

HACC – CENTRAL PENNSYLVANIA’S COMMUNITY COLLEGE  
**REQUEST FOR BID**  
10-41  
VAV BOXES

**Acknowledgement:** Please acknowledge receipt of this Bid by completing the information requested below and faxing to 717/780-2325 upon receipt.  
**Please also include this page with your bid response.**

Vendor Name: \_\_\_\_\_ Contact Name: \_\_\_\_\_  
Address (include city, state, zip): \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

Check One: **We will** \_\_\_\_\_ **Will Not** \_\_\_\_\_ be responding to this RFB.

If not responding, please explain briefly: \_\_\_\_\_

**Dates:**

Date of Issue: April 7, 2010

Bid Response Due Date: April 16, 2010 @ 11:00 AM

**Bid Delivery:**

Address: Purchasing Office/W130  
One HACC Drive  
Harrisburg PA 17110-2999

Contact: Garry Crider, Purchasing Manager

Phone: 717/780-1164  
Fax: 717/780-2325

Terms:

1. All bids must be mailed or hand delivered in a **sealed** envelope clearly marked with your company name and the HACC bid number.
2. Bids must include all costs and shipping/handling/freight charges. HACC is tax exempt.
3. Do not include a copy of the original RFB with your response.
4. Responses must be clearly subtotaled and totaled, with one “bottom line dollar amount”.

**HACC - Central Pennsylvania's Community College**  
**10-41 VAV BOXES**  
**REQUEST FOR BID**  
**BID - SPECIFICATIONS**

**SECTION 15730 – VAV BOXES**

**PART 1 GENERAL**

**1.1 RELATED SECTIONS**

- A. Drawings, Division 0 – Bidding and Contract Requirements, and Division 1 – General Requirements apply to this Section.

**1.2 SECTION INCLUDES**

- A. VAV boxes.

**1.3 SUBMITTALS**

- A. Shop Drawings: Provide submittal indicating duct material, pressure classifications, joint construction and seal method.
- B. Product Data: Provide catalog performance ratings, construction and dimensions for products listed under Part 2.
- C. Operating and Maintenance Instructions: Include instructions for lubrication, filter replacement, spare parts lists, and wiring diagrams.
- D. Coordination Drawings: Duct and piping layouts including sizes and elevations for coordination purposes with other disciplines.

**PART 2 PRODUCTS**

**2.1 VAV BOXES**

- A. Manufacturers:
  - 1. Warren Technology; model STW.
  - 2. Johnson Controls.
  - 3. Trane.
- B. Construction: The assembly casing shall be constructed of heavy-gauge galvanized steel, with gauges conforming to the requirements of UL 1995. The casing shall be formed and assembled with sufficient strength and rigidity to withstand normal handling and maintain operational integrity. The terminal casing shall be mechanically assembled. Unit casing shall have removable bottom panel and side access panel to allow removal of fan, if necessary, and servicing of unit. Unit casing shall be constructed of no less than 20 gauge galvanized steel with round or oval-round inlets sized to accommodate standard flex duct connections. Unit discharge shall be slip and drive construction for field attachment to downstream ductwork.

Unit labels shall be adhered to each unit including model number, airflow (CFM), balancing chart, electrical data and tagging data.

Unit shall be completely and fully lined internally with 1/2" thick, dual density fiberglass insulation or closed cell elastomeric material per specifications outlined in UL 181 and NFPA 90A. Insulation shall be enclosed between the unit casing and a double wall 26 gauge sheet metal cover extending over the fiberglass and liner edges.

- C. Primary Air Valve: The primary air valve shall be Zebra® Precision Air Valve, consisting of a sliding pleated plate with multiple alternately spaced orifices and with full linear stroke, open to close. Airflow through the valve shall be laminar throughout the open to close cycle. The valve mechanism shall be direct drive, utilizing a 24- VAC bi-directional electric actuator. Damper shaft shall operate over a full 90-degree rotation. The damper shaft shall rotate counter-clockwise to close the damper. The damper actuator shall be mounted on the exterior of the casing.

Terminal units 12" in diameter and smaller shall require at least a 35 inch-pound torque actuator. Terminal units 14" and 16" in diameter shall require at least a 50 inch-pound torque actuator. Terminal units 18" and 20" in diameter and smaller shall require at least a 75 inch-pound torque actuator.

- D. Primary Airflow Sensor: Terminal units shall be equipped with a factory installed Quad-4, four quadrant, multiport flow sensor. A minimum of 8 pressure-sensing points shall be utilized. The sensor shall develop a differential pressure of 0.05 in. WC at an air velocity of 500 FPM. Furnish external balancing taps to allow field airflow measurements. The sensor shall amplify the differential pressure by at least 2.5 times.
- E. Hot Water Coil: Casing shall be constructed of a minimum 20 gauge galvanized steel with slip and drive construction for field attachment to downstream ductwork. Coils shall be factory installed. Coil shall be constructed of corrugated aluminum fins mechanically expanded to seamless copper tubes, with a minimum wall thickness of 0.016", to achieve tight fin to tube bond for optimal heat transfer. Each coil shall be pressurized with high-pressure air (360 psig) under water to assure that there are no leaks. Coils shall be dehydrated by insertion in a 500-degree oven to ensure that they are completely dry inside. The tubing connections shall be capped to ensure that the inside of the coils are clean and dry. Coil shall be rated and certified in accordance with the current edition of ARI Standard 410. Coils shall bear an ARI 410 seal.
- G. Controls: Factory installed. Control Package VMA 1620 by Johnson Controls will be provided by the owner.

## 2.8 FAN-POWERED VAV BOXES

- A. Manufacturers:
  - 1. Warren Technology; model FBCW.
  - 2. Johnson Controls.
  - 3. Trane.
- B. Construction: The assembly casing shall be constructed of heavy-gauge galvanized steel, with gauges conforming to the requirements of UL 1995. The casing shall be formed and assembled with sufficient strength and rigidity to withstand normal handling and maintain operational integrity. The terminal casing shall be mechanically assembled. Unit casing shall have removable bottom panel and side access panel to allow removal of fan, if necessary, and servicing of unit. Unit casing shall be constructed of no less than 20 gauge galvanized steel with round or oval-round inlets sized to accommodate standard flex duct connections. Unit discharge shall be slip and drive construction for field attachment to downstream ductwork.

Unit labels shall be adhered to each unit including model number, airflow (CFM), balancing chart, electrical data and tagging data.

Unit shall be completely and fully lined internally with 1" thick, dual density fiberglass insulation or closed cell elastometric material per specifications outlined in UL 181 and NFPA 90A. Insulation shall be enclosed between the unit casing and a double wall 26 gauge sheet metal cover extending over the fiberglass and liner edges.

- C. Primary Air Valve: The primary air valve shall be Zebra® Precision Air Valve, consisting of a sliding pleated plate with multiple alternately spaced orifices and with full linear stroke, open to close. Airflow through the valve shall be laminar throughout the open to close cycle. The valve mechanism shall be direct drive, utilizing a 24- VAC bi-directional electric actuator. Damper shaft shall operate over a full 90-degree rotation. The damper shaft shall rotate counter-clockwise to close the damper. The damper actuator shall be mounted on the exterior of the casing.

Terminal units 12" in diameter and smaller shall require at least a 35 inch-pound torque actuator. Terminal units 14" and 16" in diameter shall require at least a 50 inch-pound torque actuator. Terminal units 18" and 20" in diameter and smaller shall require at least a 75 inch-pound torque actuator.

- D. Primary Airflow Sensor: Terminal units shall be equipped with a factory installed Quad-4, four quadrant, multiport flow sensor. A minimum of 8 pressure-sensing points shall be utilized. The sensor shall develop a differential pressure of 0.05 in. WC at an air velocity of 500 FPM. Furnish external balancing taps to allow field airflow measurements. The sensor shall amplify the differential pressure by at least 2.5 times.

- E. Fan Assembly: Fan blower shall be constructed of steel with forward curved blades, dynamically balanced wheel and direct drive motor. Motor shall be permanent split capacitor type, with permanently lubricated bearings and thermal overload protection. Motor shall be designed for use with electronic fan speed controller. The blower wheel and motor assembly shall be internally suspended and isolated from the blower housing on rubber-in-shear isolators to minimize vibration.

An electronic (SCR) fan speed controller shall be provided to allow continuously adjustable fan speed from maximum to minimum. Speed control shall be electronic and shall be matched to operate with the motor. Speed control shall be equipped with a minimum voltage stop to ensure that motor will not operate in the stall mode. Voltage stop shall be factory adjusted.

- F. Hot Water Coil: Casing shall be constructed of a minimum 20 gauge galvanized steel with slip and drive construction for field attachment to downstream ductwork. Coils shall be factory installed. Coil shall be constructed of corrugated aluminum fins mechanically expanded to seamless copper tubes, with a minimum wall thickness of 0.016", to achieve tight fin to tube bond for optimal heat transfer. Each coil shall be pressurized with high-pressure air (360 psig) under water to assure that there are no leaks. Coils shall be dehydrated by insertion in a 500-degree oven to ensure that they are completely dry inside. The tubing connections shall be capped to ensure that the inside of the coils are clean and dry. Coil shall be rated and certified in accordance with the current edition of ARI Standard 410. Coils shall bear an ARI 410 seal.

- G. Controls: Factory installed. Control Package VMA 1620 by Johnson Controls will be provided by the owner.

## **THE FOLLOWING WILL BE INCORPORATED INTO CONSTRUCTION SPECIFICATIONS:**

### **PART 3 EXECUTION**

3.1 ~~INSTALLATION~~

- ~~A. Install in accordance with manufacturer's instructions.~~
  - ~~B. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.~~
  - ~~C. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.~~
  - ~~D. Support vav boxes individually from structure. Do not support from adjacent ductwork. Provide minimum of 5 ft of 1 inch thick lined ductwork downstream of units.~~
- ~~Mount vav boxes 11' 0" AFF.~~

3.2 ~~DUCTWORK APPLICATION SCHEDULE~~

<del>AIR SYSTEM</del>	<del>MATERIAL</del>
<del>Supply</del>	<del>Steel</del>
<del>Return</del>	<del>Steel</del>
<del>Exhaust</del>	<del>Steel</del>

**END OF SECTION 15730**

**HACC - Central Pennsylvania's Community College**  
**10-41 VAV BOXES**  
**REQUEST FOR BID**  
**BID FORM**

**A) FAN POWERED VAV BOXES:**

SYMBOL	QUANTITY	MANUFACTURER	MODEL NO.	PRICE
V-4	1			
V-9	1			
V-13	1			
V-14	1			
V-17	1			
V-18	1			
<b>Total price for Fan Powered VAV Boxes:</b>				

**B) VAV BOXES:**

SYMBOL	QUANTITY	MANUFACTURER	MODEL NO.	PRICE
V-1	1			
V-2	1			
V-3	1			
V-5	1			
V-6	1			
V-7	1			
V-8	1			
V-10	1			
V-11	1			
V-12	1			
V-15	1			
V-16	1			
<b>Total price for VAV Boxes:</b>				

<b>TOTAL COST FOR ALL BOXES (Total "A" and "B"):</b>	
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**C) JONHSON CONTROL'S CONTROL PACKAGE VMA 1620 will be supplied by HACC.**

**D) Bid Deadline**

To be considered for selection, bids shall arrive at HACC's Procurement and Business Services Office, One HACC Drive, Whitaker Hall, Room W130A, Harrisburg, PA, 17110, by 11:00 a.m. on or before April 16, 2010. Bids must be in a sealed container, clearly marked " RFB #10-41, VAV Boxes." Pricing must be submitted in a separately sealed envelope. Allow time for normal mail delivery to ensure timely

receipt of bids by HACC's Procurement and Business Services Office. Bids arriving after the deadline will not be considered. All bids become the property of the College.

**E) Number of Copies and Mailing of Bid**

Two (2) copies of the bid will be submitted in a sealed container clearly marked with the name of the bid and labeled "RFB #10-41, VAV Boxes." One (1) of the copies shall be marked "Master Copy" and will contain original signatures. The remaining copies do not require original signatures.

The bids must be addressed as follows:

RFB # 10-41  
HACC  
Procurement and Business Services  
ATTN: Garry Crider, Purchasing Manager  
One HACC Drive, Whitaker Hall, Room W130A  
Harrisburg PA 17110