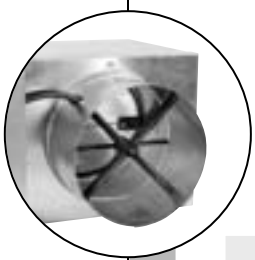
EZT–IOM–001
3/08

Anemostat®
A MESTEK COMPANY

EZT
Installation, Operation, and Maintenance

Single Duct
Variable Air Volume Terminals



Anemostat®
A MESTEK COMPANY
1220 Watson Center Road • Carson, CA 90745
Tel: (310) 835-7500 • Fax: (310) 835-0448
www.anemostat.com • airhelp@anemostat.com

Contents

Model Number Description....3
Unit Labeling....4
Receiving and Inspection Instructions....5
Warnings....5
Unit Placement and Installation....6
Shipping Weights....7
Clearance Requirements....8
Duct Connections and Insulation....8
Hot Water Coil Connections....8
Electrical Connections....9
Start-up Procedures....9
Maintenance....9
Factory Mounted DDC Controls....9
Airflow Sensor ΔP Versus Air Flow Chart – Pneumatic Controls....10
Minimum and Maximum Airflow Settings....11
Altitude Correction Factors....11
VDC Signal Versus Airflow Charts – Electronic Analog Controls....12

Anemostat®
A MESTEK COMPANY

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

Model Number Description

Digit 1, 2, 3 – Model
- EZT Single Duct

Digit 4 – Unit Type
- S Standard
- A With integral sound attenuator
- E Extended unit for electric coil

Digit 5, 6 – Inlet Size

05	5 inch	10	10 inch
06	6 inch	12	12 inch
07	7 inch	14	14 inch
08	8 inch	16	16 inch
09	9 inch	24	24 x 16 inch rectangular

Digit 7 – Casing Construction
- A 22 gauge steel (standard)
- B 20 gauge steel
- C Fibre-Lok 22 gauge steel liner (metal covering insulation edges)
- D Fibre-Lok 20 gauge steel liner (metal covering insulation edges)
- E 22 gauge steel double wall (inner liner over 1/2 inch insulation)
- F 22 gauge steel low temperature casing

Digit 8 – Insulation and Treatment
- 0 None
- 1 1/2 inch matte-faced glass fiber (standard)
- 2 1 inch matte-faced glass fiber (required with low temperature casing)
- 3 1/2 inch foil-faced glass fiber (tape covering insulation edges)
- 4 1 inch foil-faced glass fiber (tape covering insulation edges)
- 5 3/8 inch closed cell (fiber free)

Digit 9 – Control Type
- 0 None
- P Pneumatic - Pressure independent
- N Pneumatic - Pressure dependent
- A Electronic Analog - Pressure independent
- E Electric - Pressure dependent
- F Factory mounted, provided by others

Digit 10, 11, 12, 13 – Control Package Number
- 0000 None
- XXXX Refer to pages 314 thru 317

Digit 14 – Control Location (determined by facing the inlet)
- R Right hand (standard)
- L Left hand

Digit 15, 16, 17, 18 – Minimum Airflow
- 0000 None specified
- XXXX Specify minimum airflow setting in CFM Refer to pages 314 and 316

Digit 19, 20, 21, 22 – Maximum Airflow
- 0000 None specified
- XXXX Specify maximum airflow setting in CFM Refer to pages 314 and 316

Digit 23 – Heating Coil and Connection Location (determined by facing the inlet)
- 0 None
- A One-row hot water - right hand connection
- B One-row hot water - left hand connection
- C Two-row hot water - right hand connection
- D Two-row hot water - left hand connection
- G Four-row hot water - right hand connection
- H Four-row hot water - left hand connection
- J Electric Coil - right hand connection
- K Electric Coil - left hand connection

Digit 24 – Line Voltage Transformer
- 0 None
- 1 120 Volt/ 1 phase/ 60 Hz
- 2 208 Volt/ 1 phase/ 60 Hz
- 3 240 Volt/ 1 phase/ 60 Hz
- 4 277 Volt/ 1 phase/ 60 Hz

Digit 25 – Electric Coil Voltage and Steps (location same as controls)
- 0 None
- A 208 Volt/ 1 Phase/ 60 Hz 1 Step
- B 208 Volt/ 1 Phase/ 60 Hz 2 Step
- C 208 Volt/ 1 Phase/ 60 Hz 3 Step
- D 240 Volt/ 1 Phase/ 60 Hz 1 Step
- E 240 Volt/ 1 Phase/ 60 Hz 2 Step
- F 240 Volt/ 1 Phase/ 60 Hz 3 Step
- G 277 Volt/ 1 Phase/ 60 Hz 1 Step
- H 277 Volt/ 1 Phase/ 60 Hz 2 Step
- J 277 Volt/ 1 Phase/ 60 Hz 3 Step
- K 208 Volt/ 3 Phase/ 60 Hz 1 Step
- L 208 Volt/ 3 Phase/ 60 Hz 2 Step
- M 208 Volt/ 3 Phase/ 60 Hz 3 Step
- N 480 Volt/ 3 Phase/ 60 Hz 1 Step
- P 480 Volt/ 3 Phase/ 60 Hz 2 Step
- R 480 Volt/ 3 Phase/ 60 Hz 3 Step
- S 120 Volt/ 1 Phase/ 60 Hz 1 Step
- T 120 Volt/ 1 Phase/ 60 Hz 2 Step
- U 120 Volt/ 1 Phase/ 60 Hz 3 Step
- V 240 Volt/ 3 Phase/ 60 Hz 1 Step
- W 240 Volt/ 3 Phase/ 60 Hz 2 Step
- X 240 Volt/ 3 Phase/ 60 Hz 3 Step
- Y 480 Volt/ 1 Phase/ 60 Hz 1 Step
- Z 480 Volt/ 1 Phase/ 60 Hz 2 Step
- 1 480 Volt/ 1 Phase/ 60 Hz 3 Step

Digit 26, 27, 28 – Electric Coil KW
- 000 None
- XXX (in 0.5 KW increments)

Digit 29 and over – Options & Accessories

Access options
- A1 6" x 6" Bottom access plate (provided with same insulation as the casing)
- A2 6" x 6" Bottom access door w/hinge and camlock
- A3 6" x 6" Bottom removable access door with 2 camlocks
- B1 6" x 6" Side access plate (provided with same insulation as the casing on opposite side of controls)
- B2 6" x 6" Side access door w/hinge and camlock (opposite side of controls)
- B3 6" x 6" Side removable access door with 2 camlocks (opposite side of controls)

Casing options
- C1 Unit mounting brackets – shipped loose
- C2 Manual damper locking quadrant
- C3 Standard Control Enclosure
- C4 Universal (larger) control enclosure (must be opposite electric coil connection side)
- C5 Hinged front panel for control enclosure
- LL Lo-Leakage casing (available with only A3 or B3 access doors.

Electric control options
- D1 Low voltage control disconnect switch
- D2 Low voltage fuse and fuse block
- D3 Line voltage SPST disconnect switch (120/1, 277/1 line voltage)
- D4 Line voltage DPST disconnect switch (208/1, 230/1, 240/1 line voltage)
- D5 Line voltage power-fusing (fuse and fuse block for 120/1, 277/1 line voltage)
- D6 Line voltage power-fusing (fuse and fuse block for 208/1, 230/1, 240/1 line voltage)
- D9 24 VAC actuator (3 wire / tri-state / fail in place)

Electric heat options
- E1 Door interlocking disconnect switch - non-fused
- E2 Mercury de-energizing contactors
- E3 Power-fusing (Fuses and fuse blocks)
- E5 Primary fused transformer

Notes:
Z in any digit indicates a non-catalog special which requires authorization

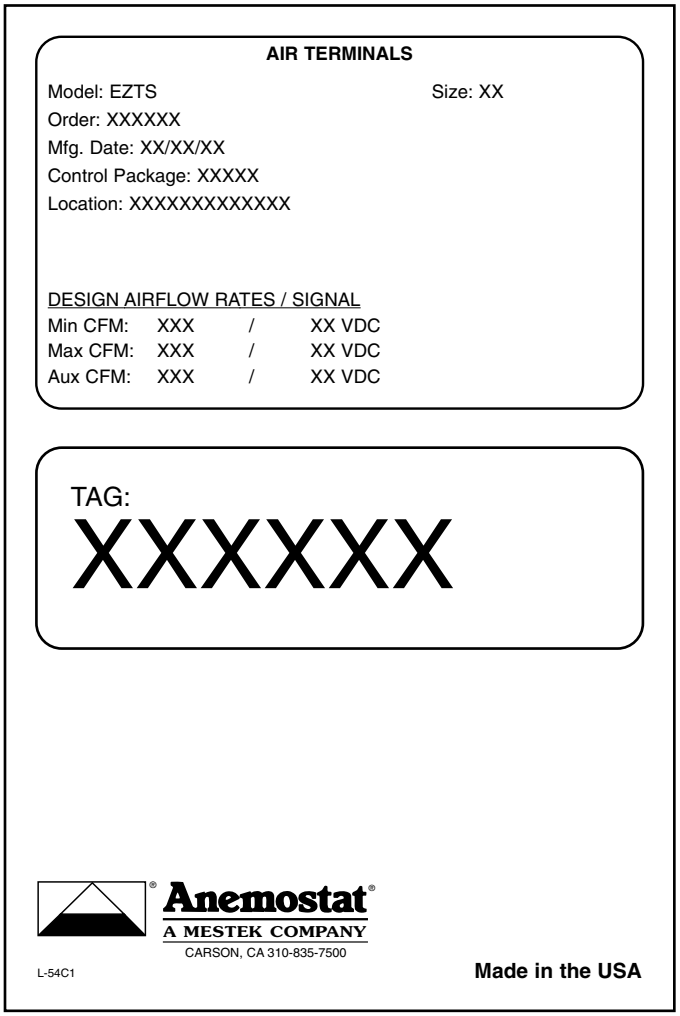
Anemostat®
A MESTEK COMPANY
1220 Watson Center Road • Carson, CA 90745
Tel: (310) 835-7500 • Fax: (310) 835-0448
www.anemostat.com • airhelp@anemostat.com

Unit Labeling

Labels are applied to each terminal as follows:

- Unit specific nameplate showing model 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 10, 11, and 12.
- The appropriate wiring/piping diagram for controls provided by Anemostat. Refer to controls manual CM-1 for controls adjustment and troubleshooting procedures.
- Up arrow indicating the proper orientation of the unit for installation.
- Airflow direction arrow indicating the proper orientation of the duct connections.
- ARI logo indicating the units performance is ARI certified.
- Sheet Metal Workers Union logo indicating unit produced by members of The Sheet Metal Workers Union.

Nameplate for terminals with electronic analog controls and/or electric heat



Nameplate for terminals with pneumatic controls without electric heat.

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

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.

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

Unit Placement and Installation

- **THE FLOW SENSOR, PNEUMATIC TUBING AND DAMPER SHAFT ARE NOT TO BE USED FOR LIFTING OR SUPPORT. THEY ARE CRITICAL TO THE PROPER OPERATION OF THE UNIT.**
- To avoid product damage, only lift or handle the EZT by fully supporting the unit from more than one location.
- Locate unit as per construction drawings, and be careful not to conflict with articles of other trades such as plumbing and electrical conduit.
- Consult SMACNA guidelines for proper transitioning and good workmanship practices.
- Using the support method from the construction plans and specification, suspend unit in a level horizontal plane noting direction of airflow. When utilizing sheet metal straps, up to 1" long screws may be utilized to penetrate the main casing. Do not secure hanging straps to unit appurtenances such as (but not limited to) electric heater cabinets, hot water coils, and control enclosures.

  For units equipped with optional hanging brackets, rods up to 3/8" diameter may be used with ANEMOSTAT brackets. Hanger rod locations are approximately 1" to 3" from the corner of the unit for most terminal configurations.
- Make certain not to obstruct service access to any electrical enclosures or access panels for access to the interior of the unit.
- Check with the local Anemostat representative if a terminal must be "flipped" over from its' intended orientation.

Anemostat®
A MESTEK COMPANY
1220 Watson Center Road • Carson, CA 90745
Tel: (310) 835-7500 • Fax: (310) 835-0448
www.anemostat.com • airhelp@anemostat.com

Shipping Weights (approximate)

EZTS Units

Inlet Size	Weight (lbs)
05	9
06	9
07	11
08	11
09	15
10	15
12	19
14	23
16	28
24x16	79

EZTS Units with Hot Water Heating Coil

Inlet Size	1 Row Wgt.	2 Row Wgt.	4 Row Wgt.
05	13	15	19
06	13	15	19
07	16	18	23
08	16	18	23
09	21	24	31
10	21	24	31
12	26	31	39
14	32	38	50
16	39	45	59
24x16	97	104	123

EZTA Units

Inlet Size	Weight (lbs)
05	20
06	20
07	22
08	22
09	28
10	28
12	32
14	39
16	44
24x16	109

EZTA Units with Hot Water Heating Coil

Inlet Size	1 Row Wgt.	2 Row Wgt.	4 Row Wgt.
05	24	26	30
06	24	26	30
07	27	29	34
08	27	29	34
09	34	37	44
10	34	37	44
12	39	44	52
14	48	54	66
16	55	61	75
24x16	127	134	153

EZTE Units

Inlet Size	Weight (lbs)
05	32
06	32
07	35
08	35
09	42
10	42
12	47
14	55
16	61
24x16	127

Notes:

1. Weights are approximate and will vary based on selected options, insulation type, etc.
2. Control Enclosures add 5 lbs. to unit weight.

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

Clearance Requirements

- Line voltage and low voltage electrical enclosures must have adequate clearances to meet requirements of NFPA 70 (NEC). This is typically 36" minimum. Note that additional clearance requirements may be required by local codes or building construction specifications.
- The EZTE unit is listed by ETL (adhering to UL1996) for zero inches clearance to combustible surfaces.
- When provided with optional bottom or side casing access plate/panel, provide sufficient clearance to allow access.
- Unit should hang freely, and not make contact with any structure above.
- There are no internally replaceable components in the EZT terminal units. All controls are externally accessible.

Duct Connections and Insulation

- Provide straight duct (minimum 3 duct diameters) prior to the inlet of the terminal and 48 inches 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.
- The EZTE (with integral electric heat) MUST be installed such that a minimum of 48 inches of full-size, straight duct is connected before any elbows, filters, transitions or any other downstream air disturbance.
- Connecting duct should be configured and installed in accordance with SMACNA guidelines and local code requirements.
- Outlet connection uses a standard slip/drive connection.
- Inlet duct should be the same size as unit inlet. Straight, solid (non-flexible) duct will yield the best airflow and acoustical performance.
- Slide duct over inlet collar, fasten and seal in accordance with the project plans. Provide insulation over the entire inlet collar, while allowing clearance for the flow sensor tubing.
- If the terminal is installed in a location with high humidity, the hot water coil (if provided) casing should be externally insulated.
- After all duct connections are made, 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.

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

Electrical Connections

NOTE: This 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 (ANSI / NFPA 70).
- Connect the electronically actuated EZT per wiring diagram supplied with the unit.
- 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.
- 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.

For EZTE units provided with an integral electric heating coil: note these additional instructions:

- Connect the EZTE 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.
- The airflow proving switch requires a minimum of 0.07" w.c. total air pressure at the inlet of the electric coil. The electric heater will not energize if the air switch contacts do not close.
- 480 volt/ 3 phase coils may incorporate "wye" or other unbalanced configuration for multiple steps.
- The installing electrician should rotate heater steps by phase for improved balance of the building electrical load.

Start-up Procedures

WARNING: Failure to adhere to these instructions, unauthorized installation, adjustment, alterations, modifications or maintenance can void the manufacturer's warranty, cause property damage, personal injury or death. For assistance or additional information, consult a qualified contractor or an ANEMOSTAT representative.

- Verify all electrical wire terminations are tightened prior to energizing terminal. Some loosening may have occurred during shipment and installation.
- Verify the minimum airflow of at least 70 CFM per KW will always be maintained during operation.
- Verify a minimum of 0.07" w.c. total air pressure at the inlet of the electric coil for proper operation of the airflow proving switch.
- Prior to start-up, the project specific control sequence / wiring diagram should be read and understood. A copy of this schematic is located on the interior of the electrical enclosure. If factory supplied analog or DDC controls are supplied, contact the project control contractor for specific start-up and balancing information.

Maintenance

- The EZT VAV terminal unit has been designed and constructed for years of reliable use.
- If installed, inspect hot water coil periodically and clean fins via the access panel upstream of the water coil. Components should be replaced with ANEMOSTAT authorized parts to avoid conflict with ETL listing.

Factory Mounted DDC Controls

Anemostat will factory mount DDC controls of all types. Refer to the wiring diagrams provided by the temperature control manufacturer for proper wiring of these controls. The maximum and minimum CFM range is determined by the controls.

Anemostat®
A MESTEK COMPANY
1220 Watson Center Road • Carson, CA 90745
Tel: (310) 835-7500 • Fax: (310) 835-0448
www.anemostat.com • airhelp@anemostat.com

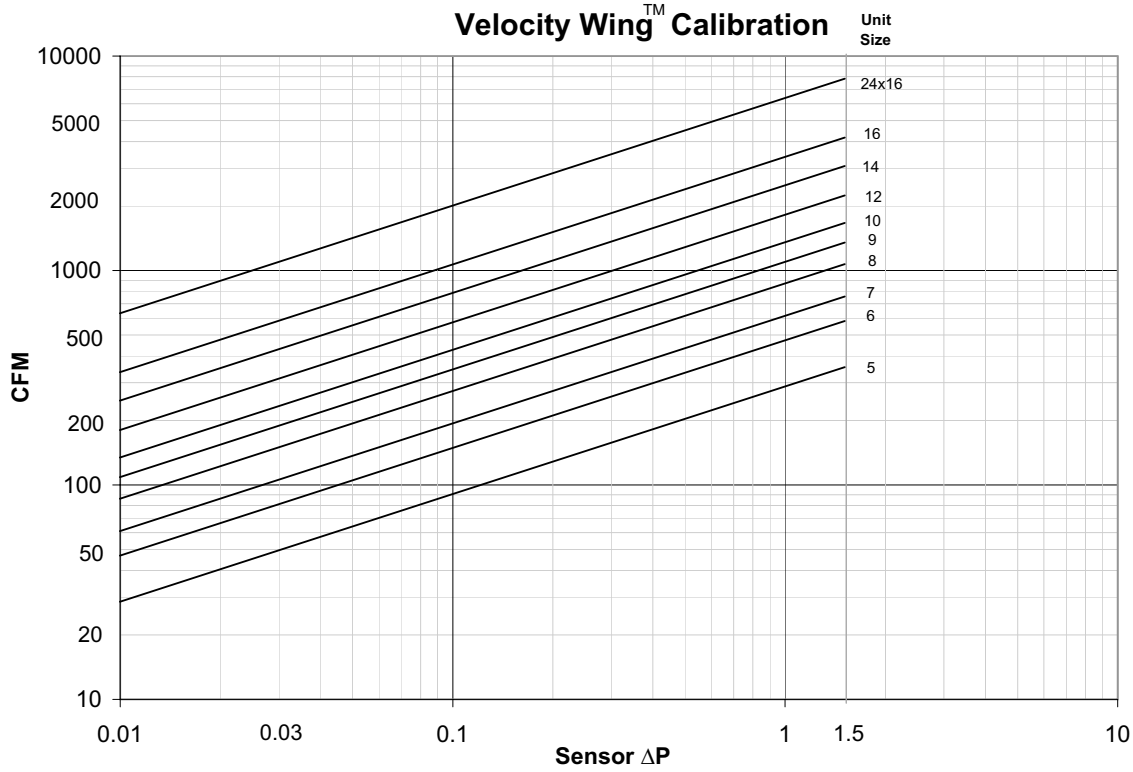
Airflow Sensor ΔP Versus Airflow

C23 / C24 / C31 Series Pneumatic Controls & DDC Controls*

	CFM									
ΔP	5	6	7	8	9	10	12	14	16	24x16
0.03	50	81	106	150	190	234	312	428	583	1101
0.04	57	94	122	173	220	271	360	494	673	1272
0.06	70	115	150	212	269	331	441	605	824	1557
0.1	91	148	194	274	347	428	570	781	1064	2011
0.2	128	210	274	388	491	605	806	1104	1505	2843
0.3	157	257	335	475	601	741	987	1352	1844	3482
0.4	182	297	387	548	694	856	1140	1562	2129	4021
0.5	203	332	433	613	776	957	1274	1746	2380	4496
0.6	222	363	474	672	851	1048	1396	1912	2607	4925
0.7	240	392	512	725	919	1132	1508	2066	2816	5319
0.8	257	419	547	775	982	1210	1612	2208	3011	5687
0.9	272	445	581	823	1042	1284	1710	2342	3193	6032
1 (K-factor)	287	469	612	867	1098	1353	1802	2469	3366	6358
1.5	352	574	750	1062	1345	1657	2207	3024	4122	7787

* DDC Controls vary by design and may require corrections to these curves.

	CFM									
	5	6	7	8	9	10	12	14	16	24x16
K-Factor	287	469	612	867	1098	1353	1802	2469	3366	6358
Area (sq. ft)	0.130	0.188	0.258	0.338	0.430	0.532	0.769	1.050	1.375	2.667



Anemostat®
A MESTEK COMPANY
1220 Watson Center Road • Carson, CA 90745
Tel: (310) 835-7500 • Fax: (310) 835-0448
www.anemostat.com • airhelp@anemostat.com

Minimum and Maximum Airflow Settings

Control Type	Inlet Size	Min Airflow (CFM)	Max Airflow[1] (CFM)
Model 51 Electronic Analog Controller	5	22	305
	6	45	470
	7	70	635
	8	90	835
	9	115	1100
	10	145	1355
	12	155	1740
	14	250	2300
	16	447	3390
	24x16	650	6480
Model 31 Pneumatic Controller	5	50	287
	6	81	469
	7	106	612
	8	150	867
	9	190	1098
	10	234	1353
	12	312	1802
	14	428	2469
	16	583	3366
	24x16	1101	6358
Models 23, 24 Pneumatic Controllers	5	57	287
	6	94	469
	7	122	612
	8	173	867
	9	220	1098
	10	271	1353
	12	360	1802
	14	494	2469
	16	673	3366
	24x16	1272	6358

Notes:

1. Minimum and maximum airflow with pressure independent controls based on the following
   flow sensor signals:
   Model 51 Controller - 1 VDC – 10 VDC
   Model 31 Controller - 0.03" w.g. – 1.0" w.g.
   Models 23, 24 Controllers - 0.04" w.g. – 1.0" w.g.
2. Settings below the minimum are not recommended for accurate control when using pressure independent controls. Minimum airflow for pressure dependent applications is 0 cfm.
3. Pressure independent controls may be set for 0 CFM, at or above the minimum airflow shown in table 4, but not between.
4. Model 23 controller available as direct acting for normally open or model 24 controller available as reverse acting for normally closed damper positions. Factory set non-field adjustable start point and reset span.
5. Model 31 controller can be used either as direct or reverse acting for normally open or normally closed damper positions. Field adjustable start point and reset span.
6. Models 23, 24, 31 controllers equipped with separate adjustable knobs for maximum and minimum airflow settings.
7. Model 51 electronic analog controller maximum and minimum airflow settings field adjustable at the thermostat.

REFER TO THE CONTROLS MANUAL CM-1 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.

[1] Airflow rates above maximum shown are available. Contact your Anemostat representative for application assistance.

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.

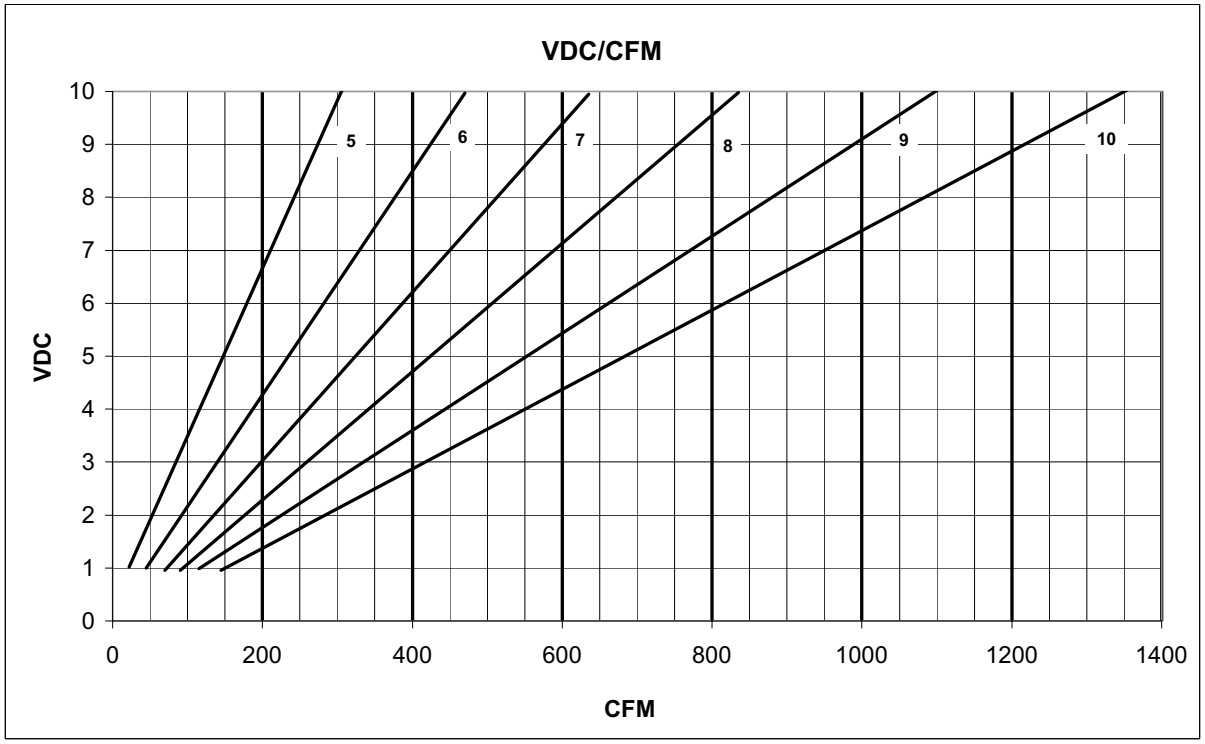
To use the correction factor:
Correction factor X CFM at unit location = .86 x 500 = 430 CFM

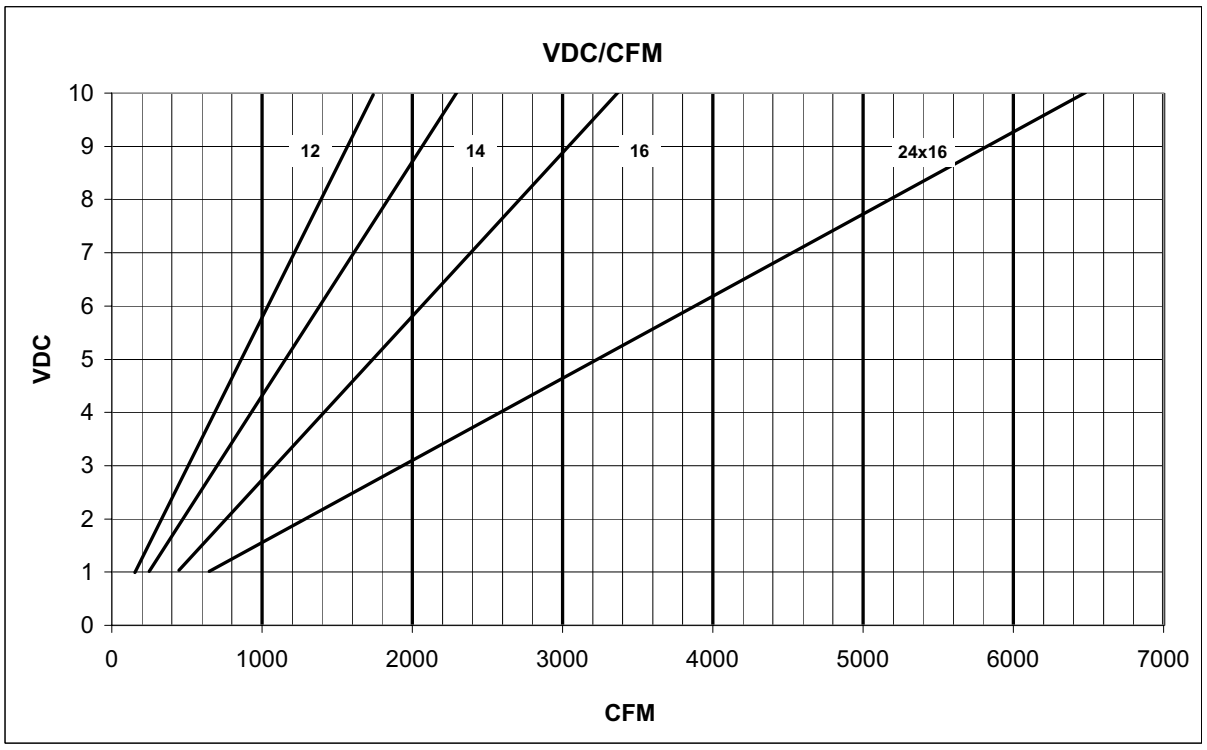
Referencing the 6" flow curve, shown on page 10, find 430 CFM @ .80" w.c. sensor signal pressure. The velocity controller set at .80" signal pressure will result in 500 CFM at 5000 ft. elevation.

Anemostat®
A MESTEK COMPANY
1220 Watson Center Road • Carson, CA 90745
Tel: (310) 835-7500 • Fax: (310) 835-0448
www.anemostat.com • airhelp@anemostat.com

VDC Signal Versus Airflow

C51 Series Electronic Analog Controls





Note: This data is valid for the specific airflow sensor tubing size and lengths as shown on the wiring diagram. Readings will vary if different tubing size and lengths are used.