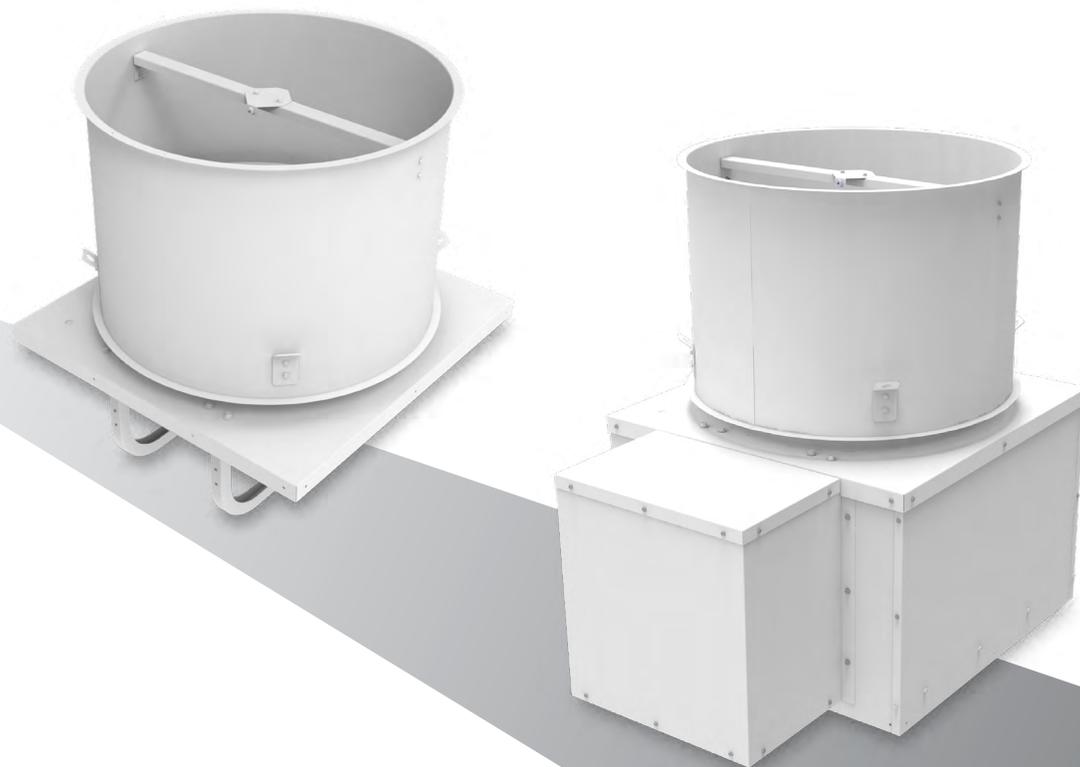


# RAU / RAUMO

## Roof Axial Upblast Ventilator

OPERATION AND MAINTENANCE MANUAL



### IMPORTANT! Read before proceeding!

The information contained herein is, to the best of our knowledge, accurate and applicable for proper operation and installation of the specified equipment at the time this document entered service. Before proceeding, it is recommended that you check for a more current version of this Installation Operation Manual (IOM) on our website at [www.pennbarry.com](http://www.pennbarry.com).

Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

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# INTRODUCTION AND INSTALLATION

These PennBarry Roof Upblast Ventilators are built for general exhaust applications in industrial and commercial buildings such as assembly areas and warehouses.

## Receiving And Handling

PennBarry fans are carefully inspected before leaving the factory. When the unit is received, inspect for any signs of tampering. Inspect the unit for any damage that may have occurred during transit and check for loose, missing or damaged parts. Mishandled units can void the warranty provisions. PennBarry is not responsible for damages incurred during shipment. Avoid severe jarring and/or dropping. Handle units with care to prevent damage to components or special finishes.

## Storage

Long-term storage requires special attention. Units should be stored on a level, solid surface, preferably indoors. If outside storage is necessary, protect the units against moisture and dirt by encasing in plastic or some similar weatherproof material. Periodically inspect units and rotate wheel to spread bearing lubricant. If unit will be stored for extended time, remove belts.

## Installation



These ventilators are not rainproof and not recommended for use over areas that may be damaged by water.



Do not use in explosive atmospheres. This is not an explosion proof ventilator and does not have spark resistant construction.

1. Cut an opening in the roof and install roof curb (by others). The curb should be at least 6" high. For installation over existing curb, use wood nailers over the mounting curb to achieve the desired dimensions.

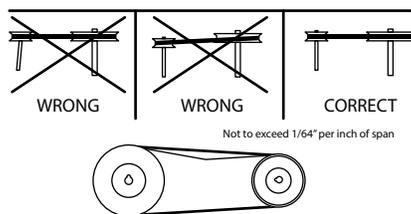


Figure 1: Pulley Alignment

2. If unit is supplied without the motor, belt(s), and pulleys, while ventilator is on its side, mount motor and install the sheaves and belt(s). See Figure 1. Connect power cable to motor as indicated on motor name plate or terminal box cover. Allow sufficient slack in power cables for belt tension adjustment.
3. Place ventilator on curb, aligning electrical conduit from power source and connect the motor per nameplate instructions. Normally, the power cable is brought up from within the building and placed inside one corner of the curb.
4. Secure ventilator to curb through vertical portion of ventilator base through all holes provided. Local codes or good practice may require that unit be additionally guy wired.



If fastening through top surface of the ventilator base, use a lead or neoprene washer under the head of each fastener to prevent water leakage.

# INTRODUCTION AND INSTALLATION



Fan frame and motor must be electrically grounded to a suitable electrical ground such as a grounded water pipe, or properly grounded metallic raceway to ground wire system.

5. Protective guards are recommended for installation below drive support assembly to prevent entry of foreign items or falling parts
6. Check ventilator impeller for free rotation.
7. Check all fasteners for tightness.

## Electrical Connection



Disconnect the power before servicing or installing.



Do not use this equipment in explosive atmospheres!

1. Follow all local electrical and safety codes, the National Electrical Code (NEC), the Occupational Safety and Health Act (OSHA), and the National Fire Protection Association (NFPA) Bulletin 70.
2. Have all electrical work performed by a qualified electrician. Wire the ventilator with proper number of conductors plus ground lead.
3. Make certain that the power source conforms to the requirements of the equipment.
4. Use only properly sized wire according to the NEC.
5. Protect the power cable from coming in contact with sharp objects.
6. Do not kink the power cable. Never allow the cable to come in contact with oil, grease, hot surfaces or chemicals.



Never connect the green, or green and yellow, conductor to a live terminal.

7. Properly ground the ventilator by using a grounded metal-clad raceway system or a separate ground wire connected to the bare metal of the ventilator.



For safety, a lockable disconnect switch, UL rated for HP and voltage, should be located near the fan so power can be positively disconnected while servicing the unit.

8. Check for free rotation of the ventilator impeller.

# START-UP AND OPERATION

## Start-Up And Operation

1. Prevent body contact with rotating components.
2. Apply power and check rotation. Rotation is clockwise when viewed from the top.  
**IMPORTANT:** Incorrect rotation severely overloads motor and may result in serious ventilator and motor damage.
3. Do not touch an operating motor, they run hot! This condition is normal when operating at rated load and voltage.
4. With air systems in full operation, measure current input (AMPS) to motor and compare with nameplate rating to determine if motor is operating under safe load conditions.
5. It is normal for new belts to stretch slightly soon after installation. Therefore, new belts must be retensioned after the first 48 hours of operation.

## Start-Up And Operation of Heat and Smoke control fan

1. Prevent body contact with rotating components
2. Verify product label has model designation ending in HS indicating the fan is listed for smoke control
3. Verify product label must indicate the fan is rated as follows 500 degrees Fahrenheit for up to 4 hours
4. Apply power and check rotation. Rotation is clockwise when viewed from the top.  
**IMPORTANT:** Incorrect rotation severely overloads motor and may result in serious ventilator and motor damage.
5. Do not touch an operating motor, they run hot! This condition is normal when operating at rated load and voltage.
6. With air systems in full operation, measure current input (AMPS) to motor and compare with nameplate rating to determine if motor is operating under safe load conditions.
7. It is normal for new belts to stretch slightly soon after installation. Therefore, new belts must be retensioned after the first 48 hours of operation.

# MAINTENANCE, HIDDEN DANGER, AND SPECIAL PURPOSE SYSTEMS

## Maintenance

Do not attempt maintenance on a fan until the electrical supply has been completely disconnected. Lubrication is a primary maintenance responsibility. Check all bearings periodically. Inspect belts for tightness. If the fan is installed in a corrosive or dirty atmosphere, periodically clean the centrifugal wheel, inlet, motor housing and other moving parts.

## Fan Shaft Lubrication

Fan shaft bearing pillow blocks are furnished in either the prelubricated sealed-for-life type or the greasable type depending on what was ordered. The prelubricated type requires no servicing for 7 to 10 years of normal use and the greasable type are factory greased eliminating the need for greasing initially. Follow the lubricating schedule recommended by the factory. This practice should not supersede any safety considerations.



*Use low pressure grease guns only. High pressure guns tend to blow out or unseat bearing seals, leaving the bearing open to collect grime, dust and foreign particles.*

## Lubrication Schedule

1. Under average conditions where ambient temperatures do not exceed 120°F, lubrication is required 1 to 2 times a year.
2. Under dirt laden atmosphere where there is a temperature range of 120°F to 150°F, lubrication is required from 3 to 6 times a year.
3. Under extreme temperature conditions and extremely dirty atmospheres, lubrication should be scheduled at least once or twice a month.
4. Belt drive units maximum temperature should not exceed 160°F. Direct driven models have temperature range stamped on motor.

## Motor Lubrication

In general, standard motors are furnished with prelubricated, sealed-for-life ball bearings which require no lubrication for 7 to 10 years of normal service. Where motors have been ordered with greasable bearings, these bearings are factory lubricated and require no attention for one year under normal conditions. If grease relief fittings are provided, remove them when performing maintenance to allow grease to flow out. Whenever possible, apply grease while the motor is running. This practice should not supersede any safety considerations. DO NOT OVER GREASE, as most lubricants deteriorate motor windings, thereby reducing motor life and presenting a fire hazard.

**Table 1: Recommended Lubricants**

Manufacturer	Product	Temperature Range
BP	LG-#P-1	Below 32°F (0°C)
Gulf	Gulfcrown EP-1	
Imperial Oil	Unirex EP-1	
Shell	Alvania R-1	
BP	Energrease MPMK11	32°F to 150°F (0°C to 66° C)
Gulf	Gulfcrown EP-2	
Imperial Oil	Unirex EP-2	
Shell	Alvania R-3	
Sun Oil	Sun Prestige 42	
Texaco	Regal AFB2	

# MAINTENANCE, HIDDEN DANGER, AND SPECIAL PURPOSE SYSTEMS

## Hidden Danger

In addition to the normal dangers of rotating machinery, fans present an additional hazard in their ability to suck in not only air, but loose material as well. Solid objects can pass through the fan and be discharged by the impeller as potentially dangerous projectiles. Therefore, screen intake to ductwork, whenever possible, to prevent the accidental entrance of solid objects. Never open access doors to a duct system with the fan running.

When starting the fan for the first time, completely inspect the ductwork and interior of the fan (with the power locked off), to make certain there is no foreign material which can be sucked into or blown through the ductwork.

Where the fan is accessible to untrained personnel or the general public, use maximum safety guards, even at the cost of some performance loss.



Unprotected fans located less than 7' above the floor also require guarding as specified in the Occupational Safety and Health Act (OSHA).

Axial fans may be connected directly to ductwork which will prevent contact with the internal moving parts, but when the inlet or outlet is exposed, install a suitable guard. YORK® by Johnson Controls recommends the use of guards on all exposed non-ducted fans, ceiling and wall mounted.

## Special Purpose Systems

Explosive, corrosive, high temperatures, etc. may require special construction, inspection and maintenance. It is necessary to observe the fan manufacturer's recommendations and limitations concerning the type of material to be handled by the fan and its application to special conditions.

# PARTS REPLACEMENT AND TROUBLESHOOTING CHECKLIST

## Parts Replacement

If replacing parts, do so with properly selected components which duplicate the original parts correctly. Incorrectly sized shafts, belts, pulleys, centrifugal wheels, etc. can damage the fan.

## Troubleshooting Checklist

Symptom	Possible Cause(s)	Corrective Action
Excessive Noise	<ol style="list-style-type: none"> <li>1. Defective or loose motor bearings.</li> <li>2. Ventilator base not securely anchored.</li> <li>3. Loose or unbalanced wheel/propeller.</li> <li>4. Misaligned pulleys or shaft.</li> <li>5. Loose or damaged wheel/propeller.</li> <li>6. Wheel running in wrong direction.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace motor with same frame size, RPM, HP.</li> <li>2. Reset properly.</li> <li>3. Tighten screws, remove build-up, balance wheel/propeller.</li> <li>4. Correct alignment.</li> <li>5. Replace wheel/propeller.</li> <li>6. Reverse direction.</li> </ol>
Fan Inoperative	<ol style="list-style-type: none"> <li>1. Blown fuse or open circuit breaker.</li> <li>2. Loose or disconnected wiring.</li> <li>3. Defective motor.</li> <li>4. Broken belts.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace fuses or circuit breaker.</li> <li>2. Shut off power and check wiring for proper connections.</li> <li>3. Repair or replace motor.</li> <li>4. Replace belts.</li> </ol>
Insufficient Airflow	<ol style="list-style-type: none"> <li>1. Open access doors or loose sections of ducts.</li> <li>2. Clogged filters.</li> <li>3. Operation in wrong direction.</li> <li>4. Insufficient make-up air direction.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check for leakage.</li> <li>2. Clean or replace filters.</li> <li>3. Correct rotation of wheel.</li> <li>4. Add make-up fan or louver opening.</li> </ol>
Motor Overheating	<ol style="list-style-type: none"> <li>1. Belt slippage.</li> <li>2. Overvoltage or under voltage.</li> <li>3. Operation in wrong direction.</li> <li>4. Fan speed too high.</li> <li>5. Incorrect motor (service factor 1.0, low ambient temperature).</li> <li>6. Blocked cooling tube or leaky gasket.</li> <li>7. Undersized motor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust tension or replace bad belts.</li> <li>2. Contact power supply company.</li> <li>3. Reverse direction of motor.</li> <li>4. Slow down fan by opening variable pitch pulley on motor shaft.</li> <li>5. Replace motor with correct open, NEMA service factors (1.15 or higher) with 40 degrees ambient.</li> <li>6. Remove blockage and seal cooling tube in place.</li> <li>7. Check motor ratings with catalog speed and air capacity chart.</li> </ol>

*Notes:*

*Care should be taken to follow all local electrical, safety and building codes. Provisions of the National Electric Code (NEC), as well as the Occupational Safety and Health Act (OSHA) should be followed.*

All motors are checked prior to shipment. If motor defects should develop, prompt service can be obtained from the nearest authorized service station of the motor manufacturer while under warranty. Exchange, repair or replacement will be provided on a no charge basis if the motor is defective within the warranty period. The PennBarry representative in your area will provide a name and address of an authorized service station if requested.

**Warning: Motor guarantee is void unless overload protection is provided in motor wiring circuit.**



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PennBarry | [www.pennbarry.com](http://www.pennbarry.com) | [pennbarrysales@pennbarry.com](mailto:pennbarrysales@pennbarry.com) | tel: 972.212.4700 | fax: 972.212.4702

PennBarry reserves the right to make changes at any time, without notice, to models, construction, specifications, options and availability. This manual illustrates the appearance of PennBarry products at the time of publication.

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