

February 4, 1998

SUBMITTAL DATA

| | |
|------------------------|---|
| PROJECT: | Rhines Hall University of Florida |
| OWNER: | University of Florida Gainesville, FL |
| MECHANICAL ENGINEER: | Van Wagenen & Beavers Jacksonville, FL |
| MECHANICAL CONTRACTOR: | W.W. Gay Mechanical Jacksonville, FL |
| PRODUCT: | Fan Terminal Units |
| MANUFACTURER: | Tempmaster |

RHINES HALL - UNIVERSITY OF FLORIDA

FAN TERMINAL UNIT SCHEDULE

| TAG # | MODEL # | INLET | | PRIMARY AIR | | SUPPLY AIR | HP | VOLTS / PHASE | HEAT COIL CFM | HEAT CAP. (MBH) | ENT. AIR TEMP. | LVG. AIR TEMP. | WATER TEMP. (E/L) | COIL GPM |
|---------|---------|-------|------|-------------|------|------------|-----|---------------|---------------|-----------------|----------------|----------------|-------------------|----------|
| | | MIN | MAX | MIN | MAX | | | | | | | | | |
| FT11/1 | HVFB-F | 500 | 1835 | 920 | 1/3 | 277 / 1 | 920 | 48.4 | 68 | 115.8 | 180/160 | 4.8 | | |
| FT11/2 | HVFB-B | 150 | 340 | 170 | 1/10 | 277 / 1 | 170 | 10.3 | 68 | 123.1 | 180/160 | 1.0 | | |
| FT11/3 | HVFB-B | 150 | 600 | 300 | 1/10 | 277 / 1 | 300 | 14.2 | 68 | 111.0 | 180/160 | 1.4 | | |
| FT11/4 | HVFB-B | 150 | 415 | 210 | 1/10 | 277 / 1 | 210 | 11.5 | 68 | 117.8 | 180/160 | 1.1 | | |
| FT11/5 | HVFB-B | 150 | 500 | 250 | 1/10 | 277 / 1 | 250 | 12.7 | 68 | 114.2 | 180/160 | 1.3 | | |
| FT11/6 | HVFB-B | 150 | 405 | 205 | 1/10 | 277 / 1 | 205 | 11.4 | 68 | 118.6 | 180/160 | 1.1 | | |
| FT11/7 | HVBE-E | 375 | 1230 | 615 | 1/4 | 277 / 1 | 615 | 30.6 | 68 | 113.2 | 180/160 | 3.1 | | |
| FT11/8 | HVFB-B | 150 | 400 | 200 | 1/10 | 277 / 1 | 200 | 11.2 | 68 | 118.9 | 180/160 | 1.1 | | |
| FT11/9 | HVFB-B | 150 | 600 | 300 | 1/10 | 277 / 1 | 300 | 14.2 | 68 | 111.0 | 180/160 | 1.4 | | |
| FT11/10 | HVBE-E | 1375 | 1375 | 690 | 1/4 | 277 / 1 | 690 | 81.0 | 68 | 174.7 | 180/160 | 8.1 | | |
| FT11/11 | HVFB-C | 200 | 800 | 400 | 1/10 | 277 / 1 | 400 | 20.5 | 68 | 114.6 | 180/160 | 2.0 | | |
| FT11/12 | HVFB-F | 500 | 1835 | 920 | 1/3 | 277 / 1 | 920 | 44.9 | 68 | 112.4 | 180/160 | 4.5 | | |
| FT21/1 | HVFB-B | 150 | 280 | 140 | 1/10 | 277 / 1 | 140 | 7.0 | 68 | 113.5 | 180/160 | 0.7 | | |
| FT21/2 | HVFB-C | 200 | 735 | 370 | 1/10 | 277 / 1 | 370 | 19.6 | 68 | 116.2 | 180/160 | 2.0 | | |
| FT21/3 | HVFB-C | 200 | 735 | 370 | 1/10 | 277 / 1 | 370 | 19.6 | 68 | 116.2 | 180/160 | 2.0 | | |
| FT21/4 | HVFB-B | 150 | 255 | 130 | 1/10 | 277 / 1 | 130 | 6.7 | 68 | 114.9 | 180/160 | 0.7 | | |
| FT21/5 | HVFB-B | 150 | 275 | 140 | 1/10 | 277 / 1 | 140 | 7.0 | 68 | 113.5 | 180/160 | 0.7 | | |
| FT21/6 | HVFB-C | 200 | 705 | 355 | 1/10 | 277 / 1 | 355 | 19.1 | 68 | 116.9 | 180/160 | 1.9 | | |
| FT21/7 | HVFB-C | 200 | 705 | 355 | 1/10 | 277 / 1 | 355 | 19.1 | 68 | 116.9 | 180/160 | 1.9 | | |
| FT21/8 | HVFB-B | 150 | 290 | 145 | 1/10 | 277 / 1 | 145 | 7.2 | 68 | 113.1 | 180/160 | 0.7 | | |

* OVAL INLET



PRODUCT DRAWING

SUPERSEDES: 130.10-PA2.8T(1293)

FORM 130.10 - PA2.8T(295)
1 of 2

**VARIABLE AIR VOLUME
MODEL HVFB SIZES B THRU G
PARALLEL FLOW FAN TERMINAL UNIT
WITH HOT WATER HEAT**

YORK INTERNATIONAL CORPORATION
P.O. Box 1592, York, PA 17405

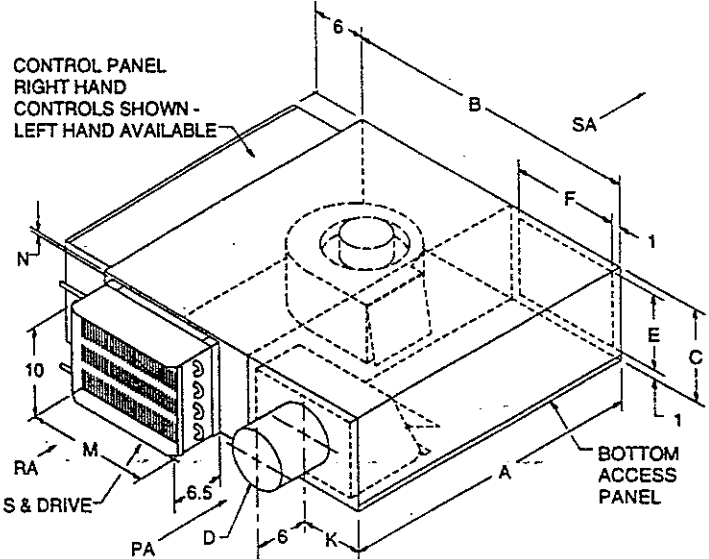
CONTRACTOR W.W. Gay Mechanical
ORDER NO. _____
TEMPMASTER CONTRACT NO. _____
TEMPMASTER ORDER NO. _____

PURCHASER W.W. Gay Mechanical Contractor
JOB NAME Rhines Hall
LOCATION University of Florida
ENGINEER Van Wagenen & Beavers

REFERENCE DATE _____ APPROVAL DATE _____ CONSTRUCTION DATE _____

FEATURES

- 22 gauge casing
- 1" dual density internal insulation w/ 4# density face
- All exposed insulation edges coated
- Insulation UL 181 approved
- Insulation meets NFPA 90A
- Insulation has a fire hazard classification of 25/50 per ASTME-84 and UL 723
- Aluminum damper w/ 60° rotation
- Damper mechanically keyed to shaft
- Nylon damper shaft bearings
- Permanent split capacitor blower motor w/ thermal overload protection
- Performance in accordance with Industry Standard 880
- 1 or 2 row hot water coils available with:
 - 1/2" OD circuit tubes
 - 10 aluminum fins per inch
 - Sweat field connections
 - S & drive duct connection
- Units ETL listed



| SIZE | NOM. CFM | | MTR HP | MTR FLA | | DIMENSIONS (Inches) | | | | | | | | | | COIL CONN. O.D. | WEIGHT (lbs.)** |
|------|----------|------|--------|---------|------|---------------------|----|------|-----|--------------|-----|----|-----|----|-----|-----------------|-----------------|
| | PRIMARY | FAN | | 120V | 277V | A | B | C | D | OVAL SIZE | E | F | K | M | N | | |
| B | 700 | 300 | 1/10 | 1.6 | 0.7 | 34 | 33 | 10.5 | 6 | N/A | 8.5 | 12 | 4.5 | 17 | .25 | 5/8 | 74 |
| C | 1000 | 400 | 1/10 | 1.6 | 0.7 | 34 | 33 | 10.5 | 7 | N/A | 8.5 | 12 | 5.5 | 17 | .25 | 5/8 | 74 |
| D | 1400 | 500 | 1/6 | 2.7 | 1.0 | 34 | 33 | 10.5 | 8 | N/A | 8.5 | 12 | 5.5 | 17 | .25 | 5/8 | 76 |
| E | 2100 | 750 | 1/4 | 3.6 | 1.4 | 34 | 33 | 10.5 | 10* | 7.88 x 11.02 | 8.5 | 12 | 7 | 17 | .25 | 5/8 | 78 |
| F | 2800 | 1000 | 1/3 | 7.6 | 2.6 | 34 | 49 | 14 | 12* | 7.88 x 14.16 | 12 | 20 | 8.5 | 27 | 2 | 5/8 | 106 |
| G | 3500 | 1500 | 1/2 | 8.1 | 3.2 | 34 | 49 | 14 | 14* | 7.88 x 17.00 | 12 | 20 | 11 | 27 | 2 | 5/8 | 112 |

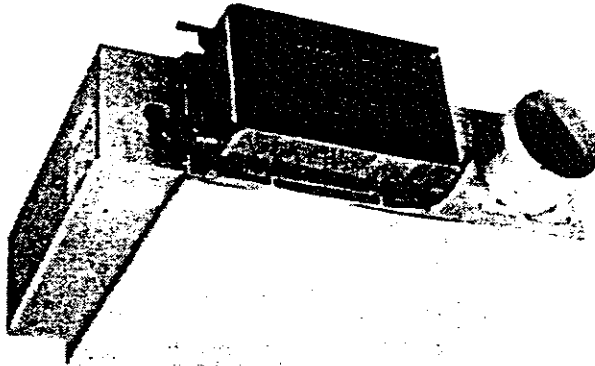
PA = Primary Air flow, RA = Return Air flow, SA = Supply Air flow.

* Supplied with flat oval collar. Field connection to collar is made with nominal size round duct compressed to conform to oval shape. All other collars are round.

** Weights are average unit weights. Actual weights may vary depending on unit and control options.

ACCESSORIES:

Panel filter, actuator, flow sensor, fan relay, control transformer, disconnect, speed control. Mounting of controller furnished by



HVFB-2
WITH OPTIONAL HOT WATER COIL



A participating corporation in the ARI Certification Program for Variable Air Volume Terminals.

(For Sound Data Certified to ARI, see Bulletin No. A247.1)

Appurtenances (hot water and electric coils) are not part of the Certification Program.

Tempmaster Bypass Fan Terminals Provide Cost Savings, Certified Performance

HVFB-2 Bypass Fan Terminals meet the requirements of the system designer, installing contractor and owner. This is the result of Tempmaster's more than 12 years experience in the design and manufacture of fan terminals. That's longer than any other major manufacturer.

APPLICATIONS

The HVFB-2 is a variable volume fan terminal unit that provides for minimum airflow in perimeter zones and heating to those zones without wasteful reheat. These units provide downdraft protection for perimeter systems where skin loss is below 250 Btuh per lineal foot. Energy is saved because the unit fan operates only upon a call for heat and first attempts to satisfy the load with plenum air. Heating is normally energized only when the cooling damper is fully closed. However, controls can be set so heating is energized whenever the unit fan is operating.

115 Volt or 277 volt motors are standard. Contact factory for other voltage requirements. 115 Volt motors are used with 208 volt, 3 phase, 4 wire systems. 277 Volt motors are used with 480 volt, 3 phase, 4 wire electrical power systems.

CERTIFIED PERFORMANCE RATINGS

The HVFB-2 has had its performance ratings certified to ARI under Industry Standard 880-86. This means published data can be used with confidence that the Tempmaster fan terminals will achieve cataloged performance.

OPTIONAL HEATING COILS

Optional factory installed hot water or electric heating coils can be specified to provide HVFB-2 fan terminals with a heating capability. The heating coils are mounted on the return air inlet to avoid pressure drop associated with heating coils in the primary air path. Field wiring is required only to a single point for power and a single point for control.

SAFETY TESTED AND LISTED

The entire line of the HVFB-2, including optional heating coils and controls, fans, volume controls and casings, has been

safety tested and listed by ETL, Electrical Testing Laboratories.

LOW SILHOUETTE

HVFB-2 fan terminals range in height from only 10½ inches in the smaller sizes to 14 inches in the largest sizes. This low silhouette frees the system designer from many of the problems of working with tight ceiling spaces.

REDUCED MAINTENANCE COST

Controls and operating components have been selected for long service life with minimal maintenance. All controls are housed on one side of the units for easier access. A removable bottom panel allows full access to the interior of the unit.

LOW SYSTEM OPERATING COST

Tempmaster V-line fan terminals use the same minimum pressure primary air volume damper as its efficient Type V terminal units. As a result, the combination of Tempmaster V-line fan terminals and terminal units, Tempmaster air handling units and the Tempmaster Duct Design Program can often provide fan horsepower savings and operating cost reductions of 10% or more.

FULL RANGE OF CONTROL OPTIONS

Type HVFB fan terminals are offered with a wide variety of control options for both independent heating/cooling operation and for easy tie-in to building energy management systems.

ELECTRIC PRESSURE DEPENDENT CONTROLS

Direct control of electric actuators, or electric actuators with a high limit control option, provide simple, low cost, accurate control of fan terminals on systems with static regain duct design.

- a. EA actuators with Type ES Electric "Floating Control" thermostats provide individual room temperature control

with an option for night setback when the central air handling system is off.

- b. Combining Tempmaster fan terminals with the Type ECC Electronic Control Center and flush mounted room temperature sensors provides complete comfort and energy management control. Satellite controllers control standard EA actuators or monitor Type TUC Terminal Unit Controllers. TUC-AR Controllers drive stepper actuators and relays to energize the fan and steps of heating to maintain proper control. Tenant override and central monitoring and alarm reporting are control options

available. The TUC Controllers reduce installation costs on systems with central monitoring and control capability.

PNEUMATIC

- a. Operator only where static regain duct design is used.
 b. Operator with velocity resetting controller where substantial system pressure variations may occur. Units with velocity resetting controllers include high and low pressure taps and flow charts for measuring velocity without interrupting operation, as well as averaging flow sensor to allow for non-straight entering runouts.

Selection Procedure

1. Using Table 1, select the proper size cooling model for the zone cooling requirement. Minimum operating static pressures shown should be added to estimated static pressures of downstream low velocity distribution ductwork (at cooling cfm) to arrive at minimum inlet SP.

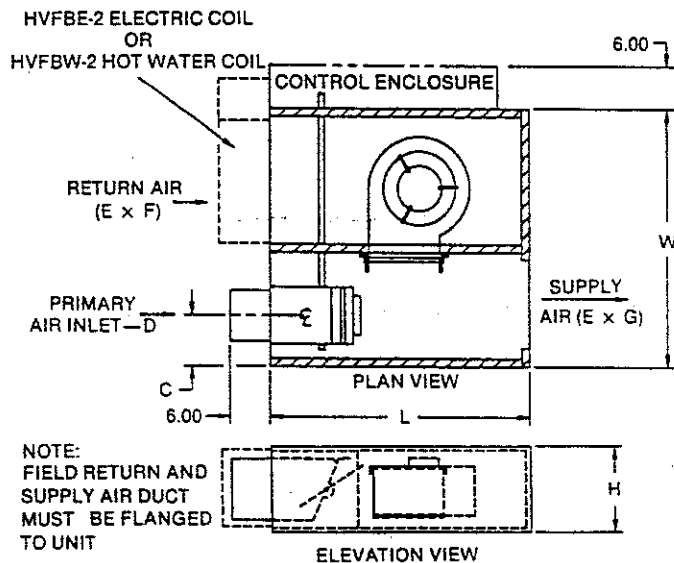
2. Using Table 1 and Charts 1-5, check for required (heating) fan performance. If higher static pressure or more fan cfm is required than the selected fan will produce, reselect for appropriate fan performance. Heating supply temperature is calculated based on fan cfm and Btu's of heat required. See supplemental coil section for heating coil capacities.

SOUND ANALYSIS

NC values in Table 1 are based on cooling operation with fan "OFF." Sound power data for cooling and heating (fan) mode is found on Sound Data Sheet.

APPLICATION NOTES:

Use caution in the application of fiberglass duct for downstream air distribution. Fiberglass duct has very poor radiated noise characteristics.



When applying HVFB units in ceiling plenums under roofs, secondary air available to the HVFB may be colder than primary air. Secondary air should be returned, in this application, directly from the room via a return air duct.

TABLE 1 -

| UNIT SIZE | TYPICAL NC LEVELS | | | | | | | | | |
|-----------|-------------------|---------|---------|------------------|--------------------|----------------|----------------------|--------|----|----|
| | PRIMARY AIR | | | PRIMARY AIR ONLY | | | FAN ONLY @ 3 IN. ESP | | | |
| | CFM | MIN. SP | MIN. TP | @ MIN. SP | @ MIN. SP + 35 IN. | MIN. + 1.5 IN. | MAX. D | MIN. D | | |
| B | 150 | 0 | .04 | — | — | 36 | 23 | 23 | 33 | 38 |
| | 300 | 0 | .14 | — | 19 | 37 | | | | |
| | 450 | .01 | .31 | 21 | 24 | 38 | | | | |
| | 600 | .02 | .55 | 28 | 30 | 39 | | | | |
| C | 200 | .01 | .09 | — | 21 | 30 | 23 | 23 | 34 | 37 |
| | 400 | .02 | .19 | — | 25 | 35 | | | | |
| | 600 | .04 | .35 | 18 | 30 | 39 | | | | |
| | 800 | .07 | .55 | 26 | 34 | 43 | | | | |
| D | 250 | .02 | .08 | — | 18 | 38 | 26 | 26 | 35 | 37 |
| | 500 | .06 | .23 | — | 21 | 39 | | | | |
| | 750 | .13 | .38 | 23 | 27 | 39 | | | | |
| | 1000 | .23 | .61 | 31 | 35 | 43 | | | | |
| E | 375 | .01 | .02 | — | 30 | 38 | 29 | 30 | 37 | 38 |
| | 750 | .04 | .08 | 17 | 33 | 40 | | | | |
| | 1000 | .08 | .19 | 24 | 35 | 42 | | | | |
| | 1500 | .14 | .33 | 29 | 37 | 46 | | | | |
| F | 500 | .02 | .04 | 18 | 23 | 37 | 33 | 33 | 38 | 40 |
| | 1000 | .08 | .16 | 19 | 25 | 39 | | | | |
| | 1500 | .19 | .37 | 24 | 27 | 41 | | | | |
| | 2000 | .33 | .65 | 31 | 33 | 43 | | | | |
| G | 750 | .03 | .05 | — | 31 | 44 | 37 | 37 | 42 | 44 |
| | 1500 | .11 | .18 | — | 32 | 45 | | | | |
| | 2250 | .24 | .40 | 20 | 35 | 46 | | | | |
| | 3000 | .42 | .72 | 36 | 41 | 46 | | | | |

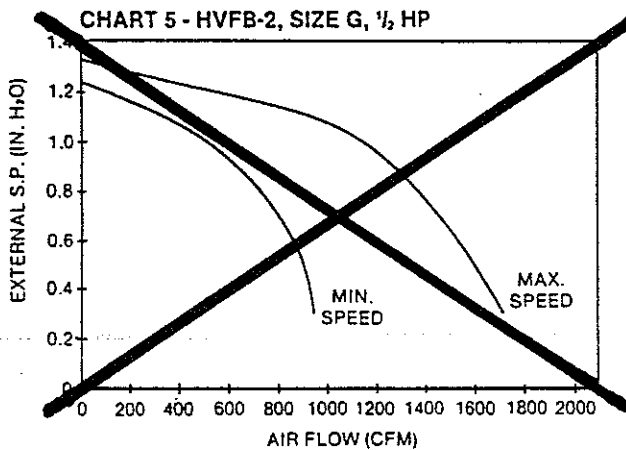
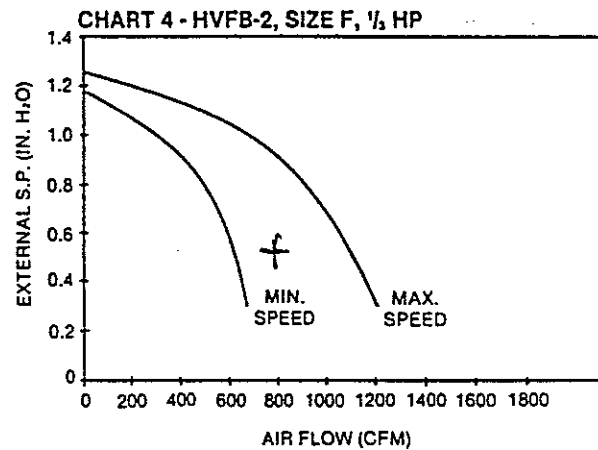
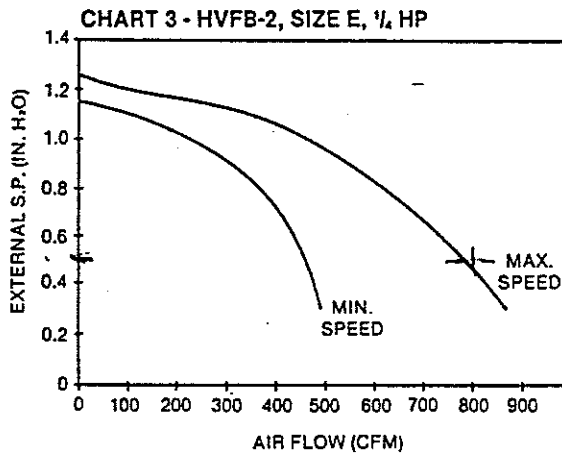
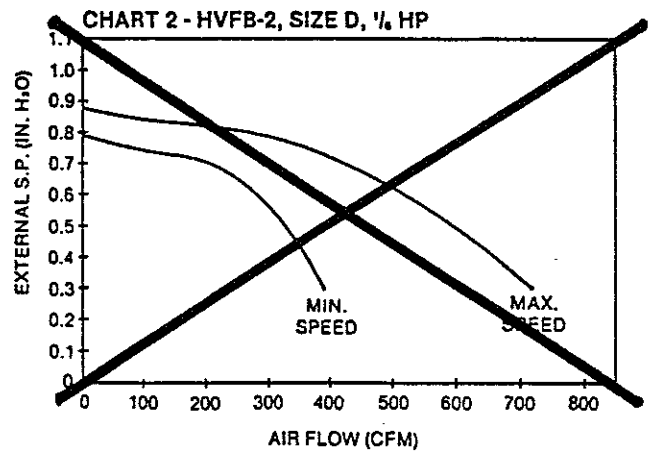
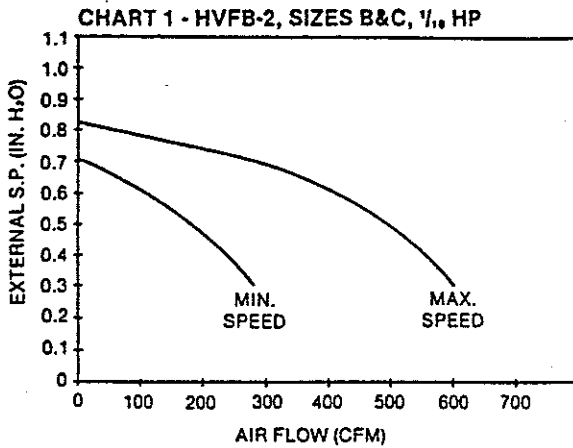
NOTES:

- Tests conducted in accordance with ARI Standard 880.
- Typical NC levels based on 3rd octave band sound power per cfm method.
- A 10 dB credit for lineal low velocity duct work on discharge sound power was assumed.
- A 6 dB credit for ceiling and plenum effect on radiated sound power was assumed.
- For specific applications, use sound power data and appropriate credits based on job design or use Tempmaster's computerized Acoustical Analysis Program.

TABLE 2 -

| SIZE | CFM | | | HP | DIMENSIONS | | | | | | |
|------|-------|------|------|----|------------|------|-----|-----|-----|--------|----|
| | PRIM. | FAN | | | L | W | H | D | D | B(HBT) | F |
| B | 600 | 300 | 1/10 | 34 | 33 | 10.5 | 4.5 | 6 | 8.5 | 18 | 12 |
| C | 800 | 400 | 1/10 | 34 | 33 | 10.5 | 5.5 | 7 | 8.5 | 18 | 12 |
| D | 1000 | 500 | 1/8 | 34 | 33 | 10.5 | 6.5 | 8 | 8.5 | 18 | 12 |
| E | 1500 | 750 | 1/4 | 34 | 33 | 10.5 | 7 | 10* | 8.5 | 18 | 12 |
| F | 2000 | 1000 | 1/3 | 34 | 49 | 14 | 8.5 | 12* | 12 | 26 | 20 |
| G | 3000 | 1500 | 1/2 | 34 | 49 | 14 | 11 | 14 | 12 | 26 | 20 |

*Oval



NOTE:
Fan performance curves are based on having no appurtenances (water coil, electric coil, filters, etc.).

Min. speed curve based on 167 volts for 277 volt motors and 69 volts for 115 volt motors.

Suggested Specifications

GENERAL

Fan terminal units designated shall be of sizes shown on drawings or terminal unit schedule. Units shall conform to cfm, full load amps, static pressure, and radiated sound power, and attenuation designated.

CONSTRUCTION

Air volume damper, fans, controls, and heating coils shall be factory assembled into a single cabinet (field assembly shall not be allowed).

Cabinets shall be constructed of not lighter than 22 gauge zinc coated steel.

Internal surfaces shall be acoustically and thermally insulated where required with a 1/2" glass fiber material, surface treated to prevent erosion, and having UL approval meeting NFPA 90A and 90B.

The air volume damper assembly shall be located within the unit casing and shall be constructed to assure the damper blades are permanently attached to the shaft. All internal damper pivot points shall be nylon fitted for noiseless operation and shall require no lubrication.

FAN ASSEMBLY

Fan shall be forward curved centrifugal type with direct drive

permanent split capacitor type motor. (Electronic speed control shall be provided). Full load amp ratings shall not exceed those shown on the schedule. Fan/motor assembly shall be isolated from the casing to minimize vibration transmission.

PERFORMANCE TESTING AND RATING

Performance of units shall be rated in accordance with Industry Standard 880 86 for Air Terminals. Units shall be certified to ARI.

LABORATORY LISTING

All fan terminal unit assemblies must be listed by ETL or other approved independent testing laboratory.

HEATING COILS

Heating coils shall be factory assembled as a part of the fan terminal unit.

Hot Water Coils

Hot water coils shall have the number of rows and heating capacity shown and shall be constructed of 1/2" OD seamless copper tubing and core of entirely straight tube construction. Casing shall be 22 gauge sheet metal with factory formed S and Drive connection. Tube headers shall be extended 3" beyond casing for sweat connections. Hot water valve and controls shall be as specified under "Controls."

~~Electric Coils~~

~~Electric heating coils shall be UL listed and meet National Electric Code requirements. The factory installed heating coil/fan terminal combination must be listed by a recognized independent testing laboratory. Coil controls will include automatic reset thermal cutouts, manual reset thermal cutouts, control line terminal blocks, and magnetic contractors or PE switches as required by phase, voltage, or KW. All control components will be mounted in a heavy gauge galvanized steel terminal box. Heating elements will be 80/20 nichrome wire with a maximum of 55 watts per square inch density.~~

CONTROLS

Controls shall be (electric with interface to control energy management system, electric, ~~pneumatic~~). ~~Controls shall be contained within a NEMA 1 enclosure with access panel cooled from the air flow and mounted on the side of the unit.~~

~~Electric~~ electric controls and flow sensing devices shall be mounted on the side of the unit. (Shall be mounted in a NEMA 1 enclosure).

Factory mounted control (and factory supplied thermostat for remote mounting) shall be provided to accomplish the following sequence of operation:

VARIABLE VOLUME FAN TERMINAL

Central Fan "On" - Occupied Mode

As a thermostat senses the need for no cooling, the control system shall close the volume damper to stop flow from the central system primary air duct. Before heating is initiated, the controls shall enter a no load band during which air from the ceiling plenum/room return duct is circulated. On sensing a further need for heat, the heating coil shall be energized.

Central System Fan "Off" - Unoccupied Mode

When there is a need for heat during the unoccupied period, the terminal unit fan and heating coil shall be energized until the thermostat is satisfied.

WIRING

Controls shall be factory mounted and wired. All electrical components shall be mounted in a control box with an easily removable cover. Units shall incorporate a single point electrical connection for 120/277/480 volt power source (transformer for control voltage shall be included on electric control units. Transformer not required for pneumatically controlled units). Terminal strip shall be provided in control box for field connection of thermostat and power source. (Optional fused/unfused disconnect shall be provided).

FACTORY TEST

Fan/motor combinations, volume dampers, and controls shall be run tested, and cfm limit set when specified preset at factory prior to shipment.

SUGGESTED SYSTEM

For low heat loss perimeters, variable volume heating can be accomplished with a Type HVF fan terminal feeding combination heating/cooling diffusers. Air circulation is maintained at all conditions while assuring that hot and cold air mixing or reheat does not occur.

Air circulation is maintained in perimeter zones under all conditions from full cooling to full heating including the "no load" condition in between heating and cooling.



February 4, 1998

SUBMITTAL DATA

| | |
|------------------------|---|
| PROJECT: | Rhines Hall University of Florida |
| OWNER: | University of Florida Gainesville, FL |
| MECHANICAL ENGINEER: | Van Wagenen & Beavers Jacksonville, FL |
| MECHANICAL CONTRACTOR: | W.W. Gay Mechanical Jacksonville, FL |
| PRODUCT: | VAV Terminal Units |
| MANUFACTURER: | Tempmaster |

RHINES HALL - UNIVERSITY OF FLORIDA

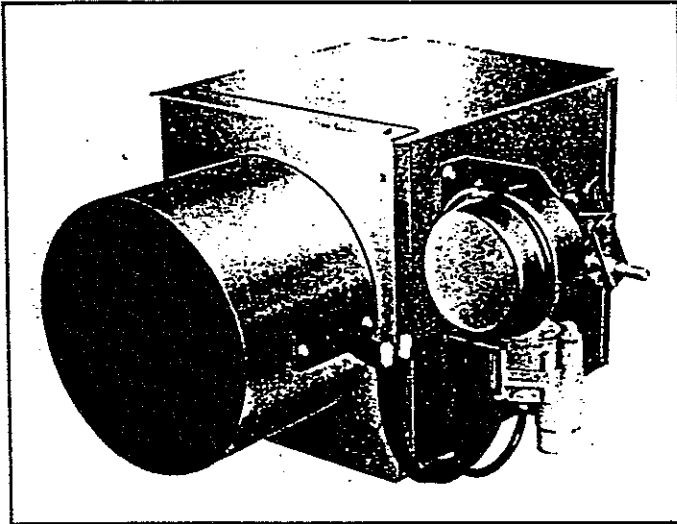
VARIABLE AIR VOLUME TERMINAL UNITS

| TAG # | MODEL # | INLET | PRIMARY AIR | | HEAT COIL CFM | HEAT CAP. (MBH) | ENT. AIR TEMP. | LVG. AIR TEMP. | ENT. WATER TEMP. | LVG. WATER TEMP. | COIL GPM |
|--------|---------|-------|-------------|-----|------------------|--------------------|-------------------|-------------------|---------------------|---------------------|-------------|
| | | | MIN | MAX | | | | | | | |
| V11/1 | HVW-B | 6" | 120 | 400 | 120 | 5.3 | 55.0 | 95.0 | 180.0 | 160.0 | 0.6 |
| V11/2 | V-A | 5" | - | 160 | - | - | - | - | - | - | - |
| V11/3 | V-A | 5" | - | 80 | - | - | - | - | - | - | - |
| V2B/1 | HVW-B | 6" | 465 | 465 | 465 | 17.9 | 55.0 | 95.0 | 180.0 | 160.0 | 1.8 |
| V2B/2 | HVW-A | 5" | 230 | 230 | 230 | 8.9 | 55.0 | 95.0 | 180.0 | 160.0 | 0.9 |
| V21/1 | HVW-A | 5" | 80 | 255 | 65 | 2.9 | 55.0 | 95.0 | 180.0 | 160.0 | 0.3 |
| V21/2 | HVW-A | 5" | 80 | 240 | 65 | 2.9 | 55.0 | 95.0 | 180.0 | 160.0 | 0.3 |
| V21/3 | HVW-A | 5" | 80 | 250 | 65 | 2.9 | 55.0 | 95.0 | 180.0 | 160.0 | 0.3 |
| V21/4 | HVW-B | 6" | 80 | 400 | 80 | 3.5 | 55.0 | 95.0 | 180.0 | 160.0 | 0.4 |
| V21/5 | HVW-B | 6" | 120 | 470 | 120 | 5.3 | 55.0 | 95.0 | 180.0 | 160.0 | 0.6 |
| V21/6 | HVW-A | 5" | 80 | 180 | 65 | 2.9 | 55.0 | 95.0 | 180.0 | 160.0 | 0.3 |
| V21/7 | HVW-A | 5" | 80 | 115 | 65 | 2.9 | 55.0 | 95.0 | 180.0 | 160.0 | 0.3 |
| V21/8 | HVW-A | 5" | 200 | 200 | 200 | 8.8 | 55.0 | 95.0 | 180.0 | 160.0 | 0.9 |
| V21/9 | HVW-A | 5" | 80 | 265 | 65 | 2.9 | 55.0 | 95.0 | 180.0 | 160.0 | 0.3 |
| V21/10 | HVW-A | 5" | 80 | 210 | 65 | 2.9 | 55.0 | 95.0 | 180.0 | 160.0 | 0.3 |
| V21/11 | HVW-A | 5" | 80 | 180 | 65 | 2.9 | 55.0 | 95.0 | 180.0 | 160.0 | 0.3 |
| V22/1 | V-A | 5" | - | 85 | - | - | - | - | - | - | - |

Product Description

Model V

The Tempmaster Model V offers a wide range of unit sizes in air flow capacities to 5,000 cfm in a low profile VAV terminal. The units are designed to control with minimum static pressure requirements and low noise operation. Units are available with ARI certified performance rated in accordance with industry standard 880-89 for air terminals. The Model V unit is provided with inlets suitable for round duct installations. At the discharge, the units are formed to provide for easy S & Drive connection to downstream ducts.



The standard model V terminal unit is constructed of heavy 22 gauge zinc-coated steel, internally lined with 1/2" dual density glass fiber material, surface and exposed edges treated to prevent erosion and having UL 181 approval against air erosion and meeting NBFU and NFPA-90A for continuous temperature. The unit damper is constructed of exactly dimensioned extruded anodized aluminum, mechanically keyed and fastened to a 3/8" damper shaft which rotates in maintenance free nylon bearings for noiseless operation. The average damper leakage of all units does not exceed 2% of rated air flow at 3" inlet static pressure.

The Model V terminal unit is available with optional hot water reheat (Model HVW). The hot water coils are available in a 1 row or a 2 row configuration. The coils are constructed of 10 corrugated aluminum fins per inch, 0.006" thick and 1/2" OD seamless copper circuit tubes, 0.016" minimum wall thickness. Tube headers are extended 3" beyond the casing for sweat connection of field mounted hot water valves provided by others.

~~The Model V terminal units can be paired together (Model VAV) for perimeter applications in a dual duct system where mixing is required. The wide open pressure characteristics of the Model VAV make it ideal for installation in existing low pressure constant volume duct systems to achieve variable level energy savings.~~

Tempmaster

PRODUCT DRAWING

SUPERSEDES: A310.2

FORM 130.10-PA1.4T(192)

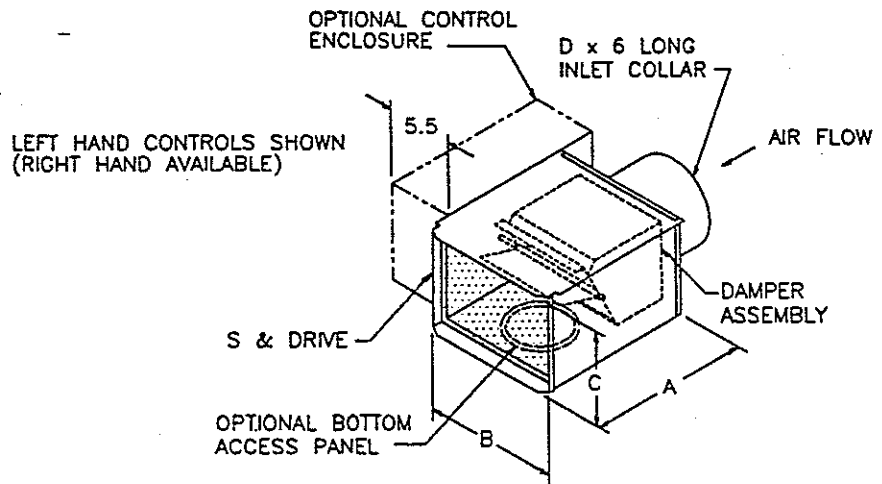
VARIABLE AIR VOLUME MODEL V SINGLE DUCT THROTTLING UNIT

YORK INTERNATIONAL CORPORATION
P.O. Box 1592, York, PA 17405

CONTRACTOR W.W. Gay Mechanical
ORDER NO. _____
TEMPMASTER CONTRACT NO. _____
TEMPMASTER ORDER NO. _____

PURCHASER W.W. Gay Mechanical Contractor
JOB NAME Rhines Hall
LOCATION University of Florida
ENGINEER Van Wagenen & Beavers

REFERENCE DATE _____ APPROVAL DATE _____ CONSTRUCTION DATE _____



FEATURES

- 22 gauge casing
- S & drive discharge connection
- 1/2" dual density internal insulation w/ 4# density face
- All exposed insulation edges coated
- Insulation UL 181 approved
- Insulation meets NFBU & NFPA 90A
- Aluminum damper w/ 60° rotation
- Damper mechanically keyed to shaft
- Nylon damper shaft bearings
- Performance in accordance with Industry Standard 880
- Units certified to ARI

| SIZE | CFM RANGE** | DIMENSIONS (Inches) | | | | | WEIGHT (Lbs.)*** |
|------|--------------|---------------------|----|----|-----|--------------|------------------|
| | | A | B | C | D | OVAL SIZE | |
| A | 80 TO 400 | 12 | 9 | 10 | 5 | N/A | 10 |
| B | 120 TO 600 | 12 | 9 | 10 | 6 | N/A | 10 |
| C | 160 TO 800 | 12 | 12 | 10 | 7 | N/A | 12 |
| D | 200 TO 1000 | 12 | 12 | 10 | 8 | N/A | 12 |
| E | 300 TO 1500 | 12 | 14 | 10 | 10* | 7.88 X 11.02 | 14 |
| F | 400 TO 2000 | 12 | 17 | 10 | 12* | 7.88 X 14.16 | 15 |
| G | 600 TO 3000 | 12 | 22 | 10 | 14* | 7.88 X 17.30 | 19 |
| H | 800 TO 4000 | 12 | 27 | 10 | 16* | 7.88 X 20.44 | 22 |
| J | 1000 TO 5000 | 12 | 36 | 10 | 18* | 7.88 X 23.58 | 27 |

* SUPPLIED WITH FLAT OVAL COLLAR. ALL OTHER COLLARS ARE ROUND.

** ALL UNITS CAN GO TO FULL SHUT OFF. "RANGE" IS RECOMMENDED FOR UNITS SUPPLIED WITH PRESSURE INDEPENDENT CONTROLS.

*** WEIGHTS ARE AVERAGE UNIT WEIGHTS. ACTUAL WEIGHTS MAY VARY DEPENDING ON UNIT AND CONTROL OPTIONS.

ACCESSORIES:

Actuator, flow sensor, control transformer,
control enclosure, mounting of controller
furnished by others

Tempmaster

PRODUCT DRAWING

SUPERSEDES: A3103

FORM 130.10-PA1.5T(192)

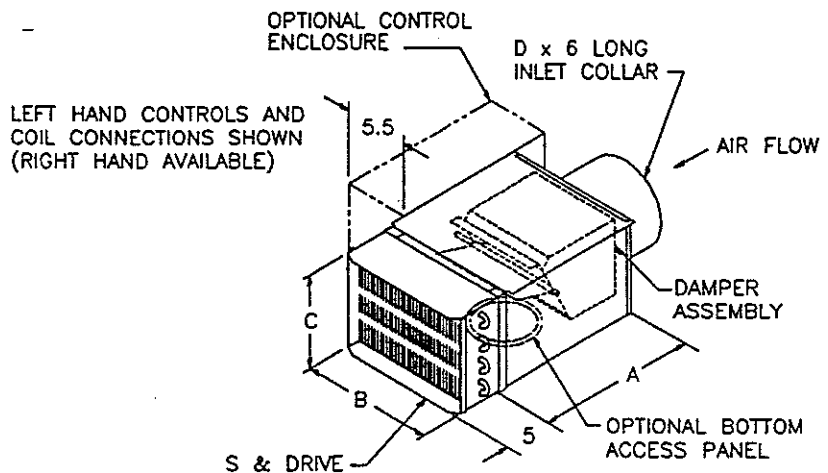
VARIABLE AIR VOLUME MODEL HWW SINGLE DUCT THROTTLING UNIT WITH HOT WATER REHEAT

YORK INTERNATIONAL CORPORATION
P.O. Box 1592, York, PA 17405

CONTRACTOR W.W. Gay Mechanical
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FEATURES

- 22 gauge casing
- S & drive discharge connection
- 1/2" dual density internal insulation w/ 4# density face
- All exposed insulation edges coated
- Insulation UL 181 approved
- Insulation meets NFBU & NFPA 90A
- Aluminum damper w/ 60° rotation
- Damper mechanically keyed to shaft
- Nylon damper shaft bearings
- Performance in accordance with Industry Standard 880
- 1 or 2 row hot water coils available with:
 - 1/2" OD circuit tubes
 - 10 aluminum fins per inch
 - Sweat field connections

| SIZE | CFM RANGE** | DIMENSIONS (Inches) | | | | | WEIGHT (Lbs.)*** |
|------|--------------|---------------------|----|----|-----|--------------|------------------|
| | | A | B | C | D | OVAL SIZE | |
| A | 80 TO 400 | 12 | 9 | 10 | 5 | N/A | 15 |
| B | 120 TO 600 | 12 | 9 | 10 | 6 | N/A | 15 |
| C | 160 TO 800 | 12 | 12 | 10 | 7 | N/A | 18 |
| D | 200 TO 1000 | 12 | 12 | 10 | 8 | N/A | 18 |
| E | 300 TO 1500 | 12 | 14 | 10 | 10* | 7.88 X 11.02 | 21 |
| F | 400 TO 2000 | 12 | 17 | 10 | 12* | 7.88 X 14.16 | 23 |
| G | 600 TO 3000 | 12 | 22 | 10 | 14* | 7.88 X 17.30 | 28 |
| H | 800 TO 4000 | 12 | 27 | 10 | 16* | 7.88 X 20.44 | 33 |
| J | 1000 TO 5000 | 12 | 36 | 10 | 18* | 7.88 X 23.58 | 42 |

* SUPPLIED WITH FLAT OVAL COLLAR. ALL OTHER COLLARS ARE ROUND.

** ALL UNITS CAN GO TO FULL SHUT OFF. "RANGE" IS RECOMMENDED FOR UNITS SUPPLIED WITH PRESSURE INDEPENDENT CONTROLS.

*** WEIGHTS ARE AVERAGE UNIT WEIGHTS WITH 2 ROW COIL. ACTUAL WEIGHTS MAY VARY DEPENDING ON UNIT AND CONTROL OPTIONS.

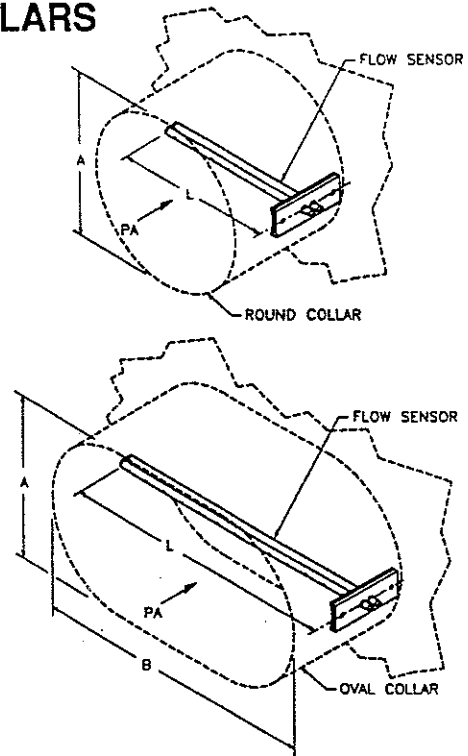
ACCESSORIES:

Actuator, flow sensor, control transformer,
control enclosure, mounting of controller
furnished by others

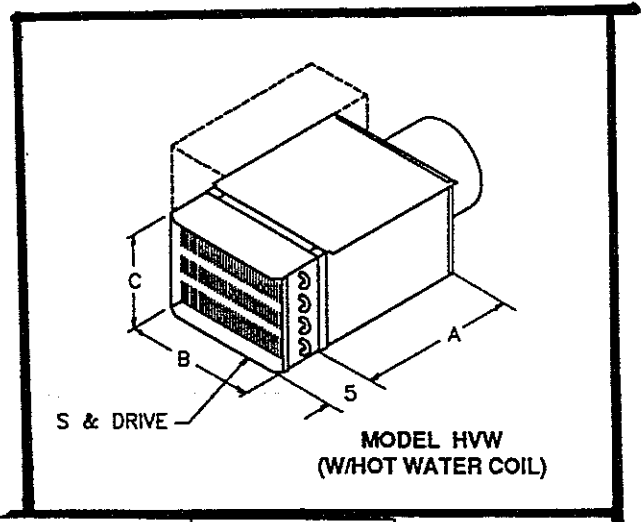
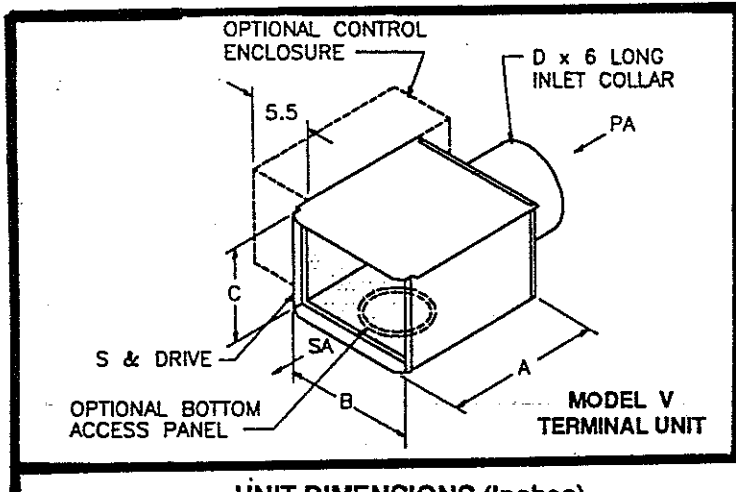
Dimensional Data

ROUND AND OVAL COLLARS

| NEW COLLAR DIA. | A | B | L |
|-----------------|------|-------|------|
| 4 | 3.88 | - | 3.5 |
| 5 | 4.88 | - | 4.5 |
| 6 | 5.88 | - | 5.5 |
| 7 | 6.88 | - | 6.5 |
| 8 | 7.88 | - | 7.5 |
| 9" | 7.88 | 9.45 | 8.5 |
| 10" | 7.88 | 11.02 | 10.5 |
| 12" | 7.88 | 14.16 | 13.5 |
| 14" | 7.88 | 17.30 | 16.5 |
| 16" | 7.88 | 20.44 | 19.5 |
| 18" | 7.88 | 23.58 | 19.5 |
| 20" | 7.88 | 26.72 | 19.5 |
| 24" | 7.88 | 33.01 | 19.5 |



MODEL V



UNIT DIMENSIONS (Inches)

| SIZE | CFM RANGE ** | DIMENSIONS | | | | | WEIGHT (LBS.) *** | |
|------|--------------|------------|----|----|-----|--------------|-------------------|-----|
| | | A | B | C | D | OVAL SIZE | V | HVW |
| A | 80 TO 400 | 12 | 9 | 10 | 5 | N/A | 10 | 15 |
| B | 120 TO 600 | 12 | 9 | 10 | 6 | N/A | 10 | 15 |
| C | 160 TO 800 | 12 | 12 | 10 | 7 | N/A | 12 | 18 |
| D | 200 TO 1000 | 12 | 12 | 10 | 8 | N/A | 12 | 18 |
| E | 300 TO 1500 | 12 | 14 | 10 | 10* | 7.88 X 11.02 | 14 | 21 |
| F | 400 TO 2000 | 12 | 17 | 10 | 12* | 7.88 X 14.16 | 15 | 23 |
| G | 600 TO 3000 | 12 | 22 | 10 | 14* | 7.88 X 17.30 | 19 | 28 |
| H | 800 TO 4000 | 12 | 27 | 10 | 16* | 7.88 X 20.44 | 22 | 33 |
| J | 1000 TO 5000 | 12 | 36 | 10 | 18* | 7.88 X 23.58 | 27 | 42 |

PA = Primary Air Flow, SA = Supply Air Flow

* Supplied with flat oval collar. All other collars are round.

** All units can go to full shut off. "RANGE" is recommended for units with pressure independent controls.

*** Weights are average unit weights. Actual weights may vary depending on unit and control options required.