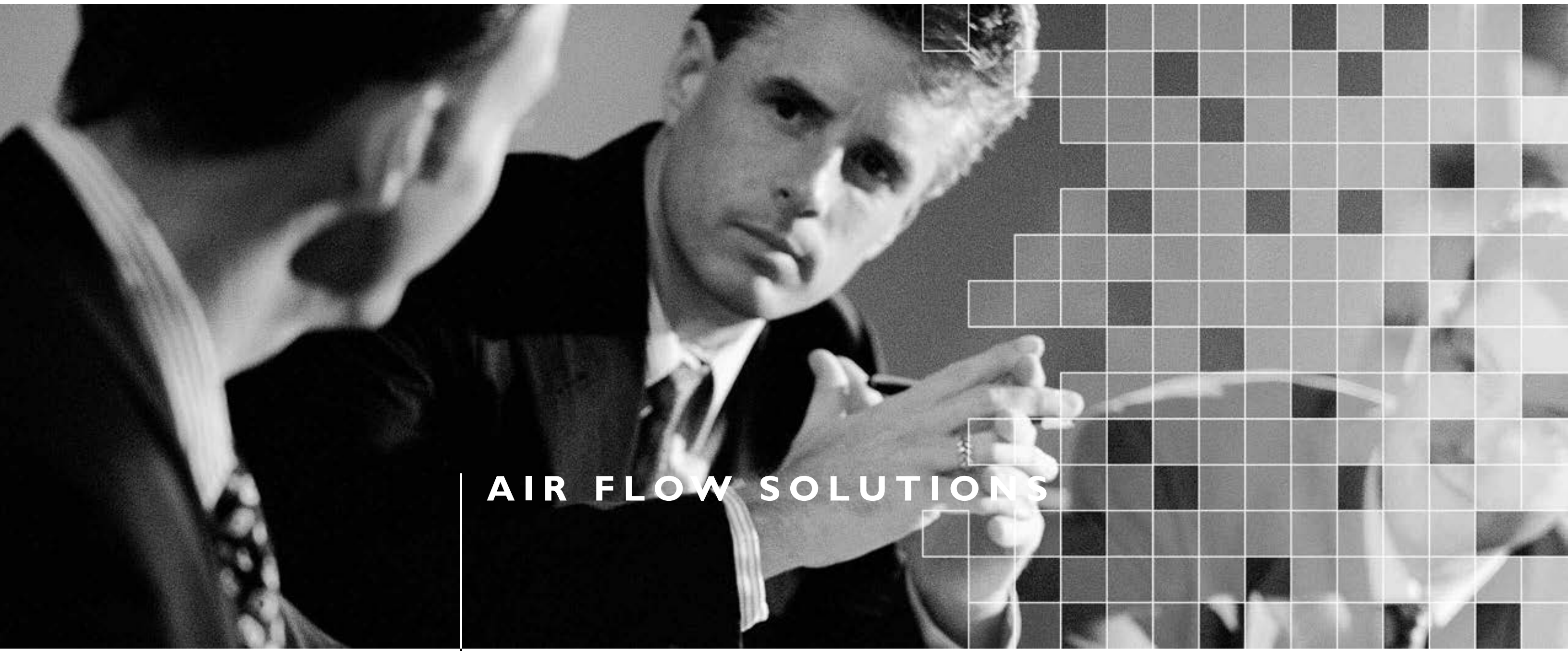
Anemostat®
AIR DISTRIBUTION



Installation, Operation, & Maintenance

MODEL QST

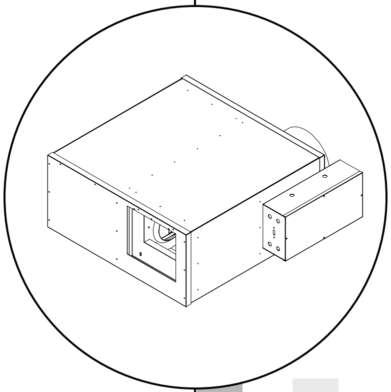
Quiet, Series (Continuous) Flow VAV Terminal Unit

MODEL QPT

Quiet, Parallel (Intermittent) Flow VAV Terminal Unit

MODEL EST

Energy Smart Series (Continuous) Flow VAV Terminal Unit



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Intertek

AHRI CERTIFIED®
www.ahridirectory.org
VAV Terminals
AHRI Standard 880

Table of Contents

1220 Watson Center Road • Carson, CA 90745
Tel: (310) 835-7500 • Fax: (310) 835-0448
www.anemostat-hvac.com • air@anemostat.com

Model QST Number Description

Typical String: QSTS / 50 / 10 / A / B / 2 / A / 5000 / L / - / - / - - - / 2 / - / 3 / B / A / - / C1 / D5 / F1

Typical String: QSTS / 50 / 10 / A / B / 2 / A / 5000 / L / - / - / - - - / 2 / - / 3 / B / A / -

Field	Field Description	Input Code	Description
1	Model	QSTS	QSTS (No Heat)
		QSTW	QSTW (Hot Water Heat)
		QSTE	QSTE (Electric Heat)
2	Horse Power	17	1/6 Horsepower
		25	1/4 Horsepower
		50	1/2 Horsepower
		75	3/4 Horsepower
		10	1 Horsepower
3	Inlet Size	05	5 inch
		06	6 inch
		07	7 inch
		08	8 inch
		09	9 inch
		10	10 inch
		12	12 inch
		14	14 inch
		16	16 inch
4	Inlet Sensor	-	None
		A	Velocity Wing
5	Casing	B	Single Wall 20 Gauge Steel
		E	Double Wall 22 Gauge Steel
		F	Low Temp
6	Insulation	-	None
		1	1/2" Glass Fiber
		2	1" Glass Fiber
		3	1/2" Foil Face
		4	1" Foil Face
		5	3/8" Closed Cell
7	Control Type	-	No Controls (Field Installed DDC)
		P	Pneumatic
		A	Electronic Pressure Independent
		D	Direct Digital Controls
		F	DDC by Others (Factory Mounted)
8	Control Package	- - - -	None
		3000	Enter applicable 4 digit CP number
9	Control Location	L	Left Hand
10	Heating Coil	-	None
		A	1 Row, HW, Right Hand
		B	1 Row, HW, Left Hand
		C	2 Row, HW, Right Hand
		D	2 Row, HW, Left Hand
		K	Electric, Left Hand
11	Electric Coil	-	None
		A	208v, 1 Ph, 60 Hz, 1 Step
		B	208v, 1 Ph, 60 Hz, 2 Step
		C	208v, 1 Ph, 60 Hz, 3 Step
		D	240v, 1 Ph, 60 Hz, 1 Step
		E	240v, 1 Ph, 60 Hz, 2 Step
		F	240v, 1 Ph, 60 Hz, 3 Step
		G	277v, 1 Ph, 60 Hz, 1 Step
		H	277v, 1 Ph, 60 Hz, 2 Step
		J	277v, 1 Ph, 60 Hz, 3 Step
		K	208v, 3 Ph, 60 Hz, 1 Step, 4-wire WYE
		L	208v, 3 Ph, 60 Hz, 2 Step, 4-wire WYE
		M	208v, 3 Ph, 60 Hz, 3 Step, 4-wire WYE
		N	480v, 3 Ph, 60 Hz, 1 Step, 4-wire WYE
		P	480v, 3 Ph, 60 Hz, 2 Step, 4-wire WYE
		R	480v, 3 Ph, 60 Hz, 3 Step, 4-wire WYE
		S	120v, 1 Ph, 60 Hz, 1 Step
		T	120v, 1 Ph, 60 Hz, 2 Step
		U	120v, 1 Ph, 60 Hz, 3 Step
		2	120v, 1 Ph, 60 Hz, SCR
		3	208v, 1 Ph, 60 Hz, SCR
		4	240v, 1 Ph, 60 Hz, SCR
		5	277v, 1 Ph, 60 Hz, SCR
		7	208v, 3 Ph, 60 Hz, SCR, 4-wire WYE
		9	480v, 3 Ph, 60 Hz, SCR, 4-wire WYE

Field	Field Description	Input Code	Description
12	Elec Coil KW	- - -	None
		010	01.0 Kw
13	Fan Motor Volts	1	120v, 1 Ph, 60 Hz
		2	277v, 1 Ph, 60 Hz
		3	240v, 1 Ph, 60 Hz(277v motor)
		4	208v, 1 Ph, 60 Hz(277v motor)
14	Coil Contactors	-	None
		B	Magnetic Disconnecting
15	Transformer	-	None
		1	120v - 1ph/60Hz
		2	208v - 1ph/60Hz
		3	277v - 1ph/60Hz
		4	240v - 1ph/60Hz
		6	24v Transformer Incl, as required
16	Disconnect Switch	-	None
		A	Door Interlocking (Non-fused)
		B	SPST Line 120/277v 1-ph
		C	DPST Line 208/240v 1-ph
17	Control Enclosure	A	Standard Enclosure
		C	Std Enclosure with Hinged Panel
18	Fusing	-	None
		A	Power (Fuses & Blocks)
19	Accessories	C1	Brackets - Mounting (Field Installed)
		C5	S&D Discharge Collar
		D5	Motor Fusing
		D8	Fan Relay, 24vac Coil, SPST/NO
		D9	Air Flow Switch (EDH)
		E1	EDH Isolation Relay - DDC Compatibility
		E4	Electric heat manual reset secondary thermal cutout
		E6	Actuator, Rotary 24 vac Tri-State
		F1	1" Throw Away Filter (MERV 7)
		F2	1" Throw Away Filter (MERV 8)
		F3	1" Throw Away Filter (MERV 8) For Cooling Coil
		Q5	Q5 Sound Elbow
		99	Special Construction - See Notes

Anemostat AIR DISTRIBUTION

Model EST Number Description

Typical String: ESTS / 50 / 10 / A / B / 2 / A / 5000 / L / - / - / - - - / 2 / - / 3 / B / A / K2 / - / C1 / D5 / F1

Typical String: ESTS / 50 / 10 / A / B / 2 / A / 5000 / L / - / - / - - - / 2 / - / 3 / B / A / K2 / -

Field	Field Description	Input Code	Description
1	Model	ESTS	ESTS (No Heat)
		ESTW	ESTW (Hot Water Heat)
		ESTE	ESTE (Electric Heat)
2	Horse Power	33	1/3 Horsepower
		50	1/2 Horsepower
		75	3/4 Horsepower
		10	1 Horsepower
3	Inlet Size	05	5 inch
		06	6 inch
		07	7 inch
		08	8 inch
		09	9 inch
		10	10 inch
		12	12 inch
		14	14 inch
		16	16 inch
4	Inlet Sensor	-	None
		A	Velocity Wing
5	Casing	B	Single Wall 20 Gauge Steel
		E	Double Wall 22 Gauge Steel
		F	Low Temp
6	Insulation	-	None
		1	1/2" Glass Fiber
		2	1" Glass Fiber
		3	1/2" Foil Face
		4	1" Foil Face
		5	3/8" Closed Cell
		6	1" Closed Cell
7	Control Type	-	No Controls (Field Installed DDC)
		P	Pneumatic
		A	Electronic Pressure Independent
		D	Direct Digital Controls
		F	DDC by Others (Factory Mounted)
8	Control Package	- - - -	None
		3000	Enter applicable 4 digit CP number
9	Control Location	L	Left Hand
		R	Right Hand
10	Heating Coil	-	None
		A	1 Row, HW, Right Hand
		B	1 Row, HW, Left Hand
		C	2 Row, HW, Right Hand
		D	2 Row, HW, Left Hand
		K	Electric, Left Hand
11	Electric Coil	-	None
		D	240v, 1 Ph, 60 Hz, 1 Step
		E	240v, 1 Ph, 60 Hz, 2 Step
		F	240v, 1 Ph, 60 Hz, 3 Step
		G	277v, 1 Ph, 60 Hz, 1 Step
		H	277v, 1 Ph, 60 Hz, 2 Step
		J	277v, 1 Ph, 60 Hz, 3 Step
		K	208v, 3 Ph, 60 Hz, 1 Step, 4-wire WYE
		L	208v, 3 Ph, 60 Hz, 2 Step, 4-Wire WYE
		M	208v, 3 Ph, 60 Hz, 3 Step, 4-wire WYE
		N	480v, 3 Ph, 60 Hz, 1 Step,4-wire WYE
		P	480v, 3 Ph, 60 Hz, 2 Step, 4-wire WYE
		R	480v, 3 Ph, 60 Hz, 3 Step, 4-wire WYE
		S	120v, 1 Ph, 60 Hz, 1 Step
		T	120v, 1 Ph, 60 Hz, 2 Step
		U	120v, 1 Ph, 60 Hz, 3 Step
		2	120v, 1 Ph, 60 Hz, SCR
		4	240v, 1 Ph, 60 Hz, SCR
		5	277v, 1 Ph, 60 Hz, SCR
		7	208v, 3 Ph, 60 Hz, SCR, 4-wire WYE
		9	480v, 3 Ph, 60 Hz, SCR, 4-Wire WYE

Field	Field Description	Input Code	Description
12	Elec Coil KW	- - -	None
		010	01.0 Kw
13	Fan Motor Volts	1	120v, 1 Ph, 60 Hz
		2	277v, 1 Ph, 60 Hz
		3	240v, 1 Ph, 60 Hz(277v motor)
14	Coil Contactors	-	None
		B	Magnetic Disconnecting
15	Transformer	-	None
		1	120v - 1ph/60Hz
		2	208v - 1ph/60Hz
		3	277v - 1ph/60Hz
		4	240v - 1ph/60Hz
		6	24v Transformer Incl, as required
16	Disconnect Switch	-	None
		A	Door Interlocking (Non-fused)
		B	SPST Line 120/277v 1-ph
		C	DPST Line 208/240v 1-ph
17	Control Enclosure	A	Standard Enclosure
		C	Std Enclosure with Hinged Panel
18	Fusing	-	None
		A	Power (Fuses & Blocks)
19	Motor Controller	K1	0-10 VDC input from DDC Controller
		K2	Manual fan adj via screwdriver
		K3	4-20 mA input signal from DDC Controller
		K4	Manual fan adj via 2 rotary switches
20	Accessories	C1	Brackets - Mounting (Field Installed)
		C5	S&D Discharge Collar
		D5	Motor Fusing
		D8	Fan Relay, 24vac Coil, SPST/NO
		D9	Air Flow Switch (EDH)
		E1	EDH Isolation Relay - DDC Compatibility
		E4	Electric heat manual reset secondary thermal cutout
		E6	Actuator, Rotary 24 vac Tri-State
		F1	1" Throw Away Filter
		K6	Factory Set Fan CFM
		Q5	Q5 Sound Elbow
		99	Special Construction - See Notes

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Model QPT Number Description

Typical String: QPTS / 50 / 10 / A / B / 2 / A / 5000 / L / - / - / - - - / 2 / - / 3 / B / A / - / 2 / C1 / D5 / F1

Typical String: QPTS / 50 / 10 / A / B / 2 / A / 5000 / L / - / - / - - - / 2 / - / 3 / B / A / - / 2

Field	Field Description	Input Code	Description
1	Model	QPTS	QPTS (No Heat)
		QPTW	QPTW (Hot Water Heat)
		QPTE	QPTE (Electric Heat)
2	Horse Power	17	1/6 Horsepower
		25	1/4 Horsepower
		50	1/2 Horsepower
		75	3/4 Horsepower
		10	1 Horsepower
		33E	1/3 Horsepower (ECM Motor)
		50E	1/2 Horsepower (ECM Motor)
		75E	3/4 Horsepower (ECM Motor)
		10E	1 Horsepower (ECM Motor)
3	Inlet Size	05	5 inch
		06	6 inch
		07	7 inch
		08	8 inch
		09	9 inch
		10	10 inch
		12	12 inch
		14	14 inch
		16	16 inch
4	Inlet Sensor	-	None
		A	Velocity Wing
5	Casing	B	Single Wall 20 Gauge Steel
		E	Double Wall 22 Gauge Steel
		F	Low Temp
6	Insulation	-	None
		1	1/2" Glass Fiber
		2	1" Glass Fiber
		3	1/2" Foil Face
		4	1" Foil Face
		5	3/8" Closed Cell
7	Control Type	-	No Controls (Field Installed DDC)
		P	Pneumatic
		A	Electronic Pressure Independent
		D	Direct Digital Controls
		F	DDC by Others (Factory Mounted)
8	Control Package	- - - -	None
		3000	Enter applicable 4 digit CP number
9	Control Location	L	Left Hand
10	Heating Coil	-	None
		A	1 Row, HW, Right Hand
		B	1 Row, HW, Left Hand
		C	2 Row, HW, Right Hand
		D	2 Row, HW, Left Hand
		K	Electric, Left Hand
11	Electric Coil	-	None
		A	208v, 1 Ph, 60 Hz, 1 Step
		B	208v, 1 Ph, 60 Hz, 2 Step
		C	208v, 1 Ph, 60 Hz, 3 Step
		D	240v, 1 Ph, 60 Hz, 1 Step
		E	240v, 1 Ph, 60 Hz, 2 Step
		F	240v, 1 Ph, 60 Hz, 3 Step
		G	277v, 1 Ph, 60 Hz, 1 Step
		H	277v, 1 Ph, 60 Hz, 2 Step
		J	277v, 1 Ph, 60 Hz, 3 Step
		K	208v, 3 Ph, 60 Hz, 1 Step, 4-wire WYE
		L	208v, 3 Ph, 60 Hz, 2 Step, 4-wire WYE
		M	208v, 3 Ph, 60 Hz, 3 Step, 4-wire WYE
		N	480v, 3 Ph, 60 Hz, 1 Step, 4-wire WYE
		P	480v, 3 Ph, 60 Hz, 2 Step, 4-wire WYE
		R	480v, 3 Ph, 60 Hz, 3 Step, 4-wire WYE
		S	120v, 1 Ph, 60 Hz, 1 Step
		T	120v, 1 Ph, 60 Hz, 2 Step
		U	120v, 1 Ph, 60 Hz, 3 Step
		2	120v, 1 Ph, 60 Hz, SCR
		3	208v, 1 Ph, 60 Hz, SCR
		4	240v, 1 Ph, 60 Hz, SCR
		5	277v, 1 Ph, 60 Hz, SCR
		7	208v, 3 Ph, 60 Hz, SCR, 4-wire WYE
		9	480v, 3 Ph, 60 Hz, SCR, 4-wire WYE

Field	Field Description	Input Code	Description
12	Elec Coil KW	- - -	None
		010	01.0 Kw
13	Fan Motor Volts	1	120v, 1 Ph, 60 Hz
		2	277v, 1 Ph, 60 Hz
		3	240v, 1 Ph, 60 Hz(277v motor)
		4	208v, 1 Ph, 60 Hz(277v motor)
14	Coil Contactors	-	None
		B	Magnetic Disconnecting
15	Transformer	-	None
		1	120v - 1ph/60Hz
		2	208v - 1ph/60Hz
		3	277v - 1ph/60Hz
		4	240v - 1ph/60Hz
		6	24v Transformer Incl, as required
16	Disconnect Switch	-	None
		A	Door Interlocking (Non-fused)
		B	SPST Line 120/277v 1-ph
		C	DPST Line 208/240v 1-ph
17	Control Enclosure	A	Standard Enclosure
		C	Std Enclosure with Hinged Panel
18	Fusing	-	None
		A	Power (Fuses & Blocks)
19	Cabinet Size	1	1
		2	2
		3	3
20	Accessories	C1	Brackets - Mounting (Field Installed)
		C5	S&D Discharge Collar
		D5	Motor Fusing
		D8	Fan Relay, 24vac Coil, SPST/NO
		D9	Air Flow Switch (EDH)
		E1	EDH Isolation Relay - DDC Compatibility
		E4	Electric heat manual reset secondary thermal cutout
		E6	Actuator, Rotary 24 vac Tri-State
		F1	1" Throw Away Filter
		Q5	Q5 Sound Elbow
		99	Special Construction - See Notes

Unit Labeling

Labels are applied to each terminal as follows:

- Unit specific nameplate showing model number, serial number, manufactured date, and information regarding controls and heat provided as appropriate.
- The appropriate airflow calibration chart indicating the airflow at varying airflow sensor signals as shown on pages 16 and 17.
- The appropriate wiring/piping diagram for controls provided by Anemostat, as well as directions for field adjusting the minimum and maximum airflow settings.
- Up arrow indicating the proper orientation of the unit for installation.
- Airflow direction arrow indicating the proper orientation of the duct connections.
- AHRI logo indicating the units performance is AHRI certified.
- Sheet Metal Workers Union logo indicating unit produced by members of The Sheet Metal Workers Union.

The unit also is shipped with a protective tape over the inlet collar. This tape must be removed prior to connecting the duct work to the inlet collar.

⚠WARNING

HAZARDOUS VOLTAGE!
RISK OF ELECTRIC SHOCK
CAN CAUSE INJURY OR DEATH
DISCONNECT ALL REMOTE POWER
SUPPLIES BEFORE SERVICING

FAN POWERED AIR TERMINALS

Model: QST
Size: XX

FAN MOTOR
Volts: XXX Phase: 1ø
Cycle: 60Hz FLA: XXX
H.P.: XXX

Order: XXXXX
Mfg. Date: XX/XX/XX
Control Package:XXXXX
Location:XXXXXXXXXX

DESIGN AIRFLOW RATES / SIGNAL
Fan CFM: XXX
Min CFM: XXX / XXX VDC
Max CFM: XXX / XXX VDC
Aux CFM: XXX / XXX VDC

TAG:
XXXXXXX

- Motor is thermally protected
- Unit designed for min. 0.1" DSP
- Use copper power supply wiring only

Anemostat
AIR DISTRIBUTION
CARSON, CA 310-835-7500

Conforms to
UL STD 1995

C ETL LISTED US
Intertek
3031533

L-77C1

Made in the USA

Receiving and Inspection Instructions

- Check the bill of lading to verify receipt of all listed items (including any loose accessory items). Notify the carrier and the local ANEMOSTAT representative of any shortages or items shipped in error.
- Thoroughly examine all units for transportation damage (dents, punctures, etc). If damage is found, immediately notify and file a claim with the carrier. Note details of any damage on the bill of lading before signing for the shipment.
- Each terminal has a nameplate indicating the model number. When requested, the unit may also be mark with job-specific information (tagging). Locate the nameplate and verify that the correct units with options (controls, heating coils, etc) where received as ordered.
- Store units in a secure, dry location in the original packing, and do not stack any higher than as shipped.

Warning – Electrical Shock, Burn, and other Hazards

- Heating elements must be disconnected, or water coils allowed to cool prior to servicing. Electric heaters may start automatically, or water valves may open intermittently. It is essential to disconnect all power and control circuits prior to servicing to avoid burning hazards.
- All fastening straps or hangers must mechanically lock the terminal in place and withstand typical vibration and/or disturbances during use.
- Use caution during rigging such that all equipment remains adequately secured until it is affixed and secured in its final location.
- All supports must be designed to meet applicable local codes and ordinances. Before rigging and installation, check equipment weights such to ensure temporary and permanent supports are safely maintained.
- Make certain all power sources are disconnected prior to installation or servicing this equipment. Make certain if there are multiple power connections, that all are securely disconnected to avoid electrocution or shock injuries.
- Disconnect control circuits or pneumatic control systems to avoid injury when working on dampers or actuators, which may respond automatically to a remote control source.
- Guard against flame hazards when soldering or brazing water coil connections to avoid personal injury or property damage. Prior to using any open flame, keep a fire extinguisher nearby.
- All insulated units (except closed-cell) contain fiberglass wool. Disturbing the insulation could expose the installer to airborne particles of glass wool fibers and ceramic fibers. Certain jurisdictions feel that exposure to these fibers through inhalation can cause cancer. Glass wool fibers may also cause respiratory, skin or eye irritation.

Terminal Installation

To ensure proper operation of the Fan Terminal, the following installation procedures must be implemented.

1. UL1995 dictates that the unit must be installed at least eight feet above floor level.
2. Install terminal to allow for straight upstream duct connection to the inlet for optimum flow uniformity, if possible.
3. Extreme care must be used when lifting the unit. **Do not use the air flow measuring tubes for lifting the unit! This could result in damage to the unit and incorrect flow measurements.**
4. The unit must be installed horizontally (the labels will be easily read). With reference to the primary air supply inlet, the fan and primary control enclosure will be on the left side. The motor access door will be on the bottom, where 7 inches of vertical clearance are required to remove the door. The unit may be suspended by four 5/16 hanger rods that are secured through 3/8 diameter hole in the four (optional) hanger brackets. Optional mounting brackets are field installed and should be located as indicated in drawings on page 9 thru 14.
5. Care must be taken so as not to crimp the inlet or discharge duct connections.
6. Proper clearance at the bottom is required for removal and service of the fan terminal components. (see note 4 above) Refer to the following dimensions for each unit size and type to verify adequate spacings.
7. Make certain not to obstruct service access to any electrical enclosures or access panels for access to the interior of the unit.

Clearance Requirements

- Line voltage and low voltage electrical enclosures must have adequate (minimum 36") clearances to meet requirements of NFPA 70 (NEC). Note that additional clearance requirements may be required by local codes or building construction specifications.
- The motor access door will be on the bottom, where 7 inches of vertical clearance are required to remove the door.
- Unit should hang freely, and not make contact with any structure above.

Duct Connections and Insulation

- Connecting duct should be configured and installed in accordance with SMACNA guidelines, local code requirements, and/or as specified for the project.
- Inlet duct should be the same size as unit inlet. Straight, solid (non-flexible) duct will yield the best airflow and acoustical performance. Duct should be slid over the round inlet of the terminal and fastened and sealed appropriately. Do not install the supply duct INSIDE the round inlet. Supply inlets are typically undersized -1/8” to allow duct to slip OVER the inlet. Provide insulation over the entire inlet collar, while allowing clearance for the air flow sensor tubing.
- Use caution when installing duct near inlet or discharge sensors. Damage to these devices will yield an non-functioning air terminal.
- The terminal should be installed with straightest possible supply duct practical for job conditions. Generally, a minimum of (3 x Diameter of the inlet size) of straight duct yields best performance.
- The discharge duct connection may utilize either a Slip & Drive or Flanged duct connection. Refer to appropriate product descriptions or submittal sheets for details. Provide 48” after the discharge prior to any transition for optimum flow control. Where space is limited, these dimensions may be reduced but an increase in minimum operating pressure and sound may occur.
- Units with integral electric heaters MUST be installed such that a minimum of 48 inches of full-size, straight downstream duct is connected before any elbows, filters, transitions or any other downstream air disturbance.
- If the terminal includes a hot water coil and is installed in a location with high humidity, the coil casing should be externally insulated.
- After all duct connections are made and sealed, check that the entire ductwork system is airtight.

Hot Water Connections (when applicable)

- Hot water heating coils require a field sweat connection to control valve(s) and water supply. Refer to unit construction submittal drawing for specific connection size. Use appropriate brazing alloy for connection.
- The hot water coil is provided in either a right or left hand connection configuration. If necessary, the coil can be rotated 180 degrees for the opposite hand connection.
- Inlet water temperature should not exceed 200°F per UL 1995.

Electrical Connections

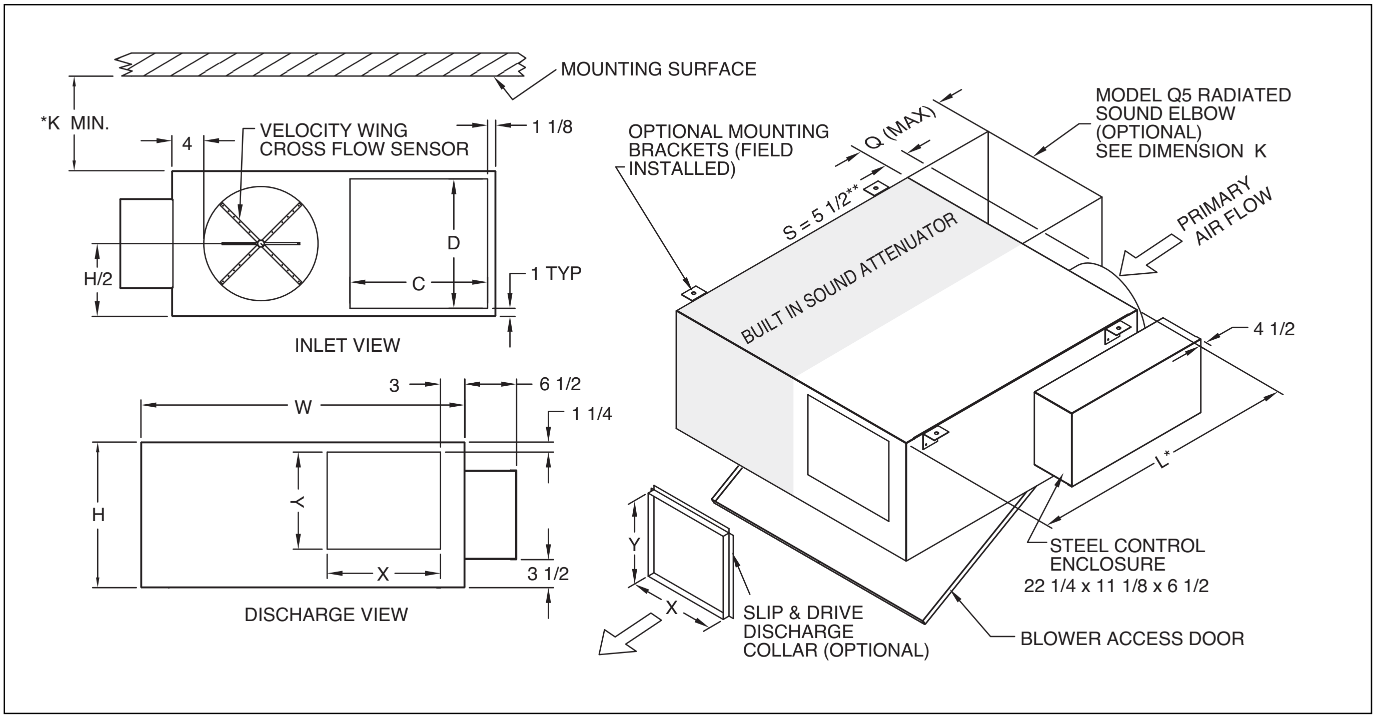
NOTE: The manual was written with the understanding that the line power and control wiring drawings submitted for the specific project have been acquired and are available during installation.

- Electrical wiring, connections, fusing and installation must conform to the local building codes and the NATIONAL ELECTRIC CODE.
- For terminal with electric heat, check the unit wiring diagram for single or dual point connection for electric heater and fan motor voltage.
- The fan terminal I.D. label lists Maximum Overcurrent Protection (MOP) for single point connection fan terminals that have loads consisting of both blower motor and electric heater. This is considered a motor group installation. For these units, the supply circuit must be fused individually.
- UL standards dictate that the power source must be within 10% of nameplate voltage, for safety and longevity. If incoming voltage is 10% above or below nameplate voltage, contact power Company to correct before operating terminal.
- The supply circuit can be fused external to the unit by the installer. The electric heater may be specified with primary circuit fusing which would not require external fusing.
- If the blower motor is the only load, the MOP value on the fan terminal label is blank. In this case, the units may be field wired for multiple hookups from a single branch circuit, as specified by the National Electric Code/Canadian Electric Code and Local Codes.
- Only special HACR-type circuit breakers may be used in place of fusing for over current protection of motor group installations.
- To determine the minimum wire size for terminals without electric heat, use the motor amperage listed on the fan terminal label. The label lists the Minimum Circuit Ampacity (MCA) to determine the proper size for units with electric heat. The power supply wiring is to be sized in accordance with the National Electric Code/Canadian Electric Code and Local Codes.
- The power supply terminal block is for use with copper conductors only.
- Field installed electrical components must be mounted and wired per factory supplied wiring diagram. Factory wiring must not be altered without written approval from ANEMOSTAT; violation of this will void warranty.

For fan terminals provided with electric heating coil: note these additional instructions:

- Connect the fan terminal as shown on the heater wiring schematic diagram found inside the heater wiring enclosure, and also per interlocking VAV controls where applicable.
- The minimum airflow allowed is 70 CFM per KW of electric heat.
- 480 volt/3 phase coils may incorporate "wye" or other unbalanced configuration for multiple steps.

QSTS – Standard



Model Number QSTS	Motor H.P.	Nominal Inlet Diameter	Height H	Width W	Length L	Min. K	Discharge		Induction			Est. Wt.
							X	Y	C	D	Q	LB
1706, 1707, 1708	1/6	6, 7, 8	18	32	36	6	11 1/2	11	12	16	18	117
2508, 2509, 2510	1/4	8, 9, 10	18	32	36	6	11 1/2	11	12	16	18	124
5010, 5012, 5014	1/2	10, 12, 14	18	40	40	6	14	12	17	16	18	139
7512, 7514	3/4	12, 14	20	48	48	8	19	16	21	18	20	187
1012, 1014, 1016	1	12, 14, 16	20	48	48	8	19	16	21	18	20	191

Notes

Weights are an estimate and will vary based on selection options, insulation type, etc.

- 36” clearance required by NEC for electrical enclosures.
- Add 1" to L dimension and **reduce dimension S to 4-1/2" for double wall and low temperature option.
- *K dimension required with optional Q5 sound elbow.

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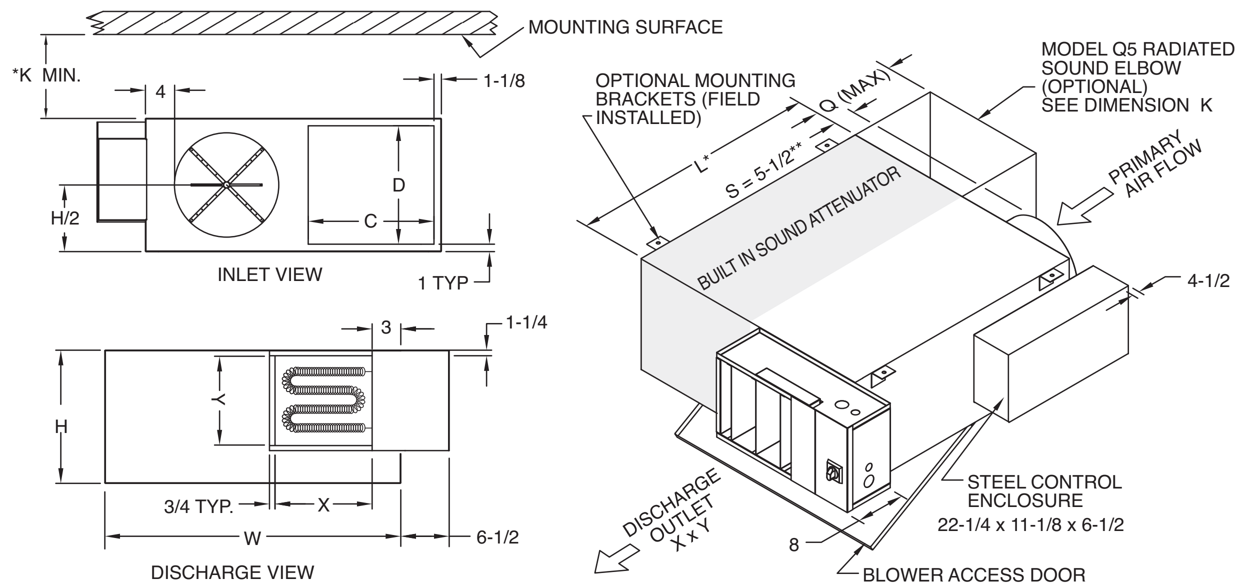
QSTE – Electric Heat



Model Number QSTE	Motor H.P.	Nominal Inlet Diameter	Height H	Width W	Length L	Min. K	Discharge		Induction		Q	Est. Wt.
							X	Y	C	D		LB
1706, 1707, 1708	1/6	6,7,8	18	32	36	6	11-1/2	11	12	16	18	142
2508, 2509, 2510	1/4	8,9,10	18	32	36	6	11-1/2	11	12	16	18	146
5010, 5012, 5014	1/2	10,12,14	18	40	40	6	14	12	17	16	18	162
7512, 7514	3/4	12,14	20	48	48	8	19	16	21	18	20	217
1012, 1014, 1016	1	12,14,16	20	48	48	8	19	16	21	18	20	224

Notes
Weights are an estimate and will vary based on selection options, insulation type, etc.
- 36” clearance required by NEC for electrical enclosures.
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- *K dimension required with optional Q5 sound elbow.

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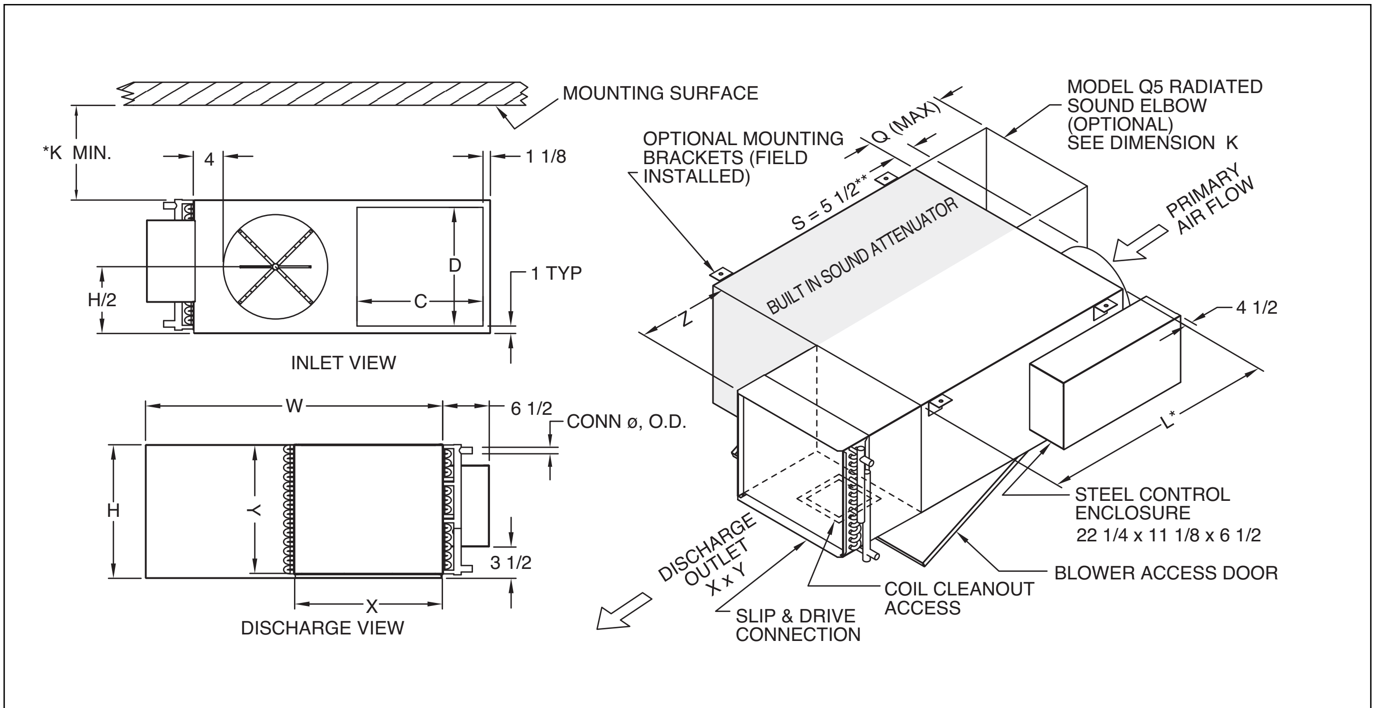
QSTW – Water Heat



Model Number QSTW	Motor H.P.	Nominal Inlet Diameter	Height H	Width W	Length L	Min. K	Discharge		Induction		Q	1 ROW COIL			2 ROW COIL		
							X	Y	C	D	Q	Z	LB	CONN ø	Z	LB	CONN ø
1706, 1707, 1708	1/6	6,7,8	18	32	36	6	16	15	12	16	18	12 1/4	133	7/8	13 1/2	137	1/2
2508, 2509, 2510	1/4	8,9,10	18	32	36	6	20	17 1/2	12	16	18	12 1/4	138	7/8	13 1/2	141	7/8
5010, 5012, 5014	1/2	10,12,14	18	40	40	6	20	17 1/2	17	16	18	12 1/4	159	7/8	13 1/2	164	7/8
7512, 7514	3/4	12,14	20	48	48	8	24	17 1/2	21	18	20	12 1/4	207	7/8	13 1/2	212	7/8
1012, 1014, 1016	1	12,14,16	20	48	48	8	24	17 1/2	21	18	20	12 1/4	211	7/8	13 1/2	217	7/8

Notes
Weights are an estimate and will vary based on selection options, insulation type, etc.
- 36” clearance required by NEC for electrical enclosures.
- Add 1" to L dimension and **reduce dimension S to 4-1/2" for double wall and low temperature option.
- *K dimension required with optional Q5 sound elbow.

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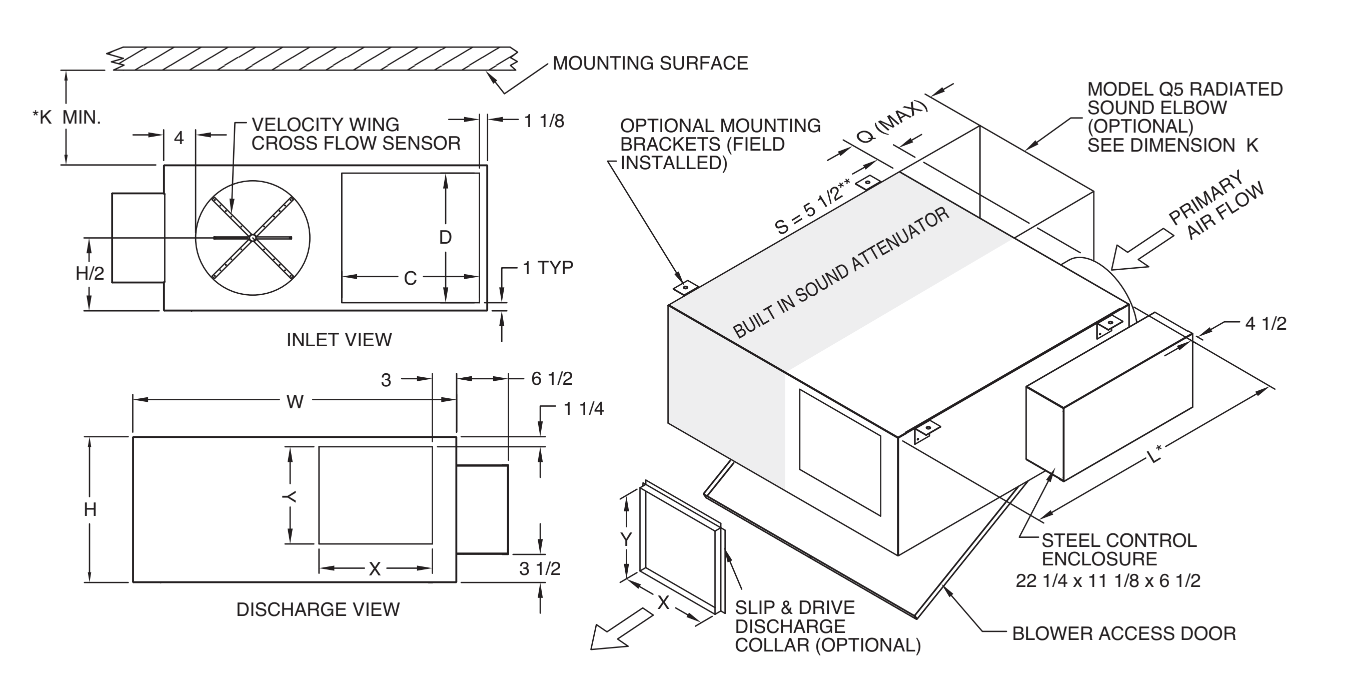
ESTS – Standard



Model Number ESTS	Motor H.P.	Nominal Inlet Diameter	Height H	Width W	Length L	Min. K	Discharge		Induction			Est. Wt.
							X	Y	C	D	Q	LB
3306, 3307, 3308 3309, 3310	1/3	6, 7, 8, 9, 10	18	32	36	6	11 1/2	11	12	16	18	124
5006, 5007, 5008, 5009 5010, 5012, 5014	1/2	6, 7, 8, 9 10, 12, 14	18	40	40	6	14	12	17	16	18	139
7507, 7508, 7509 7510, 7512, 7514	3/4	7, 8, 9 10, 12, 14	20	48	48	8	19	16	21	18	20	187
1009, 1010, 1012 1014, 1016	1	9, 10, 12 14, 16	20	48	48	8	19	16	21	18	20	191

Notes

Weights are an estimate and will vary based on selection options, insulation type, etc.

- 36” clearance required by NEC for electrical enclosures.
- Add 1" to L dimension and **reduce dimension S to 4-1/2" for double wall and low temperature option.
- *K dimension required with optional Q5 sound elbow.

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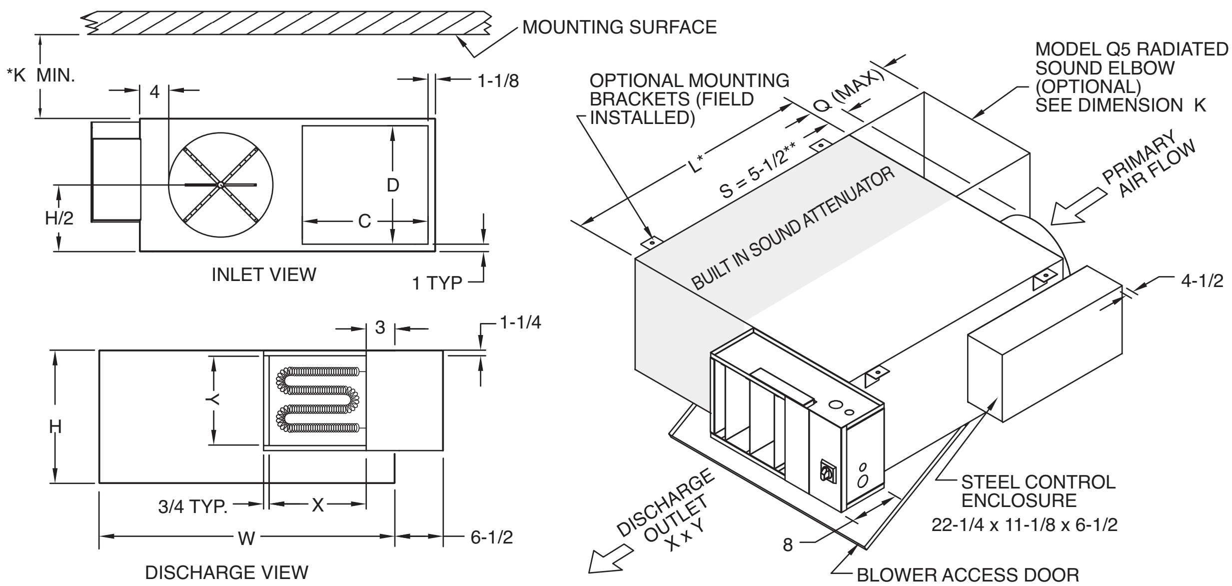
ESTE – Electric Heat



Model Number ESTE	Motor H.P.	Nominal Inlet Diameter	Height H	Width W	Length L	Min. K	Discharge		Induction		Q	Est. Wt.
							X	Y	C	D		LB
3306, 3307, 3308 3309, 3310	1/3	6, 7, 8, 9, 10	18	32	36	6	11-1/2	11	12	16	18	146
5006, 5007, 5008, 5009 5010, 5012, 5014	1/2	6, 7, 8, 9 10, 12, 14	18	40	40	6	14	12	17	16	18	162
7507, 7508, 7509 7510, 7512, 7514	3/4	7, 8, 9 10, 12, 14	20	48	48	8	19	16	21	18	20	217
1009, 1010, 1012 1014, 1016	1	9, 10, 12 14, 16	20	48	48	8	19	16	21	18	20	224

Notes

Weights are an estimate and will vary based on selection options, insulation type, etc.

- 36” clearance required by NEC for electrical enclosures.
- Add 1" to L dimension and **reduce dimension S to 4-1/2" for double wall and low temperature option.
- *K dimension required with optional Q5 sound elbow.

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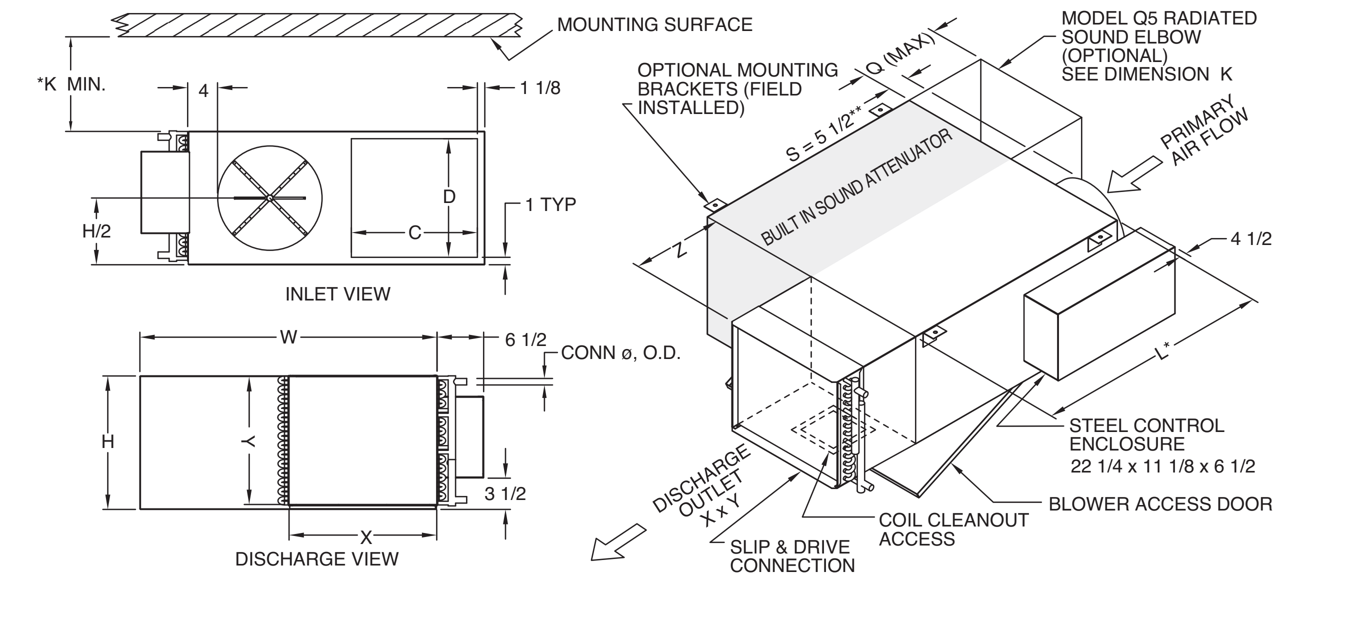
ESTW – Water Heat



Model Number ESTW	Motor H.P.	Nominal Inlet Diameter	Height H	Width W	Length L	Min. K	Discharge		Induction			1 ROW COIL			2 ROW COIL		
							X	Y	C	D	Q	Z	LB	CONN ø	Z	LB	CONN ø
3306, 3307, 3308 3309, 3310	1/3	6, 7, 8 9, 10	18	32	36	6	20	17 1/2	12	16	18	12 1/4	138	7/8	13 1/2	141	7/8
5006, 5007, 5008, 5009 5010, 5012, 5014	1/2	6, 7, 8, 9 10, 12, 14	18	40	40	6	20	17 1/2	17	16	18	12 1/4	159	7/8	13 1/2	164	7/8
7507, 7508, 7509 7510, 7512, 7514	3/4	7, 8, 9, 10, 12, 14	20	48	48	8	24	17 1/2	21	18	20	12 1/4	207	7/8	13 1/2	212	7/8
1009, 1010, 1012 1014, 1016	1	9, 10, 12 14, 16	20	48	48	8	24	17 1/2	21	18	20	12 1/4	211	7/8	13 1/2	217	7/8

Notes

Weights are an estimate and will vary based on selection options, insulation type, etc.

- 36” clearance required by NEC for electrical enclosures.
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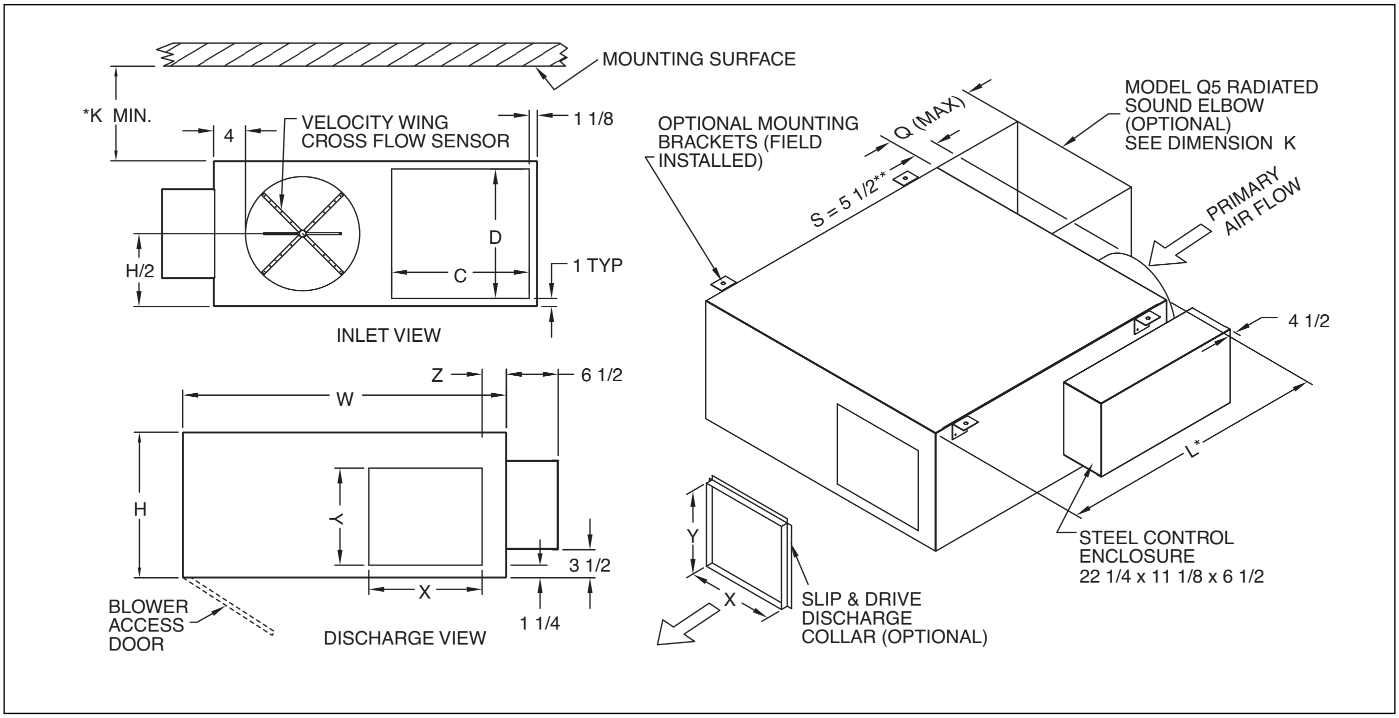
QPTS – Standard



Model QPTS Size	Cabinet Size	Motor H.P.	Nominal Inlet Diameter	H	W	L	Min. K	Discharge			Induction			Est. Wt.
								X	Y	Z	C	D	Q	LB
11706, 11707, 11708, 11709	1	1/6	6, 7, 8, 9	15	34	30	6	11-1/2	11	3	13	12	18	83
12506, 12507, 12508, 12509	1	1/4	6, 7, 8, 9	15	34	30	6	11-1/2	11	3	13	12	18	86
21709, 21710, 21712	2	1/6	9, 10, 12	18	40	34	6	14	12	3	17	16	18	100
22509, 22510, 22512	2	1/4	9, 10, 12	18	40	34	6	14	12	3	17	16	18	105
25009, 25010, 25012	2	1/2	9, 10, 12	18	40	34	6	14	12	3	17	16	18	110
35012, 35014, 35016	3	1/2	12, 14, 16	20	46	40	8	19	16	2-1/4	21	18	20	134
37512, 37514, 37516	3	3/4	12, 14, 16	20	46	40	8	19	16	2-1/4	21	18	20	139
31012, 31014, 31016	3	1	12, 14, 16	20	46	40	8	19	16	2-1/4	21	18	20	146

Notes

Weights are an estimate and will vary based on selection options, insulation type, etc.

- 36” clearance required by NEC for electrical enclosures.
- Add 1" to L dimension and **reduce dimension S to 4-1/2" for double wall and low temperature option.
- *K dimension required with optional Q5 sound elbow.

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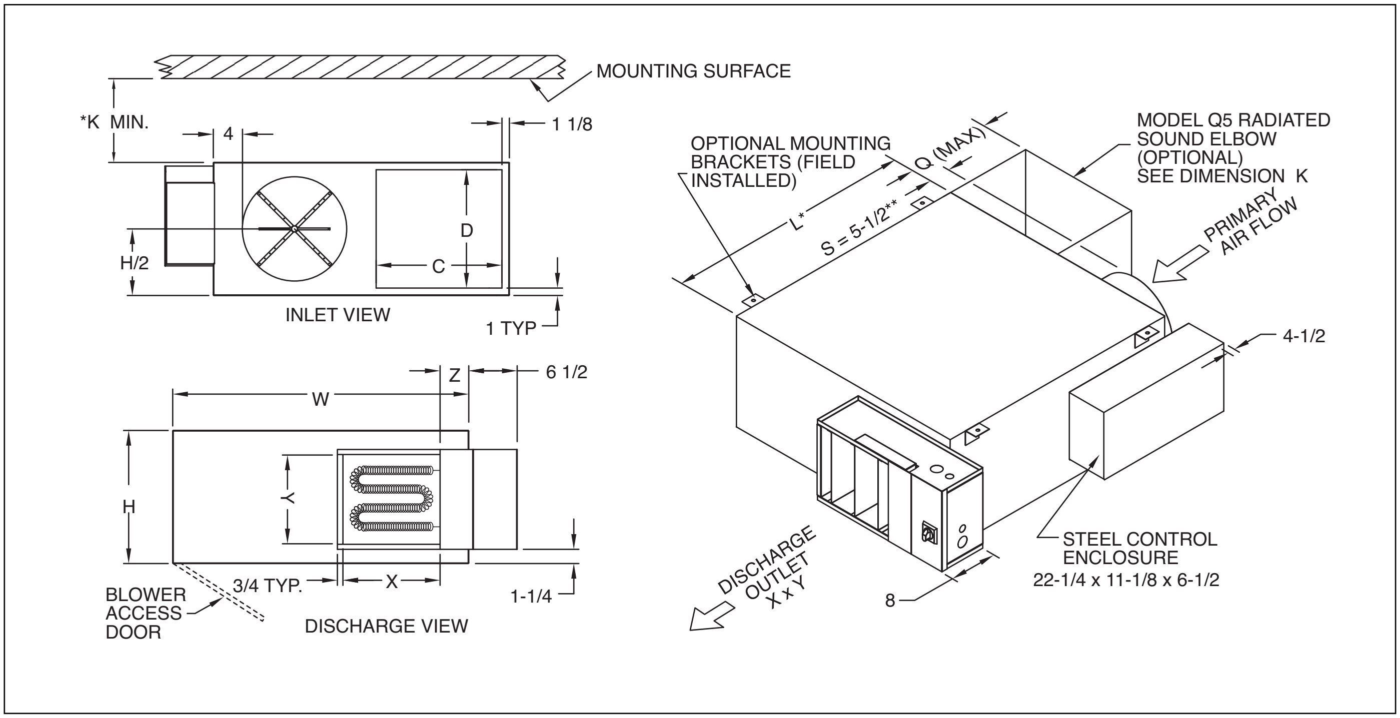
QPTE – Electric Heat



Model QPTE Size	Cabinet Size	Motor H.P.	Nominal Inlet Diameter	H	W	L	Min. K	Discharge		Z	Induction		Q	Est. Wt.
								X	Y		C	D		LB
11706, 11707, 11708, 11709	1	1/6	6,7,8,9	15	34	30	6	11-1/2	11	3	13	12	18	108
12506, 12507, 12508, 12509	1	1/4	6,7,8,9	15	34	30	6	11-1/2	11	3	13	12	18	111
21709, 21710, 21712	2	1/6	9,10,12	18	40	34	6	14	12	3	17	16	18	123
22509, 22510, 22512	2	1/4	9,10,12	18	40	34	6	14	12	3	17	16	18	128
25009, 25010, 25012	2	1/2	9,10,12	18	40	34	6	14	12	3	17	16	18	133
35012, 35014, 35016	3	1/2	12,14,16	20	46	40	8	19	16	2-1/4	21	18	20	167
37512, 37514, 37516	3	3/4	12,14,16	20	46	40	8	19	16	2-1/4	21	18	20	172
31012, 31014, 31016	3	1	12,14,16	20	46	40	8	19	16	2-1/4	21	18	20	179

Notes
Weights are an estimate and will vary based on selection options, insulation type, etc.
- 36” clearance required by NEC for electrical enclosures.
- Add 1" to L dimension and **reduce dimension S to 4-1/2" for double wall and low temperature option.
- *K dimension required with optional Q5 sound elbow.

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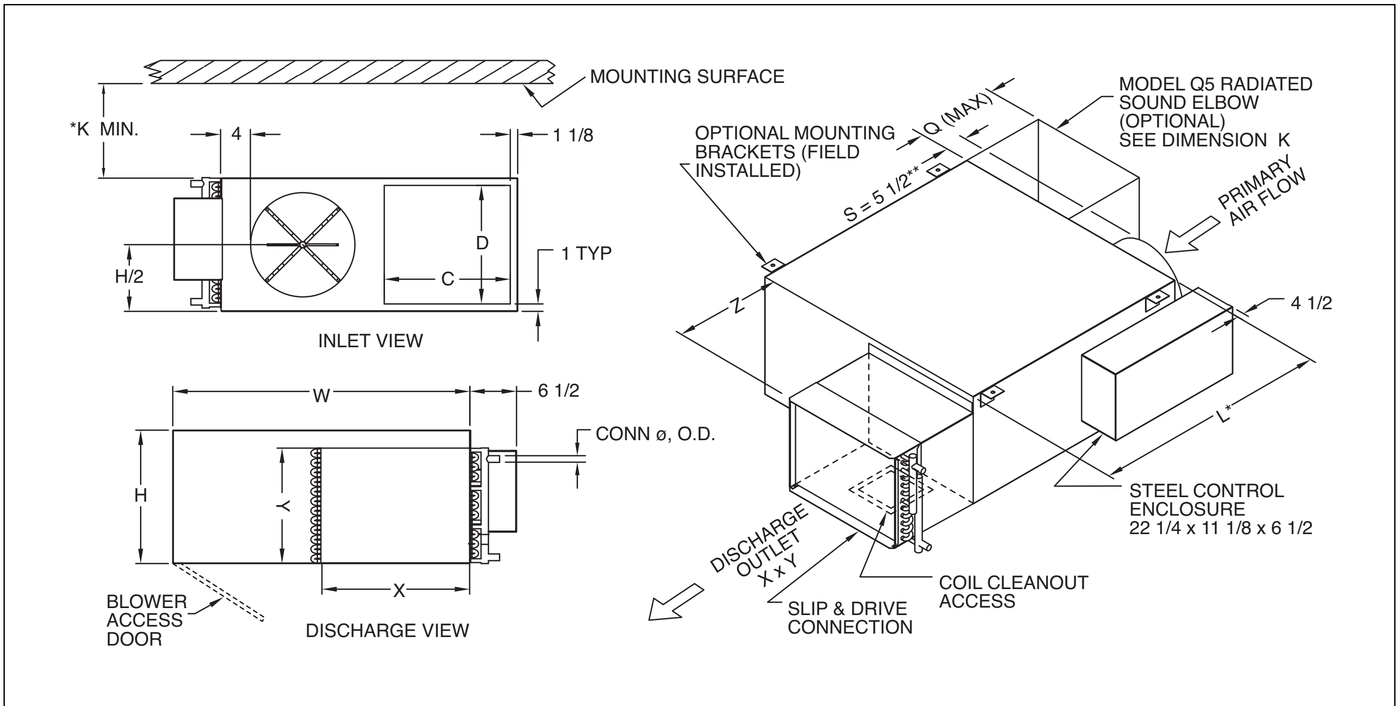
QPTW – Water Heat



Model QPTW Size	Cabinet Size	Motor H.P.	Nominal Inlet Diameter	H	W	L	Min. K	Discharge		Induction			1 ROW COIL			2 ROW COIL		
								X	Y	C	D	Q	Z	LB	CONN ø	Z	LB	CONN ø
11706, 11707, 11708, 11709	1	1/6	6,7,8,9	15	34	30	6	16	15	13	12	18	12-1/4	99	7/8	13-1/2	103	1/2
12506, 12507, 12508, 12509	1	1/4	6,7,8,9	15	34	30	6	16	15	13	12	18	12-1/4	102	7/8	13-1/2	106	1/2
21709, 21710, 21712	2	1/6	9,10,12	18	40	34	6	20	17-1/2	17	16	18	12-1/4	114	7/8	13-1/2	117	7/8
22509, 22510, 22512	2	1/4	9,10,12	18	40	34	6	20	17-1/2	17	16	18	12-1/4	119	7/8	13-1/2	122	7/8
25009, 25010, 25012	2	1/2	9,10,12	18	40	34	6	20	17-1/2	17	16	18	12-1/4	124	7/8	13-1/2	127	7/8
35012, 35014, 35016	3	1/2	12,14,16	20	46	40	8	24	17-1/2	21	18	20	12-1/4	154	7/8	13-1/2	160	7/8
37512, 37514, 37516	3	3/4	12,14,16	20	46	40	8	24	17-1/2	21	18	20	12-1/4	159	7/8	13-1/2	165	7/8
31012, 31014, 31016	3	1	12,14,16	20	46	40	8	24	17-1/2	21	18	20	12-1/4	166	7/8	13-1/2	172	7/8

Notes

Weights are an estimate and will vary based on selection options, insulation type, etc.

- 36″ clearance required by NEC for electrical enclosures.
- Add 1" to L dimension and **reduce dimension S to 4-1/2" for double wall and low temperature option.
- *K dimension required with optional Q5 sound elbow.

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General Controller Information

Notes:

1. Minimum airflow with pressure independent controls based on the following minimum flow sensor signals:
   5000-series - 1 VDC (see table 2)
   3000-series - 0.03" w.g.
2. Pressure independent controls may be set for 0 CFM, at or above the minimum airflow shown, but not between.
3. 3000 series can be used either as direct or reverse acting for normally open or normally closed damper positions. Field adjustable start point and reset span. The 3000 series is equipped with separate adjustable knobs for maximum and minimum airflow settings.
4. 5000 series maximum and minimum airflow settings field adjustable at the thermostat.

REFER TO THE DOCUMENTATION PROVIDED ON THE WIRING/PIPING DIAGRAM ON THE TERMINAL FOR THE PROPER FIELD ADJUSTMENT OF THE MINIMUM AND MAXIMUM AIRFLOW SETTINGS ON TERMINALS PROVIDED WITH PRESSURE INDEPENDENT CONTROLS.

Some adjusting tips:

1. Allow sufficient time for the controller to respond to adjustments.
2. Cycling of the thermostat to check maximum and minimum airflow settings is often required.
3. On units with pneumatic controls, do not turn the adjustment knobs excessively.

Pneumatic Connections

1. Main air is supplied to the primary control box through the hole marked M. The thermostat is connected through the hole marked T. The air flow measuring tubes are factory connected through the holes marked L and H.
2. Terminals that use pneumatic controls require a 20-30 psi supply of clean, dry, oil-free air.

Model 31 Pneumatic Controller

(Pneumatic Controls)

A pressure gauge or manometer is required for flow adjustment. Refer to Calibration Table 1 on the following page.

1. Connect pressure gauge or inclined manometer to the primary air flow taps. The upstream flow tap is connected to the high pressure side of the gauge. The downstream flow tap is connected to the low pressure side of the gauge.
2. Refer to the Calibration Table for the pressure reading at the required CFM.

Primary Air Flow Adjustment

The thermostat-reset span is factory set at 5.0 psi. To field adjust the reset span follow these steps:

1. Remove the gauge tap cap at G and attach the 0-30 psi gauge.
2. Adjust the thermostat pressure to the T port to 20 psi.
3. Adjust the RESET SPAN knob until the gauge G pressure is equal to the desired reset span. This is total span pressure, not ending span pressure.
4. Replace the gauge tap cap.

For Normally Open or Normally Closed dampers with either Direct or Reverse Acting thermostats, follow these steps:

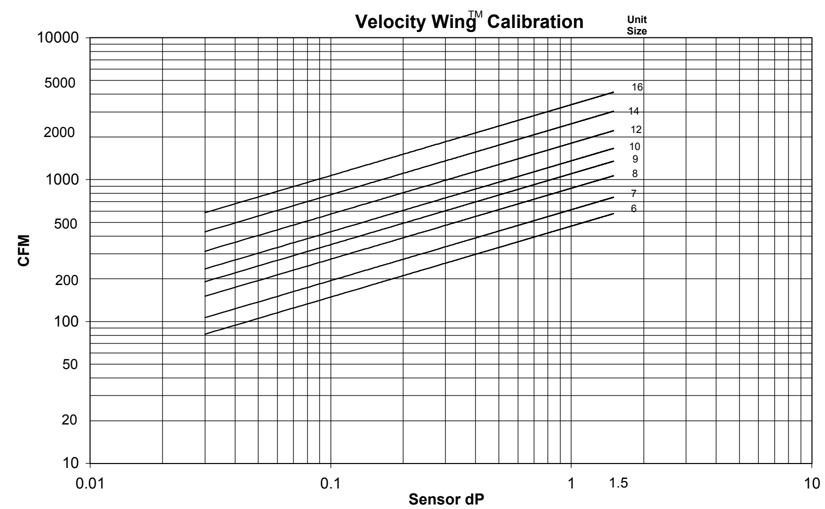
1. The LO STAT is always calibrated first, with 0 psi on the T port. This air flow setting will be the desired minimum for DA/Cooling or RA/Heating applications, or the maximum for RA/Cooling or DA/Heating.
2. The HI STAT is always calibrated second with 20 psi on the T port. This air flow setting will be the desired maximum of DA/Cooling or RA/Heating applications, or the minimum for RA/Cooling or DA/Heating applications.

NOTE: The minimum inlet static pressure, as shown on the performance data charts, is required for proper operation.

Table 1 – Airflow vs. Velocity Wing™ Signal

(Non-Flow Thru / Dead Head)

	Inlet Size							
	6	7	8	9	10	12	14	16
Sensor dP	CFM							
0.03	81	106	150	190	234	312	428	583
0.04	94	122	173	220	271	360	494	673
0.06	115	150	212	269	331	441	605	824
0.1	148	194	274	347	428	570	781	1064
0.2	210	274	388	491	605	806	1104	1505
0.3	257	335	475	601	741	987	1352	1844
0.4	297	387	548	694	856	1140	1562	2129
0.5	332	433	613	776	957	1274	1746	2380
0.6	363	474	672	851	1048	1396	1912	2607
0.7	392	512	725	919	1132	1508	2066	2816
0.8	419	547	775	982	1210	1612	2208	3011
0.9	445	581	823	1042	1284	1710	2342	3193
1 (K-Factor)	**469**	**612**	**867**	**1098**	**1353**	**1802**	**2469**	**3366**
1.5	574	750	1062	1345	1657	2207	3024	4122



Electric Analog Connections

Electronic controls are typically factory wired for single point power voltage supply with fan relay and 24VAC power (from a step-down transformer) as part of the fan circuit or electric heater circuit.

1. The remote mounted thermostat is connected to the appropriate components located in the control box. See the control wiring diagram affixed to the inside of cover.
2. When hot water reheat is used, the relay in the control box must be wired to the water valve actuator.

Electronic DDC Controls

(Factory-mounted, controls by others)

IMPORTANT All RS485 communication networks must be installed using twisted, shielded pair wiring. Each twisted pair must be individually shielded. If using unshielded wiring, cables must be placed in solid metal conduit alone, without DC switching or AC lines. Failure to use these types of connectors may result in various system communication problems such as excessive network retries, noise susceptibility, and loss of communication.

If proper wiring is not used, the site may not meet FCC class A regulations for RFI emissions; thereby forcing the installer or user to make the necessary wiring changes at a later date.

Primary Air Flow Adjustment

(Electric Analog Controls - Series CSP-5000)

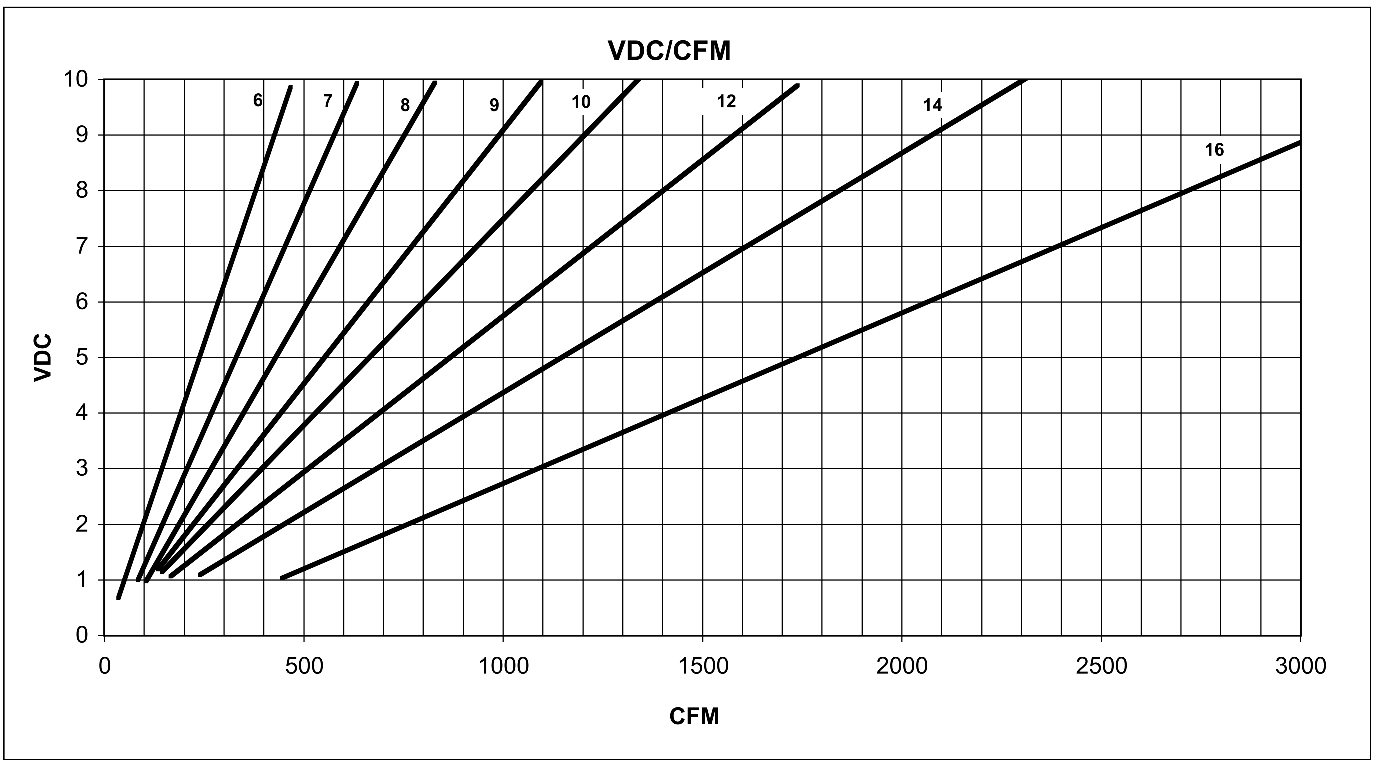
Maximum and minimum flow limits can be field-adjusted without the use of additional measuring equipment. Adjustment is made with a Digital Voltmeter (DVM) at room thermostat without accessing the air terminal. The electronic thermostat is a low voltage solid-state thermistor device, with very rapid (almost instantaneous) response to temperature changes in the conditioned space.

To adjust the maximum and minimum flow limits; a small flat blade (1/8") screwdriver and a digital voltmeter (0-10VDC in .01 of VDC) are required. In addition, the ambient room temperature at the thermostat must be within 55-85F for proper calibration.

1. Remove the thermostat cover by releasing the spring clips on both sides of the thermostat.
2. Plug the voltmeter into the thermostat meter taps.
3. Adjust the cooling setpoint slider all the way to the right for minimum cooling. Adjust the MIN INCR potentiometer to the desired DC voltage (Reference the DC voltage vs. the CFM curve in Table 2). The minimum setpoint must be adjusted first.
4. Adjust the cooling setpoint slider all the way to the left for maximum cooling. Adjust the MAX INCR potentiometer to the desired DC voltage (Reference DC voltage vs. CFM curve in Table 2). The maximum setpoint must be adjusted last.

Table 2 – Airflow vs. Velocity Wing™ Signal

(Analog Controls - Series CSP-5000)



NOTE: The minimum inlet static pressure, as shown on the performance data literature, is required for proper operation.

Altitude Correction Factors

Barometric Pressure (in h.g.)	Altitude (feet)	Density lb/ft^3	Correction Factor
29.92	0	.075	1.03
20.28	500	.074	1.01
28.85	1000	.072	0.99
28.33	1500	.071	0.98
27.82	2000	.070	0.96
27.32	2500	.068	0.95
26.81	3000	.067	0.93
26.33	3500	.066	0.91
25.84	4000	.065	0.89
25.37	4500	.064	0.88
24.89	5000	.062	0.86
24.44	5500	.061	0.85
23.98	6000	.060	0.83
23.54	6500	.059	0.82
23.09	7000	.058	0.80

Example: Determine the airflow sensor signal of a 6" unit at 500 CFM located at an elevation of 5000 ft., for a 3000 series pneumatic controller.

To use the correction factor:
Correction factor X CFM at unit location = .86 x 500 = 430 CFM

Referencing the 6" flow curve, shown on page 10, find 430 CFM @ .80" w.c. sensor signal pressure. The velocity controller set at .80" signal pressure will result in 500 CFM at 5000 ft. elevation.

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Fan Discharge Air Flow Adjustment

Two levels of adjustment are allowed
1. Motor HP (course)
2. SCR (fine)

Three motor (HP) taps are wired into the control enclosure to a terminal block. Factory default is the high tap (labeled "H"). Do not operate unit without ductwork, as motor overload and failure may occur. During final balancing, adjustment of the motor horsepower may be made inside the control enclosure, by moving the red (line-side wire from the SCR) to a different terminal (either "M" - Medium or "L" - Low).

NOTE: Disconnect power before switching motor taps.

A small flat blade 1/8" screwdriver is required to adjust the fan discharge airflow via the SCR. The adjustment screw is located through a small hole in the bottom of the control enclosure. You do not need to open the enclosure for this fan speed adjustment.

1. Fan discharge airflow is field-adjusted by varying the downstream static pressure, adjusting the motor HP taps and finally, the SCR speed controller.
2. Fan performance curves show the CFM for the various downstream static pressure (D.S.Ps) in inches of water. These are available from the Anemostat website.
3. Models QST and QPT fan terminals are designed to operate from .1 to .8 D.S.Ps. Motors may overload if terminals are operated at D.S.Ps below these limits. If terminals are operated at D.S.Ps above 0.8"w.g., freewheeling may result in possible motor damage.

Table 4 – Unit Fan & Primary Flow Range Selection

Model QST (**Note:** Primary cfm may be reduced to the minimum controllable flow, but shall never exceed fan cfm.)

Unit Size	Inlet	Min Fan CFM	Max Prim & Fan
17	6	200	500
	7	200	650
	8	200	650
25	8	600	900
	9	600	1100
	10	600	1200
50	10	1000	1400
	12	1000	1800
	14	1000	1800
75	12	1200	2000
	14	1200	2300
10	12	1600	2000
	14	1600	2600
	16	1600	2600

Note: Primary cfm may be reduced to the minimum controllable flow, but shall never exceed fan cfm.

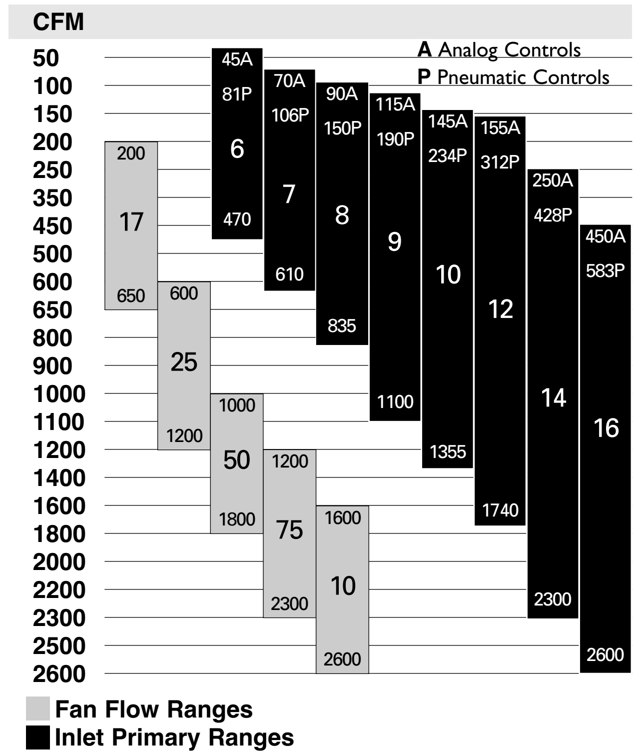

Table 5 – Unit Fan & Primary Flow Range Selection

Model EST

Unit Size	Inlet	Min Fan CFM	Max Prim & Fan
33	8	175	810
	9	175	1100
	10	175	1100
50	10	450	1355
	12	450	1600
	14	450	1600
75	12	650	1800
	14	650	2000
10	12	700	1800
	14	700	2400
	16	700	2400

Note: Primary cfm may be reduced to the minimum controllable flow, but shall never exceed fan cfm.

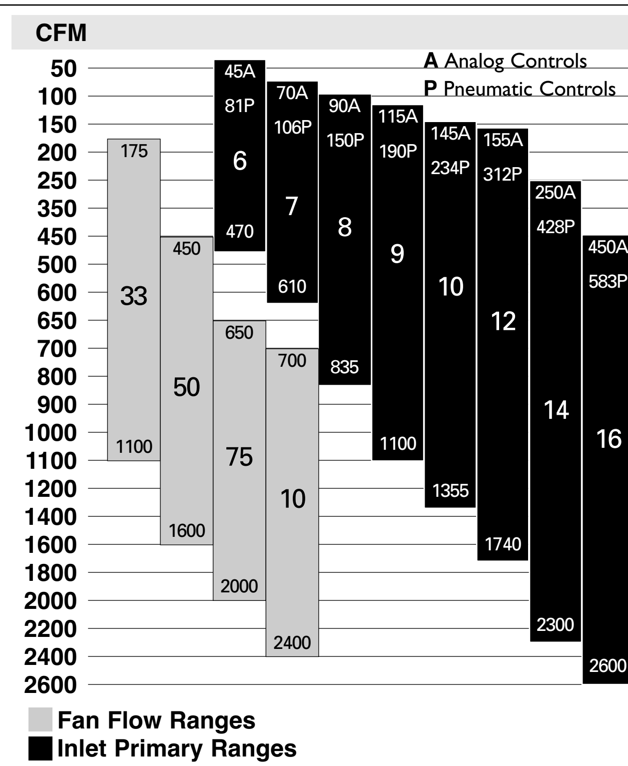

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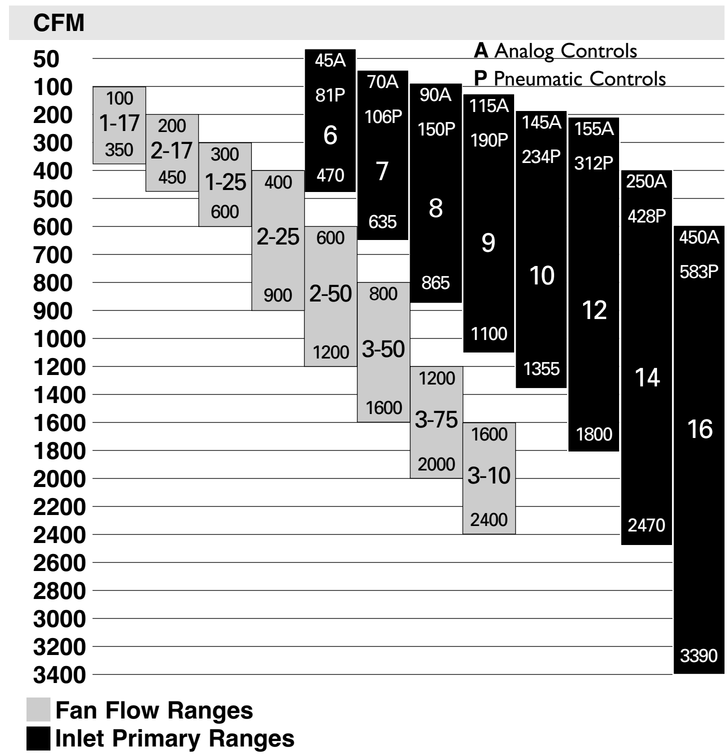
Table 6 – Unit Fan & Primary Flow Range Selection

Model QPT

Casing Size	Fan Size	Max Fan CFM @ 0.25 ESP – Tap: High	Med	Low
1	17	375	325	275
	25	715	675	635
2	17	540	410	285
	25	1100	975	820
	50	1550	1450	1280
3	50	1800	1600	1300
	75	2175	1775	1380
	10	2350	2225	2075

Inlet	Max Prim CFM
6	470
7	635
8	865
9	1100
9	1100
10	1355
12	1800
12	1800
14	2470
16	3390

Fan Flow Ranges
Inlet Primary Ranges



Service & Replacement of Blower and/or Motor

Fan terminals have a bottom removal motor and blower. **The electric power must be disconnected before servicing the unit.** After the air terminal is de-energized, the procedures listed below must be followed.

1. Remove the blower motor access door from the terminal casing, by dropping the discharge end of the access door about 7 inches and lifting up on the inlet end.
2. Disconnect the blower motor wiring by removing the four spade connectors on the controls-side of the motor.
3. The motor and blower are removed as an assembly. Remove only the two nuts on the lower blower discharge. The assembly is "hooked" at the top of the discharge bulkhead. Swing the lower end of the blower assembly back and up to unhook, and drop down, out of the casing.
4. The blower and motor assembly can be bench serviced. The motor blower assembly is replaced by following the above steps in reverse order.

Service & Replacement for Electrical & Pneumatic Parts

Fan Terminals have a control enclosure as a standard feature. The control enclosure houses the speed controller, motor relay, pneumatic electric (PE) switches, control transformer, air flow pressure switch, terminal blocks, disconnect switch, pneumatic or electric controller and the actuator that controls the inlet valve. A control-wiring diagram for each air terminal is attached to the unit. Individual components in the panels are not field-repairable. If one proves defective, it should be removed and a replacement component installed. See page 24 for replacement parts list.

General Maintenance

Before performing any maintenance, disconnect power and allow the blower motor to come to a complete stop. Disconnect the capacitor for safety (located within the blower compartment). Dirt accumulation can cause motor overheating. Use a vacuum to remove dirt accumulations from the motor, especially in and around the motor vent openings.

The unit may be provided with a temporary air filter. The air filter is installed on the right, plenum-inlet side of the unit, into filter rails. Air filters should be replaced soon after fan terminal installation and start-up. Check the air filters regularly based on the condition of the operating environment and replace as necessary.

Periodically inspect and check for unusual noises or vibrations, high motor current, worn wiring, loose mounting bolts, and worn or pitted relay contacts.

The standard Fan Motors have permanently lubricated sleeve type bearings and require no oiling.

General Troubleshooting

To troubleshoot suspected problems, a 0-1”w.g. Magnehelic, a voltmeter and a 0-20 psi pressure gauge are required.

- Be sure there is airflow through the terminal. The central (primary) fan must be on, the damper open, etc.
- Power must be supplied to the terminal. This includes line voltage to the fan circuit and transformer, 18 psi minimum to the pneumatic circuit, or 24VAC to the electronic circuit.

Pneumatic Controls

If overcooling or undercooling occurs, the problem must be isolated as follows:

Tubing Connections

- Visually check the tubing connections and compare them with the proper control schematic. Check to be sure that each tube is tightly connected. Verify that 20 psi main air is available.

Thermostat

- Set the position of the thermostat temperature adjustment lever to the full cooling position. Connect the 0-1” w/g gauge to the balance tap and compare the signal pressure with the signal marked on the terminal label. These signals should be approximately equal.
- Move the lever to the minimum cooling position. If the thermostat is working properly, the inlet valve will close off causing the signal pressure to approach its minimum setpoint or zero.
- Results other than those above indicate a temperature adjustment must be made. Move the thermostat lever to a position slightly warmer or colder than the original setting.
- If the inlet valve does not reduce CFM when the thermostat is set for minimum cooling, check the pressure in the thermostat line. It should be 0 psi for a direct-acting thermostat and 20 psi for a reverse-acting thermostat. If the pressure is not as indicated, the thermostat may need to be replaced.

Pneumatic Motor (actuator)

- Check the motor for leaks and check the shaft setscrews to verify they have not come loose.

CFM

Overcooling can also occur due to excessive CFM at minimum air setting. Ventilation air may have to be reduced or reheat added to maintain temperature control.

Undercooling may be an indication of insufficient duct pressure (air) and/or insufficient system cooling capacity. The following procedure is required:

- Check the inlet pressure to see that minimum pressure for CFM required is available at the terminal.
- Check the supply air cold duct temperature.

Electronic Analog Controls

- Check for loose wires at the connections.
- Compare the control diagram located on the fan control access door to the wiring connections.
- Check for proper primary and secondary voltages.
- Verify that the supply voltage between the controller and the thermostat is approximately 16 VDC when measured between terminals 4 and 5. If not, the controller may need to be replaced.
- Verify the velocity sensor and duct pressure tubing is connected securely, taps are covered and no leakage is occurring.
- Verify the thermostat maximum and minimum potentiometer voltage. If minimum and maximum cannot be adjusted between 0 and 10 VDC, the thermostat may need to be replaced.

Table 7 – Troubleshooting Guide

Problem	Cause	Action
Motor does not Start	Blown Fuse	Replace Fuse - Recheck
	Low voltage	Check/repair inadequate wiring or line power feed
	Improper line connections	Check against diagram and repair
	Defective Motor	Repair or replace
	Defective Capacitor	Replace
	Defective Speed Controller	Replace
Motor Stalls	Motor overloaded	Check for proper primary airflow, motor speed and HP setting
	Low Motor Voltage	Check for proper line voltage
Motor does not reach full speed	Voltage too low	Increase speed controller setting. Move to higher HP tap. Check for poor connections
	Starting load too high	Check primary airflow
Motor takes too long to accelerate	Excess loading or high inertia load	Check primary airflow, motor speed or HP tap setting. Clean blower wheel
	Applied voltage too low	Check for poor connections Increase conductor size
	Defective motor	Repair or replace
Motor vibrates or is excessively noisy	Motor misaligned	Realign
	Voltage too high	Check wiring; correct voltage
	Worn, damaged, dirty or overloaded bearings	Replace or repair motor; Check alignment and balance
Motor overheats while running under load	Overloaded motor	Check primary airflow
	Dirt clogging motor ventilation	Clean motor / blower
	Faulty connections	Clean tighten or repair wiring
	High or low voltage	Check for +/-10% rated voltage
	Defective Motor	Repair or Replace

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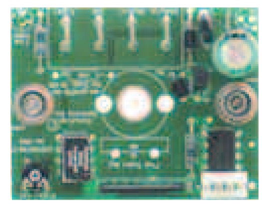
Troubleshooting EST Controllers (PWM)

EVO/ECM Series — Control Test Procedure

> **Warning**: These tests are to be performed by qualified personnel who are familiar with the machinery where the EVO/ECM series control and connected motor is installed. All mechanical, electrical and other applicable safety practices must be observed when performing these tests. While the EVO/ECM series controls are low voltage devices, they are often installed in or near high voltage cabinets and wiring. And they are connected to electrically isolated connections on the ECM motor. Wiring and device faults can occur. Always test for high voltage before starting these tests!

High Voltage Fault Test *Perform this test in addition to all tests and practices prescribed by the equipment manufacturer and your professional training.*

1. Remove the machine's control cabinet cover or otherwise obtain access to the component side of the EVO/ECM series control. Leave everything connected. Typical Component Side →



2. If you removed power to gain access, re-power the equipment as necessary to troubleshoot the equipment.

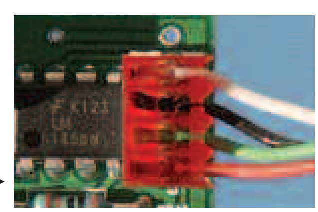
3. Set the multimeter to measure AC Volts.

4. Connect the BLACK lead to electrical earth.

5. Touch the RED lead to the EVO/ECM series connection marked 24Vac. The meter should read about 30 Volts AC. If the meter reads a voltage above 48 Volts AC, immediately disconnect the machine. There is a high voltage fault somewhere in the system.

6. Touch the RED lead to the other connectors to the board. If the meter reads a voltage above 48 Volts AC, immediately disconnect the machine. There is a high voltage fault somewhere in the system.

7. Touch the RED lead to the metal wire grippers (top of connector) for each of the 4 motor wires. If the meter reads a voltage above 48 Volts AC, immediately disconnect the machine. There is a high voltage fault somewhere in the system. Motor Control Connection →



You are ready to test the EVO/ECM series control.

Troubleshooting EST Controllers (PWM) - continued

EVO/ECM Series

Control Test Procedure

This procedure allows you to test an EVO/ECM series GE ECM Motor control while it is powered and connected to the motor. The series includes many types of controls, all having the same interface to the ECM motor.

Motor Interface

The EVO/ECM series uses a 4 wire interface to the motor. Most equipment uses our standard color coding for these wires:

Pin 1.	White	Motor On/Off	0 = Off, ~22Vdc = On
Pin 2.	Black	Tachometer	
Pin 3.	Green	Common	
Pin 4.	Red	Speed	0 = Min. Speed, ~22Vdc = Max. Speed

Problem Solver:

ECM motor will not run.
Perform the Motor On test.

Motor Runs but the speed does not change.
Perform the Variable Speed Test.

Motor does not turn off.
Perform the Motor Off Test

Motor does not run unless power is removed and restored.
Perform Motor Off Test

Intermittent operation when connected to an automation system
Perform Motor Off Test

Motor Runs, but there is no RPM indication.
Perform the Tachometer Test

A Fast Test…..

If the motor is not running and you want to determine if the EVO/ECM series control is calling for the motor to run, just measure the DC voltage between the Green and White wires on the motor control cable. If this voltage is greater than 10VDC, the motor should be running.
Especially if you measure this voltage at the connection to the motor. If you have an instance where the motor stops intermittently, and it restarts when power is removed then restored, perform this test before removing power. It will tell you if the intermittent part is the EVO/ECM series control!

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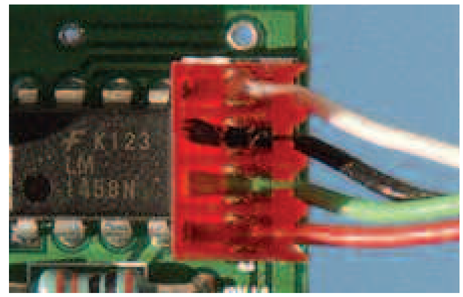
Troubleshooting EST Controllers (PWM) - continued

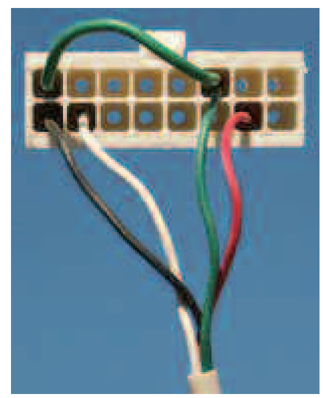
EVO/ECM Series | Control Test Procedure

Motor On Test   The *EVO/ECM series control must be set to ON to perform this test.*

Set the multimeter to read 24Vdc.



1. Touch the black lead to the common (Green) wire on the 4 pin motor connector.
2. Touch the red lead to the Motor On/Off (White) wire on the 4 pin motor connector.
3. If the Dc voltage is ~22Vdc, the motor should run.
4. If the motor does not run, the cable may be defective.
5. Go to the control connector on the motor.



6. Insert the black meter lead into the connector shell hole containing the single green wire.
7. Insert the red meter lead into the connector shell hole containing the White wire. The DC voltage should be ~22Vdc. If it is not, the control cable is defective. If the voltage is greater than 10Vdc and the motor does not run, contact the equipment manufacturer for further instructions.
8. If the EVO/ECM series control includes an off feature, turn the control to off. The motor should stop and the voltage between the green and black wires should fall to less than 0.2Vdc.

Automation Off Test   *If an automation system turns the ECM motor on/Off by directly feeding 24Vac to the EVO/ECM series controller, perform the Off Test.*

Turn the ECM motor off using the Automation System.

1. Touch the black lead to the common (Green) wire on the 4 pin motor connector.
2. Touch the red lead to the Tachometer (Black) wire on the 4 pin motor connector.
3. The Dc voltage should be less than 3Vdc
4. If the voltage is too high, the Automation Control is leaking current through its On/Off switching device.

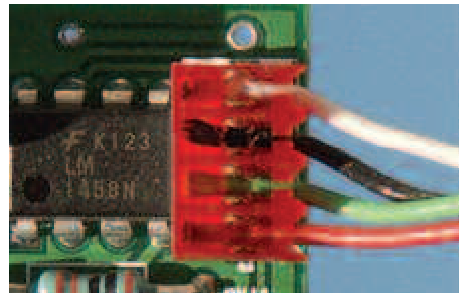
Troubleshooting EST Controllers (PWM) - continued

EVO/ECM Series

Control Test Procedure

Variable Speed Test *The motor should be running to perform this test.*

Set the multimeter to read 24Vdc.



1. Touch the black lead to the common (Green) wire on the 4 pin motor connector.

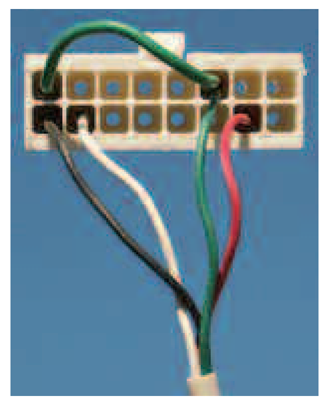
2. Touch the red lead to the Speed (Red) wire on the 4 pin motor connector.

3. Set the EVO/ECM series controller to full speed.

4. The Dc voltage should be equal to the voltage on the white wire (~22Vdc). The motor should run at full speed.

5. If the motor does not run at full speed, the cable may be defective.

6. Go to the control connector on the motor.



7. Insert the black meter lead into the connector shell hole containing the single green wire.

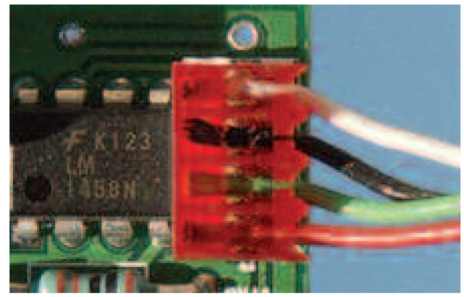
8. Insert the red meter lead into the connector shell hole containing the Red wire. The DC voltage should equal to the voltage on the white wire (~22Vdc). If it is not, the control cable is defective. If the voltage is ~22Vdc and the motor does not run at full speed, contact the equipment manufacturer for further instructions.

Troubleshooting EST Controllers (PWM) - continued

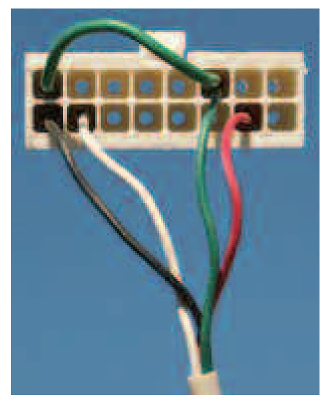
EVO/ECM Series — Control Test Procedure

Tachometer Test *This test only applies to EVO/ECM series controls that display or transmit RPM information. The motor should be connected but turned off or running at minimum speed for this test.*

Set the multimeter to read 5Vdc.



1. Touch the black lead to the common (Green) wire on the 4 pin motor connector.
2. Touch the red lead to the Tachometer (Black) wire on the 4 pin motor connector.
3. You should read about 5Vdc.
4. Go to the control connector on the motor.
5. Insert the black meter lead into the connector shell hole containing the single green wire.
6. Insert the red meter lead into the connector shell hole containing the Black wire. The DC voltage should about 5Vdc. If it is not, the control cable is defective. Swap the EVO/ECM series control with a known good control to determine if the problem is with the EVO/ECM series control. If the problem persists, contact the equipment manufacturer for further instructions.



Standard Replacement Parts List

Item	Part Number	Description
1	13-14	CSC-3011 Pneumatic Controller
2	13-34	MCP-3631 Pneumatic Actuator (5-10 PSI)
3	13-43	CSE-1102 Pressure Switch
4	13-44	PE Switch CCE-1003
5	15-87	Motor – 1/6HP 120V
6	15-88	Motor – 1/4HP 120V
7	15-89	Motor – 1/2HP 120V
8	15-90	Motor – 3/4HP 120V
9	15-91	Motor – 1HP 120V
10	15-82	Motor – 1/6HP 277V
11	15-83	Motor – 1/4HP 277V
12	15-84	Motor – 1/2HP 277V
13	15-85	Motor – 3/4HP 277V
14	15-86	Motor – 1HP 277V
15	13-31	CSP-5001 Analog Electronic Controller / Actuator
16	13-32	Thermostat – CTE-5101
17	13-35	Thermostat – CTE-5103
18	13-34	Thermostat – CTE-5104
19	13-26	Changeover Relay REE-1005
20	13-45	Temp Sensor STE-1002 (for REE-1005)
21	13-46	Trigger Relay REE-5002 (adjustable fan trip voltage)
22	13-36	Trigger Relay REE-5001
23	13-05	R8222D-1022 SPDT Fan Interlock Relay 120V coil
24	13-24	Transformer 277/24 40VA
25	13-19	Transformer 120/24 40VA
26	12-83	Velocity Wing 6”
27	12-84	Velocity Wing 7”
28	12-85	Velocity Wing 8”
29	12-86	Velocity Wing 9”
30	12-87	Velocity Wing 10”
31	12-88	Velocity Wing 12”
32	12-89	Velocity Wing 14
33	12-90	Velocity Wing 16”
34	13-47	Fuse Holder - 500V 30 AMP “Bussman” HPG/HP
35	15-65	MCSPALL-120 Motor Speed Controller 120V
36	15-37	MCSPALL-277 Motor Speed Controller 277V
37	15-26	Disconnect Switch - SPST
38	15-29	Replacement Filter – 18" x 18" x 1" (for QST-17 and QST-25)
39	15-23	Replacement Filter – 18" x 20" x 1" (for QST-50)
40	15-36	Replacement Filter – 20" x 24" x 1" (for QST-75 and QST-10)
41	15-34	Capacitor, Run 4 MFD, 370VAC, for QST/QPT-17 (120V) -25 (120/277V)
42	15-35	Capacitor, Run 6 MFD, 370VAC, for QST/QPT-17 (277V)
43	15-32	Capacitor, Run 7.5 MFD, 370VAC, for QST/QPT-50 (120/277V)
44	15-31	Capacitor, Run 10 MFD, 370VAC, for QST/QPT-75 (277V)
45	15-07	Capacitor, Run 20 MFD, 370VAC, for QST/QPT-75 (120V) -10 (277V)
46	15-28	Capacitor, Run 30 MFD, 370VAC, for QST/QPT-10 (120V)

Note: Anemostat reserves the right to make appropriate substitutions. Call Factory for any parts not shown above.

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