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The City of Traverse City

Office of the City Manager

GOVERNMENTAL CENTER

400 Boardman Avenue  
Traverse City, MI 49684  
(231) 922-4440  
(231) 922-4476 Fax



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February 11, 2015

Bidder:

The City of Traverse City will receive sealed bids in the Office of the City Manager, Second floor, Governmental Center, 400 Boardman Avenue, Traverse City, Michigan, 49684, until **Wednesday, February 25, 2015, at 2:00 PM** for the following:

**Service, Examination and Maintenance of the HVAC System  
Carnegie Building, 322 Sixth Street, Traverse City, MI  
(specifications attached)**

If the specifications are obtained from the City's new updated website link at: [http://www.traversecitymi.gov/bids\\_and\\_rfps.asp](http://www.traversecitymi.gov/bids_and_rfps.asp), it is the sole responsibility of the Bidder to check the website for updates and addenda prior to the bid being submitted. Bidder may also sign up to receive notifications when bids and RFPs are posted by sending an e-mail requesting same to [jdalton@traversecitymi.gov](mailto:jdalton@traversecitymi.gov)

The City of Traverse City reserves the right to accept or reject any or all bids, waive irregularities, and to accept the bids either on an entire or individual basis that is in the best interest of the City.

The City accepts no responsibility for any expense incurred by the Bidder in the preparation and presentation of a bid. Such expenses shall be borne exclusively by the Bidder.

Only the successful Bidder will be notified. If you so desire, you may call for results.

You must indicate on the outside of the sealed envelope that the bid is for the **“Carnegie Building HVAC.”**

You must submit **TWO (2) SEALED COPIES** of the bid to the City Manager's Office prior to the above-indicated time and date or the bid will not be accepted. Telefaxed or E-Mail bids will not be accepted.

Please note that if you have previously submitted an informal quote, you will still need to submit a sealed bid prior to the date and time specified above in order to be considered. Please ensure that all requirements listed in the specifications are met.

If you have any questions, please contact Penny Hill, Assistant City Manager, at (231) 922-444, before the bid is submitted.

PLEASE SUBMIT BID TO: Julie Dalton, Purchasing Agent  
400 Boardman Avenue, 2<sup>nd</sup> Floor  
Traverse City, MI 49684

**HVAC SYSTEM  
CARNEGIE BUILDING  
322 SIXTH STREET  
CITY OF TRAVERSE CITY  
REQUEST FOR BIDS**

**INSTRUCTIONS TO BIDDERS**

**1. INTENT**

The City of Traverse City is requesting bids from qualified experienced HVAC System contractors (Contractor) for the service, examination and maintenance of the HVAC System (including the heating, cooling, humidification and thermostat control system) at the Carnegie Building, 322 Sixth Street, Traverse City, Michigan.

The City intends to select the qualifying contractor on the basis of qualifications, ability, relevant experience, cost, work plans and time frame, possession of required licenses and insurance and other pertinent factors. The Contractor must have all required licenses and will be required to accept a service order from the City for this work. The Contractor shall comply with all applicable federal, state, local and building codes, laws, rules and regulations and obtain any required permits for this work. A sample service order is attached to this Request for Bids. All requirements of the service order must be met, including workers compensation insurance pursuant to Michigan law.

**2. SCOPE OF SERVICES**

This scope of services shall consist of the service, examination and maintenance of the HVAC System, including but not limited to the chillers, boilers, humidifiers, fan coil units, and air handlers with heating and cooling coils, located at the Carnegie Building.

**3. SPECIFICATIONS**

The service, examination and maintenance of the entire HVAC System (including the heating, cooling, humidification and thermostat control system) for defects shall be conducted by a licensed HVAC journey person twice per year. In addition, the Contractor shall be responsible for the thermostat control system which requires weekly monitoring of temperature (not humidity) levels based upon occupancy and use. Service shall be conducted during regular business hours Monday - Friday between the hours of 10:00 AM and 5:00 PM. The time frame shall be for a 3-year period. A service order shall be issued each year of the three-year period, upon satisfactory service, as determined by the City Manager or his designee, and as long as the price remains the same as in the original bid.

All systems shall be checked for proper operation, including:

- A. Inspect all belts and pulleys and replace belts as needed
- B. Inspect and lubricate all bearings

- C. Inspect and tighten electrical wiring and connections
- D. Inspect pumps for leakage
- E. Inspect valves for leakage and corrosion
- F. Inspect fans
- G. Check filters and clean if possible and/or replace every 3 months - owner to furnish filters
- H. Inspect and lubricate motors
- I. Inspect and lubricate dampers and linkage
- J. Inspect operating controls for proper operation
- K. Contractor to immediately provide written report to the City Manager describing any dangerous or unsafe condition or non-routine maintenance issues observed.

Contractor shall be responsible for all of the tasks listed on the attached maintenance schedules for equipment listed on page 8. In addition, the Nelson air fan coil units shall be inspected and cleaned (blown out) in the fall (no maintenance schedule available).

Contractor shall conduct an annual boiler inspection. Contractor shall train Traverse City staff on monthly testing requirements.

#### **4. EXAMINATION OF HVAC SYSTEM**

Contractors submitting bids may examine the HVAC System with staff prior to the bid opening date to familiarize themselves with the project. Contractors who have not seen this system are strongly encouraged to examine the system personally. The system may be examined during normal working hours between 10:00 AM and 5:00 PM Monday through Friday by contacting Penny Hill, Assistant City Manager, at (231) 922-4444.

Prior to submission of the bid, bidder shall make and shall be deemed to have made a careful examination of the site, any plans, specifications, service order as included herewith, and shall have become informed as to the location and nature of the proposed project, general local conditions and all other matters that may affect the cost and time of completion of the project.

Ignorance of conditions that now exist or that may hereafter exist, or of any conditions or difficulties that may be encountered in the execution of the work as a result of failure to make such examination or becoming so informed, will not be accepted as an excuse for any failure or omission on the part of the Contractor to fulfill in every respect all of the requirements of the service order, and will not be accepted as a basis for any claim for extra compensation or extension of time.

#### **5. DISCLOSURE BY CITY COMMISSIONER**

Pursuant to 1968 Public Act 317, a City Commissioner with a pecuniary interest in a business submitting a bid for which the City may enter into a contract is required to publicly disclose their pecuniary interest prior to awarding the contract. A form is provided and shall be included with the bid.

**6. INSURANCE**

10. Insurance. The Contractor agrees not to change and agrees to maintain the following insurance throughout the period of performance of this Agreement. The Contractor will upon execution of this Agreement provide a certificate of insurance to the City Clerk. The policy shall contain endorsements stating that at least a 10-day notice will be given to the City prior to termination or any change in the policy; and in the case where Contractor is required to name the City as additional insured, shall provide an endorsement stating that the City has been named as an additional insured onto such policy for all claims arising out of the Contractor's work. Should any required insurance be cancelled, materially reduced or expired, all activities under this Agreement shall immediately cease until substitute insurance in compliance with all requirements hereof has been procured and evidence thereof presented to the City. Upon request by the City Clerk, Contractor shall provide a full copy of any insurance policy for insurance coverage required under this agreement within ten (10) days of request. This time frame may be extended by the City Clerk in cases where the policy has not been issued.

A. Commercial General Liability. The Contractor shall acquire and maintain commercial general liability insurance coverage in the amount of \$2,000,000 per occurrence with the City being named as additional insured for all claims arising out of the Contractor's work, including completed operations coverage (if required in the Request for Proposals/Bids).

B. Workers Compensation. The parties shall maintain suitable workers compensation insurance pursuant to Michigan law and the Contractor shall provide a certificate of insurance or copy of state approval for self-insurance to the City Clerk upon execution of this Agreement.

**7. PAYMENT**

Payment shall be made by check when services are rendered quarterly or annually. The City issues checks on the 10<sup>th</sup> and the 25<sup>th</sup> of each month. Invoices must be submitted by at least the 5<sup>th</sup> and the 20<sup>th</sup> of each month to be included in the check runs on those dates.

**8. THIRD PARTY PARTICIPATION**

The Contractor agrees that despite any subcontract entered into by the Contractor for execution of activities or provision of services related to the completion of this project, the Contractor shall be solely responsible for carrying out the project pursuant to this service order. The Contractor shall specify in any such subcontract that the subcontractor shall be bound by this service order and any other requirements applicable to the Contractor in the conduct of the project unless the City and the Contractor agree to modification in a particular case. The Contractor shall not subcontract unless agreed upon in writing by the City.

**9. PROTECTION OF WORK AND PROPERTY**

The Contractor shall continuously maintain adequate protection of the Contractor's work from damage and shall protect all public and private property from injury or loss arising in connection

with Contractor's work, and shall defend and save the City harmless from all such damages or injuries occurring because of Contractor's work.

**10. SILENCE OF SPECIFICATIONS**

The apparent silence of these specifications and any supplemental specifications as to any detail, or the omission from them of a detailed description concerning any point, shall be regarded as meaning only that the best commercial practices are to prevail and only material of the first quality and correct type, size and design are to be used. All workmanship is to be first quality. All interpretations of these specifications will be made upon the basis of this statement.

**11. SUBMITTAL OF BID**

Each bidder shall sign the bid, giving bidder's name, address and status, that is, whether an individual, partnership or corporation.

Bidders shall be well qualified in the type of work which is included in this bid. Bids are solicited only from those who will start work promptly after the award is made.

The City reserves the right to accept any bid or to reject any or all bids, and to accept bids either on an entire or individual basis that is in the best interest of the City of Traverse City.

Contractors should submit a sealed bid containing:

- A. Bid Summary Sheet
- B. A statement of professional qualifications
- C. A statement of the contractor's previous experience, with references of recent customers
- D. A list of any exclusions and/or inclusions
- E. A statement of hourly rates for after hour emergencies
- F. Identification of a contact person to whom inquiries should be directed, with an address and telephone number

Sealed bids clearly marked "**Carnegie Building HVAC**" must be received at the following location no later than **Wednesday, February 25, 2015 at 2:00 P.M.**

Julie Dalton, Purchasing Agent  
400 Boardman Avenue, 2<sup>nd</sup> floor  
Traverse City MI 49684

**Telefaxed or e-mailed bids are not acceptable.** Only the successful contractor will be notified. If you so desire, you may call for results.

**Bidder - Please complete and return**

**BID SUMMARY**

**TITLE: Service, Examination and Maintenance of the HVAC System  
Carnegie Building, 322 Sixth Street, Traverse City, MI**

**DUE DATE: Wednesday, February 25, 2015 at 2:00 PM**

Having carefully examined the attached specifications and any other applicable information, the undersigned proposes to furnish all items necessary for and reasonably incidental to the proper completion of this bid. Bidder submits this bid and agrees to meet or exceed all requirements and specifications unless otherwise indicated in writing and attached hereto.

Bidder certifies that as of the date of this bid the Company or he/she is not in arrears to the City of Traverse City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City of Traverse City.

Bidder understands and agrees, if selected as the successful Bidder, to accept a Purchase Order / Service Order / Contract and to provide proof of the required insurance.

Bidder submits this bid and agrees to meet or exceed all the City of Traverse city's requirements and specifications unless otherwise indicated in writing and attached hereto. Bidder shall comply with all applicable federal, state, local and building codes, laws, rules and regulations and obtain any required permits for this work.

The Bidder certifies that it is in compliance with the City's Nondiscrimination Policy as set forth in Administrative Order No. 47 and Chapter 605 of the City's Codified Ordinances.

The Bidder certifies that none of the following circumstances have occurred with respect to the Bidder, an officer of the Bidder, or an owner of a 25% or more share in the Bidder's business, within 3 years prior to the bid:

- (a) conviction of a criminal offense incident to the application for or performance of a contract;
- (b) conviction of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense which currently, seriously and directly reflects on the Bidder's business integrity;
- (c) conviction under state or federal antitrust statutes;
- (d) attempting to influence a public employee to breach ethical conduct standards; or
- (e) conviction of a criminal offense or other violation of other state, local, or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in

the opinion of the City indicates that the bidder is unable to perform responsibility or which reflects a lack of integrity that could negatively impact or reflect upon the City of Traverse City, including but not limited to, any of the following offenses or violations of:

- i. The Natural Resources and Environmental Protection Act.
- ii. A persistent and knowing violation of the Michigan Consumer Protection Act.
- iii. Willful or persistent violations of the Michigan Occupational Health and Safety Act.
- iv. A violation of federal, local, or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
- v. Repeated or flagrant violations of laws related to the payment of wages and fringe benefits.

(f) the loss of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

Bidder understands that the City reserves the right to accept any or all bids in whole or part and to waive irregularities in any bid in the best interest of the City. The bid will be evaluated and awarded on the basis of the best value to the City. The criteria used by the City may include, but will not be limited to: ability, qualifications, timeframe, experience, price, type and amount of equipment, accessories, options, insurance, permits, licenses, other pertinent factors and overall capability to meet the needs of the City. The City is sales tax exempt – Government.

Bidder agrees that the bid may not be withdrawn for a period of sixty (60) days from the actual date of the opening of the bid.

**Total annual cost of service, examination and maintenance for:**

**Year 1:** \$ \_\_\_\_\_

**Year 2:** \$ \_\_\_\_\_

**Year 3:** \$ \_\_\_\_\_

**Total hourly rate for after hour emergencies:** \$ \_\_\_\_\_

Submitted by:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Name and Title (Print)

\_\_\_\_\_  
Company Address

\_\_\_\_\_  
Phone                      Fax

\_\_\_\_\_  
City,                      State,                      Zip

\_\_\_\_\_  
Sole proprietorship/partnership/corporation

\_\_\_\_\_  
If corporation, state of corporation

REFERENCES: (include name of organization, address, contact person, daytime phone number, and length of time services have been performed).

- 1. \_\_\_\_\_  
\_\_\_\_\_
- 2. \_\_\_\_\_  
\_\_\_\_\_
- 3. \_\_\_\_\_  
\_\_\_\_\_

SUBCONTRACTORS: (include name of organization, address, contact person, daytime phone number, and services to be performed).

- 1. \_\_\_\_\_  
\_\_\_\_\_
- 2. \_\_\_\_\_  
\_\_\_\_\_
- 3. \_\_\_\_\_  
\_\_\_\_\_

**CARNEGIE BUILDING  
CURRENT EQUIPMENT**

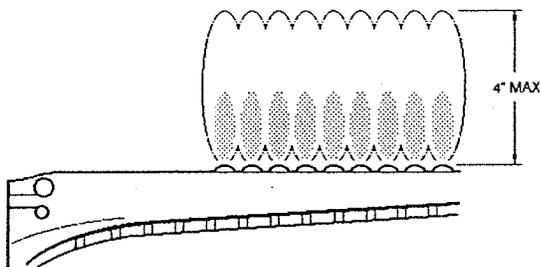
<u>Qty.</u>	<u>Make</u>	<u>Model</u>	<u>Description</u>
2	Ray-Pac	H6-0514	Hot Water Boilers
4	York	AP150 AP35 AP60 AP105	Air Handlers with heating and cooling coils
3	Dri-Steam	VLC-16-1	Steam Humidifiers
1	York	YCAL003417XAA	Scroll Chillers
3	Nelson Air		Fan Coil Units (no maintenance schedule available)

See attached maintenance schedules.

**INSPECTION PROCEDURES**

**BURNERS**

Clean main burners and air louvers of dust, lint and debris. Keep boiler area clear and free from combustibles and flammable liquids. Do not obstruct the flow of combustion and ventilating air. Make visual check of burner and pilot flame. Yellow flame indicates clogging of air openings. Lifting or blowing flame indicates excess high gas pressure. Low flame indicates low gas pressure.



TYPICAL MAIN BURNER FLAME Fig. #.

8144

*NOTE: Modulating burner flame varies in height from approximately 1/4" at low fire to approximately 4" in high fire.*

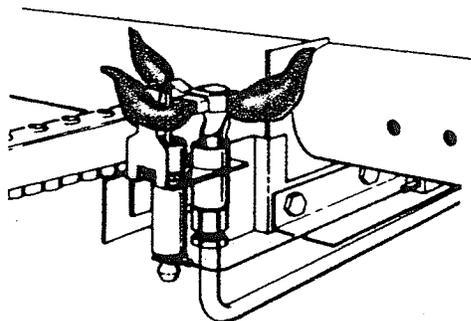


Fig #9336

PILOT BURNER FLAME (IID UNITS)

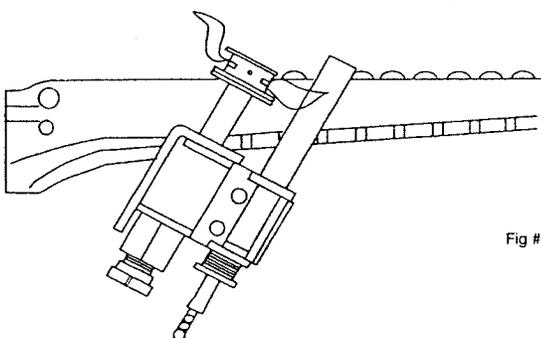


Fig #8964.1

PILOT BURNER FLAME (STG PILOT UNITS)

**CONTROLS**

Check all controls to see that they are operational. To check electronic safety (IID Models), turn off main burner. Observe pilot burner when shutting off pilot gas. Ignition spark should go on. Main gas valve will also drop out.

High Limit Switch - to check high limit switch, turn dial setting down to a point slightly below the temperature of the water leaving the heater. The reset button should snap out and the burner should shut off. Reset dial to 30°F to 40°F above desired operating temperature, and push reset button. Burner should light.

**NORMAL INSPECTION PROCEDURES**

First and third month after initial start up and then on an annual basis. If problems are found, refer to Trouble Shooting Guide for additional directions.

1. Remove top of heater and inspect heat exchanger for soot and examine venting system.
2. Remove rear header and inspect for scale deposits, and/or accelerated erosion.
- \*3. Inspect pilot and main burner flame and firing rate.
- \*4. Inspect and operate all controls and gas valve.
- \*5. Visually inspect system for water leaks.
- \*6. a. Oil pump motor and bearing assembly, if oil cups are provided.
- b. Disconnect pump from header and check condition of pump impeller. Check condition of bearing by attempting to move impeller from side to side. Replace any parts showing wear.
- c. Check pump coupler for wear and vibration.
7. Check flow switch paddle.
8. Clean room air intake openings to assure adequate flow of combustion and ventilation air.

**CAUTION:** Combustion air must not be contaminated by corrosive chemical fumes which can damage the boiler and void the warranty.

9. Keep boiler area clear and free from combustible materials, gasoline, and other flammable vapors and liquids.

\*Should be checked monthly. (Takes approximately 15 minutes).

## MAINTENANCE

### GENERAL

A planned program of regularly scheduled maintenance will return dividends by averting possible costly and unexpected periods of down time. It is the responsibility of the owner to provide the necessary maintenance for the air handling units and coils. If a system failure occurs due to improper maintenance during the warranty period, YORK will not be liable for costs incurred to return the unit to satisfactory operation.

Removable access doors have been provided on all units to enhance performance of necessary maintenance and to provide access to various components which in time may require replacement.

### PERIODIC MAINTENANCE

Every month, check the cleanliness of the filters and replace or clean air required. See Tables 5 thru 8. Examine the damper and operator linkages to insure that each is free and operating smoothly.

### Lubrication

Fan bearings on the AirPak units may be equipped with standard and/or optional extended lubrication lines enabling lubrication of both fan bearings from one side of unit. (See Figure 37 and Table 1.)

*NOTE: For specific fan bearing lubrication, check the instruction packet attached to the fan housing. Some forward curved fans are permanently lubricated.*

For best results, bearings should be relubricated while in operation providing personal safety is assured. Add grease slowly with shaft rotating until a slight bead forms at the seals.

If necessary to relubricate while bearing is stationary, refer to manufacturers for maximum grease capacity for the size bearing.

Relubrication is generally accompanied by a temporary rise in operating temperature. Excess grease will be purged at seals.

**Relubricate Type Bearings** – A Lithium / Petroleum base grease conforming to an NLGI grade two consistency is normally used. Lubricant must be free of any chemical impurities such as free acid or free alkali, dust, rust, metal particles or abrasives. This light viscosity, low torque grease is rust inhibited and water resistant, has a temperature range of  $-30^{\circ}\text{F}$  to  $+200^{\circ}\text{F}$  with intermittent highs of  $+250^{\circ}\text{F}$ . (See Table 1.) Lubricate bearings as required by the severity of required duty.

### Motor Bearing Lubrication

Follow the motor manufacturer's recommendation. Check the motor nameplate for proper lubricant. (See Table 2.)

Relubricatable Type Bearings must be relubricated periodically to assure long life. The length of intervals between greasing is dependent on the running speed and atmospheric conditions.

### Belt Tension

Adjust the belt tension if necessary. Never use a belt dressing on the belts. If belts slip with the proper tension, use a good grade of belt cleanser to clean the belts. Use the procedure outlined under the heading "Belts" for adjusting the tension.

*CAUTION: Never use excessive tension as this could result in damaging the bearing, motor pulleys or motor base. See drive label on fan housing adjacent to drive for specific details on tension.*

When is is necessary to replace one belt in a given set, the entire set of belts must be replaced.

### EVERY YEAR

1. Check the fan wheels and inspect the drain pan for sludge and foreign material. Clean if required.
2. Observe the operation of all dampers and make any necessary adjustments in linkage and blade orientation for proper operation.
3. Inspect and lubricate inlet vane bearings with SAE 30 oil.

*NOTE: With the exception of the variable inlet vanes, standard damper bearings contain synthetic bushings which do not require lubrication.*

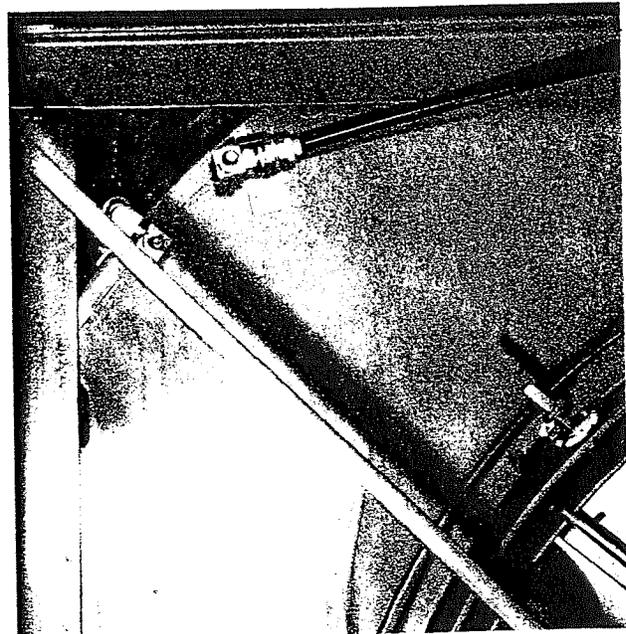


FIG. 37 – LUBRICATION LINES

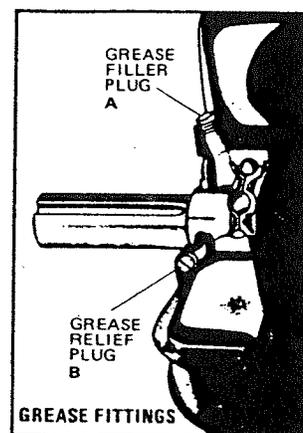
**TABLE 1 – RELUBRICATABLE TYPE FAN BEARING CONDITIONS AND GREASING INTERVALS**

SPEED	TEMPERATURE	CLEANLINESS	GREASING INTERVAL
500 RPM 1000 RPM 1500 RPM	Up to 150°F Up to 210°F Over 210°F	Clean Clean Clean	2 to 6 Months 2 Weeks to 2 Months Weekly
Any Speed Any Speed	Up to 150°F Over 150°F	Dirty Dirty	1 Week to 1 Month Daily to 2 Weeks
Any Speed	Any Temp.	Very Dirty	Daily to 1 Week

**TABLE 2 – MOTOR RELUBRICATION SCHEDULE**

MOTOR ENCLOSURE TYPE	FRAME SIZE	STANDARD SERVICE	SEVERE SERVICE
"O.D.P.R." OPEN DRIP PROOF	182T THRU 404T	18 MOS.	6 MOS.
"T.E.F.C." TOTALLY ENCLOSED FAN COOLED	254T THRU 405T	1 YEAR	4 MOS.

NOTE: High Efficiency Motor Frame Sizes may vary from Frame Specifications Listed.



**VARIABLE INLET VANES**

If the unit contains variable inlet vanes, inspect the linkages where necessary. Lubricate the bearings at each end of the VIV blades with SAE 30 oil after cleaning any dust or dirt from around each bearing.

**HUMIDIFIERS**

Humidifiers should be controlled by a humidistat or other means to avoid over-humidification. Whenever steam or raw water is discharged into a system, high-limit humidistat should be used to control the humidifier.

When the system is new, the strainer screen should be inspected at least twice during the first year. If fouled, more frequent inspection and cleaning should be administered.

At least twice a year, verify that the steam trap is functioning properly. A blocked steam trap will be cold. A "blowing" steam trap will be hot for a continuous distance up to 30 feet; it will make noise at intervals; and the discharge pipe will be progressively cooler beginning at the trap.

Control valves should be inspected at least annually to verify that they are working properly.

For further details please review the IOM for humidifiers which is enclosed with the unit.

**BELTS**

Belts should be checked again after 24 hours of operation. On multiple belt adjustable pulleys, the pitch depth should be checked to insure identical belt travel, power transfer and wear. Adjustable motor bases are provided for belt adjustment. Refer to Figure 34.

**CAUTION:** Motor pulleys, both adjustable pitch and fixed pitch and blower shaft pulleys are locked in position with either set screws or split taper lock bushings. All set screws and / or taper lock bolts must be checked for tightness and alignment before putting equipment into operation.

An incorrectly aligned and tensioned belt can substantially shorten belt life, overload blower and motor bearings, shortening their life expectancy. A belt tensioned too tight can overload the motor electrical causing nuisance tripping of the motor overloads and / or motor failure and / or shaft failure.

**BELT REPLACEMENT**

Always replace belts as a set. Used belts will always be longer because of stretching and new belts should never be installed singularly.



U-BELT DRIVE KIT

DRIVE PART • 966-63138-100  
 SALES ORDER • 96-201209-06F  
 UNIT TAG • AHU-6

J44565

FAN RPM: 1381  
 TENSION INFO: 5.5 LB. 57 IN.

MOTOR SHEAVE - 8.6X2B-SK  
 FAN SHEAVE - 11.0X2B-SK  
 DRIVE BELTS - BP103

MOTOR BUSHING - SKx1 5/8  
 FAN BUSHING - SKx2 3/16

FIG. 38 – TYPICAL LABEL ON BELT TENSIONING

Follow the steps below to replace belts:

1. Release the tension on the belts by loosening the adjusting nuts on the fan motor.
2. Remove old belts and recheck the sheave alignment with a straight edge.
3. Install the new belts on the sheaves.

**CAUTION:** *Never place the belts on the sheaves by using a screwdriver to pry the belt over the rim of the sheave.*

BELT TENSIONING

Beginning in 1995 important data such as the "Correct Belt Tensioning Data" for each specific unit is shown on the Information Label shown in Figure 38.

Use the belt tension gauge shown in Figure 39 to properly tension belts. Use the belt tension data from the label on the unit fan.

**CAUTION:** *Squealing belts during starting is caused by slipping belts that are not tensioned properly.*

REMOVAL AND INSTALLATION OF COMPONENTS

FORWARD CURVED FANS

The forward curved fan wheel must be removed through the fan discharge opening. The location of the clamps, fan wheel, and shaft must be marked so each of these components can be re-assembled in the same location. See Figure 40. This will preserve the balance of the rotating assembly. Proceed with the following steps:

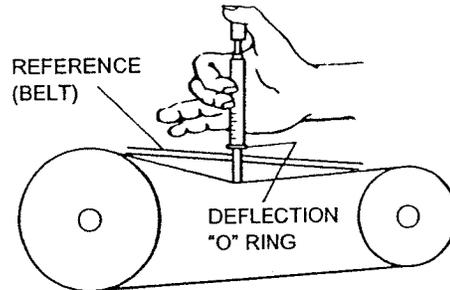
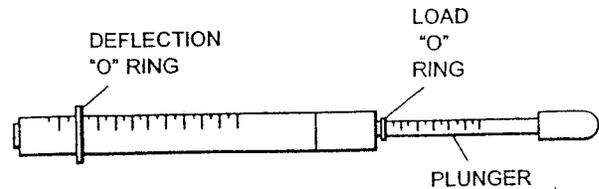


FIG. 39 – BELT TENSIONING GAUGE

1. Remove the belts from the drive.
2. Loosen the fan retaining screws in fan hub and completely remove them from the fan.
3. Thoroughly clean the shaft journal around both bearings and between the bearing and the end of the shaft.
4. Remove the fan sheave.
5. On the end of the shaft opposite the drive, loosen the set screws or remove the locking collar so the shaft is free to turn in the bearing.
6. Remove the bolts from the bearing housing and slip the bearing off the shaft.
7. Loosen the set screws or remove the locking collar from the bearing on the drive end.
8. Remove the bolts from the bearing housing flanges on the drive end. The shaft will drop slightly when these are removed. The wheel should be supported by wood blocking between the shaft and housing. Access for blocking the wheel is through fan discharge opening.
9. Slip the shaft out the drive end until it is free and clear of the fan. In replacing the wheel, follow the reverse order.

If a new fan wheel is installed, align the mark on the center disk of the wheel with the mark on the clamp. Make sure the bearing locking collar, if used, is installed per the instructions. Instructions are also packed with each replacement bearing if new ones are required. The wheel should be placed in the housing and the hub bolts / screws torqued to correct values.

**NOTE:** *If excessive vibrations is evident upon start-up, the rotating assembly must be re balanced before the fan is placed in service.*

## RECOMMENDED MAINTENANCE

### VAPORSTREAM® Model VLC Only

Using softened water will significantly reduce mineral build-up in the humidifier. When softened water is not available, the VAPORSTREAM VLC is designed to deal with water hardness in one of two ways depending on the degree of hardness. For light to moderate hardness, up to 10 grains per gallon (170 mg/l), using the surface water skim time feature with annual cleaning is recommended. For high mineral content water, above 10 grains per gallon (170 mg/l), a periodic drain and flush through the motorized drain valve, in addition to the surface water skim time feature, is recommended. The frequency of cleaning will depend on water condition and evaporation load.

The humidifier should be inspected for leaks at least annually. Also, the current draw of the heaters should be checked and all safety devices in the control circuit should be cycled on and off to verify that they are functioning.

**Caution:** When performing maintenance on the VAPORSTREAM Model VLC, always set control module switch to "STBY" position, place main disconnect in "OFF" position, and close manual water shut-off valve.

#### Seasonally or as Required

1. **Cleaning Tank** - Slide the clean-out tray out and dispose of any loose scale that has collected in the tray. This should be done before the build-up reaches the underside of the heating elements.
2. **Cleaning Probes** - Disconnect the plug and cable assembly and unscrew the probe holder from the VAPORSTREAM VLC unit. The scale will easily flake off from the sensing portion. The sensing portion, bottom 3/8" (10 mm), of the probe should be brushed clean with stainless steel wool.
3. **Cleaning Skim Overflow Port** - Loosen deposits with a long tool, such as a screwdriver. Proper skimmer drainage should be verified by a weekly visual inspection. Water should drain from skimmer drain pipe after each fill cycle. (For cleaning piping, disconnect and flush out. If mineral deposits have restricted the flow, replace piping.)

#### Summer Maintenance

After the humidification season, a complete inspection and cleaning of the heaters, probe control, skimmer port, and water chamber is recommended. After cleaning, the unit should remain empty until humidification is required.

### Adjusting the Surface Skim Bleed-Off Quantity

The skim time determines the quantity of water skimmed with each fill cycle. The skim time is field adjustable using the VAPOR-LOGIC® keypad.

Each time the VAPORSTREAM VLC refills, it fills to an elevation near the lip of the skim overflow fitting. A portion of the refill water then flows to drain carrying the minerals floating on the water with it. This reduces the mineral concentration, thereby reducing the frequency of cleaning needed.

The heated water that flows to drain is a cost of operation. Cleaning the humidifier is also an operational cost. Therefore, it is recommended that the user observe and adjust the skimming quantity. By doing so, a balance between minimizing mineral build-up and conserving hot water can be achieved.

### VAPORSTREAM Model VLDI Only

The humidifier should be inspected for leaks at least annually. Also, the current draw of the heaters should be checked and all safety devices in the control cabinet should be cycled on and off to verify that they are functioning.

#### Make-up Water Piping

Use cold or hot makeup water. If the water pressure is above 60 psi (410 kPa) and/or water hammer would be objectionable, a pressure reducing valve or shock arrester should be installed. Even though the VAPORSTREAM VLC has an internal 1" (25 mm) air gap, some local codes may require a vacuum breaker.

**Caution:** Minimum water supply pressure is 25 psi (172 kPa).

#### Cleaning Evaporating Chamber

As long as mineral-free water is used in the VAPORSTREAM VLDI, no cleaning or flushing of the evaporating chamber should be necessary.

## TROUBLE-SHOOTING GUIDE

For trouble-shooting instructions, see the VAPOR-LOGIC® Installation Instructions and Maintenance Operations Manual.

## MAINTENANCE

It is the responsibility of the equipment owner to provide maintenance on the system.

### IMPORTANT

If system failure occurs due to improper maintenance during the warranty period, YORK will not be liable for costs incurred to return the system to satisfactory operation. The following is intended only as a guide and covers only the chiller unit components. It does not cover other related system components which may or may not be furnished by YORK. System components should be maintained according to the individual manufacturer's recommendations as their operation will affect the operation of the chiller.

### COMPRESSORS

#### Oil Level check:

The oil level can only be tested when the compressor is running in stabilized conditions, to ensure that there is no liquid refrigerant in the lower shell of the compressor. When the compressor is running at stabilized conditions, the oil level must be between 1/4 and 3/4 in the oil sight glass. Note: at shutdown, the oil level can fall to the bottom limit of the oil sight glass. Use YORK "F" oil when adding oil.

#### Oil Analysis:

The oil used in these compressors is pale yellow in color (mineral oil). If the oil color darkens or exhibits a change in color, this may be an indication of contaminants in the refrigerant system. If this occurs, an oil sample should be taken and analyzed. If contaminants are present, the system must be cleaned to prevent compressor failure.



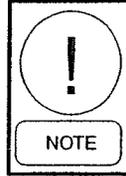
*Never use the scroll compressor to pump the refrigerant system down into a vacuum. Doing so will cause internal arcing of the compressor motor which will result in failure of compressor.*

### CONDENSER FAN MOTORS

Condenser fan motors are permanently lubricated and require no maintenance.

### CONDENSER COILS

Dirt should not be allowed to accumulate on the condenser coil surfaces. Cleaning should be as often as necessary to keep coil clean.



*Exercise care when cleaning the coil so that the coil fins are not damaged.*

### OPERATING PARAMETERS

Regular checks of the system should be performed to ensure that operating temperatures and pressures are within limitations, and that the operating controls are set within proper limits. Refer to the Operation, Start-Up, and Installation sections of this manual.

### ON-BOARD BATTERY BACK-UP

U17 is the Real Time Clock chip that maintains the date/time and stores customer programmed setpoints. Anytime the chiller is to be off (no power to the microboard) for an extended time (weeks/months), the clock should be turned off to conserve power of the on-board battery. To accomplish this, the J11 jumper on the microboard must be moved to the "CLKOFF" position while power is still supplied to the microboard.



***THE UNIT EVAPORATOR HEATER IS 120 VAC. DISCONNECTING 120VAC POWER FROM THE UNIT, AT OR BELOW FREEZING TEMPERATURES, CAN RESULT IN DAMAGE TO THE EVAPORATOR AND UNIT AS A RESULT OF THE CHILLED LIQUID FREEZING.***

### OVERALL UNIT INSPECTION

In addition to the checks listed on this page, periodic overall inspections of the unit should be accomplished to ensure proper equipment operation. Items such as loose hardware, component operation, refrigerant leaks, unusual noises, etc. should be investigated and corrected immediately.



**CITY OF TRAVERSE CITY**  
 400 BOARDMAN AVE. - TRAVERSE CITY, MI 49684  
 231-922-4440

THE ABOVE NUMBER  
 MUST APPEAR ON YOUR  
 INVOICE, PACKAGES, ALL  
 SHIPPING PAPERS AND  
 CORRESPONDENCE.

STANDARD

BLANKET

CONFIRMING

**IMPORTANT  
 SHIP TO:**

TO:

**PURCHASE ORDER**

**CONTRACT**

**SERVICE ORDER\***

\*IF THIS IS A SERVICE  
 ORDER OR CONTRACT,  
 REFER TO THE PROVISIONS  
 ON THE REVERSE SIDE.

ORDER DATE		REQUISITION	TERMS	SHIPPING INSTRUCTIONS	DATE REQUIRED
QUAN.	UNIT	DESCRIPTION		UNIT PRICE	AMOUNT

**SALES TAX EXEMPT – GOVERNMENT**

\_\_\_\_\_  
 AUTHORIZED SIGNATURE

\_\_\_\_\_  
 DATE

**INSTRUCTION TO VENDOR: SEND ALL INVOICES TO CITY TREASURER**

400 Boardman Ave., Traverse City, MI 49684. Purchase Order No. and Department name must be shown on all documents. A separate invoice must be submitted for each Purchase Order. Cash discount date will begin with receipt of invoice or goods, whichever is later.

**MORE THAN \$7,000 CITY COMMISSION APPROVAL REQUIRED**

**WHITE – VENDOR • YELLOW – ATTACH TO INVOICE • PINK – PURCHASING DEPT. • GOLDENROD – DEPARTMENT COPY**

## ADDITIONAL TERMS AND CONDITIONS:

### **THE VENDOR, BY RENDERING SERVICE TO THE CITY OF TRAVERSE CITY (CITY), HEREBY AGREES TO ALL PROVISIONS LISTED BELOW:**

1. **Non-Discrimination.** The Vendor agrees not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions or privileges of employment, or a matter directly or indirectly related to employment because of race, color, religion, national origin, sex, age, height, weight, marital status, physical or mental disability, family status, sexual orientation, or gender identity. A breach of this covenant may be regarded as a material breach of this Service Order.
2. **Assignment.** There shall be no assignment or transfer of this Service Order or any part thereof unless mutually agreed to in writing by both parties.
3. **Venue.** Any and all suits for any and every breach of this Service Order shall be instituted and maintained in any court of competent jurisdiction in the County of Grand Traverse, State of MI.
4. **Independent Contractor.** The relationship of the Vendor to the City is that of an Independent Contractor. The Vendor and the personnel employed by the Vendor shall not be deemed to be agents or employees of the City, shall not hold themselves out as employees of the City and shall not be entitled to any fringe benefits the City affords its employees.
5. **Required Insurance.** (*If City named as additional insured*): The Vendor shall provide the City with an endorsement to its insurance policy stating that the City of Traverse City is named as additional insured and that a minimum of 10 days advance written notice will be provided in the event of cancellation; the Vendor shall also provide the City with an insurance certificate evidencing the required coverage. (*If City not named as additional insured*): The Vendor shall provide the City a copy of a certificate of insurance for any required insurance under this Service Order prior to performing any services. Such certificate shall provide that the City shall receive notice of any cancellation or material alteration in its coverage at least 10 days prior thereto. A breach of this provision may be regarded as a material breach of this Service Order.
6. **Workers Compensation.** The parties agree to maintain at all times while work is being performed under this Service Order, suitable workers compensation insurance pursuant to Michigan law and will, upon receipt of this Service Order, provide a certificate of insurance or copy of state approval for self insurance to the City Manager.
7. **Interpretation.** This Service Order shall be governed by the laws of the State of Michigan both as to interpretation and performance.
8. **Indemnification.** The Vendor shall defend, indemnify and hold the City, its agents, officials and employees harmless from and against all claims, damages, losses and expenses, including reasonable attorney fees arising out of the performance of this Service Order which is caused in whole or in part by the Vendor's negligent, careless or intentional act or omission, or that of any agent, employee, or subcontractor of the Vendor. The Vendor shall not be obligated to indemnify the City for the City's own negligence. This indemnification provision shall not be limited by reason of insurance coverage of any type. This provision is not intended to waive the defense of governmental immunity that may be asserted by the City in an action against them. The Vendor expressly acknowledges and agrees that this indemnification provision is intended to be as broad and inclusive as is permitted by law and that if any portion thereof is held invalid, it is agreed that the balance shall, notwithstanding, continue in full legal force and effect. This provision shall survive the termination of this Agreement.
9. **Time.** Time is of the essence in rendering the services described in this Service Order.
10. **Third Party Beneficiaries.** This Service Order confers no rights or remedies on any third party, other than the parties to this Service Order and their respective successors and permitted assigns.
11. **Freedom of Information Act.** The Vendor acknowledges that the City may be required from time to time to release records in its possession by law. The Vendor hereby gives permission to the City to release any records or materials received by the City as it may be requested to do so as permitted by the Freedom of Information Act, MCL 15.231 *et seq.*
12. **Arrears/Defaulter.** The Vendor certifies that as of the date of this Service Order, Vendor's company or Vendor is not in arrears to the City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City.
13. **Standard of Conduct.** The Vendor shall render all services under this Service Order according to generally accepted professional practices.
14. **Termination.**
  - A. **For Fault.** If the City Manager determines that the Vendor has failed to perform or will fail to perform all or any part of the services, obligations, or duties required by this Agreement, the City Manager may terminate or suspend this Agreement in whole or in part upon written notice to the Vendor specifying the portions of this Agreement and in the case of suspension shall specify a reasonable period not more than thirty (30) days nor less than fifteen (15) days from receipt of the notice, during which time the Vendor shall correct the violations referred to in the notice. If the Vendor does not correct the violations during the period provided for in the notice, this Agreement shall be terminated upon expiration of such time. Upon termination, any payment due the Vendor at time of termination may be adjusted to cover any additional costs occasioned the City by reason of the termination. This provision for termination shall not limit or modify any other right to the City to proceed against the Vendor at law or under the terms of this Agreement.
  - B. **Not for Fault.** Whenever the City Manager determines that termination of this Agreement in whole or in part is in the best interest of the City or in the event that termination is required by any state or federal agency, the City Manager may terminate this Agreement by written notice to the Vendor specifying the services terminated and the effective date of such termination. Upon termination, the Vendor shall be entitled to and the City shall pay the costs actually incurred in compliance with this Agreement until the date of such termination.

**DISCLOSURE BY CITY COMMISSIONER**

I would like to make the following disclosure:

The City of Traverse City may be entering into a contract with or issuing a service/purchase order

to: \_\_\_\_\_, and

\_\_\_\_\_  
(Describe your pecuniary interest, see examples below)

As I have a pecuniary interest, I will be abstaining from deliberations and the vote on that contract or service/purchase order.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print name

\_\_\_\_\_  
Date

---

**Pecuniary Interest.** In the Disclosure you must state your pecuniary interest. Examples are given below, but you need to customize this depending on your circumstances:

*This is a company in which I have an ownership interest.*

*My spouse owns the business.*

*I am a subcontractor on this project.*