Furnish and install Anemostat Model (QST)(EST)(QPT) Quiet fan powered terminals, as shown on the plans. The performance of all fan terminals shall be certified under ARI Standard 880 and must display the required ARI 880 Certification Seal. Discharge and radiated sound power levels shall not exceed the values as shown on the terminal unit schedule. All models shall be listed by ETL, conforming to UL 1995 and CAN/CSA-C22.2 No. 236-95, and shall display the ETL logo.

Casing Construction:

The unit casing shall be fabricated from zinc-coated steel and use mechanical locking seams to form a leak-resistant assembly. Any sealant used in the unit's construction must be approved for duct use and conform to NFPA 90A.

The terminal discharge connection shall be:

- Flange type integral to the casing (standard)
- Slip-drive discharge collar

The casing shall be:

- 20 gauge (standard) with 18 gauge bottom panels.

The casing shall be provided with:

- Full unit-width, swing-down blower access door with 1/4-turn, quick open fasteners
- Unit mounting brackets, field installed (option)
- Manual damper locking quadrant (option)
- Standard 20 gauge zinc-coated steel control enclosure
- Hinged front cover for control enclosure (option)
- Hinged, power-interlocking cover for control enclosure (option)

Insulation and Treatment:

The unit casing shall be internally lined with:

- 1" thick matte-faced dual density glass fiber insulation that conforms to NFPA-90A and UL 181 (standard).
- 1/2" thick aluminum foil-faced dual density glass fiber insulation. The edges of the insulation shall be sealed with aluminum tape. The insulation shall conform to NFPA 90A, UL 181, and ASTM C665.
- 1" thick aluminum foil-faced dual density glass fiber insulation. The edges of the insulation shall be sealed with aluminum tape. The insulation shall conform to NFPA 90A, UL 181, and ASTM C665.
- 1/2" thick dual density glass fiber insulation with a 22 gauge non-perforated sheet metal liner, covering all fiber insulation surfaces. The construction shall conform to NFPA 90A, UL 181, and ASTM C665.
- 3/8" thick (fiber-less) smooth skin surface closed cell foam insulation. The insulation shall conform to NFPA 255 and UL 181.
- No Insulation

Low Temperature Units:

Low temperature units shall be capable of handling 40 F primary air without condensation forming on the terminal casing at ambient conditions of 80° F and 60% relative humidity. The unit casing shall be lined with 1" dual density glass fiber insulation. The air valve shall be thermally isolated from the unit casing.

Fan:

The fan blower assembly shall be of the centrifugal forward-curve blade, direct drive design. Blower and motor shall be accessible from the bottom of the unit via an easily removable swing-down door, and removable as an assembly for serviceability. The fan motor shall be mounted directly to the fan housing via rubber, vibration-isolated legs.

Model QST & QPT Motors:

Fan motor shall be high-efficiency permanent split capacitor, designed specifically for use with a factory mounted motor speed controller. Fan motor shall incorporate three motor horsepower windings for potential energy savings at varying flow requirements. Single speed motors are not acceptable.

A motor speed controller shall have a factory-set minimum speed stop to prevent stalling the fan motor or operating the motor below the manufacturer's recommended RPM. A second setting shall provide fully variable adjustment within the allowable range. Mechanical dampering is not an acceptable method of controlling total air volume.

Fan motor shall include thermal overload protection and permanently lubricated sleeve type bearings. Motor shall be suitable for 120V or 277V single phase power. Motor leads with quick disconnects are routed back to the terminal block located in the control enclosure for easy onsite selection of horsepower. Control sequence shall start terminal fan before starting the central AHU system.

Model EST Electronically Commutated Motors (ECM's):

The motor shall be a variable speed, brushless DC type and shall directly drive the fan blower. A permanent magnet type rotor shall operate with zero rotor loss with motor efficiency gains from 20-30% over standard induction motors. Primary motor voltage shall be single phase 120, 240 or 277 vac. An integral inverter/microprocessor shall control the motor's speed and torque by sensing rotor position to perform the commutation function. A pulse width modulating (PWM) controller shall provide input signals to the motor electronics to provide the desired airflow. Fan airflow rates shall be pressure independent by maintaining flow regardless of changes in external static pressure. Motor control logic shall include soft start and soft speed ramp control and be designed to defeat reverse rotation without harming motor. Motors shall use permanently lubricated ball bearings.

Air Valve:

The damper assembly shall consist of a round blade that requires nominal 90-degree rotation from fully opened to fully closed positions on inlet sizes 06 through 16. The damper blade shall be mechanically attached to the die-cast metal damper shaft with through-the-shaft machine-applied rivets. The low leakage damper shall be constructed with a gasket material sandwiched between two 22-gauge zinc coated steel plates. Leakage through the damper shall be less than 1% of the maximum rated airflow at 3" w.g. inlet static pressure. The damper gasket material is securely fastened between the two damper plates using machine applied rivets.

The damper assembly shall rotate freely in self-lubricating bearings. Damper position shall be indicated on the end of the shaft on the outside of the casing. The damper mechanism shall be tested to exceed the 6000-cycle durability requirements conforming to UL standard 429.

Airflow Sensor:

A multi-point airflow sensor (Anemostat Velocity Wing) of the center-averaging type shall be located in the terminal primary air inlet. The airflow sensor shall be aerodynamically designed to provide low pressure loss, quiet operation and have not less than 20 sensing points on any given size unit. The sensor shall amplify the velocity pressure signal and provide feedback of actual flow to the controller. Traverse tubes and non-center averaging sensors are not acceptable.

An identification label with piping/wiring diagram and airflow calibration chart shall be affixed to each unit. Brass flow taps with caps (plastic not accepted), separate from the airflow sensor or controller taps shall be provided for flow readjustment.

Pneumatic Controls:

The pneumatic controls shall be suitable for a 20-psi control system. The sequence of operation is based on Anemostat Control Package Number _____. The pneumatic actuator shall be furnished and mounted by the terminal manufacturer to rotate the damper from fully open to fully closed positions. The actuator shall be directly coupled to the damper shaft with no linkages. The actuator shall develop a minimum of 42 inch-pounds of torque at 5 psi.

The damper shall be:

- Normally open
- Normally closed
- A pneumatic pressure independent controller shall be furnished and mounted by the terminal manufacturer and shall control primary air flow within +/-5% of the design air flow regardless of changes in system static pressure. The controller shall reset the primary flow as required by the thermostat. The maximum and minimum primary airflow set points shall be set at the factory.

The pneumatic thermostats shall be provided and installed by the temperature control contractor. It shall be the responsibility of the temperature control contractor to coordinate their requirements with those of the terminal manufacturer.

Electronic analog controls:

Electronic analog controls shall be suitable for a 24-volt control system. The sequence of operation is based on Anemostat Control Package Number_____. The electronic actuator shall be furnished and mounted by the terminal manufacturer to rotate the damper from fully open to fully closed positions. The actuator shall be directly coupled to the damper shaft with no linkages.

Electronic pressure independent controller shall control primary air flow within +/-3% of the design airflow regardless of changes in system static pressure. The controller shall reset the primary flow as required by the thermostat. The maximum and minimum primary airflow set points shall be set at the factory.

The electronic actuator and controller shall be combined in a single compact housing. The damper/actuator drive mechanism with Analog Electronic controls shall be tested to exceed the 6000-cycle durability requirements conforming to UL standard 429. The electronic actuator shall be designed for permanent stall without damage and develop a minimum of 50 inch-pounds of torque.

The terminal shall also be provided with:

- Transformer to step down incoming line voltage to 24 volts (standard with Analog Electronic control packages)
- Service disconnect switch for 24 volt controls (pilot duty)
- Low voltage fuse and fuse block (option)
- Line voltage disconnect switch (option)
- Line voltage fusing and fuse block (option)

The wall thermostat shall be furnished by the terminal manufacturer for installation by the temperature control contractor. Flow adjustments shall be made at the wall thermostat utilizing a digital voltmeter.

It shall be the responsibility of the temperature control contractor to coordinate these requirements with those of the terminal manufacturer.

DDC Controls:

Terminal manufacturer shall mount DDC controls provided by others. All mounting hardware will be provided by the DDC control supplier.

Hot Water Coils:

Where shown on the plans, hot water heating coils shall be provided and mounted by the terminal manufacturer. The hot water coils shall be mounted at the discharge of the terminal unit, incorporating Slip & Drive type connection for attachment to the downstream ductwork. Coils shall be 1/2" copper tubing mechanically expanded in aluminum fins. Coils shall be leak tested at 300 psi and burst tested at 450 psi. The performance of all hot water coils shall be rated in accordance with ARI standard 410. Refer to the terminal schedule on the plans for capacities and performance requirements. The sequencing of the airflow and water valve shall be controlled as defined by the control sequence selected. The water control valves shall be furnished and installed by others and not by the terminal manufacturer.

Electric Heating Coils:

Where shown on the plans, electric resistance open wire type heating coils and coil controls shall be provided and mounted by the terminal manufacturer. The electric coils shall be located immediately at the fan outlet, and configured such to provide maximum coil longevity and avoid nuisance tripping. The heating elements shall be installed as an integral part of the terminal unit. All fan terminals with electric heat shall be ETL listed for zero clearance, conforming to UL standard 1995, and shall meet the requirements of the National Electric Code. Each heater shall have a transformer, primary disc type automatic reset hi-limit, fan-interlocking relay or air proving switch, magnetic de-energizing contactors (250,000 cycle) or PE switches (pneumatic controls) per step, grounding terminal, and circuit fusing on heaters exceeding 48 amps. Coil panel and frame shall be constructed from aluminized or galvanized steel. A wiring diagram shall be affixed to the coil control enclosure panel. Refer to the terminal schedule on the plans for capacity and performance requirements.

- Pneumatic control systems - the temperature control contractor shall be responsible for connecting pneumatic signal lines to the coil for proper sequencing. Power connection for the coil and fan shall be made at a single point.
- Electronic analog control systems - the terminal manufacturer shall interconnect the electronic control package with the electric coil controls for fan-proving and for proper staging or modulation of heat. Power connection for the coil, fan and controls shall be made at a single point.

The coils shall also be provided with the following options:

- Door interlocking disconnect switch, non-fused
- Power-fusing (Fuses and fuse blocks)
- Manual reset secondary thermal cutout
- Primary fused transformer
- Solid state relay switching for proportioned electric heat