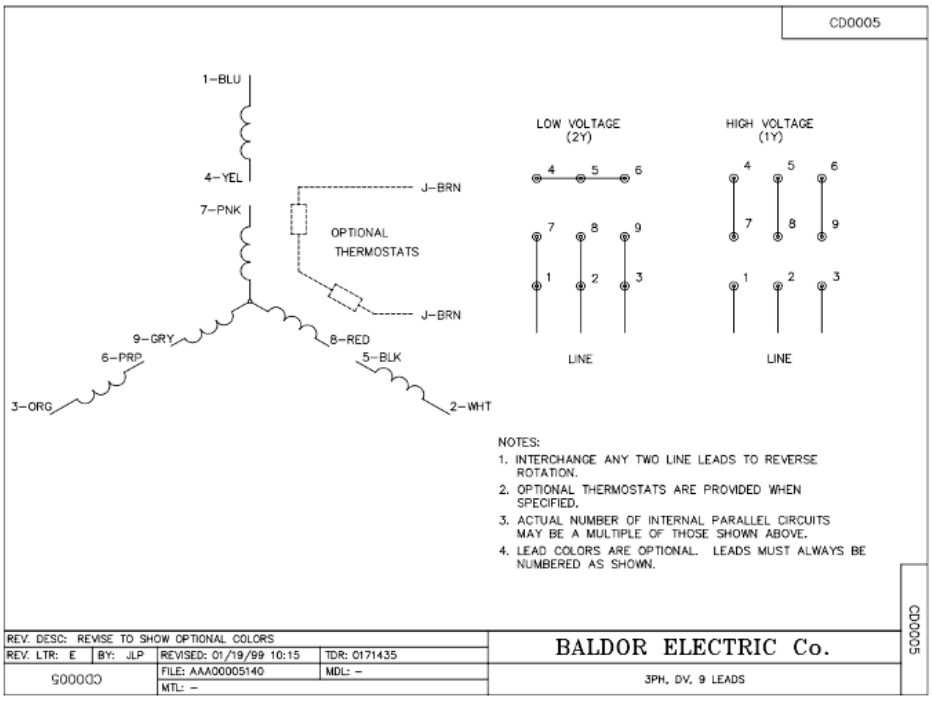
**WARNING:** Danger from lifting heavy loads. Manual handling of the unit is only permitted within the following limits.

For the weight of the fan, see the Technical Data section of this manual. All fans heavier than the maximums stated above must be lifted using lifting equipment.

1. Upon receiving the fan, all motor wiring will have been routed to the auxiliary electrical box and is ready for connection.
2. Install the fan in a stable position using the bolt on connection points included on each flange.
3. **Have a qualified electrician configure the motor to your incoming voltage as noted in the "Motor Wiring" section of the manual. Refer to the motor nameplate for your correct power supply requirements.**
4. In order to ensure sufficient fan performance, be sure to align all incoming and outgoing ductwork with the drum of the fan as well as create a sufficient seal between bolted surfaces.
5. The fan is suitable for installation within the following ambient conditions: dusty or damp environment, in buildings, and in the open (unless exposed to intense direct sunlight). Fans may be installed at up to 1,000 feet above sea level (for higher altitudes, contact Republic Manufacturing at (800) 847-0380).
6. Fan may be installed in the horizontal or vertical position.
7. Verify that the fan blades are spinning in the correct direction as indicated by the rotation labels.

# Motor Wiring

The following wiring diagram is standard for Baldor's 3 phase motors being used in Republic's Tube Axial Fans. Voltages typically are 230 V (low) or 460 V (high).



# Commissioning

**WARNING:** Improper use of the unit can result in serious or even fatal injuries. Do not proceed without reading Safety Instructions.

**WARNING:** Danger from rotating parts cutting/cutting off of extremities, grasping/winding up of hair and clothing.

**WARNING:** Danger due to vacuum and pressure, sudden escape of vapor (skin and eye injuries), sudden drawing in of hair and clothing, or burns.

Only start-up and operate under the following conditions:

- The fan must be completely assembled. Pay particular attention to the following components:
  - The fan guard
  - The impeller (make sure it is securely fastened to the motor shaft)
- Ensure there are no foreign objects in the drum of the fan.
- Check the mounting elements, connections of any plumbing, lines, and fittings for strength, leaks and firm seating at regular intervals.

## Preparation

**DANGER:** Fan can overheat causing damage to the drive motor winding if intake or discharge connections are closed/soiled.

Before start-up, make sure the inlet and discharge connections are not closed, clogged or soiled.

**CAUTION:** Before starting up after a longer standstill: Measure the insulation resistance of the motor. With values $\leq$1 kΩ per volt of nominal voltage, the winding is too dry.

1. Check the direction of the rotation. The intended rotating direction of the shaft is marked with arrows on the drum.
2. The flow direction is marked with arrows on the drum.
3. Make sure any plumbing on the inlet and discharge connections are properly connected and that the fan is properly secured.
4. Switch the fan on briefly and then off again.
5. Compare the actual rotating direction of the external fan with the intended shaft rotating direction indicated with the arrows shortly before the blower comes to a standstill.
6. If necessary, reverse the direction of the rotation of the motor.

**Start-Up**

1. Switch on power supply for drive motor.
2. Operate fan for an hour, and then check:

   Ambient temperature - increased room temperatures may require stronger ventilation especially for larger blowers. Room temperature should not exceed 104°F (40°C).
   Pressure and vacuum valves - adjust relief valve pressure or vacuum setting if needed.
   Motor current - check that current supply matches recommended current rating on blower nameplate.
   Electrical overload cutout - check that current matches rating on blower nameplate

If motor fails to start or slows down significantly under load, shut off and disconnect from power supply. Check that the voltage is correct for the motor and that the motor is turning in the proper direction.

**Shut-Down**

1. Switch off power supply for drive motor.
2. Close shut-off device in intake/discharge pipe, if applicable.

## Operation

**WARNING:** Improper use of the unit can result in serious or even fatal injuries. Do not proceed without reading Safety Instructions.

**WARNING:** Danger due to vacuum and pressure, sudden escape of vapors (skin and eye injuries), sudden drawing in of hair or clothing.

**WARNING:** Danger of overheating

## Shut-Down & Longer Standstills

**WARNING**: Improper use of the unit can result in serious or even fatal injuries. Do not proceed without reading “Safety Instructions”.

**CAUTION**: Danger of rusting due to collection of condensed water in drive motor area. On drive motors with closed condensed water openings, remove closures occasionally to allow any water which has collected to drain off.

## Troubleshooting

| Problem | Reason | Remedy |
|---|---|---|
| Unit temperature high | Motor overheating | Check amperage, bearing noise |
| | Inlet side air temperature higher than normal | Inspect process piping/ duct work for irregularities |
| Vibration or Noise | Flange interface misaligned | Check flange alignment and secure bolts |
| | Flange rubbing | Install gasketed connection at flange interface |
| | Fan blade misaligned | Contact Republic |
| | Bearing failure | Replace bearings or motor |

## In the Event of a Breakdown

1. Use a lockout/tagout procedure to ensure the blower may be worked on safely.
2. Refer to the "Troubleshooting" section of the manual to determine the cause of the breakdown and the appropriate action to take.
3. If further assistance is needed, please call Republic Manufacturing at (800) 847-0380.

## When to Ship the Product Back to Republic

If you cannot fix or troubleshoot your fan using this manual then, a skilled Republic Manufacturing professional is required. Please ship your fan back to Republic Manufacturing.

## Disabling, Dismantling, and Scrapping of Unit

1. Disable the fan using the lockout/tagout procedure outlined in the manual.
2. Scrap entire unit using a suitable disposal company.

## Warranty Terms and Conditions

Republic Manufacturing warrants all finished Republic Manufacturing products to be free from functional defects in material and workmanship for a period of twelve (12) months from the date of installation, or no longer than eighteen (18) months from shipment.
Wear parts are not covered by the 12 to 18 month warranty.

**DISASSEMBLY OF BLOWER MAY VOID WARRANTY.**

To obtain service within the warranty period, first contact your authorized Republic Manufacturing dealer or Republic Manufacturing Service Department. Republic's responsibility under this warranty shall be to provide an analysis of the blower, which will determine course of action. Any product found to be defective within the warranty period will merit either:

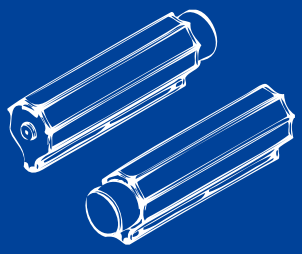
a. A no charge repair of existing blower. Any freight charges will be the purchaser's responsibility.
b. A replacement blower*. Any freight charges will be the purchaser's responsibility.

*This option would be a chargeable replacement until the original blower is received by Republic Manufacturing, and warranty is approved.

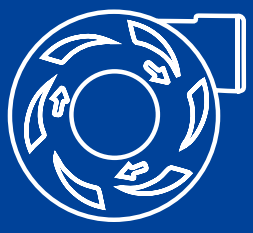
Republic Manufacturing shall not be liable for incidental nor consequential damages resulting from the use of this product. There are no expressed nor implied warranties, which extend beyond the warranty of merchantability or fitness for a particular purpose to the equipment and/or its parts and components.

REPUBLIC MANUFACTURING

**Air Knife Systems**



**Centrifugal Blowers**



**Regenerative Blowers**

**Vacuum Pumps**

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