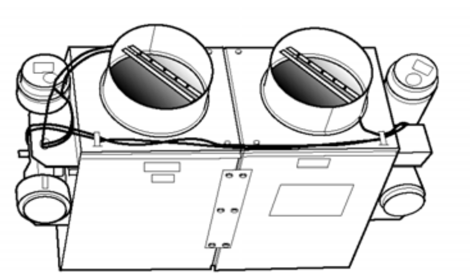
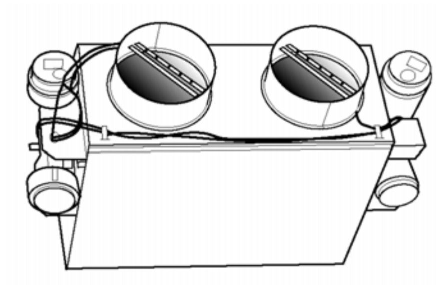
Models LMHD/LDT/LMHDT
Form No. DDOM.0 07/03

KRUEGER Dual-Duct Terminal Units

PRE-INSTALLATION

General — The LMHD, LDT and LMHDT are dual duct terminals available with factory installed Pneumatic, Analog electronic, and DDC control options. Figure 1shows a basic box.





(LMHD Sizes 6-16) **LDT/LMHDT**

FIGURE 1 –Dual Duct Boxes (with pneumatic controls shown)

STORAGE AND HANDLING — Inspect for damage upon receipt. Shipping damage claims should be filed with shipper at time of delivery. Store in a clean, dry, and covered location. Do not stack cartons. When unpacking units, care should be taken that the inlet collars and externally mounted components do not become damaged. Do not lift units using collars, inlet flow sensors, or externally mounted components as handles. Do not lay uncrated units on end or sides. Do not stack uncrated units over 6 ft high. Do not handle control boxes by tubing connections or other external attachments. Table 1 shows component weights.

LMHD Weights			
Size	Base Unit (lb)	With Pneumatic Controls (lb)	With DDC or Analog Controls (lb)
4,5,6	29	37	47
7,8	33	41	51
9,10	41	49	59
12	51	59	69
14	67	75	85
16	75	83	93
22	129	137	147

LDT Weights			
Size	Base Unit (lb)	With Pneumatic Controls (lb)	With DDC or Analog Controls (lb)
4,5,6	38	46	56
7,8	42	50	60
9,10	52	60	70
12	62	70	80
14	78	86	96
16	86	94	104

LMHDT Weights			
Size	Base Unit (lb)	With Pneumatic Controls (lb)	With DDC or Analog Controls (lb)
4,5,6	65	73	83
7,8	79	87	97
9,10	111	119	129
12	152	161	171
14	248	256	266
16	274	282	292

Table 1 –Unit Weights:

INITIAL INSPECTION — Once items have been removed from the carton, check carefully for damage to duct connections, inlet probes or controls. File damage claim immediately with transportation agency and notify Factory.

UNIT IDENTIFICATION — Each unit is supplied with a shipping label and an identification label

INSTALLATION PRECAUTION — Check that construction debris does not enter unit or ductwork. Do not operate the central-station air-handling fan without final or construction filters in place. Accumulated dust and construction debris distributed through the ductwork can adversely affect unit operation.

SERVICE ACCESS — Provide service clearance for unit access.

CODES — Install units in compliance with all applicable code requirements.

UNIT SUSPENSION — See Fig. 2 for optional unit suspension details.

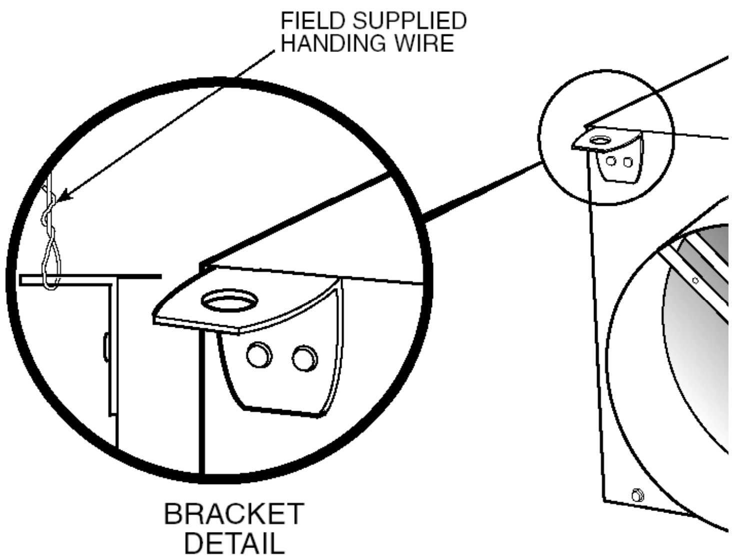


Figure 2 – Optional Unit Suspension Bracket

Warranty — All Krueger furnished items carry the standard 1-year warranty.

MAINTENANCE

No periodic preventative maintenance required, unless called for specific control sequence.

CONTROL ARRANGEMENTS

The LMHD, LDT and LMHDT dual duct units are offered with a wide variety of factory-mounted controls that regulate the volume of air delivery from the unit and respond to cooling and heating load requirements of the conditioned space. Stand-alone controls will fulfill the thermal requirements of a given control space. These devices are available in both pneumatic and electronic arrangements. A number of DDC (Direct Digital Controls) control packages by others are available for consignment mounting, as indicated.

Each control approach offers a variety of operating functions; a control package number identifies combinations of control functions. The following listings contain the basic function arrangements for each control offering. Because of the variety of functions available, circuit diagrams, operating sequences, and function descriptions are contained in separate Application Data publications. Refer to the specific control publication for details.

Analog Electronic Control Arrangement — Control package is pressure independent and includes either a linear or center averaging airflow sensor in two locations as required by the control, 24-volt transformer, control enclosures, and a wall thermostat to match the control type.

2400 — Heating and cooling control, hot and cold inlet sensor location (all units)
2440 — Heating and cooling control, hot inlet and discharge airflow sensing (LDT and LMHDT only)
2470 — Heating and cooling control, cold inlet and discharge airflow sensing (LDT and LMHDT only)

Direct Digital Electronic Control Arrangement (Field Supplied) — Control packages are field supplied for factory mounting, unless otherwise noted. All DDC control arrangements include a flow sensor, control enclosure and optional 24-volt transformer. Contact factory for details about mounting field-supplied controls.

Pneumatic Control Arrangement — All control packages are pressure independent and include standard linear or center averaging airflow sensors in both the hot and cold inlets for variables air volume control or an airflow sensor in one inlet and the unit discharge for constant volume control arrangements. Thermostats will either be Direct Acting (DA) or Reverse Acting (RA), and damper position will be identified as Normally Open (NO) or Normally Closed (NC).

Variable air volume control with inlet air sensing (all units):

1500 — Multi-function controller, DA-NC cold inlet, NC hot inlet
1501 — Multi-function controller, DA-NC cold inlet, NO hot inlet
1502 — Multi-function controller, DA-NO cold inlet, NO hot inlet
1503 — Multi-function controller, DA-NO cold inlet, NC hot inlet
1504 — Multi-function controller, RA-NC cold inlet, NC hot inlet
1505 — Multi-function controller, RA-NC cold inlet, NO hot inlet
1506 — Multi-function controller, RA-NO cold inlet, NO hot inlet
1507 — Multi-function controller, RA-NO cold inlet, NC hot inlet

Constant volume control with inlet and discharge air sensing (LDT and LMHDT only):

1508 — Multi-function controller, DA-NC cold inlet, NC hot inlet
1509 — Multi-function controller, DA-NC cold inlet, NO hot inlet
1510 — Multi-function controller, DA-NO cold inlet, NO hot inlet
1511 — Multi-function controller, DA-NO cold inlet, NC hot inlet
1512 — Multi-function controller, RA-NC cold inlet, NC hot inlet
1513 — Multi-function controller, RA-NC cold inlet, NO hot inlet
1514 — Multi-function controller, RA-NO cold inlet, NO hot inlet
1515 — Multi-function controller, RA-NO cold inlet, NC hot inlet
1516 — Multi-function controller, DA-NC cold inlet, NC hot inlet
1517 — Multi-function controller, DA-NC cold inlet, NO hot inlet
1518 — Multi-function controller, DA-NO cold inlet, NO hot inlet
1519 — Multi-function controller, DA-NO cold inlet, NC hot inlet
1520 — Multi-function controller, RA-NC cold inlet, NC hot inlet
1521 — Multi-function controller, RA-NC cold inlet, NO hot inlet
1522 — Multi-function controller, RA-NO cold inlet, NO hot inlet
1523 — Multi-function controller, RA-NO cold inlet, NC hot inlet

A multi-function controller is capable of providing DA-NO, DA-NC, RA-NC or RA-NO functions (all units).

No Control
0000: box only
D000: box with control box only
D001: box with control box and optional transformer

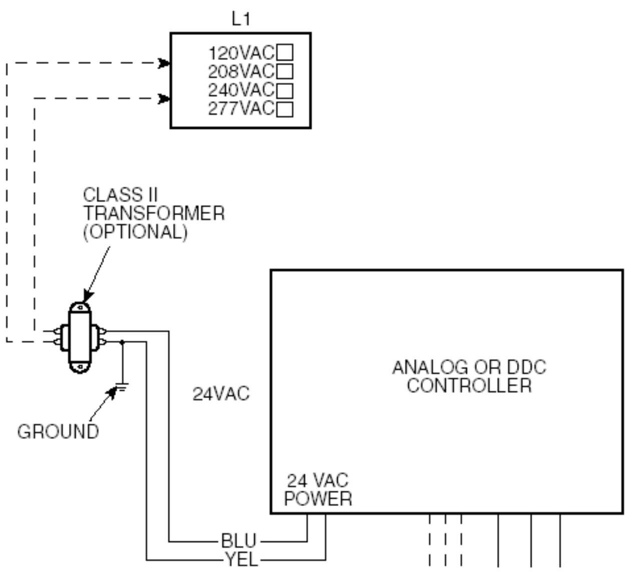
INSTALLATION

Step 1 — Install Volume Control Box
1. Move unit to installation area. Remove unit from shipping package. Do not handle by controls, flow sensors or damper extension rod.
2. Optionally, the unit may have factory-installed brackets.

3. Suspend units from building structure with straps, rods, or hanger wires. Secure the unit and level it in each direction.

Step 2 — Make Duct Connections
1. Install supply ductwork on each of the unit inlet collars. Check that air-supply duct connections are airtight and follow all accepted medium-pressure duct installation procedures. (Refer to Tables 3-5 for pressure and flow data.)
2. Install the discharge ducts. Fully open all balancing dampers. A straight length of inlet duct is not required before the unit inlet. Ninety-degree elbows or tight radius flexible duct immediately upstream of inlet collar should be avoided.

Step 3 — Install Sensors and Make Field Wiring Connections — Electric Analog or DDC (Direct Digital Controls) — Refer to specific unit dimensional submittals and control application diagrams for control specifications. All field wiring must comply with National Electrical Code (NEC) and local requirements. Refer to the wiring diagram on the unit for specific wiring connections. A field-supplied transformer is required if the unit was not equipped with a factory-installed transformer. See Fig. 3.



LEGEND
DDC — Direct Digital Controls
- - - - Field Wiring
——— Factory Wiring

NOTE: Drawing is typical — refer to actual unit wiring diagram for details.

Fig. 3 — Wiring of Optional Factory-Mounted Transformer

NOTE: Refer to wiring diagram attached to each unit for specific information on that particular unit. Unit airflow should not be set outside of the range noted in Fig. 4A-4C and the performance data section of this document.

CONTROL SET UP
General — The LMHD, LDT and LMHDT dual duct terminals are designed to maintain optimum temperatures in the conditioned zone by varying the air volume supplied by the hot and cold ducts while providing the proper discharge air temperature. To balance the unit it is

necessary to set both the maximum and minimum set points of the controllers. Many types of control options are available, each have specific procedures required for balancing the unit.

Set Points — Maximum and minimum airflow set points are normally specified for the job and specific for each unit on the job. Where maximum and minimum airflow levels are not specified on the order, default values are noted on unit ID label.

Field Adjustment of Minimum and Maximum Airflow Set Points

Each unit is equipped with an amplifying flow probe that measures a differential pressure proportional to the airflow. The relationship between flow probe pressures and cfm is shown in the Flow Probe Graphs (Fig. 4A-4B). This chart is attached to each unit. There are several conventions (and no universally accepted method) in use for representing this flow factor:

1.) **Magnification Factor:** The magnification factor may be expressed as the ratio of either velocity or pressure, of the output of the sensor to that of a pitot tube.
   a. For example, a velocity magnification may be used. All Krueger probes develop an average signal of 1” w.g. @2625 fpm. This gives a velocity magnification of 4005/2625, or 1.52.
   b. It may be a pressure magnification factor. In this case, the ratio of pressures at a given air velocity is presented. For a velocity constant of 2626, at 1000 fpm, this is 0.1451 / 0.0623 = 2.33.

2.) **K-Factor:** The ‘K-factor’ may be represented in two ways –
   a. It may be a velocity K-factor, which is the velocity factor times the inlet area, (which for all Krueger probes, both Linear and the new “LineaCross”, is 2625 fpm/in w.g.).
   b. Alternatively, it may be the airflow K-Factor, which is the velocity factor times the inlet area. For an 8 inch Krueger unit, therefore, this would be 2625 * 0.349, or 916. A separate airflow factor is required for each size. All Krueger VAV terminals have round inlets. Below is a K-Factor table for all Krueger VAV terminal inlets.

Inlet Probe Area and K Factor

LMHS,LMHD	04	05	06	07	08	09	10	12	14	16	22
Inlet Diameter, in.	4	5	6	7	8	9	10	12	14	16	22
Velocity Magnification	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52
Velocity Constant	2625	2625	2625	2625	2625	2625	2625	2625	2625	2625	2625
CFM K Factor.	229	358	515	702	916	1160	1432	2062	2806	3665	7000
Inlet Area, Sq. ft.	0.087	0.136	0.196	0.267	0.349	0.442	0.545	0.785	1.069	1.396	2.667
Recommended Min cfm	40	62	89	122	159	201	248	357	486	635	1212

Table 2

System Calibration of the Flow Probe — To achieve accurate pressure independent operation, the velocity sensor and flow probe must be calibrated to the controller. This will ensure that airflow measurements will be accurate for all terminals at system start-up. System calibration is accomplished by calculating a flow coefficient that adjusts the pressure fpm characteristics. The flow coefficient is determined by dividing the flow for a given unit (design air volume in cfm), at a pressure of 1.0 in. w.g differential pressure, by the standard Pitot tube coefficient of 4005. This ratio is the same for all sizes, no matter which probe type is installed. Determine the design air velocity by dividing the design air volume (the flow at 1.0 in. w.g) by the nominal inlet area (sq. ft). This factor is the K factor.

NOTE: The LDT and LMHDT discharge sensors equal next larger even inlet size flow curve. (Example LDT 8 size inlet will have a 10 size discharge.) Size 16 discharge outlet is same as the inlet.

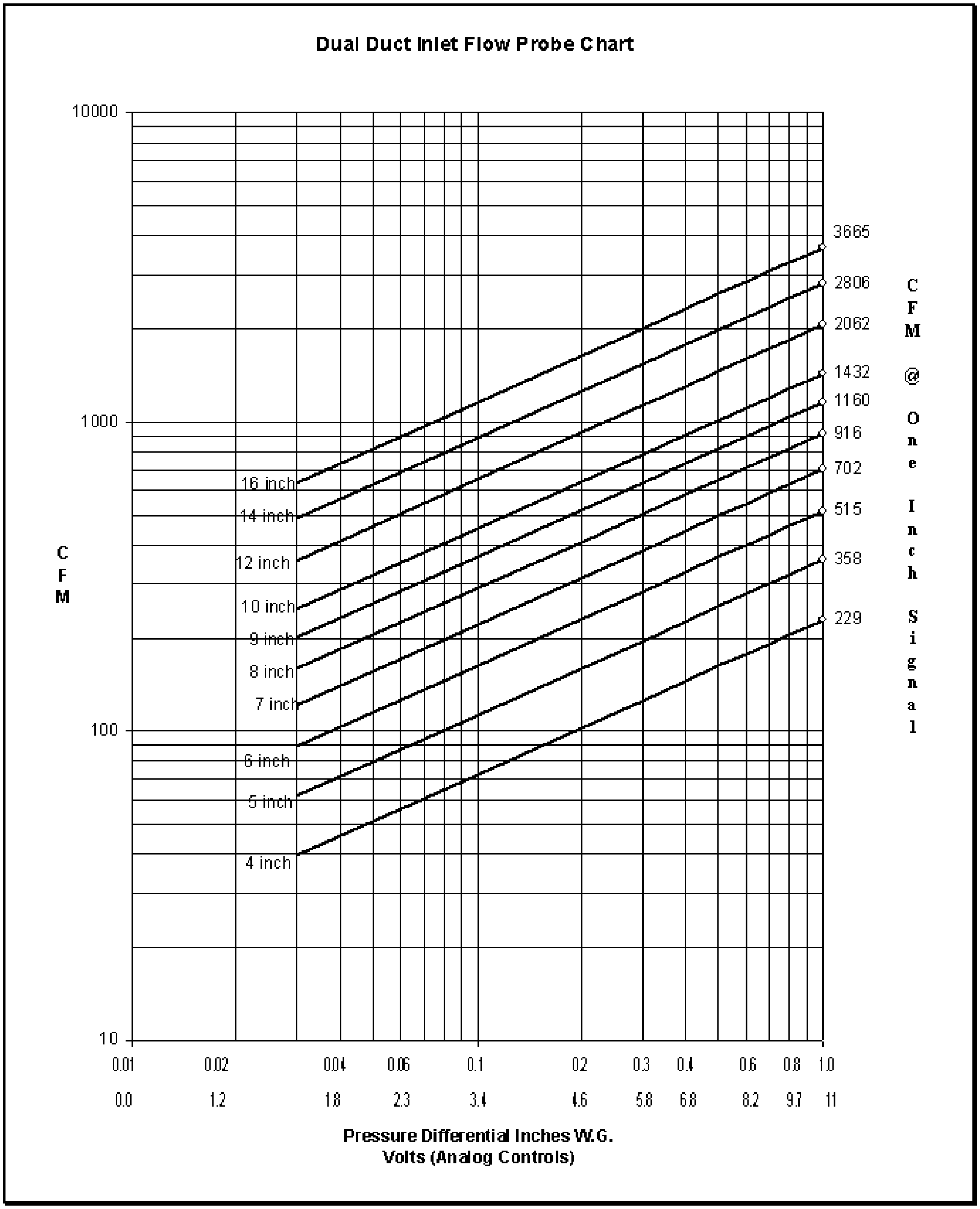


Fig. 4A — Dual Duct Inlet Flow Probe Chart

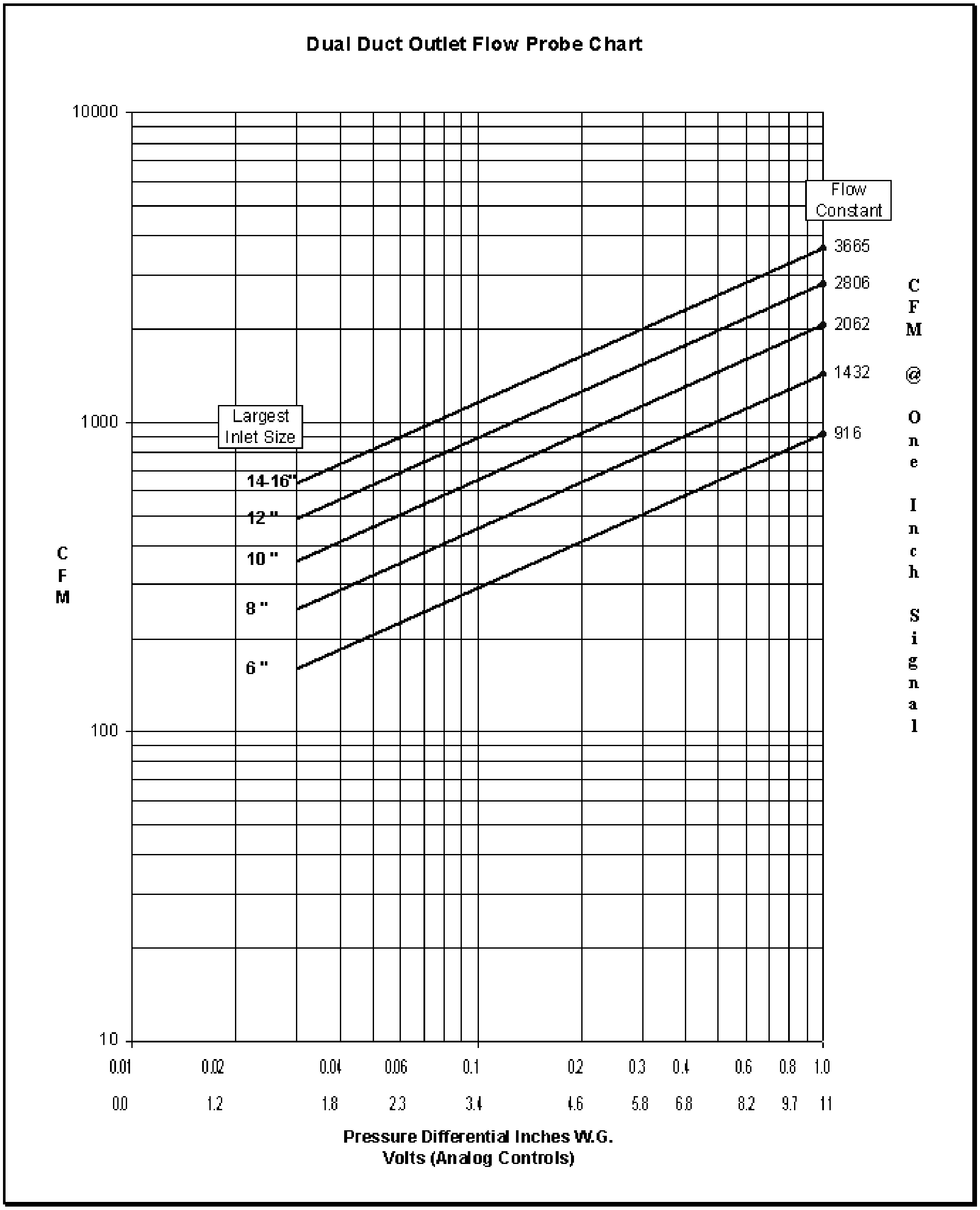


Fig. 4B — Dual Duct Outlet Flow Probe Chart (LDT and LMHDT)

PNEUMATIC CONTROLS

All control packages are pressure independent and include airflow sensors in both the hot and cold inlets for variable air volume control (control sequence 1500 to 1507) or an airflow sensor in one inlet and unit discharge for constant volume control arrangements (control sequence 1508 to 1523).

Preparation for Balancing

A. Inspect all pneumatic connections to assure tight fit and proper location.

B. Verify that the thermostat being used is compatible with the control sequence provided (direct acting or reverse acting).

C. Check main air pressure at the controller(s). The main air pressure must be between 15 psi and 25 psi. (If dual or switched-main air pressure is used, check the pressure at both high and low settings.) The difference between "high" pressure main and "low" pressure main should beat least 4 psi, unless otherwise noted, and the "low" setting difference should exceed 15 psi.

D. Check that the unit damper will fail to the proper position when main air pressure is lost. Disconnect the pneumatic actuator line from the velocity controller and observe the VAV damper position. The damper should fail to either a normally open position (with the box installed horizontally, indicator mark on shaft end is horizontal) or a normally closed position (indicator mark on shaft end is vertical).

E. Check that there is primary airflow in the inlet duct.

F. Connect a Magnehelic gage, inclined manometer or other differential pressure measuring device to the balancing taps provided in the velocity probe sensor lines. The manometer should have a full-scale reading of 0.0 to 1.0 in. w.g. The high-pressure signal is delivered from the front sensor tap (away from the valve), and the low-pressure signal is delivered from the back line (near the valve). The pressure differential between high and low represents the amplified velocity pressure in the inlet duct.

G. Read the differential pressure and enter the Probe Chart to determine the airflow in the terminal unit. This chart is shown in Fig. 4A-4B and is also attached to the side of each unit. For example, a differential pressure of 0.10 in. w.g for size 8 units yields an airflow of 275 cfm. Volume controller for units is shown in Fig. 5.

Balancing Procedure (Control Sequences 1500-1523)

1. Damper action is factory set at N.O. (normally open), or N.C. (normally closed). To reselect loosen damper selection switch screw and align pointer with damper pointer and tighten screw. The spring range of the actuator is not critical since the controller will output the necessary pressure to the actuator to position the damper according to set point. (See Fig. 5.)

2. Pipe the controller: Connect port "B" to the damper actuator. Connect port "M" to the clean, dry main air. Connect port "T" to the thermostat output. Connect port "H" to the total pressure tap on the airflow sensor. Connect port "L" to the static pressure tap on the airflow sensor.

The controller can be set up for cooling or heating applications using either a Direct Acting (DA) or Reverse Acting (RA) thermostat signal. The two flow adjustments are labeled "LO STAT ∆P" and "HI STAT ∆P".

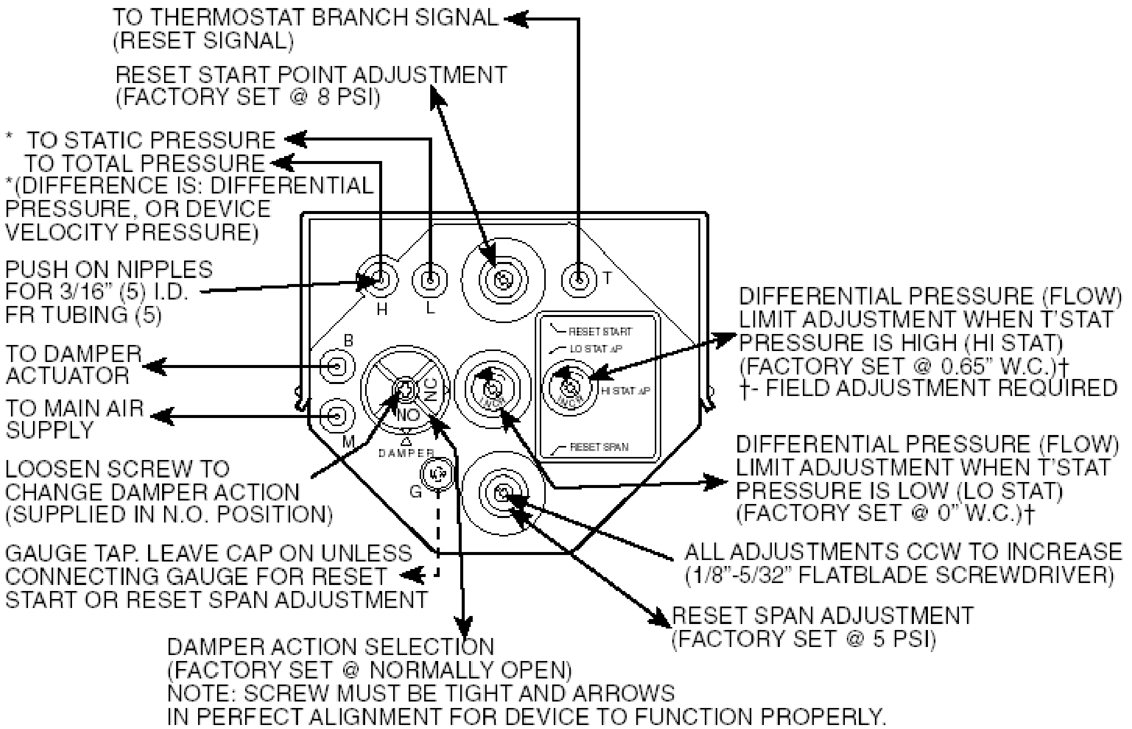


Fig. 5 — CSC-3011 Controller

LO STAT ∆P setting is the desired airflow limit when the thermostat pressure is less than, or equal to, the reset start point.

- For DA Cooling or RA Heating: Adjust LO STAT ∆P to the desired minimum airflow with 0 psig (or a pressure less than the reset start point) at port "T". The LO STAT ∆P must be set first. The LO STAT ∆P will affect the HI STAT ∆P setting.

- For RA Cooling or DA Heating: Adjust LO STAT ∆P to the desired maximum airflow with 0 psig (or a pressure less than the reset start point) at port "T". The LO STAT ∆P must be set first. The LO STAT ∆P will affect the HI STAT ∆P setting.

HI STAT ∆P setting is the desired airflow limit when the thermostat pressure is greater than, or equal to, the reset stop-point. The reset stop-point is the reset span pressure added to the reset start-point pressure.

- For DA Cooling or RA Heating (see Fig. 6): Adjust HI STAT ∆P to the desired maximum airflow with 20 psig (or a pressure greater than the reset stop point) at port "T". The HI STAT ∆P must be set last. The HI STAT ∆P setting will be affected by the LO STAT ∆P setting.

- For RA Cooling or DA Heating (see Fig. 6): Adjust HI STAT ∆P to the desired minimum airflow with 20 psig (or a pressure greater than the reset stop point) at port "T". The HI STAT ∆P must be set last. The HI STAT ∆P setting will be affected by the LO STAT ∆P setting.

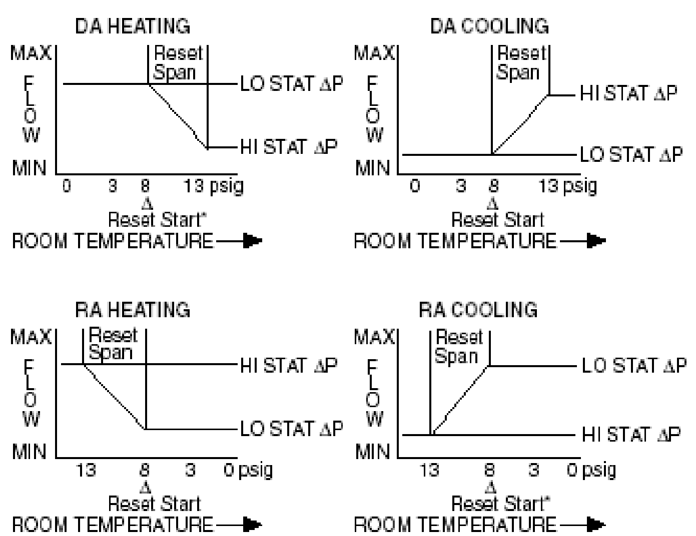
NOTE: After the “LO STAT ΔP” and “HI STAT ΔP” initial adjustments are made, cycle the thermostat pressure a few times to settle the internal reset mechanisms and verify settings. Fine-tune the settings if necessary. The thermostat pressure may be left at a high pressure and the “G” port cap may be removed and replaced to cycle the reset mechanism.

RESET START setting is factory set at 8.0 psig. This is the lowest thermostat pressure that the LO STAT ΔP airflow will begin to reset towards the HI STAT ΔP airflow. To change the RESET START setting; regulate thermostat pressure to the “T” port to the desired reset start point pressure, adjust RESET START adjustment until pressure at the “G” port is slightly higher than 0 psig, i.e., 0.1 psig.

NOTE: The “G” port taps into the controller’s internal reset chamber, which always starts at 0 psig. The RESET START adjustment is a positive bias adjustment that sets the desired thermostat start point to the controller’s internal reset start point of 0 psig.

RESET SPAN setting is factory set at 5.0 psig. This is the required change in thermostat pressure that the controller will reset between the LO STAT ΔP setting and the HI STAT ΔP setting. To change the RESET SPAN setting; adjust RESET SPAN adjustment until pressure at the “G” port equals the desired reset span pressure.

NOTE: The “G” port taps into the controller’s internal reset chamber, which will always be at a pressure between 0 psig and the RESET SPAN pressure.



*May require changing the RESET START from 8.0 to 3.0 psig if sequencing is involved.

Fig. 6 — Reset Cycle for CSC-3011 Control

Preventative Maintenance

1. Inspect pneumatic tubing for loose connections or leaks.
2. Clean out pneumatic line filters regularly according to manufacturer’s recommendations.

Pneumatic Control Troubleshooting.

PROBLEM	PROBABLE CAUSE
Controller does not reset to maximum or minimum set point during balance procedure.	Balancer is using the thermostat for control signal. An artificial signal must be provided in place of the thermostat.
Controller does not reset to maximum or minimum set point during operation.	Thermostat is not demanding maximum or minimum air volume. Main air pressure at the controller is less than 15 psi.
Pneumatic actuator does not stroke fully.	Leak in pneumatic line between the controller and the actuator. Main air pressure at the controller is less than 15 psi. Leak in the diaphragm.
Air valve stays in wide open position.	Velocity probe is blocked by an obstruction (sandwich bag, etc.). Insufficient supply air in the inlet duct.
NOTE: Always check: • Main air pressure (15 psi to 25 psi) at the controller. • Disconnected or kinked pneumatic lines to the controller • Quality of compressed air (oil or water in lines).	• Proper thermostat signal and logic (Direct/Reverse Acting). • Blocked velocity probe or insufficient primary supply air. • Leaks in the actuator diaphragm. • Mechanical linkage of the actuator/air valve.

Table 3 – Pneumatic Controls troubleshooting:

Analog Controls

Balancing Procedures (Control Sequences 2400, 2440, 2470) — The Analog Electronic Control System is a pressure independent volume reset control that uses KMC Controls CSP-5001 controller-actuator. See Fig. 7. The system provides for independently adjustable set points for minimum, maximum, and auxiliary airflow limits. Room temperature control is provided by the associated room thermostat that is selected according to the application. The room thermostat provides a fixed 2 degrees F reset span regardless of the minimum and maximum velocity limit set points.

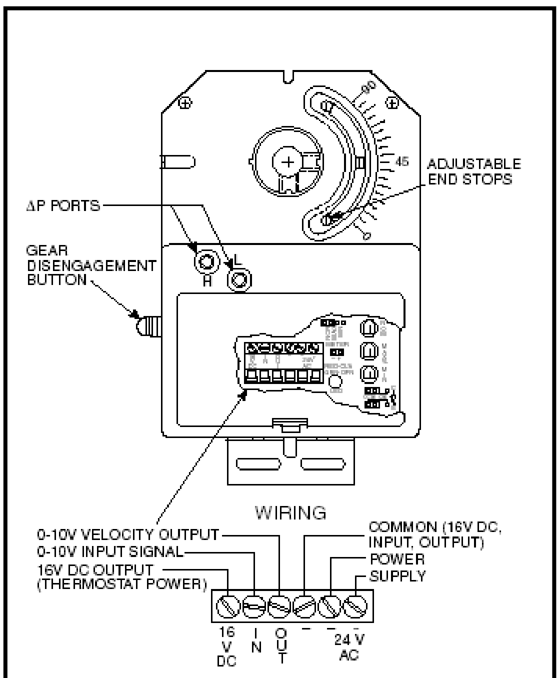


Fig. 7 — CSP-5001 Controller

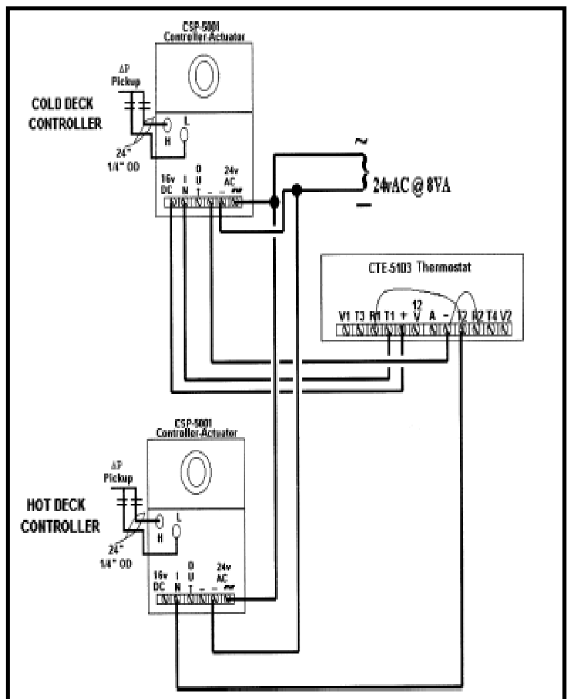


Fig. 8 — Dual Control Connections

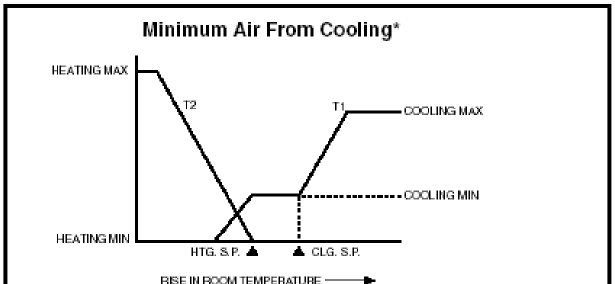
Adjustments for the minimum and maximum airflows are made at the thermostat.

The thermostat (CTE-5100 Series) operates on a 16 vdc power supply from the CSP controller and outputs a 0 to 10 vdc signal on the T terminals; T1 in the cooling mode (DA [Direct Acting]) and T2 in the heating mode (RA [Reverse Acting]). See the reference sequence diagram on unit for details on which ‘T’ terminals are used on each model thermostat, but in general T1 and T3 are used for the cooling mode, T2 and T4 for heating. Terminals T1 and T2 are adjustable to limit minimum and maximum flow. T3 and T4 have a fixed 0 to 10 vdc output signal.

1. Required Tools:
   A. 1/16 in. hex/key wrench
   B. Small flat blade (1/8 in.) screwdriver
   C. Digital voltmeter capable of displaying a 0 to 10 vdc range which will display in hundredths of 1 vdc
   D. HSO-5001 Test Leads (optional for meter taps)

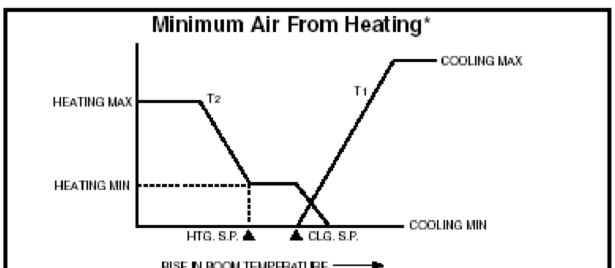
2. Remove thermostat cover. Thermostat cover is removed by loosening the setscrews on each side of the thermostat. Using a 1/16 in. hex/key wrench turn the setscrews clockwise until cover is loose.

3. Check voltages. Verify 16 vdc between (+) and (–) terminals. Applications for Dual Duct (Minimum Air From Cold Duct) — Dual duct applications are easily accomplished by connecting two CSP-5001 Series controllers with a dual set point (RA/DA) thermostat, as shown in Fig. 8. In this application the CSP controllers are mounted separately on the cold and hot deck dampers with each utilizing its own flow sensor. The cold deck utilizes the T1 signal from the thermostat while the hot deck controller receives its requested flow signal from T2. Both units can be set independently for minimum and maximum flow settings. In addition, by using the “R” override terminal on the thermostat cold deck, minimum flow can be overridden to zero upon a call for heating (or vice-versa). See Fig. 9 and 10:



*Connect jumper from T2 to R1 to override cooling minimum to zero, upon call for heating. Leave R2 connected to ground.

Fig. 9 — Minimum Air From Cooling



*Connect jumper from T1 to R2 to override heating minimum to zero, upon call for heating. Leave R1 connected to ground.

Fig. 10 — Minimum Air From Heating

Analog Control Troubleshooting — The following troubleshooting guide is directed towards single duct cooling applications, the same concepts can be applied to other configurations.

CONTROLLER

1. Verify 24 VAC at terminals "~" (phase) and "-" (ground). Tolerance can be –15% to +20% (20.4 to 28.8 VAC).

2. Verify 16 vdc at terminals "(16 VDC)" and "(-)".
   a. Tolerance is 15.0 to 17.0 vdc power supply to thermostat.
   b. If not correct, disconnect thermostat and recheck.
   c. If still incorrect, replace CSP controller.

3. Check "Requested Flow" voltage on terminal "IN" and "-".
   a. Use charts on pages 7 and 8, Fig. 4A-4C to correlate into cubic feet per minute (CFM).
   b. If reading is not what is desired, see "Calibration" to adjust thermostat.

4. Check "Actual Flow" voltage on terminal "OUT" and "-" for 0 to 10 vdc). Use Fig. 4A-4C to correlate into cfm.

5. Check box movement, damper rotation, etc.
   a. Review "Requested Flow" and "Actual Flow" above to determine if unit should be satisfied (within 50 fpm) or driving open or closed.
   b. If damper is not moving, verify damper is not stuck or at end of travel. Check rotation jumpers for proper position.
   c. Change "Requested Flow" to make unit drive opposite direction. This can be accomplished by moving the set point sliders or 1) and 2) below.

      1.) To manually open the box, remove wiring from terminal "IN" and jumper terminal "IN" to terminal "16VDC". This will tell unit to control at 3300 fpm/full airflow, and the green LED should turn on (and the box should drive open).

      2.) To manually close the box, remove wiring from terminal "IN", jumper and "IN" terminal to "-" terminal. This will tell unit to control at zero fpm/no airflow, and the red LED should be on (and the box should drive closed).

NOTE: Never jumper terminal 16 VDC to "-" as this would cause a short, and possibly damage the power supply.

NOTE: When using the same transformer for more than one control, the phase and ground must be consistent with each device
.

Pressure and Flow Data

Minimum pressure values (The least pressure required to deliver the indicated airflow with a full open damper, and no downstream pressure), as well as maximum and minimum airflows are shown in the following tables. Some DDC controllers may be able to operate at lower sensed pressures than shown. Operating at very low sensed pressures may result in erratic performance and objectionable noise.

LMHD Units

Inlet Size	Max CFM	Min CFM*	Min Pressures		
			Ps	ΔPv	ΔPt
4	229	40	0.03	0.43	0.46
5	358	62	0.08	0.42	0.50
6	515	89	0.17	0.41	0.58
7	701	121	0.16	0.40	0.57
8	916	159	0.17	0.39	0.56
9	1159	201	0.30	0.38	0.67
10	1431	248	0.17	0.35	0.52
12	2060	357	0.17	0.33	0.49
14	2804	486	0.18	0.29	0.47
16	3662	634	0.17	0.24	0.42
24 x 16	6909	1212	0.16	0.28	0.44

* This value is based on a signal of 0.03 in w.g. differential pressure of the linlet probe. Minimum may be 0.

To obtain Total Pressure, add the Δ Pv to the Static Pressure

Table 4 LMHD Pressures and flows.

LDT Units / Inlet Sensor pickup

Inlet Size	Max CFM	Min CFM*	Min Pressures		
			Ps	ΔPv	ΔPt
4	229	40	0.47	0.43	0.89
5	358	62	0.41	0.42	0.83
6	515	89	0.33	0.41	0.74
7	701	121	0.32	0.40	0.73
8	916	159	0.34	0.39	0.73
9	1159	201	0.33	0.38	0.71
10	1431	248	0.34	0.35	0.69
12	2060	357	0.33	0.33	0.66
14	2804	486	0.36	0.29	0.65
16	3662	634	0.34	0.24	0.59

* Minimum flow may be 0

LDT Units / Discharge Sensor pickup

Inlet Size	Max CFM	Min CFM*
4	910	160
5	910	160
6	910	160
7	1430	250
8	1430	250
9	2060	360
10	2060	360
12	2800	490
14	3660	635
16	3660	635

* Some DDC controls supplied by others may have differing limitations

This value is based on a signal of 0.03 in w.g. differential pressure of the inlet flow probe.

Minimum flow may be 0

Table 5 LDT Pressures and flows

LMHDT Units / Inlet Sensor pickup

Inlet Size	Max CFM	Min CFM*	Min Pressures		
			Ps	ΔPv	ΔPt
4	229	40	0.08	0.43	0.51
5	358	62	0.20	0.42	0.62
6	515	89	0.41	0.41	0.82
7	701	121	0.41	0.40	0.81
8	916	159	0.43	0.39	0.81
9	1159	201	0.41	0.38	0.79
10	1431	248	0.42	0.35	0.77
12	2060	357	0.41	0.33	0.74
14	2804	486	0.45	0.29	0.73
16	3662	634	0.43	0.24	0.67

* Minimum flow may be 0

LMHDT Units / Discharge Sensor pickup

inlet size	Max. Primary Airflow - CFM	Min Airflow* Standard
4	910	160
5	910	160
6	910	160
7	1430	250
8	1430	250
9	2060	360
10	2060	360
12	2800	490
14	3660	635
16	3660	635

* Some DDC controls supplied by others may have differing limitations
This value is based on a signal of 0.03 in w.g. differential pressure of the inlet flow probe.
* Minimum flow may be 0

Table 6 LMHDT Pressures and Flows