

Routine Maintenance

⚠ WARNING

Hazardous Service Procedures!

The maintenance and troubleshooting procedures recommended in this manual could result in exposure to electrical, mechanical or other potential safety hazards. Always refer to the safety warnings provided throughout this manual concerning these procedures. Unless specified otherwise, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks. Failure to follow all of the recommended safety warnings provided, could result in death or serious injury.

⚠ WARNING

Rotating Components!

The following procedure involves working with rotating components. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/ tagout procedures to ensure the power can not be inadvertently energized. Secure rotor to ensure rotor cannot freewheel. Failure to secure rotor or disconnect power before servicing could result in rotating components cutting and slashing technician which could result in death or serious injury.

Maintenance Checklist

Table 17. Maintenance Checklist

After 48 hours of operation	
<input type="checkbox"/>	For belt-drive fans, the belts have acquired their permanent set. Readjust but do not overtighten. See "Tension the Fan Belt," p. 52 for more information.
Every week	
<input type="checkbox"/>	Observe unit weekly for any change in running condition and unusual noise.
Every month	
<input type="checkbox"/>	Clean or replace air filters if clogged or dirty; coat permanent filters with oil after cleaning; change bag filters when pressure drop is 1 in. wg. See "Air Filters" on page 57 for more information.
<input type="checkbox"/>	Belt-drive fans - relubricate fan bearings if necessary. See "Fan Bearing Lubrication" on page 63 for more information.
<input type="checkbox"/>	Belt-drive fans - check and adjust fan belt tension. See "Tension the Fan Belt," p. 52 for more information.
Every three to six months	
<input type="checkbox"/>	Belt-drive fans - check fan bearing grease line connections. Lines should be tight to the bearings.
<input type="checkbox"/>	Check motor bracket torque. See Table 18, p. 63 for torque requirements.
<input type="checkbox"/>	Belt-drive fans - check bearing bolt torque and bearing setscrew torque. See Table 18, p. 63 for torque requirements.
<input type="checkbox"/>	Belt-drive fans - align fan and motor sheaves. Tighten sheave set screws to the proper torque. See "Align Fan and Motor Sheaves," p. 54 for more information.
<input type="checkbox"/>	Inspect and clean drain pans. See "Coils" on page 57 for more information.
<input type="checkbox"/>	Tighten electrical connections.
<input type="checkbox"/>	Inspect coils for dirt build-up. See "Coils" on page 57 for more information.
Every year	
<input type="checkbox"/>	Inspect the unit casing for corrosion. If damage is found, clean and repaint.
<input type="checkbox"/>	Clean the fan wheels and shaft. See "Coils" on page 57 for more information.
<input type="checkbox"/>	Inspect and clean drain pans.
<input type="checkbox"/>	Check damper linkages, set screws, and blade adjustment. Clean, but do not lubricate, the nylon damper rod bushings.
<input type="checkbox"/>	Clean damper operators.
<input type="checkbox"/>	Inspect electrical components and insulation.
<input type="checkbox"/>	Inspect wiring for damage.
<input type="checkbox"/>	Rotate the fan wheel and check for obstructions. The wheel should not rub. Adjust the center if necessary.
<input type="checkbox"/>	Lubricate motor bearings in accordance with motor manufacturer's recommendations (see "Motor Bearing Lubrication" on page 63 for more information).
<input type="checkbox"/>	Check condition of gasketing and insulation around unit, door and dampers.
<input type="checkbox"/>	Examine flex connections for cracks or leaks. Repair or replace damaged material.

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⚠ WARNING

Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

Maintenance Checklist

Table 61. Maintenance Checklist

Frequency	Maintenance
Every week	<ul style="list-style-type: none"> Observe unit weekly for any change in running condition and unusual noise.
Every month	<ul style="list-style-type: none"> Clean or replace air filters if clogged or dirty. Inspect and clean the main and auxiliary drain pans.
Every three to six months	<ul style="list-style-type: none"> Manually rotate the fan wheel to check for obstructions in the housing or interference with fan blades. Remove any obstructions and debris. Check motor bracket torque. Inspect coils for dirt build-up. Clean fins if airflow is clogged.
Every year	<ul style="list-style-type: none"> Check and tighten all set screws, bolts, locking collars and sheaves. Inspect the unit casing for chips corrosion. If damage is found, clean and repaint. Clean the fan wheels. Remove any rust from the shaft with an emery cloth and recoat with L.P.S. 3 or equivalent. Rotate the fan wheel and check for obstructions. The wheel should not rub. Adjust the center if necessary. Inspect and clean drain pans. Check damper linkages, fan set screws, and blade adjustment. Clean, but do not lubricate, the nylon damper rod bushings. Inspect, clean, and tighten all electrical connections and wiring. Inspect the strainer option for debris trapped in the filter screen. Examine flex connections for cracks or leaks. Repair or replace damaged material.

Air Filters

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Rotating Components!

The following procedure involves working with rotating components. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/ tagout procedures to ensure the power can not be inadvertently energized. Secure rotor to ensure rotor cannot freewheel. Failure to secure rotor or disconnect power before servicing could result in rotating components cutting and slashing technician which could result in death or serious injury.

Change or clean air filters at least twice a year. Filters require more frequent care under high load or dirty air conditions since a clogged filter reduces airflow. Table 1 and Table 2 on page 16 lists filter size and quantity by unit size. Throwaway and pleated media filters are available for all units.

NOTICE:

Replace All Panels and Filters Properly!

All unit panels and filters must be in place prior to unit startup. Failure to have panels and filters in place could result in equipment damage.

Remove the front panel of the vertical recessed unit and open the bottom panel door of the horizontal cabinet and

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Maintenance Checklist

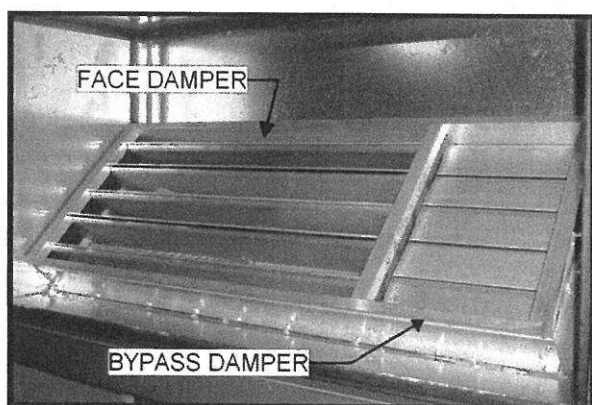
Table 52. Maintenance Checklist

Frequency	Maintenance
After 48 hours of operation	<ul style="list-style-type: none"> For belt-drive fans, the belts have acquired their permanent set. Readjust but do not overtighten. See "Tension the Fan Belt," p. 119 for more information.
Every week	<ul style="list-style-type: none"> Observe unit weekly for any change in running condition and unusual noise.
Every month	<ul style="list-style-type: none"> Clean or replace air filters if clogged or dirty; coat permanent filters with oil after cleaning; change bag filters when pressure drop is 1 in. w.g. See "Filters," p. 151 for more information. Belt-drive fans - relubricate fan bearings if necessary. See "Fan Bearing Lubrication," p. 150 for more information. Belt-drive fans - check and adjust fan belt tension. See "Tension the Fan Belt," p. 119 for more information.
Every three to six months	<ul style="list-style-type: none"> Belt-drive fans - check fan bearing grease line connections. Lines should be tight to the bearings. Check motor bracket torque. See Table 53, p. 150 for torque requirements. Belt-drive fans - check bearing bolt torque and bearing setscrew torque. See Table 53, p. 150 for torque requirements. Belt-drive fans - align fan and motor sheaves. Tighten sheave set screws to the proper torque. See "Align Fan and Motor Sheaves," p. 121 for more information. Inspect and clean drain pans. See "Drain Pans," p. 136 for more information. Tighten electrical connections. Inspect coils for dirt build-up. See "Coils," p. 134 for more information. Clean moisture eliminator with high pressure sprayer. Remove pollen in the spring and leaves in the fall.
Every year	<ul style="list-style-type: none"> Inspect the unit casing for corrosion. If damage is found, clean and repaint. Clean the fan wheels and shaft. See "Fans," p. 149 for more information. Inspect and clean drain pans. Check damper linkages, set screws, and blade adjustment. Clean, but do not lubricate, the nylon damper rod bushings. Clean damper operators. Inspect electrical components and insulation. Inspect wiring for damage. Rotate the fan wheel and check for obstructions. The wheel should not rub. Adjust the center if necessary. Lubricate motor bearings in accordance with motor manufacturer's recommendations (see "Motor Bearing Lubrication," p. 150 for more information). Check condition of gasketing and insulation around unit, door and dampers. Examine flex connections for cracks or leaks. Repair or replace damaged material.

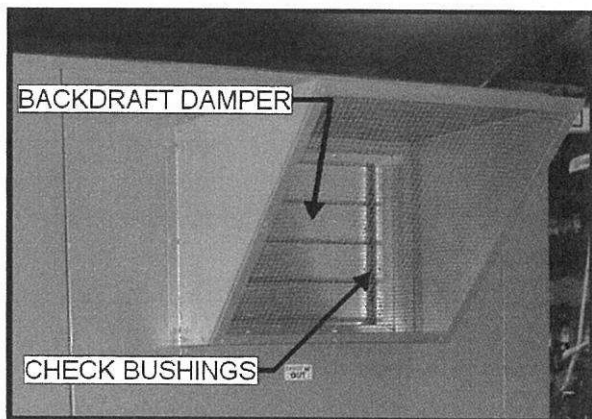
INSTALLATION INSTRUCTIONS FOR OPTIONAL EQUIPMENT

DAMPERS

- Check the damper actuators and linkage connections to ensure they are securely mounted.
- The damper should be unobstructed and operate freely.
- Outside Air and Return Air shut-off dampers should open before blower motors engage.



Face and Bypass Dampers



Backdraft Damper

- Damper actuators must be wired to operate in accordance with system requirements. On-Off actuators should generally open the face side of the damper when in the "ON" position. Modulating actuators must operate in accordance with the system wiring diagram.

MAINTENANCE INSTRUCTIONS FOR GENERAL EQUIPMENT

NEVER ATTEMPT TO PERFORM ANY MAINTENANCE ON AN XETEX UNIT UNLESS THE POWER IS COMPLETELY DISCONNECTED AND LOCKED. FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN SERIOUS INJURY OR DEATH.

HEAT-X-CHANGERS

Periodically check the four exchanger face surfaces to assure unobstructed airflow. Place a light in the exhaust outlet and examine the inside of the Heat-X-Changer from the Exhaust Inlet. Examine the inside of the supply air channels in the same way.

For flat plate exchangers, it is normally sufficient to clean just a few inches inside the face of the exchanger with a brush or hot water. For the enthalpy core in this unit, use only pure water—do not use any additional chemicals or cleaning solutions. For dirtier applications, the exchanger core may periodically be removed from the unit to facilitate cleaning of entire plate surfaces (again, using only pure water). Never exert excessive direct or shearing force against the plates as they may deform or tear.

BLOWERS

Periodic Inspection

- Check the security of mounting bolts and look for signs of corrosion.
- If provided, check the security of the Vibration Isolators.
- If provided, inspect the flexible canvas duct connectors for tears, cracks, and other signs of wear.

- If the unit is shut off or stored and the blower is not regularly run, the blower wheel should be manually rotated every two weeks. Turn the wheel several times and bring it to a stop 90° from the previous position. This will redistribute the grease and prevent flat-spotting of the bearings and deformation of the shafts.

Bearing Lubrication

- Blowers in XeteX units are filled with grease before they are shipped. If the unit is not immediately installed and run, the blower bearings should be regreased and wrapped with plastic.
- When adding grease, rotate the blower wheel to ensure an even distribution throughout the bearing assembly. Note: excessive pressure may damage the seals.
- After each month of storage the bearings should be purged with new grease to remove any accumulated moisture.
- Use lithium-based grease that conforms to NLGI Grade 2, such as Shell Alvania®.
- Blower bearings are shipped filled with grease. When the blower is operating it requires less grease than when in storage. When first run, extra grease may bleed from the seals and internal bearing temperature

may be higher than expected. This is normal and no attempt need be made to replace lost grease. When the appropriate level of grease is reached, bearing temperature will return to normal.

- When adding grease to a blower in regular service, the blower should be rotating. Making sure that all guards are in place and—observing all other safety precautions—rotate it by hand (hand rotation is recommended). Add just enough grease to cause a slight purging at the seals.

Direct Drive Blowers

- Electrically connect the correct motor leads to obtain the appropriate RPM. Follow the rest of the instructions in this manual to check out the blower and motor.

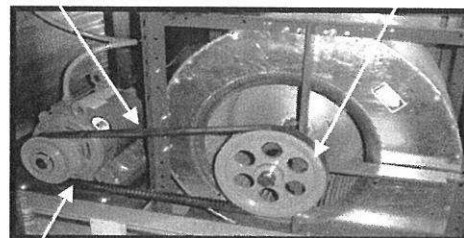
V-Belt Drives

- Check and adjust belt tension and alignment as necessary. After start up and 80 hours of operation, re-tighten belt tension. See Attachment A at the end of this document for further information.
- To maintain performance, it is important that the drives be properly aligned with motor and blower shafts parallel. Good pulley alignment is also important in order to conserve belt life and eliminate unnecessary noise. Motors must be adjusted until finger pressure in the middle of the belt results in about $\frac{3}{4}$ " deflection of the belt. Small adjustments may be required after initial startup to maintain smooth operation. Belts stretch over a period of time and the motor must be adjusted to compensate.
- Excessive deflection indicates that the belt is not tight enough. If not corrected, this condition could result in slippage, loss of blower speed, and eventual belt failure.
- Too small a deflection indicates that the

belt is too tight. If it is not slackened, it could cause noise from excessive vibration, premature bearing failure, and shorter belt life. Excessive belt tension can create a power demand sufficient to overload an otherwise-adequate motor. A belt should be just tight enough to avoid slippage.

CHECK BELT TENSION
AND ALIGNMENT

GREASE BEARINGS



MOTOR BASE
ADJUSTMENT

- Inspect motors regularly to determine whether they are still soundly mounted and belts are not slipping. Accumulation of dust and oil on the wheel will impair its performance and put the unit out of balance. If this occurs, the wheel and housing must be cleaned. A large amount of oil accumulating in a system is dangerous and can create a fire hazard.
- If blowers are provided with starters and overloads, overloads may trip if adjusted to a setting below the rated load amps (RLA) of the motors. Periodically check to see that the overloads adjusted to the appropriate value slightly above the motor RLA.

MOTORS

- Lubricate the bearings (if the unit is not provided with permanently lubricated bearings).
- Check the security of the motor mount bolts.

DRAINS

- Insure that drains are opened and unobstructed. Drain lines must be free of foreign material.
- Drains must be kept wet. Failure to do so will result in condensate leakage within the unit and potentially leakage from outside of the unit.

DISPOSABLE FILTERS

Inspect the filters and change or clean as required by the environmental conditions.

INTAKE AND EXHAUST HOODS

For units with outdoor mounted hoods, inspect bird screens for debris such as cat tail and cotton wood seeds, insects, etc. Clean with unit shutdown using a brush or vacuum.

EXHAUST AIR STREAM

- Visually inspect the leading edges of the intake end on the exhaust air stream side of the heat recovery elements.
- Inspect the exhaust blower intake, blower wheels, and blower housing. Clean these as necessary.
- Initial inspections must be conducted in order to determine the necessity and the frequency needed for cleaning the heat recovery elements. *Note: the unit must be shut down (supply and exhaust fans) during cleaning and at any time the unit is being serviced.

SUPPLY AIR STREAM

The supply air side of the heat recovery element should not require wash down if the disposable filters are maintained regularly according to the environmental conditions.

DUCT WORK SEALS

Periodically examine the ductwork connections seals. Reseal as necessary. (The entire heat recovery unit may operate under negative pressure.)

MAINTENANCE INSTRUCTIONS FOR OPTIONAL EQUIPMENT

DAMPERS

Check the bearings and motors to assure smooth operation. Periodically clean the damper blades and components.



PERFORMANCE SPECIFICATION

UNIT TAG : ERV-1

MODEL : IAQ- 4000-RT-BP-SP

PROJECT: Beecher

LOCATION: CT

Elevation: 0 ft

UNIT SPECIFICATIONS

	SUPPLY	AIRFLOW	EXHAUST
AIRFLOW :	3500	SCFM	3500
EXTERNAL, S.P. :	0.50	IN. WG	0.50
TOTAL S.P. :	2.75	IN. WG	2.65
DRIVE TYPE :	Belt	DRIVE	Belt
BLOWER SIZE :	12"-9"	FC DWDI	12"-9"
MOTOR HP :	5	HP	5
BHP :	2.53	BHP	2.69
RPM :	1295	RPM	1345
VOLTAGE :	480	VOLTS	480
PHASE :	3	PHASE	3
Enthalpy Exchanger			
ELEMENT SIZE	30(2.5)		
LENGTH (in.) :	42		
1 OR 2 PASS :	1		
Frost Bypass (%) :	0		
Frost Ctrl Stpt (*F DB) :	35		
Frost Ctrl SA (*F DB) :	49.1		
IDEC (Y or N) :	n		

UNIT OPTIONS

	COOLING	HEATING	HEATING
	(None)	(None)	(None)
COIL TYPE	0%	%	0%
BYPASS :	0%	%	0%
PERCENT GLYCOL :			
ROWS :			
FINS :		FPI	
HEIGHT :		INCHES	
WIDTH :		FPM	
AIR VELOCITY :		IN. WG	
AIR P.D. :			
ENT. TEMP DB :		°F	
ENT. TEMP WB :		°F	
LEAV. TEMP DB :		°F	
LEAV. TEMP WB :		°F	
MIXED AIR DB :		°F	
MIXED AIR ABS HUMIDITY :		grains/lb	
CAPACITY :		MBH	
TONS COOLING :		KW	
SENS. HEAT RATIO :			

EXCHANGER PERFORMANCE

SUPPLY AIR	WINTER		SUMMER
ENTERING TEMP :	10	*F DB	87
ENTERING WB :	8	*F WB	73
ENTERING % RH :	61.5%	% RH	51.7%
ENT. ENTHALPY :	3.36	BTU/LB	36.49
LEAVING TEMP :	49.1	*F DB	80.3
LEAVING WB :	37.3	*F WB	68.7
LEAV. ENTHALPY :	13.95	BTU/LB	32.81
FACE VELOCITY :	431	FPM	431
AIR P.D. :	1.52	IN. WG	1.52
ENERGY RECOVERED :	166	MBH	58

EXHAUST AIR			
ENTERING TEMP :	68	*F DB	77
ENTERING WB :	50	*F WB	64
ENTERING % RH :	24.6%	% RH	49.3%
ENT. ENTHALPY :	20.17	BTU/LB	29.13
LEAVING TEMP :	29	*F DB	83.8
LEAVING WB :	26.3	*F WB	68.7
LEAV. ENTHALPY :	9.51	BTU/LB	32.77
FACE VELOCITY :	431	FPM	431
AIR P.D. :	1.52	IN. WG	1.52

FILTERS

OUTSIDE AIR (2", MERV 8) :	Height	Width	Quantity
SIZE :	24	16	4
FACE VEL. (FPM) :	328		
AIR P.D. (IN. WG) :	0.41	(includes filter loading)	
RETURN AIR (2", MERV 8) :	Height	Width	Quantity
SIZE :	24	16	4
FACE VEL. (FPM) :	328		
AIR P.D. (IN. WG) :	0.41	(includes filter loading)	

Primary Energy Recovery Effectiveness*

	Winter		Summer
Sensible :	67.4	%	67.0
Latent :	44.7	%	41.0

DAMPERS
OA SHUT-OFF : Included
EA SHUT-OFF : Included
FACE&BYPASS : Included

ACUTATORS
2 Position : Included
2 Position : Included
Modulating : Included

*Effectiveness is calculated according to ASHRAE and AHRI 1060-2005. The occurrence of condensation may cause values of greater than 100%. Contact Factory for further information.

Notes:

UNIT PHYSICAL DATA

HEIGHT (IN.) 64"

LENGTH (IN.) 132"

WIDTH (IN.) 70"

WGT (lbs) 3,600