

ATU PRODUCT CATALOG



AIR TERMINAL UNITS

SD



SINGLE DUCT AIR TERMINALS

- TH – Single Duct Unit (TH1-TH23)
- TL – Low Profile Single Duct Unit (TL1-TL20)
- BP – By-Pass Unit (BP1-BP7)

FP



FAN POWERED TERMINALS

- FCI – Series Fan Powered Unit (FCI1-FCI22)
- FCL – Low Profile Series Fan Powered Unit (FCL1-FCL18)
- FCQ – Ultra Quiet Series Fan Powered Unit (FCQ1-FCQ22)
- FVI – Parallel Fan Powered Unit (FVI1-FVI27)
- FVL – Low Profile Parallel Fan Powered Unit (FVL1-FVL19)

DD



DUAL DUCT AIR TERMINALS

- DD – Dual Duct Unit (DD1-DD9)
- DH – High Performance Mixing Dual Duct Unit (DH1-DH8)
- DS – Short Mixing Dual Duct Unit (DS1-DS8)

RF



RETROFIT AIR TERMINALS

- SR – Square Retrofit Unit (SR1-SR5)
- RT – Round Retrofit Unit (RT1-RT5)
- RA – Customized Retrofit Unit (RA1-RA8)

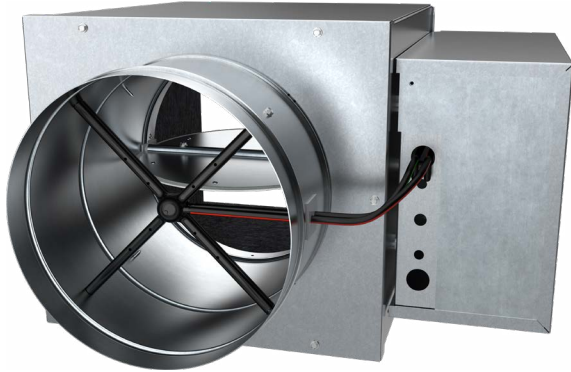
ACC



OPTIONS, ACCESSORIES AND REFERENCE MATERIAL

- ACC – Accessories (ACC1-ACC36)

SINGLE DUCT AIR TERMINAL UNITS



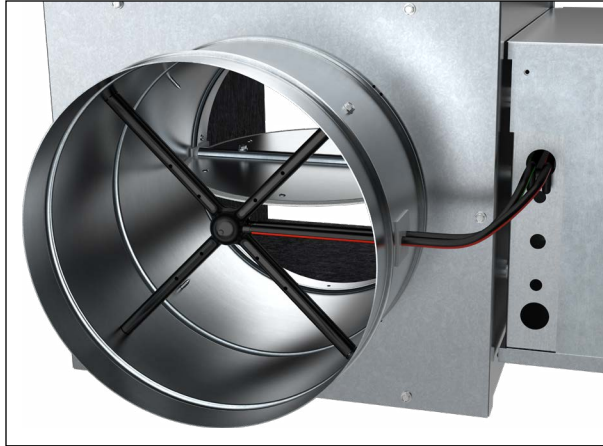
TH-500
SINGLE DUCT BOX
PAGES TH1 - TH23



TL-500
LOW-PROFILE SINGLE DUCT BOX
PAGES TL1 - TL20



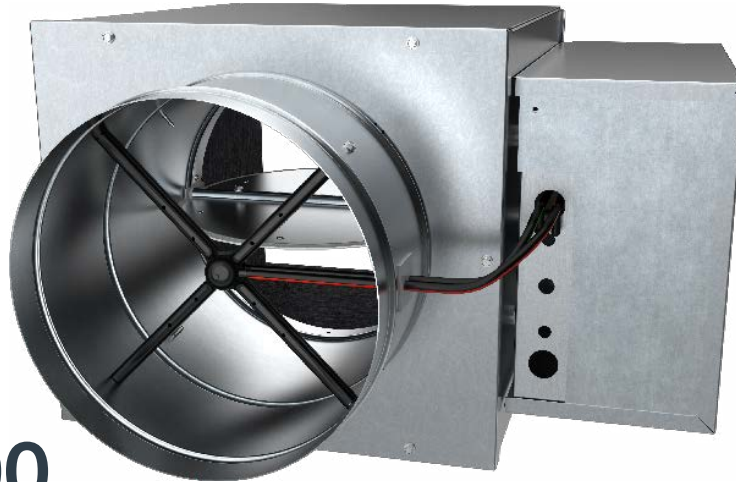
BP-600
BYPASS BOX
PAGES BP1 - BP7



SINGLE DUCT AIR TERMINAL UNITS

The METALAIRE single duct terminal units are at the core of today's variable air volume (VAV) systems. The staple of today's HVAC system designer, VAV systems lower operating costs by using less central fan energy and less refrigeration energy. VAV systems also have lower first costs by allowing the designer to take advantage of the building's diversity.

The primary function of the METALAIRE single duct terminal units is to regulate conditioned air flow into an occupied zone in response to a control signal. METALAIRE single duct terminal units are available with a wide range of control options to suit any application. These include pneumatic and direct digital control (DDC). METALAIRE single duct terminal units can be applied in both pressure-dependent and pressure-independent applications in duct systems with static pressures up to 3" wg. With the demands of today's building designs to reduce energy in smaller mechanical spaces, the METALAIRE single duct terminal unit is the perfect choice.

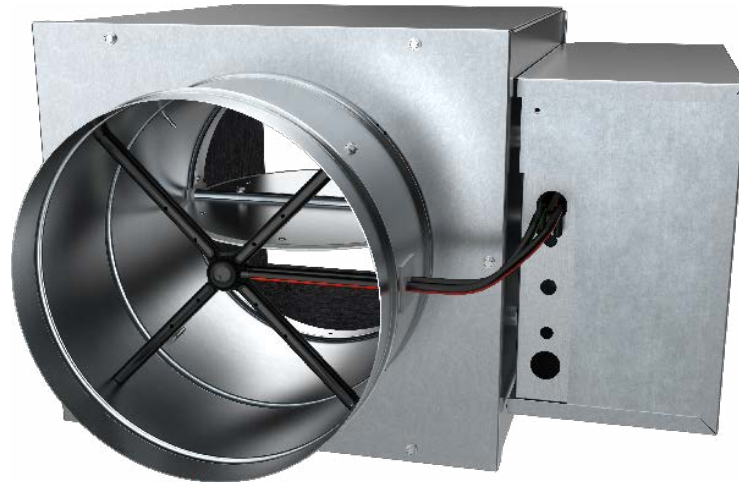


TH-500 SINGLE DUCT AIR TERMINAL UNIT

SPECIFIABLE FEATURES

- 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- Damper construction of double layer 18 gauge equivalent with integral blade seal.
- Riveted round primary inlet duct to minimize leakage.

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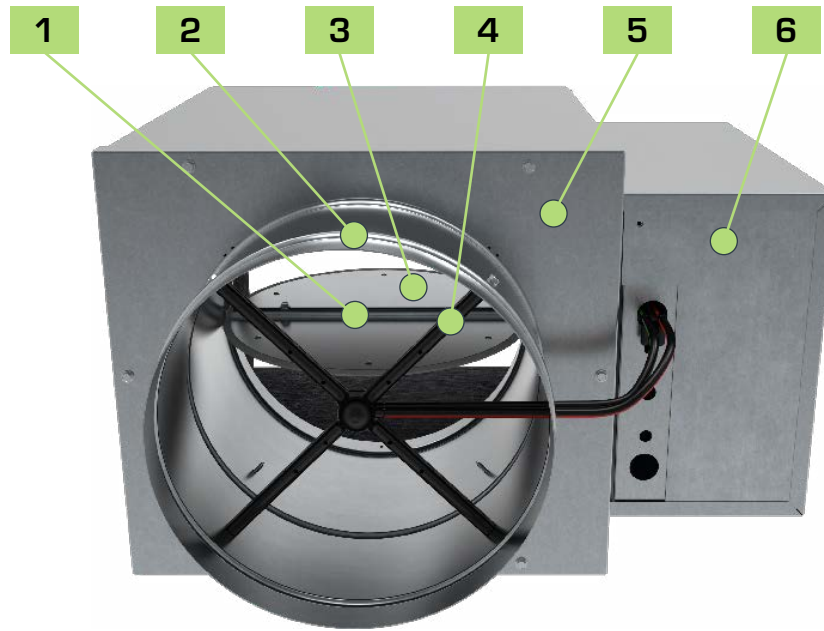
TH-500 SINGLE DUCT AIR TERMINAL UNIT

The METALAIRE TH-500 is the simplest and most widely used VAV terminal unit. Its basic components are an insulated sheet metal box, round inlet damper, flow measuring device and rectangular outlet. The unit is served by a central air handler and modulates the amount of 'primary' cooling air to the space between a minimum set point and the design airflow.

When necessary, the METALAIRE TH-500 can be provided with a heating coil on the discharge of the unit to provide for reheat.

STANDARD FEATURES

- TH-500 available in 12 unit sizes and TH-ECO-500 available in 10 sizes to handle 30-8900 CFM.
- Variable or constant volume applications.
- 22 ga. galvanized steel casing, mechanically sealed for low leakage.
- Mechanically fastened damper assembly is double layer, 18 gauge equivalent, galvanized steel with integral blade seal. (<1% at 3.0" wg static pressure).
- Optional factory calibrated controls to meet all control strategies.
- Multi-point center averaging flow sensor for highly accurate (+/-5%) flow readings with varying inlet duct configurations after certified balancer has balanced terminal.
- External control cabinet with offset mounting plate is standard.
- 3-beaded inlet connection tube for added rigidity and secure flex duct connections.
- 1/2" thick, dual density (1.5lb / ft³ min.) fiberglass insulation with edges coated. Meets NFPA 90A and UL 181.
- Rectangular discharge with slip and drive cleat duct connection.
- Independently tested and certified laboratory performance data.
- Full range of options and accessories available (heating coils, disconnects, attenuators, etc.).
- Full range of liners / insulation available.

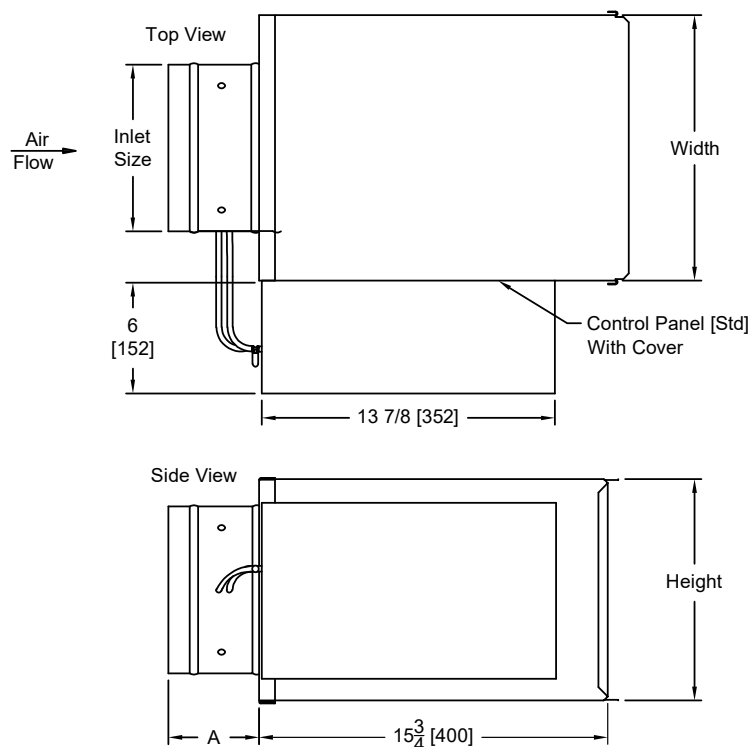


TH-500 SINGLE DUCT AIR TERMINAL UNIT

FEATURES AND BENEFITS

- 1** Damper rotates in a self-lubricating, long life, low friction thermoplastic bearing.
- 2** Riveted primary inlet duct to minimize leakage with three stiffening beads for added rigidity.
- 3** Damper construction of double layer 18 gauge equivalent with integral blade seal.
- 4** Multi-Point Center Averaging Airflow Sensor
- 5** Galvanized steel casing, mechanically sealed for low leakage construction.
- 6** NEMA TYPE 1 rated control enclosure with stand-off to prevent penetration of casing standard on all terminal units.
- 7** All TH-500 terminal units are AHRI certified and shipped with the AHRI seal.

TH-500-001 SINGLE DUCT AIR TERMINAL UNIT, COOLING ONLY



The standard location for control panel is Right Hand on Model TH.

Looking in the direction of airflow, the control panel is on the right.

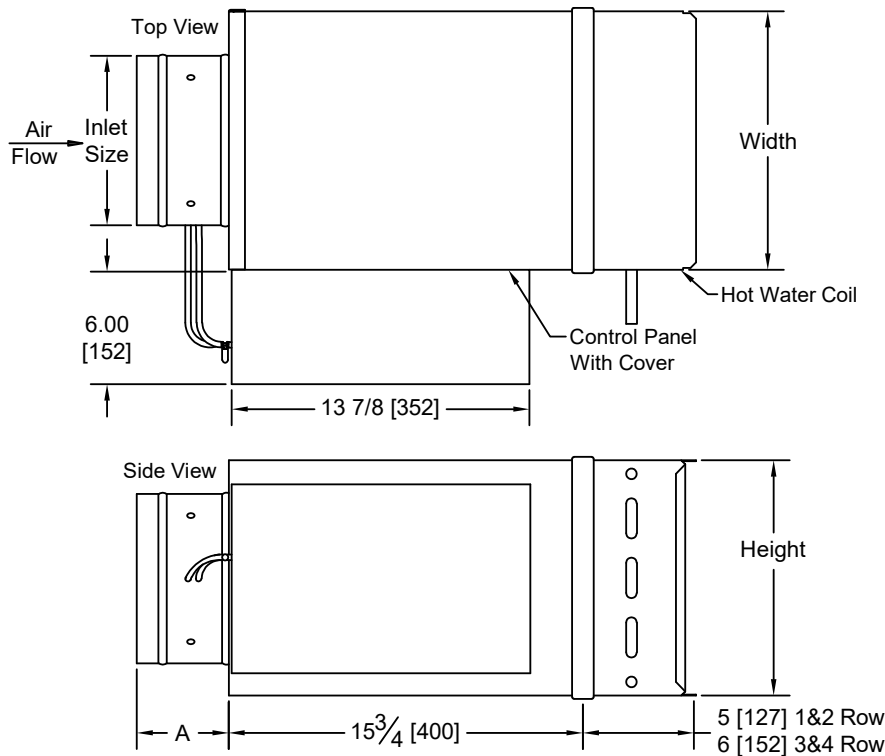
The control panel will overhang the top and bottom of Unit Size 4, 5, & 6, 1" (25.4 mm).

Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".

Models TH Unit Size 20 & 24 have rectangular inlet ducts.

Unit Size	Inlet Size		A		Width		Height		Unit wt.	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lb.	kg.
4	3 7/8	99	5	254	12	305	8	203	12	5
5	4 7/8	124	5	127	12	305	8	203	12	5
6	5 7/8	149	5	127	12	305	8	203	12	5
7	6 7/8	174	5	127	12	305	10	254	15	7
8	7 7/8	200	5	127	12	305	10	254	15	7
9	8 7/8	225	5	127	14	356	12 1/2	318	18	8
10	9 7/8	251	5	127	14	356	12 1/2	318	18	8
12	11 7/8	302	5	127	16	406	15	381	22	10
14	13 7/8	353	5	127	20	508	17 1/2	445	24	11
16	15 7/8	403	5	127	24	610	18	457	29	13
20	19 7/8 x 15 7/8	505 x 403	6	152	30	762	20	508	47	21
24	23 7/8 x 15 7/8	607 x 403	6	152	38	965	20	508	58	26

TH-500-002 SINGLE DUCT AIR TERMINAL UNIT WITH HOT WATER COIL



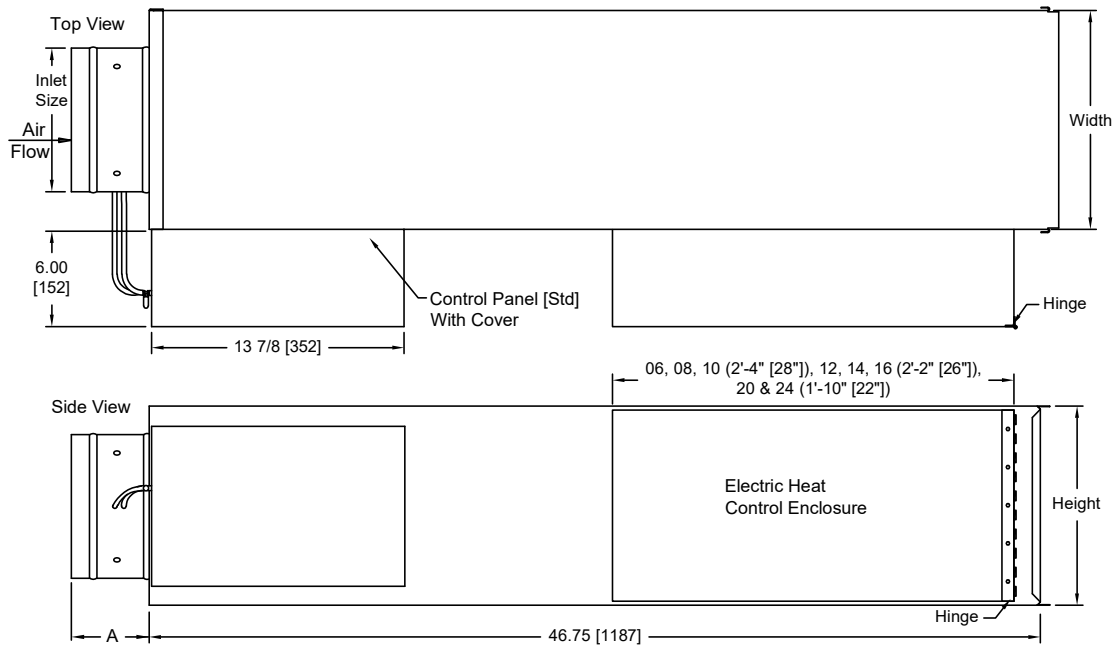
The standard location for control panel is Right Hand on Model TH.
Looking in the direction of airflow, the control panel is on the right.

The control panel will overhang the top and bottom of Unit Size 4, 5, & 6, 1" (25.4 mm).
Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".

Models TH Unit Size 20 & 24 have rectangular inlet ducts.

Unit Size	Inlet Size		A		Width		Height		Unit wt.							
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	1 Row		2 Row		3 Row		4 Row	
									lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.
4	3 7/8	99	5	254	12	305	8	203	17	7.7	18	8	24	11	23	10.4
5	4 7/8	124	5	127	12	305	8	203	17	7.7	18	8	24	11	23	10.4
6	5 7/8	149	5	127	12	305	8	203	17	7.7	18	8	24	11	23	10.4
7	6 7/8	174	5	127	12	305	10	254	20	9	22	10	28	13	28	13
8	7 7/8	200	5	127	12	305	10	254	20	9	22	10	28	13	28	13
9	8 7/8	225	5	127	14	356	12 1/2	318	24	11	27	12	34	15	38	17
10	9 7/8	251	5	127	14	356	12 1/2	318	24	11	27	12	34	15	38	17
12	11 7/8	302	5	127	16	406	15	381	31	14	34	15.4	41	19	43	19.5
14	13 7/8	353	5	127	20	508	17 1/2	445	34	15.4	39	17.7	47	21	53	24
16	15 7/8	403	5	127	24	610	18	457	42	19	48	21.8	54	25	59	26.8
20	19 7/8 x 15 7/8	505 x 403	6	152	30	762	20	508	64	29	72	32.7	77	35	86	39
24	23 7/8 x 15 7/8	607 x 403	6	152	38	965	20	508	79	36	89	40	93	42	109	49

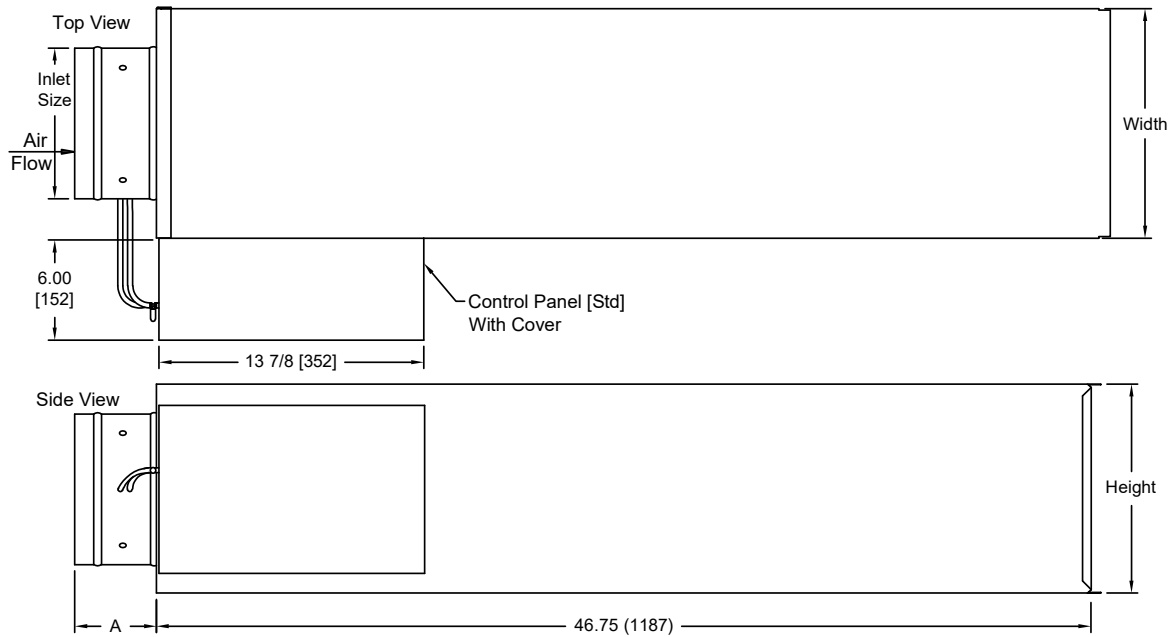
TH-500-003 SINGLE DUCT AIR TERMINAL UNIT WITH ELECTRIC HEAT



The standard location for control panel is Right Hand on Model TH.
Looking in the direction of airflow, the control panel is on the right.
The control panel will overhang the top and bottom of Unit Size 4, 5, & 6, 1" (25.4 mm).
Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".
Models TH Unit Size 20 & 24 have rectangular inlet ducts.

Unit Size	Inlet Size		A		Width		Height		Unit wt.	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lb.	kg.
4	3 7/8	99	5	254	12	305	8	203	38	17
5	4 7/8	124	5	127	12	305	8	203	38	17
6	5 7/8	149	5	127	12	305	8	203	38	17
7	6 7/8	174	5	127	12	305	10	254	43	20
8	7 7/8	200	5	127	12	305	10	254	43	20
9	8 7/8	225	5	127	14	356	12 1/2	318	50	23
10	9 7/8	251	5	127	14	356	12 1/2	318	50	23
12	11 7/8	302	5	127	16	406	15	381	59	27
14	13 7/8	353	5	127	20	508	17 1/2	445	67	30
16	15 7/8	403	5	127	24	610	18	457	77	35
20	19 7/8 x 15 7/8	505 x 403	6	152	30	762	20	508	103	47
24	23 7/8 x 15 7/8	607 x 403	6	152	38	965	20	508	122	55

TH-500-004 SINGLE DUCT AIR TERMINAL UNIT WITH INTEGRAL ATTENUATOR



The standard location for control panel is Right Hand on Model TH.

Looking in the direction of airflow, the control panel is on the right.

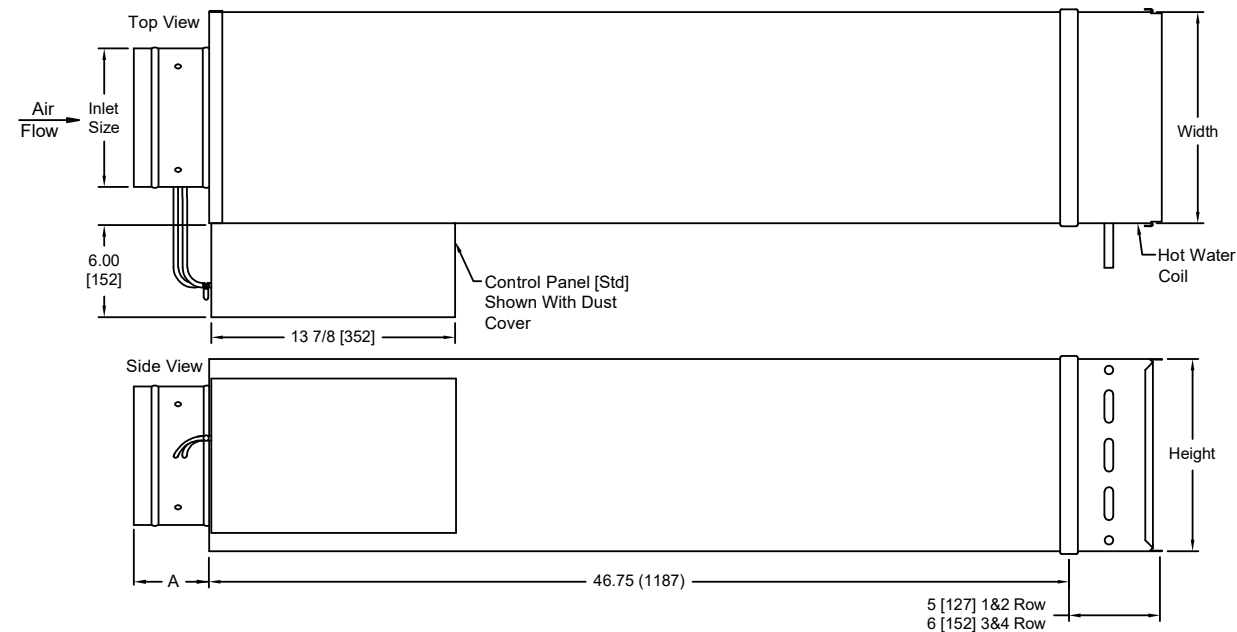
The control panel will overhang the top and bottom of Unit Size 4, 5, & 6, 1" (25.4 mm).

Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".

Models TH Unit Size 20 & 24 have rectangular inlet ducts.

Unit Size	Inlet Size		A		Width		Height		Unit wt.	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lb.	kg.
4	3 7/8	99	5	254	12	305	8	203	24	11
5	4 7/8	124	5	127	12	305	8	203	24	11
6	5 7/8	149	5	127	12	305	8	203	24	11
7	6 7/8	174	5	127	12	305	10	254	28	13
8	7 7/8	200	5	127	12	305	10	254	28	13
9	8 7/8	225	5	127	14	356	12 1/2	318	34	15
10	9 7/8	251	5	127	14	356	12 1/2	318	34	15
12	11 7/8	302	5	127	16	406	15	381	41	19
14	13 7/8	353	5	127	20	508	17 1/2	445	47	21
16	15 7/8	403	5	127	24	610	18	457	54	25
20	19 7/8 x 15 7/8	505 x 403	6	152	30	762	20	508	77	35
24	23 7/8 x 15 7/8	607 x 403	6	152	38	965	20	508	93	42

TH-500-005 SINGLE DUCT AIR TERMINAL UNIT WITH INTEGRAL ATTENUATOR AND HOT WATER COIL



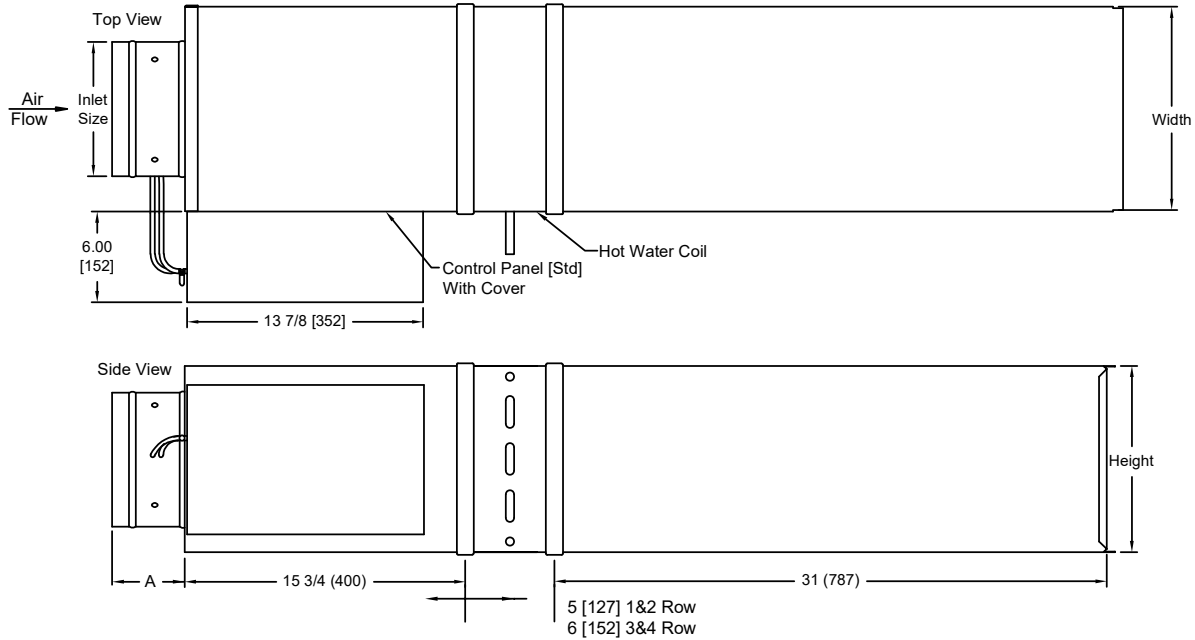
The standard location for control panel is Right Hand on Model TH.
Looking in the direction of airflow, the control panel is on the right.

The control panel will overhang the top and bottom of Unit Size 4, 5, & 6, 1" (25.4 mm).
Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".

Models TH Unit Size 20 & 24 have rectangular inlet ducts.

Unit Size	Inlet Size		A		Width		Height		Unit Weight							
									1 Row		2 Row		3 Row		4 Row	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.
4	3 7/8	99	5	254	12	305	8	203	29	13	30	14	33	15	35	16
5	4 7/8	124	5	127	12	305	8	203	29	13	30	14	33	15	35	16
6	5 7/8	149	5	127	12	305	8	203	29	13	30	14	33	15	35	16
7	6 7/8	178	5	127	12	305	10	254	33	15	35	16	39	18	41	19
8	7 7/8	200	5	127	12	305	10	254	33	15	35	16	39	18	41	19
9	8 7/8	225	5	127	14	356	12 1/2	318	40	18	43	20	48	22	54	25
10	9 7/8	251	5	127	14	356	12 1/2	318	40	18	43	20	48	22	54	25
12	11 7/8	302	5	127	16	406	15	381	50	23	53	24	59	27	62	28
14	13 7/8	353	5	127	20	508	17 1/2	445	57	26	62	28	71	32	76	35
16	15 7/8	403	5	127	24	610	18	457	67	30	73	33	79	36	84	38
20	19 7/8 x 15 7/8	505 x 403	6	152	30	762	20	508	94	43	102	46	108	49	116	53
24	23 7/8 x 15 7/8	607 x 403	6	152	38	965	20	508	114	52	124	56	134	61	144	65

TH-500-006 SINGLE DUCT AIR TERMINAL UNIT WITH HOT WATER COIL AND ATTENUATOR



The standard location for control panel is Right Hand on Model TH.
Looking in the direction of airflow, the control panel is on the right.

The control panel will overhang the top and bottom of Unit Size 4, 5, & 6, 1" (25.4 mm).
Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".

Models TH Unit Size 20 & 24 have rectangular inlet ducts.

Unit Size	Inlet Size		A		Width		Height		Unit Weight							
									1 Row		2 Row		3 Row		4 Row	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.
4	3 7/8	99	5	254	12	305	8	203	29	13	30	14	33	15	35	16
5	4 7/8	124	5	127	12	305	8	203	29	13	30	14	33	15	35	16
6	5 7/8	149	5	127	12	305	8	203	29	13	30	14	33	15	35	16
7	6 7/8	178	5	127	12	305	10	254	33	15	35	16	39	18	41	19
8	7 7/8	200	5	127	12	305	10	254	33	15	35	16	39	18	41	19
9	8 7/8	225	5	127	14	356	12 1/2	318	40	18	43	20	48	22	54	25
10	9 7/8	251	5	127	14	356	12 1/2	318	40	18	43	20	48	22	54	25
12	11 7/8	302	5	127	16	406	15	381	50	23	53	24	59	27	62	28
14	13 7/8	353	5	127	20	508	17 1/2	445	57	26	62	28	71	32	76	35
16	15 7/8	403	5	127	24	610	18	457	67	30	73	33	79	36	84	38
20	19 7/8 x 15 7/8	505 x 403	6	152	30	762	20	508	94	43	102	46	108	49	116	53
24	23 7/8 x 15 7/8	607 x 403	6	152	38	965	20	508	114	52	124	56	134	61	144	65



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TH-500 AHRI CERTIFIED RATING POINTS



RADIATED SOUND

Power Levels @ 1.5" w.g. ΔPs

Unit Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
4	150	0.03	48	41	32	28	24	20
5	250	0.06	54	46	42	34	31	30
6	400	0.10	58	53	49	44	41	36
7	550	0.06	59	53	46	41	34	31
8	700	0.09	62	56	49	44	36	32
9	900	0.02	58	57	51	43	38	33
10	1100	0.04	59	60	53	46	40	35
12	1600	0.08	60	56	54	46	41	40
14	2100	0.08	62	56	54	44	38	34
16	2800	0.08	64	62	56	50	48	44
20	4400	0.06	69	68	64	61	54	48
24	5300	0.10	73	70	66	63	59	52

DISCHARGE SOUND

Power Levels @ 1.5" w.g. ΔPs

Unit Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
4	150	0.03	63	58	54	49	43	37
5	250	0.06	65	60	56	50	46	41
6	400	0.10	66	63	59	52	48	48
7	550	0.06	73	68	60	57	53	50
8	700	0.09	75	71	63	60	56	52
9	900	0.02	71	68	62	58	54	51
10	1100	0.04	72	70	64	59	56	52
12	1600	0.08	68	67	62	60	59	56
14	2100	0.08	65	60	60	62	61	58
16	2800	0.08	73	68	66	64	62	58
20	4400	0.06	80	77	76	76	70	64
24	5300	0.10	85	81	80	81	74	66

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation

RADIATED SOUND MODEL TH

OCTAVE BAND SOUND POWER, Lw, dB																															
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.							
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	
4	50	0.01	41	32	19	19	15	7	<15	43	34	21	21	17	9	<15	44	35	22	22	18	11	<15	45	38	25	24	23	18	<15	
	100	0.02	43	34	23	22	19	13	<15	45	36	25	24	21	15	<15	46	37	26	24	22	17	20	47	40	29	27	27	24	<15	
	150	0.03	46	36	29	26	21	16	<15	48	40	31	28	23	18	<15	48	41	32	28	24	20	21	50	44	35	31	29	27	<15	
	200	0.04	49	41	35	29	23	18	<15	51	43	37	31	25	20	22	52	44	38	32	26	22	31	53	47	41	34	31	29	<15	
	250	0.06	51	43	39	32	28	26	<15	53	45	41	34	30	28	29	54	46	42	34	31	30	35	55	49	45	37	36	37	19	
5	150	0.03	46	38	29	26	21	16	<15	48	40	31	28	23	18	<15	48	41	32	28	24	20	<15	50	44	35	31	29	27	<15	
	200	0.04	49	41	35	29	23	18	<15	51	43	37	31	25	20	<15	52	44	38	32	26	22	<15	53	47	41	34	31	29	<15	
	250	0.06	51	43	39	32	28	26	<15	53	45	41	34	30	28	<15	54	46	42	34	31	30	15	55	49	45	37	36	37	19	
	300	0.07	53	46	43	35	32	30	16	55	48	45	37	34	32	19	56	49	46	38	35	34	20	57	52	49	40	40	41	23	
	350	0.09	54	48	46	38	35	33	20	56	50	48	39	37	35	22	57	51	48	40	38	37	22	58	53	51	42	42	42	25	
6	200	0.04	49	41	35	29	23	18	<15	51	43	37	31	25	20	<15	52	44	38	32	26	22	<15	53	47	41	34	31	29	<15	
	300	0.07	53	46	43	35	32	30	16	55	48	45	37	34	32	19	56	49	46	38	35	34	20	57	52	49	40	40	41	23	
	400	0.10	55	50	46	41	38	32	20	57	52	48	43	40	34	22	58	53	49	44	41	36	23	59	56	52	46	46	43	26	
	500	0.14	57	53	48	44	40	34	22	59	55	50	46	42	36	24	60	56	51	46	43	38	25	61	59	54	49	48	45	29	
	600	0.15	58	54	49	45	41	35	23	60	56	51	47	43	37	25	60	57	52	47	44	39	26	61	60	55	50	49	46	30	
7	350	0.03	52	41	34	26	21	19	<15	56	47	42	36	28	24	18	56	48	43	38	32	28	18	57	49	46	43	40	38	20	
	450	0.04	52	42	35	29	22	19	<15	56	49	42	37	30	25	18	57	50	45	40	34	30	19	58	53	50	46	42	40	24	
	550	0.06	54	44	36	32	24	20	15	58	51	42	38	30	26	20	59	53	46	41	34	31	21	60	57	52	48	42	40	26	
	650	0.08	55	45	38	34	26	20	16	60	52	44	39	32	28	22	61	55	48	43	36	32	24	62	60	55	50	44	41	30	
	750	0.10	56	47	41	36	28	22	18	62	54	46	40	34	29	25	63	57	50	44	37	33	26	66	62	57	52	44	42	32	
8	400	0.04	52	42	34	28	22	19	<15	56	48	42	36	29	24	18	56	49	44	39	33	29	18	58	51	48	44	41	39	22	
	550	0.06	54	44	36	32	24	20	15	58	51	42	38	30	26	20	59	53	46	41	34	31	21	60	57	52	48	42	40	26	
	700	0.09	56	46	40	35	27	21	18	61	53	45	40	33	28	24	62	56	49	44	36	32	25	64	61	56	51	44	41	31	
	850	0.11	58	49	43	38	30	24	20	63	54	47	42	36	31	26	64	58	51	45	39	34	28	68	64	58	52	46	42	35	
	1000	0.13	60	52	46	42	34	27	22	65	57	50	45	39	33	29	66	60	53	48	42	36	30	70	66	60	54	47	42	37	
9	500	0.01	46	45	34	28	25	21	<15	51	50	44	34	30	24	18	55	51	45	38	34	29	19	59	52	47	44	41	40	21	
	700	0.01	48	47	38	32	27	22	<15	52	52	46	38	32	26	20	56	54	49	41	36	31	23	62	59	53	47	44	41	29	
	900	0.02	48	48	41	35	28	23	15	54	54	48	40	34	27	22	58	57	51	43	38	33	26	64	64	58	50	46	44	35	
	1100	0.04	51	50	44	38	30	24	18	55	55	49	41	35	29	24	59	60	53	46	40	35	30	65	68	61	53	48	47	39	
	1300	0.06	54	54	47	41	32	26	22	58	56	50	42	36	30	25	62	61	54	47	41	37	31	68	70	62	55	50	49	41	
10	700	0.01	48	47	38	32	27	22	<15	52	52	46	38	32	26	20	56	54	49	41	36	31	23	62	59	53	47	44	41	29	
	900	0.02	48	48	41	35	28	23	15	54	54	48	40	34	27	22	58	57	51	43	38	33	26	64	64	58	50	46	44	35	
	1100	0.04	51	50	44	38	30	24	18	55	55	49	41	35	29	24	59	60	53	46	40	35	30	65	68	61	53	48	47	39	
	1300	0.06	54	54	47	41	32	26	22	58	56	50	42	36	30	25	62	61	54	47	41	37	31	68	70	62	55	50	49	41	
	1500	0.08	56	56	49	42	36	20	25	61	58	51	44	38	32	28	66	62	55	48	43	39	32	72	70	63	56	50	50	41	
12	800	0.02	50	42	35	28	26	29	<15	54	48	45	36	32	32	19	56	51	49	40	36	36	23	58	56	56	50	46	47	31	
	1200	0.04	51	46	41	34	29	30	<15	56	51	49	39	35	34	23	58	55	53	44	39	38	28	62	62	62	54	48	48	37	
	1600	0.08	54	48	46	39	33	32	20	58	53	51	42	38	37	25	60	56	54	46	41	40	29	65	65	63	55	49	48	38	
	2000	0.12	55	51	50	42	37	36	24	59	54	52	44	41	39	26	62	58	56	48	44	42	31	66	67	64	56	50	49	39	
	2400	0.17	57	52	46	38	38	36	20	62	57	55	47	44	42	30	64	61	59	51	47	45	34	69	67	66	59	53	51	41	
14	1000	0.02	53	41	39	31	27	22	<15	55	43	41	33	29	24	16	56	44	42	34	30	24	18	57	45	43	35	31	26	19	
	1600	0.05	56	46	44	35	31	26	18	58	48	46	37	33	28	20	58	48	46	38	34	28	20	60	50	48	39	35	30	22	
	2100	0.08	59	54	51	42	36	31	25	61	56	53	44	38	33	28	62	56	54	44	38	34	29	63	58	55	46	40	35	30	
	2600	0.12	62	56	54	43	40	36	29	64	58	56	45	42	38	31	64	58	56	46	42	38	31	66	60	58	47	44	40	33	
	3100	0.16	63	59	56	45	43	39	31	65	61	58	47	45	41	33	66	61	59	48	45	41	31	67	63	60	49	47	43	35	
16	1400	0.02	58	50	40	34	29	24	20	58	54	45	38	34	28	22	60	56	49	44	38	34	25	62	60	56	52	47	44	31	
	2100	0.05	60	52	43	38	35	31	22	60	56	48	42	38	34	25	62	60	53	47	44	40	30	66	66	62	58	55	52	37	
	2800	0.08	61	54	47	42	39	35	24	62	58	51	45	42	37	28	64	62	56	50	48	44	32	69	69	65	62	61	59	40	
	3500	0.11	62	56	51	46	42	38	25	64	60	54	48	44	40	30	66	64	59	54	50	47	35	71	70	67	64	63	62	42	
	4200	0.14	64	60</																											

DISCHARGE SOUND MODEL TH

OCTAVE BAND SOUND POWER, Lw, dB																														
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
4	50	0.01	59	47	39	35	29	22	<15	60	55	50	47	39	31	<15	61	56	51	48	40	32	16	64	59	52	51	43	35	20
	100	0.02	60	49	39	34	30	26	<15	61	56	52	47	40	34	16	62	57	53	48	41	35	18	65	60	54	51	44	38	21
	150	0.03	61	51	42	37	32	27	16	62	57	53	48	42	36	18	63	58	54	49	43	37	19	66	61	55	52	46	40	22
	200	0.04	62	52	45	40	34	28	18	63	58	53	49	44	37	19	64	59	54	50	45	38	20	67	62	55	53	48	41	24
	250	0.06	63	54	47	42	36	32	19	64	59	55	49	45	40	20	65	60	56	50	46	41	21	68	63	59	53	49	44	25
5	150	0.03	61	51	42	37	32	27	16	62	57	53	48	42	36	18	63	58	54	49	43	37	19	66	61	55	52	46	40	22
	200	0.04	62	52	45	40	34	28	18	63	58	53	49	44	37	19	64	59	54	50	45	38	20	67	62	55	53	48	41	24
	250	0.06	63	54	47	42	36	32	19	64	59	55	49	45	40	20	65	60	56	50	46	41	21	68	63	59	53	49	44	25
	300	0.07	64	56	51	45	38	34	16	64	61	57	50	46	43	19	65	62	58	51	47	44	20	68	65	61	54	50	47	24
	350	0.09	63	57	52	46	40	37	15	63	61	58	50	47	44	19	64	62	58	51	48	45	20	67	64	61	53	50	48	22
6	200	0.04	62	52	45	40	34	28	18	63	58	53	49	44	37	19	64	59	54	50	45	38	20	67	62	55	53	48	41	24
	300	0.07	64	56	51	45	38	34	16	64	61	57	50	46	43	19	65	62	58	51	47	44	20	68	65	61	54	50	47	24
	400	0.10	65	60	55	49	42	40	20	65	62	58	51	47	47	20	66	63	59	52	48	48	21	69	67	62	55	51	51	26
	500	0.14	68	64	59	54	48	45	22	68	66	62	56	52	50	25	69	67	63	57	53	51	26	72	70	66	60	56	54	30
	600	0.15	68	66	60	56	50	47	25	68	67	63	58	54	50	26	70	68	64	59	54	52	28	72	71	67	62	57	54	31
7	350	0.03	65	58	49	44	39	34	18	69	65	58	54	50	46	24	69	65	58	54	50	48	24	70	66	58	58	54	52	25
	450	0.04	66	60	51	47	40	36	19	71	66	60	55	51	46	25	71	66	60	56	52	50	25	72	68	60	58	54	54	28
	550	0.06	68	62	53	50	42	38	21	72	68	60	57	52	48	28	73	68	60	57	53	50	28	74	69	60	60	56	55	29
	650	0.08	70	64	55	52	44	40	24	74	70	62	59	54	49	30	74	70	62	59	55	52	30	76	72	62	61	58	56	32
	750	0.10	72	66	57	55	46	42	24	75	70	64	60	54	50	29	76	72	64	61	56	53	31	78	74	64	63	60	58	34
8	400	0.04	66	59	50	46	40	35	19	70	66	59	54	50	46	25	70	66	59	55	51	49	25	71	67	59	58	54	53	26
	550	0.06	68	62	53	50	42	38	21	72	68	60	57	52	48	28	73	68	60	57	53	50	28	74	69	60	60	56	55	29
	700	0.09	71	65	56	54	45	40	22	74	70	63	60	54	50	29	75	71	63	60	56	52	30	77	73	64	62	59	57	32
	850	0.11	73	67	59	57	48	44	25	77	72	65	62	56	51	31	78	73	65	63	58	55	32	80	75	66	66	62	60	35
	1000	0.13	75	70	62	60	52	47	29	79	74	67	65	58	53	34	80	75	68	66	60	56	35	82	77	69	70	65	62	37
9	500	0.01	60	58	48	45	36	34	15	65	64	56	53	48	44	22	66	64	58	54	49	46	22	68	66	60	58	54	52	25
	700	0.01	64	60	52	48	40	38	16	68	66	59	55	50	47	24	69	67	61	56	51	49	25	71	69	64	60	56	53	28
	900	0.02	66	62	54	50	41	40	19	70	68	61	57	53	50	26	71	68	62	58	54	51	26	73	70	66	61	57	54	29
	1100	0.04	68	64	57	53	45	43	21	72	69	63	58	55	52	28	72	70	64	59	56	52	29	74	72	68	62	59	55	31
	1300	0.06	70	68	60	57	50	48	26	74	72	66	62	56	54	31	75	72	67	62	58	54	31	78	74	70	64	62	59	34
10	700	0.01	64	60	52	48	40	38	16	68	66	59	55	50	47	24	69	67	61	56	51	49	25	71	69	64	60	56	53	28
	900	0.02	66	62	54	50	41	40	19	70	68	61	57	53	50	26	71	68	62	58	54	51	26	73	70	66	61	57	54	29
	1100	0.04	68	64	57	53	45	43	21	72	69	63	58	55	52	28	72	70	64	59	56	52	29	74	72	68	62	59	55	31
	1300	0.06	70	68	60	57	50	48	26	74	72	66	62	56	54	31	75	72	67	62	58	54	31	78	74	70	64	62	59	34
	1500	0.08	73	71	62	60	54	52	30	77	75	68	66	60	56	35	77	75	68	66	60	57	35	80	78	72	68	64	61	38
12	800	0.02	57	55	52	50	46	40	<15	62	59	54	53	51	48	15	63	59	54	54	51	49	15	66	61	55	56	53	52	18
	1200	0.04	60	58	57	53	48	43	<15	64	63	59	56	54	51	20	65	64	58	56	55	52	21	68	66	60	59	58	56	24
	1600	0.08	62	60	59	55	51	46	16	67	66	62	59	58	55	24	68	67	62	60	59	56	25	71	70	65	63	62	60	29
	2000	0.12	64	61	59	56	52	48	18	70	68	64	62	61	59	26	72	70	66	64	63	62	29	76	74	69	68	67	66	34
	2400	0.17	65	62	61	57	53	49	19	72	70	66	64	63	61	29	74	72	67	66	65	63	31	78	76	71	70	70	68	36
14	1000	0.02	46	39	39	37	31	24	<15	57	52	51	51	48	43	<15	61	56	55	56	53	48	<15	68	64	62	63	61	57	21
	1600	0.05	49	43	43	42	37	32	<15	60	55	54	55	52	48	<15	64	59	58	59	56	53	17	70	66	65	66	64	61	25
	2100	0.08	53	48	49	48	44	41	<15	62	57	57	58	57	54	18	65	60	60	62	61	58	22	71	67	66	68	68	65	28
	2600	0.12	58	52	52	51	48	47	<15	65	59	59	60	59	57	21	68	62	62	63	62	60	24	73	68	67	69	69	67	30
	3100	0.16	63	56	53	53	51	53	17	67	61	60	61	60	59	23	69	64	62	64	64	62	26	74	69	68	70	70	68	31
16	1400	0.02	52	47	44	40	35	20	<15	64	58	55	52	50	46	<15	66	62	58	56	55	52	19	72	66	64	62	62	58	24
	2100	0.05	58	52	50	48	42	38	<15	66	62	60	56	54	51	19	69	64	62	60	58	55	21	74	69	66	65	64	61	28
	2800	0.08	64	58	58	55	49	44	<15	71	66	64	61	59	55	24	73	68	66	64	62	58	26	77	72	69	68	68	64	31
	3500	0.11	68	62	63	60	54	49	19	74	68	66	64	62	58	26	76	70	68	66	66	61	29	79	74	71	70	70	66	34
	4200	0.14	72	66	66	64	56	52	24																					

TH-500 STANDARD CONSTRUCTION CASING AND DAMPER LEAKAGE

Standard Construction				
Inlet Diameter	Static Pressure " w.g.	Maximum Airflow	Max Casing Leakage	Max Damper Leakage
4	3	300	5	5
5	3	375	5	5
6	3	540	5	5
7	3	760	7	7
8	3	990	9	9
9	3	1250	12	12
10	3	1640	16	16
12	3	2350	22	22
14	3	3250	32	32
16	3	4100	41	41
20	3	6430	64	64
24	3	7270	72	72

PERFORMANCE NOTES

- 1) Leakage testing conducted in accordance with ASHRAE 130-2016
- 2) Per ASHRAE Standard 130-2016 "terminal casing leakage: the amount of the air in ft 3/min (L/s) leaking from the terminal unit at a given inlet pressure with the outlet(s) and inlet(s) blocked and with the damper/valve fully opened"
- 3) Per ASHRAE Standard 130-2016 "terminal damper leakage: the amount of air in ft 3/min (L/s) leaking through a fully closed damper/valve of a supply/exhaust terminal unit at a given inlet pressure"opened"
- 4) Casing and Damper leakage shall not exceed 1% of the maximum rated airflow at 3" w.g.
- 5) 4" and 5" inlets are built with 6" casings

CERTIFICATIONS AND STANDARDS

- Units tested per ASHRAE Standard 130-2016.
- All model sizes certified in accordance with AHRI 880-2017 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A/90B.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.
- Hot water coils are manufactured in accordance to AHRI Standard 410.

TH-500 HOT WATER COILS MBH SELECTION DATA

Unit Size	Rows	GPM	Head Loss	CFM							
				100	200	300	350	400	450	500	600
4 5 6	1	1	0.46	5.1	7.2	8.6	9.1	9.6	10.0	10.3	11.0
		2	1.76	5.4	7.8	9.5	10.1	10.7	11.2	11.7	12.5
		3	3.86	5.5	8.1	9.8	10.5	11.2	11.7	12.2	13.2
		4	6.73	5.6	8.2	10.0	10.7	11.4	12.0	12.6	13.5
		Airside ΔPs		0.01	0.04	0.07	0.10	0.12	0.15	0.18	0.24
	2	1	0.12	7.5	11.1	13.4	14.3	15.0	15.7	16.3	17.3
		2	0.46	8.1	12.5	15.5	16.8	17.8	18.8	19.7	21.2
		4	1.75	8.4	13.4	17.0	18.4	19.8	21.0	22.1	24.1
		6	3.84	8.5	13.7	17.5	19.1	20.6	21.9	23.1	25.2
		Airside ΔPs		0.03	0.08	0.16	0.21	0.26	0.32	0.38	0.51
	3	1	0.07	8.9	13.2	15.9	16.8	17.7	18.4	19.0	20.0
		2	0.28	9.6	15.2	19.1	20.6	21.9	23.1	24.1	25.9
		4	1.09	10.0	16.5	21.3	23.2	25.0	26.6	28.0	30.5
		6	2.44	10.2	17.0	22.2	24.3	26.3	28.0	29.7	32.5
		Airside ΔPs		0.04	0.12	0.24	0.31	0.39	0.47	0.56	0.77
	4	1	0.05	9.7	14.5	17.4	18.4	19.3	20.1	20.7	21.7
		2	0.20	10.5	17.0	21.4	23.2	24.7	26.0	27.1	29.1
		4	0.79	10.9	18.6	24.2	26.6	28.7	30.6	32.3	35.3
		6	1.77	11.1	19.2	25.3	28.0	30.4	32.5	34.5	38.0
		Airside ΔPs		0.05	0.16	0.32	0.41	0.52	0.63	0.75	1.02

Unit Size	Rows	GPM	Head Loss	CFM							
				300	400	500	600	700	800	900	1000
7 8	1	1	0.63	9.9	11.1	12.1	12.9	13.5	14.1	14.6	15.1
		2	2.39	10.8	12.4	13.7	14.7	15.6	16.4	17.1	17.7
		3	5.24	11.3	12.9	14.3	15.4	16.4	17.3	18.1	18.8
		4	9.14	11.5	13.2	14.7	15.9	16.9	17.9	18.7	19.5
		Airside ΔPs		0.05	0.07	0.11	0.15	0.19	0.24	0.30	0.36
	2	1	0.17	15.1	17.1	18.6	19.8	20.9	21.7	22.1	22.5
		2	0.63	17.4	20.2	22.5	24.3	25.9	27.3	27.9	28.5
		4	2.39	18.9	22.3	25.1	27.5	29.6	31.5	32.3	33.1
		6	5.22	19.5	23.2	26.2	28.8	31.1	33.2	34.2	35.1
		Airside ΔPs		0.10	0.16	0.23	0.32	0.41	0.51	0.57	0.62
	3	1	0.08	18.0	20.2	21.8	23.1	24.1	25.0	25.7	26.3
		2	0.31	21.3	24.8	27.5	29.8	31.6	33.2	34.5	35.8
		4	1.21	23.5	28.0	31.7	34.8	37.5	39.9	41.9	43.8
		8	4.78	24.8	30.0	34.3	38.1	41.5	44.4	47.0	49.5
		Airside ΔPs		0.15	0.24	0.35	0.47	0.61	0.77	0.94	1.11
	4	2	0.21	23.8	27.8	30.9	33.4	35.4	37.1	38.5	39.9
		4	0.84	26.6	31.9	36.3	40.0	43.1	45.9	48.2	50.5
		6	1.87	27.6	33.5	38.5	42.8	46.5	49.8	52.6	55.4
		8	3.32	28.2	34.4	39.8	44.4	48.5	52.1	55.2	58.3
		Airside ΔPs		0.20	0.32	0.46	0.63	0.82	1.02	1.26	1.49

- 1) All coil performance in accordance with AHRI Standard 410-2001
- 2) Heating capacities are in MBH
- 3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)
- 4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

- 5) Head Loss is in feet of water
- 6) Airside ΔPs is the air pressure drop of the hot water coil
- 7) Air temperature rise = $927 \times \text{MBH}/\text{CFM}$
- 8) Water temperature drop = $2.04 \times \text{MBH}/\text{GPM}$
- 9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

TH-500 HOT WATER COILS MBH SELECTION DATA

Unit Size	Rows	GPM	Head Loss	CFM							
				500	600	700	800	1000	1200	1400	1600
9 10	1	1	0.11	13.4	14.3	15.0	15.6	16.7	17.5	18.2	18.7
		2	0.43	15.7	16.9	17.9	18.8	20.4	21.6	22.7	23.6
		4	1.63	17.2	18.6	19.9	21.1	23.0	24.7	26.0	27.3
		6	3.58	17.8	19.3	20.7	22.0	24.1	25.9	27.5	28.8
		Airsides ΔPs		0.06	0.08	0.10	0.13	0.19	0.25	0.33	0.42
	2	1	0.36	20.5	21.9	23.0	24.0	25.5	26.7	27.7	28.5
		2	1.43	25.2	27.4	29.3	30.9	33.6	35.8	37.6	39.1
		3	3.20	27.3	29.9	32.2	34.2	37.6	40.4	42.8	44.8
		4	5.68	28.5	31.4	34.0	36.2	40.0	43.2	46.0	48.3
		Airsides ΔPs		0.12	0.17	0.22	0.27	0.39	0.54	0.69	0.87
	3	1	0.24	23.7	25.1	26.2	27.1	28.6	29.6	30.4	31.1
		2	0.94	30.4	33.0	35.1	36.9	39.9	42.2	44.0	45.5
		4	3.79	35.3	39.0	42.2	45.0	49.8	53.6	56.8	59.6
		6	8.53	37.3	41.6	45.3	48.6	54.3	59.0	63.0	66.5
		Airsides ΔPs		0.19	0.25	0.33	0.41	0.59	0.80	1.04	1.30
	4	2	0.83	34.3	37.3	39.7	41.7	45.0	47.5	49.5	—
		4	3.35	40.3	44.7	48.6	51.9	57.5	62.0	65.8	—
		6	7.54	42.7	47.9	52.4	56.5	63.4	69.1	73.9	—
		8	13.41	44.0	49.6	54.6	59.0	66.8	73.2	78.8	—
		Airsides ΔPs		0.25	0.34	0.43	0.54	0.79	1.07	1.39	—

Unit Size	Rows	GPM	Head Loss	CFM							
				800	1000	1200	1400	1600	1800	2000	2200
12	1	2	0.54	22.2	24.1	25.7	27.1	28.2	29.3	30.2	31.0
		4	2.07	24.8	27.3	29.4	31.2	32.7	34.1	35.4	36.5
		6	4.53	25.9	28.6	30.9	32.9	34.6	36.2	37.6	38.9
		8	7.90	26.5	29.3	31.7	33.8	35.7	37.4	38.9	40.3
		Airsides ΔPs		0.07	0.11	0.15	0.19	0.24	0.30	0.36	0.42
	2	2	0.33	34.1	37.2	39.7	41.7	43.4	46.2	47.3	48.4
		4	1.30	40.4	44.9	48.7	51.8	54.6	59.2	61.2	62.9
		6	2.89	43.1	48.3	52.7	56.5	59.9	65.5	67.9	70.1
		8	5.10	44.6	50.3	55.1	59.2	62.9	69.2	71.9	74.4
		Airsides ΔPs		0.16	0.23	0.32	0.41	0.51	0.74	0.87	1.01
	3	2	0.23	42.4	46.0	48.9	51.2	53.1	54.7	56.1	57.3
		4	0.90	51.3	57.2	62.0	66.1	69.6	72.6	75.2	77.6
		8	3.55	57.2	64.9	71.5	77.2	82.2	86.7	90.7	94.3
		12	7.95	59.5	68.0	75.4	81.8	87.6	92.7	97.4	101.6
		Airsides ΔPs		0.24	0.35	0.47	0.61	0.77	0.93	1.11	1.31
	4	2	0.42	47.6	51.6	54.7	57.2	59.2	60.9	62.3	—
		4	0.73	58.6	65.6	71.2	76.0	79.7	83.4	86.4	—
		8	2.89	65.9	75.3	83.4	90.4	96.5	101.9	106.7	—
		12	6.47	68.7	79.2	88.4	96.4	103.5	110.0	115.8	—
		Airsides ΔPs		0.32	0.46	0.63	0.82	1.02	1.25	1.49	—

1) All coil performance in accordance with AHRI Standard 410-2001

2) Heating capacities are in MBH

3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)

4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

5) Head Loss is in feet of water

6) Airside ΔPs is the air pressure drop of the hot water coil

7) Air temperature rise = $927 \times \text{MBH}/\text{CFM}$

8) Water temperature drop = $2.04 \times \text{MBH}/\text{GPM}$

9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

TH-500 HOT WATER COILS MBH SELECTION DATA

Unit Size	Rows	GPM	Head Loss	CFM							
				600	700	800	1000	1500	2000	2500	3000
14	1	1	0.20	19.8	21.9	22.7	23.5	26.3	28.2	29.5	30.6
		2	0.74	23.4	26.6	27.9	29.1	33.6	36.9	39.3	41.3
		3	3.36	25.9	29.8	31.4	33.0	37.1	41.1	44.2	46.8
		4	6.17	26.8	31.1	32.9	34.6	39.1	43.6	47.1	50.1
		Airside ΔPs		0.02	0.04	0.05	0.06	0.11	0.19	0.27	0.37
	2	2	0.39	34.4	39.4	41.4	43.3	50.1	54.7	58.0	60.6
		4	1.52	39.7	46.6	49.6	52.3	63.0	70.7	76.6	81.4
		6	3.36	41.8	49.7	53.1	56.2	68.9	78.4	85.8	91.9
		8	5.84	43.0	47.4	51.3	58.4	72.3	82.9	91.3	98.2
		Airside ΔPs		0.05	0.09	0.10	0.12	0.24	0.39	0.57	0.78
	3	2	0.25	42.8	46.1	48.9	53.5	61.2	66.0	69.4	71.8
		6	2.20	52.1	57.6	62.7	71.5	88.5	100.8	110.3	117.9
		8	3.89	53.4	59.4	64.8	74.5	93.4	107.6	118.7	127.8
		10	6.05	54.3	60.5	66.2	76.3	96.6	112.1	124.4	134.5
		Airside ΔPs		0.08	0.10	0.13	0.19	0.37	0.59	0.86	1.17
	4	4	0.78	55.4	61.2	66.3	75.0	90.9	101.7	109.5	115.5
		6	1.26	58.3	64.9	71.0	81.6	101.9	116.5	127.5	136.3
		8	3.08	59.8	66.9	73.5	85.2	108.2	125.3	138.6	149.4
		12	6.89	61.3	69.0	76.1	89.0	115.1	135.3	151.6	165.0
		Airside ΔPs		0.11	0.14	0.17	0.25	0.49	0.79	1.15	1.56

Unit Size	Rows	GPM	Head Loss	CFM							
				1000	1500	2000	2500	3000	3500	4000	4200
16	1	1	0.23	25.4	28.5	30.5	32.0	33.2	34.1	34.8	35.1
		2	0.86	31.6	36.7	40.3	43.1	45.3	47.1	48.7	49.2
		4	3.25	35.9	42.8	47.9	51.9	55.3	58.1	60.5	61.4
		6	7.12	37.6	45.3	51.1	55.8	59.7	63.0	65.9	66.9
		Airside ΔPs		0.04	0.08	0.14	0.20	0.27	0.36	0.45	0.49
	2	2	0.41	46.2	53.7	58.8	62.4	65.2	67.5	69.3	69.9
		4	1.59	55.8	67.8	76.4	83.0	88.4	92.7	96.5	97.8
		6	2.52	60.0	74.2	84.8	93.1	100.0	105.8	110.8	112.6
		8	6.21	62.3	77.9	89.7	99.2	107.1	113.8	119.6	121.7
		Airside ΔPs		0.09	0.18	0.29	0.42	0.57	0.74	0.93	1.01
	3	2	0.26	57.1	65.5	70.8	74.4	77.0	79.1	80.7	81.3
		4	1.03	70.4	85.7	96.3	104.2	110.3	115.3	119.4	120.8
		8	4.06	78.9	100.0	115.9	128.5	138.8	147.4	141.1	157.5
		10	6.31	80.8	103.4	120.7	134.6	146.1	155.9	154.8	167.4
		Airside ΔPs		0.14	0.27	0.44	0.63	0.86	1.11	1.40	1.51
	4	2	0.20	63.2	72.1	77.5	81.0	83.5	85.5	—	—
		4	0.80	79.5	97.1	109.1	117.8	124.4	129.7	—	—
		8	1.80	86.1	115.1	134.3	149.3	161.4	171.5	—	—
		10	4.95	91.8	119.3	140.4	157.3	171.2	182.8	—	—
		Airside ΔPs		0.18	0.36	0.58	0.84	1.15	1.49	—	—

- 1) All coil performance in accordance with AHRI Standard 410-2001
- 2) Heating capacities are in MBH
- 3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)
- 4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

- 5) Head Loss is in feet of water
- 6) Airside ΔPs is the air pressure drop of the hot water coil
- 7) Air temperature rise = $927 \times \text{MBH}/\text{CFM}$
- 8) Water temperature drop = $2.04 \times \text{MBH}/\text{GPM}$
- 9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

TH-500 HOT WATER COILS MBH SELECTION DATA

Unit Size	Rows	GPM	Head Loss	CFM							
				2000	2500	3000	3500	4000	4500	5000	5500
20	1	2	0.33	43.8	46.7	49.0	50.9	52.4	53.8	54.9	55.9
		4	1.30	54.0	58.5	62.3	65.4	68.1	70.5	72.6	74.4
		6	2.89	58.6	64.0	68.5	72.4	75.7	78.7	81.3	83.7
		8	5.10	61.2	67.2	72.2	76.5	80.2	83.6	86.6	89.3
		Airside ΔPs		0.07	0.11	0.15	0.19	0.24	0.30	0.36	0.42
	2	2	0.56	63.3	67.2	70.2	72.5	74.4	75.9	77.3	78.4
		4	1.12	84.3	91.8	97.8	102.7	106.9	110.4	113.5	116.2
		8	3.89	100.7	111.9	121.3	129.2	136.0	142.1	147.4	152.2
		10	6.05	104.8	117.1	127.3	136.2	143.9	150.7	156.8	162.2
		Airside ΔPs		0.16	0.23	0.32	0.41	0.51	0.62	0.74	0.87
	3	4	0.44	97.4	106.1	112.9	118.5	123.1	127.1	130.5	133.4
		6	0.97	109.4	121.1	130.6	138.5	145.3	151.2	156.3	160.8
		8	1.71	116.3	130.0	141.3	151.0	159.3	166.5	173.0	178.7
		12	3.79	124.1	140.1	153.7	165.5	175.8	185.0	193.2	200.7
		Airside ΔPs		0.19	0.29	0.40	0.52	0.66	0.81	0.97	1.15
	4	6	0.62	124.6	137.8	148.3	157.0	164.3	170.5	175.8	180.6
		10	1.70	139.8	157.5	172.4	184.9	195.8	205.3	213.8	221.3
		14	3.31	147.2	167.5	184.8	199.7	212.8	224.4	234.9	244.3
		18	5.44	151.6	173.5	192.3	208.8	223.4	236.5	248.3	259.0
		Airside ΔPs		0.26	0.38	0.53	0.69	0.88	1.08	1.29	1.53

Unit Size	Rows	GPM	Head Loss	CFM							
				2000	2500	3000	3500	4000	5000	6000	7000
24	1	2	0.36	48.7	52.0	54.6	56.7	58.5	61.3	63.5	65.3
		4	1.41	60.3	65.7	70.0	73.7	76.8	82.0	86.2	89.6
		6	3.13	65.6	71.9	77.2	81.8	85.7	92.3	97.7	102.3
		8	5.52	68.5	75.6	81.4	86.6	91.0	98.6	104.8	110.0
		Airside ΔPs		0.05	0.07	0.10	0.13	0.16	0.24	0.32	0.42
	2	2	0.27	68.4	72.7	75.9	78.4	80.5	83.6	85.9	87.6
		4	1.05	91.7	100.2	107.0	112.6	117.3	124.8	130.6	135.2
		8	4.15	109.9	122.7	133.4	142.6	150.5	163.8	174.4	183.2
		10	6.45	114.3	128.4	140.2	150.5	159.4	174.5	186.7	197.0
		Airside ΔPs		0.11	0.16	0.21	0.27	0.34	0.50	0.68	0.88
	3	3	0.28	94.7	102.0	107.6	112.0	115.6	121.1	125.1	128.2
		6	1.07	118.8	132.0	142.9	151.9	159.6	172.0	181.7	189.6
		10	2.92	131.1	148.2	162.7	175.2	186.0	204.3	219.0	231.3
		15	6.46	138.0	157.5	174.3	189.1	202.2	224.5	243.1	258.8
		Airside ΔPs		0.13	0.19	0.26	0.34	0.43	0.64	0.88	1.16
	4	4	0.29	117.9	128.3	136.3	142.6	147.7	155.5	161.3	165.7
		8	1.16	144.4	162.4	177.2	189.7	200.3	217.6	231.2	242.1
		12	2.58	155.0	176.8	195.4	211.3	225.3	248.6	267.5	283.2
		18	5.76	162.7	187.5	209.1	228.0	244.9	273.7	297.6	317.9
		Airside ΔPs		0.17	0.25	0.35	0.46	0.58	0.86	1.18	1.54

1) All coil performance in accordance with AHRI Standard 410-2001

2) Heating capacities are in MBH

3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)

4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

5) Head Loss is in feet of water

6) Airside ΔPs is the air pressure drop of the hot water coil

7) Air temperature rise = $927 \times \text{MBH}/\text{CFM}$

8) Water temperature drop = $2.04 \times \text{MBH}/\text{GPM}$

9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

TH-500 HOT WATER COILS

When ordered with the air terminal, the hot water coil is shipped attached to the discharge of the terminal casing via slip and drive connections. The discharge end of the casing has slip and drive connections for easy connection to downstream ductwork. The hot water coil is constructed of aluminum fin and copper serpentine-type tubes with male sweat connections tested at 300 psig.

Coil selection may be made using METALAIRE Terminal Selection Software. Contact your METALAIRE representative for a copy. In the interest of energy conservation and due to the possibility of condensation, all hot water coils are marked, "Coil must be externally insulated after installation in the field." Hot water coils are tested in accordance to AHRI Standard 410.

HOT WATER COIL CONSTRUCTION DETAILS

- Hot water coils are factory mounted on the discharge of the terminal and are available with an optional integral coil access door.
- Coils are enclosed in 20 gauge coated steel casing with slip and drive connection.
- Fins are rippled and sine wave type constructed from heavy gauge aluminum, mechanically bonded to the tubes.
- Tubes are copper with a minimum wall thickness of 0.016" with male sweat header connections.
- Coils are leak tested to 300 psig with minimum burst of 2000 psig at ambient temperature.
- Coil performance data is based on tests run in accordance with AHRI Standard 410; coils are AHRI certified and include AHRI label.



TH-500 COIL CONNECTION SIZE

Outside Diameter (OD) connection size, Inches				
Inlet Size	1 Row	2 Row	3 Row	4 Row
4	5/8"	7/8"	7/8"	7/8"
5	5/8"	7/8"	7/8"	7/8"
6	5/8"	7/8"	7/8"	7/8"
7	5/8"	7/8"	7/8"	7/8"
8	5/8"	7/8"	7/8"	7/8"
9	5/8"	7/8"	7/8"	7/8"
10	5/8"	7/8"	7/8"	7/8"
12	7/8"	7/8"	7/8"	7/8"
14	5/8"	7/8"	7/8"	7/8"
16	5/8"	7/8"	7/8"	7/8"
20	7/8"	7/8"	1 1/8"	1 1/8"
24	7/8"	7/8"	1 1/8"	1 1/8"

Note: All coils have 10 fins/inch with optional 12 fins/inch

All accessories that can be attached to the Single Duct Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

METALAIRE™

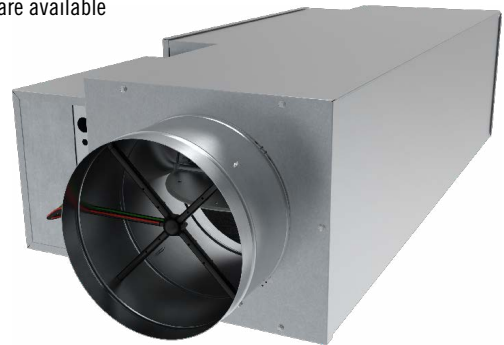
TH-500 ELECTRIC HEAT

METALAIRE's electric heaters are factory mounted, ETL listed to meet electrical safety standards and comply with UL 60335 and CSA C22.2. Electric heaters, as pictured on this page, are integral to the air terminal unit. The discharge end has slip and drive connections for easy connection to downstream ductwork. The heater plenums are an integral attenuator that is lined with the same liner selected for the casing. The integral attenuator also helps to reduce discharge sound.

Single duct electric heaters are a side-mounted, slide in style to allow easy field maintenance. The heating elements are designed to minimize hot spots and nuisance tripping of the thermal cutouts.

INCLUDED WITH EACH HEATER ASSEMBLY:

- ▶ Heater and cabinet mounted on the discharge of the TH-500
- ▶ Discharge plenum comes standard with ½" dual density fiberglass lining, optional liners are available
- ▶ Air pressure switch
- ▶ De-energizing magnetic contactors per step and backup magnetic contactor
- ▶ Magnetic contactors are the standard configuration, optional SCR control is available
- ▶ Backup manual reset high temperature limit (disc type)
- ▶ Non-isolated transformer
- ▶ Slip and drive connections
- ▶ Heater is shipped factory mounted and wired



ELECTRIC HEATER ASSEMBLY CONSTRUCTION DETAILS

- ▶ Electric reheat coils are factory mounted on the discharge of the air terminal. The heaters are ETL listed for zero clearance, and are tested in accordance with UL 60335, CSA-C22.2 and the National Electric Code (NEC). Heater casings are constructed of galvanized steel. Element wire is high grade nichrome alloy derated to 45 watts per square inch density. Element wire is supported by moisture-resistant steatite ceramics.
- ▶ Ceramics are enclosed in reinforcement brackets spaced across the heater element rack at 2" to 4" intervals. Controls are contained in a NEMA 1 control cabinet with a hinged, latching door. A permanent wiring diagram is affixed to the inside of the control cabinet door for field reference.

All accessories that can be attached to the Single Duct Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

TH-500 ELECTRIC HEATER CAPACITIES

Model TH		Single Phase										Three Phase			
		120V		208V		240V		277V		480V		208V		480V	
Inlet Size	# of Steps Available	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
4	1/SCR	0.5	4	0.5	4	0.5	4	1	4	2	4	0.5	4	2	4
	2	1		1		1		2		4		1		4	
	3	1.5		1.5		1.5		3		N/A		1.5		N/A	
5	1/SCR	0.5	4	0.5	4	0.5	4	1	4	2	4	0.5	4	2	4
	2	1		1		1		2		4		1		4	
	3	1.5		1.5		1.5		3		N/A		1.5		N/A	
6	1/SCR	0.5	4	0.5	4	0.5	4	1	4	2	4	0.5	4	2	4
	2	1		1		1		2		4		1		4	
	3	1.5		1.5		1.5		3		N/A		1.5		6	
7	1/SCR	0.5	5	0.5	8	0.5	8	0.5	8	1.5	8	0.5	8	1.5	8
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
8	1/SCR	0.5	5	0.5	8	0.5	8	0.5	8	1.5	8	0.5	8	1.5	8
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
9	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	1	15	0.5	13	1	15
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	
10	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	1	15	0.5	13	1	15
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	
12	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	0.5	23	0.5	16	1	23
	2	1		1		1		1		1		1		2	
	3	1.5		1.5		1.5		1.5		1.5		1.5		3	
14	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	0.5	23	0.5	16	0.5	23
	2	1		1		1		1		1		1		1	
	3	1.5		1.5		1.5		1.5		1.5		1.5		1.5	
16	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	0.5	23	0.5	16	0.5	39
	2	1		1		1		1		1		1		1	
	3	1.5		1.5		1.5		1.5		1.5		1.5		1.5	
20	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	0.5	23	0.5	16	0.5	39
	2	1		1		1		1		1		1		1	
	3	1.5		1.5		1.5		1.5		1.5		1.5		1.5	
24	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	0.5	23	0.5	16	0.5	39
	2	1		1		1		1		1		1		1	
	3	1.5		1.5		1.5		1.5		1.5		1.5		1.5	

ELECTRIC HEAT SELECTION:

A. Specify electric duct heaters using voltage, phase, kW, and number of steps.

B. Use above chart to select voltage. Calculate required kW using following equations:

$$kW = \frac{BTU / HR}{3413} \quad kW = \frac{CFM \times \Delta \times 1.085}{3413} \quad \Delta = \frac{kW \times 3413}{CFM \times 1.085}$$

$$CFM = \frac{kW \times 3413}{\Delta \times 1.085} \quad CFM = \frac{kW \times 3413}{\Delta \times 1.085}$$

* air density at sea level—reduce by 0.036 for each 1000 feet of altitude above sea level

Where: BTU / Hr = Required heating capacity

CFM = volume of air during heating. Typically 100% of maximum cooling air volume

Δ = desired air temperature rise across the electric heater

Inlet air temperature = primary air temperature, usually 55°F

NOTES:

1. Heaters less than 10 kW are specifiable to nearest 0.5 kW. Heaters greater than 10 kW are specifiable to nearest 1 kW.
2. Minimum flow rate for electric heat is 70 CFM / kW. Lower CFM's can cause nuisance tripping, excessive discharge temperatures, rapid cycling, and rapid element failure. Electric Heat units running below 70 CFM / kW will void all warranties.
3. For optimum thermal comfort, the suggested discharge temperature should not exceed 20°F above room set point.
4. We do not recommend discharge temperatures in excess of 115°F to protect heater coils.
5. Maximum number of steps at "Min. kW per Step" is one step.
6. If more than 1 heater is wired into a building's circuit breaker (multi-outlet branch circuit) each heater will require the addition of power side fusing.

TH SOUND ATTENUATORS

- ▶ The optional acoustically lined sound attenuator is designed to further reduce discharge sound levels from the air terminal. The chart below gives reductions to the discharge sound power figures at minimum static pressure for each octave band.
- ▶ Attenuators are integral to the box
- ▶ Standard attenuator is 3 ft. (36 inches) long

TH-500						
Octave Band / Frequency (Hz)						
Unit Size	2 / 125	3 / 250	4 / 500	5 / 1000	6 / 2000	7 / 4000
4	2	4	8	18	20	13
5	2	4	8	18	20	13
6	2	4	8	18	20	13
7	2	3	8	16	16	11
8	2	3	8	16	16	11
9	1	3	7	15	15	11
10	1	3	7	15	15	11
12	1	3	7	14	13	10
14	1	2	6	13	12	9
16	1	2	6	13	11	8
20	1	2	5	10	7	6
24	1	2	5	10	8	6

All accessories that can be attached to the Single Duct Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

TH-500 RECOMMENDED MIN/MAX AIRFLOW RANGES

TH-500 Recommended Minimum and Maximum Airflow Ranges				
Unit Size	Pneumatic		Digital Controls - DDC	
			Transducer Min ΔP / Min CFM	Transducer Max ΔP / Max CFM
	Min CFM	Max CFM	0.01	1
4	50	300	30	300
5	65	375	40	375
6	95	540	55	540
7	130	760	75	760
8	170	990	100	990
9	220	1250	125	1250
10	285	1640	165	1640
12	410	2350	235	2350
14	565	3250	325	3250
16	710	4100	410	4100
20	1115	6430	645	6430
24	1260	7270	725	7270

PERFORMANCE NOTES

- 1) Actual minimum and maximum airflow ranges depend on the transducer differential pressure range and accuracy.
- 2) Contact the manufacturer of installed DDC equipment for transducer minimum and maximum differential pressure, ΔP , limits.
- 3) Minimum CFM for Pneumatic controls are based on a sensor differential pressure of 0.03 in. w.g.
- 4) Maximum CFM for Pneumatic controls are based on a sensor differential pressure of 1.00 in. w.g.
- 5) $CFM = (\sqrt{\Delta P}) * K$ Factor
- 6) K Factor is the airflow at 1" ΔP
- 7) Recommendations are for pressure independent units.
- 8) Pressure dependent units minimum CFM is always zero and there is no maximum.

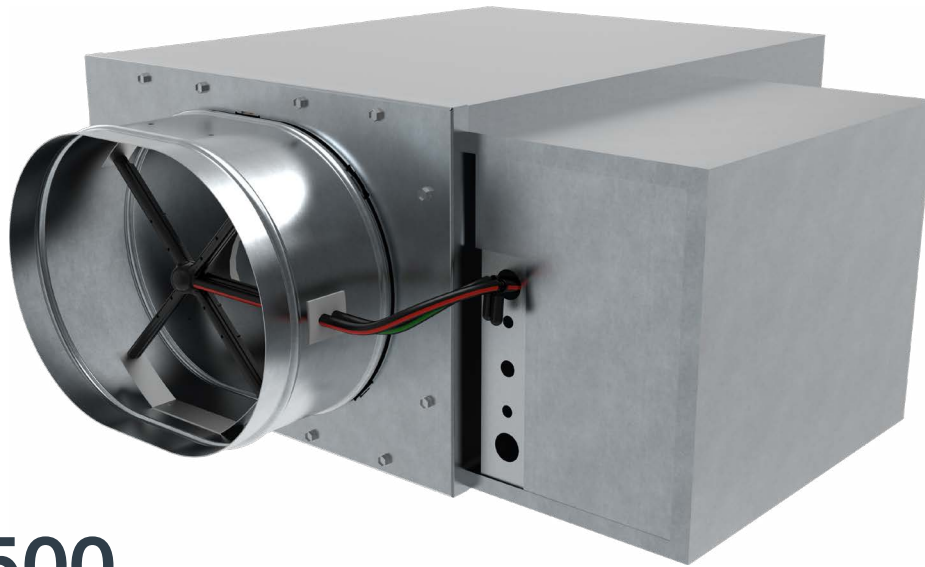


TL-500 LOW PROFILE SINGLE DUCT AIR TERMINAL UNIT

SPECIFIABLE FEATURES

- Maximum height of units is 12 1/2".
- 22 ga. galvanized steel casing, mechanically sealed for low leakage construction.
- Damper construction of double layer 18 gauge equivalent with integral blade seal.
- Riveted round primary inlet duct to minimize leakage.

INDEX OF SECTIONS	PAGE
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AHRI Certified Rating Points	9
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Casing Leakage / Damper Leakage	12
Certifications and Standards	12
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Hot Water Coils	16
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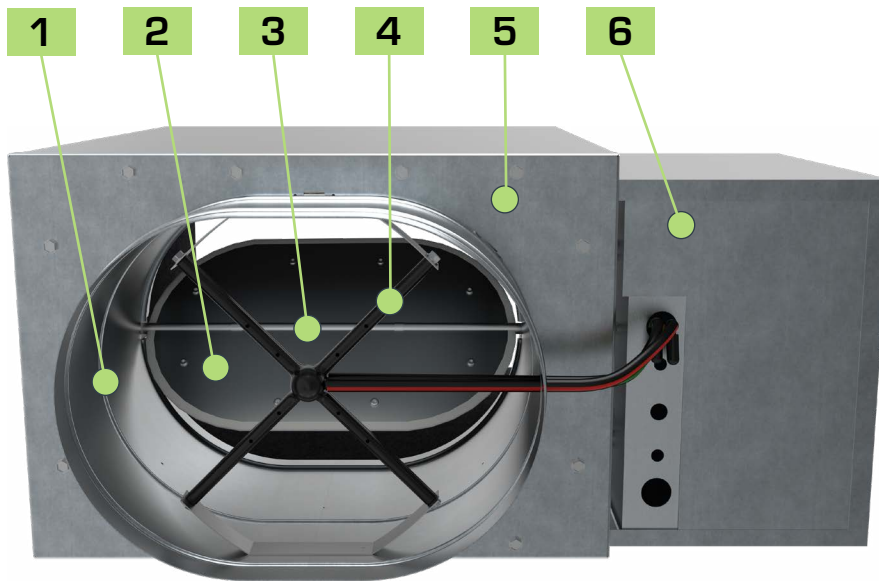
METALAIRE™

TL-500 LOW PROFILE SINGLE DUCT AIR TERMINAL UNIT

The METALAIRE TL-500 is the simplest and most widely used VAV terminal unit used for low profile applications. Its basic components are an insulated sheet metal box, round inlet damper, flow measuring device and rectangular outlet. The unit is served by a central air handler and modulates the amount of 'primary' cooling air to the space between a minimum set point and the design airflow. When necessary, the METALAIRE TL-500 can be provided with a heating coil on the discharge of the unit to provide for reheat. The unit has a maximum height of 12 1/2".

STANDARD FEATURES

- ▶ TL-500 is available in 10 unit sizes to handle 30–4350 CFM.
- ▶ Variable or constant volume applications.
- ▶ 22 ga. galvanized steel casing, mechanically sealed for low leakage
- ▶ Mechanically fastened damper assembly is double layer, 18 gauge equivalent, galvanized steel with integral blade seal. (<1% at 3.0" wg static pressure).
- ▶ Optional factory calibrated controls to meet all control strategies.
- ▶ Multi-point center averaging flow sensor for highly accurate (+/-5%) flow readings with varying inlet duct configurations after certified balancer has balanced terminal
- ▶ External control cabinet with offset mounting plate is standard.
- ▶ 3-beaded inlet connection tube for added rigidity and secure flex duct connections.
- ▶ 1/2" thick, dual density (1.5lb / ft³ min.) fiberglass insulation with edges coated. Meets NFPA 90A and UL 181.
- ▶ Rectangular discharge with slip and drive cleat duct connection.
- ▶ Independently tested and certified laboratory performance data.
- ▶ Full range of options and accessories available (heating coils, disconnects, attenuators, etc.).
- ▶ Full range of liners / insulation available.

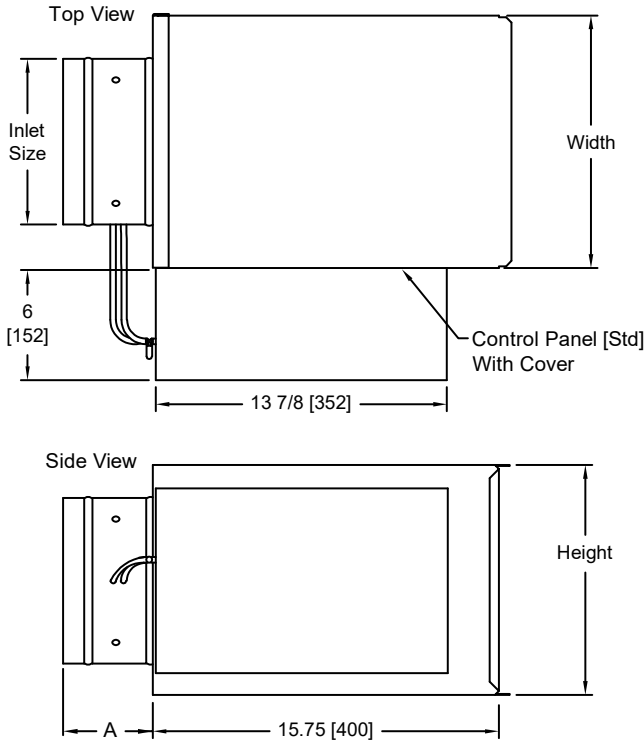


TL-500 LOW PROFILE SINGLE DUCT AIR TERMINAL UNIT

FEATURES AND BENEFITS

- 1** Riveted primary inlet duct to minimize leakage with three stiffening beads for added rigidity.
- 2** Damper construction of double layer 18 gauge equivalent with integral blade seal.
- 3** Damper rotates in a self-lubricating, long life, low friction thermoplastic bearing.
- 4** Multi-Point Center Averaging Airflow Sensor
- 5** Galvanized steel casing, mechanically sealed for low leakage construction.
- 6** NEMA TYPE 1 rated control enclosure with stand-off to prevent penetration of casing standard on all terminal units.
- 7** All TL-500 terminal units are AHRI certified and shipped with the AHRI seal.

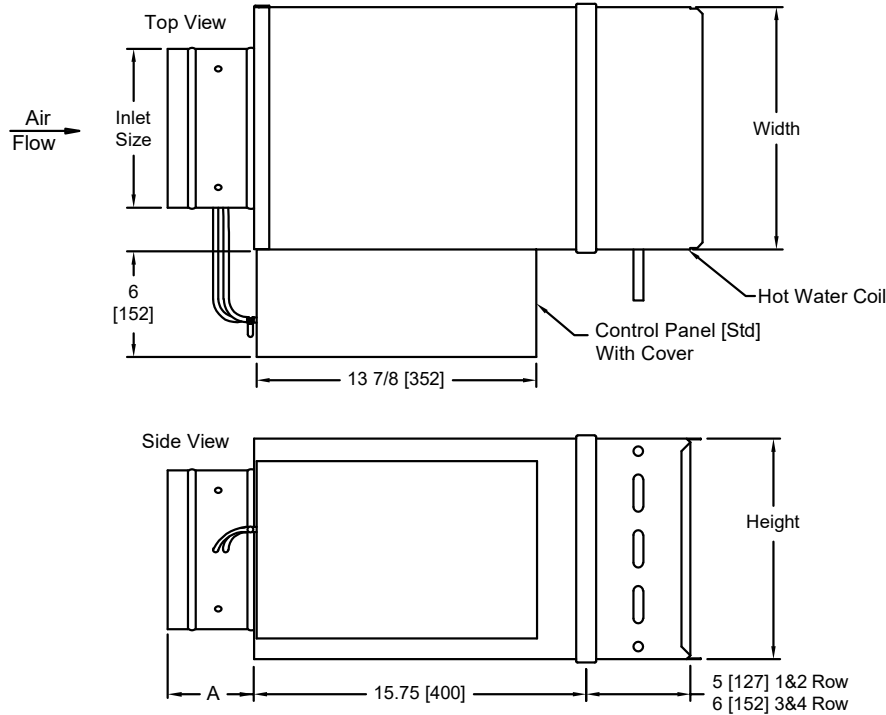
TL-500-001 LOW PROFILE SINGLE DUCT AIR TERMINAL UNIT, COOLING ONLY



The standard location for control panel is Right Hand on Model TL.
Looking in the direction of airflow, the control panel is on the right.
The control panel will overhang the top and bottom of unit size 4, 5, and 6, 1" (25.4 mm).
Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".
Unit Sizes 12-OV, 14-OV & 16-OV have flat oval inlet ducts.

Unit Size	Inlet Size		A		Width		Height		Unit wt.	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lb.	kg.
4	3 7/8	99	5	254	12	305	8	203	12	5
5	4 7/8	124	5	127	12	305	8	203	12	5
6	5 7/8	149	5	127	12	305	8	203	12	5
7	6 7/8	174	5	127	12	305	10	254	15	7
8	7 7/8	200	5	127	12	305	10	254	15	7
9	8 7/8	225	5	127	14	356	12 1/2	318	18	8
10	9 7/8	251	5	127	14	356	12 1/2	318	18	8
12-OV	13 x 9 7/8	330 x 251	5	127	18	457	12 1/2	318	23	10
14-OV	16 1/4 x 9 7/8	413 x 251	5	127	24	610	12 1/2	318	26	12
16-OV	19 3/8 x 9 7/8	492 x 251	5	127	28	711	12 1/2	318	30	14

TL-500-002 LOW PROFILE SINGLE DUCT AIR TERMINAL UNIT WITH HOT WATER COIL



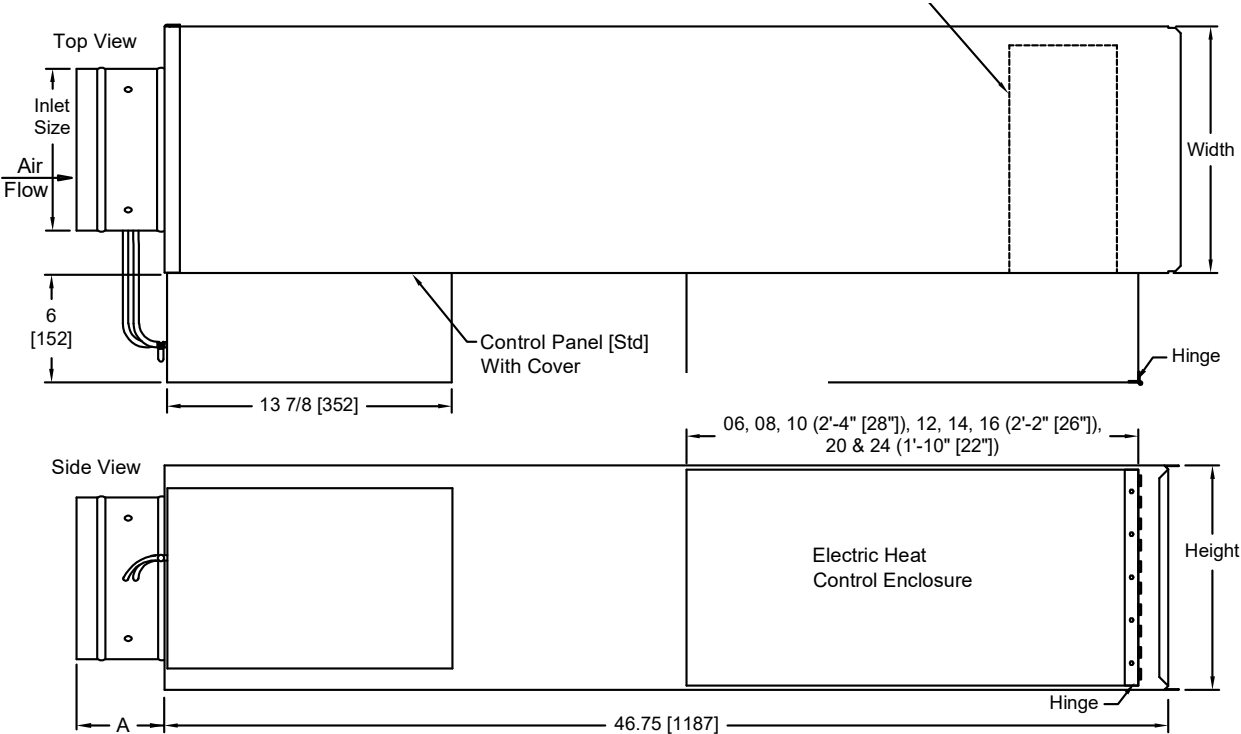
The standard location for control panel is Right Hand on Model TL.
Looking in the direction of airflow, the control panel is on the right.

The control panel will overhang the top and bottom of unit size 4, 5, and 6, 1" (25.4 mm).
Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".

Unit Sizes 12-OV, 14-OV & 16-OV have flat oval inlet ducts.

Unit Size	Inlet Size		A		Width		Height		Unit wt.							
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	1 Row		2 Row		3 Row		4 Row	
									lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.
4	3 7/8	99	5	254	12	305	8	203	16.5	8	17.5	8	20	9	20.25	9
5	4 7/8	124	5	127	12	305	8	203	16.5	8	17.5	8	20	9	20.25	9
6	5 7/8	149	5	127	12	305	8	203	16.5	8	17.5	8	20	9	20.25	9
7	6 7/8	174	5	127	12	305	10	254	20	9	22.75	10	26.25	12	26.5	12
8	7 7/8	200	5	127	12	305	10	254	20	9	22.75	10	26.25	12	26.5	12
9	8 7/8	225	5	127	14	356	12 1/2	318	24.5	11	27.5	13	33.75	15	34.75	16
10	9 7/8	251	5	127	14	356	12 1/2	318	24.5	11	27.5	13	33.75	15	34.75	16
12-OV	13 x 9 7/8	300 x 251	5	127	18	457	12 1/2	318	31.5	14	35.5	16	42.25	19	44.5	20
14-OV	16 1/4 x 9 7/8	413 x 251	5	127	24	610	12 1/2	318	35	16	41.5	19	50	23	51.75	24
16-OV	19 3/8 x 9 7/8	492 x 251	5	127	28	711	12 1/2	318	41.5	19	47.25	21	55.25	25	58.5	27

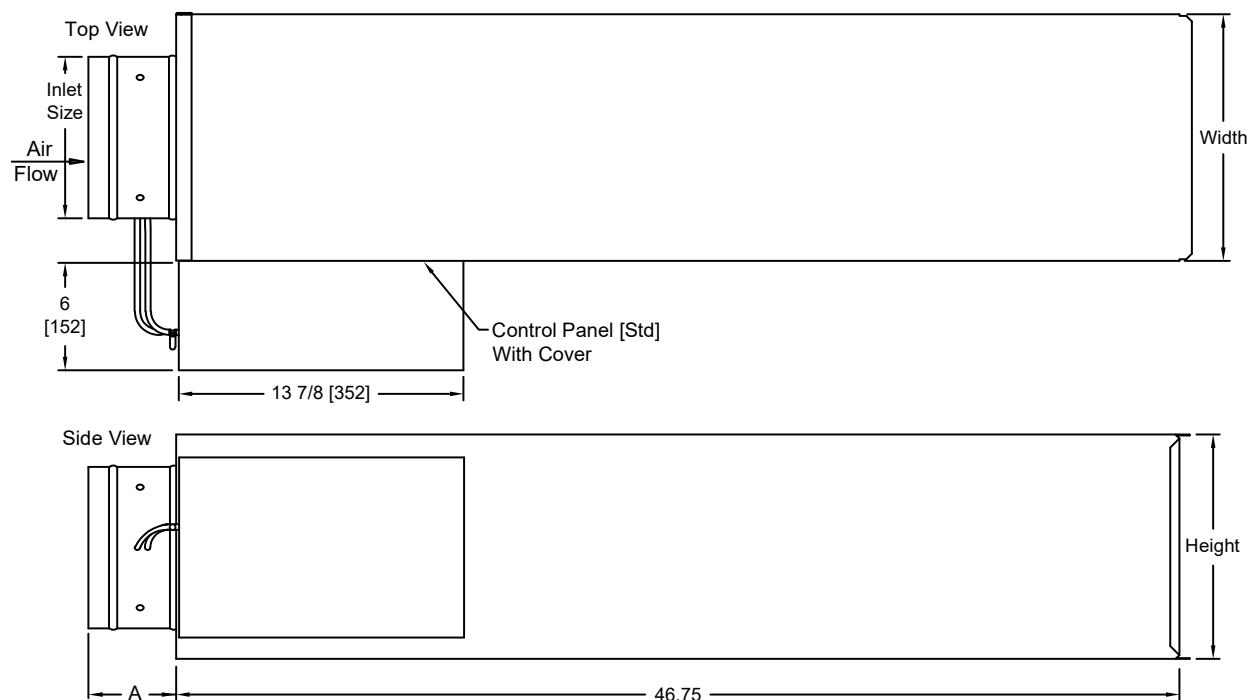
TL-500-003 LOW PROFILE SINGLE DUCT AIR TERMINAL UNIT WITH INTEGRAL ATTENUATOR AND ELECTRIC HEAT



The standard location for control panel is Right Hand on Model TL.
Looking in the direction of airflow, the control panel is on the right.
The control panel will overhang the top and bottom of unit size 4, 5, and 6, 1" (25.4 mm).
Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".
Unit Sizes 12-OV, 14-OV & 16-OV have flat oval inlet ducts.

Unit Size	Inlet Size		A		Width		Height		Unit wt.	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lb.	kg.
4	3 7/8	99	5	254	12	305	8	203	39	18
5	4 7/8	124	5	127	12	305	8	203	39	18
6	5 7/8	149	5	127	12	305	8	203	39	17
7	6 7/8	174	5	127	12	305	10	254	43	20
8	7 7/8	200	5	127	12	305	10	254	43	20
9	8 7/8	225	5	127	14	356	12 1/2	318	50	23
10	9 7/8	251	5	127	14	356	12 1/2	318	50	23
12-OV	13 x 9 7/8	330 x 251	5	127	18	457	12 1/2	318	59	27
14-OV	16 1/4 x 9 7/8	413 x 251	5	127	24	610	12 1/2	318	67	30
16-OV	19 3/8 x 9 7/8	492 x 251	5	127	28	711	12 1/2	318	77	35

TL-500-004 LOW PROFILE SINGLE DUCT AIR TERMINAL UNIT
WITH INTEGRAL ATTENUATOR



The standard location for control panel is Right Hand on Model TL.
Looking in the direction of airflow, the control panel is on the right.

The control panel will overhang the top and bottom of unit size
4, 5, and 6, 1" (25.4 mm).

Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".

Unit Sizes 12-OV, 14-OV & 16-OV have flat oval inlet ducts.

Unit Size	Inlet Size		A		Width		Height		Unit wt.	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lb.	kg.
4	3 7/8	99	5	254	12	305	8	203	24	10
5	4 7/8	124	5	127	12	305	8	203	24	10
6	5 7/8	149	5	127	12	305	8	203	24	10
7	6 7/8	174	5	127	12	305	10	254	28	12
8	7 7/8	200	5	127	12	305	10	254	28	12
9	8 7/8	225	5	127	14	356	12 1/2	318	34	15
10	9 7/8	251	5	127	14	356	12 1/2	318	34	15
12-OV	13 x 9 7/8	330 x 251	5	127	18	457	12 1/2	318	41	18
14-OV	16 1/4 x 9 7/8	413 x 251	5	127	24	610	12 1/2	318	47	21
16-OV	19 3/8 x 9 7/8	492 x 251	5	127	28	711	12 1/2	318	54	24



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TL-500 AHRI CERTIFIED RATING POINTS



RADIATED SOUND

Power Levels @ 1.5" w.g. ΔPs

Unit Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
4	150	0.03	48	41	32	28	24	20
5	250	0.06	54	46	42	34	31	30
6	400	0.10	58	53	49	44	41	36
7	550	0.06	59	53	46	41	34	31
8	700	0.09	62	56	49	44	36	32
9	900	0.02	58	57	51	43	38	33
10	1100	0.04	59	60	53	46	40	35
12-0V	1500	0.10	64	59	55	47	42	37
14-0V	2000	0.11	62	58	51	44	37	34
16-0V	2400	0.09	65	62	57	51	48	45

DISCHARGE SOUND

Power Levels @ 1.5" w.g. ΔPs

Unit Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
4	150	0.03	63	58	54	49	43	37
5	250	0.06	65	60	56	50	46	41
6	400	0.10	66	63	59	52	48	48
7	550	0.06	73	68	60	57	53	50
8	700	0.09	75	71	63	60	56	52
9	900	0.02	71	68	62	58	54	51
10	1100	0.04	72	70	64	59	56	52
12-0V	1500	0.10	73	72	68	63	57	54
14-0V	2000	0.11	72	68	61	60	60	59
16-0V	2400	0.09	79	76	72	68	63	58

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation

RADIATED SOUND MODEL TL

OCTAVE BAND SOUND POWER, Lw, dB																														
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
4	50	0.01	41	32	19	19	15	7	<15	43	34	21	21	17	9	<15	44	35	22	22	18	11	<15	45	38	25	24	23	18	<15
	100	0.02	43	34	23	22	19	13	<15	45	36	25	24	21	15	<15	46	37	26	24	22	17	20	47	40	29	27	27	24	<15
	150	0.03	46	36	29	26	21	16	<15	48	40	31	28	23	18	<15	48	41	32	28	24	20	21	50	44	35	31	29	27	<15
	200	0.04	49	41	35	29	23	18	<15	51	43	37	31	25	20	22	52	44	38	32	26	22	31	53	47	41	34	31	29	<15
	250	0.06	51	43	39	32	28	26	<15	53	45	41	34	30	28	29	54	46	42	34	31	30	35	55	49	45	37	36	37	19
5	150	0.03	46	38	29	26	21	16	<15	48	40	31	28	23	18	<15	48	41	32	28	24	20	<15	50	44	35	31	29	27	<15
	200	0.04	49	41	35	29	23	18	<15	51	43	37	31	25	20	<15	52	44	38	32	26	22	<15	53	47	41	34	31	29	<15
	250	0.06	51	43	39	32	28	26	<15	53	45	41	34	30	28	<15	54	46	42	34	31	30	15	55	49	45	37	36	37	19
	300	0.07	53	46	43	35	32	30	16	55	48	45	37	34	32	19	56	49	46	38	35	34	20	57	52	49	40	40	41	23
	350	0.09	54	48	46	38	35	33	20	56	50	48	39	37	35	22	57	51	48	40	38	37	22	58	53	51	42	42	42	25
6	200	0.04	49	41	35	29	23	18	<15	51	43	37	31	25	20	<15	52	44	38	32	26	22	<15	53	47	41	34	31	29	<15
	300	0.07	53	46	43	35	32	30	16	55	48	45	37	34	32	19	56	49	46	38	35	34	20	57	52	49	40	40	41	23
	400	0.10	55	50	46	41	38	32	20	57	52	48	43	40	34	22	58	53	49	44	41	36	23	59	56	52	46	46	43	26
	500	0.14	57	53	48	44	40	34	22	59	55	50	46	42	36	24	60	56	51	46	43	38	25	61	59	54	49	48	45	29
	600	0.15	58	54	49	45	41	35	23	60	56	51	47	43	37	25	60	57	52	47	44	39	26	61	60	55	50	49	46	30
7	350	0.03	52	41	34	26	21	19	<15	56	47	42	36	28	24	18	56	48	43	38	32	28	18	57	49	46	43	40	38	20
	450	0.04	52	42	35	29	22	19	<15	56	49	42	37	30	25	18	57	50	45	40	34	30	19	58	53	50	46	42	40	24
	550	0.06	54	44	36	32	24	20	15	58	51	42	38	30	26	20	59	53	46	41	34	31	21	60	57	52	48	42	40	26
	650	0.08	55	45	38	34	26	20	16	60	52	44	39	32	28	22	61	55	48	43	36	32	24	62	60	55	50	44	41	30
	750	0.10	56	47	41	36	28	22	18	62	54	46	40	34	29	25	63	57	50	44	37	33	26	66	62	57	52	44	42	32
8	400	0.04	52	42	34	28	22	19	<15	56	48	42	36	29	24	18	56	49	44	39	33	29	18	58	51	48	44	41	39	22
	550	0.06	54	44	36	32	24	20	15	58	51	42	38	30	26	20	59	53	46	41	34	31	21	60	57	52	48	42	40	26
	700	0.09	56	46	40	35	27	21	18	61	53	45	40	33	28	24	62	56	49	44	36	32	25	64	61	56	51	44	41	31
	850	0.11	58	49	43	38	30	24	20	63	54	47	42	36	31	26	64	58	51	45	39	34	28	68	64	58	52	46	42	35
	1000	0.13	60	52	46	42	34	27	22	65	57	50	45	39	33	29	66	60	53	48	42	36	30	70	66	60	54	47	42	37
9	500	0.01	46	45	34	28	25	21	<15	51	50	44	34	30	24	18	55	51	45	38	34	29	19	59	52	47	44	41	40	21
	700	0.01	48	47	38	32	27	22	<15	52	52	46	38	32	26	20	56	54	49	41	36	31	23	62	59	53	47	44	41	29
	900	0.02	48	48	41	35	28	23	15	54	54	48	40	34	27	22	58	57	51	43	38	33	26	64	64	58	50	46	44	35
	1100	0.04	51	50	44	38	30	24	18	55	55	49	41	35	29	24	59	60	53	46	40	35	30	65	68	61	53	48	47	39
	1300	0.06	54	54	47	41	32	26	22	58	56	50	42	36	30	25	62	61	54	47	41	37	31	68	70	62	55	50	49	41
10	700	0.01	48	47	38	32	27	22	<15	52	52	46	38	32	26	20	56	54	49	41	36	31	23	62	59	53	47	44	41	29
	900	0.02	48	48	41	35	28	23	15	54	54	48	40	34	27	22	58	57	51	43	38	33	26	64	64	58	50	46	44	35
	1100	0.04	51	50	44	38	30	24	18	55	55	49	41	35	29	24	59	60	53	46	40	35	30	65	68	61	53	48	47	39
	1300	0.06	54	54	47	41	32	26	22	58	56	50	42	36	30	25	62	61	54	47	41	37	31	68	70	62	55	50	49	41
	1500	0.08	56	56	49	42	36	20	25	61	58	51	44	38	32	28	66	62	55	48	43	39	32	72	70	63	56	50	50	41
12-0V	700	0.02	56	45	37	30	26	20	18	56	51	45	36	30	25	20	59	53	48	41	35	30	22	61	58	55	50	45	42	30
	1100	0.05	57	49	41	34	30	24	19	60	54	49	40	33	28	23	61	57	53	45	39	33	28	64	64	62	56	49	45	37
	1500	0.10	58	50	46	39	36	28	20	62	55	51	43	38	32	25	64	59	55	47	42	37	30	67	68	64	57	50	45	39
	1900	0.15	61	53	50	43	39	32	24	63	57	53	46	42	36	28	65	61	57	50	45	39	32	69	70	65	58	51	46	41
	2300	0.19	63	56	55	48	44	37	30	65	60	57	50	46	41	32	67	65	61	53	50	44	36	71	75	70	63	55	51	48
14-0V	1000	0.03	57	44	39	33	30	27	19	57	48	44	37	28	25	19	58	49	45	38	29	26	20	61	52	48	43	33	31	24
	1500	0.06	60	50	44	40	37	34	22	59	54	47	42	33	31	22	60	55	48	43	34	32	24	63	59	52	48	40	38	29
	2000	0.11	62	53	46	41	39	35	25	61	57	50	43	36	33	26	62	58	51	44	37	34	28	65	63	56	51	46	45	34
	2500	0.16	62	56	48	44	42	37	25	62	59	52	46	38	34	29	64	60	54	46	38	36	30	66	64	58	54	46	46	35
	3000	0.21	65	61	54	49	46	42	31	65	64	57	50	41	38	35	66	65	58	51	42	39	36	69	69	63	58	51	52	40
16-0V	1200	0.02	57	49	40	33	29	24	19	58	53	45	38	34	28	21	59	55	49	43	38	34	24	62	60	55	52	46	44	30
	1800	0.06	60	53	43	38	35	31	22	60	57	48	42	39	34	26	62	60	53	47	44	40	30	67	66	62	58	56	53	37
	2400	0.09	61	54	47	43	39	36	24	62	58	52	46	42	38	28	65	62	57	51	48	45	32	69	69	65	62	61	60	40
	3000	0.14	62	57	52	46	42	39	26	64	60	55	49	44	41	30	66	64	59	54	50	47	35	71	70	67	64	63	62	42
	3600	0.18	63	61	56	51	47	44	31	66	63	59	53	48	44	34	68	67	63	57	55	51	38	73	73	72	69	69	69	48

DISCHARGE SOUND MODEL TL

OCTAVE BAND SOUND POWER, Lw, dB																														
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
4	50	0.01	59	47	39	35	29	22	<15	60	55	50	47	39	31	<15	61	56	51	48	40	32	16	64	59	52	51	43	35	20
	100	0.02	60	49	39	34	30	26	<15	61	56	52	47	40	34	16	62	57	53	48	41	35	18	65	60	54	51	44	38	21
	150	0.03	61	51	42	37	32	27	16	62	57	53	48	42	36	18	63	58	54	49	43	37	19	66	61	55	52	46	40	22
	200	0.04	62	52	45	40	34	28	18	63	58	53	49	44	37	19	64	59	54	50	45	38	20	67	62	55	53	48	41	24
	250	0.06	63	54	47	42	36	32	19	64	59	55	49	45	40	20	65	60	56	50	46	41	21	68	63	59	53	49	44	25
5	150	0.03	61	51	42	37	32	27	16	62	57	53	48	42	36	18	63	58	54	49	43	37	19	66	61	55	52	46	40	22
	200	0.04	62	52	45	40	34	28	18	63	58	53	49	44	37	19	64	59	54	50	45	38	20	67	62	55	53	48	41	24
	250	0.06	63	54	47	42	36	32	19	64	59	55	49	45	40	20	65	60	56	50	46	41	21	68	63	59	53	49	44	25
	300	0.07	64	56	51	45	38	34	16	64	61	57	50	46	43	19	65	62	58	51	47	44	20	68	65	61	54	50	47	24
	350	0.09	63	57	52	46	40	37	15	63	61	58	50	47	44	19	64	62	58	51	48	45	20	67	64	61	53	50	48	22
6	200	0.04	62	52	45	40	34	28	18	63	58	53	49	44	37	19	64	59	54	50	45	38	20	67	62	55	53	48	41	24
	300	0.07	64	56	51	45	38	34	16	64	61	57	50	46	43	19	65	62	58	51	47	44	20	68	65	61	54	50	47	24
	400	0.10	65	60	55	49	42	40	20	65	62	58	51	47	47	20	66	63	59	52	48	48	21	69	67	62	55	51	51	26
	500	0.14	68	64	59	54	48	45	22	68	66	62	56	52	50	25	69	67	63	57	53	51	26	72	70	66	60	56	54	30
	600	0.15	68	66	60	56	50	47	25	68	67	63	58	54	50	26	70	68	64	59	54	52	28	72	71	67	62	57	54	31
7	350	0.03	65	58	49	44	39	34	18	69	65	58	54	50	46	24	69	65	58	54	50	48	24	70	66	58	58	54	52	25
	450	0.04	66	60	51	47	40	36	19	71	66	60	55	51	46	25	71	66	60	56	52	50	25	72	68	60	58	54	54	28
	550	0.06	68	62	53	50	42	38	21	72	68	60	57	52	48	28	73	68	60	57	53	50	28	74	69	60	60	56	55	29
	650	0.08	70	64	55	52	44	40	24	74	70	62	59	54	49	30	74	70	62	59	55	52	30	76	72	62	61	58	56	32
	750	0.10	72	66	57	55	46	42	24	75	70	64	60	54	50	29	76	72	64	61	56	53	31	78	74	64	63	60	58	34
8	400	0.04	66	59	50	46	40	35	19	70	66	59	54	50	46	25	70	66	59	55	51	49	25	71	67	59	58	54	53	26
	550	0.06	68	62	53	50	42	38	21	72	68	60	57	52	48	28	73	68	60	57	53	50	28	74	69	60	60	56	55	29
	700	0.09	71	65	56	54	45	40	22	74	70	63	60	54	50	29	75	71	63	60	56	52	30	77	73	64	62	59	57	32
	850	0.11	73	67	59	57	48	44	25	77	72	65	62	56	51	31	78	73	65	63	58	55	32	80	75	66	66	62	60	35
	1000	0.13	75	70	62	60	52	47	29	79	74	67	65	58	53	34	80	75	68	66	60	56	35	82	77	69	70	65	62	37
9	500	0.01	60	58	48	45	36	34	15	65	64	56	53	48	44	22	66	64	58	54	49	46	22	68	66	60	58	54	52	25
	700	0.01	64	60	52	48	40	38	16	68	66	59	55	50	47	24	69	67	61	56	51	49	25	71	69	64	60	56	53	28
	900	0.02	66	62	54	50	41	40	19	70	68	61	57	53	50	26	71	68	62	58	54	51	26	73	70	66	61	57	54	29
	1100	0.04	68	64	57	53	45	43	21	72	69	63	58	55	52	28	72	70	64	59	56	52	29	74	72	68	62	59	55	31
	1300	0.06	70	68	60	57	50	48	26	74	72	66	62	56	54	31	75	72	67	62	58	54	31	78	74	70	64	62	59	34
10	700	0.01	64	60	52	48	40	38	16	68	66	59	55	50	47	24	69	67	61	56	51	49	25	71	69	64	60	56	53	28
	900	0.02	66	62	54	50	41	40	19	70	68	61	57	53	50	26	71	68	62	58	54	51	26	73	70	66	61	57	54	29
	1100	0.04	68	64	57	53	45	43	21	72	69	63	58	55	52	28	72	70	64	59	56	52	29	74	72	68	62	59	55	31
	1300	0.06	70	68	60	57	50	48	26	74	72	66	62	56	54	31	75	72	67	62	58	54	31	78	74	70	64	62	59	34
	1500	0.08	73	71	62	60	54	52	30	77	75	68	66	60	56	35	77	75	68	66	60	57	35	80	78	72	68	64	61	38
12-0V	700	0.02	64	60	50	44	34	32	16	67	65	58	52	43	40	22	69	67	61	57	49	45	25	72	71	65	64	61	56	30
	1100	0.05	67	64	54	50	41	39	21	69	68	62	55	48	45	26	71	71	65	60	53	49	30	74	75	71	69	64	59	35
	1500	0.10	71	68	60	56	48	46	26	71	70	64	59	54	50	29	73	72	68	63	57	54	31	77	78	74	72	66	62	38
	1900	0.15	73	71	64	61	55	52	30	73	72	66	62	58	55	31	76	74	69	65	60	58	34	80	79	76	73	67	63	39
	2300	0.19	76	76	68	66	62	58	36	75	76	70	66	64	60	36	78	79	73	69	65	61	39	82	83	80	77	72	67	44
14-0V	1000	0.03	58	48	43	39	40	40	<15	64	54	49	47	48	48	<15	66	56	51	49	50	50	16	69	59	54	53	54	54	20
	1500	0.06	61	57	50	47	48	48	<15	67	63	56	55	56	56	20	69	65	58	57	58	58	22	72	68	61	61	62	62	26
	2000	0.11	64	60	53	50	50	49	16	70	66	59	58	58	57	24	72	68	61	60	60	59	26	75	71	64	64	64	63	30
	2500	0.16	66	62	56	54	52	52	19	72	68	62	62	60	60	26	74	70	64	64	62	62	29	77	72	68	68	66	66	31
	3000	0.21	70	68	65	61	60	59	26	74	72	69	67	66	66	31	76	74	70	68	68	67	34	79	76	73	72	71	72	36
16-0V	1200	0.02	69	66	60	55	49	44	24	71	70	65	60	53	49	29	72	71	67	64	58	53	30	73	74	71	69	66	61	34
	1800	0.06	74	71	64	59	54	49	30	75	73	69	63	57	52	32	77	75	71	67	61	55	35	79	79	75	76	70	65	39
	2400	0.09	77	73	68	62	57	54	32	77	75	70	64	59	55	35	79	76	72	68	63	58	36	82	80	76	76	71	65	40
	3000	0.14	77	74	70	64	59	56	34	78	75	71	65	61	57	35	80	77	73	68	64	60	37	83	81	78	76	72	66	41
	3600	0.18	79	78	73	67	62	60	38	80	79	74	68	64	60	39	82	81	76	72	67	63	41	86	84	82	80	76	70	45

TL-500 STANDARD CONSTRUCTION CASING AND DAMPER LEAKAGE

Standard Construction				
Inlet Diameter	Static Pressure " w.g.	Maximum Airflow	Max Casing Leakage	Max Damper Leakage
4	3	300	5	5
5	3	375	5	5
6	3	540	5	5
7	3	760	7	7
8	3	990	9	9
9	3	1250	12	12
10	3	1640	16	16
12	3	2350	22	22
14	3	3250	32	32
16	3	4100	41	41
20	3	6430	64	64
24	3	7270	72	72

PERFORMANCE NOTES

- 1) Leakage testing conducted in accordance with ASHRAE 130-2016
- 2) Per ASHRAE Standard 130-2016 "terminal casing leakage: the amount of the air in ft³/min (L/s) leaking from the terminal unit at a given inlet pressure with the outlet(s) and inlet(s) blocked and with the damper/valve fully opened"
- 3) Per ASHRAE Standard 130-2016 "terminal damper leakage: the amount of air in ft³/min (L/s) leaking through a fully closed damper/valve of a supply/exhaust terminal unit at a given inlet pressure"opened"
- 4) Casing and Damper leakage shall not exceed 1% of the maximum rated airflow at 3" w.g.
- 5) 4" and 5" inlets are built with 6" casings

CERTIFICATIONS AND STANDARDS

- Units tested per ASHRAE Standard 130-2016.
- All model sizes certified in accordance with AHRI 880-2017 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A/90B.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.
- Hot water coils are manufactured in accordance to AHRI Standard 410.

TL-500 HOT WATER COILS MBH SELECTION DATA – IMPERIAL UNITS

Unit Size	Rows	Connection OD (in)	GPM	Head Loss (ft-H ₂ O)	CFM							
					100	200	300	350	400	450	500	600
4 5 6	1	0.625	1	0.46	5.1	7.2	8.6	9.1	9.6	10.0	10.3	11.0
			2	1.76	5.4	7.8	9.5	10.1	10.7	11.2	11.7	12.5
			3	3.86	5.5	8.1	9.8	10.5	11.2	11.7	12.2	13.2
			4	6.73	5.6	8.2	10.0	10.7	11.4	12.0	12.6	13.5
			Airside Ps		0.01	0.04	0.07	0.10	0.12	0.15	0.18	0.24
	2	0.875	1	0.12	7.5	11.1	13.4	14.3	15.0	15.7	16.3	17.3
			2	0.46	8.1	12.5	15.5	16.8	17.8	18.8	19.7	21.2
			4	1.75	8.4	13.4	17.0	18.4	19.8	21.0	22.1	24.1
			6	3.84	8.5	13.7	17.5	19.1	20.6	21.9	23.1	25.2
			Airside Ps		0.03	0.08	0.16	0.21	0.26	0.32	0.38	0.51
	3	0.875	1	0.07	8.9	13.2	15.9	16.8	17.7	18.4	19.0	20.0
			2	0.28	9.6	15.2	19.1	20.6	21.9	23.1	24.1	25.9
			4	1.09	10.0	16.5	21.3	23.2	25.0	26.6	28.0	30.5
			6	2.44	10.2	17.0	22.2	24.3	26.3	28.0	29.7	32.5
			Airside Ps		0.04	0.12	0.24	0.31	0.39	0.47	0.56	0.77
	4	0.875	1	0.05	9.7	14.5	17.4	18.4	19.3	20.1	20.7	21.7
			2	0.20	10.5	17.0	21.4	23.2	24.7	26.0	27.1	29.1
			4	0.79	10.9	18.6	24.2	26.6	28.7	30.6	32.3	35.3
			6	1.77	11.1	19.2	25.3	28.0	30.4	32.5	34.5	38.0
			Airside Ps		0.05	0.16	0.32	0.41	0.52	0.63	0.75	1.02

Unit Size	Rows	Connection OD (in)	GPM	Head Loss (ft-H ₂ O)	CFM							
					500	600	700	800	1000	1200	1400	1600
7 8	1	0.625	1	0.63	12.1	12.9	13.5	14.1	15.1	15.9	16.5	17.1
			2	2.39	13.7	14.7	15.6	16.4	17.7	18.8	19.7	20.5
			3	5.24	14.3	15.4	16.4	17.3	18.8	20.1	21.1	22.1
			4	9.14	14.7	15.9	16.9	17.9	19.5	20.8	21.9	22.9
			Airside Ps		0.11	0.15	0.19	0.24	0.36	0.49	0.64	0.81
	2	0.625	1	0.17	18.6	19.8	20.9	21.7	22.5	23.1	25.1	—
			2	0.63	22.5	24.3	25.9	27.3	28.5	29.6	33.0	—
			4	2.39	25.1	27.5	29.6	31.5	33.1	34.6	39.4	—
			6	5.22	26.2	28.8	31.1	33.2	35.1	36.7	42.2	—
			Airside Ps		0.23	0.32	0.41	0.51	0.62	0.74	1.31	—
	3	0.625	1	0.08	21.8	23.1	24.1	25.0	26.3	27.3	—	—
			2	0.31	27.5	29.8	31.6	33.2	35.8	37.8	—	—
			4	1.21	31.7	34.8	37.5	39.9	43.8	47.0	—	—
			8	4.78	34.3	38.1	41.5	44.4	49.5	53.8	—	—
			Airside Ps		0.35	0.47	0.61	0.77	1.11	1.51	—	—
	4	0.875	2	0.21	30.9	33.4	35.4	37.1	39.9	—	—	—
			4	0.84	36.3	40.0	43.1	45.9	50.5	—	—	—
			6	1.87	38.5	42.8	46.5	49.8	55.4	—	—	—
			8	3.32	39.8	44.4	48.5	52.1	58.3	—	—	—
			Airside Ps		0.46	0.63	0.82	1.02	1.49	—	—	—

1) All coil performance in accordance with AHRI Standard 410-2001

2) Heating capacities are in MBH

3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)

4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

5) Head Loss is in feet of water

6) Airside ΔPs is the air pressure drop of the hot water coil

7) Air temperature rise = 927 x MBH/CFM

8) Water temperature drop = 2.04 x MBH/GPM

9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

TL-500 HOT WATER COILS MBH SELECTION DATA – IMPERIAL UNITS

Unit Size	Rows	Connection OD (in)	GPM	Head Loss (ft-H ₂ O)	CFM							
					500	600	700	800	1000	1200	1400	1600
9 10	1	0.625	1	0.11	13.4	14.3	15.0	15.6	16.7	17.5	18.2	18.7
			2	0.43	15.7	16.9	17.9	18.8	20.4	21.6	22.7	23.6
			4	1.63	17.2	18.6	19.9	21.1	23.0	24.7	26.0	27.3
			6	3.58	17.8	19.3	20.7	22.0	24.1	25.9	27.5	28.8
			Airside Ps		0.06	0.08	0.10	0.13	0.19	0.25	0.33	0.42
	2	0.875	1	0.36	20.5	21.9	23.0	24.0	25.5	26.7	27.7	28.5
			2	1.43	25.2	27.4	29.3	30.9	33.6	35.8	37.6	39.1
			3	3.20	27.3	29.9	32.2	34.2	37.6	40.4	42.8	44.8
			4	5.68	28.5	31.4	34.0	36.2	40.0	43.2	46.0	48.3
			Airside Ps		0.12	0.17	0.22	0.27	0.39	0.54	0.69	0.87
	3	0.875	1	0.24	23.7	25.1	26.2	27.1	28.6	29.6	30.4	31.1
			2	0.94	30.4	33.0	35.1	36.9	39.9	42.2	44.0	45.5
			4	3.79	35.3	39.0	42.2	45.0	49.8	53.6	56.8	59.6
			6	8.53	37.3	41.6	45.3	48.6	54.3	59.0	63.0	66.5
			Airside Ps		0.19	0.25	0.33	0.41	0.59	0.80	1.04	1.30
	4	0.875	2	0.83	34.3	37.3	39.7	41.7	45.0	47.5	49.5	—
			4	3.35	40.3	44.7	48.6	51.9	57.5	62.0	65.8	—
			6	7.54	42.7	47.9	52.4	56.5	63.4	69.1	73.9	—
			8	13.41	44.0	49.6	54.6	59.0	66.8	73.2	78.8	—
			Airside Ps		0.25	0.34	0.43	0.54	0.79	1.07	1.39	—

Unit Size	Rows	Connection OD (in)	GPM	Head Loss (ft-H ₂ O)	CFM							
					600	800	1000	1200	1400	1600	1800	2000
12-0V	1	0.5	0.5	0.27	13.8	14.9	15.7	16.3	16.9	17.3	17.6	17.9
			1	1.04	17.5	19.4	20.8	22.0	23.0	23.8	24.5	25.2
			2	3.93	20.1	22.7	24.8	26.5	28.0	29.3	30.4	31.4
			3	8.57	21.2	24.1	26.5	28.5	30.2	31.7	33.0	34.2
			Airside Ps		0.05	0.08	0.12	0.16	0.21	0.27	0.33	0.40
	2	0.875	1	0.27	25.4	28.1	30.1	31.7	32.9	34.0	34.8	35.6
			2	1.02	31.3	35.8	39.3	42.1	44.5	46.5	48.2	49.7
			4	3.85	35.4	41.3	46.1	50.2	53.7	56.7	59.4	61.8
			6	8.40	37.1	43.6	49.0	53.6	57.7	61.2	64.4	67.2
			Airside Ps		0.11	0.18	0.26	0.35	0.46	0.57	0.69	0.83
	3	0.875	2	0.39	38.5	43.7	44.7	50.8	53.4	55.5	57.2	58.8
			4	1.52	44.3	52.0	58.1	63.2	67.5	71.2	74.4	77.3
			6	3.37	46.6	55.3	62.6	68.6	73.9	78.5	82.5	86.2
			8	5.94	47.8	57.2	65.0	71.7	77.5	82.7	87.2	91.4
			Airside Ps		0.17	0.27	0.39	0.53	0.68	0.85	1.04	1.24
	4	0.875	3	0.55	47.4	55.2	61.1	65.9	69.9	73.2	76.0	—
			5	1.51	51.7	61.6	69.6	76.2	81.9	86.7	91.0	—
			7	2.94	53.7	64.7	73.8	81.5	88.2	94.0	99.2	—
			10	5.95	55.3	67.2	77.3	86.0	93.6	100.3	106.4	—
			Airside Ps		0.22	0.36	0.52	0.70	0.91	1.14	1.39	—

1) All coil performance in accordance with AHRI Standard 410-2001

2) Heating capacities are in MBH

3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)

4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

5) Head Loss is in feet of water

6) Airside ΔPs is the air pressure drop of the hot water coil

7) Air temperature rise = 927 x MBH/CFM

8) Water temperature drop = 2.04 x MBH/GPM

9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

TL-500 HOT WATER COILS MBH SELECTION DATA – IMPERIAL UNITS

Unit Size	Rows	Connection OD (in)	GPM	Head Loss (ft-H ₂ O)	CFM							
					600	700	800	1000	1500	2000	2500	3000
14-0V	1	0.625	0.5	0.33	15.4	16.1	16.6	17.6	19.1	20.0	20.6	21.1
			1	1.23	19.7	20.9	21.9	23.7	26.7	28.8	30.3	31.4
			2	4.65	22.8	24.5	26.0	28.5	33.1	36.4	39.0	41.1
			3	10.15	24.1	26.0	27.6	30.5	35.9	39.9	43.1	45.6
			Airside Ps		0.03	0.04	0.05	0.07	0.15	0.24	0.36	0.49
	2	0.875	1	0.32	27.8	29.5	30.9	33.2	37.0	39.3	40.9	42.1
			2	1.22	34.5	37.2	39.7	43.7	51.1	56.0	59.7	62.5
			4	4.62	39.0	42.7	45.9	51.6	62.5	70.4	76.5	81.5
			6	10.09	40.8	44.8	48.5	54.9	67.4	76.8	84.3	90.4
			Airside Ps		0.07	0.09	0.11	0.16	0.32	0.51	0.74	1.01
	3	0.875	2	0.43	42.4	45.7	48.6	53.3	61.2	66.2	69.7	72.3
			4	1.68	48.5	53.3	57.5	64.8	78.4	87.9	95.0	100.6
			6	3.72	50.8	56.2	61.0	69.6	86.1	98.1	107.4	114.9
			8	6.55	52.0	57.7	62.9	72.2	90.4	104.0	114.8	123.6
			Airside Ps		0.10	0.13	0.17	0.24	0.47	0.77	1.11	1.51
	4	0.875	2	0.26	46.8	50.6	53.7	58.7	67.0	72.0	75.4	—
			6	2.30	57.0	63.4	69.2	79.4	98.9	113.0	123.7	—
			8	4.06	58.4	65.2	71.5	82.7	104.6	121.0	133.7	—
			10	6.32	59.3	66.4	73.0	84.8	108.3	126.3	140.5	—
			Airside Ps		0.14	0.18	0.22	0.32	0.63	1.02	1.49	—

Unit Size	Rows	Connection OD (in)	GPM	Head Loss (ft-H ₂ O)	CFM							
					600	700	800	1000	1500	2000	2500	3000
16-0V	1	0.625	0.5	0.36	16.2	16.9	17.6	18.5	20.1	21.0	21.7	22.2
			1	1.37	20.9	22.2	23.4	25.2	28.5	30.7	32.3	33.6
			2	5.19	24.4	26.2	27.8	30.5	35.6	39.3	42.1	44.4
			3	11.33	25.7	27.8	29.6	32.7	38.8	43.2	46.7	49.5
			Airside Ps		0.02	0.03	0.04	0.06	0.11	0.19	0.27	0.37
	2	0.875	2	1.36	36.1	39.1	41.7	46.1	54.0	59.3	63.3	66.3
			3	2.96	39.2	42.7	45.9	51.4	61.7	69.0	74.6	79.0
			4	5.15	40.9	44.8	48.4	54.5	66.4	75.0	81.8	87.2
			5	7.92	42.0	46.2	49.9	56.6	69.5	79.1	86.7	92.9
			Airside Ps		0.05	0.07	0.09	0.12	0.24	0.39	0.57	0.78
	3	0.875	2	0.46	44.4	48.0	51.1	56.2	64.8	70.2	73.9	76.7
			4	1.79	50.7	55.8	60.4	68.4	83.2	93.6	101.4	107.5
			6	3.95	53.0	58.7	64.0	73.3	91.3	104.6	114.9	123.2
			8	6.95	54.1	60.3	65.9	76.0	95.9	110.9	122.9	132.7
			Airside Ps		0.08	0.10	0.13	0.19	0.37	0.59	0.86	1.17
	4	0.875	2	0.27	49.0	53.0	56.4	61.8	70.7	76.1	79.7	82.3
			4	1.07	56.4	62.4	67.8	77.0	94.0	105.6	114.1	120.6
			8	4.22	60.4	67.7	74.4	86.5	110.5	128.5	142.6	154.1
			10	6.56	61.2	68.8	75.8	88.6	114.3	134.0	149.8	162.7
			Airside Ps		0.11	0.14	0.17	0.25	0.49	0.79	1.15	1.56

1) All coil performance in accordance with AHRI Standard 410-2001

2) Heating capacities are in MBH

3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)

4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

5) Head Loss is in feet of water

6) Airside ΔPs is the air pressure drop of the hot water coil

7) Air temperature rise = 927 x MBH/CFM

8) Water temperature drop = 2.04 x MBH/GPM

9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

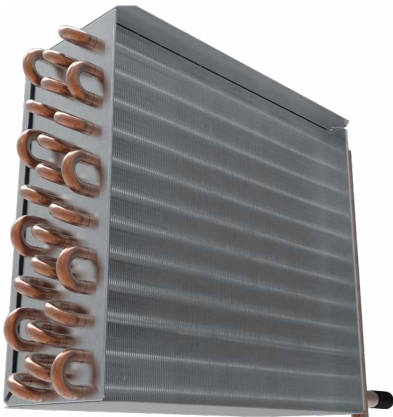
TL-500 HOT WATER COILS

When ordered with the air terminal, the hot water coil is shipped attached to the discharge of the terminal casing via slip and drive connections. The discharge end of the casing has slip and drive connections for easy connection to downstream ductwork. The hot water coil is constructed of aluminum fin and copper serpentine-type tubes with male sweat connections tested at 300 psig.

Coil selection may be made using METALAIRE Terminal Selection Software. Contact your METALAIRE representative for a copy. In the interest of energy conservation and due to the possibility of condensation, all hot water coils are marked, "Coil must be externally insulated after installation in the field." Hot water coils are tested in accordance to AHRI Standard 410.

HOT WATER COIL CONSTRUCTION DETAILS

- Hot water coils are factory mounted on the discharge of the terminal and are available with an optional integral coil access door.
- Coils are enclosed in 20 gauge coated steel casing with slip and drive connection.
- Fins are rippled and sine wave type constructed from heavy gauge aluminum, mechanically bonded to the tubes.
- Tubes are copper with a minimum wall thickness of 0.016" with male sweat header connections.
- Coils are leak tested to 300 psig with minimum burst of 2000 psig at ambient temperature.
- Coil performance data is based on tests run in accordance with AHRI Standard 410; coils are AHRI certified and include AHRI label.



TL-500 COIL CONNECTION SIZE

Outside Diameter (OD) connection size, Inches				
Inlet Size	1 Row	2 Row	3 Row	4 Row
4	5/8"	7/8"	7/8"	7/8"
5	5/8"	7/8"	7/8"	7/8"
6	5/8"	7/8"	7/8"	7/8"
7	5/8"	7/8"	7/8"	7/8"
8	5/8"	7/8"	7/8"	7/8"
9	5/8"	7/8"	7/8"	7/8"
10	5/8"	7/8"	7/8"	7/8"
12-0V	5/8"	7/8"	7/8"	7/8"
14-0V	5/8"	7/8"	7/8"	7/8"
16-0V	5/8"	7/8"	7/8"	7/8"

All coils have 10 fins/inch with optional 12 fins/inch

All accessories that can be attached to the Single Duct Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

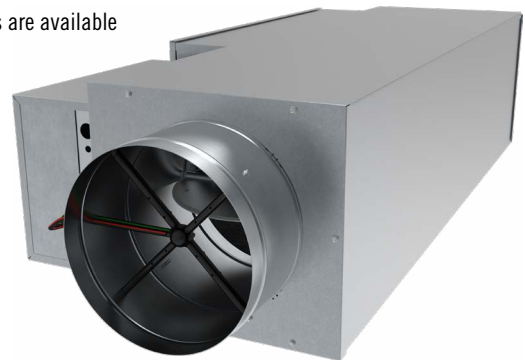
TL-500 ELECTRIC HEAT

METALAIRE's electric heaters are factory mounted, ETL listed to meet electrical safety standards and comply with UL 60335 and CSA C22.2. Electric heaters, as pictured on this page, are integral to the air terminal unit. The discharge end has slip and drive connections for easy connection to downstream ductwork. The heater plenums are an integral attenuator that is lined with the same liner selected for the casing. The integral attenuator also helps to reduce discharge sound.

Single duct electric heaters are a side-mounted, slide in style to allow easy field maintenance. The heating elements are designed to minimize hot spots and nuisance tripping of the thermal cutouts.

INCLUDED WITH EACH HEATER ASSEMBLY:

- ▶ Heater and cabinet mounted on the discharge of the TL-500
- ▶ Discharge plenum comes standard with ½" dual density fiberglass lining, optional liners are available
- ▶ Air pressure switch
- ▶ De-energizing magnetic contactors per step and backup magnetic contactor
- ▶ Magnetic contactors are the standard configuration, optional SCR control is available
- ▶ Backup manual reset high temperature limit (disc type)
- ▶ Non-isolated transformer
- ▶ Slip and drive connections
- ▶ Heater is shipped factory mounted and wired



ELECTRIC HEATER ASSEMBLY CONSTRUCTION DETAILS

- ▶ Electric reheat coils are factory mounted on the discharge of the air terminal. The heaters are ETL listed for zero clearance, and are tested in accordance with UL 60335, CSA-C22.2 and the National Electric Code (NEC). Heater casings are constructed of galvanized steel. Element wire is high grade nichrome alloy derated to 45 watts per square inch density. Element wire is supported by moisture-resistant steatite ceramics.
- ▶ Ceramics are enclosed in reinforcement brackets spaced across the heater element rack at 2" to 4" intervals. Controls are contained in a NEMA 1 control cabinet with a hinged, latching door. A permanent wiring diagram is affixed to the inside of the control cabinet door for field reference.

All accessories that can be attached to the Single Duct Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

TL-500 ELECTRIC HEATER CAPACITIES

Model TL		Single Phase										Three Phase			
		120V		208V		240V		277V		480V		208V		480V	
Inlet Size	# of Steps Available	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
4	1/SCR	0.5	4	0.5	4	0.5	4	1	4	2	4	0.5	4	2	4
	2	1		1		1		2		4		1		4	
	3	1.5		1.5		1.5		3		N/A		1.5		N/A	
5	1/SCR	0.5	4	0.5	4	0.5	4	1	4	2	4	0.5	4	2	4
	2	1		1		1		2		4		1		4	
	3	1.5		1.5		1.5		3		N/A		1.5		N/A	
6	1/SCR	0.5	4	0.5	4	0.5	4	1	4	2	4	0.5	4	2	4
	2	1		1		1		2		4		1		4	
	3	1.5		1.5		1.5		3		N/A		1.5		6	
7	1/SCR	0.5	5	0.5	8	0.5	8	0.5	8	1.5	8	0.5	8	1.5	8
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
8	1/SCR	0.5	5	0.5	8	0.5	8	0.5	8	1.5	8	0.5	8	1.5	8
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
9	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	1	15	0.5	13	1.5	15
	2	1		1		1		1		2		1		3	
	3	1.5		1.5		1.5		1.5		3		1.5		4.5	
10	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	1	15	0.5	13	1.5	15
	2	1		1		1		1		2		1		3	
	3	1.5		1.5		1.5		1.5		3		1.5		4.5	
12-0V	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	0.5	23	0.5	16	1	23
	2	1		1		1		1		1		1		2	
	3	1.5		1.5		1.5		1.5		1.5		1.5		3	
14-0V	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	0.5	23	0.5	16	0.5	23
	2	1		1		1		1		1		1		1	
	3	1.5		1.5		1.5		1.5		1.5		1.5		1.5	
16-0V	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	12	0.5	23	0.5	16	0.5	39
	2	1		1		1		1		1		1		1	
	3	1.5		1.5		1.5		1.5		1.5		1.5		1.5	

ELECTRIC HEAT SELECTION:

A. Specify electric duct heaters using voltage, phase, kW, and number of steps.

B. Use above chart to select voltage. Calculate required kW using following equations:

$$\begin{aligned} kW &= \frac{BTU / HR}{3413} & kW &= \frac{CFM \times \Delta \times 1.085}{3413} & \Delta &= \frac{kW \times 3413}{CFM \times 1.085} \\ CFM &= \frac{kW \times 3413}{\Delta \times 1.085} & CFM &= \frac{kW \times 3413}{\Delta \times 1.085} \end{aligned}$$

* air density at sea level—reduce by 0.036 for each 1000 feet of altitude above sea level

Where: BTU / Hr = Required heating capacity

CFM = volume of air during heating. Typically 100% of maximum cooling air volume

Δ = desired air temperature rise across the electric heater

Inlet air temperature = primary air temperature, usually 55°F

NOTES:

1. Heaters less than 10 kW are specifiable to nearest 0.5 kW. Heaters greater than 10 kW are specifiable to nearest 1 kW.
2. Minimum flow rate for electric heat is 70 CFM / kW. Lower CFM's can cause nuisance tripping, excessive discharge temperatures, rapid cycling, and rapid element failure. Electric Heat units running below 70 CFM / kW will void all warranties.
3. For optimum thermal comfort, the suggested discharge temperature should not exceed 20°F above room set point.
4. We do not recommend discharge temperatures in excess of 115°F to protect heater coils.
5. Maximum number of steps at "Min. kW per Step" is one step.
6. If more than 1 heater is wired into a building's circuit breaker (multi-outlet branch circuit) each heater will require the addition of power side fusing.

TL SOUND ATTENUATORS

- The optional acoustically lined sound attenuator is designed to further reduce discharge sound levels from the air terminal. The chart below gives reductions to the discharge sound power figures at minimum static pressure for each octave band.
- Attenuators are integral to the box
- Standard attenuator is 3 ft. (36 inches) long

TL-500						
Octave Band / Frequency (Hz)						
Unit Size	2 / 125	3 / 250	4 / 500	5 / 1000	6 / 2000	7 / 4000
4	2	4	8	18	20	13
5	2	4	8	18	20	13
6	2	4	8	18	20	13
7	2	3	8	16	16	11
8	2	3	8	16	16	11
9	1	3	7	15	15	11
10	1	3	7	15	15	11
12-0V	2	4	8	17	17	12
14-0V	2	3	8	16	16	11
16-0V	1	3	7	15	15	10

All accessories that can be attached to the Single Duct Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

TL-500 RECOMMENDED MIN/MAX AIRFLOW RANGES

TL-500 Recommended Minimum and Maximum Airflow Ranges				
Unit Size	Pneumatic		Digital Controls - DDC	
			Transducer Min ΔP / Min CFM	Transducer Max ΔP / Max CFM
	Min CFM	Max CFM	0.01	1
4	50	300	30	300
5	65	375	40	375
6	95	540	55	540
7	130	760	75	760
8	170	990	100	990
9	220	1250	125	1250
10	285	1640	165	1640
12-0V	395	2270	225	2270
14-0V	495	2850	285	2850
16-0V	615	3550	355	3550

PERFORMANCE NOTES

- Actual minimum and maximum airflow ranges depend on the transducer differential pressure range and accuracy.
- Contact the manufacturer of installed DDC equipment for transducer minimum and maximum differential pressure, ΔP , limits.
- Minimum CFM for Pneumatic controls are based on a sensor differential pressure of 0.03 in. w.g.
- Maximum CFM for Pneumatic controls are based on a sensor differential pressure of 1.00 in. w.g.
- $CFM = (\sqrt{\Delta P}) * K$ Factor
- K Factor is the airflow at 1" ΔP
- Recommendations are for pressure independent units.
- Pressure dependent units minimum CFM is always zero and there is no maximum.



BP-600 BYPASS AIR TERMINAL UNIT

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Dimensional Data	3
AHRI Certified Rating Points	5
Sound Performance Data	6
Certifications and Standards	7



BP-600 BYPASS TERMINAL UNIT

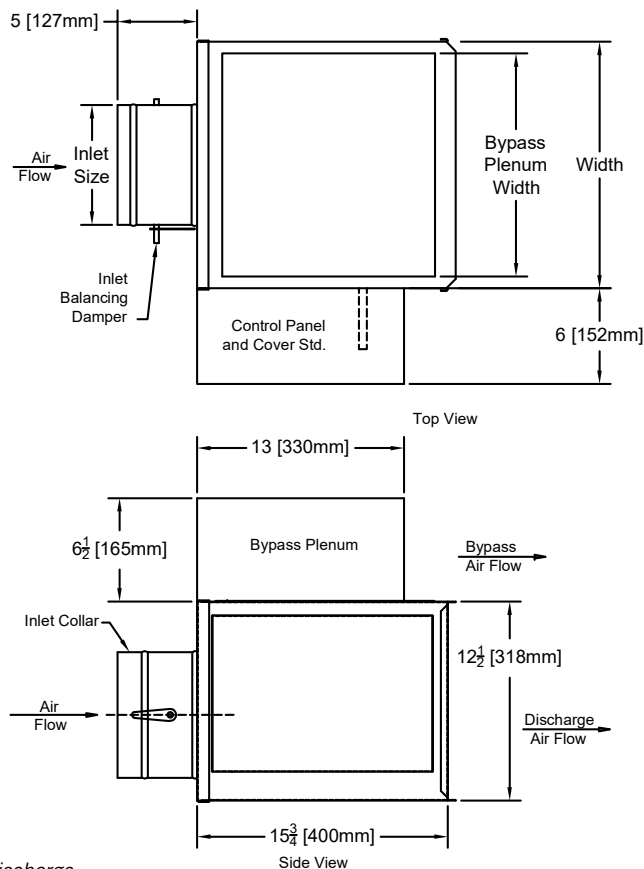
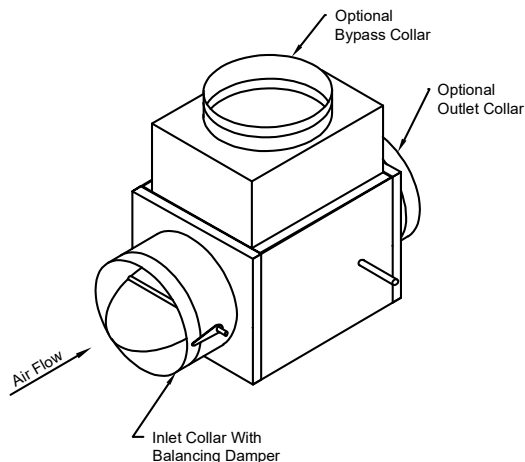
The BP-600 Bypass Air Terminals are used to achieve variable air volume delivery of conditioned air to a space or zone where constant volume air handlers exist. Variable air volume control is achieved by directing air flow either to the space or to a bypass port in direct response to a signal from the room thermostat. The damper assembly design includes a galvanized single ½" thick box damper providing superior rigidity and close off for accurate control without the use of cumbersome and high maintenance internal linkage. The damper rotates in a self-lubricating, low friction, long life thermal plastic bearing. A constant volume of air is delivered by the air terminal, but varying amounts are delivered to the space and the bypass plenum. A locking quadrant on the inlet balancing damper determines the total air flow through the air terminal. The primary air valve is enclosed in an insulated sheet metal casing. Control components are shipped piped and wired, and a piping/wiring diagram is affixed to the bottom of the unit for field reference.

STANDARD FEATURES

- ▶ BP-600 available in 10 unit sizes to handle 30-4100 CFM
- ▶ Casing constructed of 22 ga. galvanized steel.
- ▶ Damper assembly includes a galvanized single ½" thick box damper providing superior rigidity and close off for accurate control without the use of internal linkage.
- ▶ Insulation is 1/2" thick, 1.5lb / ft³ dual density coated fiberglass that complies with NFPA 90A, ASTM C-665, and UL-181 requirements.
- ▶ 3-beaded inlet connection tube for added rigidity and secure flex duct connections.
- ▶ All BP-600 terminal units are AHRI certified and shipped with the AHRI seal.

BP-600-001 BYPASS AIR TERMINAL UNIT

Note:
Outlet Collar & Bypass Collar
Are Same Size as Inlet Collar



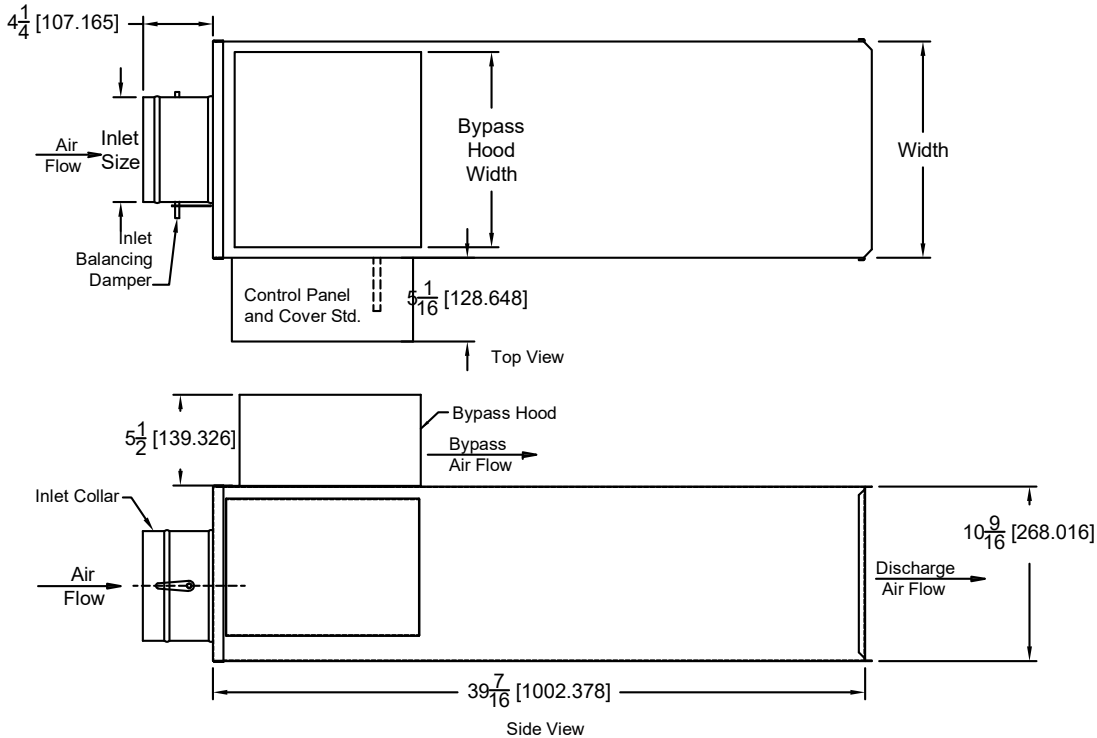
Field sensor is installed minimum 3 feet downstream of box discharge.
Sensor is shipped under control enclosure when optional sensor is ordered.

The standard location for control panel is Right Hand on Model BP.
Looking in the direction of airflow, the control panel is on the right.

Unit Size 12-OV, 14-OV, & 16-OV have flat oval inlet ducts.

Unit Size	Inlet Size	CFM Range	Unit Width	Bypass Hood		Shipping Weight Lbs
				Width	Length	
4	3 7/8	0-300	12	12	12	23
5	4 7/8	0-375	12	12	12	23
6	5 7/8	0-540	12	12	12	23
7	6 7/8	0-760	14	14	14	26
8	7 7/8	0-990	14	14	14	26
9	8 7/8	0-1250	16	16	16	29
10	9 7/8	0-1640	16	16	16	29
12-OV	13 x 9 7/8	0-2270	18	18	20	31
14-OV	16 1/4 x 9 7/8	0-2850	24	24	26	34
16-OV	19 3/8 x 9 7/8	0-3550	28	28	34	38

BP-600-002
BYPASS AIR TERMINAL UNIT WITH INTEGRAL SOUND ATTENUATOR



Field sensor is installed minimum 3 feet downstream of box discharge.
Sensor is shipped under control enclosure when optional sensor is ordered.
The standard location for control panel is Right Hand on Model BP.
Looking in the direction of airflow, the control panel is on the right.
Unit Size 12-OV, 14-OV, & 16-OV have flat oval inlet ducts.

Unit Size	Inlet Size	CFM Range	Unit Width	Bypass Hood		Shipping Weight Lbs
				Width	Length	
4	3 7/8	0-300	12	12	12	37
5	4 7/8	0-375	12	12	12	37
6	5 7/8	0-540	12	12	12	37
7	6 7/8	0-760	14	14	14	42
8	7 7/8	0-990	14	14	14	42
9	8 7/8	0-1250	16	16	16	47
10	9 7/8	0-1640	16	16	16	47
12-OV	13 x 9 7/8	0-2270	18	18	20	50
14-OV	16 1/4 x 9 7/8	0-2850	24	24	26	55
16-OV	19 3/8 x 9 7/8	0-3550	28	28	34	62

BP-600 AHRI CERTIFIED RATING POINTS



RADIATED SOUND

Power Levels @ Min ΔPs

Unit Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
4	150	0.01	35	29	26	22	19	17
5	250	0.05	40	37	36	32	24	20
6	400	0.13	50	46	45	43	36	29
7	550	0.03	53	44	39	35	25	22
8	700	0.05	60	53	45	40	31	27
9	900	0.03	57	45	40	35	29	25
10	1100	0.05	57	49	45	40	33	28
12-0V	1500	0.08	55	51	47	41	33	26
14-0V	2000	0.10	57	54	53	49	43	41
16-0V	2400	0.09	59	58	57	53	45	31

DISCHARGE SOUND

Power Levels @ Min ΔPs

Unit Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
4	150	0.01	54	39	33	29	27	19
5	250	0.06	57	46	40	38	33	24
6	400	0.13	61	57	52	51	44	39
7	550	0.03	64	52	48	45	40	31
8	700	0.05	65	59	56	53	45	38
9	900	0.04	64	58	54	50	41	35
10	1100	0.05	66	62	58	54	46	41
12-0V	1500	0.08	63	60	58	55	48	42
14-0V	2000	0.10	64	65	65	58	53	50
16-0V	2400	0.09	62	59	59	58	49	42

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10^{-12} Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation

RADIATED SOUND MODEL BP

OCTAVE BAND SOUND POWER, Lw, dB									
Unit Size	CFM	Min ΔPs	ΔPs = Min ΔPs						
			2	3	4	5	6	7	NC
4	50	0.01	33	27	25	21	18	13	<15
	100	0.01	35	29	26	22	19	14	<15
	150	0.01	35	29	26	22	19	17	<15
	200	0.05	35	35	29	29	20	20	<15
	250	0.05	40	37	36	32	24	20	<15
5	150	0.01	35	29	26	22	19	17	<15
	200	0.05	35	35	29	29	20	20	<15
	250	0.05	40	37	36	32	24	20	<15
	300	0.08	45	39	42	35	27	20	15
	350	0.10	47	42	43	39	33	25	17
6	200	0.05	35	35	29	29	20	20	<15
	300	0.08	45	39	42	35	27	20	15
	400	0.13	50	46	45	43	36	29	19
	500	0.20	52	47	45	44	38	34	20
	600	0.30	54	49	46	47	41	39	20
7	350	0.01	46	38	33	28	20	20	<15
	450	0.02	48	40	35	30	22	20	<15
	550	0.03	53	44	39	35	25	22	17
	650	0.04	58	51	43	38	29	25	21
	750	0.05	61	54	46	41	32	27	22
8	400	0.02	45	38	33	26	20	20	<15
	550	0.03	53	44	39	35	25	22	17
	700	0.05	60	53	45	40	31	27	22
	850	0.08	63	54	47	44	35	33	25
	1000	0.10	66	55	48	46	40	35	30
9	500	0.01	55	38	30	23	20	20	16
	700	0.02	56	40	35	29	22	20	17
	900	0.03	57	45	40	35	29	25	19
	1100	0.07	58	50	48	43	36	31	22
	1300	0.07	58	50	48	43	36	31	22
10	700	0.02	56	40	35	29	22	20	17
	900	0.03	57	45	40	35	29	25	19
	1100	0.05	57	49	45	40	33	28	19
	1300	0.07	58	50	48	43	36	31	22
	1500	0.13	59	51	52	46	40	35	26
12-0V	700	0.02	47	45	42	34	28	20	<15
	1100	0.04	50	48	45	37	28	20	19
	1500	0.08	55	51	47	41	33	26	21
	1900	0.15	60	55	50	44	36	30	26
	2300	0.20	65	59	52	47	40	34	28
14-0V	1000	0.02	55	46	44	39	31	25	20
	1500	0.05	58	49	47	42	34	25	21
	2000	0.10	57	54	53	49	43	41	27
	2500	0.15	57	59	59	54	49	50	34
	3000	0.20	71	68	64	57	52	50	39
16-0V	1200	0.03	55	54	53	49	41	27	22
	1800	0.05	57	56	55	51	43	29	28
	2400	0.09	59	58	57	53	45	31	34
	3000	0.14	61	62	61	58	51	43	37
	3600	0.21	67	68	67	64	58	53	43

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Radiated sound is the noise transmitted through the unit casing
- 3) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 4) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 5) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 6) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

DISCHARGE SOUND MODEL BP

OCTAVE BAND SOUND POWER, Lw, dB									
Unit Size	CFM	Min ΔPs	ΔPs = Min ΔPs						
			2	3	4	5	6	7	NC
4	50	0.01	48	33	27	23	21	13	<15
	100	0.01	51	36	30	26	24	16	<15
	150	0.01	54	39	33	29	27	19	<15
	200	0.05	57	42	36	32	30	22	<15
	250	0.06	57	46	40	38	33	24	<15
5	150	0.01	54	39	33	29	27	19	<15
	200	0.05	57	42	36	32	30	22	<15
	250	0.06	57	46	40	38	33	24	<15
	300	0.08	56	50	45	43	35	25	<15
	350	0.10	58	54	48	47	39	35	<15
6	200	0.05	57	42	36	32	30	22	<15
	300	0.08	56	50	45	43	35	32	<15
	400	0.13	61	57	52	51	44	39	<15
	500	0.20	66	62	58	56	49	45	21
	600	0.30	72	68	64	62	55	52	27
7	350	0.01	61	46	42	38	37	26	<15
	450	0.02	63	48	44	40	39	28	15
	550	0.03	64	52	48	45	40	31	16
	650	0.04	65	57	51	49	43	35	17
	750	0.06	66	60	57	54	46	39	18
8	400	0.02	63	46	40	36	36	25	<15
	550	0.03	64	52	48	45	40	31	16
	700	0.05	65	59	56	53	45	38	17
	850	0.08	68	64	60	58	50	42	21
	1000	0.10	72	68	64	63	55	49	26
9	500	0.01	61	50	45	39	31	24	<15
	700	0.03	63	52	47	41	33	26	<15
	900	0.04	64	58	54	50	41	35	16
	1100	0.05	66	62	58	54	46	41	19
	1300	0.07	67	63	61	58	51	42	20
10	700	0.03	63	52	47	41	33	26	<15
	900	0.04	64	58	54	50	41	35	16
	1100	0.05	66	62	58	54	46	41	19
	1300	0.07	67	63	61	58	51	42	20
	1500	0.10	69	64	65	60	57	43	22
12-0V	700	0.02	57	49	46	43	35	27	<15
	1100	0.04	59	51	48	45	37	27	15
	1500	0.08	63	60	58	55	48	42	16
	1900	0.12	65	62	61	58	52	47	17
	2300	0.17	68	63	63	62	56	52	19
14-0V	1000	0.02	55	56	51	44	38	33	<15
	1500	0.05	58	59	54	47	41	36	15
	2000	0.10	64	65	65	58	53	50	22
	2500	0.15	70	69	69	63	58	55	27
	3000	0.20	77	74	74	68	63	60	33
16-0V	1200	0.03	55	50	51	49	41	34	<15
	1800	0.05	58	53	54	52	44	37	15
	2400	0.09	62	59	59	58	49	42	17
	3000	0.14	68	71	66	65	58	54	29
	3600	0.21	73	71	73	72	65	60	29

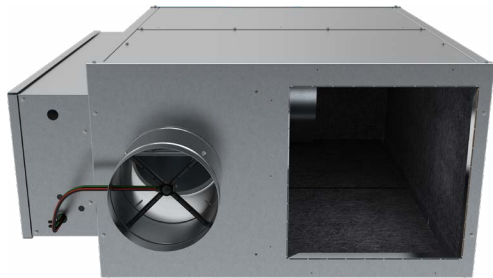
- 7) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 8) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 9) Sound performance based on units lined with standard dual density fiberglass insulation
- 10) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 11) Size 12, 14, and 16 are flat ovals and the AHRI rating points are calculated from multiplying the inlet area, ft², by 2000 fpm per AHRI Standard 880-2017

CERTIFICATIONS AND STANDARDS

- ▶ Units tested per ASHRAE Standard 130-2016.
- ▶ All model sizes certified in accordance with AHRI 880-2017 certification program.
- ▶ ETL listed to meet requirements of UL 60335 and CSA C22.2.
- ▶ Dual-density fiberglass insulation meets UL 181 and NFPA 90A/90B.
- ▶ Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.
- ▶ Hot water coils are manufactured in accordance to AHRI Standard 410.



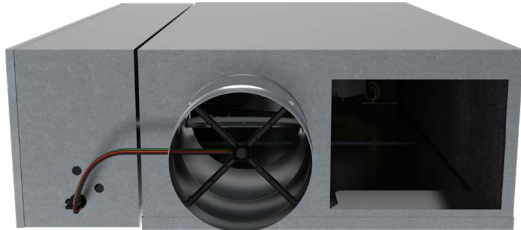
FAN POWERED TERMINAL UNITS



FCI-600
SERIES FAN TERMINAL
PAGES FCI1 - FCI22



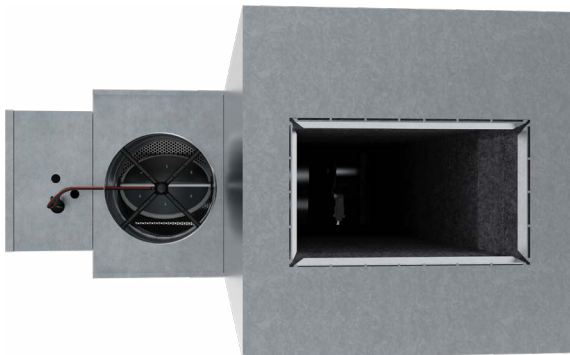
FVI-500
PARALLEL FAN TERMINAL
PAGES FVI1 - FVI27



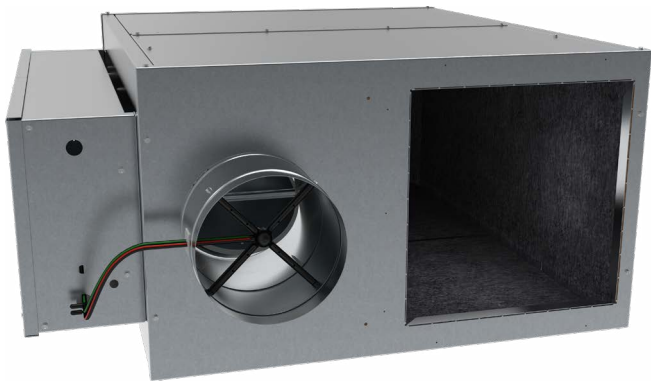
FCL-600
LOW-PROFILE SERIES FAN TERMINAL
PAGES FCL1 - FCL18



FVL-600
LOW-PROFILE PARALLEL FAN TERMINAL
PAGES FVL1 - FVL19



FCQ-700
ULTRA QUIET SERIES FAN TERMINAL
PAGES FCQ1 - FCQ22



FAN POWERED TERMINAL UNITS

BENEFITS:

Fan powered terminals are typically used for heating and cooling of perimeter zones. Operating cost savings can be achieved through the use of waste heat recovery from the ceiling plenum and from reduced central fan HP. This coupled with a relatively low impact on installation costs are reasons for the widespread application of fan powered terminal units.

Both parallel and series fan powered terminals have a damper to modulate primary cooling air and a fan/motor assembly that draws return air from the ceiling plenum. The difference in the configuration and operation of these terminals is illustrated on these pages.

**SERIES FAN
POWERED TERMINAL UNITS**

In the series fan powered terminal, the primary air valve and fan are in the primary airstream, and are sized for the cooling load. The fan runs continuously during both heating and cooling modes. The volume of supply air remains constant at all times resulting in better diffuser performance and constant noise levels.

**PARALLEL FAN
POWERED TERMINAL UNITS**

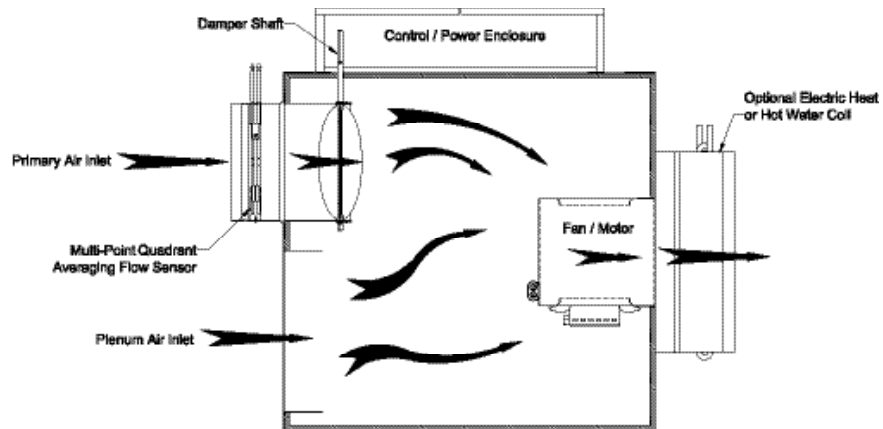
In the parallel fan powered terminal, the primary air valve is sized for the cooling airflow just as in single duct terminals. The fan section is outside of the primary airstream and typically runs only in the heating mode. It is typically sized for 50% of the maximum primary airflow which can result in lower noise levels, lower unit first costs, and reduced energy usage when compared to a series fan powered terminal due to the fan not being on at all times with fan being energized only during heating mode.

Function	Series Terminal Constant volume	Parallel Terminal Variable volume
Fan Operation	Continuous. Runs under heating and cooling in occupied and unoccupied modes.	Intermittent. Typically runs only under heating mode.
Operation of Terminal	Constant volume, variable temperature at all times. Supplemental heat raises supply temperature in stages.	Variable volume, constant temperature during cooling. Constant volume variable temperature during heating. Fan and supplemental heat raise supply temperature in stages.
Terminal Fan Sizing	For design airflow — heating or cooling, whichever is greater — at required downstream static pressure.	For design heating load at reduced downstream static pressure (typically 50% of cooling CFM).
Central Fan Sizing	Static pressure needed to overcome volume damper only.	Static pressure needed to overcome volume damper, heating coil, downstream duct, and diffusers.

TYPES OF FAN POWERED TERMINAL UNITS

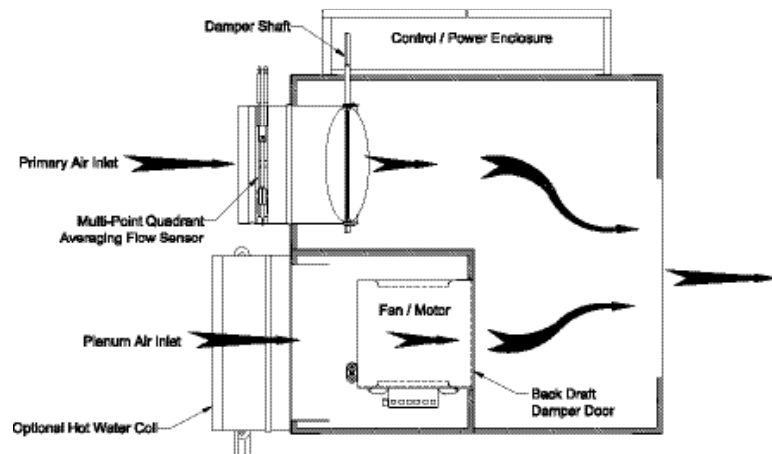
FCI-600 SERIES FAN POWERED UNIT

In a constant volume (or series) fan powered terminal, the fan runs continuously. Both primary and induced air are discharged through the fan.



FVI-500 PARALLEL FAN POWERED UNIT

In a variable volume (or parallel) terminal unit, the fan runs only when heating is required. In cooling, the unit functions the same as a single duct VAV terminal.

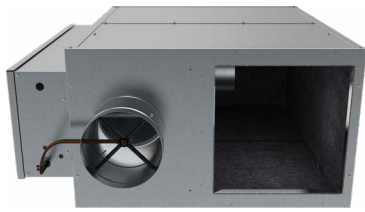


CERTIFICATION AND STANDARDS

- Units tested per ANSI / ASHRAE Standard 130.
- All model sizes certified in accordance with AHRI 880 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A requirements.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.

OPTIONS

- Energy-efficient electronically commutated motor (ECM).
- SSR controlled electric heater.
- Inlet attenuator for quiet applications.



FCI-600
CONSTANT VOLUME UNIT



FCL-600
LOW-PROFILE CONSTANT VOLUME UNIT



FCQ-700
ULTRA QUIET CONSTANT VOLUME UNIT

SERIES FAN POWERED TERMINAL UNITS

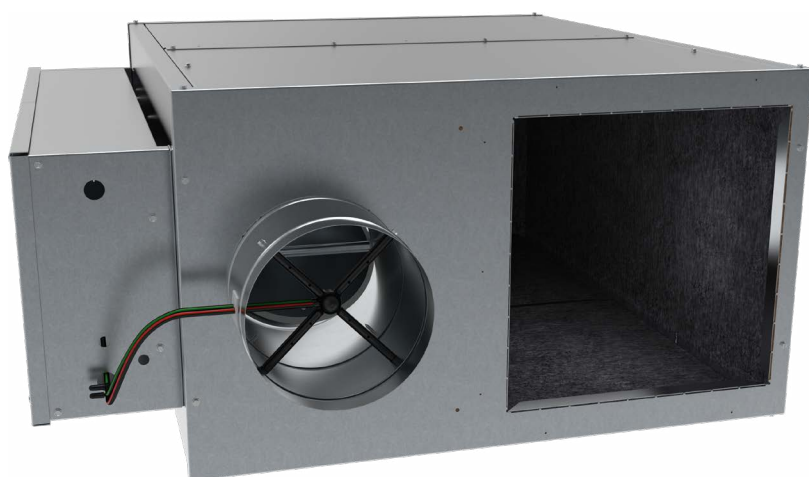
METALAIRE's series fan-powered terminal units are designed to provide superior comfort by supplying constant volume, variable temperature air into the occupied zone. Series fan-powered terminal units reduce central fan energy, allow for recovery of waste heat from the return plenum, lower operating costs, improve air circulation through better diffuser performance, and provide a constant sound level for maximum occupant comfort.

The primary function of the METALAIRE series fan-powered terminal unit is to deliver a constant volume of conditioned air into the occupied zone. The terminal unit mixes conditioned air from the primary duct and warm air from the return plenum in varying amounts in response to a control signal. Supplemental heating is available in both electric heat and hot water coils if plenum heat is insufficient. METALAIRE series fan-powered terminal units are available with a wide range of control options to suit any application.

These include pneumatic and direct digital control (DDC). With the demands of today's building designs to reduce energy in smaller mechanical spaces, the METALAIRE series fan-powered terminal unit is the perfect choice.

FEATURES

- FCI-600 is available in 6 casing sizes to handle 200–4400 CFM.
- FCL-600 is available in 2 casing sizes to handle 350–1825 CFM.
- FCQ-700 is available in 6 casing sizes to handle 200–4000 CFM.
- 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- Mechanically fastened damper assembly is double layer, 18 gauge equivalent, galvanized steel with integral blade seal. (<1% at 3.0" wg static pressure).
- Factory calibrated controls per each job requirement.
- Multi-point center averaging flow sensor provides highly accurate +/- 5% flow readings after certified balancer has balanced terminal.
- Easy access external balancing taps.
- Energy efficient PSC motors with adjustable SCR solid state fan speed controllers are standard.
- Optional highly efficient Electronically Commutated Motors (ECM).
- External control cabinet with offset mounting plate as standard.
- Single point electrical connections.
- For added rigidity, the primary inlet incorporates 3 strengthening beads which also provide a stop for field attached flex duct, forms the seal where primary duct enters the casing and serves as the sealing surface for the damper assembly in closed position.
- Round inlets available in sizes 6" through 16".
- 1" thick, dual density (1.5lb / ft³ min.) fiberglass insulation with edges coated. Meets NFPA 90A and UL 181. (1/2" thick insulation standard on FCL-600).
- Flanged discharge with optional slip and drive cleat duct connection.
- Removable bottom access panel provides complete access to motor / blower.
- Independently tested and certified laboratory performance data.
- Full range of options and accessories available (heating coils, disconnects, attenuators, etc.).
- Full range of liners / insulation available.



Intertek

FCI-600 CONSTANT VOLUME FAN TERMINAL UNIT

SPECIFIABLE FEATURES

- Galvanized steel casing, mechanically sealed for low leakage construction
- NEMA TYPE 1 rated hinged control enclosure with standoff to prevent penetration of casing
- Single speed high efficiency PSC motor with SCR motor speed control
- Riveted round primary inlet duct to minimize leakage
- Damper constructed of double layer 18 gauge equivalent with integral blade seal
- Single point electrical connection

INDEX OF SECTIONS	PAGE
Dimensional Data	4
Shipping Weights / Filter Sizes / Certifications & Standards	7
AHRI Certified Rating Points	8
Sound Performance Data	10
Motor Data / Damper Leakage	12
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FCI-600 CONSTANT VOLUME FAN AIR TERMINAL UNIT

The METALAIRE FCI series fan-powered terminal unit has been engineered to provide a balance between quiet operation, minimal footprint, and a broad flow range.

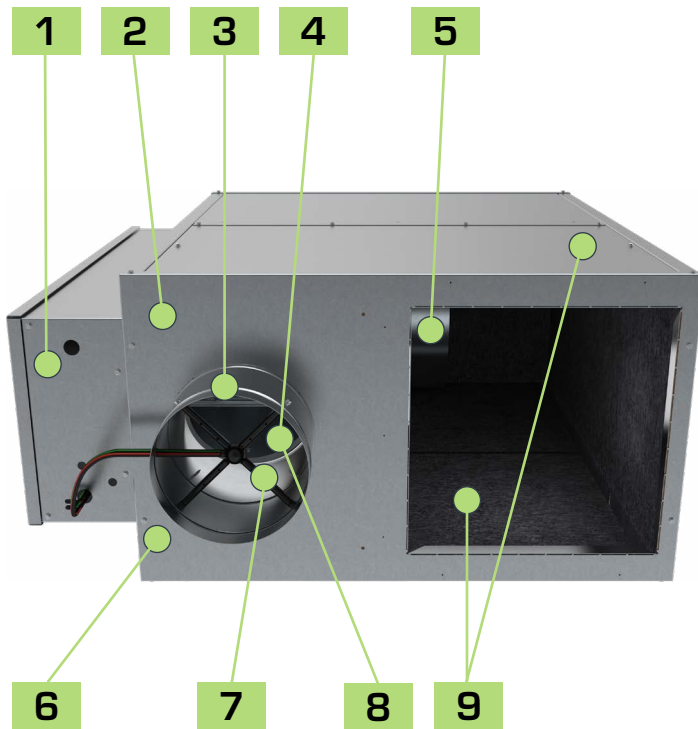
The FCI is constructed from 20 gauge metal designed to mitigate vibration and increase rigidity. The unique 4-piece case allows for fewer seams to minimize leakage. Every FCI includes bottom motor/blower access panel: These simple-to-remove panels provide access to allow trouble-free maintenance of the fan motor and blower assembly. The control enclosure for the FCI allows critical component access.

FCI units include 1" thick, matte-faced fiberglass insulation that complies with UL 181 horizontal burn test, NFPA 90A and UL 723/ASTM E 84 flame spread and smoke developed ratings of 25/50. Optional insulations include metal-foil-faced and fiber- and erosion-free ThermoPure (closed-cell foam), a polyolefin product with superior acoustical properties compared to solid metal duct liner.

Optional electronically commutated motors (ECM) are available to minimize energy usage. Up to 75% energy savings is typical with the ECM option.

STANDARD FEATURES

- ▶ Available in 6 casing sizes to handle 200–4400 CFM.
- ▶ 20 gauge galvanized steel casing.
- ▶ Low leakage construction.
- ▶ Low leakage inlet damper (< 1% at 3" static pressure).
- ▶ Optional factory calibrated controls per each job requirement.
- ▶ Multi-point center averaging airflow sensor provides +/- 5% accuracy even with 90 degree elbow at inlet.
- ▶ Energy efficient PSC motors with adjustable SCR solid state fan speed controller.
- ▶ External control cabinet with offset mounting plate.
- ▶ Single point electrical connections.
- ▶ Beaded primary inlet connection tube for added rigidity and secure flex duct connections.
- ▶ Round inlets available in sizes 6" through 16".
- ▶ 1" thick, dual density (1.5lb / ft³ min.) fiberglass insulation with edges coated.
- ▶ Rectangular discharge with optional slip and drive cleat duct connection.
- ▶ Large removable bottom access panel provides access to fan motor / blower assembly.
- ▶ Independently tested and certified laboratory performance data.
- ▶ Full range of options and accessories available (heating coils, disconnects, attenuators, etc.).
- ▶ Full range of liners / insulation available.
- ▶ Auto and manual thermal resets on every electric heater.
- ▶ High efficiency six-pole, single speed permanent split capacitor (PSC) motors.
- ▶ Available fan motor voltages of 120, 277, and 208-240 (50 / 60 Hz).



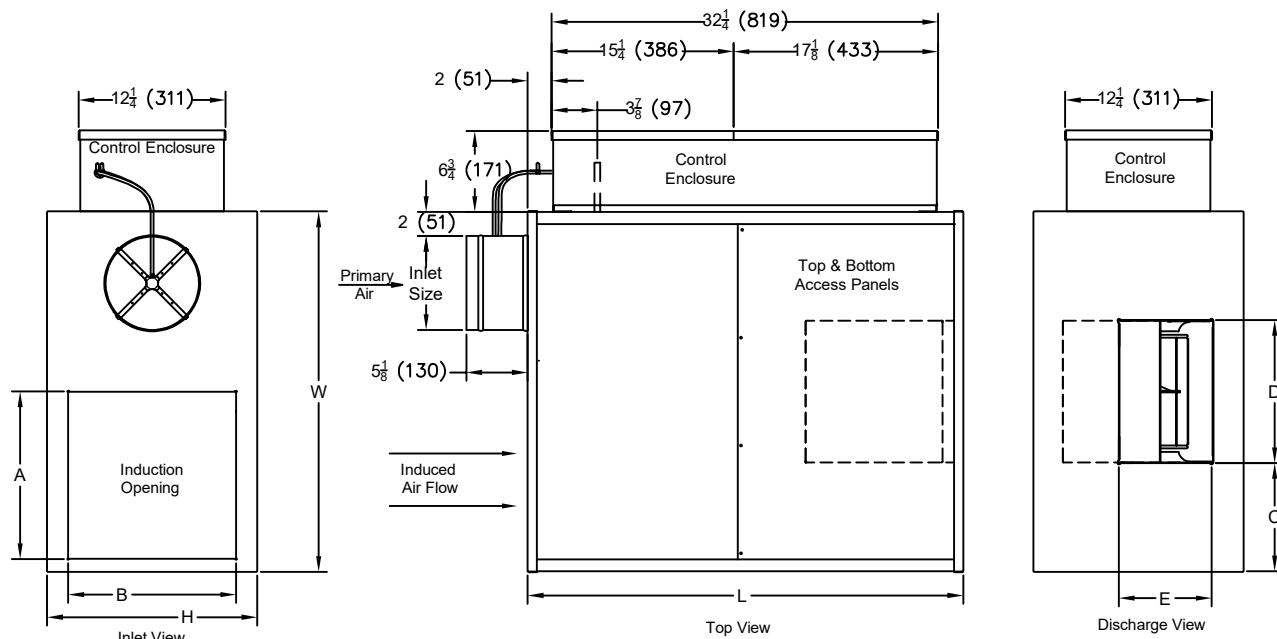
Top view of FCI-600 with panels removed.

FCI-600 CONSTANT VOLUME FAN AIR TERMINAL UNIT

FEATURES AND BENEFITS

- 1** Galvanized steel casing, mechanically sealed for low leakage construction.
- 2** NEMA TYPE 1 rated hinged control enclosure with standoff to prevent penetration of casing.
- 3** Riveted primary inlet duct to minimize leakage with 3 stiffening beads for added rigidity.
- 4** Damper construction of double layer 18 gauge equivalent with integral blade seal.
- 5** Single speed high efficiency PSC motor with SCR motor speed control.
- 6** Discharge panel is manufactured with 18 gauge galvanized steel to mitigate vibration.
- 7** Multi-Point Center Averaging Airflow Sensor.
- 8** Damper assembly rotates in long life, low friction, self lubricating thermoplastic bearing.
- 9** Top and bottom access panels provided for easy motor / blower servicing.

FCI-600-001 SERIES FAN POWERED AIR TERMINAL UNIT COOLING ONLY



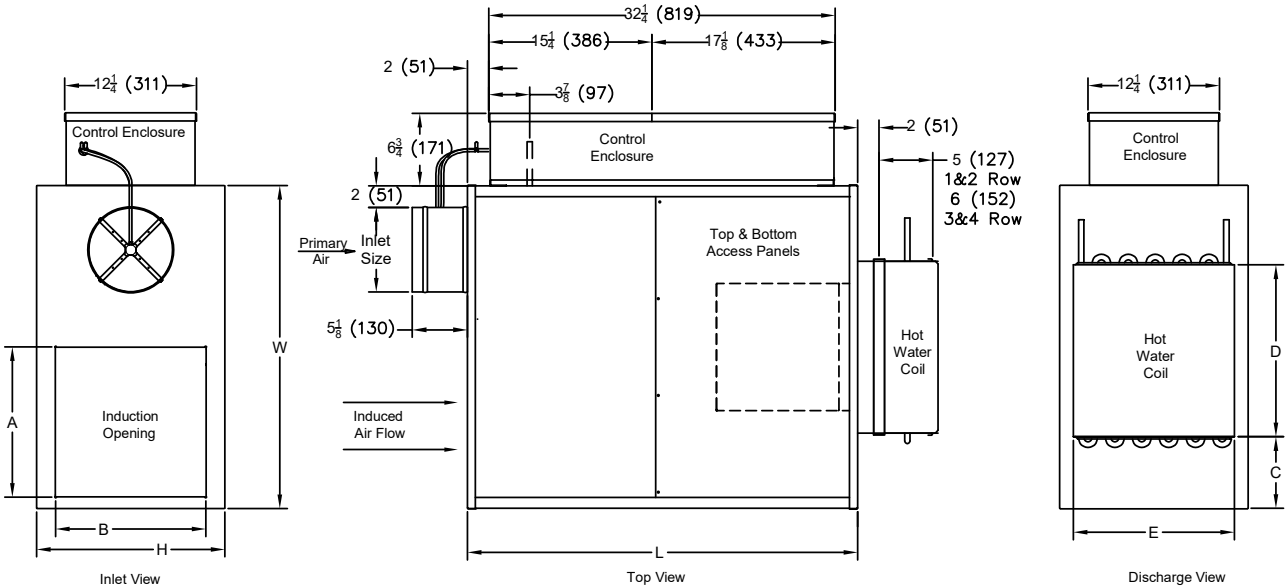
The standard location for control enclosure is Left Hand. Looking in the direction of airflow, the control enclosure is on the left. Case size 7 includes two discharge blowers. All dimensions shown in inches, parenthesis () indicate millimeters.

PSC MOTOR CONFIGURATION				
Case Size	Horse Power	Discharge		
		Loc.	Width	Height
		C	D	E
2	1/8	10 15/16 (278)	8 3/8 (213)	10 1/8 (257)
3	1/8	12 3/16 (309)	11 15/16 (303)	7 3/4 (197)
4	1/4	11 1/2 (292)	13 1/4 (336)	10 1/8 (257)
5	1/3	13 1/2 (343)	13 1/4 (336)	11 3/16 (284)
6	1	14 1/8 (359)	14 (355)	13 1/2 (343)
7	3/4 (QTY 2)	5 13/16 (148)	13 1/4 (337)	9 1/2 (241)

ECM MOTOR CONFIGURATION				
Case Size	Horse Power	Discharge		
		Loc.	Width	Height
		C	D	E
2	1/3	9 1/8 (231)	11 15/16 (303)	7 3/4 (197)
3	1/3	12 3/16 (309)	11 15/16 (303)	7 3/4 (197)
4	1/2	12 3/4 (324)	10 5/8 (270)	10 7/8 (276)
5	1	13 1/2 (343)	13 1/4 (336)	11 3/16 (284)
6	1	14 1/8 (359)	14 (355)	13 1/2 (343)
7	1 (QTY 2)	5 13/16 (148)	13 1/4 (337)	9 1/2 (241)

Case Size	Inlet Size		Unit Width	Unit Height	Unit Length	Induction	
	Standard	Optional				Width	Height
			W	H	L	A	B
2	8 (203)	4,5,6,10,12	30 (762)	17 1/2 (445)	36 (914)	14 (356)	14 (356)
3	10 (254)	4,5,6,8,12,14	36 (914)	17 1/2 (445)	40 (1016)	18 (457)	14 (356)
4	12 (305)	8,10,14	36 (914)	17 1/2 (445)	40 (1016)	18 (457)	14 (356)
5	14 (356)	10,12,16	40 (1016)	20 (508)	40 (1016)	18 (457)	16 (406)
6	16 (406)	10,12,14	42 (1067)	20 (508)	42 (1067)	20 (508)	16 (406)
7	16 (406)	12,14,18 x 16	46 (1168)	20 (508)	46 (1168)	22 (559)	16 (406)

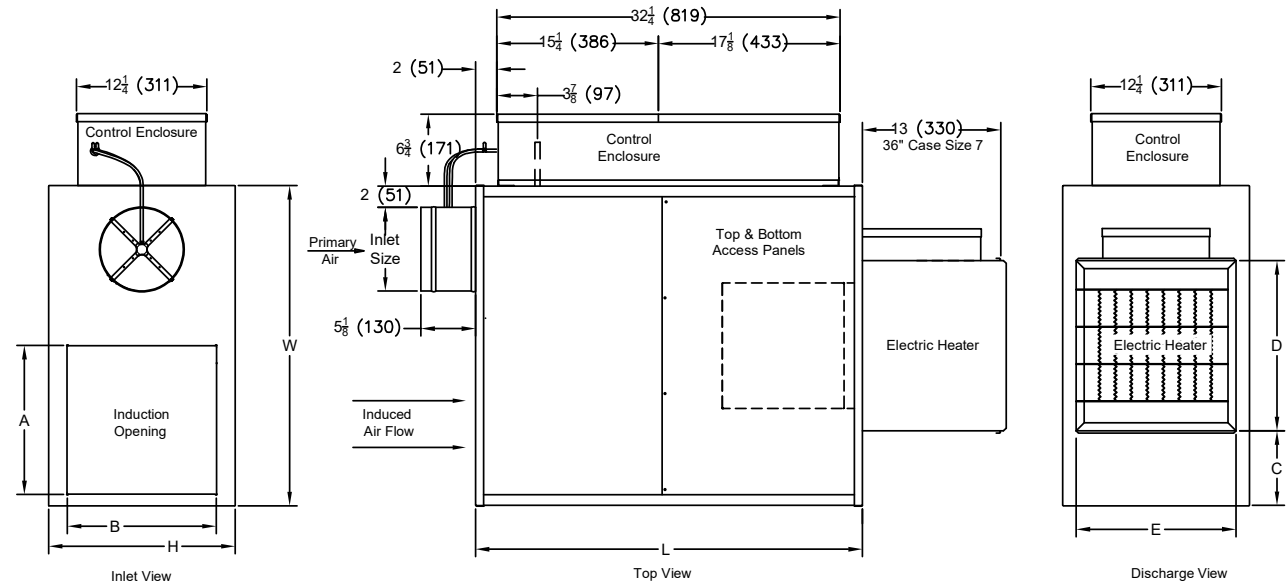
FCI-600-002 SERIES FAN POWERED AIR TERMINAL UNIT
WITH HOT WATER COIL



The standard location for control enclosure is Left Hand. Looking in the direction of airflow, the control enclosure is on the left.
Case size 7 includes two discharge blowers.

Case Size	Inlet Size		Horse Power		Unit Width	Unit Height	Unit Length	Induction		Direction		
								Width	Height	Loc.	Width	Height
	Standard	Optional	PSC	ECM	W	H	L	A	B	C	D	E
2	8 (203)	4,5,6,10,12	1/8	1/3	30 (762)	17 1/2 (445)	36 (914)	14 (356)	14 (356)	7 (178)	16 (406)	15 (381)
3	10 (254)	4,5,6,8,12,14	1/8	1/3	36 (914)	17 1/2 (445)	40 (1016)	18 (457)	14 (356)	8 (203)	20 (508)	17 1/2 (445)
4	12 (305)	8,10,14	1/4	1/2	36 (914)	17 1/2 (445)	40 (1016)	18 (457)	14 (356)	8 (203)	20 (508)	17 1/2 (445)
5	14 (356)	10,12,16	1/3	1	40 (1016)	20 (508)	40 (1016)	18 (457)	16 (406)	10 (254)	20 (508)	17 1/2 (445)
6	16 (406)	10,12,14	1	1	42 (1067)	20 (508)	42 (1067)	20 (508)	16 (406)	10 (254)	22 (559)	18 (457)
7	16 (406)	12,14,18x16	3/4 (QTY 2)	1 (QTY 2)	46 (1168)	20 (508)	46 (1168)	22 (559)	16 (406)	4 (102)	38 (965)	20 (508)

FCI-600-003 SERIES FAN POWERED AIR TERMINAL UNIT
WITH ELECTRIC HEAT



The standard location for control enclosure is Left Hand.
Looking in the direction of airflow, the control enclosure is on the left.
Case size 7 includes two discharge blowers.

Case Size	Inlet Size		Horse Power		Unit Width	Unit Height	Unit Length	Induction		Direction		
								Width	Height	Loc.	Width	Height
	Standard	Optional	PSC	ECM	W	H	L	A	B	C	D	E
2	8 (203)	4,5,6,10,12	1/8	1/3	30 (762)	17 1/2 (445)	36 (914)	14 (356)	14 (356)	7 (178)	16 (406)	15 (381)
3	10 (254)	4,5,6,8,12,14	1/8	1/3	36 (914)	17 1/2 (445)	40 (1016)	18 (457)	14 (356)	10 (254)	16 (406)	15 (381)
4	12 (305)	8,10,14	1/4	1/2	36 (914)	17 1/2 (445)	40 (1016)	18 (457)	14 (356)	8 (203)	20 (508)	17 1/2 (445)
5	14 (356)	10,12,16	1/3	1	40 (1016)	20 (508)	40 (1016)	18 (457)	16 (406)	10 (254)	20 (508)	17 1/2 (445)
6	16 (406)	10,12,14	1	1	42 (1067)	20 (508)	42 (1067)	20 (508)	16 (406)	10 (254)	20 (508)	17 1/2 (445)
7	16 (406)	12,14,18x16	3/4 (QTY 2)	1 (QTY 2)	46 (1168)	20 (508)	46 (1168)	22 (559)	16 (406)	4 (102)	38 (965)	20 (508)

FCI-600 APPROXIMATE WEIGHTS

Case	FCI
2	124 lbs.
3	165 lbs.
4	165 lbs.
5	198 lbs.
6	220 lbs.
7	260 lbs.

FCI-600 FILTER SIZES PER CASE SIZE

Case Size	Filter Dimensions
2	16" x 16"
3	20" x 16"
4	20" x 16"
5	20" x 20"
6	24" x 20"
7	20" x 20"

Filters are mounted on the fan induction and are available in 1" or 2" thickness.

CERTIFICATIONS AND STANDARDS

- Units tested per ASHRAE Standard 130-2016.
- All model sizes certified in accordance with AHRI 880-2017 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A/90B.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.
- Hot water coils are manufactured in accordance to AHRI Standard 410.

FCI-600 AHRI CERTIFIED RATING POINTS



RADIATED SOUND FAN ONLY

Case-Inlet Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
2-08	400	0.03	57	51	50	33	33	29
3-10	700	0.03	58	55	46	39	37	37
4-12	1200	0.01	65	64	50	47	45	42
5-14	1800	0.09	67	67	56	51	50	48
6-16	2400	0.07	67	67	56	51	50	48
7-16	2800	0.10	74	66	60	54	54	53

RADIATED SOUND

Power Levels @ 1.5" w.g. ΔPs

Case-Inlet Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
2-08	400	0.03	59	58	53	44	46	46
3-10	700	0.03	63	60	54	47	48	49
4-12	1200	0.01	68	66	60	56	52	50
5-14	1800	0.09	72	71	66	59	57	55
6-16	2400	0.07	74	71	56	51	50	48
7-16	2800	0.10	80	73	69	69	58	57

DISCHARGE SOUND FAN ONLY

Case-Inlet Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
2-08	400	0.03	58	59	58	50	49	45
3-10	700	0.03	62	61	61	59	56	54
4-12	1200	0.01	66	69	65	64	64	63
5-14	1800	0.09	73	69	72	70	67	66
6-16	2400	0.07	76	74	75	74	74	74
7-16	2800	0.10	81	72	70	69	68	67

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation
- 8) Discharge (external) static pressure is 0.25" w.g. for all cases



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RADIATED SOUND MODEL FCI - PSC MOTOR

SERIES FAN POWERED

FCI-600 CONSTANT VOLUME

OCTAVE BAND SOUND POWER, Lw, dB																														
Case-Inlet Size	CFM	Min ΔPs	FAN ONLY							ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
2-08	150	0.02	53	49	47	28	27	22	21	53	52	48	36	36	35	22	55	55	51	40	41	40	25	57	57	52	43	43	42	26
	300	0.02	55	50	49	31	30	26	23	55	54	50	38	38	37	24	55	55	51	40	41	41	25	57	57	52	43	43	43	26
	400	0.03	57	51	50	33	33	29	24	57	55	52	40	41	40	26	57	56	52	42	44	44	26	59	58	53	44	46	46	28
	500	0.04	58	52	51	34	34	30	25	58	56	52	41	42	41	26	58	57	53	43	45	45	28	60	59	54	45	47	47	29
700	0.10	62	55	53	36	36	33	27	61	58	54	42	44	43	29	61	59	55	45	47	47	30	63	61	56	47	49	49	31	
3-10	550	0.02	57	53	44	37	35	34	21	60	56	48	44	42	42	25	60	56	50	44	44	44	25	60	57	52	46	46	48	26
	600	0.02	57	54	45	38	36	36	22	60	56	48	44	43	42	25	61	57	51	44	44	45	26	61	58	53	47	47	48	28
	700	0.03	58	55	46	39	37	37	24	61	57	49	45	44	43	26	62	59	52	45	45	46	29	63	60	54	47	48	49	30
	800	0.04	60	57	46	41	40	40	26	62	60	50	47	45	45	30	64	61	53	46	46	47	31	64	62	55	48	48	50	32
	850	0.05	61	58	47	43	42	42	27	63	60	50	48	46	46	30	64	62	54	46	47	48	32	65	62	56	48	49	50	32
4-12	600	0.01	57	55	45	39	36	31	19	63	60	49	42	40	35	30	64	61	52	46	41	35	31	65	62	53	48	43	39	32
	900	0.01	60	58	47	42	40	35	27	64	62	51	45	44	40	32	66	63	54	49	45	40	34	66	64	55	51	47	44	35
	1200	0.01	65	64	50	47	45	42	34	66	64	56	50	49	46	35	67	65	59	54	50	46	32	68	66	60	56	52	50	37
	1300	0.01	65	65	51	49	47	44	35	67	66	56	52	51	48	37	68	66	60	56	52	48	37	69	68	60	58	54	52	39
1400	0.02	65	65	53	50	49	46	35	68	67	57	53	53	50	38	69	68	60	57	54	50	39	70	69	61	59	56	54	40	
5-14	1100	0.03	64	61	51	44	43	39	30	68	63	54	48	46	42	34	68	63	56	50	46	42	34	68	63	56	50	46	42	34
	1400	0.05	66	64	53	48	47	43	34	71	66	57	51	50	46	37	71	66	58	52	50	46	37	71	66	59	53	50	46	37
	1800	0.09	67	67	56	51	50	48	38	72	71	60	55	54	51	42	72	71	61	56	54	51	42	72	71	62	57	54	51	42
	1900	0.10	68	69	57	53	52	50	40	72	72	61	56	55	52	44	72	72	62	57	55	52	44	72	72	63	58	55	52	44
	2000	0.11	69	70	57	54	54	52	41	73	73	62	57	56	53	45	73	73	63	58	56	53	45	73	73	64	59	56	53	45
6-16	1500	0.01	60	60	53	45	42	41	29	66	64	60	51	47	46	35	68	65	62	53	49	47	37	69	66	62	53	50	48	37
	1900	0.04	62	62	53	48	44	43	32	68	66	61	52	50	48	37	70	68	63	54	51	50	39	70	68	64	54	52	50	39
	2400	0.07	67	67	56	51	50	48	38	72	70	63	56	55	53	41	73	71	65	58	56	54	42	74	71	66	59	57	55	42
	2600	0.08	69	69	57	55	53	51	40	74	71	64	57	56	54	42	75	72	66	58	57	55	44	76	72	66	59	57	56	44
2800	0.10	72	72	58	59	56	54	44	75	74	66	59	58	56	46	76	74	68	59	58	56	46	77	75	68	60	59	57	48	
7-16	2400	0.07	70	63	58	53	53	52	35	74	66	61	55	54	55	40	75	68	62	55	54	55	41	77	70	66	56	55	54	44
	2600	0.08	71	64	59	54	54	52	36	76	69	64	56	56	55	42	76	70	64	56	56	56	42	78	72	68	58	56	56	45
	2800	0.10	74	66	60	54	54	53	40	77	71	65	57	56	55	44	77	72	66	57	56	55	44	80	73	69	69	58	57	48
	3400	0.13	76	69	63	57	57	55	43	79	73	67	59	58	57	46	79	74	68	59	58	57	46	83	76	72	62	61	60	52
4100	0.16	78	71	65	59	60	57	45	80	74	68	61	61	59	48	80	75	69	61	60	60	48	85	78	74	65	64	63	55	

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Radiated sound is the noise transmitted through the unit casing
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge (external) static pressure is 0.25" w.g. for all cases

DISCHARGE SOUND MODEL FCI - PSC MOTOR

OCTAVE BAND SOUND POWER, Lw, dB																														
Case-Inlet Size	CFM	Min ΔPs	FAN ONLY							ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
2-08	150	0.02	54	57	55	45	43	38	15	55	57	56	47	45	41	<15	58	60	59	50	48	43	19	58	60	59	51	48	43	19
	300	0.02	56	58	57	48	46	42	15	57	59	58	49	47	43	16	58	60	59	50	48	44	19	58	60	59	51	48	44	18
	400	0.03	58	59	58	50	49	45	16	59	60	59	51	50	46	18	60	61	60	52	51	47	19	60	61	60	52	51	47	19
	500	0.04	59	60	59	51	50	46	18	60	61	60	52	51	47	19	61	62	61	53	52	48	20	61	62	61	53	52	48	20
	700	0.10	62	62	61	53	52	48	20	63	63	62	54	53	49	20	64	64	63	55	54	50	21	64	64	63	55	54	50	21
3-10	550	0.02	61	59	61	57	54	51	16	62	60	62	58	56	53	18	63	62	63	60	56	54	20	63	62	63	60	56	54	20
	600	0.02	61	60	61	58	55	53	18	62	61	62	59	56	54	19	63	62	63	60	57	55	20	63	62	63	60	57	55	20
	700	0.03	62	61	61	59	56	54	19	63	62	62	60	57	55	19	64	63	61	58	56	20	20	64	63	63	61	58	56	20
	800	0.04	64	63	61	61	59	57	21	65	64	62	62	60	58	22	66	65	63	63	61	59	23	66	65	63	63	61	59	23
	850	0.05	65	64	62	63	61	59	23	66	64	62	63	61	59	23	66	66	64	64	62	60	24	66	66	64	64	62	60	24
4-12	600	0.01	63	59	58	56	55	52	16	64	62	59	57	56	53	20	65	63	60	58	57	54	21	65	64	60	58	57	54	22
	900	0.01	65	65	60	59	59	57	22	66	68	61	60	60	58	26	66	68	62	61	61	58	26	66	70	62	61	61	58	29
	1200	0.01	66	69	65	64	64	63	27	67	72	66	65	65	64	31	68	73	67	66	66	65	32	68	74	67	66	66	65	34
	1300	0.01	67	70	65	66	66	65	29	68	72	66	66	67	66	31	69	74	68	68	68	67	34	69	74	68	68	68	67	34
	1400	0.02	68	70	66	67	68	67	31	69	73	67	68	69	68	32	70	74	68	69	70	69	34	70	75	68	69	70	69	35
5-14	1100	0.03	70	62	66	63	60	56	21	71	63	67	64	61	57	22	72	64	68	64	62	58	24	72	64	68	64	62	58	24
	1400	0.05	72	66	69	67	64	61	25	73	67	70	68	65	62	26	74	68	71	69	66	63	27	74	68	71	69	66	63	27
	1800	0.09	73	69	72	70	67	66	30	74	70	73	71	68	67	30	75	71	74	72	69	68	31	75	71	74	72	69	68	31
	1900	0.10	74	71	72	71	70	68	32	75	72	74	72	70	69	32	76	72	74	74	71	70	33	76	72	74	74	71	70	33
	2000	0.11	75	72	73	73	71	70	33	76	73	74	74	72	71	34	77	74	75	75	73	72	35	77	74	75	75	73	72	35
6-16	1500	0.01	67	65	71	66	64	65	29	68	66	72	67	65	66	29	69	67	73	68	66	67	30	69	67	73	68	66	67	30
	1900	0.04	72	70	72	72	69	69	33	73	71	74	72	70	70	33	74	72	74	74	71	72	35	74	72	74	74	71	72	35
	2400	0.07	76	74	75	74	74	74	37	77	75	76	75	75	75	38	78	76	77	76	76	76	39	78	76	77	76	76	76	39
	2600	0.08	78	76	76	78	77	77	40	79	77	77	79	78	78	41	80	78	78	80	79	79	42	80	78	78	80	79	79	42
	2800	0.10	81	79	77	82	80	80	43	82	80	78	83	81	81	44	83	81	79	84	82	82	45	83	81	79	84	82	82	45
7-16	2400	0.07	77	69	68	68	67	65	30	78	70	69	69	68	67	31	79	71	70	70	69	68	32	79	71	70	70	69	68	32
	2600	0.08	78	70	69	69	68	66	31	80	72	70	70	69	68	34	82	73	72	71	70	68	36	82	73	72	71	70	68	36
	2800	0.10	81	72	70	69	68	67	35	82	73	71	70	69	68	36	83	74	72	71	70	69	38	83	74	72	71	70	69	38
	3400	0.13	83	75	73	72	71	69	36	84	76	74	73	72	70	39	85	77	75	74	73	71	40	85	77	75	74	73	71	40
	4100	0.16	85	77	75	74	74	71	40	86	78	76	76	76	72	41	87	79	77	76	76	74	42	87	79	77	76	76	74	42

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E

- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 10) Discharge (external) static pressure is 0.25" w.g. for all cases

FCI-600 PSC FAN MOTOR AMPERAGE RATINGS

Case Size	Motor HP	Standard PSC Motor Amperage Ratings		
		120v-1 Phase 60 Hz Rated Amps	208-240v-1 Phase 60 Hz Rated Amps	277v-1 Phase 60 Hz Rated Amps
2	1/8	2.6	0.8	1.1
3	1/8	2.6	0.8	1.1
4	1/4	4.8	1.9	1.9
5	1/3	8.8	3.0	3.6
6	1	N/A	6.2	6.2
7	3/4 (two motors)	22.8 (two motors)	8.0 (two motors)	8.6 (two motors)

FCI-600 ECM FAN MOTOR AMPERAGE RATINGS

Case	HP	FLA 120	FLA 208	FLA 230	FLA 277
2	1/3	5.50	3.10	2.7	2.60
3	1/3	5.50	3.10	2.7	2.60
4	1/2	8.30	4.80	4.5	3.70
5	1	12.00	7.80	7.3	6.60
6	1	12.00	7.80	7.3	6.60
7	1 (2)	24.00	15.60	14.6	13.20

FCI-600 DAMPER LEAKAGE

Standard Construction			
Inlet Diameter	Static Pressure " w.g.	Maximum Airflow	Max Damper Leakage
4	3	300	5
5	3	375	5
6	3	540	5
7	3	760	7
8	3	990	9
9	3	1250	12
10	3	1640	16
12	3	2350	22
14	3	3250	32
16	3	4100	41
20	3	6430	64
24	3	7270	72

PERFORMANCE NOTES

- 1) Leakage testing conducted in accordance with ASHRAE 130-2016
- 2) Per ASHRAE Standard 130-2016 "terminal damper leakage: the amount of air in ft 3/min (L/s) leaking through a fully closed damper/valve of a supply/exhaust terminal unit at a given inlet pressure"opened"

- 3) Damper leakage shall not exceed 1% of the maximum rated airflow at 3" w.g.
- 4) 4" and 5" inlets are built with 6" casings

FCI-600 HOT WATER COILS

When ordered with the air terminal, the hot water coil is shipped attached to the discharge of the terminal casing. The discharge end of the casing has slip and drive connections for easy connection to downstream ductwork. The hot water coil is constructed of aluminum fin and copper serpentine-type tubes with male sweat connections tested at 300 psig.

Coil selection can be made using METALAIRE's Air Terminal Unit Selection Software. Contact your representative for a copy. In the interest of energy conservation and due to the possibility of condensation, all hot water coils are marked "Coil must be externally insulated after installation in the field." Hot water coils are tested in accordance with AHRI Standards 410. Hot water coils may be ordered with optional access doors for inspection and cleaning to meet requirements of ASHRAE Standard 62.1.

HOT WATER COIL CONSTRUCTION DETAILS

- Hot Water Coils are factory mounted to the discharge of the terminal and are available with an optional factory mounted discharge plenum section with access door.
- Hot water coils are enclosed in a 20 gauge coated steel casing allowing for attachment to metal ductwork with a slip and drive connection.
- Fins are rippled and sine wave type constructed from heavy gauge aluminum and are mechanically bonded to the tubes.
- Tubes are copper with a minimum wall thickness of 0.016" with male sweat header connections.
- Coils are leak tested to 300 psi with minimum burst of 2000 psi at ambient temperature. Coil performance data is based on tests run in accordance with AHRI standard 410. Coils are AHRI certified and include an AHRI label.



FCI-600 COIL CONNECTION SIZE

Outside Diameter (OD) connection size, Inches		
Case Size	Standard HW Coil Inches	
	1 Row	2 Row
2	7/8	7/8
3	5/8	7/8
4	5/8	7/8
5	5/8	7/8
6	5/8	7/8
7	7/8	7/8

All coils have 10 fins/inch with optional 12 fins/inch

All accessories that can be attached to the Series Fan Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

FCI-600 HOT WATER COILS MBH SELECTION DATA

Case Size	Rows	Connection (OD)	GPM	Head Loss (ft-H ₂ O)	CFM							
					300	350	400	450	500	550	600	700
2	One	0.875	1	0.14	12.7	13.5	14.3	15.0	15.6	16.2	16.7	17.6
			2	0.54	14.3	15.4	16.5	17.4	18.2	19.0	19.7	21.1
			4	2.06	15.3	16.6	17.8	18.9	20.0	20.9	21.8	23.4
			6	4.52	15.7	17.1	18.4	19.5	20.6	21.6	22.6	24.3
			Airside Ps		0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.06
2	Two	0.875	1	0.09	17.8	19.1	20.3	21.3	22.2	23.0	23.7	25.0
			2	0.34	20.9	22.9	24.6	26.2	27.6	28.9	30.1	32.2
			4	1.32	23.0	25.4	27.6	29.6	31.5	33.2	34.8	37.8
			6	2.94	23.8	26.4	28.8	31.0	33.0	35.0	36.8	40.1
			Airside Ps		0.03	0.04	0.05	0.06	0.07	0.09	0.10	0.13

Case Size	Rows	Connection (OD)	GPM	Head Loss (ft-H ₂ O)	CFM							
					400	450	500	550	600	700	800	900
3	One	0.625	1	0.20	16.8	17.6	18.4	19.1	19.8	20.9	21.9	22.7
			2	0.75	19.3	20.5	21.5	22.5	23.4	25.1	26.6	27.9
			4	2.88	20.9	22.3	23.5	24.8	25.9	27.9	29.8	31.4
			6	6.30	21.5	23.0	24.3	25.6	26.8	29.0	31.1	32.9
			Airside Ps		0.01	0.01	0.02	0.02	0.02	0.03	0.04	0.05
3	Two	0.875	1	0.10	22.9	24.1	25.3	26.2	27.1	28.7	30.0	31.1
			2	0.39	27.7	29.6	31.3	32.9	34.4	37.1	39.4	41.4
			4	1.52	30.9	33.3	35.6	37.7	39.7	43.3	46.6	49.6
			6	3.36	32.1	34.8	37.2	39.6	41.8	45.9	49.7	53.1
			Airside Ps		0.03	0.03	0.04	0.05	0.05	0.07	0.09	0.10

Case Size	Rows	Connection (OD)	GPM	Head Loss (ft-H ₂ O)	CFM							
					800	900	1000	1100	1200	1300	1400	1500
4	One	0.625	1	0.20	21.9	22.7	23.5	24.2	24.8	25.3	25.9	26.3
			2	0.76	26.6	27.9	29.1	30.1	31.1	32.0	32.9	33.6
			4	2.88	29.8	31.4	33.0	34.4	35.7	36.9	38.0	39.1
			6	6.31	31.1	32.9	34.6	36.1	37.5	38.9	40.2	41.4
			Airside Ps		0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11
4	Two	0.875	1	0.10	30.0	31.1	32.1	32.9	33.6	34.3	34.9	35.4
			2	0.39	39.4	41.4	43.3	44.9	46.4	47.7	49.0	50.1
			4	1.52	46.6	49.6	52.3	54.8	57.1	59.2	61.2	63.0
			6	3.36	49.7	53.1	56.2	59.1	61.8	64.3	66.7	68.9
			Airside Ps		0.09	0.10	0.12	0.15	0.17	0.19	0.22	0.24

1) All coil performance in accordance with AHRI Standard 410-2001

2) Heating capacities are in MBH

3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)

4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

5) Head Loss is in feet of water

6) Airside ΔPs is the air pressure drop of the hot water coil

7) Air temperature rise = $927 \times \text{MBH/CFM}$

8) Water temperature drop = $2.04 \times \text{MBH/GPM}$

9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

FCI-600 HOT WATER COILS MBH SELECTION DATA

Case Size	Rows	Connection (OD)	GPM	Head Loss (ft-H ₂ O)	CFM							
					1200	1350	1475	1600	1725	1850	1975	2000
5	One	0.625	1	0.20	24.8	25.6	26.2	26.7	27.2	27.7	28.1	28.2
			2	0.76	31.1	32.4	33.4	34.4	35.2	36.0	36.7	36.9
			4	2.89	35.7	37.5	38.8	40.1	41.3	42.4	43.4	43.6
			6	6.32	37.5	39.5	41.1	42.5	43.8	45.1	46.2	46.5
			Airside Ps		0.08	0.09	0.11	0.13	0.14	0.16	0.18	0.19
5	Two	0.875	1	0.10	33.6	34.6	35.3	35.9	36.5	37.0	37.4	37.5
			2	0.39	46.4	48.4	49.8	51.2	52.4	53.5	54.5	54.7
			4	1.52	57.1	60.2	62.5	64.7	66.8	68.6	70.4	70.7
			6	3.36	61.8	65.5	68.4	71.0	73.5	75.8	77.9	78.4
			Airside Ps		0.17	0.20	0.24	0.27	0.31	0.35	0.39	0.39

Case Size	Rows	Connection (OD)	GPM	Head Loss (ft-H ₂ O)	CFM							
					1800	1900	2000	2100	2200	2300	2400	2600
6	One	0.625	1	0.21	28.7	29.1	29.4	29.7	30.0	30.3	30.6	31.1
			2	0.81	37.4	38.0	38.7	39.2	39.8	40.3	40.8	41.7
			4	3.08	44.0	45.0	45.8	46.6	47.4	48.2	48.9	50.3
			6	6.73	46.8	47.9	48.9	49.8	50.7	51.6	52.4	54.0
			Airside Ps		0.13	0.14	0.16	0.17	0.19	0.2	0.22	0.25
6	Two	0.875	1	0.10	38.0	38.4	38.8	39.0	39.4	39.7	40.0	40.4
			2	0.40	55.0	55.9	56.8	57.6	58.4	59.0	59.7	60.9
			4	1.57	70.6	72.2	73.7	75.1	76.4	77.6	78.8	81.1
			6	3.47	78.0	79.9	81.7	83.4	85.1	86.6	88.2	91.0
			Airside Ps		0.28	0.31	0.34	0.36	0.39	0.43	0.46	0.52

Case Size	Rows	Connection (OD)	GPM	Head Loss (ft-H ₂ O)	CFM							
					2400	2600	2800	3000	3200	3400	3600	4000
7	One	0.875	2	0.37	51.4	52.6	53.6	54.6	55.5	56.3	57.1	58.5
			4	1.43	64.7	66.6	68.4	70.0	71.5	73.0	74.3	76.8
			6	3.18	70.8	73.1	75.2	77.2	79.1	80.9	82.6	85.7
			8	3.65	74.3	76.8	79.2	81.5	83.6	85.6	87.5	91.0
			Airside Ps		0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.16
7	Two	0.875	2	0.27	71.9	73.4	74.7	75.9	77.0	78.0	78.9	80.5
			4	1.07	98.7	101.7	104.5	107.0	109.4	111.6	113.6	117.3
			6	2.39	112.2	116.2	119.9	123.3	126.6	129.6	132.4	137.6
			8	4.22	120.3	125.0	129.3	133.4	137.2	140.9	144.3	150.5
			Airside Ps		0.15	0.17	0.19	0.21	0.24	0.26	0.29	0.34

- 1) All coil performance in accordance with AHRI Standard 410-2001
- 2) Heating capacities are in MBH
- 3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)
- 4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

- 5) Head Loss is in feet of water
- 6) Airside ΔPs is the air pressure drop of the hot water coil
- 7) Air temperature rise = $927 \times \text{MBH/CFM}$
- 8) Water temperature drop = $2.04 \times \text{MBH/GPM}$
- 9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

FCI-600 ELECTRIC HEAT

The discharge end has slip and drive connections for easy connection to downstream ductwork. ETL® listed heaters are provided with a fan interlock relay. Heaters that will be controlled electronically must include a 24 VAC control circuit to operate with the low voltage controls on the air terminal. Heater plenums are internally insulated. When an air terminal is ordered with clean room lining and electric heat, the heater plenum is either internally lined with optional foil backed insulation or closed cell foam or may require external insulation in field.

INCLUDED WITH EACH HEATER ASSEMBLY:

- Heater and cabinet mounted on the discharge of the FCI-600
- Electric Heater is interlocked into fan control relay
- De-energizing magnetic contactors per step
- Primary automatic reset high temperature limit (disc type)
- Backup manual reset high temperature limit (disc type)
- Non-fused transformer with voltage to match Heater voltage
- Single point power wiring connection
- Heater is shipped factory mounted and wired



ELECTRIC HEATER ASSEMBLY CONSTRUCTION DETAILS

- Electric Reheat Coils are factory mounted on the discharge of the Air Terminal. The heaters are ETL® listed for zero clearance, are tested in accordance with UL 60335, CSA-C22.2 and the National Electric Code (NEC). Heater casings are constructed of galvanized steel. Element wire is high grade nichrome alloy derated to 45 watts per square inch density. Element wire is supported by moisture-resistant steatite ceramics.
- Ceramics are enclosed in reinforcement brackets spaced across the heater element rack at 2" to 4" intervals. Controls are contained in a NEMA 1 control cabinet with a hinged, latching door. A permanent wiring diagram is affixed to the inside of the control cabinet door for field reference.
- The 208 and 480 volt units require a neutral connection for both single and three phase service. Our standard motors are 120 and 277 volt single phase. The 208-240 volt single phase motor is optional. 480 volt motors are not available for our units. See table for reference.

Heater Voltage	Fan Motor Voltage	Separate Neutral Required
120 V 1PH	120 V 1PH	NO
208 V 1PH	120 V 1PH	YES
277 V 1PH	277 V 1PH	NO
480 V 1PH	277 V 1PH	YES
208 V 1PH	208 V 1PH	NO
208 V 3PH	120 V 1PH	YES
480 V 3PH	277 V 1PH	YES
208 V 3PH	208 V 1PH	NO

All accessories that can be attached to the Series Fan Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

FCI-600 ELECTRIC HEATER CAPACITIES

Model FCI		Single Phase										Three Phase			
		120V		208V		240V		277V		480V		208V		480V	
Inlet Size	# of Steps Available	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	10	1.5	10	0.5	10	1.5	10
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
3	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1.5	11	0.5	12	1.5	12
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
4	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1.5	17	0.5	13	1.5	20
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
5	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1	17	0.5	13	1	25
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	
6	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1	17	0.5	13	1	25
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	
7	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1	17	0.5	13	1	25
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	

NOTES:

- Heaters less than 10 kW are specifiable to nearest 0.5 kW. Heaters greater than 10.0 kW are specifiable to nearest 1.0 kW.
- Minimum flow rate for electric heat is 70 CFM / kW.
Lower CFM's can cause nuisance tripping, excessive discharge temperatures, rapid cycling, and rapid element failure. Electric Heat units running below 70 CFM / kW will void all warranties.
- For optimum thermal comfort, the suggested discharge temperature should not exceed 20°F above room set point.
- We do not recommend discharge temperatures in excess of 115°F to protect heater coils.
- Maximum number of steps at "Min kW per Step" is one step.
- If more than 1 heater is wired into a building's circuit breaker (multi-outlet branch circuit), each heater will require the addition of power side fusing.

ELECTRIC HEAT SELECTION:

- Specify electric duct heaters using voltage, phase, kW, and number of steps.
- Use above chart to select voltage. Calculate required kW using following equations:

$$kW = \frac{BTU / HR}{3413} \quad kW = \frac{CFM \times \Delta \times 1.085}{3413} \quad \Delta = \frac{kW \times 3413}{CFM \times 1.085}$$

$$CFM = \frac{kW \times 3413}{\Delta \times 1.085} \quad CFM = \frac{kW \times 3413}{\Delta \times 1.085}$$

* air density at sea level—reduce by 0.036 for each 1000 feet of altitude above sea level

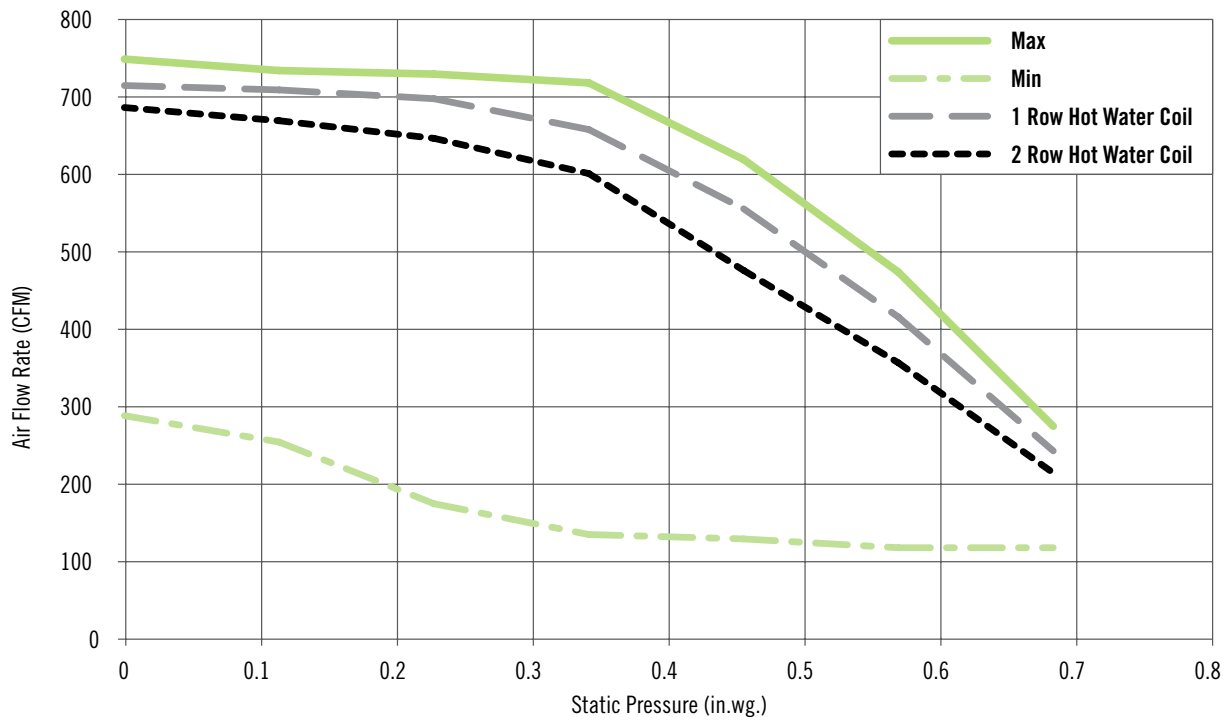
Where: BTU / Hr = Required heating capacity

CFM = volume of air during heating. Typically 100% of maximum cooling air volume

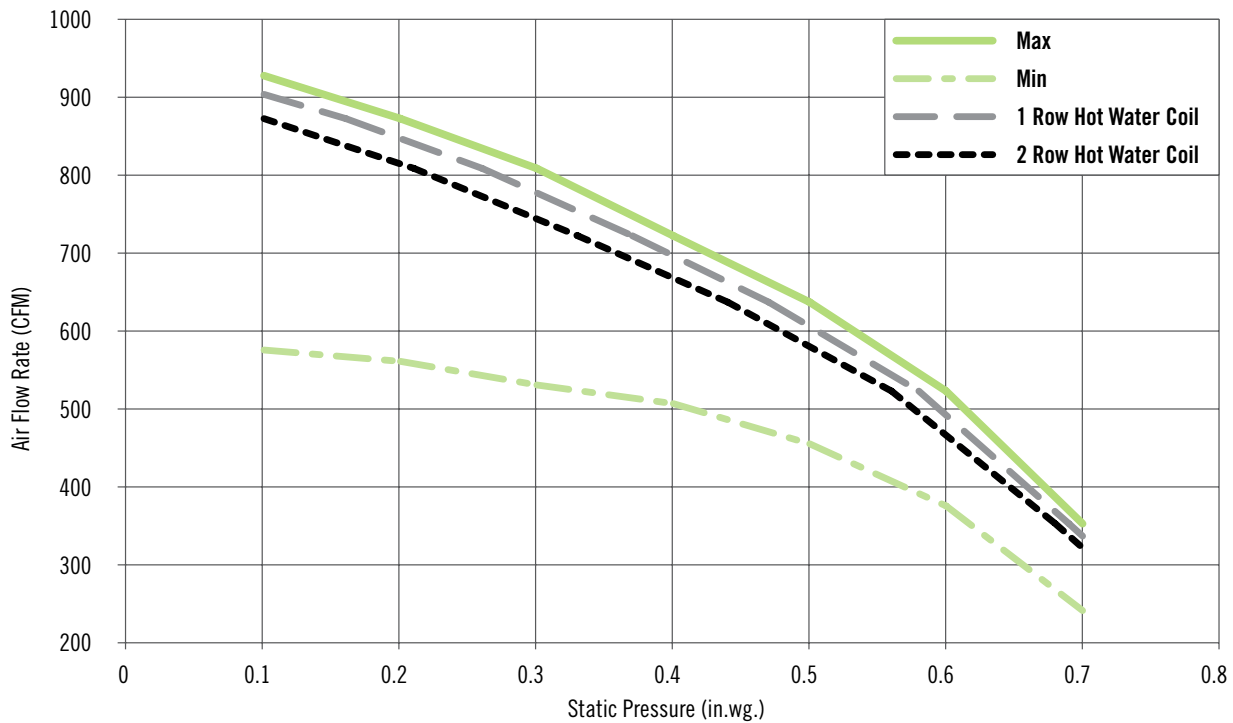
Δ = desired air temperature rise across the electric heater

Inlet air temperature = primary air temperature, usually 55°F

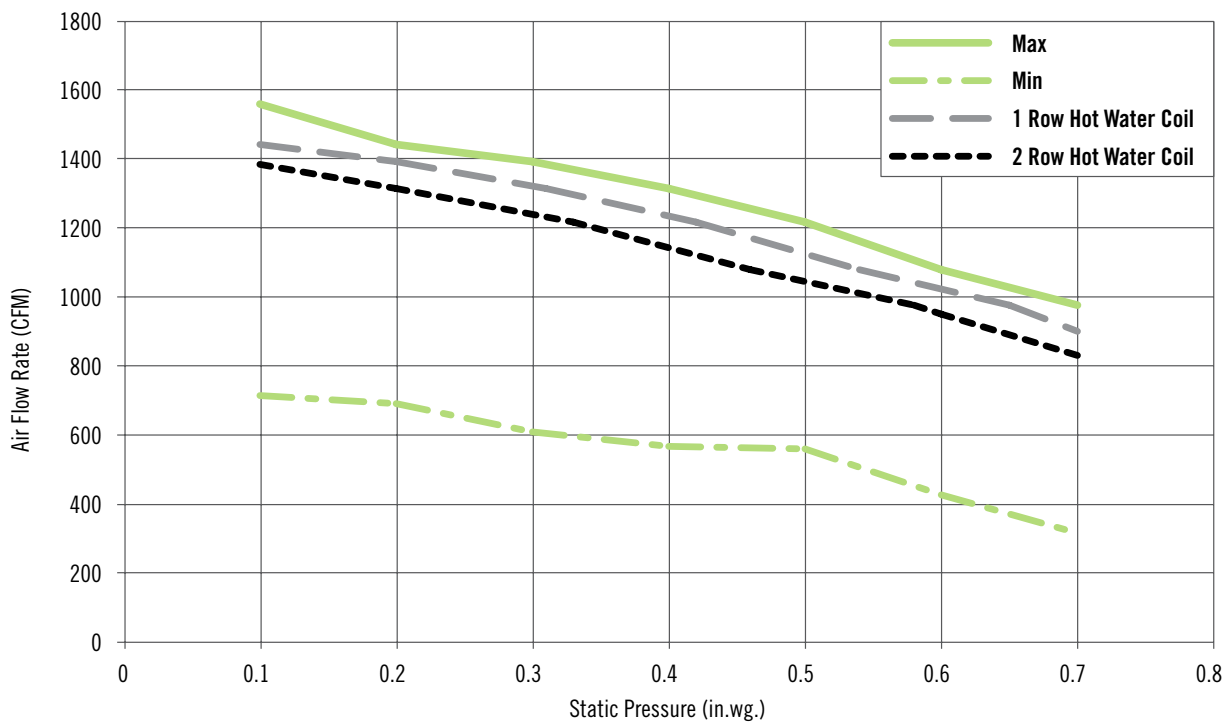
FCI-600 FAN PERFORMANCE CURVES CASE SIZE 2



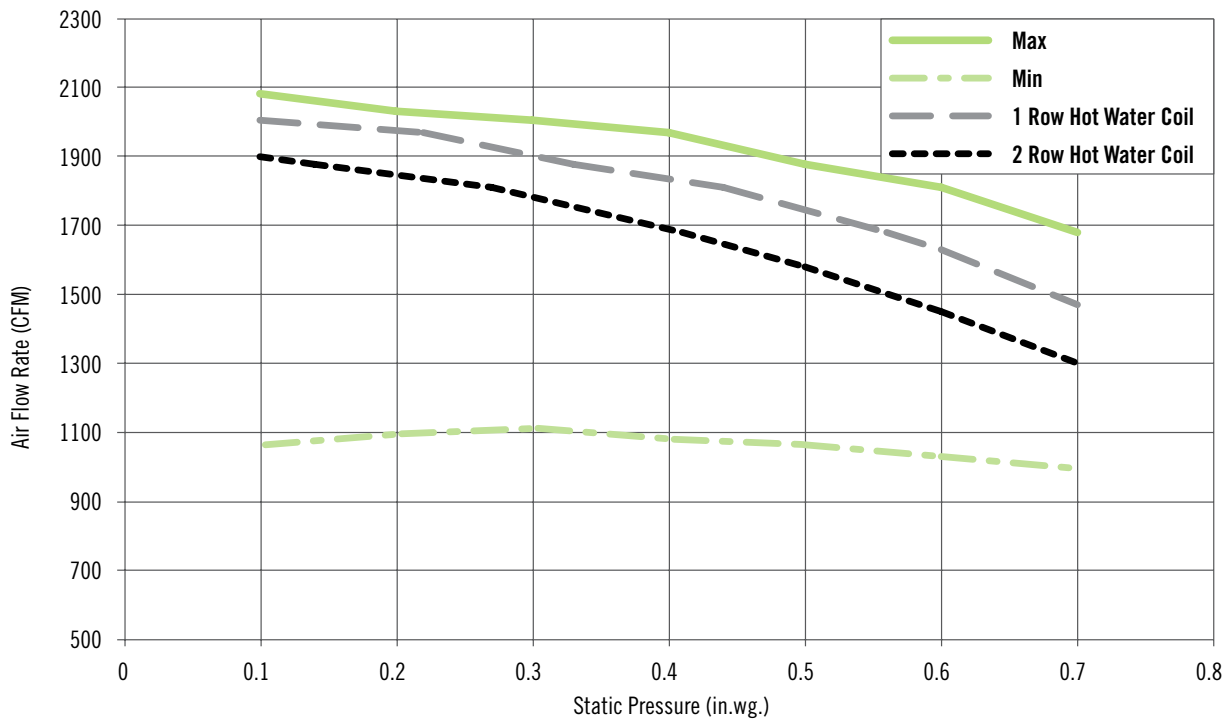
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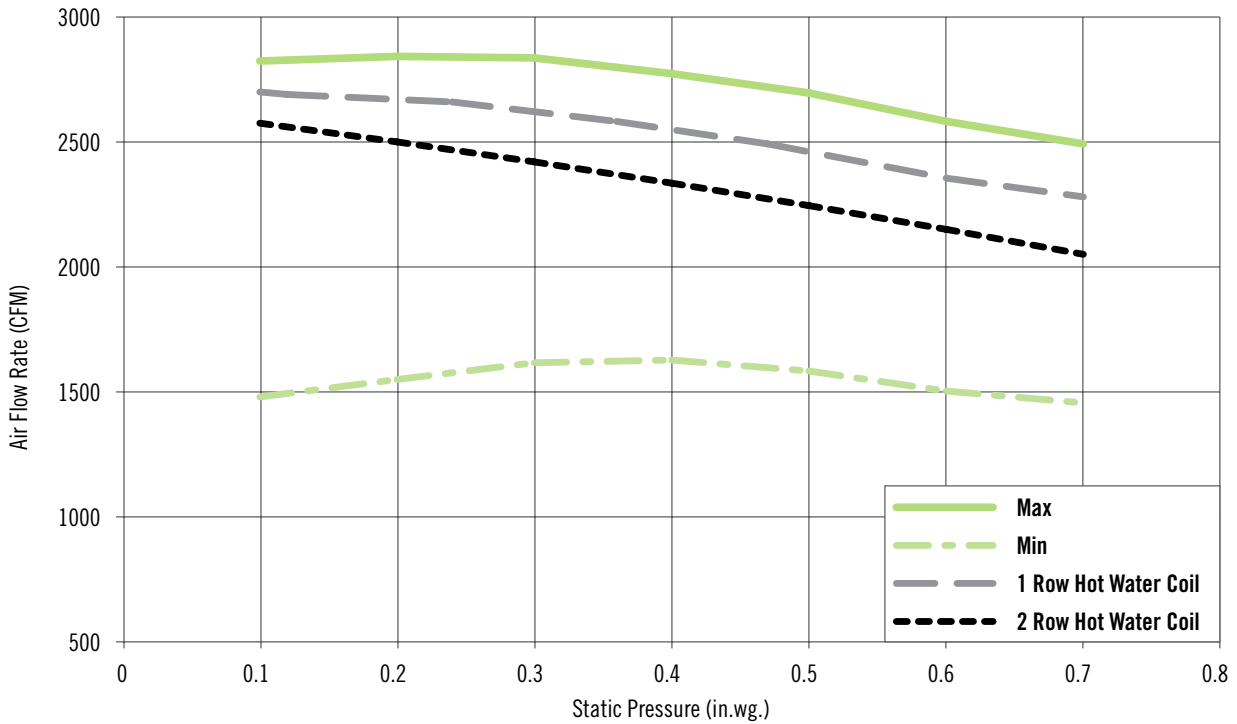
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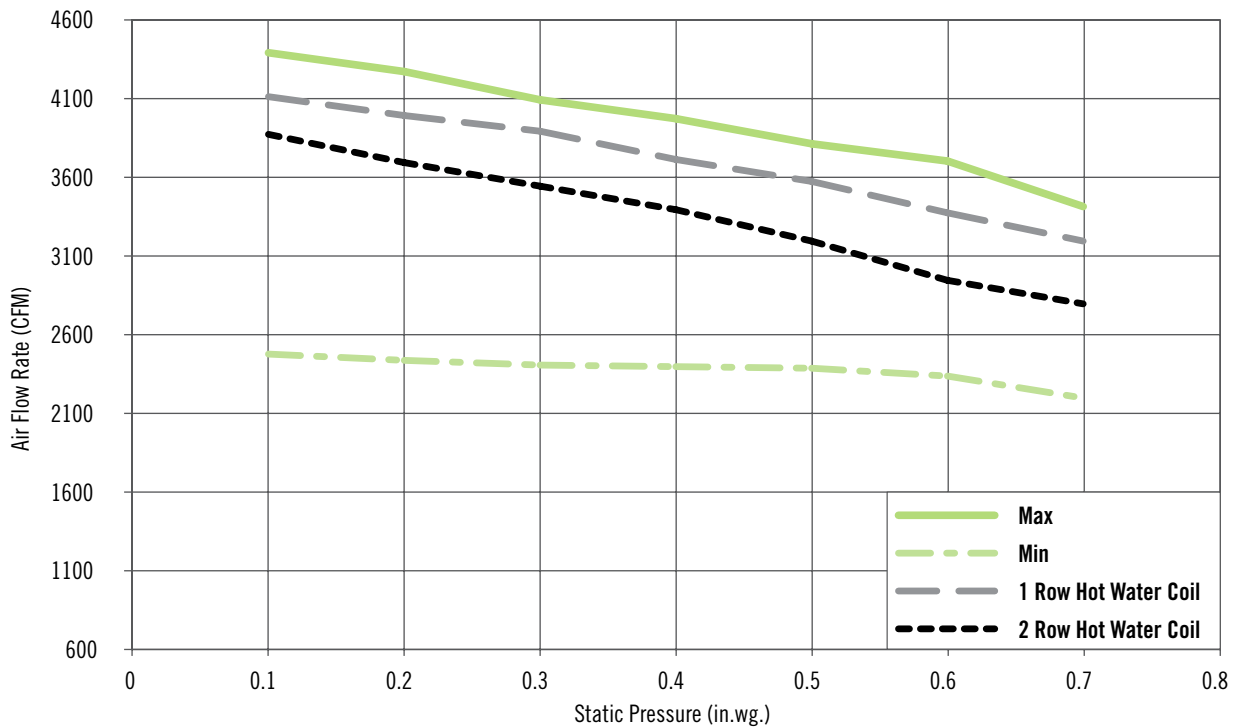
FCI-600 FAN PERFORMANCE CURVES CASE SIZE 5



FCI-600 FAN PERFORMANCE CURVES CASE SIZE 6

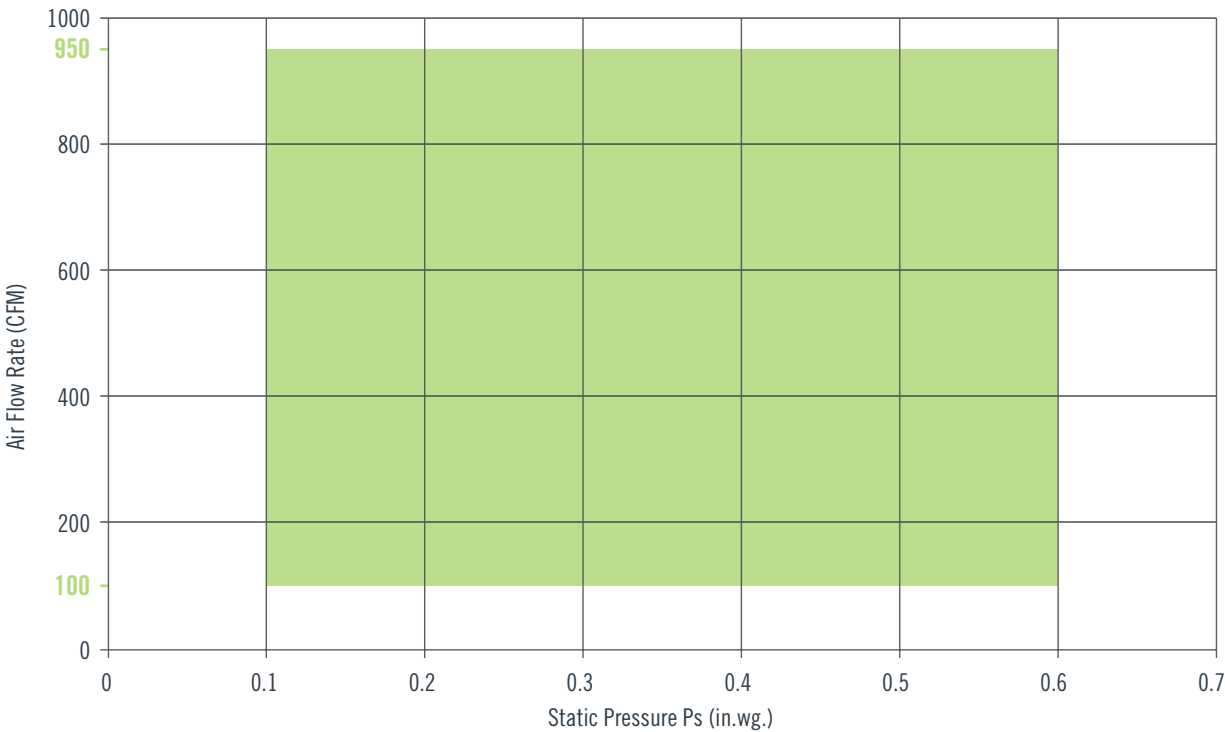


FCI-600 FAN PERFORMANCE CURVES CASE SIZE 7

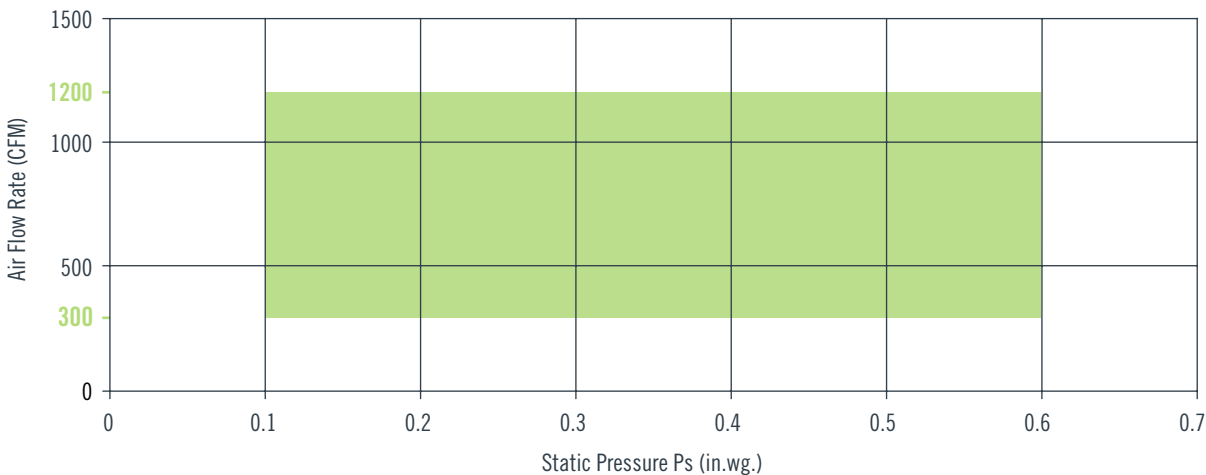




FCI-600 ECM FAN PERFORMANCE CURVES CASE SIZE 2



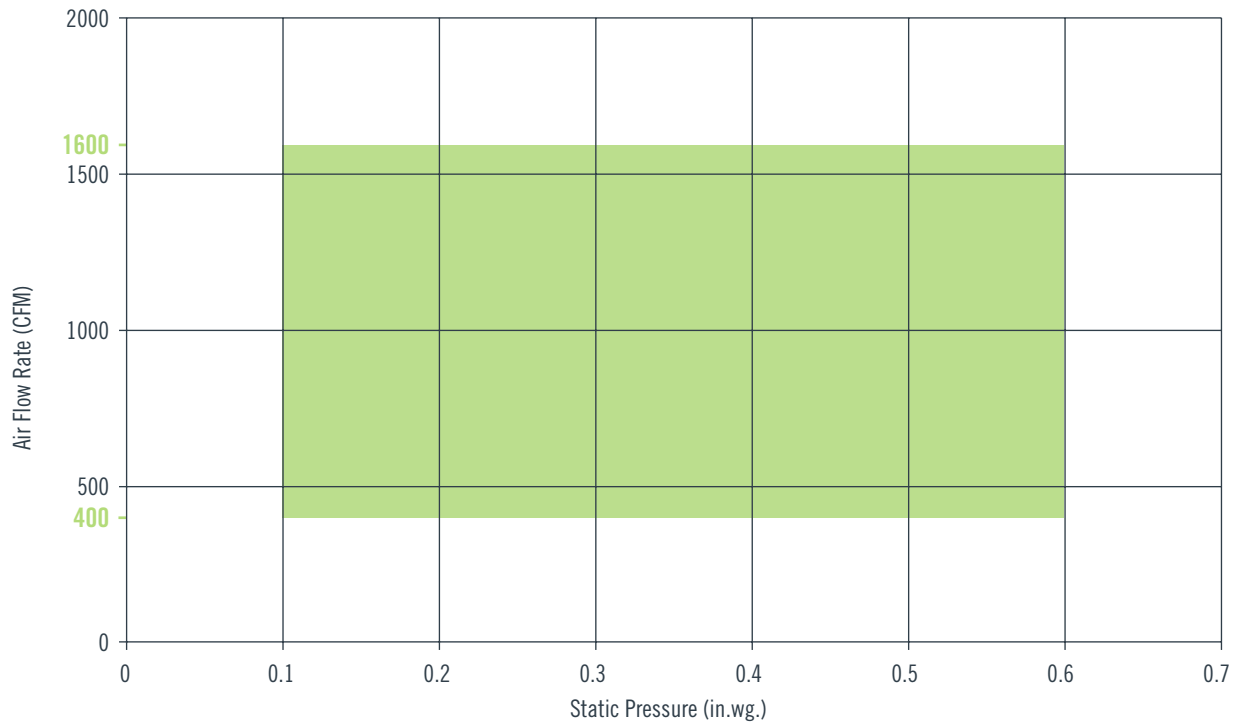
FCI-600 ECM FAN PERFORMANCE CURVES CASE SIZE 3



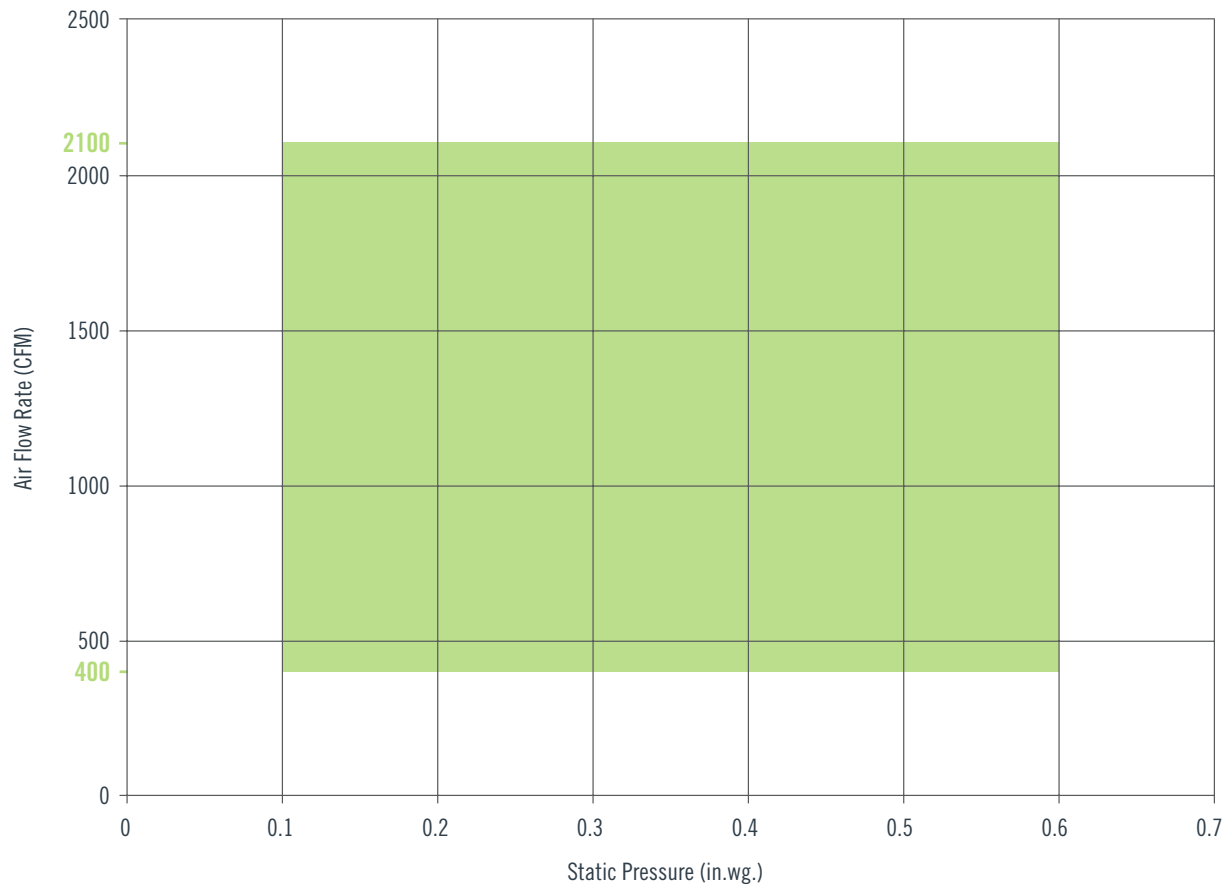
SERIES FAN POWERED

FCI-600 CONSTANT VOLUME

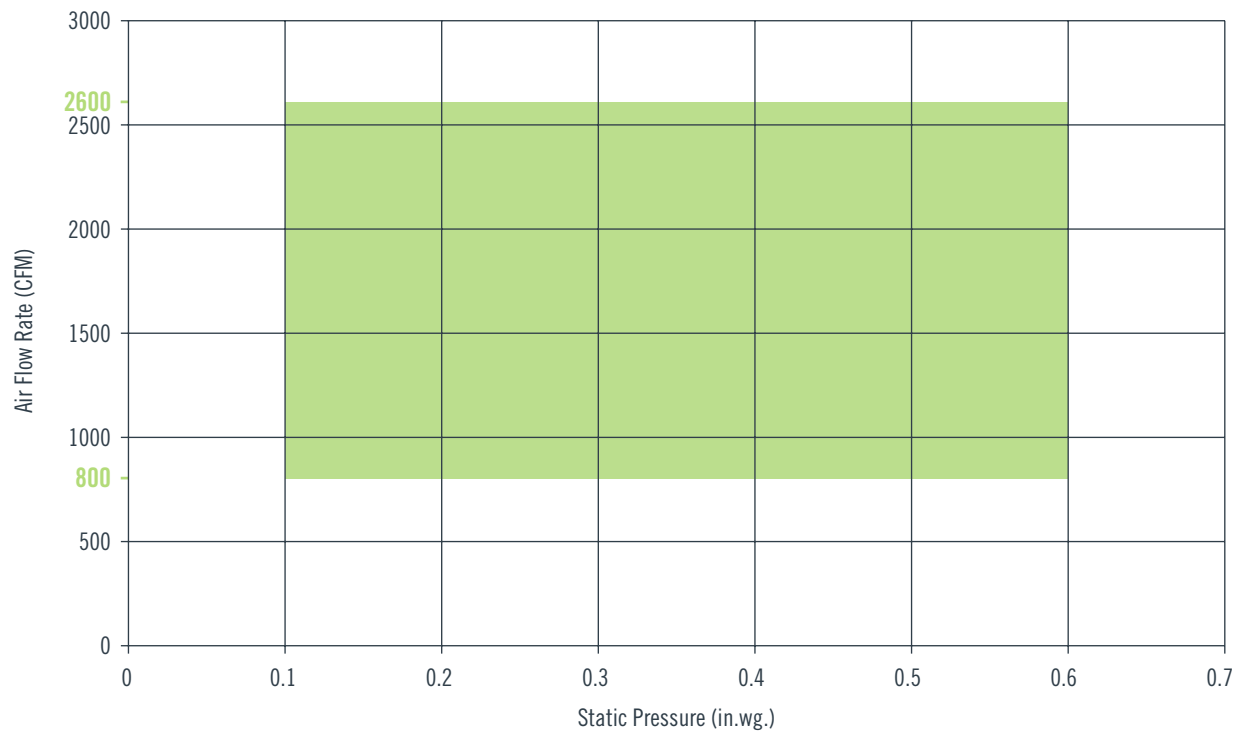
FCI-600 ECM FAN PERFORMANCE CURVES CASE SIZE 4



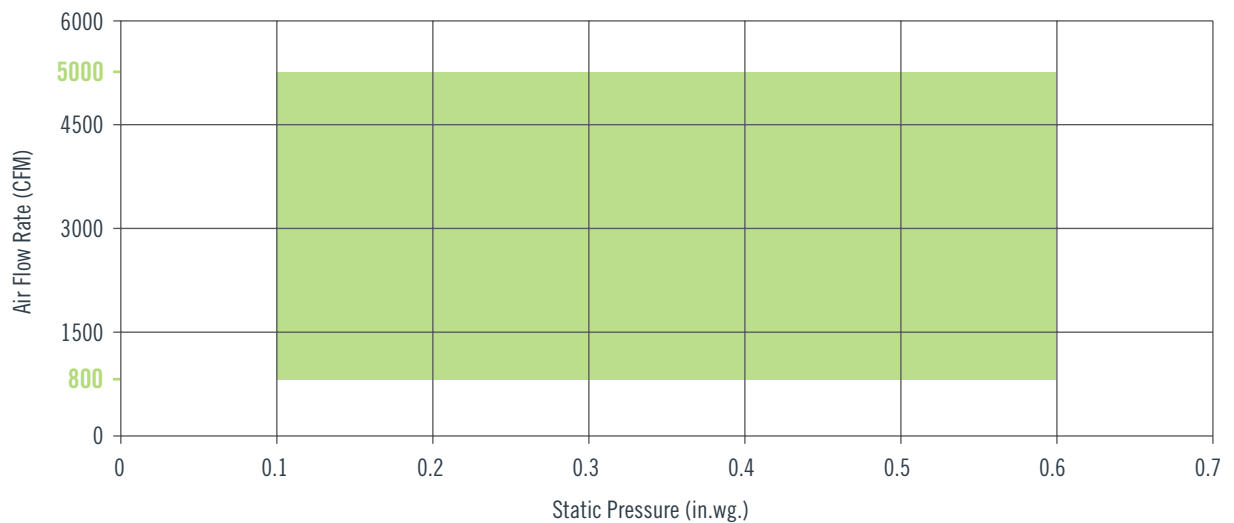
FCI-600 ECM FAN PERFORMANCE CURVES CASE SIZE 5



FCI-600 ECM FAN PERFORMANCE CURVES CASE SIZE 6

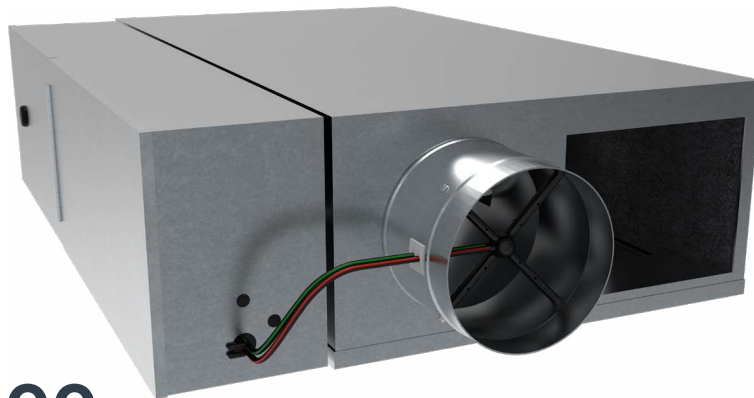


FCI-600 ECM FAN PERFORMANCE CURVES CASE SIZE 7



SERIES FAN POWERED

FCI-600 CONSTANT VOLUME



Intertek

FCL-600 LOW PROFILE CONSTANT VOLUME FAN TERMINAL UNIT

SPECIFIABLE FEATURES

- ▶ Galvanized steel casing, mechanically sealed for low leakage construction
- ▶ NEMA Type 1 rated hinged control enclosure with stand off to prevent penetration of casing
- ▶ Single speed high efficiency PSC motor with SCR motor speed control
- ▶ Riveted round primary inlet duct to minimize leakage
- ▶ Damper constructed of double layer 18 gauge equivalent with integral blade seal
- ▶ Single point electrical connection

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FCL-600 LOW PROFILE CONSTANT VOLUME FAN TERMINAL UNIT

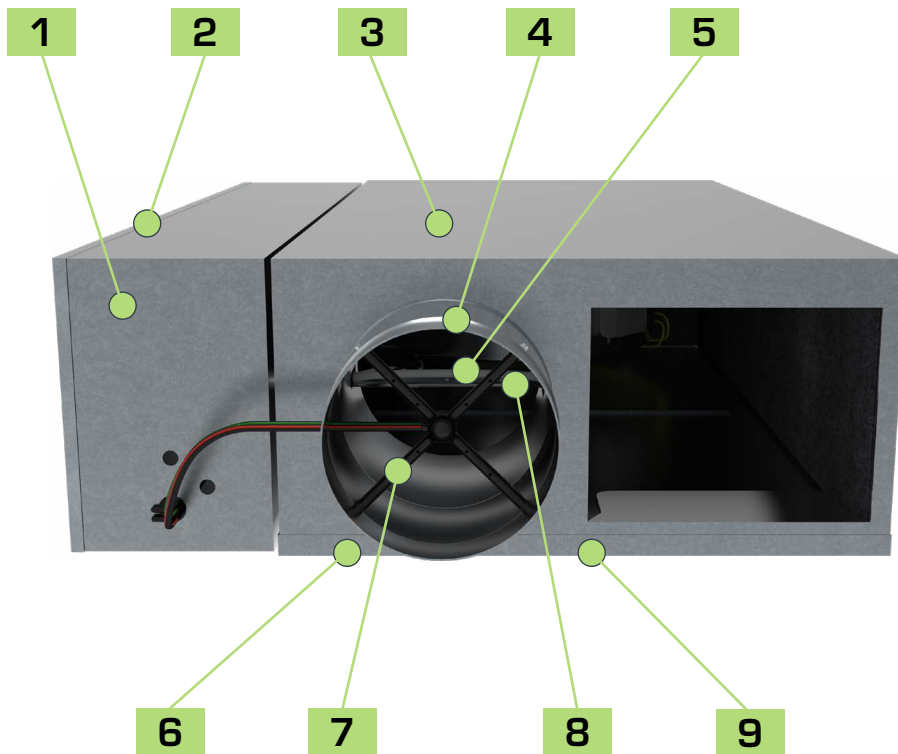
The METALAIRE FCL low profile series fan-powered terminal unit has been engineered to provide a balance between quiet operation, minimal footprint, and a broad flow range with a reduced height for low clearance ceiling applications. The FCL is constructed from 22 gauge metal construction designed to mitigate vibration and increase rigidity. The unique 4-piece case allows for fewer seams and low leakage. Every FCL includes bottom rigid access panel. These simple-to-remove panels provide access to allow trouble-free maintenance of the fan motor and blower assembly. The control enclosure for the FCL allows critical component access.

FCL units include 1/2" thick, matte-faced fiberglass insulation that complies with UL 181 horizontal burn test, NFPA 90 and UL 723/ASTM E 84 flame spread and smoke developed ratings of 25/50. Optional insulations include metal-foil-faced and fiber- and erosion-free ThermoPure (closed-cell foam), a polyolefin product with superior acoustical properties compared to solid metal duct liner.

Optional electronically commutated motors (ECM) are available to minimize energy usage. Up to 75% energy savings is typical with the ECM option. Refer to the fan curves for proper selection and to maximize energy savings.

STANDARD FEATURES

- ▶ Available in 2 casing sizes to handle 340-1800 CFM.
- ▶ 22 ga. galvanized steel casing.
- ▶ Low leakage construction.
- ▶ Low leakage inlet damper (< 1% at 3" static pressure).
- ▶ Optional factory calibrated controls per each job requirement.
- ▶ Multi-point center averaging airflow sensor provides +/- 5% flow readings after certified balancer has balanced terminal.
- ▶ Energy efficient PSC motors with adjustable SCR solid state fan speed controller.
- ▶ External control cabinet with offset mounting plate.
- ▶ Single point electrical connections.
- ▶ Beaded primary inlet connection tube for added rigidity and secure flex duct connections.
- ▶ Inlets available in sizes 8" and rect. 8 x 16".
- ▶ 1/2" thick, dual density (1.5 lb min.) fiberglass insulation with edges coated.
- ▶ Rectangular discharge with optional slip and drive cleat duct connection.
- ▶ Large removable bottom access panel provides access to fan motor / blower assembly.
- ▶ Independently tested and certified laboratory performance data.
- ▶ Full range of options and accessories available (heating coils, disconnects, attenuators, etc.).
- ▶ Full range of liners / insulation available.
- ▶ Auto and manual thermal resets on every electric heater.
- ▶ High efficiency six-pole, single speed permanent split capacitor (PSC) motors.
- ▶ Available fan motor voltages of 120, 277, and 208-240 (50 / 60 Hz).



FCL-600 LOW PROFILE CONSTANT VOLUME FAN TERMINAL UNIT

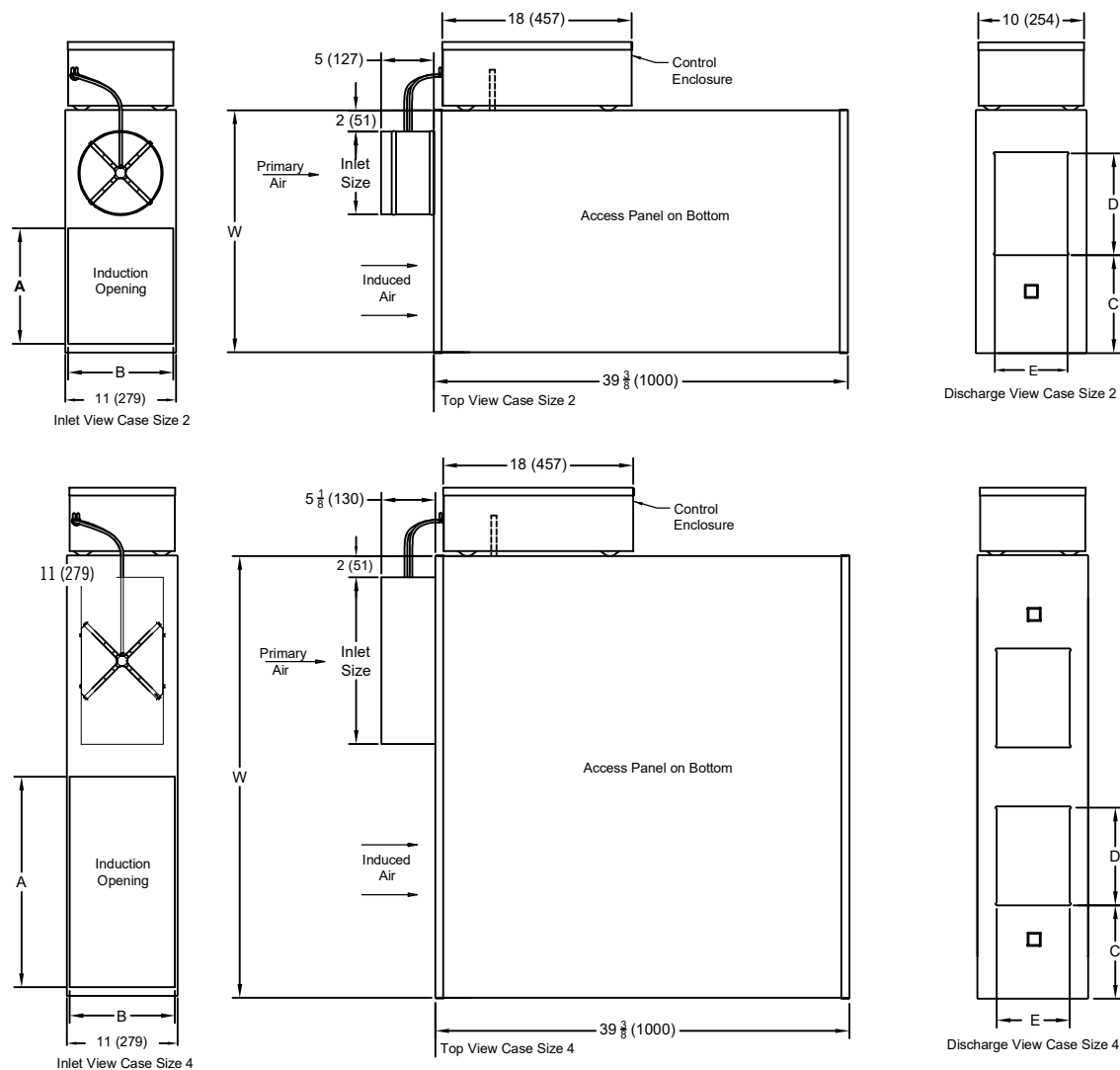
FEATURES AND BENEFITS

- 1** Galvanized steel casing, mechanically sealed for low leakage construction.
- 2** NEMA Type 1 rated hinged control enclosure with stand off to prevent penetration of casing.
- 3** Single speed high efficiency PSC motor with SCR motor speed control.
- 4** Riveted primary inlet duct to minimize leakage with 3 stiffening beads for added rigidity.
- 5** Damper constructed of double layer 18 gauge equivalent with integral blade seal.
- 6** Discharge panel is manufactured with 18 gauge galvanized steel to mitigate vibration.
- 7** Multi-Point Center Averaging Airflow Sensor.
- 8** Damper assembly rotates in long life, low friction, self lubricating thermoplastic bearing.
- 9** Bottom access panel provided for easy motor / blower servicing.

FCL-600-001 SERIES FAN POWERED AIR TERMINAL UNIT COOLING ONLY

SERIES FAN POWERED

FCL-600 CONSTANT VOLUME



The standard location for control enclosure is Left Hand. Looking in the direction of airflow, the control enclosure is on the left. Case size 4 includes two discharge blowers. All dimensions shown in inches, parentheses () indicate millimeters.

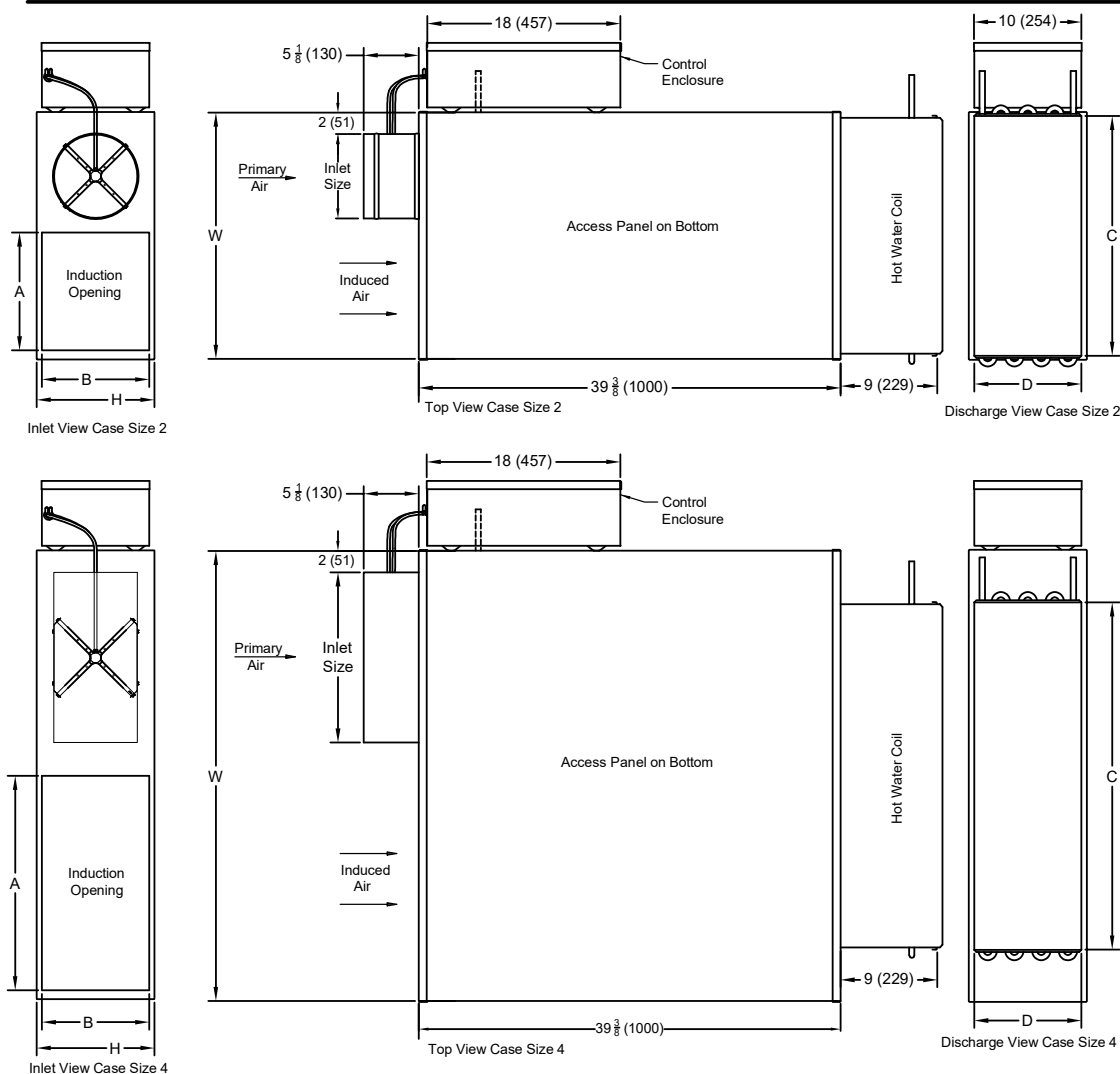
Case size	Inlet Size	Unit Width	Unit Length	Unit Height	Induction		Discharge		
	Standard	W	L	H	Width A	Height B	Loc. C	Width D	Height E
2	8 (203) Round	23 (584)	39 (991)	11 (279)	10 1/2 (267)	8 1/2 (216)	9.5 (241)	9.5 (241)	7 (178)
4	8 (203) x 16 (406) Rect.	42 (1067)	39 (991)	11 (279)	18 (457)	8 1/2 (216)	9 (229)	9 (229)	7 (178)

PCS MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/4
4	1/4 (QTY 2)

ECM MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/3
4	1/3 (QTY 2)

Optional inlet sizes 4, 5 and 6. Available on Case Size 2 only.

FCL-600-002 SERIES FAN POWERED AIR TERMINAL UNIT WITH HOT WATER COIL



The standard location for control enclosure is Left Hand. Looking in the direction of airflow, the control enclosure is on the left. Case size 4 includes two discharge blowers. All dimensions shown in inches, parentheses () indicate millimeters.

Case size	Inlet Size	Unit Width	Unit Length	Unit Height	Induction		Discharge	
	Standard	W	L	H	Width A	Height B	Width C	Height D
2	8 (203) Round	23 (584)	39 (991)	11 (279)	10 1/2 (267)	8 1/2 (216)	22 (559)	10 1/2 (267)
4	8 (203) x 16 (406) Rect.	42 (1067)	39 (991)	11 (279)	18 (457)	8 1/2 (216)	32 (813)	10 1/2 (267)

PCS MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/4
4	1/4 (QTY 2)

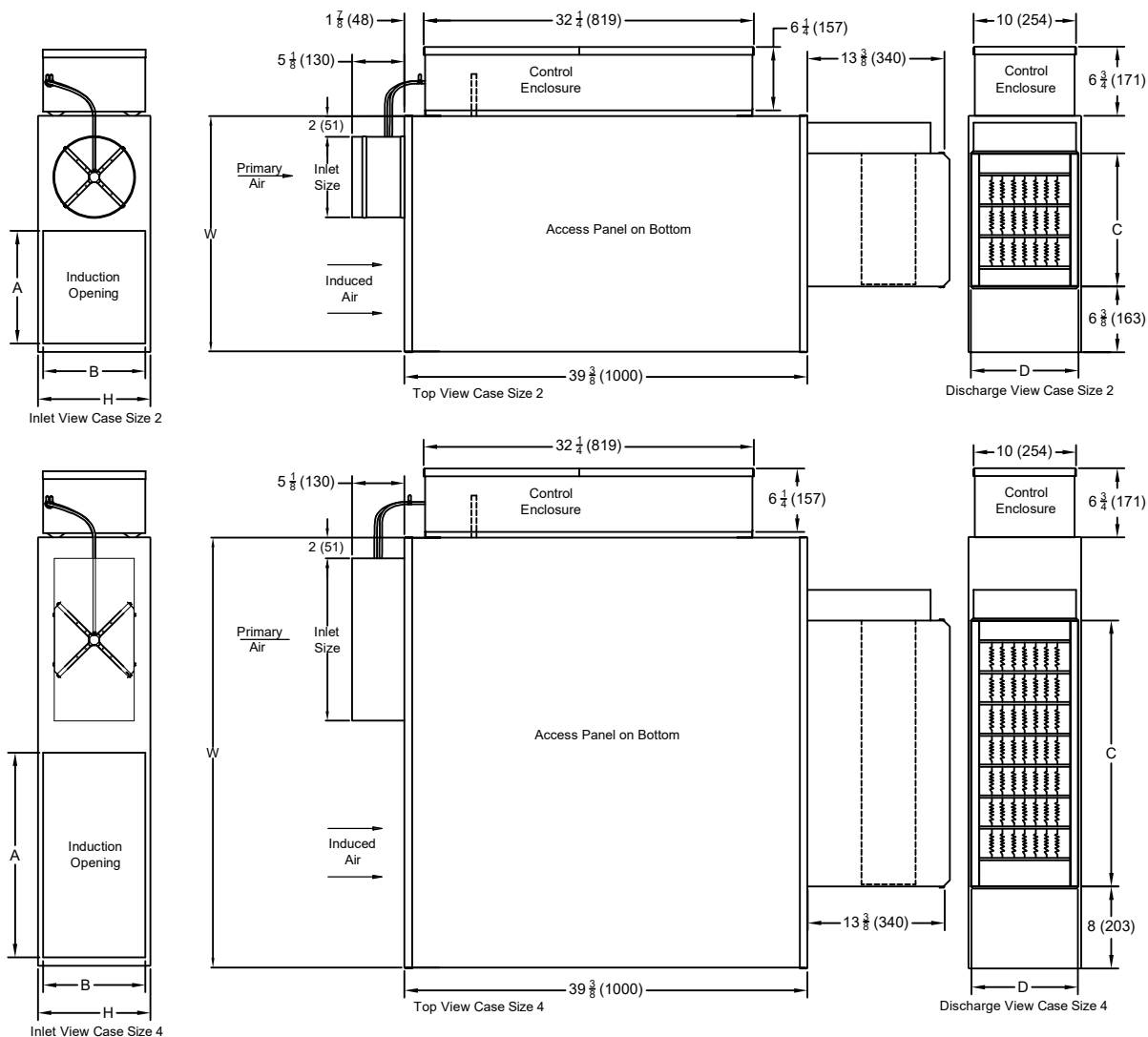
ECM MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/3
4	1/3 (QTY 2)

Optional inlet sizes 4, 5 and 6. Available on Case Size 2 only.

FCL-600-003 SERIES FAN POWERED AIR TERMINAL UNIT WITH ELECTRIC HEAT

SERIES FAN POWERED

FCL-600 CONSTANT VOLUME



The standard location for control enclosure is Left Hand. Looking in the direction of airflow, the control enclosure is on the left. Case size 4 includes two discharge blowers. All dimensions shown in inches, parentheses () indicate millimeters.

Case size	Inlet Size	Unit Width	Unit Length	Unit Height	Induction		Discharge	
	Standard	W	L	H	Width A	Height B	Width C	Height D
2	8 (203) Round	23 (584)	39 (991)	11 (279)	10 1/2 (267)	8 1/2 (216)	13 (330)	10 1/2 (267)
4	8 (203) x 16 (406) Rect.	42 (1067)	39 (991)	11 (279)	18 (457)	8 1/2 (216)	26 (660)	10 1/2 (267)

PCS MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/4
4	1/4 (QTY 2)

ECM MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/3
4	1/3 (QTY 2)

Optional inlet sizes 4, 5 and 6. Available on Case Size 2 only.

FCL-600 APPROXIMATE WEIGHTS

Case	FCL
2	118 lbs.
4	197 lbs.

FCL-600 FILTER SIZES PER CASE SIZE

Case Size	Filter Dimensions
2	10" x 12"
4	10" x 12" quantity 2

Filters are mounted on the fan induction and are available in 1" or 2" thickness.

CERTIFICATIONS AND STANDARDS

- Units tested per ASHRAE Standard 130-2016.
- All model sizes certified in accordance with AHRI 880-2017 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A/90B.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.
- Hot water coils are manufactured in accordance to AHRI Standard 410.



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FCL-600 AHRI CERTIFIED RATING POINTS



RADIATED SOUND FAN ONLY

Case-Inlet Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
2-08	400	0.03	53	48	50	46	38	33
4-8x16	1750	0.25	76	69	64	63	53	46

RADIATED SOUND

Power Levels @ 1.5" w.g. ΔPs

Case-Inlet Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
2-08	400	0.03	58	54	56	52	44	39
4-8x16	1750	0.25	80	74	69	68	58	51

DISCHARGE SOUND FAN ONLY

Case-Inlet Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
2-08	400	0.03	62	56	55	55	49	42
4-8x16	1750	0.25	78	75	72	74	72	70

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10^{-12} Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation
- 8) Discharge (external) static pressure is 0.25" w.g. for all cases

RADIATED SOUND MODEL FCL - PSC MOTOR

OCTAVE BAND SOUND POWER, Lw, dB																																	
Case-Inlet Size	CFM	Min ΔPs	FAN ONLY							ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.									
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC			
2-08	400	0.03	53	48	50	46	38	33	24	56	52	54	50	42	37	29	57	53	55	51	43	38	30	58	54	56	52	44	39	31			
	500	0.03	54	50	51	47	39	35	25	56	52	54	50	42	38	29	58	54	55	51	44	38	30	59	56	57	53	46	41	32			
	600	0.04	54	51	52	48	41	36	26	57	54	55	51	44	39	30	58	55	56	52	45	40	31	58	56	57	53	46	41	32			
	700	0.06	56	53	54	49	43	37	29	58	56	57	52	46	40	32	60	57	58	53	46	41	33	60	58	59	54	48	42	34			
	800	0.09	57	55	56	50	44	38	31	60	58	59	53	47	41	34	61	59	60	54	48	42	35	62	60	61	55	49	43	36			
4-8x16	950	0.09	67	59	58	54	41	33	33	70	64	61	59	50	44	36	70	64	61	59	50	44	36	71	65	62	60	51	45	37			
	1150	0.18	70	62	60	56	45	37	35	72	67	63	61	52	45	38	72	67	63	61	52	45	38	73	68	64	62	53	46	39			
	1350	0.24	72	65	62	59	48	41	38	75	70	65	63	54	47	41	75	70	65	63	54	47	41	76	71	66	64	55	48	42			
	1550	0.25	74	67	61	61	50	43	41	78	72	67	65	56	48	45	78	72	67	65	56	48	45	79	73	68	66	57	49	46			
	1750	0.25	76	69	64	63	53	46	43	79	73	68	67	57	50	46	79	73	68	67	57	50	46	80	74	69	68	58	51	48			

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Radiated sound is the noise transmitted through the unit casing
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge (external) static pressure is 0.25" w.g. for all cases

DISCHARGE SOUND MODEL FCL - PSC MOTOR

OCTAVE BAND SOUND POWER, Lw, dB																																		
Case-Inlet Size	CFM	Min ΔPs	FAN ONLY							ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.										
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC				
2-08	400	0.03	62	56	55	55	49	42	<15	63	58	57	57	51	44	15	64	59	58	58	52	45	16	64	59	58	58	52	45	16				
	500	0.03	62	57	56	56	51	43	15	63	58	57	57	52	44	15	64	59	58	58	52	46	16	64	59	58	58	52	46	16				
	600	0.04	62	58	57	57	52	45	15	63	59	58	58	53	46	16	64	60	59	59	54	47	18	64	60	59	59	54	47	18				
	700	0.06	63	60	59	58	53	46	17	64	61	60	59	54	47	18	66	62	60	60	56	48	19	66	62	61	60	56	48	19				
	800	0.09	65	62	61	59	55	47	19	66	63	62	60	56	48	20	67	63	62	61	57	48	20	67	64	63	61	57	49	21				
4-8x16	950	0.09	68	65	63	61	58	55	22	70	67	64	63	60	58	25	71	68	65	64	61	59	26	71	68	65	64	61	59	26				
	1150	0.18	72	68	66	65	63	61	26	73	70	67	67	65	63	29	74	71	68	68	66	64	30	74	71	68	68	66	64	30				
	1350	0.24	74	71	68	70	67	66	30	75	72	69	71	68	67	31	76	73	70	72	69	68	32	76	73	70	72	69	68	32				
	1550	0.25	76	74	70	72	70	68	32	77	74	72	74	71	70	34	78	75	73	75	72	71	35	78	75	73	75	72	71	35				
	1750	0.25	78	75	72	74	72	70	34	79	76	73	75	73	71	36	80	77	74	76	74	72	37	80	77	74	76	74	72	37				

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E

- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 10) Discharge (external) static pressure is 0.25" w.g. for all cases

FCL-600 PSC FAN MOTOR AMPERAGE RATINGS

Case	HP	Standard PSC Motor Amperage Ratings		
		120v-1 Phase 60 Hz Rated Amps	208-240v-1 Phase 60 Hz Rated Amps	277v-1 Phase 60 Hz Rated Amps
2	1/3	4.8	1.9	1.9
4	1/3 (two motors)	9.6	3.8	3.8

FCL-600 ECM FAN MOTOR AMPERAGE RATINGS

Case	HP	FLA 120	FLA 208	FLA 230	FLA 277
2	1/3	5.50	3.10	2.7	2.60
4	1/3 (2)	11.00	6.20	5.40	5.20

FCL-600 DAMPER LEAKAGE

Standard Construction			
Inlet Diameter	Static Pressure " w.g.	Maximum Airflow	Max Damper Leakage
4	3	300	5
5	3	375	5
6	3	540	5
7	3	760	7
8	3	990	9
9	3	1250	12
10	3	1640	16
12	3	2350	22
14	3	3250	32
16	3	4100	41
20	3	6430	64
24	3	7270	72

PERFORMANCE NOTES

- 1) Leakage testing conducted in accordance with ASHRAE 130-2016
- 2) Per ASHRAE Standard 130-2016 "terminal damper leakage: the amount of air in ft 3/min (L/s) leaking through a fully closed damper/valve of a supply/exhaust terminal unit at a given inlet pressure"opened"

- 3) Damper leakage shall not exceed 1% of the maximum rated airflow at 3" w.g.
- 4) 4" and 5" inlets are built with 6" casings

FCL-600 HOT WATER COILS

When ordered with the air terminal, the hot water coil is shipped attached to the discharge of the terminal casing. The discharge end of the casing has slip and drive connections for easy connection to downstream ductwork. The hot water coil is constructed of aluminum fin and copper serpentine-type tubes with male sweat connections tested at 300 psig.

Coil selection can be made using METALAIRE's Air Terminal Unit Selection Software. Contact your representative for a copy. In the interest of energy conservation and due to the possibility of condensation, all hot water coils are marked "Coil must be externally insulated after installation in the field." Hot water coils are tested in accordance with AHRI Standards 410. Hot water coils may be ordered with optional access doors for inspection and cleaning to meet requirements of ASHRAE Standard 62.1.

HOT WATER COIL CONSTRUCTION DETAILS

- Hot Water Coils are factory mounted to the discharge of the terminal and are available with an optional factory mounted discharge plenum section with access door.
- Hot water coils are enclosed in a 20 gauge coated steel casing allowing for attachment to metal ductwork with a slip and drive connection.
- Fins are rippled and sine wave type constructed from heavy gauge aluminum and are mechanically bonded to the tubes.
- Tubes are copper with a minimum wall thickness of 0.016" with male sweat header connections.
- Coils are leak tested to 300 psi with minimum burst of 2000 psi at ambient temperature. Coil performance data is based on tests run in accordance with AHRI standard 410. Coils are AHRI certified and include an AHRI label.



FCL-600 COIL CONNECTION SIZE

Outside Diameter (OD) connection size, Inches		
Case Size	Standard HW Coil Inches	
	1 Row	2 Row
2	7/8"	7/8"
4	7/8"	7/8"

All coils have 10 fins per inch with optional 12 fins per inch.

All accessories that can be attached to the Series Fan Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

FCL-600 HOT WATER COILS MBH SELECTION DATA

Case Size	Rows	Connection (OD)	GPM	Head Loss (ft-H ₂ O)	CFM							
					350	400	500	600	700	800	900	1000
2	One	0.63	1	0.12	13.0	13.8	15.0	16.0	16.9	17.6	18.3	18.8
			2	0.45	14.8	15.8	17.5	18.9	20.2	21.2	22.2	23.1
			4	1.71	16.0	17.1	19.2	20.9	22.4	23.8	25.0	26.1
			6	5.05	16.5	17.7	19.8	21.7	23.3	24.8	26.1	27.3
			Airsides Ps (in. wg)		0.02	0.03	0.04	0.05	0.07	0.09	0.1	0.12
2	Two	0.875	1	0.29	18.5	19.7	21.5	22.9	24.1	25.1	26.0	26.7
			2	1.16	22.2	23.9	26.7	29.1	31.1	32.9	34.4	35.8
			4	4.65	24.7	26.8	30.5	33.7	36.5	39.0	41.2	43.2
			6	10.45	25.7	28.0	32.0	35.6	38.8	41.6	44.2	46.5
			Airsides Ps (in. wg)		0.05	0.06	0.08	0.11	0.15	0.19	0.23	0.27

Case Size	Rows	Connection (OD)	GPM	Head Loss (ft-H ₂ O)	CFM							
					500	600	800	1000	1200	1400	1600	1800
4	One	0.875	1	0.15	17.7	19.0	21.0	22.6	23.8	24.8	25.7	26.4
			2	0.90	20.7	22.5	25.5	27.8	29.8	31.4	32.9	34.1
			4	2.24	22.7	24.9	28.6	31.6	34.1	36.3	38.3	40.0
			6	4.91	23.4	25.8	29.8	33.1	35.9	38.4	40.5	42.5
			Airsides Ps (in. wg)		0.02	0.03	0.04	0.07	0.09	0.12	0.15	0.18
4	Two	0.875	2	0.34	30.5	33.4	38.1	41.8	44.8	47.3	—	—
			4	1.33	34.6	38.5	45.1	50.5	55.1	58.9	—	—
			6	2.95	36.3	40.6	48.1	54.3	59.6	64.2	—	—
			8	5.20	37.2	41.8	49.8	56.5	62.2	67.3	—	—
			Airsides Ps (in. wg)		0.05	0.06	0.10	0.14	0.19	0.25	—	—

1) All coil performance in accordance with AHRI Standard 410-2001

2) Heating capacities are in MBH

3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)

4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

5) Head Loss is in feet of water

6) Airside ΔPs is the air pressure drop of the hot water coil

7) Air temperature rise = 927 x MBH/CFM

8) Water temperature drop = 2.04 x MBH/GPM

9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

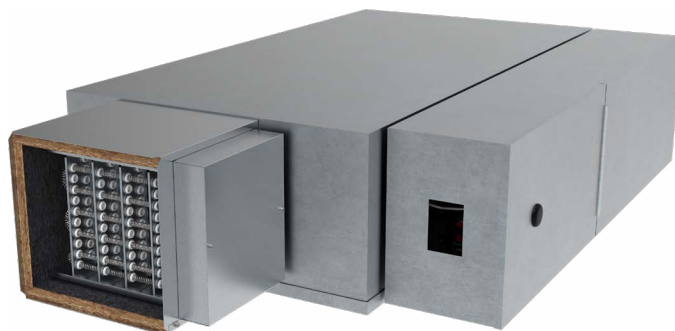
ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

FCL-600 ELECTRIC HEAT

The discharge end has slip and drive connections for easy connection to downstream ductwork. ETL® listed heaters are provided with a fan interlock relay. Heaters that will be controlled electronically must include a 24 VAC control circuit to operate with the low voltage controls on the air terminal. Heater plenums are internally insulated. When an air terminal is ordered with clean room lining and electric heat, the heater plenum is either internally lined with optional foil backed insulation or closed cell foam or may require external insulation in field.

INCLUDED WITH EACH HEATER ASSEMBLY:

- ▶ Heater and cabinet mounted on the discharge of the FCL-600
- ▶ Electric Heater is interlocked into fan control relay
- ▶ De-energizing magnetic contactors per step
- ▶ Primary automatic reset high temperature limit (disc type)
- ▶ Backup manual reset high temperature limit (disc type)
- ▶ Non-fused transformer with voltage to match Heater voltage
- ▶ Single point power wiring connection
- ▶ Heater is shipped factory mounted and wired



ELECTRIC HEATER ASSEMBLY CONSTRUCTION DETAILS

- ▶ Electric Reheat Coils are factory mounted on the discharge of the Air Terminal. The heaters are ETL® listed for zero clearance, are tested in accordance with UL® 60335, CSA-C22.2 and the National Electric Code (NEC). Heater casings are constructed of galvanized steel. Element wire is high grade nichrome alloy derated to 45 watts per square inch density. Element wire is supported by moisture-resistant steatite ceramics.
- ▶ Ceramics are enclosed in reinforcement brackets spaced across the heater element rack at 2" to 4" intervals. Controls are contained in a NEMA 1 control cabinet with a hinged, latching door. A permanent wiring diagram is affixed to the inside of the control cabinet door for field reference.
- ▶ The 208 and 480 volt units require a neutral connection for both single and three phase service. Our standard motors are 120 and 277 volt single phase. The 208-240 volt single phase motor is optional. 480 volt motors are not available for our units. See table for reference.

Heater Voltage	Fan Motor Voltage	Separate Neutral Required
120 V 1PH	120 V 1PH	NO
208 V 1PH	120 V 1PH	YES
277 V 1PH	277 V 1PH	NO
480 V 1PH	277 V 1PH	YES
208 V 1PH	208 V 1PH	NO
208 V 3PH	120 V 1PH	YES
480 V 3PH	277 V 1PH	YES
208 V 3PH	208 V 1PH	NO

All accessories that can be attached to the Series Fan Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

FCL-600 ELECTRIC HEATER CAPACITIES

Model FCL		Single Phase										Three Phase			
		120V		208V		240V		277V		480V		208V		480V	
Inlet Size	# of Steps Available	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2	1/SCR	0.5	5	0.5	8	0.5	8	0.5	8	1.5	8	0.5	8	1.5	8
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
4	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1	15	0.5	13	1	15
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	

NOTES:

1. Heaters less than 10 kW are specifiable to nearest 0.5 kW. Heaters greater than 10.0 kW are specifiable to nearest 1.0 kW.
2. Minimum flow rate for electric heat is 70 CFM / kW. Lower CFM's can cause nuisance tripping, excessive discharge temperatures, rapid cycling, and rapid element failure. Electric Heat units running below 70 CFM / kW will void all warranties.
3. For optimum thermal comfort, the suggested discharge temperature should not exceed 20°F above room set point.
4. We do not recommend discharge temperatures in excess of 115°F to protect heater coils.
5. Maximum number of steps at Min. kW per Step is one step.
6. If more than 1 heater is wired into a building's circuit breaker (multi-outlet branch circuit), each heater will require the addition of power side fusing.

ELECTRIC HEAT SELECTION:

A. Specify electric duct heaters using voltage, phase, kW, and number of steps.

B. Use above chart to select voltage. Calculate required kW using following equations:

$$kW = \frac{BTU / HR}{3413} \quad kW = \frac{CFM \times \Delta \times 1.085}{3413} \quad \Delta = \frac{kW \times 3413}{CFM \times 1.085}$$

$$CFM = \frac{kW \times 3413}{\Delta \times 1.085} \quad CFM = \frac{kW \times 3413}{\Delta \times 1.085}$$

* air density at sea level—reduce by 0.036 for each 1000 feet of altitude above sea level

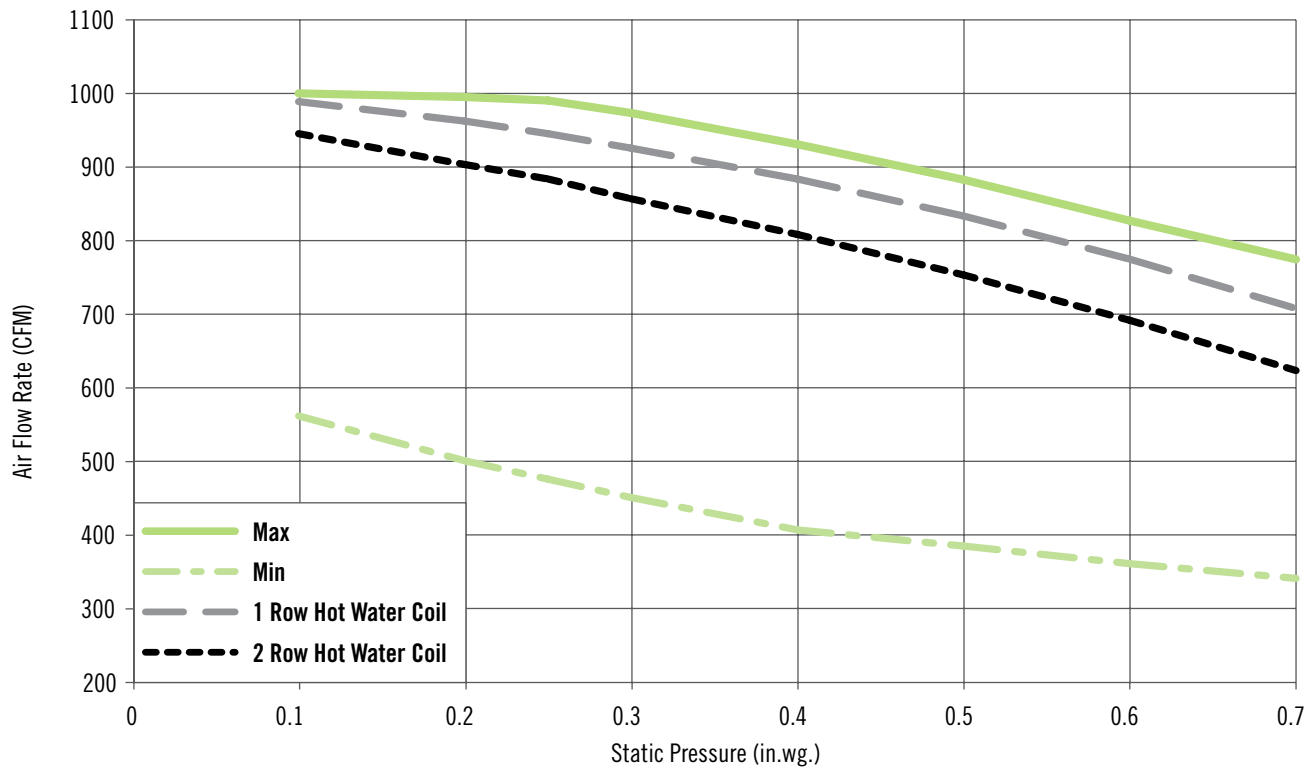
Where: BTU / Hr = Required heating capacity

CFM = volume of air during heating. Typically 100% of maximum cooling air volume

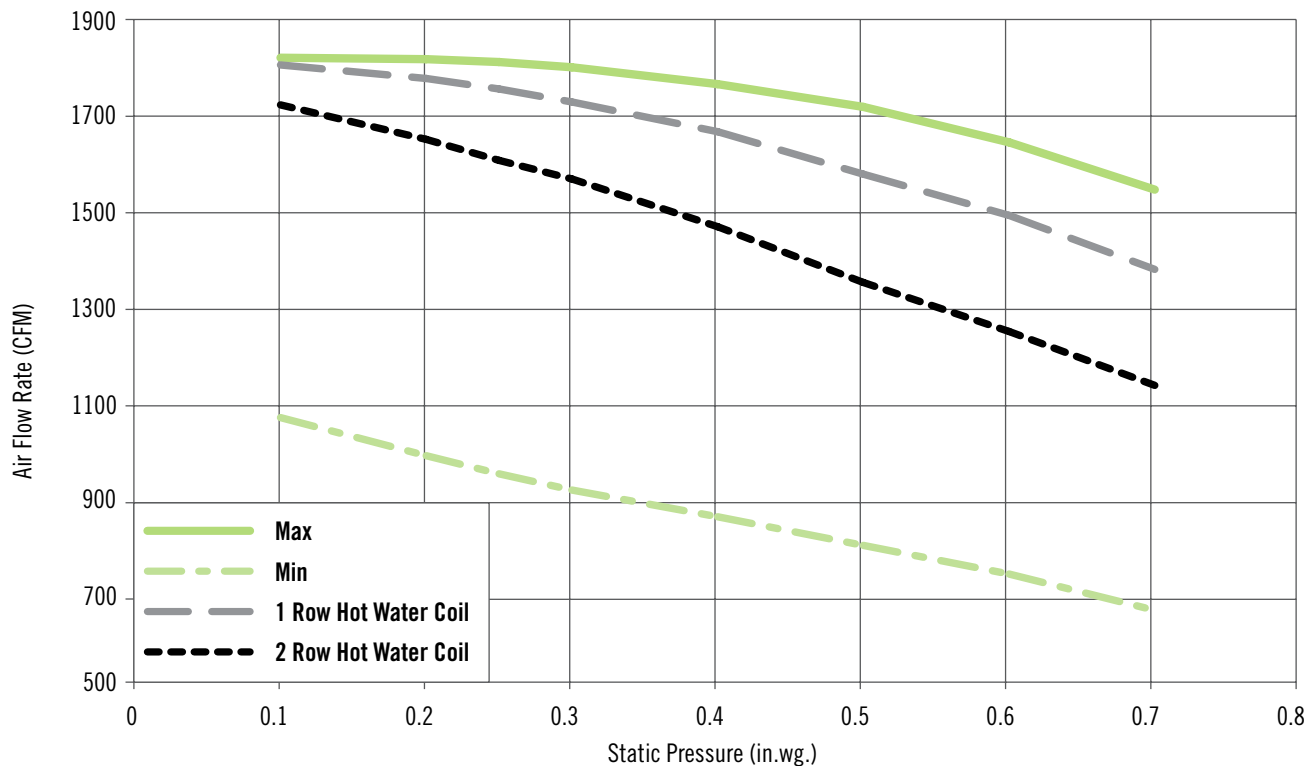
Δ = desired air temperature rise across the electric heater

Inlet air temperature = primary air temperature, usually 55°F

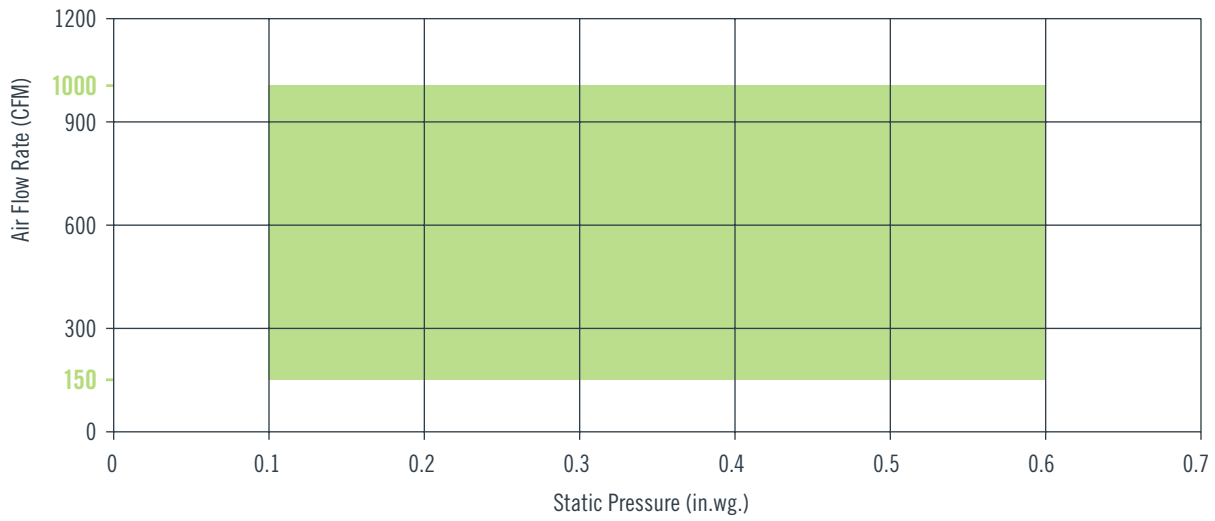
FCL-600 FAN PERFORMANCE CURVES CASE 2



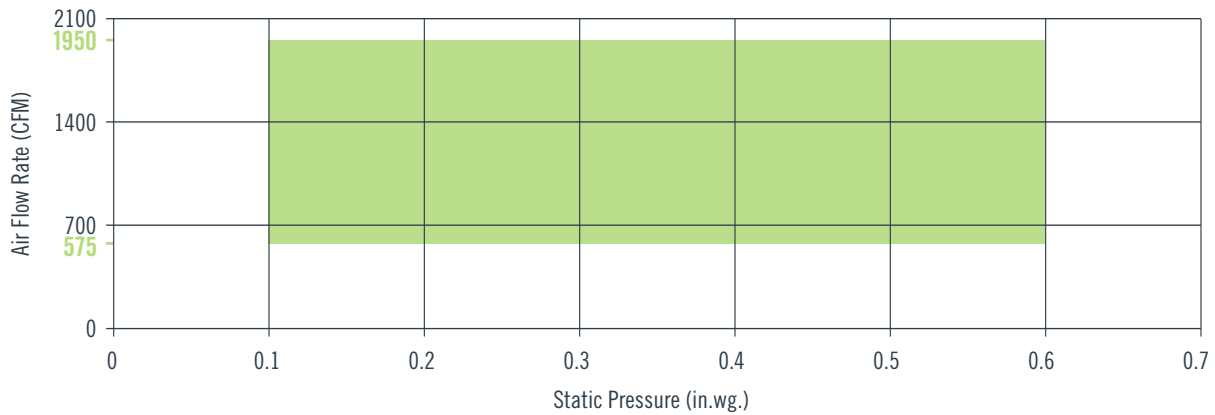
FCL-600 FAN PERFORMANCE CURVES CASE 4

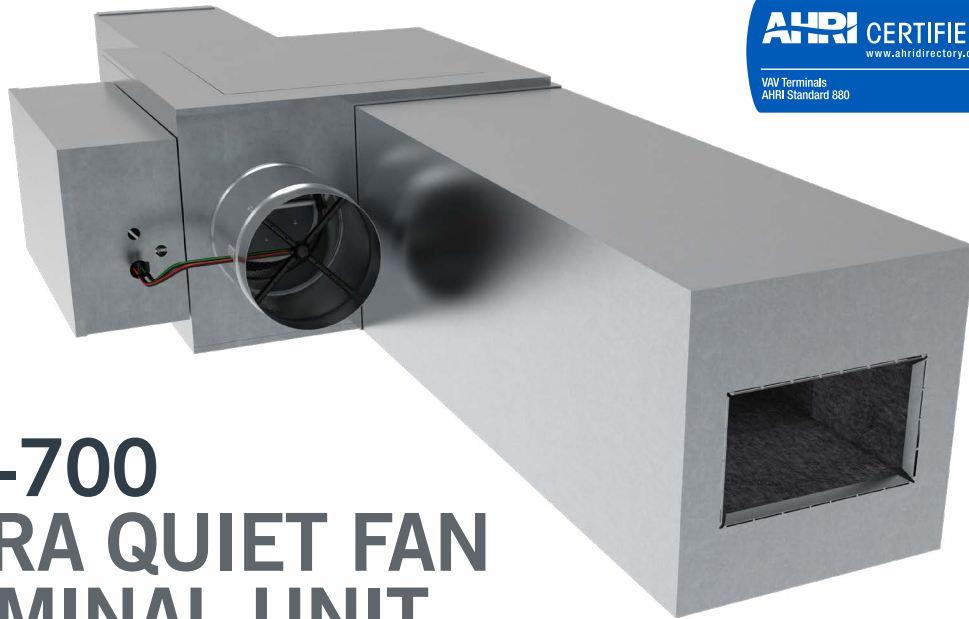


FCL-600 ECM FAN PERFORMANCE CURVES CASE 2



FCL-600 ECM FAN PERFORMANCE CURVES CASE 4





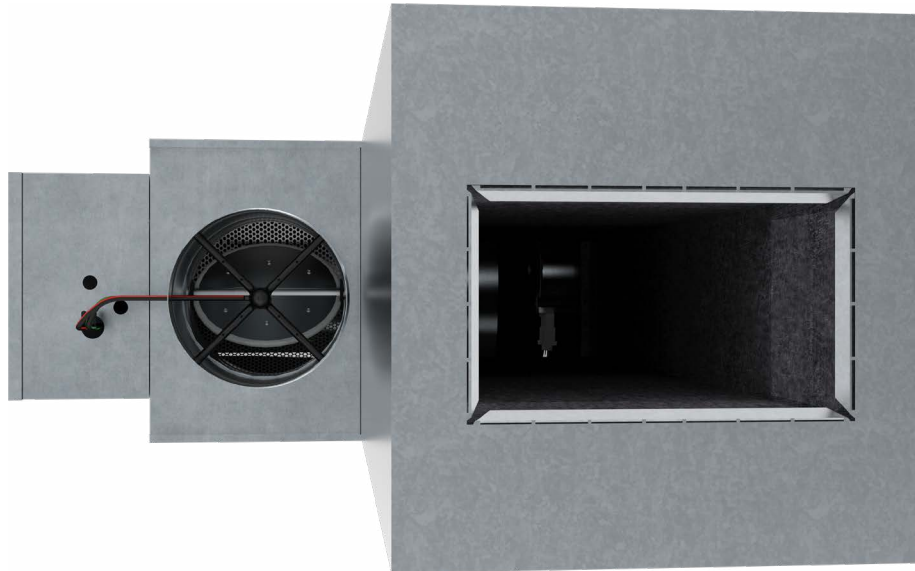
FCQ-700 ULTRA QUIET FAN TERMINAL UNIT

SPECIFIABLE FEATURES

- ▶ Rigid construction to mitigate vibration
- ▶ Minimal clearance NEMA TYPE 1 rated control enclosure
- ▶ Units can be rotated in the field for left / right hand installation
- ▶ Single speed high efficiency PSC motor with SCR motor speed control
- ▶ Energy saving case design allows for less seams for very low leakage
- ▶ Tuned inlet and outlet attenuators
- ▶ The quietest box available

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FCQ-700 ULTRA QUIET SERIES FAN TERMINAL UNIT

The new FCQ quiet series fan-powered ATU has been engineered to provide noise levels that are the best in the business. All six sizes of the FCQ product line include exclusively tuned inlet and outlet attenuators. The FCQ includes an internal flow-dispersion screen designed specifically to provide low-frequency acoustic conversion. The FCQ attenuators add to the overall length, not width, providing easier installation and access.

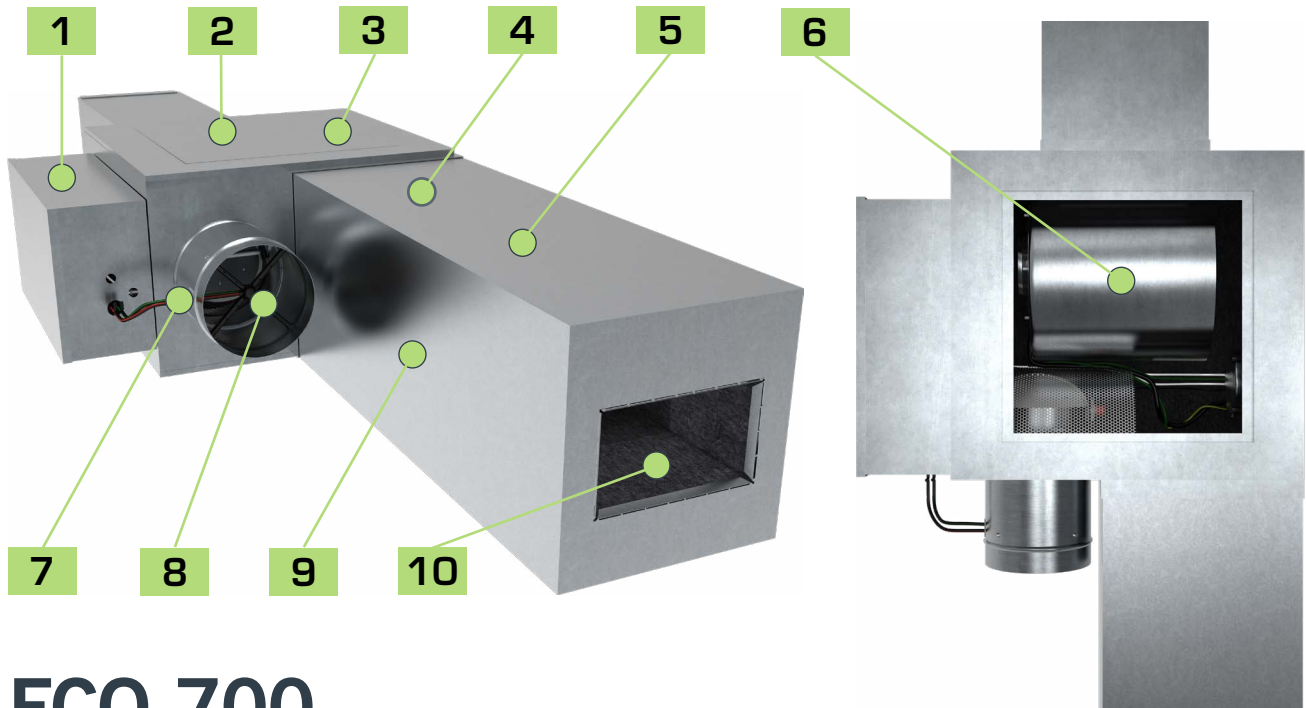
The FCQ is constructed from rigid galvanized steel designed to mitigate vibration and increase rigidity. The unique Energy Saving 4-piece case construction allows fewer seams for low leakage. Every FCQ includes top and bottom rigid access panels. This feature allows units to be rotated, eliminating left-hand/right-hand (LH/RH) issues in the field. These simple-to-remove panels use quarter-turn latches to allow trouble-free maintenance and access to the critical internal components.

FCQ units include 1" thick, matte-faced fiberglass insulation that complies with UL 181 horizontal burn test, NFPA 90 and UL 723/ASTM E 84 flame spread and smoke developed ratings of 25/50. Optional insulations include metal-foil-faced and fiber- and erosion-free ThermoPure (closed-cell foam).

High efficiency single phase, single speed permanent split capacitor (PSC) motors are standard in the FCQ product line. Available voltages of 120, 277, and 208-240 volts (50/60 Hz) allows for every possible situation, and all motors come with a solid state SCR motor speed controller to adjust fan speed.

Optional electronically commutated motors (ECM) are available to increase energy savings further. Up to 75% energy savings is typical with the ECM option.

No detail was overlooked. A new optional control panel was developed for the FCQ to allow critical component access with minimal clearance. This unique control panel utilizes a sliding door with integral backstop. Simply slide it open for maintenance or access.

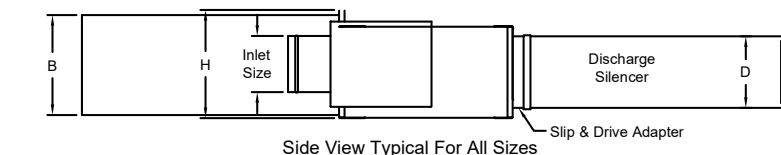


FCQ-700 ULTRA QUIET SERIES FAN TERMINAL UNIT

FEATURES AND BENEFITS

- 1** Minimal clearance NEMA TYPE 1 rated control enclosure.
- 2** Top and bottom motor / blower access panels with ¼ turn fasteners for easy removal and installation.
- 3** Energy saving case design allows fewer seams for very low leakage.
- 4** Unit can be rotated in field for left hand or right hand installation.
- 5** Unit includes exclusively tuned inlet and discharge attenuators.
- 6** Single speed high efficiency PSC motor with SCR motor speed control.
- 7** Riveted galvanized steel primary inlet valve for leak proof and rigid design.
- 8** Multi-Point Center Averaging Airflow Sensor.
- 9** Constructed with galvanized steel casing to help mitigate vibration.
- 10** 1" thick matt faced fiberglass insulation that complies with UL 181, NFPA 90 and UL7 23 / ASTM E 84. Capped to prevent delaminating.

FCQ700-001 ULTRA QUIET SERIES FAN POWERED AIR TERMINAL UNIT COOLING ONLY



The standard location for control panel is Left Hand. Looking in the direction of airflow, the control panel is on the left.

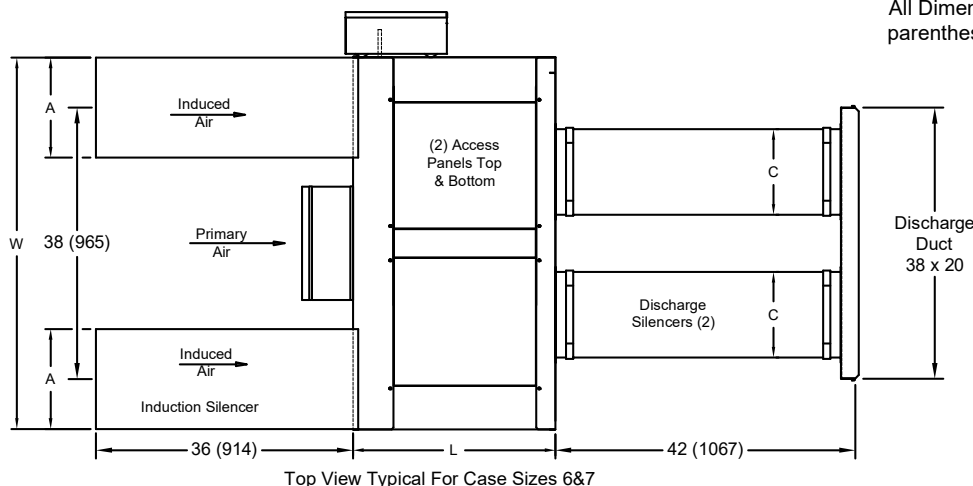
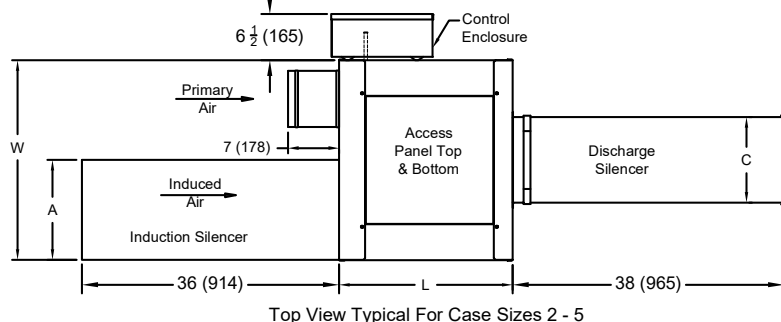
The Discharge Silencer is centered on H and W dimensions

Top & Bottom Mounted Access Panels Allow Unit To Be Hung LH or RH

The Induction and Discharge Silencers are shipped loose. A Slip & Drive Adapter is provided and mounted for field connection of the Discharge Silencer(s).

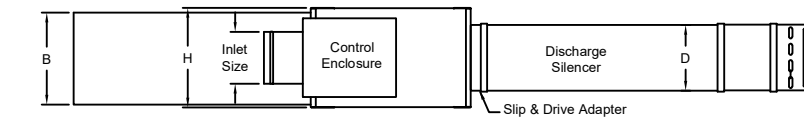
Optional ECM Motor available on Case sizes 2,3,4&6

All Dimensions shown in Inches, parentheses () indicate millimeters

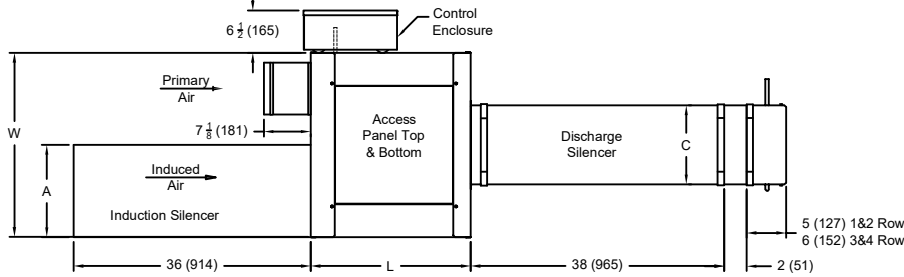


Case size	Inlet Size		Horsepower		Unit Dimensions			Induction Silencer		Discharge Silencer	
	Standard	Optional	Standard PSC	ECM	Width W	Height H	Length L	Width A	Height B	Width C	Height D
2	8 (203)	4,5,6	1/8	1/3	25	15	24	14	14	12	10
3	10 (254)	4,5,6,8	1/4	1/2	29	18	28	16	18	14	12 1/2
4	12 (305)	6,8,10	1/3	3/4	32 1/2	18	28	18	18	16	15
5	14 (356)	8,10,12	1/3	NA	32 1/2	18	28	18	18	16	15
6	16 (406)	10,12,14	1/3 (QTY 2)	1/2 (QTY 2)	52	18	30	16	18	16	15
7	18x16 (457x406)	12,14,16	3/4 (QTY 2)	NA	52	20	30	16	20	16	15

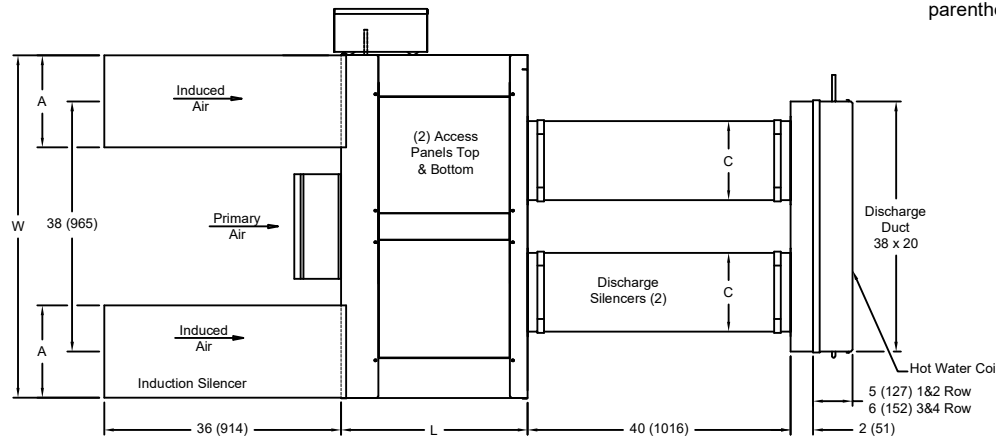
FCQ700-002 ULTRA QUIET SERIES FAN POWERED AIR TERMINAL UNIT WITH HOT WATER COIL



Side View Typical For All Sizes



Top View Typical For Case Sizes 2 - 5



Top View Typical For Case Sizes 6 & 7

The standard location for control panel is Left Hand. Looking in the direction of airflow, the control panel is on the left.

The Discharge Silencer is centered on H and W dimensions

Top & Bottom Mounted Access Panels Allow Unit To Be Hung LH or RH

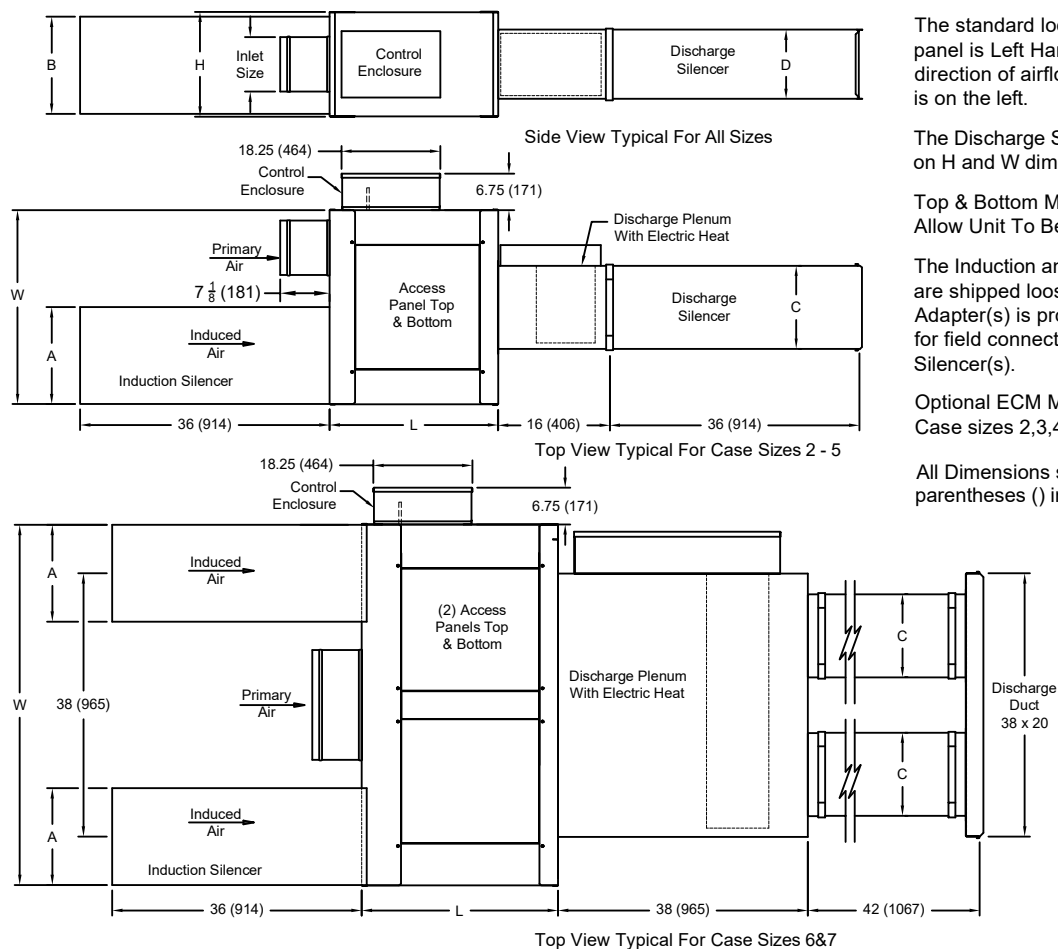
The Induction and Discharge Silencers are shipped loose. A Slip & Drive Adapter(s) is provided and mounted for field connection of the Discharge Silencer(s).

Optional ECM Motor available on Case sizes 2,3,4&6

All Dimensions shown in Inches, parentheses () indicate millimeters

Case size	Inlet Size		Horsepower		Unit Dimensions			Induction Silencer		Discharge Silencer	
	Standard	Optional	Standard PSC	ECM	Width W	Height H	Length L	Width A	Height B	Width C	Height D
2	8 (203)	4,5,6	1/8	1/3	25	15	24	14	14	12	10
3	10 (254)	4,5,6,8	1/4	1/2	29	18	28	16	18	14	12 1/2
4	12 (305)	6,8,10	1/3	1	32 1/2	18	28	18	18	16	15
5	12 (305)	8,10	1/3	NA	32 1/2	18	28	18	18	16	15
6	16 (406)	10,12,14	1/3 (QTY 2)	1/2 (QTY 2)	52	18	30	16	18	16	15
7	18x16 (457x406)	12,14,16	3/4 (QTY 2)	NA	52	20	30	16	20	16	15

FCQ-700-003 ULTRA QUIET SERIES FAN POWERED AIR TERMINAL UNIT WITH ELECTRIC HEAT



Case size	Inlet Size		Horsepower		Unit Dimensions			Induction Silencer		Discharge Silencer	
	Standard	Optional	Standard PSC	ECM	Width W	Height W	Length L	Width A	Height B	Width C	Height D
2	8 (203)	4,5,6	1/8	1/3	25	15	24	14	14	12	10
3	10 (254)	4,5,6,8	1/4	1/2	29	18	28	16	18	14	12 1/2
4	12 (305)	6,8,10	1/3	1	32 1/2	18	28	18	18	16	15
5	12 (305)	8,10	1/3	NA	32 1/2	18	28	18	18	16	15
6	16 (406)	10,12,14	1/3 (QTY 2)	1/2 (QTY 2)	52	18	30	16	18	16	15
7	18x16 (457x406)	12,14,16	3/4 (QTY 2)	NA	52	20	30	16	20	16	15



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FCQ-700 APPROXIMATE WEIGHTS

Case	FCQ
2	170 lbs.
3	190 lbs.
4	210 lbs.
5	210 lbs.
6	310 lbs.
7	330 lbs.

FCQ-700 FILTER SIZES PER CASE SIZE

Case Size	Filter Dimensions
2	14" x 14"
3	16" x 18"
4	18" x 18"
5	18" x 18"
6	16" x 18" (2)
7	16" x 20" (2)

Filters are mounted on the fan induction and are available in 1" or 2" thickness.



CERTIFICATIONS AND STANDARDS

- Units tested per ASHRAE Standard 130-2016.
- All model sizes certified in accordance with AHRI 880-2017 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A/90B.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.
- Hot water coils are manufactured in accordance to AHRI Standard 410.

FCQ-700 AHRI CERTIFIED RATING POINTS



RADIATED SOUND FAN ONLY

Case-Inlet Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
2-08	400	0.10	51	46	42	37	31	27
3-10	900	0.11	58	55	49	46	40	34
4-12	1400	0.12	62	55	48	46	42	40
5-12	1600	0.13	63	58	50	48	44	43
6-16	2500	0.14	67	60	54	53	50	48
7-18x16	2800	0.15	69	63	57	53	49	47

RADIATED SOUND

Power Levels @ 1.5" w.g. ΔPs

Case-Inlet Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
2-08	400	0.10	57	51	47	42	39	39
3-10	900	0.11	64	60	54	50	50	52
4-12	1400	0.12	68	60	51	50	46	46
5-12	1600	0.13	69	62	53	52	48	48
6-16	2500	0.14	73	65	59	57	55	54
7-18x16	2800	0.15	72	66	58	53	51	51

DISCHARGE SOUND FAN ONLY

Case-Inlet Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
2-08	400	0.10	51	45	41	37	32	28
3-10	900	0.11	56	54	48	43	40	47
4-12	1400	0.12	61	58	53	49	47	54
5-12	1600	0.13	61	59	53	49	48	54
6-16	2500	0.14	64	61	49	48	45	51
7-18x16	2800	0.15	62	62	53	48	47	55

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10^{-12} Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation
- 8) Discharge (external) static pressure is 0.25" w.g. for all cases

RADIATED SOUND MODEL FCQ - PSC MOTOR

OCTAVE BAND SOUND POWER, Lw, dB																														
Case-Inlet Size	CFM	Min ΔPs	FAN ONLY							ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
2-08	200	0.10	46	42	38	29	27	24	<15	50	46	42	34	33	32	15	50	47	42	34	34	34	15	52	49	44	36	36	36	18
	300	0.10	49	44	40	33	29	26	<15	51	47	43	35	33	32	16	51	47	43	35	34	34	16	53	49	45	37	36	36	19
	400	0.10	51	46	42	37	31	27	15	54	49	45	40	36	35	19	55	49	45	40	37	37	19	57	51	47	42	39	39	21
	500	0.10	52	47	43	37	32	28	17	55	50	46	39	35	34	20	56	51	46	39	36	35	20	58	53	48	41	38	37	22
	600	0.10	53	49	44	37	33	30	18	56	51	47	38	36	35	21	57	51	47	38	36	36	21	59	53	49	40	38	38	23
3-10	500	0.11	52	53	46	43	34	27	21	56	55	49	45	44	45	24	58	55	49	45	46	50	24	59	57	51	47	48	51	26
	700	0.11	55	54	48	44	37	31	22	58	56	50	46	45	46	25	59	56	50	46	47	50	25	61	58	52	48	49	52	27
	900	0.11	58	55	49	46	40	34	24	61	58	52	48	46	46	28	62	58	52	48	48	50	28	64	60	54	50	50	52	30
	1100	0.11	60	56	51	47	42	37	25	64	59	53	50	48	48	29	65	60	53	50	49	51	30	67	62	55	52	51	53	32
	1300	0.11	63	58	52	49	45	41	27	66	61	55	52	49	49	31	67	62	55	52	50	51	32	69	64	57	54	52	53	35
4-12	1000	0.12	60	51	44	43	39	37	22	61	55	48	46	42	41	24	61	56	49	47	43	42	25	61	56	49	47	45	43	25
	1200	0.12	61	53	46	44	40	38	23	64	56	49	47	43	42	28	64	57	50	47	44	43	28	64	58	50	48	46	45	28
	1400	0.12	62	55	48	46	42	40	25	65	58	51	48	45	43	29	66	58	51	48	45	44	30	68	60	51	50	46	46	32
	1600	0.12	63	58	50	48	44	43	27	67	60	53	50	47	46	31	68	60	53	50	47	47	32	69	62	53	52	48	48	34
	1800	0.12	65	60	52	50	46	45	29	68	62	55	53	49	49	32	69	62	55	53	49	50	34	70	64	55	54	50	51	35
5-12	1200	0.13	61	53	46	44	40	38	23	64	56	49	47	43	42	28	64	57	50	47	44	43	28	64	58	50	48	46	45	28
	1400	0.13	62	55	48	46	42	40	25	65	58	51	48	45	43	29	66	58	51	48	45	44	30	68	60	51	50	46	46	32
	1600	0.13	63	58	50	48	44	43	27	67	60	53	50	47	46	31	68	60	53	50	47	47	32	69	62	53	52	48	48	34
	1800	0.13	65	60	52	50	46	45	29	68	62	55	53	49	49	32	69	62	55	53	49	50	34	70	64	55	54	50	51	35
	2000	0.13	67	62	54	52	48	47	31	68	62	55	53	49	49	32	69	62	55	53	49	50	34	70	64	55	54	50	51	35
6-16	1700	0.14	65	56	48	45	40	36	28	68	61	53	49	45	43	32	68	62	54	50	46	44	32	69	63	55	51	47	45	34
	2100	0.14	67	58	50	47	44	40	31	70	62	55	51	48	46	35	70	63	56	52	49	47	35	72	64	57	53	51	48	38
	2500	0.14	67	60	54	53	50	48	31	71	63	57	56	53	52	36	72	64	58	56	54	53	38	73	65	59	57	55	54	39
	2900	0.14	70	63	57	56	53	51	35	73	65	59	58	55	54	39	74	66	60	58	56	55	40	75	67	61	59	57	57	41
	3300	0.14	71	65	58	57	54	53	36	75	68	61	60	57	58	41	76	68	62	60	58	59	42	77	69	63	61	59	60	44
7-18x16	1800	0.15	69	58	52	47	42	38	34	69	61	54	49	46	47	34	70	61	54	49	47	49	35	70	62	55	50	49	50	35
	2300	0.15	68	60	55	50	46	43	32	69	62	55	50	47	48	34	69	62	55	50	48	49	34	70	63	56	51	49	50	35
	2800	0.15	69	63	57	53	49	47	34	71	64	57	52	50	49	36	71	64	57	52	50	50	36	72	66	58	53	51	51	38
	3300	0.15	70	66	62	57	56	47	37	73	67	63	56	54	51	39	74	67	63	56	54	52	40	75	69	64	57	55	53	41
	3800	0.15	72	68	65	59	57	48	41	75	70	66	59	57	53	41	76	70	66	59	57	54	42	77	71	68	61	58	55	44

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Radiated sound is the noise transmitted through the unit casing
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge (external) static pressure is 0.25" w.g. for all cases

DISCHARGE SOUND MODEL FCQ - PSC MOTOR

OCTAVE BAND SOUND POWER, Lw, dB																														
Case-Inlet Size	CFM	Min ΔPs	FAN ONLY							ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
2-08	200	0.10	46	41	37	33	28	23	<15	59	48	41	36	32	27	<15	60	49	41	36	32	27	15	62	51	43	38	34	29	18
	300	0.10	49	43	39	35	30	25	<15	60	49	42	37	33	28	<15	61	50	42	37	33	28	<15	63	52	44	39	35	30	15
	400	0.10	51	45	41	37	32	28	<15	63	51	44	39	35	30	15	64	52	44	39	35	30	16	66	54	46	41	37	32	19
	500	0.10	52	46	42	38	34	28	<15	64	52	46	41	37	31	16	65	53	46	41	37	32	18	67	55	48	43	39	34	20
600	0.10	54	48	43	40	35	30	<15	66	54	47	43	38	33	19	67	55	47	43	39	34	20	69	57	49	45	41	36	22	
3-10	500	0.11	50	49	44	40	34	37	<15	62	56	49	44	38	42	<15	64	58	49	44	40	44	16	65	59	50	44	41	44	18
	700	0.11	53	52	46	41	37	42	<15	64	58	50	44	40	45	<15	65	59	50	44	41	46	15	67	60	51	45	42	47	18
	900	0.11	56	54	48	43	40	47	<15	67	60	52	46	43	50	18	68	61	52	46	44	51	19	70	62	53	47	45	52	21
	1100	0.11	58	56	51	44	42	51	15	69	62	55	47	45	54	20	70	63	55	47	46	55	21	72	65	56	48	48	56	24
1300	0.11	61	58	53	45	45	55	19	72	64	57	48	48	58	24	73	65	57	48	49	59	25	75	67	58	49	50	60	28	
4-12	1000	0.12	57	53	48	45	42	47	<15	62	55	48	45	42	47	<15	62	55	48	45	42	47	<15	62	55	48	45	43	47	<15
	1200	0.12	59	56	50	47	44	50	<15	64	58	50	47	44	50	<15	64	58	50	47	45	50	<15	65	58	50	47	45	50	15
	1400	0.12	61	58	53	49	47	54	18	67	60	54	49	47	54	18	67	60	54	49	47	54	18	68	61	55	49	47	54	19
	1600	0.12	61	59	53	49	48	54	18	68	62	54	50	49	56	20	68	62	54	50	49	56	20	69	63	55	51	50	57	21
1800	0.12	62	59	53	49	48	54	18	69	64	56	52	51	58	22	69	64	57	53	52	59	23	71	65	58	53	53	60	24	
5-12	1200	0.13	59	56	50	47	44	50	<15	64	58	50	47	44	50	<15	64	58	50	47	44	50	<15	65	58	50	47	44	52	16
	1400	0.13	61	58	53	49	47	54	18	67	60	53	49	47	54	18	67	60	54	49	47	54	18	68	61	55	49	47	54	19
	1600	0.13	61	59	53	49	48	54	18	68	62	54	50	49	56	20	68	62	54	50	49	56	20	69	63	55	51	50	57	21
	1800	0.13	62	59	53	49	48	54	18	69	64	56	52	51	58	22	69	64	57	53	52	59	23	71	65	58	53	53	60	24
2000	0.13	64	61	55	51	50	56	20	69	64	56	52	51	58	22	69	64	57	53	52	59	23	71	65	58	53	53	60	24	
6-16	1700	0.14	58	56	45	46	41	38	<15	69	63	49	50	45	44	20	70	64	49	50	46	45	21	72	66	50	51	47	46	24
	2100	0.14	60	58	47	48	44	45	<15	71	65	50	51	47	49	22	72	66	50	51	48	50	24	74	68	51	52	49	51	26
	2500	0.14	64	61	49	48	45	51	18	74	67	52	51	48	54	26	75	68	52	51	49	55	28	77	70	53	52	50	56	30
	2900	0.14	65	63	53	50	49	56	20	75	69	55	53	51	58	28	76	70	55	53	52	59	29	78	72	56	54	53	60	31
3300	0.14	66	65	55	52	51	59	23	76	71	58	55	54	62	30	77	72	58	55	55	63	31	79	74	59	56	56	64	34	
7-18x16	1800	0.15	56	57	47	44	41	47	<15	66	63	50	47	44	50	20	67	64	50	47	45	51	21	70	66	51	48	47	52	24
	2300	0.15	60	60	50	46	45	52	16	68	66	52	48	46	53	22	69	66	52	48	47	54	24	72	67	53	49	49	56	25
	2800	0.15	62	62	53	48	47	55	19	71	67	55	50	49	57	25	72	68	55	50	50	58	26	74	69	56	51	52	59	28
	3300	0.15	64	62	54	50	50	58	22	73	68	57	52	52	60	26	74	69	57	52	53	61	28	76	71	58	53	54	62	30
3800	0.15	66	64	57	52	53	62	26	75	69	59	54	55	63	28	76	70	59	54	56	64	29	79	72	60	55	57	65	32	

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E

- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 10) Discharge (external) static pressure is 0.25" w.g. for all cases

FCQ-700 PSC FAN MOTOR AMPERAGE RATINGS

Case Size	Motor HP	Standard PSC Motor Amperage Ratings		
		120v-1 Phase 60 Hz Rated Amps	208-240V-1 Phase 60 Hz Rated Amps	277V-1 Phase 60 Hz Rated Amps
2	1/8	2.6	0.8	1.1
3	1/4	4.8	1.9	1.9
4	1/3	8.8	3.0	1.9
5	1/3	8.8	3.0	3.6
6	1/3 (two motors)	17.6 (two motors)	12.4 (two motors)	12.4 (two motors)
7	3/4 (two motors)	22.8 (two motors)	8.0 (two motors)	8.6 (two motors)

FCQ-700 ECM FAN MOTOR AMPERAGE RATINGS

Case	HP	FLA 120	FLA 208	FLA 230	FLA 277
2	1/3	5.50	3.10	2.7	2.60
3	1/2	8.30	4.80	4.5	3.70
4	1	12.00	7.80	7.3	6.60
6	1/2 (2)	16.6	9.6	9	7.4

FCQ-700 DAMPER LEAKAGE

Standard Construction			
Inlet Diameter	Static Pressure " w.g.	Maximum Airflow	Max Damper Leakage
4	3	300	5
5	3	375	5
6	3	540	5
7	3	760	7
8	3	990	9
9	3	1250	12
10	3	1640	16
12	3	2350	22
14	3	3250	32
16	3	4100	41
20	3	6430	64
24	3	7270	72

PERFORMANCE NOTES

- 1) Leakage testing conducted in accordance with ASHRAE 130-2016
- 2) Per ASHRAE Standard 130-2016 "terminal damper leakage: the amount of air in ft 3/min (L/s) leaking through a fully closed damper/valve of a supply/exhaust terminal unit at a given inlet pressure"opened"

- 3) Damper leakage shall not exceed 1% of the maximum rated airflow at 3" w.g.
- 4) 4" and 5" inlets are built with 6" casings

FCQ-700 HOT WATER COILS

When ordered with the air terminal, the hot water coil is shipped attached with slip and drive connections to the air terminal casing. The discharge end of the casing has slip and drive connections for easy connection to downstream ductwork.

Coil selection can be made using METALAIRE's Air Terminal Unit Selection Software. Contact your representative for a copy. In the interest of energy conservation and due to the possibility of condensation, all hot water coils are marked "Coil must be externally insulated after installation in the field." Hot water coils are tested in accordance with AHRI Standards 410. Hot water coils may be ordered with optional access doors for inspection and cleaning to meet requirements of ASHRAE Standard 62.1.

HOT WATER COIL CONSTRUCTION DETAILS

- Hot Water Coils are factory mounted to the discharge of the terminal and are available with an optional factory mounted discharge plenum section with access door.
- Hot water coils are enclosed in a 20 gauge coated steel casing allowing for attachment to metal ductwork with a slip and drive connection.
- Fins are rippled and sine wave type constructed from heavy gauge aluminum and are mechanically bonded to the tubes.
- Tubes are copper with a minimum wall thickness of 0.016" with male sweat header connections.
- Coils are leak tested to 300 psi with minimum burst of 2000 psi at ambient temperature. Coil performance data is based on tests run in accordance with AHRI standard 410. Coils are AHRI certified and include an AHRI label.



Outside Diameter (OD) connection size, Inches		
Case Size	Standard HW Coil Inches	
	1 Row	2 Row
2	5/8 (15.8)	7/8 (22.2)
3	5/8 (15.8)	7/8 (22.2)
4	7/8 (22.2)	7/8 (22.2)
5	7/8 (22.2)	7/8 (22.2)
6	7/8 (22.2)	7/8 (22.2)
7	7/8 (22.2)	7/8 (22.2)

All coils have 10 fins/inch with optional 12 fins/inch

All accessories that can be attached to the Series Fan Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

FCQ-700 HOT WATER COILS MBH SELECTION DATA

SERIES FAN POWERED

FCQ-700 ULTRA QUIET

Case Size	Rows	GPM	Head Loss (ft-H ₂ O)	CFM				
				200	400	500	600	750
2	One	1	0.64	8.9	12.1	13.1	14.0	15.0
		2	2.46	9.7	13.5	14.8	16.0	17.4
		4	9.40	10.1	14.4	15.9	17.2	18.9
		Airside Ps		0.02	0.07	0.11	0.15	0.22
2	Two	2	0.62	15.0	22.0	24.4	26.4	28.9
		4	2.38	16.0	24.3	27.3	29.9	33.2
		8	9.10	16.6	25.7	29.1	32.1	36.0
		Airside Ps		0.05	0.16	0.23	0.32	0.46

Case Size	Rows	GPM	Head Loss (ft-H ₂ O)	CFM				
				1000	1200	1400	1600	1800
5	One	3	1.19	28.4	30.5	32.2	33.8	35.1
		6	4.54	31.1	33.6	35.7	37.6	39.4
		9	9.93	32.1	34.8	37.1	39.2	41.1
		Airside Ps		0.11	0.15	0.19	0.24	0.30
5	Two	4	1.32	48.8	52.9	56.3	59.3	62.0
		8	5.19	54.6	59.8	64.4	68.4	72.0
		10	8.06	56.0	61.5	66.3	70.6	74.4
		Airside Ps		0.23	0.32	0.41	0.51	0.62

Case Size	Rows	GPM	Head Loss (ft-H ₂ O)	CFM				
				500	700	900	1100	1300
3	One	4	1.64	18.6	21.6	24.0	25.9	27.6
		8	6.27	19.7	23.0	25.7	28.0	29.9
		10	9.66	19.9	23.3	26.1	28.4	30.4
		Airside Ps		0.06	0.10	0.15	0.22	0.29
3	Two	4	1.84	31.0	36.9	41.5	45.3	48.5
		6	4.09	32.5	39.1	44.3	48.7	52.4
		8	7.19	33.3	40.3	45.9	50.6	54.6
		Airside Ps		0.12	0.22	0.33	0.46	0.61

Case Size	Rows	GPM	Head Loss (ft-H ₂ O)	CFM				
				1500	2000	2500	3000	3300
6	One	4	1.43	58.3	65.6	71.3	76.0	78.5
		8	5.61	65.1	74.5	82.1	88.5	91.9
		10	8.71	66.7	76.6	84.7	91.6	95.2
		Airside Ps		0.03	0.05	0.07	0.10	0.12
6	Two	4	1.07	87.6	99.6	108.8	116.2	120.0
		8	4.22	102.2	119.4	133.3	145.0	151.1
		12	9.42	108.2	127.7	144.0	157.8	165.2
		Airside Ps		0.07	0.11	0.16	0.21	0.25

Case Size	Rows	GPM	Head Loss (ft-H ₂ O)	CFM				
				1000	1200	1400	1600	1800
4	One	3	1.19	28.4	30.5	32.2	33.8	35.1
		6	4.54	31.1	33.6	35.7	37.6	39.4
		9	9.93	32.1	34.8	37.1	39.2	41.1
		Airside Ps		0.11	0.15	0.19	0.24	0.30
4	Two	4	1.32	48.8	52.9	56.3	59.3	62.0
		8	5.19	54.6	59.8	64.4	68.4	72.0
		10	8.06	56.0	61.5	66.3	70.6	74.4
		Airside Ps		0.23	0.32	0.41	0.51	0.62

Case Size	Rows	GPM	Head Loss (ft-H ₂ O)	CFM				
				2000	2500	3000	3500	4000
7	One	4	1.43	65.6	71.3	76.0	80.0	83.4
		8	5.61	74.5	82.1	88.5	94.1	98.9
		10	8.71	76.6	84.7	91.6	97.5	102.7
		Airside Ps		0.05	0.07	0.10	0.13	0.16
7	Two	4	1.07	99.6	108.8	116.2	122.2	127.3
		8	4.22	119.4	133.3	145.0	154.9	163.5
		12	9.42	127.7	144.0	157.8	169.8	180.3
		Airside Ps		0.11	0.16	0.21	0.27	0.34

1) All coil performance in accordance with AHRI Standard 410-2001

2) Heating capacities are in MBH

3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)

4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

5) Head Loss is in feet of water

6) Airside ΔPs is the air pressure drop of the hot water coil

7) Air temperature rise = 927 x MBH/CFM

8) Water temperature drop = 2.04 x MBH/GPM

9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

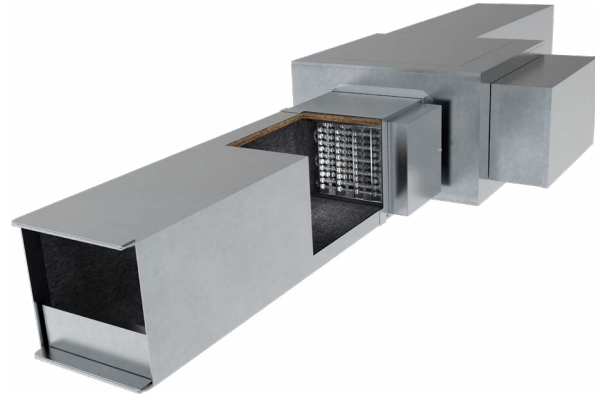
ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

FCQ-700 ELECTRIC HEAT

The discharge end has slip and drive connections for easy connection to downstream ductwork. ETL® listed heaters are provided with a fan interlock relay. Heaters that will be controlled electronically must include a 24 VAC control circuit to operate with the low voltage controls on the air terminal. Heater plenums are internally insulated. When an air terminal is ordered with clean room lining and electric heat, the heater plenum is either internally lined with optional foil backed insulation or closed cell foam or may require external insulation in field.

INCLUDED WITH EACH HEATER ASSEMBLY:

- ▶ Heater and cabinet mounted on the discharge of the FCQ-700
- ▶ Electric Heater is interlocked into fan control relay
- ▶ De-energizing magnetic contactors per step
- ▶ Primary automatic reset high temperature limit (disc type)
- ▶ Backup manual reset high temperature limit (disc type)
- ▶ Non-fused transformer with voltage to match Heater voltage
- ▶ Single point power wiring connection
- ▶ Heater is shipped factory mounted and wired



ELECTRIC HEATER ASSEMBLY CONSTRUCTION DETAILS

- ▶ Electric Reheat Coils are factory mounted on the discharge of the Air Terminal. The heaters are ETL® listed for zero clearance, are tested in accordance with UL® 60335, CSA-C22.2 and the National Electric Code (NEC). Heater casings are constructed of galvanized steel. Element wire is high grade nichrome alloy derated to 45 watts per square inch density. Element wire is supported by moisture-resistant steatite ceramics.
- ▶ Ceramics are enclosed in reinforcement brackets spaced across the heater element rack at 2" to 4" intervals. Controls are contained in a NEMA 1 control cabinet with a hinged, latching door. A permanent wiring diagram is affixed to the inside of the control cabinet door for field reference.
- ▶ The 208 and 480 volt units require a neutral connection for both single and three phase service. Our standard motors are 120 and 277 volt single phase. The 208-240 volt single phase motor is optional. 480 volt motors are not available for our units. See table for reference.

Heater Voltage	Fan Motor Voltage	Separate Neutral Required
120 V 1PH	120 V 1PH	NO
208 V 1PH	120 V 1PH	YES
277 V 1PH	277 V 1PH	NO
480 V 1PH	277 V 1PH	YES
208 V 1PH	208 V 1PH	NO
208 V 3PH	120 V 1PH	YES
480 V 3PH	277 V 1PH	YES
208 V 3PH	208 V 1PH	NO

All accessories that can be attached to the Series Fan Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

FCQ-700 ELECTRIC HEATER CAPACITIES

Model FCQ		Single Phase										Three Phase			
		120V		208V		240V		277V		480V		208V		480V	
Inlet Size	# of Steps Available	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2	1/SCR	0.5	5	0.5	9	0.5	9	0.5	9	1.5	9	0.5	9	1.5	9
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
3	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	13	1.5	13	0.5	13	1	13
	2	1		1		1		1		3		1		2	
	3	1.5		1.5		1.5		1.5		4.5		1.5		3	
4	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	13	1.5	16	0.5	17	1	19
	2	1		1		1		1		3		1		2	
	3	1.5		1.5		1.5		1.5		4.5		1.5		3	
5	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	13	1	16	0.5	17	0.5	24
	2	1		1		1		1		2		1		1	
	3	1.5		1.5		1.5		1.5		3		1.5		1.5	
6	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	13	1	16	0.5	17	0.5	24
	2	1		1		1		1		2		1		1	
	3	1.5		1.5		1.5		1.5		3		1.5		1.5	
7	1/SCR	0.5	5	0.5	9.5	0.5	11	0.5	13	1	16	0.5	17	0.5	24
	2	1		1		1		1		2		1		1	
	3	1.5		1.5		1.5		1.5		3		1.5		1.5	

NOTES:

- Heaters less than 10 kW are specifiable to nearest 0.5 kW. Heaters greater than 10.0 kW are specifiable to nearest 1.0 kW.
- Minimum flow rate for electric heat is 70 CFM / kW.
Lower CFM's can cause nuisance tripping, excessive discharge temperatures, rapid cycling, and rapid element failure.
Electric Heat units running below 70 CFM / kW will void all warranties.
- For optimum thermal comfort, the suggested discharge temperature should not exceed 20°F above room set point.
- We do not recommend discharge temperatures in excess of 115°F to protect heater coils.
- Maximum number of steps at minimum kW per Step is one step.
- If more than 1 heater is wired into a building's circuit breaker (multi-outlet branch circuit) each heater will require the addition of power side fusing.

ELECTRIC HEAT SELECTION:

A. Specify electric duct heaters using voltage, phase, kW, and number of steps.

B. Use above chart to select voltage. Calculate required kW using following equations:

$$kW = \frac{BTU / HR}{3413} \quad kW = \frac{CFM \times \Delta \times 1.085}{3413} \quad \Delta = \frac{kW \times 3413}{CFM \times 1.085}$$

$$CFM = \frac{kW \times 3413}{\Delta \times 1.085} \quad CFM = \frac{kW \times 3413}{\Delta \times 1.085}$$

* air density at sea level—reduce by 0.036 for each 1000 feet of altitude above sea level

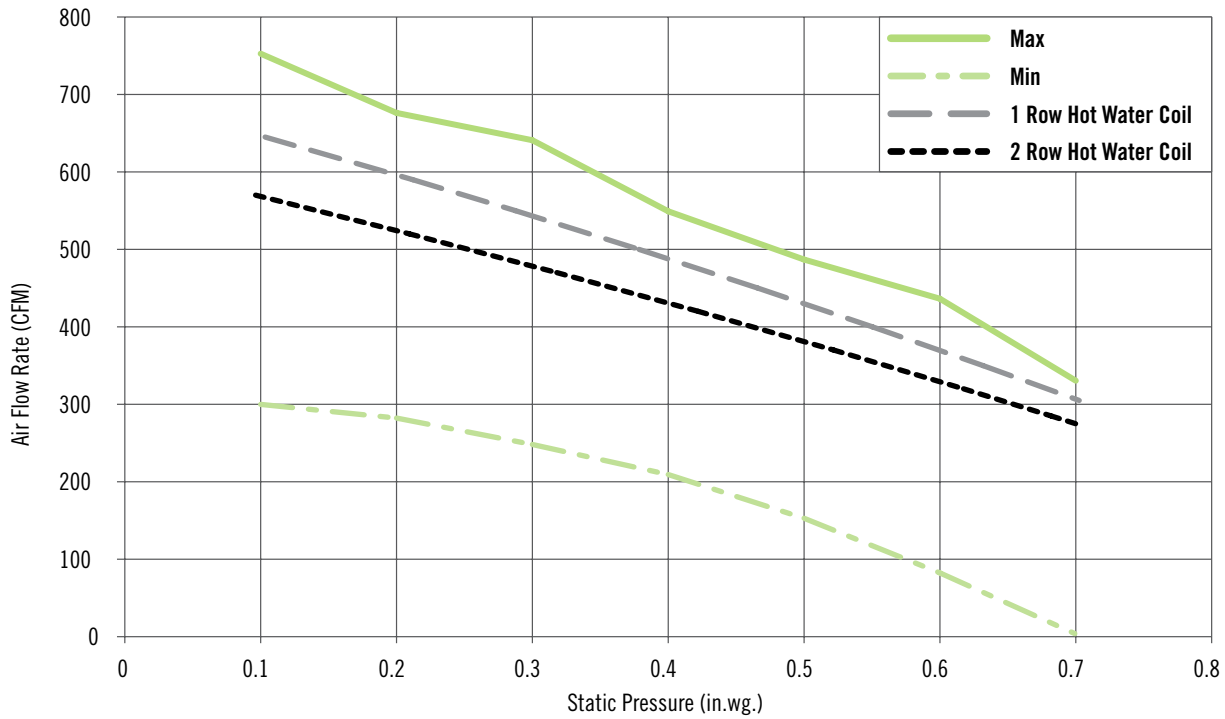
Where: BTU / Hr = Required heating capacity

CFM = volume of air during heating. Typically 100% of maximum cooling air volume

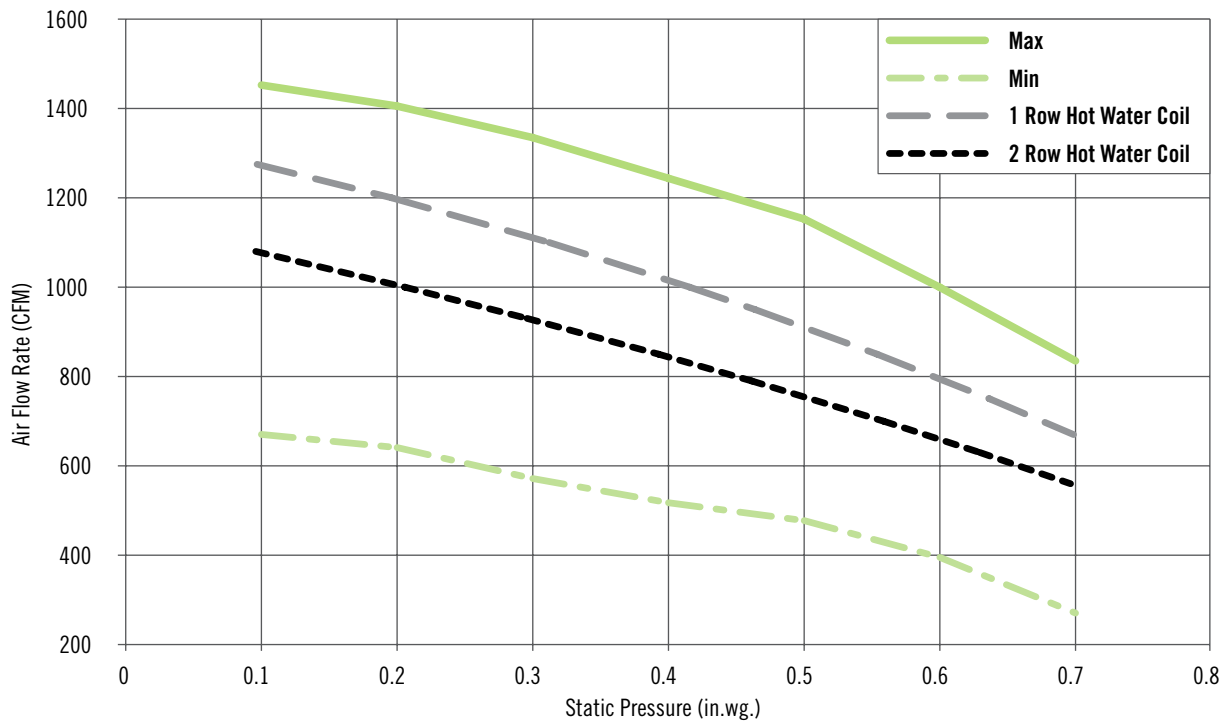
Δ = desired air temperature rise across the electric heater

Inlet air temperature = primary air temperature, usually 55°F

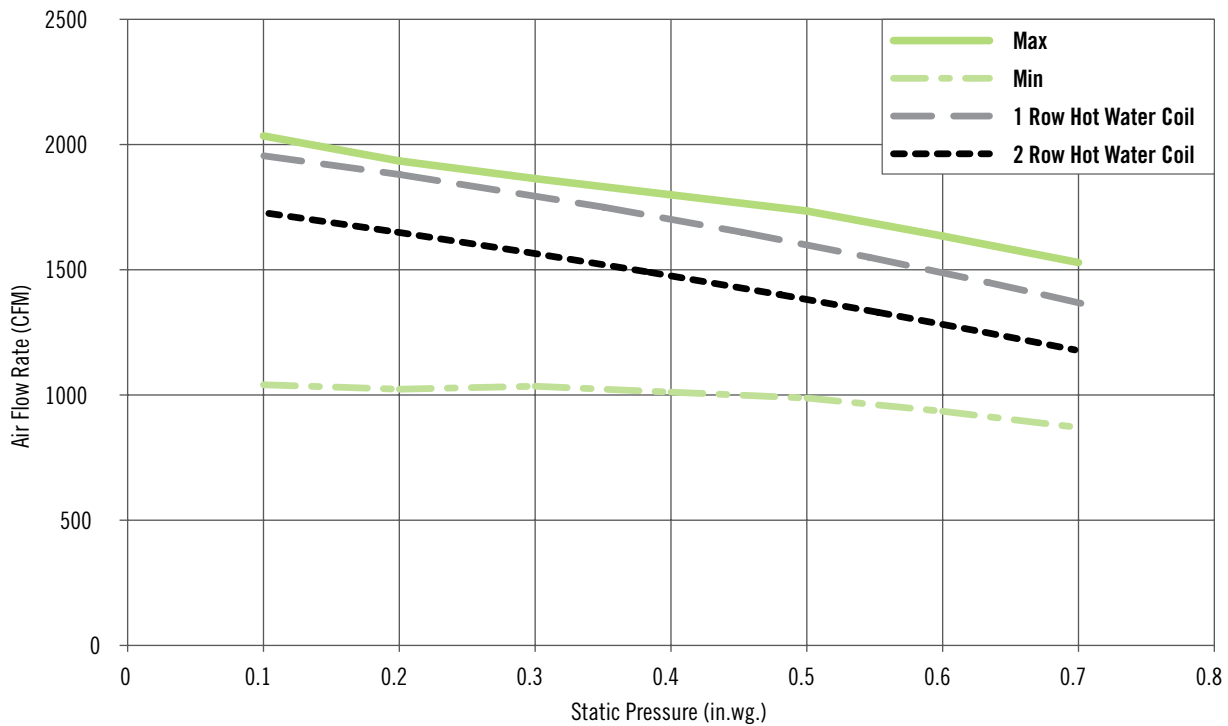
FCQ-700 FAN PERFORMANCE CURVES CASE 2 - PSC MOTOR



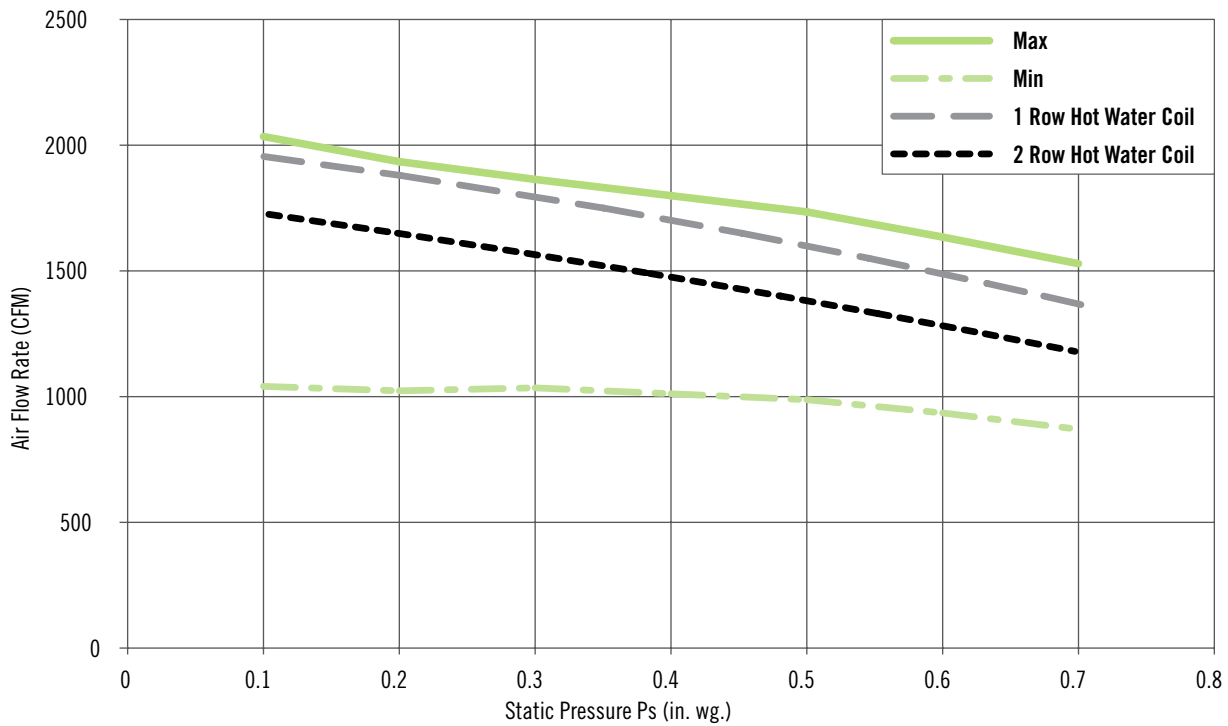
FCQ-700 FAN PERFORMANCE CURVES CASE 3 - PSC MOTOR



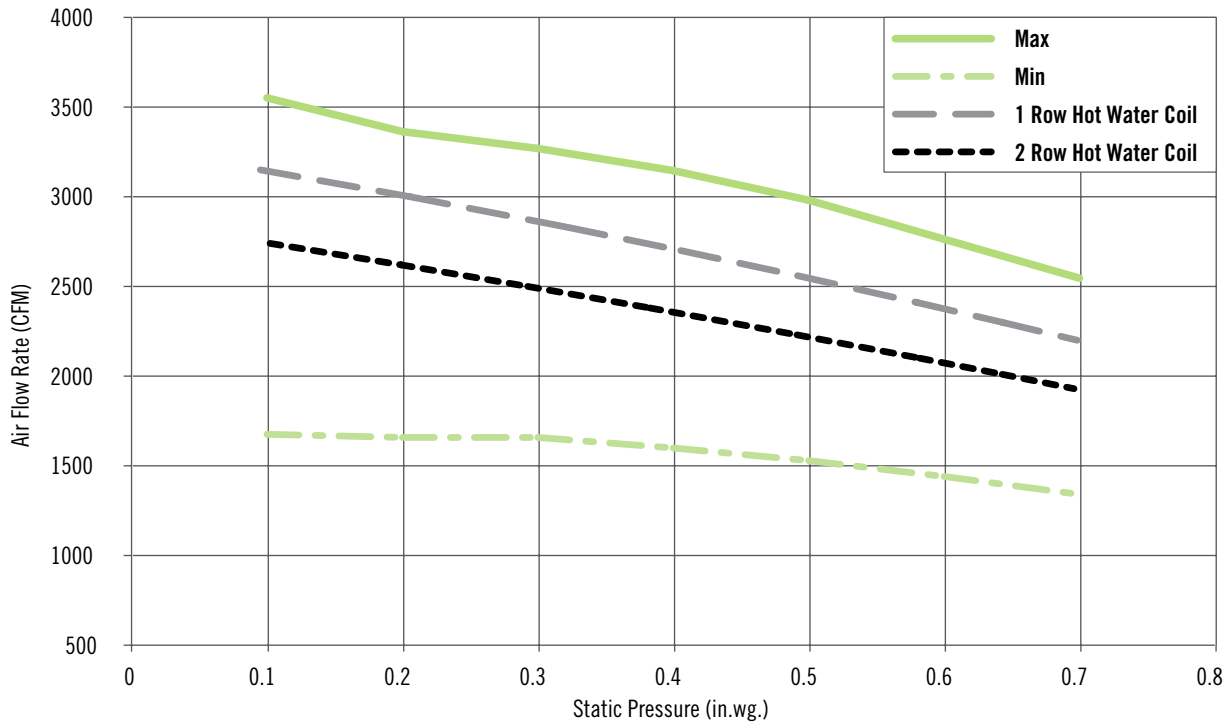
FCQ-700 FAN PERFORMANCE CURVES CASE 4 - PSC MOTOR



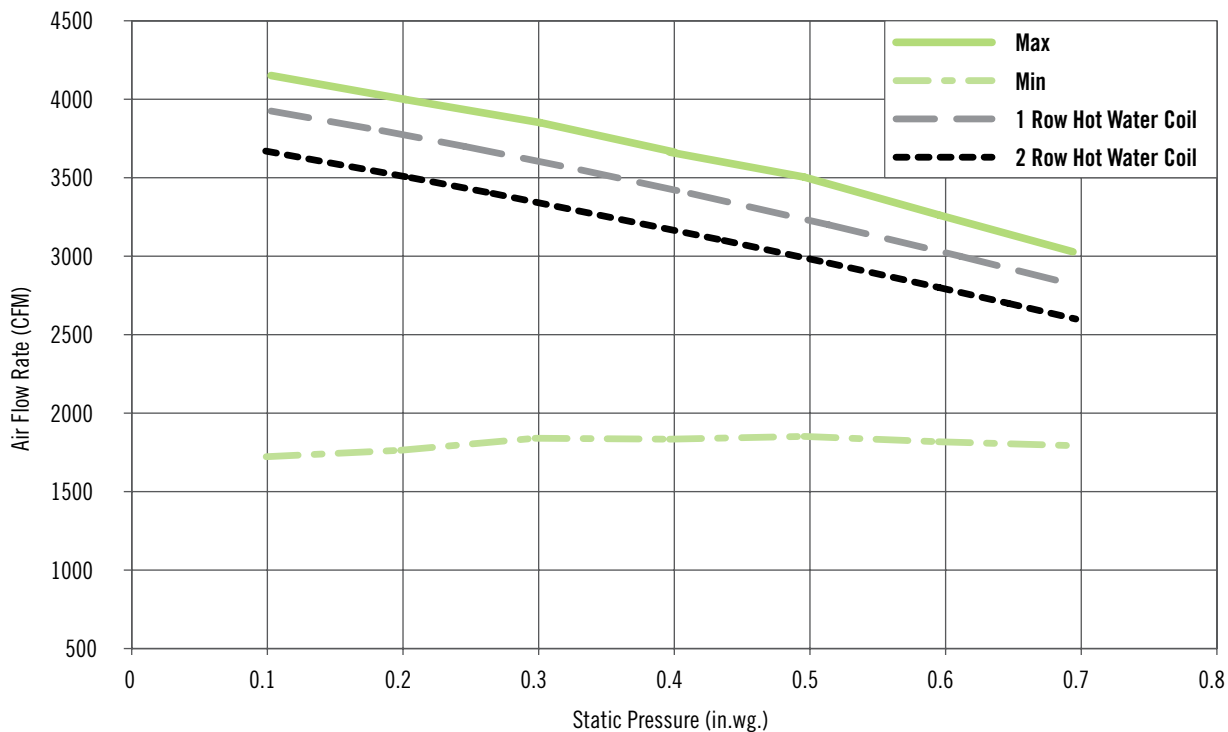
FCQ-700 FAN PERFORMANCE CURVES CASE 5 - PSC MOTOR

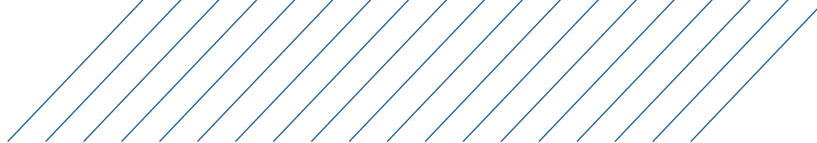


FCQ-700 FAN PERFORMANCE CURVES CASE 6 - PSC MOTOR

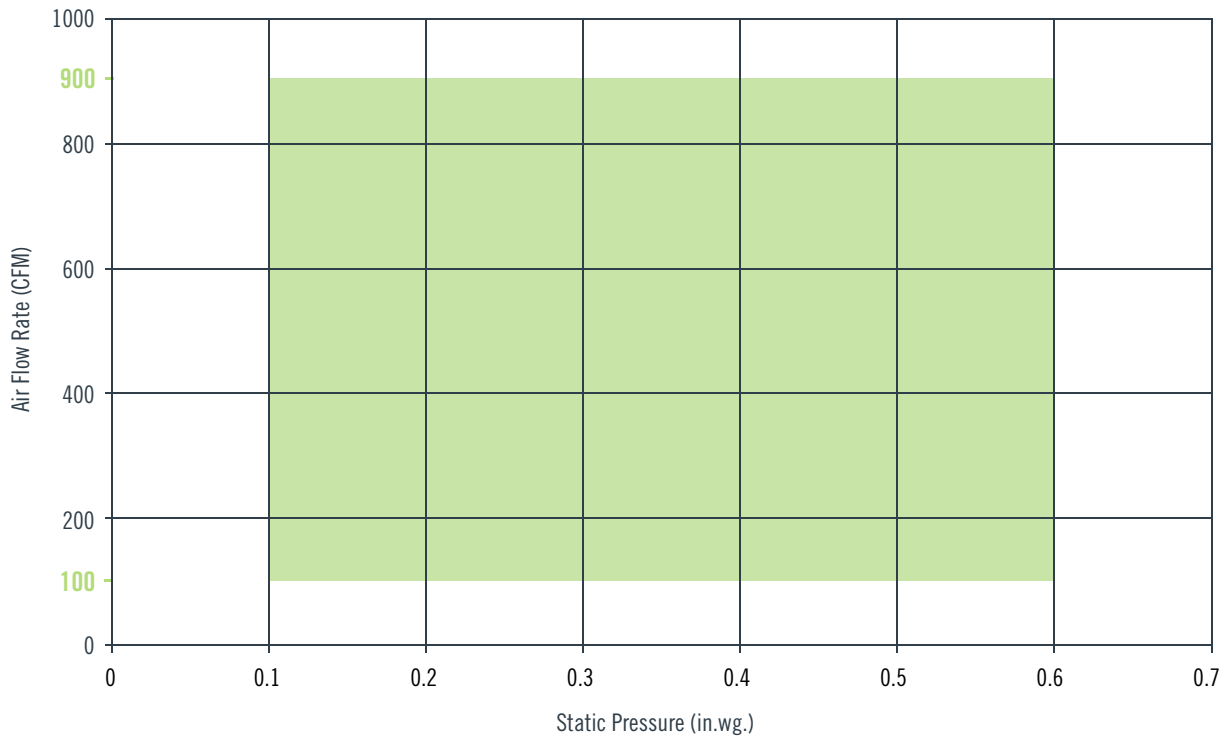


FCQ-700 FAN PERFORMANCE CURVES CASE 7 - PSC MOTOR

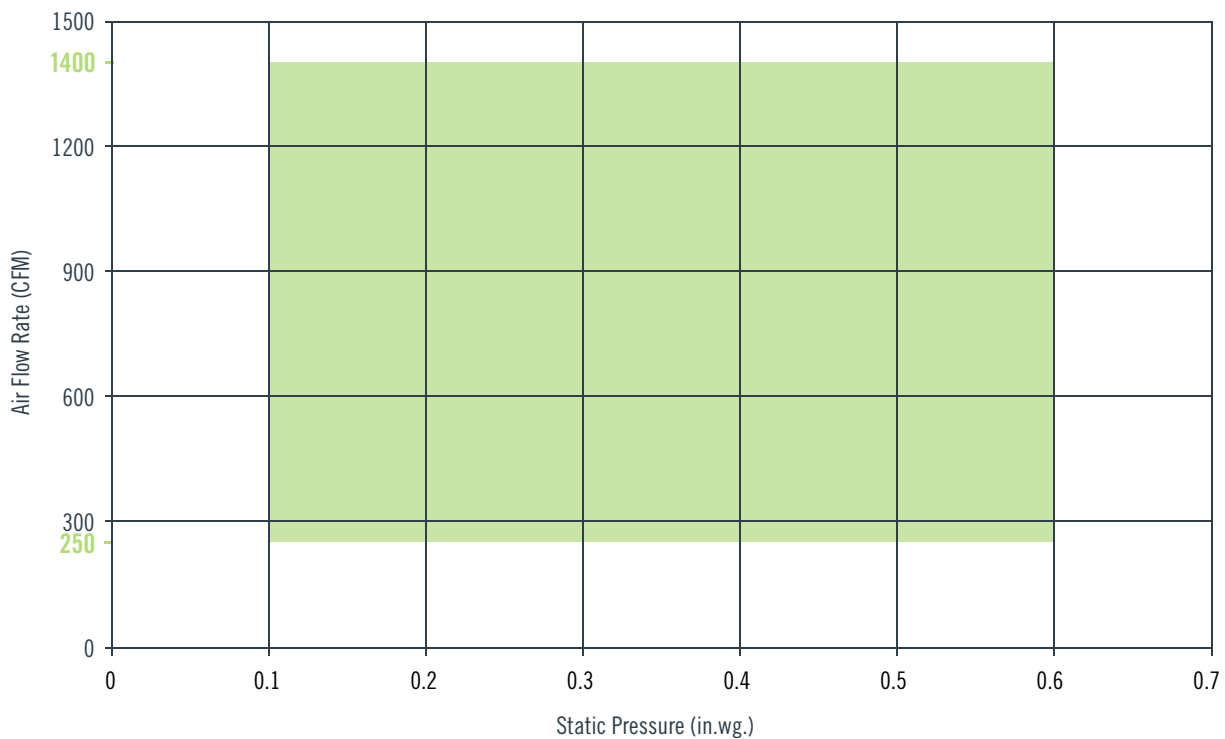


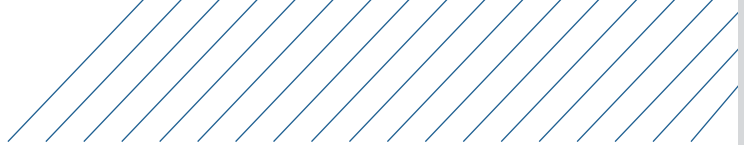


FCQ 700 ECM FAN PERFORMANCE CURVES CASE 2

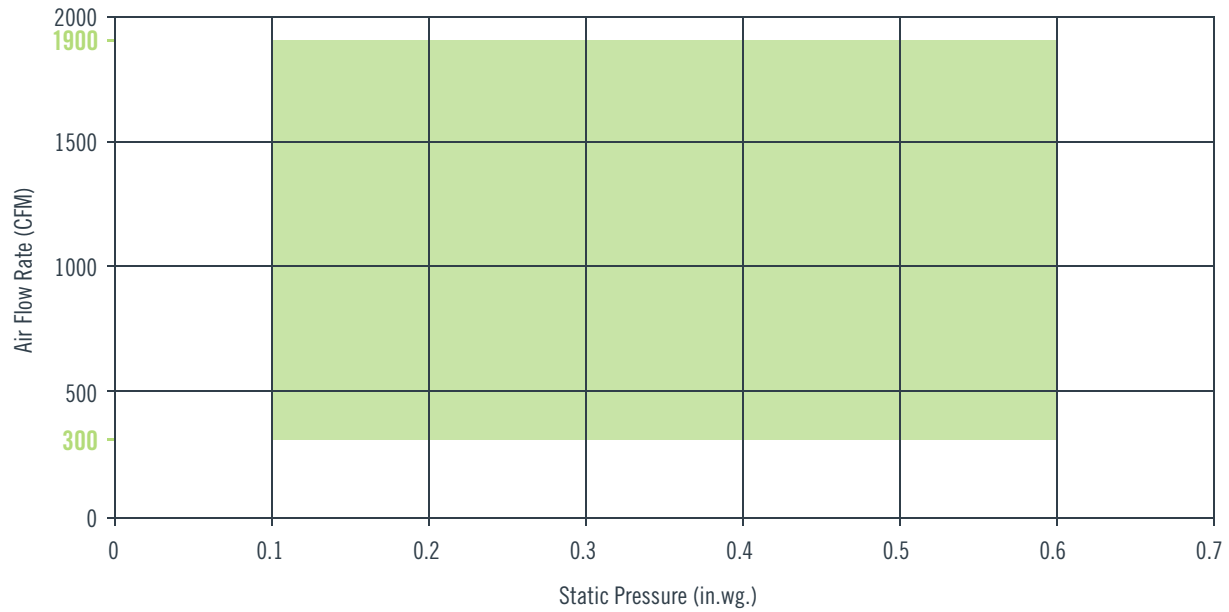


FCQ 700 ECM FAN PERFORMANCE CURVES CASE 3

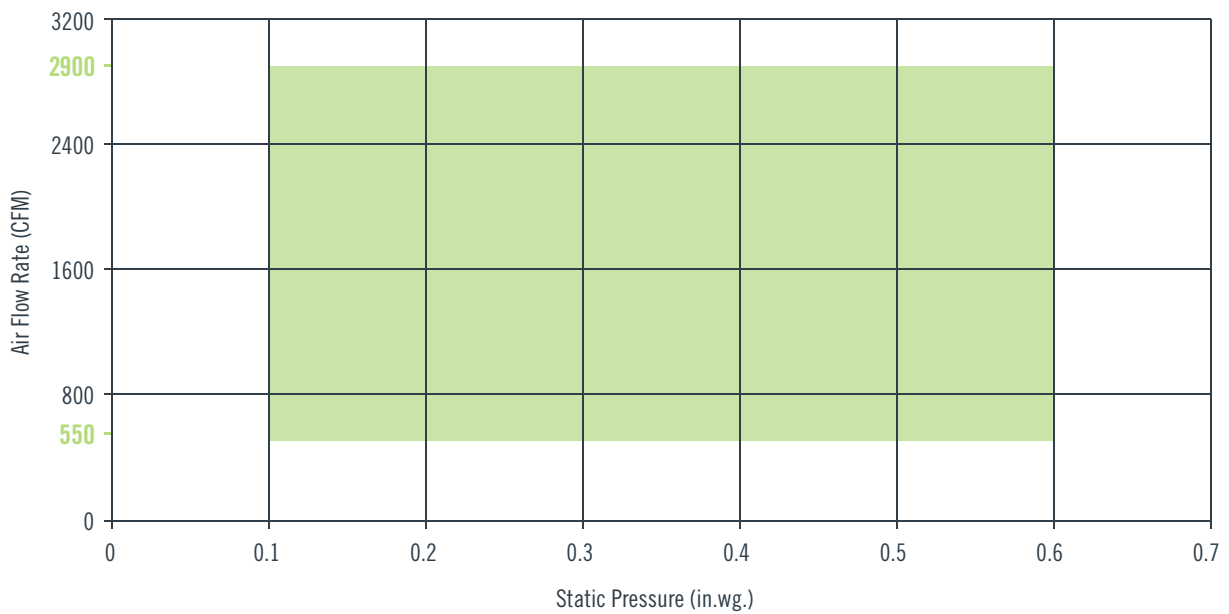




FCQ 700 ECM FAN PERFORMANCE CURVES CASE 4



FCQ 700 ECM FAN PERFORMANCE CURVES CASE 6





FVI-500
VARIABLE VOLUME UNIT



FVL-600
LOW-PROFILE VARIABLE VOLUME UNIT

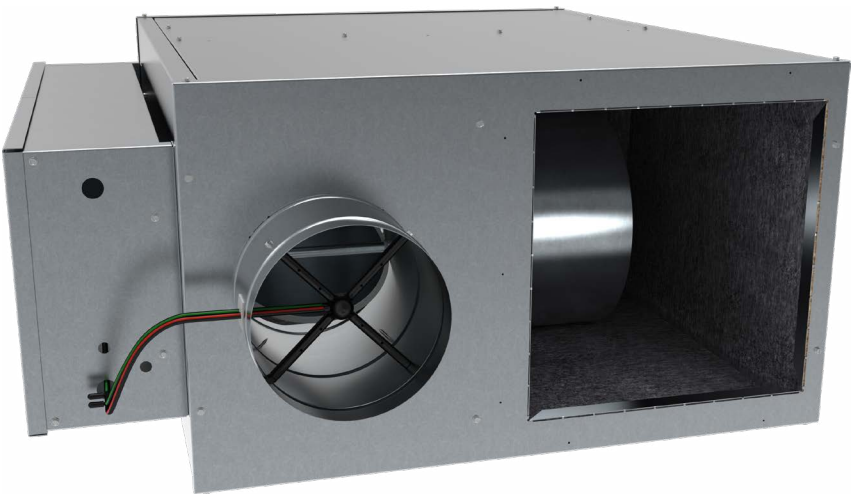
PARALLEL FAN POWERED TERMINAL UNITS

METALAIRE's parallel fan-powered terminal units are designed to provide superior comfort by intermittent parallel fan operation. Conditioned primary air is varied during cooling while the fan cycles on during heating. Parallel fan-powered terminal units allow for recovery of waste heat from the return plenum and a potential reduction in central fan energy, thereby lowering operating costs. In the heating mode with the fan energized, parallel fan-powered terminal units improve air circulation through better diffuser performance.

The primary function of the METALAIRE parallel fan-powered terminal unit is to deliver variable volume, constant temperature primary air to the space in the cooling mode. The volume of supply air is varied in response to a control signal. In the heating mode, with the fan energized, the terminal unit mixes conditioned air and plenum air in response to a control signal to supply constant volume, variable temperature supply air into the space. Supplemental heating is available in both electric heat and hot water coils if plenum heat is insufficient. METALAIRE parallel fan-powered terminal units are available with a wide range of control options to suit any application. These include pneumatic and direct digital control (DDC). With the demands of today's building designs to reduce energy in smaller mechanical spaces, the METALAIRE parallel fan-powered terminal unit is the perfect choice.

FEATURES

- FVI-500 is available in 7 casing sizes to handle 150 – 5600 CFM.
- FVL-600 is available in 2 casing sizes to handle 150 – 1825 CFM.
- 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- Mechanically fastened damper assembly is double layer, 18 gauge equivalent, galvanized steel with integral blade seal. (<1% at 3" static pressure).
- Factory calibrated controls per each job requirement.
- Multi-point center averaging flow sensor provides highly accurate +/- 5% flow readings after certified balancer has balanced terminal.
- Easy access, steel balancing taps.
- Energy efficient PSC motors with adjustable SCR solid state fan speed controllers are standard.
- Electronically Commutated Motors (ECM) available as an option.
- External control cabinet with offset mounting plate as standard.
- Single point electrical connections.
- 3-beaded primary inlet connection tube for added rigidity and secure flex duct connections.
- Round inlets available in sizes 6" through 16".
- 1" thick, dual density (1.5lb / ft³ min.) fiberglass insulation with edges coated. Meets NFPA 90A and UL 181 (1/2" thick insulation standard on FVL-600).
- Rectangular discharge with optional slip and drive duct connection.
- Large removable bottom access panel provides complete access to interior of unit.
- Independently tested and certified laboratory performance data.
- Full range of options and accessories available (heating coils, disconnects, attenuators, etc.).
- Full range of liners / insulation available.

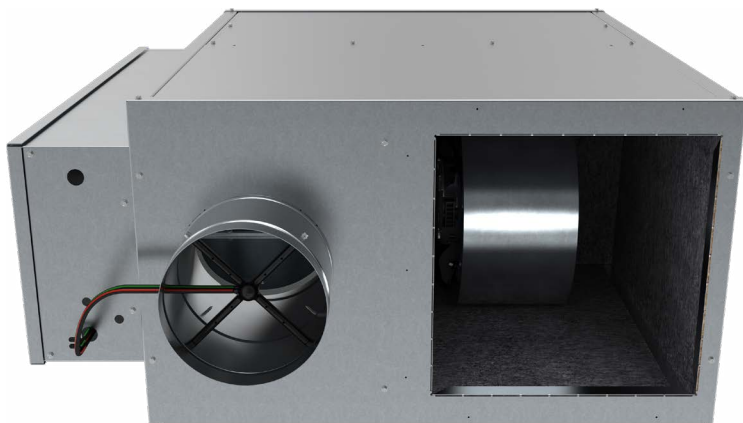


FVI-500 VARIABLE VOLUME FAN TERMINAL UNIT

SPECIFIABLE FEATURES

- ▶ Galvanized steel casing, mechanically sealed for low leakage construction
- ▶ NEMA TYPE 1 rated hinged control enclosure with standoff to prevent penetration of casing
- ▶ Single speed high efficiency PSC motor with SCR motor speed control
- ▶ Riveted primary inlet duct to minimize leakage with 3 stiffening beads for added rigidity
- ▶ Damper construction of double layer 18 gauge equivalent with integral blade seal
- ▶ Single point electrical connection
- ▶ Gasketed back draft damper door to minimize leakage in cooling mode

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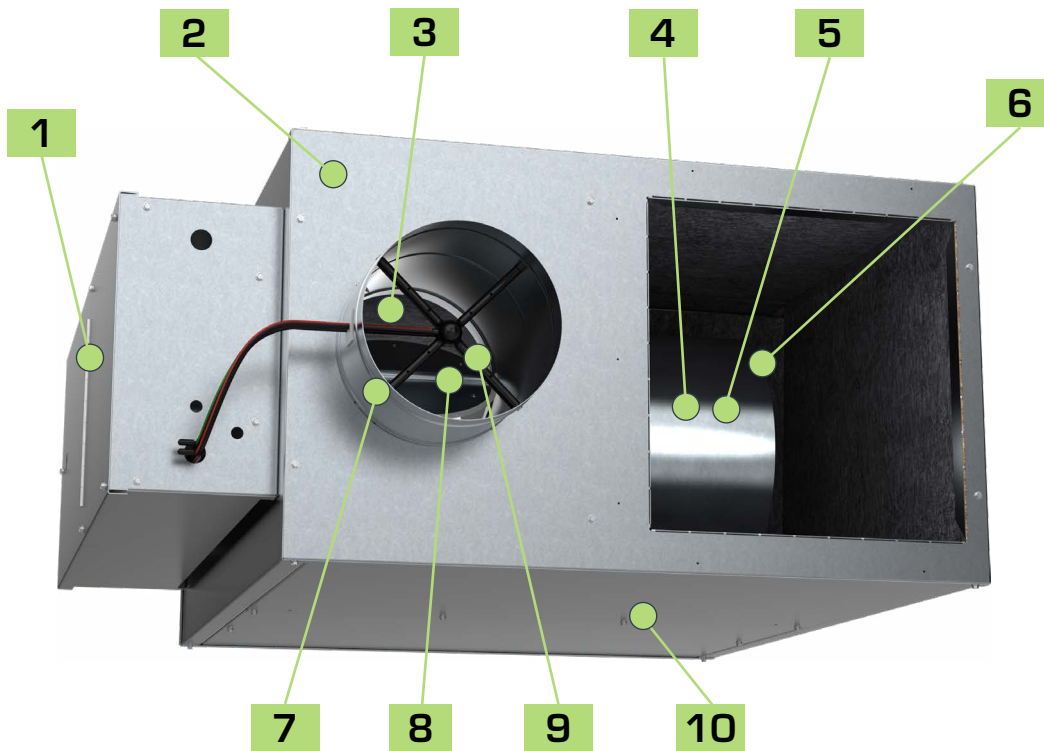
FVI-500 VARIABLE VOLUME FAN TERMINAL UNIT

METALAIRE's model FVI-500 parallel fan-powered terminal unit is designed to provide superior comfort to zones by intermittent parallel fan operation. Conditioned primary air is varied during cooling while the fan cycles on during heating. Parallel fan-powered terminal units allow for recovery of waste heat from the return plenum and a potential reduction in central fan energy, thereby lowering operating costs. In the heating mode with the fan energized, parallel fan-powered terminal units improve air circulation through better diffuser performance. The primary air does not pass through the fan.

The primary function of the METALAIRE model FVI-500 parallel fan-powered terminal unit is to deliver variable volume, constant temperature primary air to the space in the cooling mode. The volume of supply air is varied in response to a control signal. In the heating mode, with the fan energized, the terminal unit mixes conditioned air and plenum air in response to a control signal to supply constant volume, variable temperature supply air into the space. Supplemental heating is available in both electric heat and hot water coils if plenum heat is insufficient. METALAIRE model FVI-500 parallel fan-powered terminal units are available with a wide range of control options to suit any application. These include pneumatic factory provided commissioned direct digital control (DDC) or factory mounted field supplied (DDC) controls. With the demands of today's building designs to reduce energy in smaller mechanical spaces, the METALAIRE model FVI-500 parallel fan-powered terminal unit is the perfect choice.

STANDARD FEATURES

- ▶ Available in 7 casing sizes to handle 150–5600 CFM.
- ▶ 20 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- ▶ Mechanically fastened damper assembly is double layer, 18 gauge equivalent, galvanized steel with integral blade seal. (<1% at 3" static pressure).
- ▶ Factory calibrated controls per each job requirement.
- ▶ Multi-point center averaging airflow sensor provides highly accurate +/- 5% flow readings after certified balancer has balanced terminal.
- ▶ Energy efficient six pole single speed PSC motors with adjustable SCR solid state fan speed controllers are standard.
- ▶ Electronically Commutated Motors (ECM) available as an option.
- ▶ Available fan motor voltages of 120, 277 and 208-240 (50 / 60 HZ)
- ▶ External control cabinet with offset mounting plate as standard.
- ▶ Single point electrical connections.
- ▶ 3-beaded primary inlet connection tube for added rigidity and secure flex duct connections.
- ▶ Round inlets available in sizes 6" through 16".
- ▶ 1" thick, dual density (1.5lb / ft³ min.) fiberglass insulation with edges coated. Meets NFPA 90A and UL 181. (1/2" thick insulation standard on FVL-600).
- ▶ Rectangular flanged discharge with optional slip and drive cleat duct connection.
- ▶ Large Bottom access panel provides access to fan motor / blower assembly.
- ▶ Independently tested and certified laboratory performance data.
- ▶ Full range of options and accessories available (heating coils, disconnects, attenuators, etc.).
- ▶ Full range of liners / insulation available.
- ▶ Auto and manual thermal resets on every electric heater.



FVI-500 VARIABLE VOLUME FAN TERMINAL UNIT

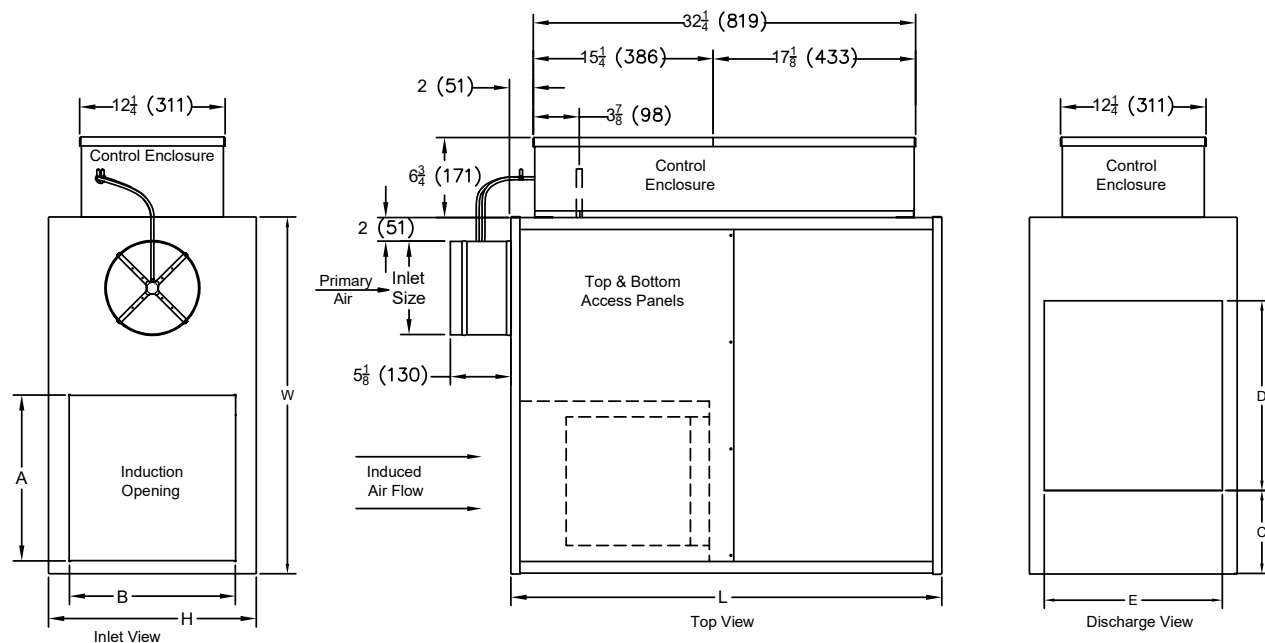
FEATURES AND BENEFITS

- 1** NEMA TYPE 1 rated hinged control enclosure with standoff to prevent penetration of casing.
- 2** Galvanized steel casing, mechanically sealed for low leakage construction.
- 3** Damper construction of double layer 18 gauge equivalent with integral blade seal.
- 4** Motor / blower assembly assembled to 18 gauge bulkhead to mitigate vibration.
- 5** Single speed high efficiency PSC motor with SCR motor speed control.
- 6** Gasketed back draft damper door to minimize leakage in cooling mode.
- 7** Riveted primary inlet duct to minimize leakage with 3 stiffening beads for added rigidity.
- 8** Damper assembly rotates in long life, low friction, self lubricating thermoplastic bearing.
- 9** Multi-Point Center Averaging Airflow Sensor.
- 10** Top and bottom access panels provided for easy motor / blower servicing.

FVI-500-001 PARALLEL FAN POWERED AIR TERMINAL UNIT COOLING ONLY

PARALLEL FAN POWERED

FVI-500 VARIABLE VOLUME



The standard location for control enclosure is Left Hand. Looking in the direction of airflow, the control enclosure is on the left.

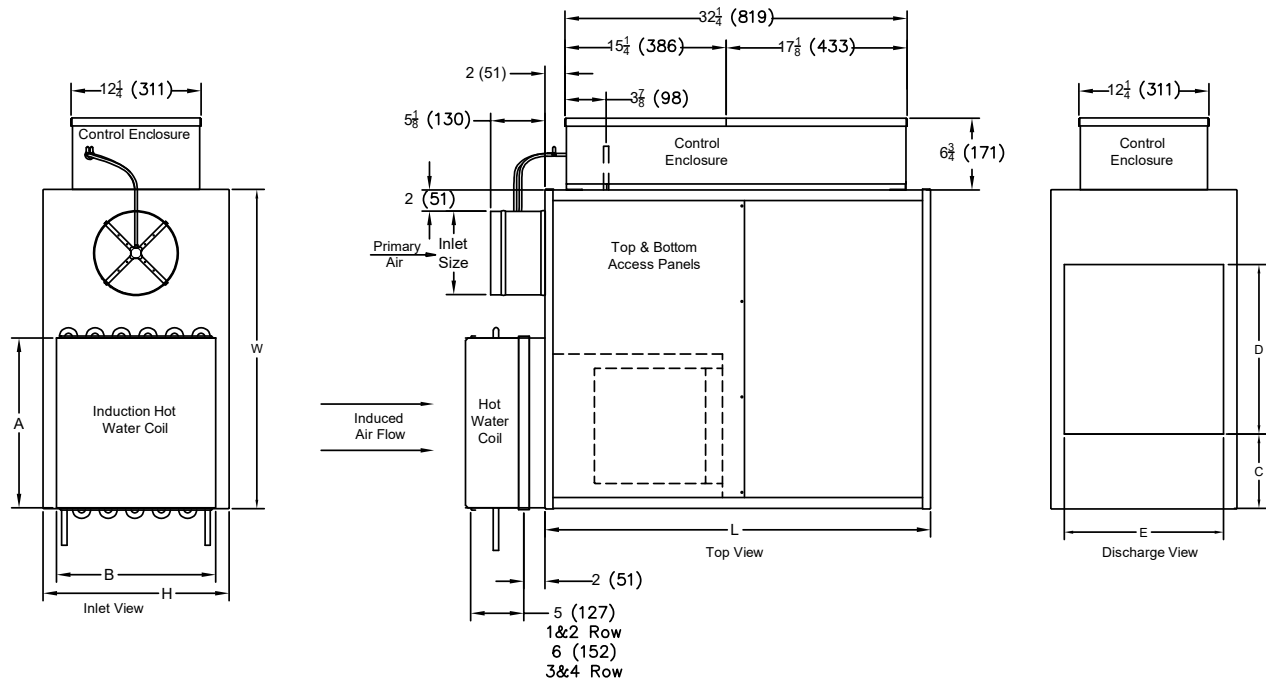
Case size	Inlet Size		Unit Dimensions			Induction		Discharge		
	Standard	Optional	Width W	Height H	Length L	Width A	Height B	Loc. C	Width D	Height E
1	6 (152)	4,5,8,10	30 (762)	17 1/2 (445)	36 (914)	14 (356)	14 (356)	8 (203)	14 (356)	13 (330)
2	8 (203)	4,5,6,10	30 (762)	17 1/2 (445)	36 (914)	14 (356)	14 (356)	8 (203)	14 (356)	13 (330)
3	10 (254)	4,5,6,8,12,14	36 (914)	17 1/2 (445)	40 (1016)	18 (457)	14 (356)	10 (254)	16 (406)	15 1/2 (394)
4	12 (305)	8,10,12,14	36 (914)	17 1/2 (445)	40 (1016)	18 (457)	14 (356)	10 (254)	16 (406)	15 1/2 (394)
5	14 (356)	10,12,16	40 (1016)	20 (508)	40 (1016)	18 (457)	16 (406)	11 (279)	18 (457)	15 (4381)
6	16 (406)	10,12,14	42 (1067)	20 (508)	42 (1067)	20 (508)	16 (406)	11 (279)	20 (508)	16 (406)
7	16 (406)	12,14	42 (1067)	20 (508)	42 (1067)	20 (508)	16 (406)	14 (356)	22 (559)	18 (457)

All dimensions shown in inches, parentheses () indicate millimeters.

PSC MOTOR CONFIGURATION	
Case Size	Horse Power
1	1/8
2	1/6
3	1/4
4	1/4
5	1/3
6	1/2
7	1

ECM MOTOR CONFIGURATION	
Case Size	Horse Power
1	1/3
2	1/3
3	1/2
4	1/2
5	1
6	1
7	1

FVI-500-002 PARALLEL FAN POWERED AIR TERMINAL UNIT WITH HOT WATER COIL ON INDUCTION



The standard location for control enclosure is Left Hand. Looking in the direction of airflow, the control enclosure is on the left.

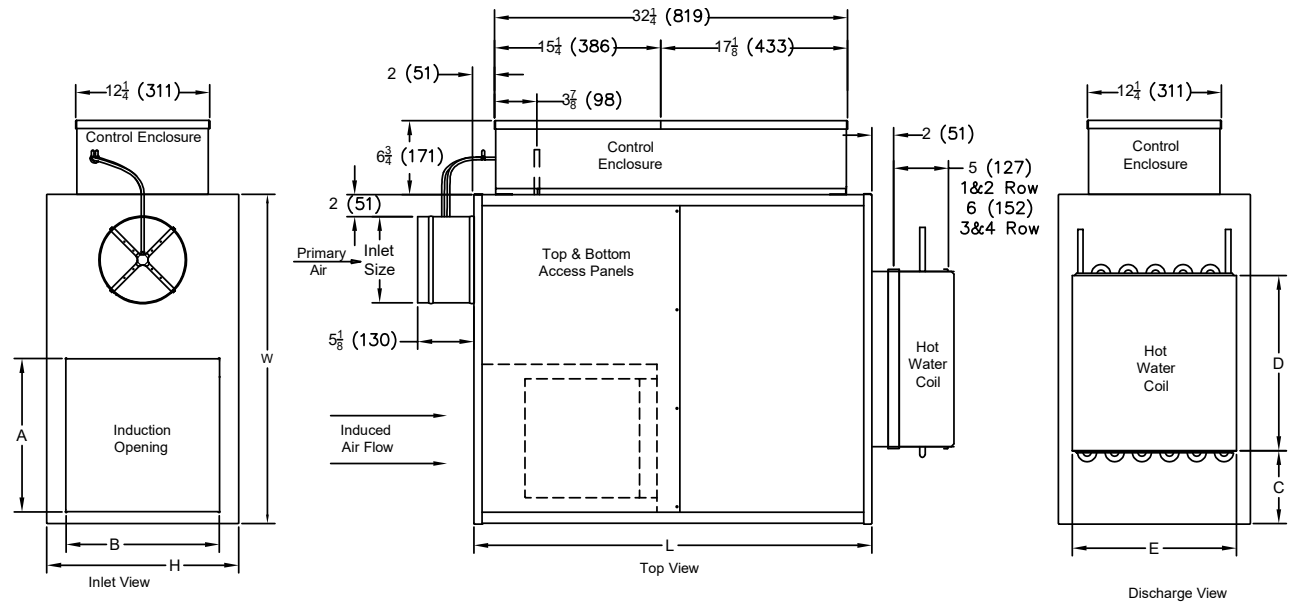
Case size	Inlet Size		Unit Dimensions			Induction Hot Water Coil		Discharge		
	Standard	Optional	Width W	Height H	Length L	Height A	Width B	Loc. C	Width D	Height E
1	6 (152)	4,5,8,10	30 (762)	17 1/2 (445)	36 (914)	16 (406)	15 (381)	8 (203)	14 (356)	13 (330)
2	8 (203)	4,5,6,10	30 (762)	17 1/2 (445)	36 (914)	16 (406)	15 (381)	8 (203)	14 (356)	13 (330)
3	10 (254)	4,5,6,8,12,14	36 (914)	17 1/2 (445)	40 (1016)	20 (508)	17 1/2 (445)	10 (254)	16 (406)	15 1/2 (394)
4	12 (305)	8,10,12,14	36 (914)	17 1/2 (445)	40 (1016)	20 (508)	17 1/2 (445)	10 (254)	16 (406)	15 1/2 (394)
5	14 (356)	10,12,16	40 (1016)	20 (508)	40 (1016)	20 (508)	17 1/2 (445)	11 (279)	18 (457)	15 (4381)
6	16 (406)	10,12,14	42 (1067)	20 (508)	42 (1067)	22 (559)	18 (457)	11 (279)	20 (508)	16 (406)
7	16 (406)	12,14	42 (1067)	20 (508)	42 (1067)	24 (610)	18 (457)	14 (356)	22 (559)	18 (457)

All dimensions shown in inches, parentheses () indicate millimeters.

PSC MOTOR CONFIGURATION	
Case Size	Horse Power
1	1/8
2	1/6
3	1/4
4	1/4
5	1/3
6	1/2
7	1

ECM MOTOR CONFIGURATION	
Case Size	Horse Power
1	1/3
2	1/3
3	1/2
4	1/2
5	1
6	1
7	1

FVI-500-003 PARALLEL FAN POWERED AIR TERMINAL UNIT
WITH HOT WATER COIL ON DISCHARGE



The standard location for control enclosure is Left Hand. Looking in the direction of airflow, the control enclosure is on the left.

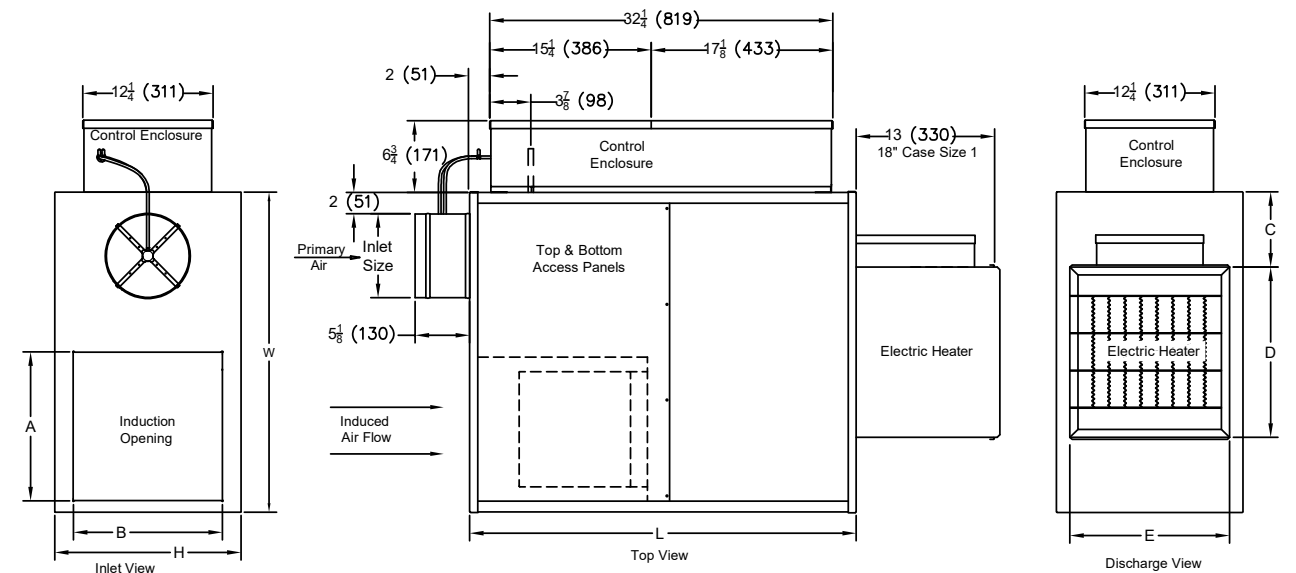
Case size	Inlet Size		Unit Dimensions			Induction		Discharge		
	Standard	Optional	Width W	Height H	Length L	Width A	Height B	Loc. C	Width D	Height E
1	6 (152)	4,5,8,10	30 (762)	17 1/2 (445)	36 (914)	14 (356)	14 (356)	7 (178)	16 (406)	15 (381)
2	8 (203)	4,5,6,10	30 (762)	17 1/2 (445)	36 (914)	14 (356)	14 (356)	7 (178)	16 (406)	15 (381)
3	10 (254)	4,5,6,8,12,14	36 (914)	17 1/2 (445)	40 (1016)	18 (457)	14 (356)	8 (203)	20 (508)	17 1/2 (445)
4	12 (305)	8,10,12,14	36 (914)	17 1/2 (445)	40 (1016)	18 (457)	14 (356)	8 (203)	20 (508)	17 1/2 (445)
5	14 (356)	10,12,16	40 (1016)	20 (508)	40 (1016)	18 (457)	16 (406)	10 (254)	20 (508)	17 1/2 (445)
6	16 (406)	10,12,14	42 (1067)	20 (508)	42 (1067)	20 (508)	16 (406)	10 (254)	22 (559)	18 (457)
7	16 (406)	12,14	42 (1067)	20 (508)	42 (1067)	20 (508)	16 (406)	4 1/2 (114)	30 (762)	20 (508)

All dimensions shown in inches, parentheses () indicate millimeters.

PSC MOTOR CONFIGURATION	
Case Size	Horse Power
1	1/8
2	1/6
3	1/4
4	1/4
5	1/3
6	1/2
7	1

ECM MOTOR CONFIGURATION	
Case Size	Horse Power
1	1/3
2	1/3
3	1/2
4	1/2
5	1
6	1
7	1

FVI-500-004 PARALLEL FAN POWERED AIR TERMINAL UNIT WITH ELECTRIC HEAT



The standard location for control enclosure is Left Hand. Looking in the direction of airflow, the control enclosure is on the left.

Case size	Inlet Size		Unit Dimensions			Induction		Discharge		
	Standard	Optional	Width W	Height H	Length L	Width A	Height B	Loc. C	Width D	Height E
1	6 (152)	4,5,8,10	30 (762)	17 1/2 (445)	36 (914)	16 (406)	16 (406)	11 (279)	16 (406)	15 (381)
2	8 (203)	4,5,6,10	30 (762)	17 1/2 (445)	36 (914)	16 (406)	16 (406)	11 (279)	16 (406)	15 (381)
3	10 (254)	4,5,6,8,12,14	36 (914)	17 1/2 (445)	40 (1016)	20 (508)	16 (406)	13 1/8 (333)	16 (406)	15 (381)
4	12 (305)	8,10,12,14	36 (914)	17 1/2 (445)	40 (1016)	20 (508)	16 (406)	11 1/8 (283)	20 (508)	17 1/2 (445)
5	14 (356)	10,12,16	40 (1016)	20 (508)	40 (1016)	20 (508)	20 (508)	14 3/8 (365)	20 (508)	17 1/2 (445)
6	16 (406)	10,12,14	42 (1067)	20 (508)	42 (1067)	24 (610)	20 (508)	15 3/4 (400)	20 (508)	17 1/2 (445)
7	16 (406)	12,14	42 (1067)	20 (508)	42 (1067)	24 (610)	20 (508)	6 (152)	30 (762)	20 (508)

All dimensions shown in inches, parentheses () indicate millimeters.

PSC MOTOR CONFIGURATION	
Case Size	Horse Power
1	1/8
2	1/6
3	1/4
4	1/4
5	1/3
6	1/2
7	1

ECM MOTOR CONFIGURATION	
Case Size	Horse Power
1	1/3
2	1/3
3	1/2
4	1/2
5	1
6	1
7	1

FVI-500 APPROXIMATE WEIGHTS

Case Size	FVI
1	120 lbs.
2	124 lbs.
3	165 lbs.
4	165 lbs.
5	198 lbs.
6	220 lbs.
7	220 lbs.

FVI-500 FILTER SIZES PER CASE SIZE

Case Size	Filter Dimensions
1	16" x 16"
2	16" x 16"
3	20" x 16"
4	20" x 16"
5	20" x 20"
6	24" x 20"
7	24" x 20"

Filters are mounted on the fan induction and are available in 1" or 2" thickness.



CERTIFICATIONS AND STANDARDS

- Units tested per ASHRAE Standard 130-2016.
- All model sizes certified in accordance with AHRI 880-2017 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A/90B.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.
- Hot water coils are manufactured in accordance to AHRI Standard 410.

FVI-500 AHRI CERTIFIED RATING POINTS



RADIATED AND DISCHARGE SOUND - PSC MOTOR - FAN ONLY HEATING

OCTAVE BAND SOUND POWER, Lw, dB														
Case-Inlet Size	CFM	Discharge Ps	RADIATED SOUND FAN ONLY						DISCHARGE SOUND FAN ONLY					
			2	3	4	5	6	7	2	3	4	5	6	7
1-06	270	0.25	65	60	52	45	42	41	59	56	52	50	46	41
2-08	440	0.25	63	58	48	41	37	35	58	53	53	52	47	40
3-10	780	0.25	66	62	55	49	43	44	65	61	58	57	53	49
4-12	1000	0.25	70	68	62	62	53	53	69	67	59	63	59	56
5-14	1200	0.25	66	61	58	50	49	48	60	52	59	57	54	53
6-16	1800	0.25	76	73	67	63	57	56	73	70	67	69	63	64
7-16	2800	0.25	78	75	73	72	66	64	81	78	76	75	72	74

RADIATED AND DISCHARGE SOUND - PSC MOTOR - PRIMARY AIR ONLY COOLING

OCTAVE BAND SOUND POWER, Lw, dB														
Case-Inlet Size	CFM	Min ΔPs	ΔPs = 1.5 in. wg.											
			RADIATED SOUND						DISCHARGE SOUND					
			2	3	4	5	6	7	2	3	4	5	6	7
1-06	400	0.16	56	50	43	38	34	34	62	54	51	48	45	45
2-08	700	0.15	59	52	43	39	34	29	67	59	52	53	49	45
3-10	1100	0.16	63	54	50	47	41	35	69	62	57	56	53	50
4-12	1600	0.12	70	62	55	51	48	45	77	69	63	62	56	54
5-14	2100	0.16	66	61	52	48	43	36	73	67	61	61	58	52
6-16	2800	0.16	73	67	62	58	54	50	80	74	68	63	61	60
7-16	2800	0.16	73	68	65	63	58	55	81	76	64	62	61	60

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation
- 8) Discharge (external) static pressure is 0.25" w.g. for all cases

FVI RADIATED AND DISCHARGE SOUND - PSC MOTOR - FAN ONLY HEATING

Case-Inlet Size	CFM	Discharge Ps	OCTAVE BAND SOUND POWER, Lw, dB													
			RADIATED SOUND FAN ONLY							DISCHARGE SOUND FAN ONLY						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
1-06	230	0.25	65	58	51	43	40	41	29	55	52	48	47	43	38	<15
	250		65	59	52	44	41	41	29	58	55	51	50	45	40	<15
	270		65	60	52	45	42	41	30	59	56	52	50	46	41	<15
	290		66	61	53	46	43	42	31	60	57	53	51	47	42	15
	310		66	61	54	47	44	43	31	60	57	53	51	47	42	15
2-08	380	0.25	61	57	47	41	37	35	26	57	52	51	51	45	39	<15
	410		62	57	47	41	37	35	26	57	52	52	51	46	39	<15
	440		63	58	48	41	37	35	28	58	53	53	52	47	40	<15
	470		63	58	48	42	38	36	28	58	53	53	52	47	41	<15
	500		64	59	49	42	38	36	29	59	54	54	53	48	42	16
3-10	580	0.25	60	58	51	45	38	39	28	60	57	52	49	48	42	>15
	680		63	61	53	47	40	41	31	63	60	57	55	50	46	18
	780		66	62	55	49	43	44	32	65	61	58	57	53	49	18
	880		67	63	56	50	44	45	34	68	62	59	60	57	54	19
	980		68	65	57	51	41	45	36	70	64	60	61	58	57	21
4-12	700	0.25	64	63	58	56	48	46	34	64	62	56	55	54	50	19
	850		66	65	60	58	50	49	36	66	64	58	56	56	52	21
	1000		70	68	62	62	53	53	39	69	67	59	63	59	56	25
	1150		70	69	62	63	54	54	40	70	68	60	63	60	57	26
	1300		72	71	64	66	56	57	42	71	70	61	62	62	59	29
5-14	1000	0.25	64	57	53	45	43	42	28	62	59	58	55	52	50	15
	1100		67	60	57	49	48	47	32	59	61	58	56	53	52	18
	1200		66	61	58	50	49	48	33	60	62	59	57	54	53	19
	1300		69	62	59	51	50	49	34	61	62	60	58	55	54	19
	1400		70	64	61	52	51	50	36	67	66	62	60	58	57	24
6-16	1600	0.25	74	72	66	62	56	55	35	69	66	64	61	59	59	24
	1700		75	72	66	62	56	55	36	71	68	66	64	61	61	26
	1800		76	73	67	63	57	56	40	73	70	67	69	63	64	29
	1900		77	74	67	64	58	57	43	74	71	67	68	64	64	30
	2000		77	74	68	64	58	57	45	74	71	68	68	65	65	30
7-16	2600	0.25	77	74	71	69	62	61	47	79	76	75	73	70	73	36
	2700		78	74	72	70	64	62	48	80	77	76	74	71	74	37
	2800		78	75	73	72	66	64	49	81	78	76	75	72	74	38
	2900		79	76	74	72	66	65	50	82	78	76	76	73	74	38
	3000		80	76	75	73	67	66	51	82	79	77	76	74	74	39

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Radiated sound is the noise transmitted through the unit casing
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge (external) static pressure is 0.25" w.g. for all cases
- 10) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017

FVI RADIATED SOUND - PSC MOTOR - PRIMARY AIR ONLY COOLING

OCTAVE BAND SOUND POWER, Lw, dB																								
Case-Inlet Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	
1-06	300	0.13	48	40	33	29	24	24	<15	54	48	39	36	32	30	15	55	49	41	37	32	33	16	
	350	0.14	50	42	35	30	26	26	<15	55	49	41	37	33	31	17	56	50	42	37	33	33	17	
	400	0.16	51	44	38	32	28	29	<15	55	50	42	37	34	32	18	56	50	43	38	34	34	18	
	450	0.18	52	46	40	33	29	29	<15	56	51	46	41	35	33	20	56	51	45	41	35	34	19	
	500	0.19	53	47	41	35	30	30	<15	57	52	46	43	36	33	20	57	52	49	42	36	34	20	
2-08	500	0.12	51	43	36	30	23	25	<15	55	49	40	35	30	27	16	56	49	41	36	31	29	17	
	600	0.13	52	45	39	33	25	27	<15	57	51	42	37	32	28	19	58	51	42	37	33	29	19	
	700	0.15	53	48	42	35	27	28	15	58	52	43	38	33	28	20	59	52	43	39	34	29	21	
	800	0.16	54	50	44	38	29	30	18	59	54	45	39	34	29	22	60	54	45	40	35	30	22	
	900	0.17	56	53	48	42	32	33	22	59	56	49	43	35	29	25	61	55	47	42	35	30	24	
3-10	700	0.12	52	44	40	37	29	21	<15	60	50	45	43	37	32	22	61	52	47	45	39	34	23	
	900	0.13	54	46	42	39	31	23	15	62	51	46	45	38	33	25	62	53	48	46	39	34	25	
	1100	0.16	57	50	45	42	34	29	19	63	52	47	46	40	34	26	63	54	50	47	41	35	26	
	1300	0.17	62	51	48	44	32	24	25	64	55	54	49	43	35	29	64	56	55	49	43	36	30	
	1500	0.18	63	53	49	46	32	26	26	65	56	54	50	44	36	36	66	57	55	51	45	37	31	
4-12	1000	0.10	55	50	44	42	32	27	16	64	57	50	46	44	42	28	66	59	52	48	46	44	31	
	1300	0.11	57	55	49	45	36	28	24	66	58	52	48	45	42	30	68	60	54	50	47	44	32	
	1600	0.12	65	56	51	47	43	39	29	68	60	54	50	47	43	32	70	62	55	51	48	45	35	
	1900	0.13	68	58	53	46	41	37	32	71	62	56	52	49	45	36	72	64	57	53	50	47	37	
	2200	0.14	69	59	54	47	42	38	35	73	61	56	52	49	43	39	75	64	58	54	50	46	41	
5-14	1300	0.11	52	47	38	34	25	26	15	61	57	48	44	39	32	26	63	58	50	46	41	34	27	
	1700	0.14	57	50	41	36	29	30	18	63	59	50	46	41	34	28	65	60	52	48	43	36	29	
	2100	0.16	59	53	45	40	34	32	21	64	59	50	46	41	34	28	66	61	52	48	43	36	31	
	2500	0.18	62	52	44	38	31	33	25	68	62	53	49	44	36	32	69	63	55	51	46	37	31	
	2900	0.20	64	54	47	40	33	36	27	69	64	54	50	44	38	34	71	65	57	52	47	39	36	
6-16	1800	0.12	60	48	44	42	37	30	22	67	62	57	53	49	46	32	68	64	59	56	52	49	34	
	2300	0.14	64	57	51	47	42	36	28	70	64	59	54	50	47	35	71	66	61	57	53	49	37	
	2800	0.16	69	63	56	51	47	42	34	72	66	60	55	51	47	38	73	67	62	58	54	50	39	
	3300	0.18	71	64	59	53	48	42	36	74	68	63	58	52	48	41	76	69	64	59	55	51	44	
	3800	0.20	74	67	61	56	50	46	41	78	71	66	61	55	52	45	79	71	66	61	56	54	47	
7-16	1800	0.12	62	53	51	51	44	39	25	64	58	54	53	49	46	28	67	63	59	58	53	50	30	
	2300	0.13	65	58	55	54	48	43	30	69	64	61	59	54	51	36	71	66	63	62	56	54	39	
	2800	0.16	69	62	59	57	51	46	32	72	66	63	61	55	52	38	73	68	65	63	58	55	42	
	3300	0.18	71	65	62	58	53	48	37	74	68	65	62	56	52	41	75	69	67	64	59	55	43	
	3800	0.20	74	68	64	60	55	49	40	76	70	67	64	58	53	43	77	71	68	65	61	56	44	

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Radiated sound is the noise transmitted through the unit casing
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge (external) static pressure is 0.25" w.g. for all cases

FVI DISCHARGE SOUND - PSC MOTOR - PRIMARY AIR ONLY COOLING

OCTAVE BAND SOUND POWER, Lw, dB																								
Case-Inlet Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	
1-06	300	0.13	56	46	42	36	37	34	<15	61	52	47	45	42	41	<15	62	53	49	47	43	43	17	
	350	0.14	57	48	43	37	38	36	<15	62	53	49	46	44	42	<15	62	54	50	47	44	44	17	
	400	0.16	58	49	44	38	39	37	<15	62	54	50	46	45	43	<15	62	54	51	48	45	45	17	
	450	0.18	59	51	46	39	40	38	<15	63	55	54	51	46	44	<15	63	55	55	51	46	46	18	
	500	0.19	60	52	47	41	41	38	<15	64	56	55	53	47	44	16	64	56	56	53	47	46	20	
2-08	500	0.12	63	53	46	46	42	39	<15	64	56	48	49	46	43	16	64	57	49	50	47	44	20	
	600	0.13	64	55	49	49	44	40	16	65	57	50	51	47	44	16	66	58	51	52	48	44	20	
	700	0.15	64	56	51	51	45	40	16	66	58	51	52	48	44	16	67	59	52	53	49	45	20	
	800	0.16	64	56	51	51	45	40	16	66	58	51	52	48	44	16	67	59	52	53	49	45	20	
3-10	900	0.17	65	58	54	53	46	42	17	66	59	53	54	49	44	16	67	60	53	55	50	46	20	
	700	0.12	66	56	50	49	43	42	16	67	60	55	53	51	48	17	68	61	55	54	52	49	21	
	900	0.13	67	58	51	51	44	42	17	69	61	56	55	52	49	20	69	62	57	56	53	50	22	
	1100	0.16	67	58	51	51	44	42	17	69	61	56	55	52	49	20	69	62	57	56	53	50	22	
4-12	1300	0.17	72	60	54	54	47	44	23	70	64	64	58	55	50	21	70	64	63	58	56	50	23	
	1500	0.18	73	62	56	56	48	46	25	70	65	63	59	57	51	22	71	65	62	59	57	51	25	
	1000	0.10	68	60	53	51	47	43	18	71	64	58	54	49	46	22	72	65	59	55	51	48	26	
	1300	0.11	70	62	56	55	50	47	21	73	69	59	57	51	49	25	74	67	60	58	53	51	29	
5-14	1600	0.12	74	64	60	58	54	52	26	76	69	62	60	55	53	29	77	69	63	62	56	54	30	
	1900	0.13	77	66	63	62	57	55	30	78	71	64	63	58	56	31	79	71	65	63	58	57	32	
	2200	0.14	80	67	64	68	62	62	34	81	72	68	67	64	62	35	82	73	69	68	65	63	36	
	1300	0.11	62	55	49	47	42	37	<15	69	64	57	57	54	50	21	70	65	59	59	56	51	22	
6-16	1700	0.14	67	58	52	51	45	41	17	71	65	58	58	55	51	22	73	66	61	61	57	52	25	
	2100	0.16	68	60	54	53	47	43	18	72	66	59	59	56	51	24	73	67	61	61	58	52	25	
	2500	0.18	71	60	54	53	48	44	22	72	67	60	60	57	52	25	74	68	63	62	59	53	26	
	2900	0.20	73	61	56	55	48	45	25	74	68	61	61	57	52	26	76	69	64	63	59	53	29	
7-16	1800	0.12	71	63	56	50	47	45	22	73	65	59	53	52	51	25	74	66	61	55	53	52	26	
	2300	0.14	76	67	60	54	52	51	29	78	69	62	58	57	56	31	79	70	64	59	58	57	32	
	2800	0.16	77	69	62	57	56	55	30	79	73	67	63	61	59	32	80	74	68	63	61	60	34	
	3300	0.18	79	71	64	59	60	59	32	81	76	70	65	65	62	35	83	78	71	66	66	63	38	
8-18	3800	0.20	82	73	65	63	61	61	36	84	77	71	67	66	63	39	86	80	72	68	67	64	41	
	1800	0.12	70	65	57	56	53	51	22	75	70	61	59	57	55	28	75	70	61	59	57	55	28	
	2300	0.13	74	68	59	58	56	54	26	79	74	62	61	59	58	33	79	74	62	61	59	58	33	
	2800	0.16	78	71	61	60	59	59	31	81	76	64	62	61	60	35	81	76	64	62	61	60	35	
9-24	3300	0.18	79	76	66	66	64	62	35	83	80	78	73	71	70	40	83	80	78	73	71	70	40	
	3800	0.20	81	78	68	67	66	64	38	85	82	77	76	74	74	42	85	82	77	76	74	74	42	

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Radiated sound is the noise transmitted through the unit casing
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge (external) static pressure is 0.25" w.g. for all cases
- 10) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017

FVI-500 PSC FAN MOTOR AMPERAGE RATINGS

Case Size	Motor HP	Standard PSC Motor Amperage Ratings		
		120v-1 Phase 60 Hz Rated Amps	208-240v-1 Phase 60 Hz Rated Amps	277v-1 Phase 60 Hz Rated Amps
1	1/8	2.6	0.8	1.1
2	1/6	3.1	0.8	1.1
3	1/4	4.8	1.9	1.9
4	1/4	4.8	1.9	1.9
5	1/3	8.8	3.0	3.6
6	1/2	9.8	3.5	3.9
7	1	N/A	6.2	6.2

FVI-500 ECM FAN MOTOR AMPERAGE RATINGS

Case	HP	FLA 120	FLA 208	FLA 230	FLA 277
1	1/3	5.50	3.10	2.7	2.60
2	1/3	5.50	3.10	2.7	2.60
3	1/2	8.30	4.80	4.5	3.70
4	1/2	8.30	4.80	4.5	3.70
5	1	12.00	7.80	7.3	6.60
6	1	12.00	7.80	7.3	6.60
7	1	12.00	7.80	7.3	6.60

FVI-500 DAMPER LEAKAGE

Standard Construction			
Inlet Diameter	Static Pressure " w.g.	Maximum Airflow	Max Damper Leakage
4	3	300	5
5	3	375	5
6	3	540	5
7	3	760	7
8	3	990	9
9	3	1250	12
10	3	1640	16
12	3	2350	22
14	3	3250	32
16	3	4100	41
20	3	6430	64
24	3	7270	72

PERFORMANCE NOTES

- 1) Leakage testing conducted in accordance with ASHRAE 130-2016
- 2) Per ASHRAE Standard 130-2016 "terminal damper leakage: the amount of air in ft 3/min (L/s) leaking through a fully closed damper/valve of a supply/exhaust terminal unit at a given inlet pressure"opened"

- 3) Damper leakage shall not exceed 1% of the maximum rated airflow at 3" w.g.
- 4) 4" and 5" inlets are built with 6" casings

FVI-500 HOT WATER COILS

When ordered with the air terminal, the hot water coil is shipped attached to the discharge of the terminal casing. The discharge end of the casing has slip and drive connections for easy connection to downstream ductwork. The hot water coil is constructed of aluminum fin and copper serpentine-type tubes with male sweat connections tested at 300 psig.

Coil selection may be made using METALAIRE Terminal Selection Software. Contact your METALAIRE representative for a copy. In the interest of energy conservation and due to the possibility of condensation, all hot water coils are marked, "Coil must be externally insulated after installation in the field." Hot water coils are tested in accordance with AHRI. Options, at an additional charge on hot water coils, include access doors for inspection and cleaning, and inlet/outlet on opposite sides of coils.

HOT WATER COIL CONSTRUCTION DETAILS

- Hot Water Coils are factory mounted to the discharge of the terminal and are available with an optional factory mounted discharge plenum section with access door.
- Hot water coils are enclosed in a 20 gauge coated steel casing allowing for attachment to metal ductwork with a slip and drive connection.
- Fins are rippled and sine wave type constructed from heavy gauge aluminum and are mechanically bonded to the tubes.
- Tubes are copper with a minimum wall thickness of 0.016" with male sweat header connections.
- Coils are leak tested to 300 psi with minimum burst of 2000 psi at ambient temperature. Coil performance data is based on tests run in accordance with AHRI standard 410. Coils are AHRI certified and include an AHRI label.



Outside Diameter (OD) connection size, Inches		
Case Size	Standard HW Coil Inches	
	1 Row	2 Row
1	7/8 (22.2)	7/8 (22.2)
2	7/8 (22.2)	7/8 (22.2)
3	5/8 (15.8)	7/8 (22.2)
4	5/8 (15.8)	7/8 (22.2)
5	7/8 (15.8)	7/8 (22.2)
6	7/8 (15.8)	7/8 (22.2)
7	7/8 (22.2)	7/8 (22.2)

All coils have 10 fins/inch with optional 12 fins/inch

All accessories that can be attached to the Parallel Fan Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

FVI-500 HOT WATER COILS MBH SELECTION DATA

Imperial Units				Head Loss (ft-H ₂ O)	MBH							
Case Size	Rows	Connection OD	GPM		CFM							
					200	250	300	350	400	450	500	550
1	One	0.875	1	0.14	10.4	11.6	12.7	13.5	14.3	15.0	15.6	16.2
			2	0.54	11.5	13.0	14.3	15.4	16.5	17.4	18.2	19.0
			4	2.06	12.1	13.8	15.3	16.6	17.8	18.9	20.0	20.9
			6	4.52	12.3	14.1	15.6	17.1	18.4	19.5	20.6	21.6
			Airside Ps		0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.04
1	Two	0.875	1	0.09	14.3	16.2	17.8	19.1	20.3	21.3	22.2	—
			2	0.34	16.2	18.7	20.9	22.9	24.6	26.2	27.6	—
			4	1.32	17.4	20.3	23.0	25.4	27.6	29.6	31.5	—
			6	2.94	17.8	21.0	23.8	26.4	28.8	31.0	33.0	—
			Airside Ps		0.02	0.02	0.03	0.04	0.05	0.06	0.07	—

Case Size	Rows	Connection OD	GPM	Head Loss (ft-H ₂ O)	CFM							
					300	350	400	450	500	600	650	700
2	One	0.875	1	0.14	12.7	13.5	14.3	15.0	15.6	16.7	17.2	17.6
			2	0.54	14.3	15.4	16.5	17.4	18.2	19.7	20.4	21.1
			4	2.06	15.3	16.6	17.8	18.9	20.0	21.8	22.6	23.4
			6	4.52	15.7	17.1	18.4	19.5	20.6	22.6	23.5	24.3
			Airside Ps		0.01	0.02	0.02	0.03	0.03	0.04	0.05	0.06
2	Two	0.875	1	0.09	17.8	19.1	20.3	21.3	22.2	23.7	24.4	—
			2	0.34	20.9	22.9	24.6	26.2	27.6	30.1	31.2	—
			4	1.32	23.0	25.4	27.6	29.6	31.5	34.8	36.3	—
			6	2.94	23.8	26.4	28.8	31.0	33.0	36.8	38.5	—
			Airside Ps		0.03	0.04	0.05	0.06	0.07	0.10	0.11	—

Case Size	Rows	Connection OD	GPM	Head Loss (ft-H ₂ O)	CFM							
					400	500	600	700	800	900	1000	1200
3	One	0.625	1	0.20	16.8	18.4	19.8	20.9	21.9	22.7	23.5	24.8
			2	0.76	19.3	21.5	23.4	25.1	26.6	27.9	29.1	31.1
			4	2.88	20.9	23.5	25.9	27.9	29.8	31.4	33.0	35.7
			6	6.30	21.5	24.3	26.8	29.0	31.1	32.9	34.6	37.5
			Airside Ps		0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.08
3	Two	0.875	1	0.10	22.9	25.3	27.1	28.7	30.0	31.1	32.1	—
			2	0.39	27.7	31.3	34.4	37.1	39.4	41.4	43.3	—
			4	1.51	30.9	35.6	39.7	43.3	46.6	49.6	52.3	—
			6	3.36	32.1	37.2	41.8	45.9	49.7	53.1	56.2	—
			Airside Ps		0.03	0.04	0.05	0.07	0.09	0.10	0.12	—

Case Size	Rows	Connection OD	GPM	Head Loss (ft-H ₂ O)	CFM							
					800	900	1000	1100	1200	1300	1400	1600
4	One	0.625	1	0.20	21.9	22.7	23.5	24.2	24.8	25.3	25.9	26.7
			2	0.76	26.6	27.9	29.1	30.1	31.1	32.0	32.9	34.4
			4	2.88	29.8	31.4	33.0	34.4	35.7	36.9	38.0	40.1
			6	6.31	31.1	32.9	34.6	36.1	37.5	38.9	40.2	42.5
			Airside Ps		0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.13
4	Two	0.875	1	0.10	30.0	31.1	32.1	32.9	33.6	34.3	34.9	—
			2	0.39	39.4	41.4	43.3	44.9	46.4	47.7	49.0	—
			4	1.52	46.6	49.6	52.3	54.8	57.1	59.2	61.2	—
			6	3.36	49.7	53.1	56.2	59.1	61.8	64.3	66.7	—
			Airside Ps		0.09	0.10	0.12	0.15	0.17	0.19	0.22	—

1) All coil performance in accordance with AHRI Standard 410-2001

2) Heating capacities are in MBH

3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)

4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below

5) Head Loss is in feet of water

6) Airside ΔPs is the air pressure drop of the hot water coil

7) Air temperature rise = 927 x MBH/CFM

8) Water temperature drop = 2.04 x MBH/GPM

9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

FVI-500 HOT WATER COILS MBH SELECTION DATA

PARALLEL FAN POWERED

FVI-500 VARIABLE VOLUME

Case Size	Rows	Connection OD	GPM	Head Loss (ft-H ₂ O)	CFM							
					1000	1100	1200	1300	1400	1500	1600	1700
5	One	0.625	1	0.20	23.5	24.2	24.8	25.3	25.9	26.3	26.7	27.1
			2	0.76	29.1	30.1	31.1	32.0	32.9	33.6	34.4	35.0
			4	2.89	33.0	34.4	35.7	36.9	38.0	39.1	40.1	41.0
			6	6.32	34.6	36.1	37.5	38.9	40.2	41.4	42.5	43.6
			Airside Ps		0.06	0.07	0.08	0.09	0.1	0.11	0.13	0.14
5	Two	0.875	1	0.10	32.1	32.9	33.6	34.3	34.9	35.4	35.9	—
			2	0.39	43.3	44.9	46.4	47.7	49.0	50.1	51.2	—
			4	1.52	52.3	54.7	57.1	59.2	61.2	63.0	64.7	—
			6	3.36	56.2	59.1	61.8	64.3	66.7	68.9	71.0	—
			Airside Ps		0.12	0.15	0.17	0.19	0.22	0.24	0.27	—

Case Size	Rows	Connection OD	GPM	Head Loss (ft-H ₂ O)	CFM							
					1000	1100	1200	1300	1400	1600	1800	2000
6	One	0.625	1	0.21	24.5	25.2	25.9	26.4	27.0	27.9	28.7	29.4
			2	0.81	30.4	31.5	32.5	33.5	34.4	36.0	37.4	38.7
			4	3.07	34.5	36.0	37.4	38.7	39.9	42.1	44.0	45.8
			6	6.72	36.2	37.8	39.3	40.8	42.1	44.6	46.8	48.9
			Airside Ps		0.05	0.06	0.07	0.07	0.09	0.11	0.13	0.16
6	Two	0.875	1	0.10	33.1	34.0	34.8	35.4	36.1	37.1	38.0	—
			2	0.40	44.8	46.5	48.1	49.5	50.8	53.1	55.1	—
			4	1.57	54.1	56.7	59.2	61.4	63.5	67.3	70.7	—
			6	3.47	58.2	61.3	64.1	66.8	69.3	73.9	78.0	—
			Airside Ps		0.11	0.12	0.14	0.16	0.19	0.23	0.28	—

Case Size	Rows	Connection OD	GPM	Head Loss (ft-H ₂ O)	CFM							
					2000	2100	2200	2300	2400	2600	2800	3000
7	One	0.875	2	0.34	43.8	44.5	45.1	45.7	46.2	47.2	48.1	49.0
			4	1.32	54.0	55.0	55.9	56.8	57.7	59.3	60.9	62.3
			6	2.94	58.6	59.7	60.9	61.9	63.0	65.0	66.8	68.5
			8	5.19	61.2	62.5	63.7	64.9	66.0	68.2	70.3	72.2
			Airside Ps		0.07	0.08	0.09	0.09	0.1	0.11	0.13	0.15
7	Two	0.875	2	0.26	63.3	64.2	65.0	65.8	66.5	67.9	69.1	—
			4	1.01	84.3	86.0	87.5	89.0	90.4	93.1	95.5	—
			6	2.24	94.6	96.7	98.8	100.7	102.5	106.0	109.3	—
			8	3.97	100.7	103.2	105.5	107.7	109.9	113.9	117.7	—
			Airside Ps		0.16	0.17	0.19	0.20	0.22	0.25	0.28	—

Heating capacity data in tables assume an entering water temperature (EWT) of 180°F, and an entering air temperature (EAT) of 65°F, which corresponds to a temperature difference of 115°F. Smaller temperature differences will result in a decrease of heating capacity. To obtain the heating capacity at another temperature difference, refer to the hot water coil notes located in the Reference Section.

- 1) All coil performance in accordance with AHRI Standard 410-2001
- 2) Heating capacities are in MBH
- 3) Performance data based on a temperature differential of 115°F (180°F entering water temperature and 65°F entering air temperature)
- 4) For temperature differentials other than 115°F, multiply the MBH by the correction factors below
- 5) Head Loss is in feet of water
- 6) Airside ΔPs is the air pressure drop of the hot water coil
- 7) Air temperature rise = 927 x MBH/CFM
- 8) Water temperature drop = 2.04 x MBH/GPM
- 9) Values in tables are listed for 0 ft. of altitude and no glycol in the system

MBH CORRECTION FACTORS

ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

FVI-500 ELECTRIC HEAT

The discharge end has slip and drive connections for easy connection to downstream ductwork. ETL® listed heaters are provided with a fan interlock relay. Heaters that will be controlled electronically must include a 24 VAC control circuit to operate with the low voltage controls on the air terminal. Heater plenums are internally insulated. When an air terminal is ordered with clean room lining and electric heat, the heater plenum is either internally lined with optional foil backed insulation or closed cell foam or may require external insulation in field.

INCLUDED WITH EACH HEATER ASSEMBLY:

- ▶ Heater and cabinet mounted on the discharge of the FVI-500
- ▶ Electric Heater is interlocked into fan control relay
- ▶ De-energizing magnetic contactors per step
- ▶ Primary automatic reset high temperature limit (disc type)
- ▶ Backup manual reset high temperature limit (disc type)
- ▶ Non-fused transformer with voltage to match Heater voltage
- ▶ Single point power wiring connection
- ▶ Heater is shipped factory mounted and wired



ELECTRIC HEATER ASSEMBLY CONSTRUCTION DETAILS

- ▶ Electric Reheat Coils are factory mounted on the discharge of the Air Terminal. The heaters are ETL® listed for zero clearance, are tested in accordance with UL® 60335, CSA-C22.2 and the National Electric Code (NEC). Heater casings are constructed of galvanized steel. Element wire is high grade nichrome alloy derated to 45 watts per square inch density. Element wire is supported by moisture-resistant steatite ceramics.
- ▶ Ceramics are enclosed in reinforcement brackets spaced across the heater element rack at 2" to 4" intervals. Controls are contained in a NEMA 1 control cabinet with a hinged, latching door. A permanent wiring diagram is affixed to the inside of the control cabinet door for field reference.
- ▶ The 208 and 480 volt units require a neutral connection for both single and three phase service. Our standard motors are 120 and 277 volt single phase. The 208-240 volt single phase motor is optional. 480 volt motors are not available for our units. See table for reference.

Heater Voltage	Fan Motor Voltage	Separate Neutral Required
120 V 1PH	120 V 1PH	NO
208 V 1PH	120 V 1PH	YES
277 V 1PH	277 V 1PH	NO
480 V 1PH	277 V 1PH	YES
208 V 1PH	208 V 1PH	NO
208 V 3PH	120 V 1PH	YES
480 V 3PH	277 V 1PH	YES
208 V 3PH	208 V 1PH	NO

All accessories that can be attached to the Parallel Fan Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

FVI-500 ELECTRIC HEATER CAPACITIES

Model FVI		Single Phase										Three Phase			
		120V		208V		240V		277V		480V		208V		480V	
Inlet Size	# of Steps Available	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1.5	11	0.5	13	1.5	17
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
2	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1.5	11	0.5	13	1.5	17
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
3	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1.5	11	0.5	13	1.5	17
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
4	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1	17	0.5	13	1	25
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	
5	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1	17	0.5	13	1	25
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	
6	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1	17	0.5	13	1	25
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	
7	1/SCR	0.5	5	0.5	8.5	0.5	10	0.5	11	1	17	0.5	13	1	25
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	

NOTES:

- Heaters equal to or less than 10 kW are specifiable to nearest 0.5 kW. Heaters greater than 5 kW and less than 10 kW are specifiable to nearest 0.5 kW.
- Minimum flow rate for electric heat is 70 CFM / kW.
Lower CFM's can cause nuisance tripping, excessive discharge temperatures, rapid cycling, and rapid element failure.
Electric Heat units running below 70 CFM / kW will void all warranties.
- For optimum thermal comfort, the suggested discharge temperature should not exceed 20°F above room set point.
- We do not recommend discharge temperatures in excess of 115°F to protect heater coils.
- Maximum number of steps at minimum kW per step is one step.
- If more than 1 heater is wired into a building's circuit breaker (multi-outlet branch circuit) each heater will require the addition of power side fusing.

ELECTRIC HEAT SELECTION:

A. Specify electric duct heaters using voltage, phase, kW, and number of steps.

B. Use above chart to select voltage. Calculate required kW using following equations:

$$kW = \frac{BTU / HR}{3413} \quad kW = \frac{CFM \times \Delta \times 1.085}{3413} \quad \Delta = \frac{kW \times 3413}{CFM \times 1.085}$$

$$CFM = \frac{kW \times 3413}{\Delta \times 1.085} \quad CFM = \frac{kW \times 3413}{\Delta \times 1.085}$$

* air density at sea level—reduce by 0.036 for each 1000 feet of altitude above sea level

Where: BTU / Hr = Required heating capacity

CFM = volume of air during heating. Typically 100% of maximum cooling air volume

Δ = desired air temperature rise across the electric heater

Inlet air temperature = primary air temperature, usually 55°F

FVI-500 ELECTRIC HEATER CAPACITIES

Three Phase FVI kW Limits				
Case Size	Heater Voltage	Min. kW per Step	Max. kW	Max. Steps
1	208	0.5	13	2
1	480	10.5	17	2
2	208	0.5	13	2
2	480	1.5	17	2
3	208	0.5	13	3
3	480	1.5	17	3
4	208	0.5	13	3
4	480	1.5	25	3

Three Phase FVI kW Limits				
Case Size	Heater Voltage	Min. kW per Step	Max. kW	Max. Steps
5	208	0.5	13	3
5	480	1.5	25	3
6	208	0.5	13	3
6	480	1.5	25	3
7	208	0.5	13	3
7	480	1.5	25	3

NOTES:

1. Heaters less than 10 kW are specifiable to nearest 0.5 kW. Heaters greater than 10.0 kW are specifiable to nearest 1.0 kW.
2. Minimum flow rate for electric heat is 70 CFM / kW.
Lower CFM's can cause nuisance tripping, excessive discharge temperatures, rapid cycling, and rapid element failure.
Electric Heat units running below 70 CFM / kW will void all warranties.
3. For optimum thermal comfort, the suggested discharge temperature should not exceed 20°F above room set point.
4. We do not recommend discharge temperatures in excess of 115°F to protect heater coils.
5. Maximum number of steps at minimum kW per step is one step.
6. If more than 1 heater is wired into a building's circuit breaker (multi-outlet branch circuit) each heater will require the addition of power side fusing.

ELECTRIC HEAT SELECTION:

- A. Specify electric duct heaters using voltage, phase, kW, and number of steps.
- B. Use above chart to select voltage. Calculate required kW using following equations:

$$kW = \frac{BTU / HR}{3413} \quad kW = \frac{CFM \times \Delta \times 1.085}{3413} \quad \Delta = \frac{kW \times 3413}{CFM \times 1.085}$$

$$CFM = \frac{kW \times 3413}{\Delta \times 1.085} \quad CFM = \frac{kW \times 3413}{\Delta \times 1.085}$$

* air density at sea level—reduce by 0.036 for each 1000 feet of altitude above sea level

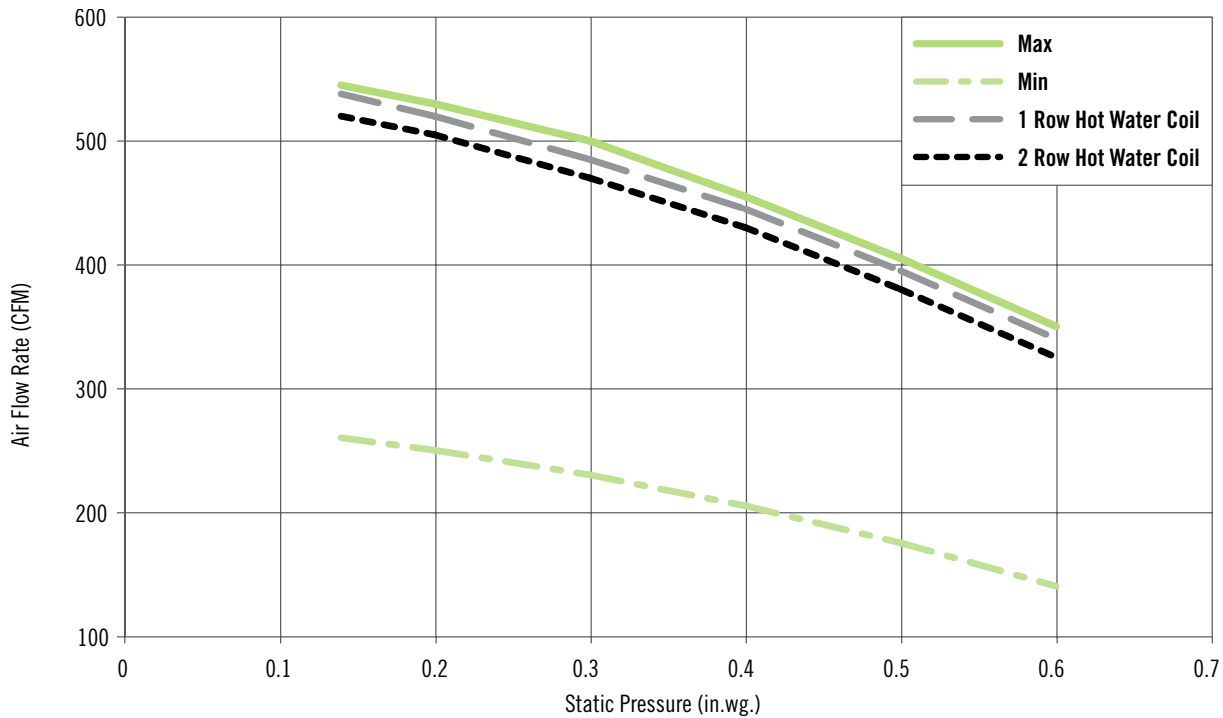
Where: BTU / Hr = Required heating capacity

CFM = volume of air during heating. Typically 100% of maximum cooling air volume

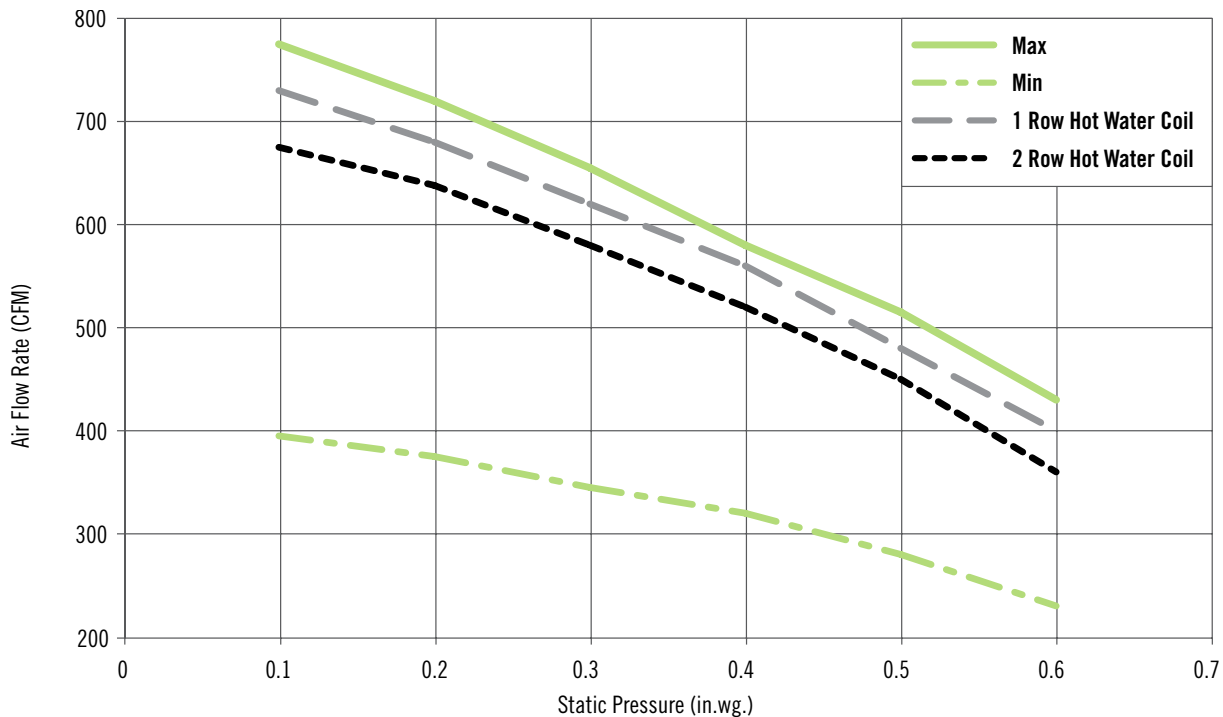
Δ = desired air temperature rise across the electric heater

Inlet air temperature = primary air temperature, usually 55°F

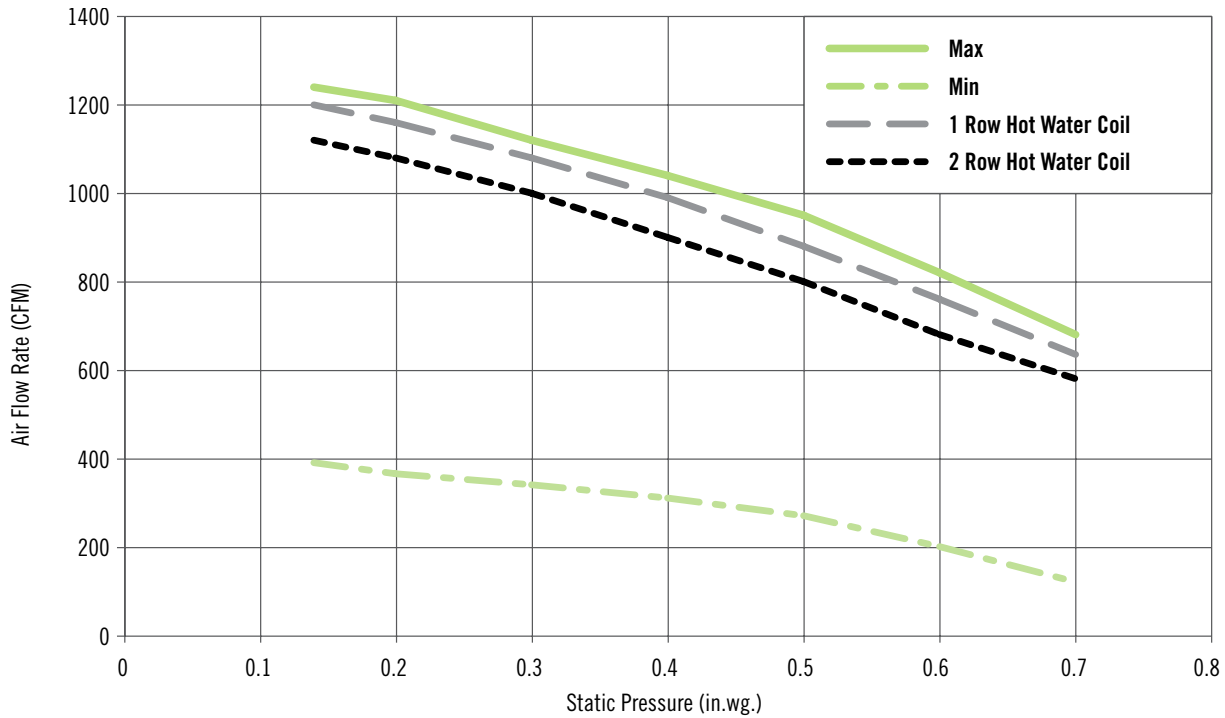
FVI-500 FAN PERFORMANCE CURVES UNIT SIZE 1 - STANDARD HW COIL



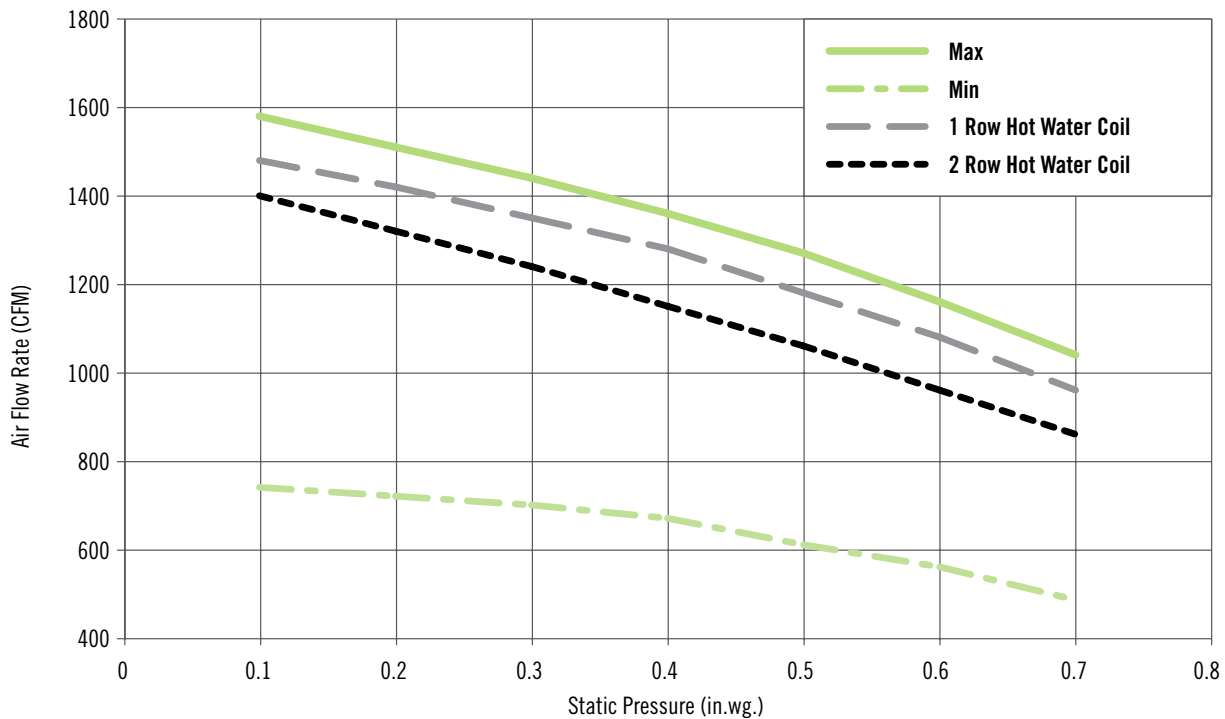
FVI-500 FAN PERFORMANCE CURVES UNIT SIZE 2 - STANDARD HW COIL



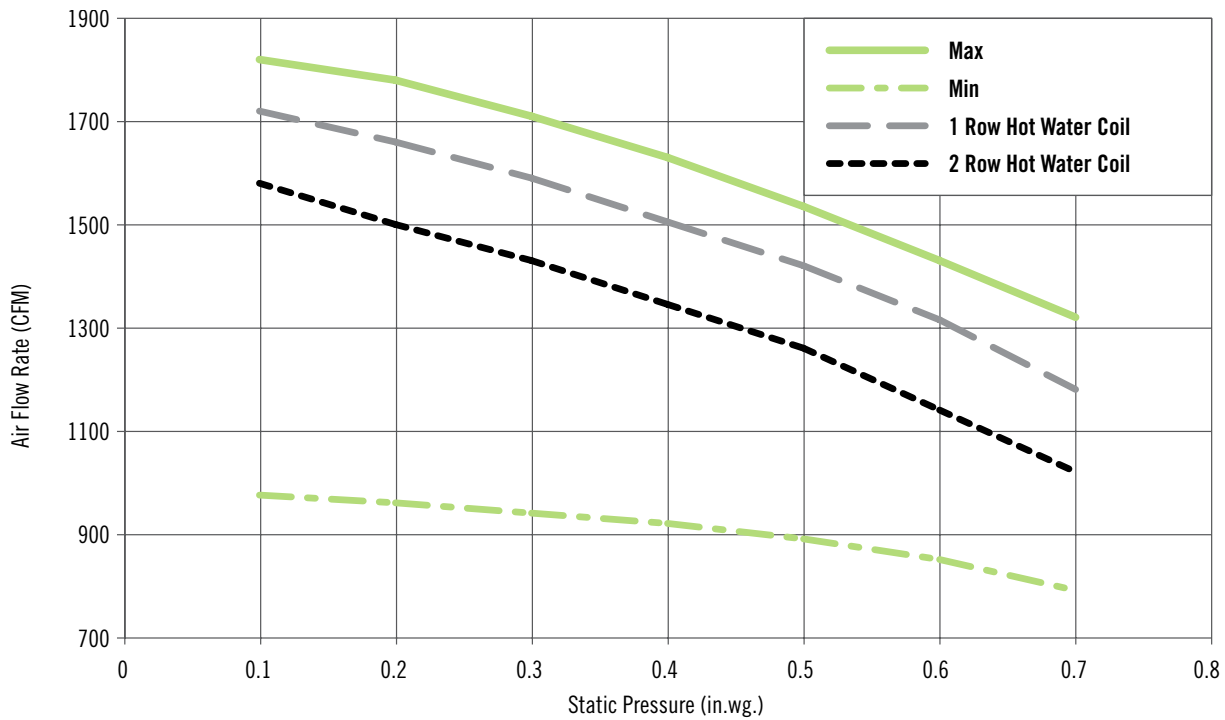
FVI-500 FAN PERFORMANCE CURVES UNIT SIZE 3 - STANDARD HW COIL



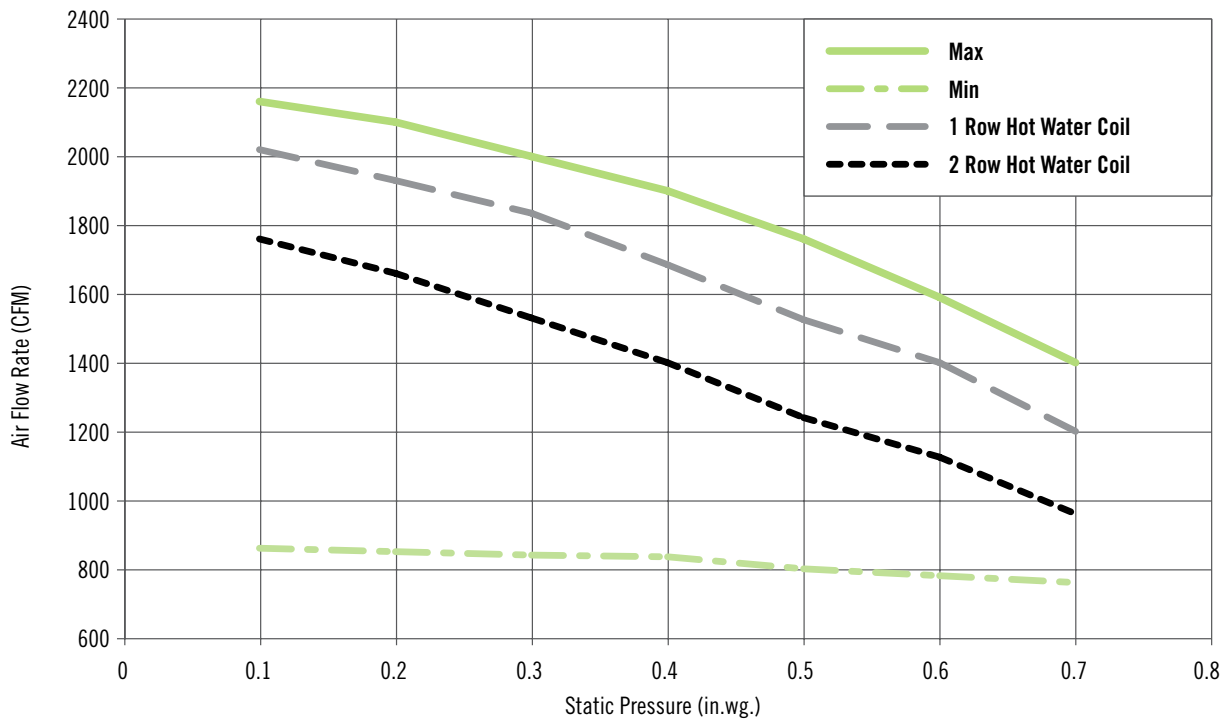
FVI-500 FAN PERFORMANCE CURVES UNIT SIZE 4 - STANDARD HW COIL



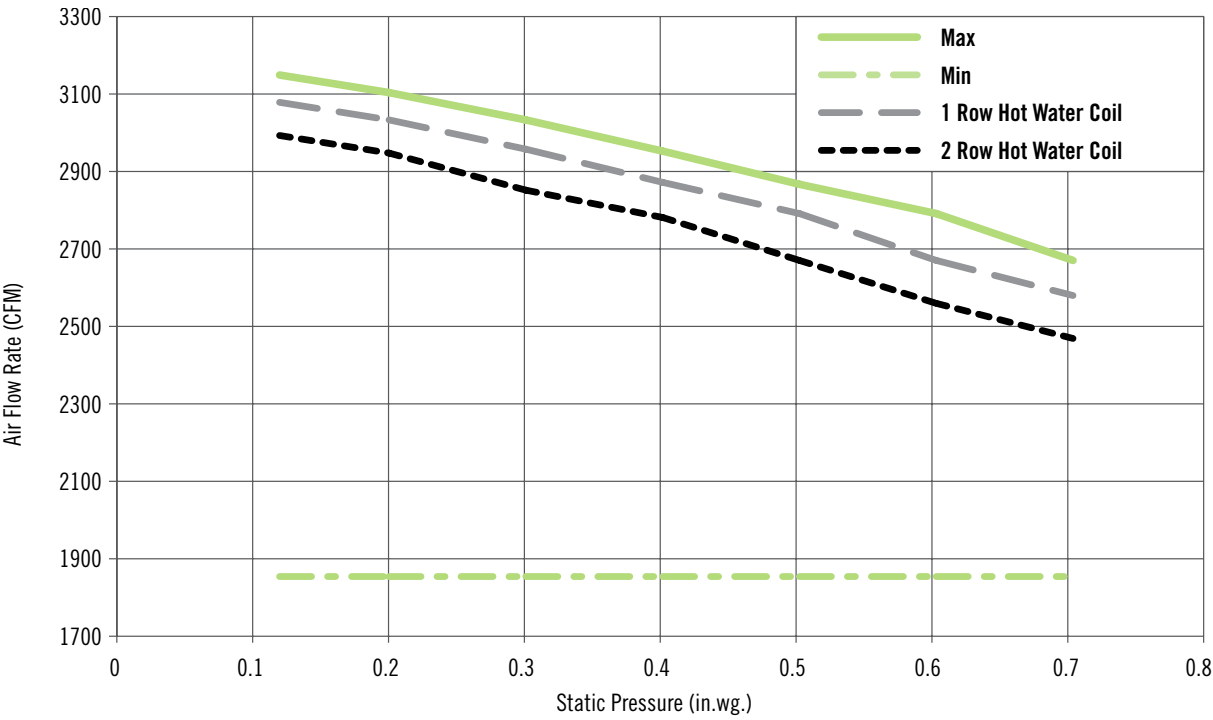
FVI-500 FAN PERFORMANCE CURVES UNIT SIZE 5 - STANDARD HW COIL



FVI-500 FAN PERFORMANCE CURVES UNIT SIZE 6 - STANDARD HW COIL



FVI-500 FAN PERFORMANCE CURVES
UNIT SIZE 7 - STANDARD HW COIL

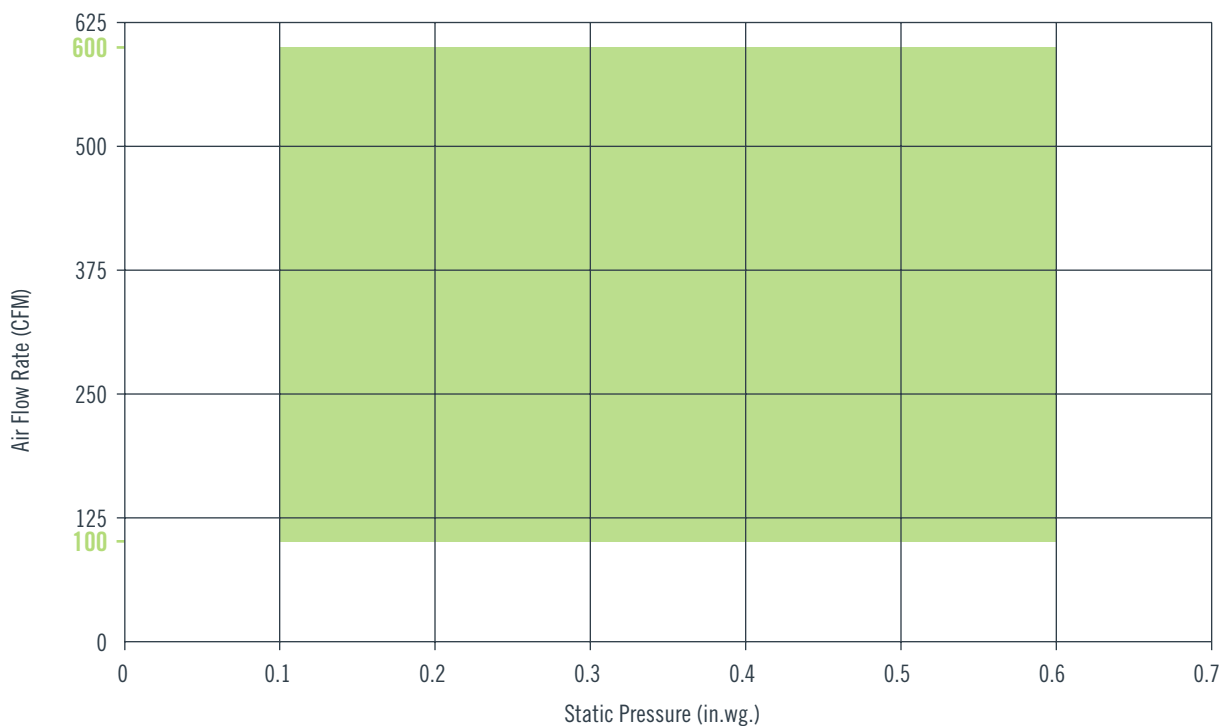


PARALLEL FAN POWERED

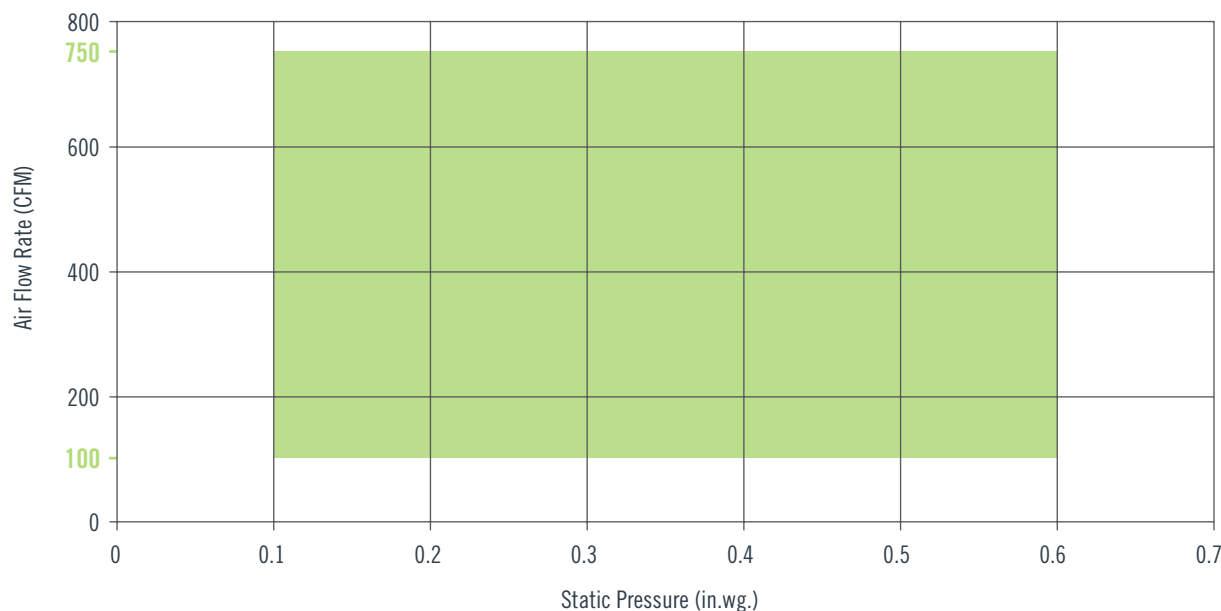
FVI-500 VARIABLE VOLUME



FVI-500 ECM FAN PERFORMANCE CURVES UNIT SIZE 1 - STANDARD HW COIL

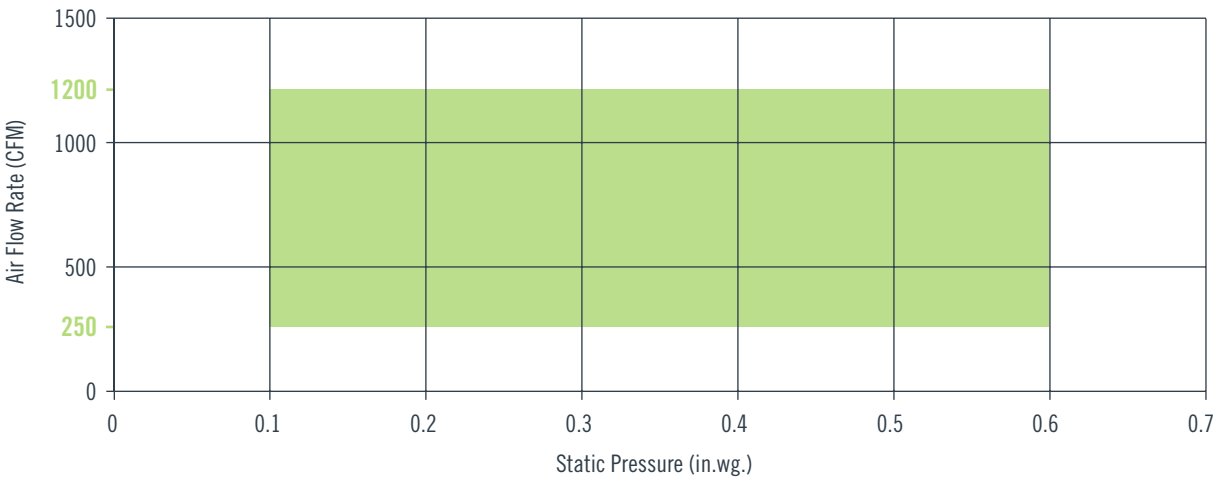


FVI-500 ECM FAN PERFORMANCE CURVES UNIT SIZE 2 - STANDARD HW COIL

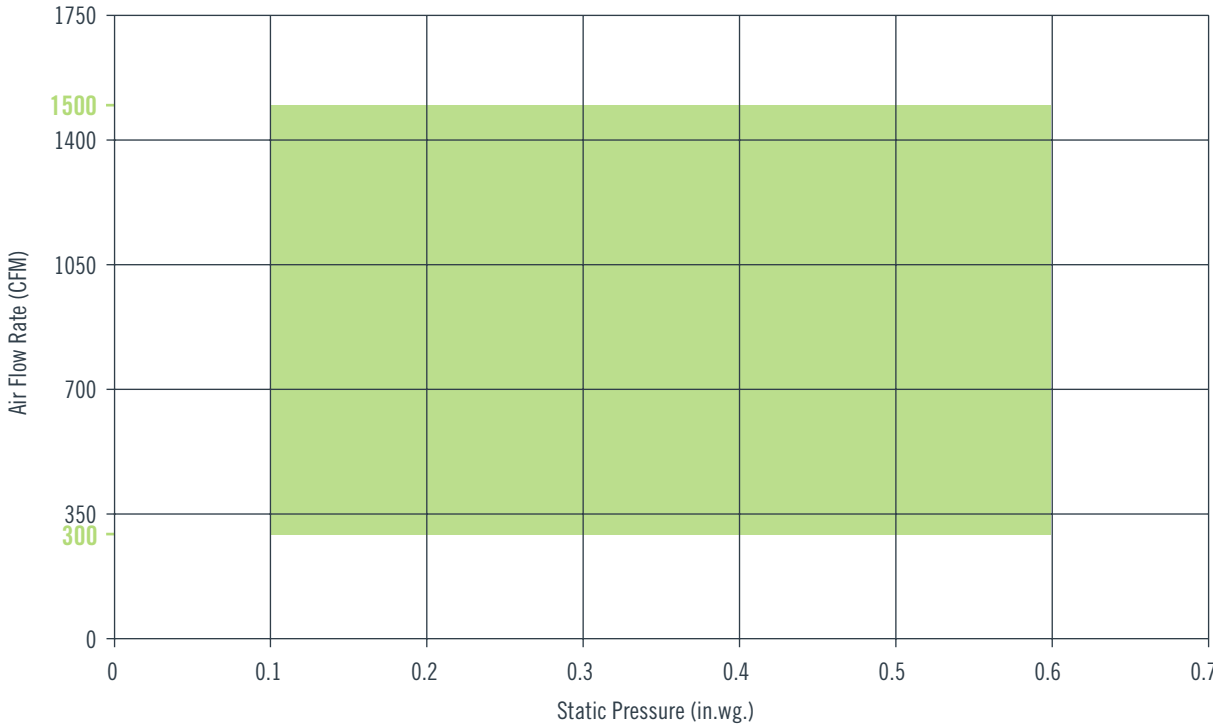




FVI-500 ECM FAN PERFORMANCE CURVES UNIT SIZE 3 - STANDARD HW COIL



FVI-500 ECM FAN PERFORMANCE CURVES UNIT SIZE 4 - STANDARD HW COIL

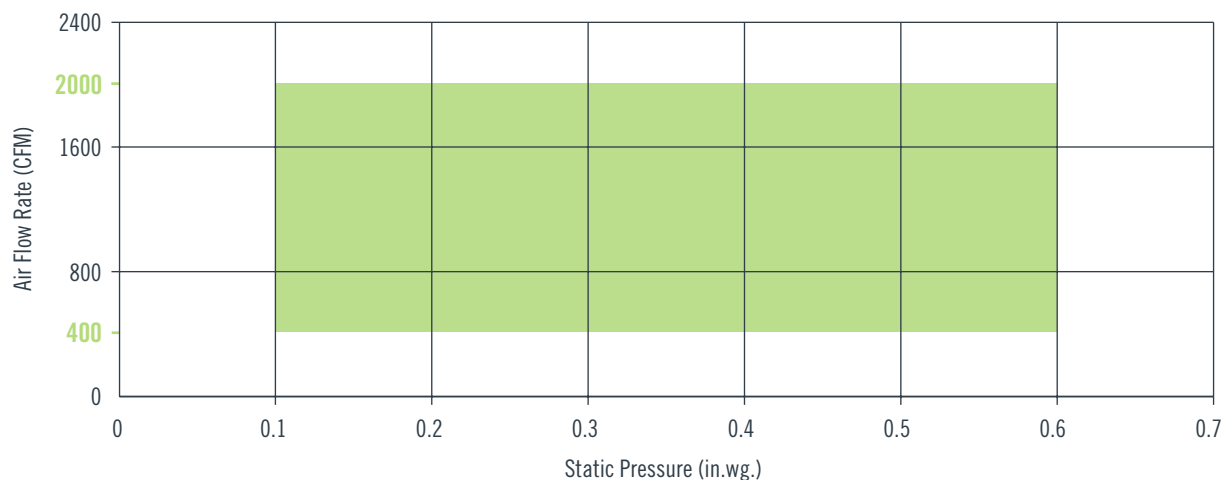


PARALLEL FAN POWERED

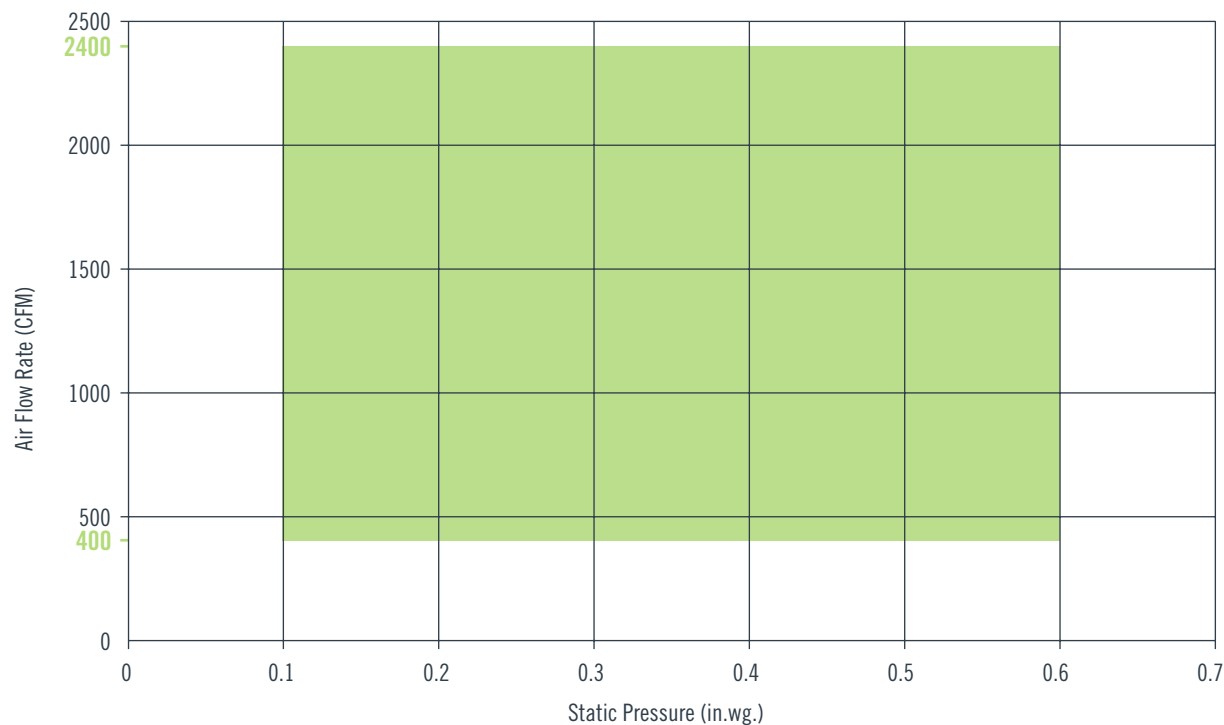
FVI-500 VARIABLE VOLUME



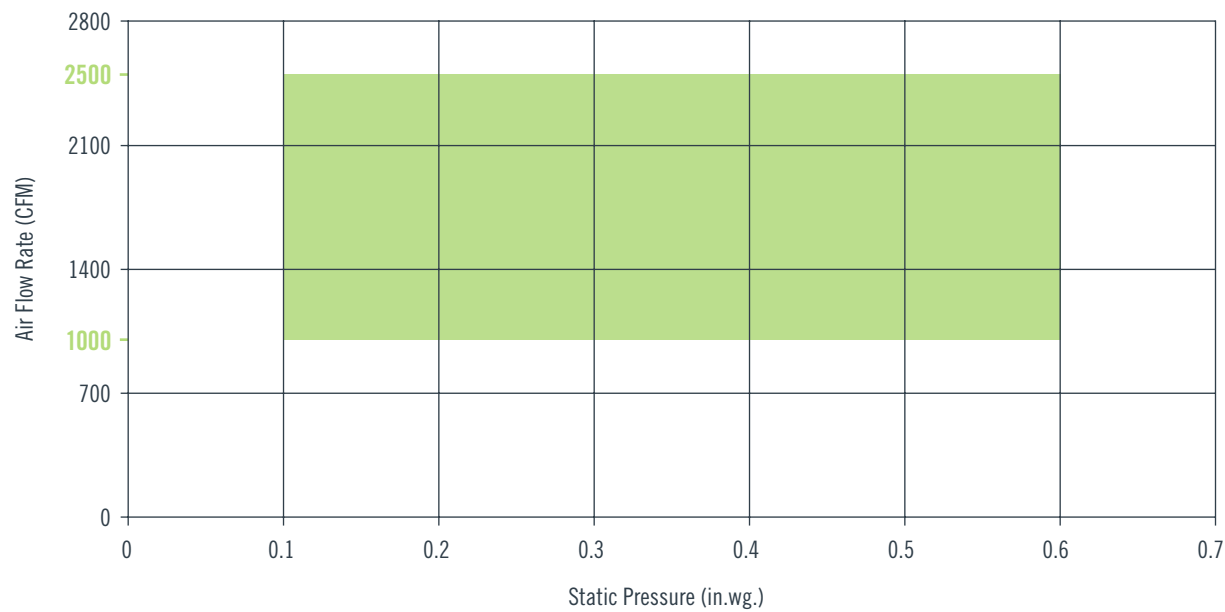
FVI-500 ECM FAN PERFORMANCE CURVES UNIT SIZE 5 - STANDARD HW COIL



FVI-500 ECM FAN PERFORMANCE CURVES UNIT SIZE 6 - STANDARD HW COIL



FVI-500 ECM FAN PERFORMANCE CURVES UNIT SIZE 7 - STANDARD HW COIL



PARALLEL FAN POWERED

FVI-500 VARIABLE VOLUME

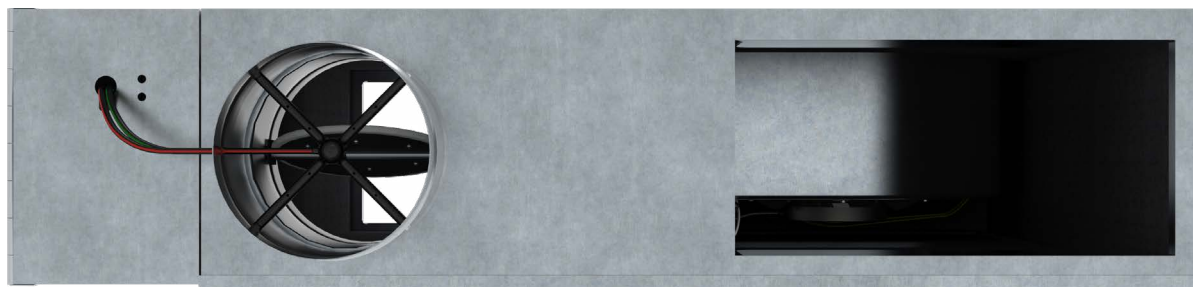


FVL-600 LOW PROFILE VARIABLE VOLUME FAN TERMINAL UNIT

SPECIFIABLE FEATURES

- Galvanized steel casing, mechanically sealed for low leakage construction
- NEMA TYPE 1 rated hinged control enclosure with standoff to prevent penetration of casing
- Single speed high efficiency PSC motor with SCR motor speed control
- Riveted primary inlet duct to minimize leakage with 3 stiffening beads for added rigidity
- Damper construction of double layer 18 gauge equivalent with integral blade seal
- Single point electrical connection
- Gasketed back draft damper door to minimize leakage in cooling mode

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AHRI Data / Certification and Standards	9
Sound Performance Data	10
Hot Water Coils	13
Motor Data / Damper Leakage	15
Electric Heat	16
Fan Performance Curves	18



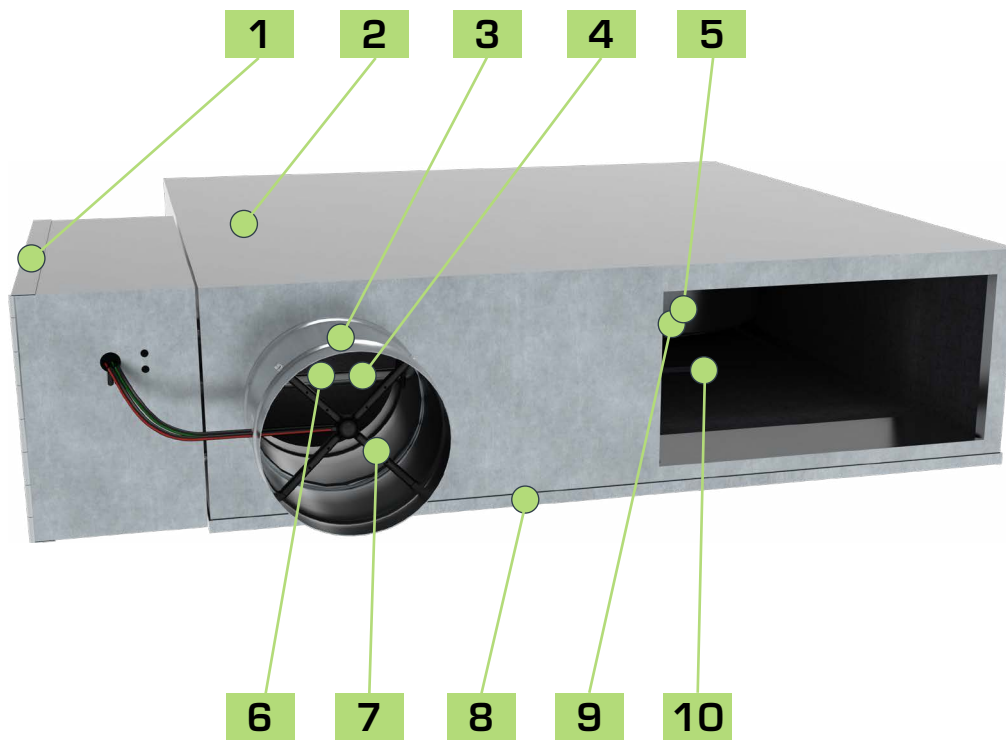
FVL-600 LOW PROFILE VARIABLE VOLUME FAN TERMINAL UNIT

METALAIRE's model FVL-600 parallel fan-powered terminal unit is designed to provide superior comfort to zones by intermittent parallel fan operation. Conditioned primary air is varied during cooling while the fan cycles on during heating. Parallel fan-powered terminal units allow for recovery of waste heat from the return plenum and a potential reduction in central fan energy, thereby lowering operating costs. In the heating mode with the fan energized, parallel fan-powered terminal units improve air circulation through better diffuser performance. The primary air does not pass through the fan.

The primary function of the METALAIRE model FVL-600 parallel fan-powered terminal unit is to deliver variable volume, constant temperature primary air to the space in the cooling mode. The volume of supply air is varied in response to a control signal. In the heating mode, with the fan energized, the terminal unit mixes conditioned air and plenum air in response to a control signal to supply constant volume, variable temperature supply air into the space. Supplemental heating is available in both electric heat and hot water coils if plenum heat is insufficient. METALAIRE model FVL-600 parallel fan-powered terminal units are available with a wide range of control options to suit any application. These include pneumatic factory provided commissioned direct digital control (DDC) or factory mounted field supplied (DDC) controls. With the demands of today's building designs to reduce energy in smaller mechanical spaces, the METALAIRE model FVL-600 parallel fan-powered terminal unit is the perfect choice.

STANDARD FEATURES

- ▶ Available in 3 casing sizes to handle 200 – 2500 CFM.
- ▶ 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- ▶ Mechanically fastened damper assembly is double layer, 18 gauge equivalent, galvanized steel with integral blade seal. (<1% at 3" static pressure).
- ▶ Factory calibrated controls per each job requirement.
- ▶ Multi-point center averaging airflow sensor provides highly accurate +/- 5% flow readings after certified balancer has balanced terminal.
- ▶ Easy access, steel balancing taps on inlet flow sensor.
- ▶ Energy efficient six pole single speed PSC motors with adjustable SCR solid state fan speed controllers are standard.
- ▶ Available fan motor voltages of 120, 277, and 208-240 (50 / 60 HZ).
- ▶ External control cabinet with offset mounting plate as standard.
- ▶ Single point electrical connections.
- ▶ 3-beaded primary inlet connection tube for added rigidity and secure flex duct connections.
- ▶ Round inlets available in sizes 4" through 8" round, 12" and 14" flat oval and 14 x 8" rectangular.
- ▶ 1/2" thick, dual density (1.5lb / ft³ min.) fiberglass insulation with edges coated. Meets NFPA 90A and UL 181.
- ▶ Rectangular flanged discharge with optional slip and drive cleat duct connection.
- ▶ Large Bottom access panel provides access to fan motor / blower assembly.
- ▶ Independently tested and certified laboratory performance data.
- ▶ Full range of options and accessories available (heating coils, disconnects, attenuators, etc.).
- ▶ Full range of liners / insulation available.
- ▶ Auto and manual thermal resets on every electric heater.

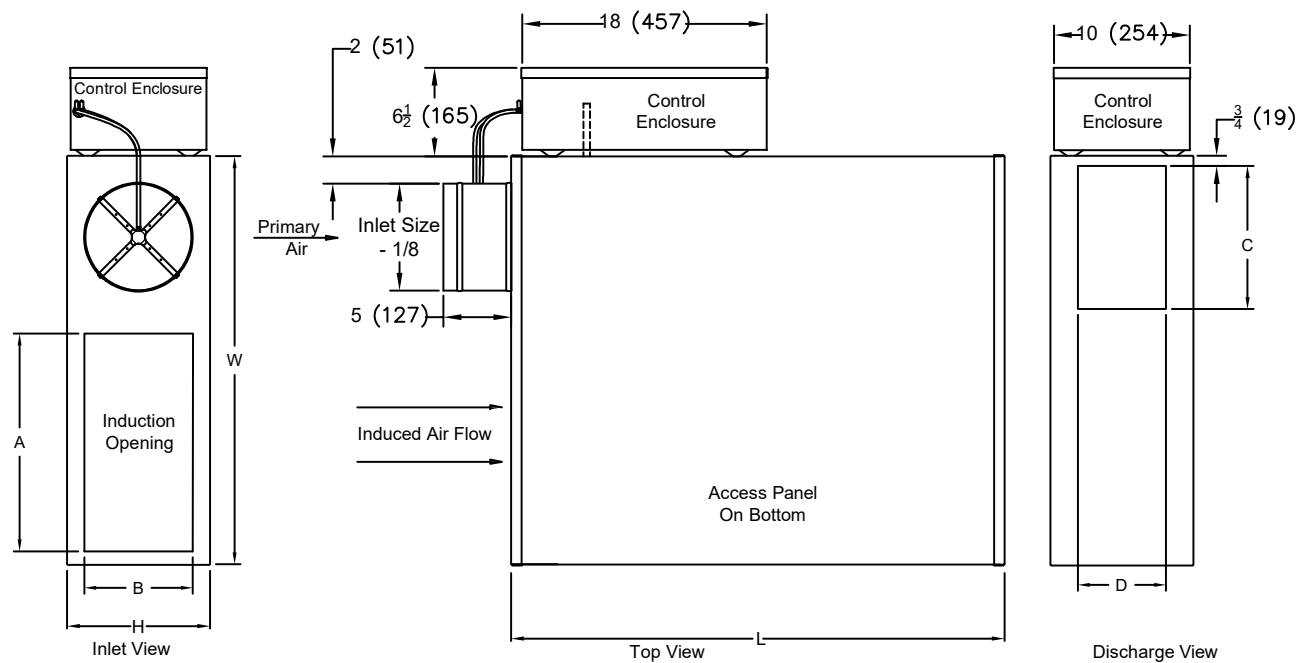


FVL-600 LOW PROFILE VARIABLE VOLUME FAN TERMINAL UNIT

FEATURES AND BENEFITS

- 1** NEMA TYPE 1 rated hinged control enclosure with standoff to prevent penetration of casing.
- 2** Galvanized steel casing, mechanically sealed for low leakage construction.
- 3** Riveted primary inlet duct to minimize leakage with 3 stiffening beads for added rigidity.
- 4** Damper construction of double layer 18 gauge equivalent with integral blade seal.
- 5** Single speed high efficiency PSC motor with SCR motor speed control.
- 6** Damper assembly rotates in long life, low friction, self lubricating thermoplastic bearing.
- 7** Multi-Point Center Averaging Airflow Sensor.
- 8** Bottom access panel provided for easy motor / blower servicing.
- 9** Motor / blower assembly assembled to 18 gauge bulkhead to mitigate vibration.
- 10** Gasketed back draft damper door to minimize leakage in cooling mode.

FVL600-001 LOW PROFILE PARALLEL FAN POWERED AIR TERMINAL UNIT



The standard location for control enclosure is Left Hand on all Case Sizes.
Looking in the direction of airflow, the control enclosure is on the left.

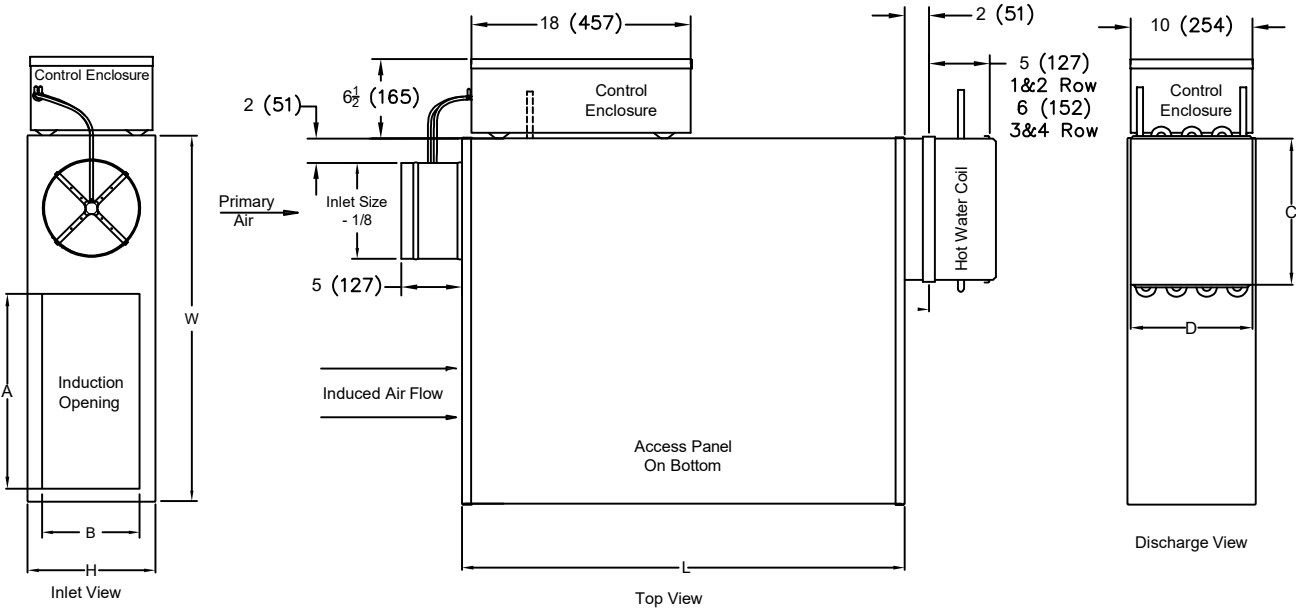
Case size	Inlet Size		Unit Dimensions			Induction		Discharge	
	Standard	Optional	Height H	Width W	Length L	Width A	Height B	Width C	Height D
2	6 (152)	4 & 5	10 1/2 (267)	30 (762)	32 (813)	16 (406)	8 (203)	10 1/2 (267)	6 1/2 (165)
4	8 (203)	14 x 8 Rect	10 1/2 (267)	36 (914)	36 (914)	16 (406)	8 (203)	16 1/2 (419)	8 1/2 (216)
6	10 (254)	12 & 14 Flat Oval	12 1/2 (318)	38 (965)	36 (914)	16 (406)	10 (254)	16 1/2 (419)	10 1/2 (267)

All dimensions are in inches; parentheses () indicate millimeters.

PSC MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/8
4	1/4
6	1/3

ECM MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/3
4	1/3
6	1/2

FVL-600-002 LOW PROFILE PARALLEL FAN POWERED AIR TERMINAL UNIT WITH INDUCTION MOUNTED HOT WATER COIL



The standard location for control enclosure is Left Hand on all Case Sizes.
Looking in the direction of airflow, the control enclosure is on the left.

Case size	Inlet Size		Unit Dimensions			Induction		Discharge	
	Standard	Optional	Height H	Width W	Length L	Width A	Height B	Width C	Height D
2	6 (152)	4 & 5	10 1/2 (267)	30 (762)	32 (813)	16 (406)	8 (203)	12 (305)	10 (254)
4	8 (203)	14 x 8 Rect	10 1/2 (267)	36 (914)	36 (914)	16 (406)	8 (203)	22 (559)	10 (254)
6	10 (254)	12 & 14 Flat Oval	12 1/2 (318)	38 (965)	36 (914)	16 (406)	10 (254)	18 (457)	12 1/2 (318)

All dimensions are in inches; parentheses () indicate millimeters.

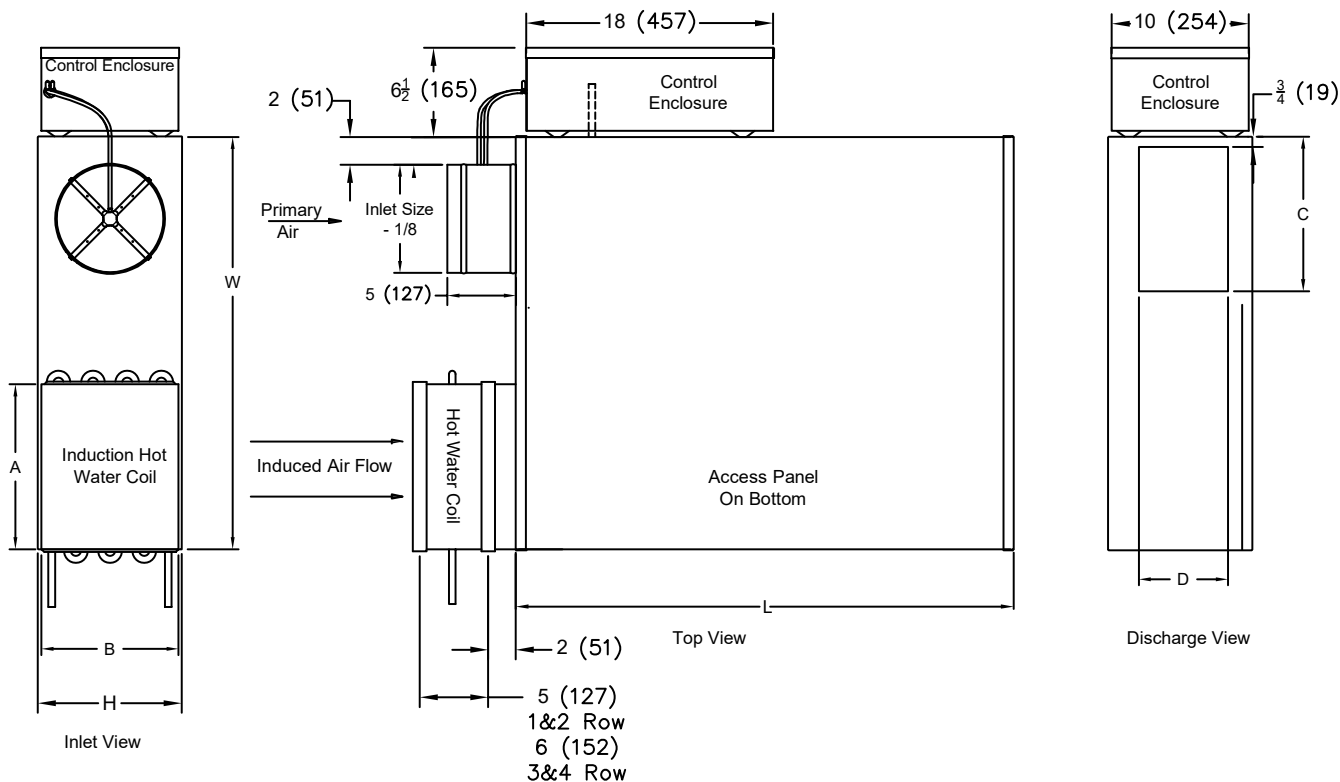
PSC MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/8
4	1/4
6	1/3

ECM MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/3
4	1/3
6	1/2

FVL-600-003 LOW PROFILE PARALLEL FAN POWERED AIR TERMINAL UNIT WITH HOT WATER COIL ON INDUCTION

PARALLEL FAN POWERED

FVL-600 LOW PROFILE VARIABLE VOLUME



The standard location for control enclosure is Left Hand on all Case Sizes.
Looking in the direction of airflow, the control enclosure is on the left.

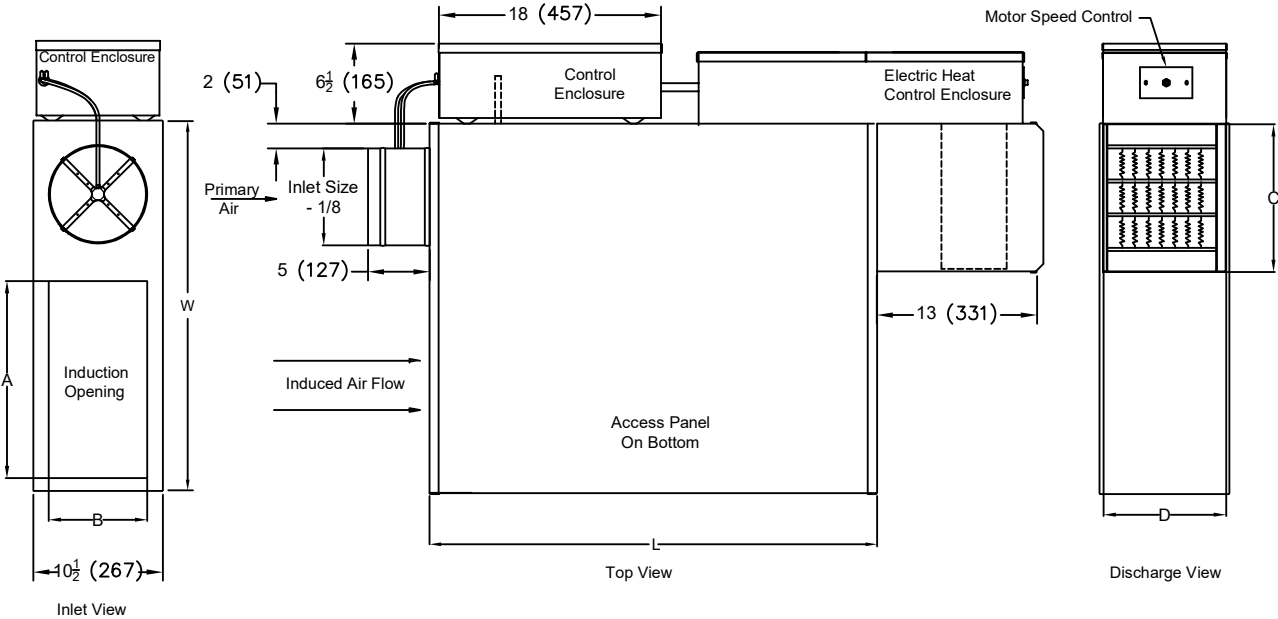
Case size	Inlet Size		Unit Dimensions			Induction		Discharge	
	Standard	Optional	Height H	Width W	Length L	Width A	Height B	Width C	Height D
2	6 (152)	4 & 5	10 1/2 (267)	30 (762)	32 (813)	12 (305)	10 (254)	10 1/2 (267)	6 1/2 (165)
4	8 (203)	-	10 1/2 (267)	36 (914)	36 (914)	22 (559)	10 (254)	16 1/2 (419)	8 1/2 (216)
6	10 (254)	12 & 14 Flat Oval	12 1/2 (318)	38 (965)	36 (914)	18 (457)	12 1/2 (318)	16 1/2 (419)	10 1/2 (267)

PSC MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/8
4	1/4
6	1/3

ECM MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/3
4	1/3
6	1/2

All dimensions are in inches; parentheses () indicate millimeters.

FVL-600 LOW PROFILE PARALLEL FAN POWERED AIR TERMINAL UNIT WITH ELECTRIC HEAT



The standard location for control enclosure is Left Hand on all Case Sizes.
Looking in the direction of airflow, the control enclosure is on the left.

Case size	Inlet Size		Unit Dimensions			Induction		Discharge	
	Standard	Optional	Height H	Width W	Length L	Width A	Height B	Width C	Height D
2	6 (152)	4 & 5	10 1/2 (267)	30 (762)	32 (813)	16 (406)	8 (203)	12 (305)	8 (203)
4	8 (203)	14 x 8 Rect	10 1/2 (267)	36 (914)	36 (914)	16 (406)	8 (203)	18 (457)	10 (254)
6	10 (254)	12 & 14 Flat Oval	12 1/2 (318)	38 (965)	36 (914)	16 (406)	10 (254)	18 (457)	12 (305)

All dimensions are in inches; parentheses () indicate millimeters.

PSC MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/8
4	1/4
6	1/3

ECM MOTOR CONFIGURATION	
Case Size	Horse Power
2	1/3
4	1/3
6	1/2

FVL-600 APPROXIMATE WEIGHTS

Case Size	FVL
2	130 lbs.
4	170 lbs.
6	190 lbs.

FVL-600 FILTER SIZES PER CASE SIZE

Case Size	Filter Dimensions	
	With HW Coil	No HW Coil
2	12" x 10"	18" x 10"
4	12" x 10"	18" x 10"
6	18" x 12"	18" x 12"

Filters are mounted on the fan induction and are available in 1" or 2" thickness.



CERTIFICATIONS AND STANDARDS

- Units tested per ASHRAE Standard 130-2016.
- All model sizes certified in accordance with AHRI 880-2017 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A/90B.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.
- Hot water coils are manufactured in accordance to AHRI Standard 410.

FVL-600 AHRI CERTIFIED RATING POINTS



RADIATED AND DISCHARGE SOUND - PSC MOTOR - FAN ONLY HEATING

OCTAVE BAND SOUND POWER, Lw, dB														
Case-Inlet Size	CFM	Discharge Ps	RADIATED SOUND FAN ONLY						DISCHARGE SOUND FAN ONLY					
			2	3	4	5	6	7	2	3	4	5	6	7
2-06	500	0.25	68	58	60	55	44	36	58	54	50	50	42	39
4-08	700	0.25	66	61	64	59	50	44	62	61	58	60	51	50
6-10	1200	0.25	74	70	67	62	54	46	70	63	64	64	55	57

RADIATED AND DISCHARGE SOUND - PSC MOTOR - PRIMARY AIR ONLY COOLING

OCTAVE BAND SOUND POWER, Lw, dB														
Case-Inlet Size	CFM	Min ΔPs	ΔPs = 1.5 in. wg.											
			RADIATED SOUND						DISCHARGE SOUND					
			2	3	4	5	6	7	2	3	4	5	6	7
2-06	400	0.10	62	56	51	48	46	44	63	59	57	51	45	41
4-08	700	0.09	65	54	50	45	42	42	64	60	55	50	48	44
6-10	1100	0.05	62	57	53	49	46	46	69	63	62	56	56	51

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation
- 8) Discharge (external) static pressure is 0.25" w.g. for all cases

FVL RADIATED AND DISCHARGE SOUND - PSC MOTOR - FAN ONLY HEATING

Case-Inlet Size	CFM	Discharge Ps	OCTAVE BAND SOUND POWER, Lw, dB													
			RADIATED SOUND FAN ONLY							DISCHARGE SOUND FAN ONLY						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
2-06	400	0.25	67	56	58	53	42	34	33	54	51	48	48	38	35	<15
	450		68	57	59	54	43	35	34	56	52	49	49	40	37	<15
	500		68	58	60	55	44	36	35	58	54	50	50	42	39	15
	550		69	59	60	56	45	38	35	61	55	52	51	43	41	15
	600		70	60	61	58	46	40	36	62	56	54	52	44	42	16
4-08	600	0.25	64	59	62	57	47	41	37	61	59	57	58	49	48	16
	650		65	60	63	58	49	43	38	62	60	58	59	50	49	18
	700		66	61	64	59	50	44	39	62	61	58	60	51	50	18
	750		68	62	64	60	52	46	39	62	62	59	60	52	51	19
	800		69	63	65	61	54	48	40	63	63	60	61	53	52	20
6-10	1000	0.25	73	70	66	61	54	48	41	68	60	61	60	52	52	24
	1100		74	70	66	62	54	47	41	69	62	62	62	54	54	25
	1200		74	70	67	62	54	46	42	70	63	64	64	55	57	26
	1300		74	70	67	62	54	46	42	71	63	64	64	55	57	27
	1400		74	70	67	62	54	46	42	72	63	64	64	55	57	28

1) AHRI certified data is highlighted while all other data are application ratings

2) Radiated sound is the noise transmitted through the unit casing

3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts

4) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge

5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E

7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit

8) Sound performance based on units lined with standard dual density fiberglass insulation

9) Discharge (external) static pressure is 0.25" w.g. for all cases

10) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017

FVL RADIATED SOUND - PSC MOTOR - PRIMARY AIR ONLY COOLING

OCTAVE BAND SOUND POWER, Lw, dB																											
Case-Inlet Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.										
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC				
2-06	300	0.05	50	44	42	34	30	31	32	56	52	47	44	41	40	32	60	54	50	48	46	44	32				
	350	0.08	52	46	43	36	32	32	32	58	53	48	44	42	40	32	61	55	50	48	46	44	32				
	400	0.10	54	48	44	38	33	33	33	60	54	49	45	42	40	33	62	56	51	48	46	44	33				
	450	0.13	56	50	45	39	34	34	34	62	55	50	46	42	41	34	64	57	52	48	46	45	34				
	500	0.15	58	51	46	40	36	36	35	64	56	50	46	42	42	35	66	58	52	49	46	46	35				
4-08	500	0.04	53	42	38	34	30	30	35	58	48	44	40	38	37	35	60	51	48	44	42	42	35				
	600	0.06	56	44	40	35	31	30	37	60	50	45	41	38	37	37	62	52	49	44	42	42	37				
	700	0.09	58	56	41	36	32	30	39	62	51	46	42	38	37	39	65	54	50	45	42	42	39				
	800	0.11	60	48	42	38	34	32	40	64	52	48	43	39	38	40	67	56	51	46	43	43	40				
	900	0.13	62	50	44	41	36	34	40	66	54	49	44	40	39	40	69	58	52	48	44	44	40				
6-10	700	0.02	47	43	42	40	35	31	40	49	47	45	44	41	40	40	53	51	48	46	45	45	40				
	900	0.03	50	46	44	41	36	32	41	54	51	48	45	42	40	41	58	54	51	47	46	46	41				
	1100	0.05	53	48	45	42	36	32	41	58	54	50	46	42	40	41	62	57	53	49	46	46	41				
	1300	0.08	54	49	46	43	37	32	42	61	55	51	47	43	40	42	66	60	54	50	47	45	42				
	1500	0.11	56	50	47	44	38	32	42	64	57	52	48	44	40	42	70	62	56	52	47	45	42				

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Radiated sound is the noise transmitted through the unit casing
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge (external) static pressure is 0.25" w.g. for all cases

FVL DISCHARGE SOUND - PSC MOTOR - PRIMARY AIR ONLY COOLING

OCTAVE BAND SOUND POWER, Lw, dB																							
Case-Inlet Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
2-06	300	0.05	56	52	49	46	40	36	<15	58	54	51	48	42	38	<15	60	56	53	50	44	40	<15
	350	0.08	58	54	51	46	40	36	<15	60	56	53	48	42	38	<15	62	58	55	50	44	40	15
	400	0.10	59	55	53	47	41	37	<15	61	57	55	49	43	39	<15	63	59	57	51	45	41	16
	450	0.13	60	56	54	48	42	38	<15	62	58	56	50	44	40	15	64	60	58	52	46	42	18
	500	0.15	61	57	54	49	43	39	<15	63	59	56	51	45	41	16	65	61	58	53	47	43	19
4-08	500	0.04	57	50	46	42	40	36	15	59	53	48	44	42	38	15	60	56	52	47	44	42	15
	600	0.06	58	52	48	44	42	37	16	61	56	50	46	44	40	16	62	58	54	48	46	43	16
	700	0.09	60	54	50	46	44	38	18	63	58	52	48	46	42	18	64	60	55	50	48	44	18
	800	0.11	62	58	54	50	48	42	20	65	62	56	52	51	46	20	66	64	58	54	53	48	21
	900	0.13	64	62	57	54	52	46	20	67	66	59	56	56	50	24	68	68	61	58	58	52	26
6-10	700	0.02	56	50	47	44	42	36	<15	59	54	53	48	47	41	<15	62	57	57	51	51	48	<15
	900	0.03	59	51	48	45	44	37	19	62	57	55	51	50	44	19	65	60	60	54	54	48	19
	1100	0.05	61	53	50	47	46	39	19	65	59	57	53	52	47	19	69	63	62	56	56	51	20
	1300	0.08	62	55	51	48	47	40	21	68	60	58	54	54	48	21	72	64	63	58	58	54	24
	1500	0.11	64	57	53	50	48	42	21	71	62	59	56	56	50	22	76	66	64	60	60	56	29

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Radiated sound is the noise transmitted through the unit casing
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge (external) static pressure is 0.25" w.g. for all cases
- 10) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017

FVL-600 HOT WATER COILS MBH SELECTION DATA

Case Size	Rows	Connection OD	GPM	Head Loss (ft-H ₂ O)	CFM							
					200	250	300	350	400	450	500	550
2	One	0.625	1	0.63	8.2	9.1	9.9	10.5	11.1	11.6	12.1	12.5
			2	2.40	8.9	10.0	10.9	11.7	12.4	13.1	13.7	14.2
			3	5.25	9.3	10.3	11.3	12.2	12.9	13.7	14.3	14.9
			4	9.15	9.5	10.5	11.5	12.4	13.2	14.0	14.7	15.3
			Airside Ps (in. wg)		0.02	0.03	0.04	0.06	0.07	0.09	0.11	0.13
2	Two	0.875	1	0.17	12.3	13.8	15.1	16.1	17.1	17.9	18.6	19.2
			2	0.63	13.8	15.7	17.4	18.9	20.2	21.4	22.5	23.4
			4	2.39	14.7	17.0	18.9	20.7	22.3	23.8	24.2	26.4
			6	5.22	15.1	17.4	19.5	21.4	23.2	24.7	25.1	27.6
			Airside Ps (in. wg)		0.05	0.07	0.10	0.13	0.16	0.19	0.23	0.27

Case Size	Rows	Connection OD	GPM	Head Loss (ft-H ₂ O)	CFM							
					500	600	700	800	1000	1200	1400	1600
4	One	0.500	0.5	0.24	12.5	12.9	13.3	13.7	14.3	14.8	15.2	15.6
			1	0.93	15.4	16.1	16.7	17.3	18.3	19.2	19.9	20.6
			2	3.52	17.4	18.3	19.1	19.9	21.3	22.5	23.5	24.5
			3	7.71	18.3	19.2	20.1	21.0	22.5	23.8	25.1	26.2
			Airside Ps (in. wg)		0.03	0.04	0.04	0.05	0.07	0.09	0.10	0.12
4	Two	0.875	1	0.24	22.4	23.4	24.4	25.2	26.7	27.9	29.0	29.9
			2	0.91	26.8	28.4	29.8	31.1	33.4	35.5	37.3	38.9
			4	3.45	29.7	31.7	33.5	35.1	38.2	40.9	43.5	45.7
			6	7.53	30.9	33.0	34.9	36.8	40.2	43.2	46.0	48.6
			Airside Ps (in. wg)		0.07	0.08	0.10	0.11	0.15	0.19	0.23	0.27

Case Size	Rows	Connection OD	GPM	Head Loss (ft-H ₂ O)	CFM							
					500	600	700	800	1000	1200	1400	1600
6	One	0.500	0.5	0.27	13.1	13.8	14.4	14.9	15.7	16.3	16.9	17.3
			1	1.03	16.3	17.5	18.5	19.4	20.8	22.0	23.0	23.8
			2	3.91	18.5	20.1	21.5	22.7	24.8	26.5	28.0	29.3
			3	8.54	19.4	21.2	22.7	24.1	26.5	28.5	30.2	31.7
			Airside Ps (in. wg)		0.04	0.05	0.07	0.08	0.12	0.16	0.21	0.27
6	Two	0.875	1	0.27	23.6	25.4	26.9	28.1	30.1	—	—	—
			2	1.01	28.6	31.3	33.7	35.8	39.2	—	—	—
			4	3.83	31.9	35.4	38.5	41.3	46.1	—	—	—
			6	8.37	33.2	37.1	40.5	43.6	49.0	—	—	—
			Airside Ps (in. wg)		0.08	0.11	0.14	0.18	0.26	—	—	—

Heating capacity data in tables assume an entering water temperature (EWT) of 180°F, and an entering air temperature (EAT) of 65°F, which corresponds to a temperature difference of 115°F. Smaller temperature differences will result in a decrease of heating capacity. To obtain the heating capacity at another temperature difference, refer to the hot water coil notes located in the Reference Section.

FVL-600 HOT WATER COILS

When ordered with the air terminal, the hot water coil is shipped attached to the discharge of the terminal casing. The discharge end of the casing has slip and drive connections for easy connection to downstream ductwork. The hot water coil is constructed of aluminum fin and copper serpentine-type tubes with male sweat connections tested at 300 psig.

Coil selection may be made using METALAIRE Terminal Selection Software. Contact your METALAIRE representative for a copy. In the interest of energy conservation and due to the possibility of condensation, all hot water coils are marked, "Coil must be externally insulated after installation in the field." Hot water coils are tested in accordance to AHRI. Options, at an additional charge on hot water coils, include access doors for inspection and cleaning, and inlet/outlet on opposite sides of coils.

HOT WATER COIL CONSTRUCTION DETAILS

- Hot Water Coils are factory mounted to the discharge of the terminal and are available with an optional factory mounted discharge plenum section with access door.
- Hot water coils are enclosed in a 20 gauge coated steel casing allowing for attachment to metal ductwork with a slip and drive connection.
- Fins are rippled and sine wave type constructed from heavy gauge aluminum and are mechanically bonded to the tubes.
- Tubes are copper with a minimum wall thickness of 0.016" with male sweat header connections.
- Coils are leak tested to 300 psi with minimum burst of 2000 psi at ambient temperature. Coil performance data is based on tests run in accordance with AHRI standard 410. Coils are AHRI certified and include an AHRI label.



Outside Diameter (OD) connection size, Inches		
Case Size	Standard HW Coil Inches	
	1 Row	2 Row
2	5/8 (16)	7/8 (22)
4	5/8 (16)	7/8 (22)
6	5/8 (16)	5/8 (16)

All coils have 10 fins/inch with optional 12 fins/inch

All accessories that can be attached to the Parallel Fan Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

FVL-600 PSC FAN MOTOR AMPERAGE RATINGS

Case Size	Motor HP	Standard PSC Motor Amperage Ratings		
		120v-1 Phase 60 Hz Rated Amps	208-240v-1 Phase 60 Hz Rated Amps	277V-1 Phase 60 Hz Rated Amps
2	1/8	2.6	0.8	1.1
4	1/4	4.8	1.9	1.9
6	1/3	8.8	3.0	3.6

Motors also available: 208-240 V, 50 / 60 Hz.

Contact your METALAIRE Representative for details.

FVL-600 ECM FAN MOTOR AMPERAGE RATINGS

Case	HP	FLA 120	FLA 208	FLA 230	FLA 277
2	1/3	5.50	3.10	2.7	2.60
4	1/3	5.50	3.10	2.7	2.60
6	1/2	8.30	4.80	4.5	3.70

FVL-600 DAMPER LEAKAGE

Standard Construction			
Inlet Diameter	Static Pressure " w.g.	Maximum Airflow	Max Damper Leakage
4	3	300	5
5	3	375	5
6	3	540	5
7	3	760	7
8	3	990	9
9	3	1250	12
10	3	1640	16
12	3	2350	22
14	3	3250	32
16	3	4100	41
20	3	6430	64
24	3	7270	72

PERFORMANCE NOTES

- 1) Leakage testing conducted in accordance with ASHRAE 130-2016
- 2) Per ASHRAE Standard 130-2016 "terminal damper leakage: the amount of air in ft 3/min (L/s) leaking through a fully closed damper/valve of a supply/exhaust terminal unit at a given inlet pressure"opened"

- 3) Damper leakage shall not exceed 1% of the maximum rated airflow at 3" w.g.
- 4) 4" and 5" inlets are built with 6" casings

FVL-600 ELECTRIC HEAT

The discharge end has slip and drive connections for easy connection to downstream ductwork. ETL® listed heaters are provided with a fan interlock relay. Heaters that will be controlled electronically must include a 24 VAC control circuit to operate with the low voltage controls on the air terminal. Heater plenums are internally insulated. When an air terminal is ordered with clean room lining and electric heat, the heater plenum is either internally lined with optional foil backed insulation or closed cell foam or may require external insulation in field.

INCLUDED WITH EACH HEATER ASSEMBLY:

- Heater and cabinet mounted on the discharge of the FVL-600
- Electric Heater is interlocked into fan control relay
- De-energizing magnetic contactors per step
- Primary automatic reset high temperature limit (disc type)
- Backup manual reset high temperature limit (disc type)
- Non-fused transformer with voltage to match Heater voltage
- Single point power wiring connection
- Heater is shipped factory mounted and wired



ELECTRIC HEATER ASSEMBLY CONSTRUCTION DETAILS

- Electric Reheat Coils are factory mounted on the discharge of the Air Terminal. The heaters are ETL® listed for zero clearance, are tested in accordance with UL® 60335, CSA-C22.2 and the National Electric Code (NEC). Heater casings are constructed of galvanized steel. Element wire is high grade nichrome alloy derated to 45 watts per square inch density. Element wire is supported by moisture-resistant steatite ceramics.
- Ceramics are enclosed in reinforcement brackets spaced across the heater element rack at 2" to 4" intervals. Controls are contained in a NEMA 1 control cabinet with a hinged, latching door. A permanent wiring diagram is affixed to the inside of the control cabinet door for field reference.
- The 208 and 480 volt units require a neutral connection for both single and three phase service. Our standard motors are 120 and 277 volt single phase. The 208-240 volt single phase motor is optional. 480 volt motors are not available for our units. See table for reference.

Heater Voltage	Fan Motor Voltage	Separate Neutral Required
120 V 1PH	120 V 1PH	NO
208 V 1PH	120 V 1PH	YES
277 V 1PH	277 V 1PH	NO
480 V 1PH	277 V 1PH	YES
208 V 1PH	208 V 1PH	NO
208 V 3PH	120 V 1PH	YES
480 V 3PH	277 V 1PH	YES
208 V 3PH	208 V 1PH	NO

All accessories that can be attached to the Parallel Fan Boxes are not a part of the AHRI certification program but ratings can be affected by their use.

FVL-600 ELECTRIC HEATER CAPACITIES

Model FVL		Single Phase										Three Phase			
		120V		208V		240V		277V		480V		208V		480V	
Inlet Size	# of Steps Available	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2	1/SCR	0.5	5.5	0.5	7.5	0.5	7.5	0.5	7.5	1.5	7.5	0.5	7.5	1.5	7.5
	2	1		1		1		1		3		1		3	
	3	1.5		1.5		1.5		1.5		4.5		1.5		4.5	
4	1/SCR	0.5	5.5	0.5	9.5	0.5	11	0.5	12	1	12	0.5	12	1	12
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	
6	1/SCR	0.5	5.5	0.5	9.5	0.5	11	0.5	13	1	16	0.5	16	1	16
	2	1		1		1		1		2		1		2	
	3	1.5		1.5		1.5		1.5		3		1.5		3	

NOTES:

- Heaters less than 10 kW are specifiable to nearest 0.5 kW. Heaters greater than 10.0 kW are specifiable to nearest 1.0 kW.
- Minimum flow rate for electric heat is 70 CFM / kW.
Lower CFM's can cause nuisance tripping, excessive discharge temperatures, rapid cycling, and rapid element failure.
Electric Heat units running below 70 CFM / kW will void all warranties.
- For optimum thermal comfort, the suggested discharge temperature should not exceed 20°F above room set point.
- We do not recommend discharge temperatures in excess of 115°F to protect heater coils.
- Maximum number of steps at Min kW per step is one step.
- If more than 1 heater is wired into a building's circuit breaker (multi-outlet branch circuit) each heater will require the addition of power side fusing.

ELECTRIC HEAT SELECTION:

- Specify electric duct heaters using voltage, phase, kW, and number of steps.
- Use above chart to select voltage. Calculate required kW using following equations:

$$kW = \frac{BTU / HR}{3413} \quad kW = \frac{CFM \times \Delta \times 1.085}{3413} \quad \Delta = \frac{kW \times 3413}{CFM \times 1.085}$$

$$CFM = \frac{kW \times 3413}{\Delta \times 1.085} \quad CFM = \frac{kW \times 3413}{\Delta \times 1.085}$$

* air density at sea level—reduce by 0.036 for each 1000 feet of altitude above sea level

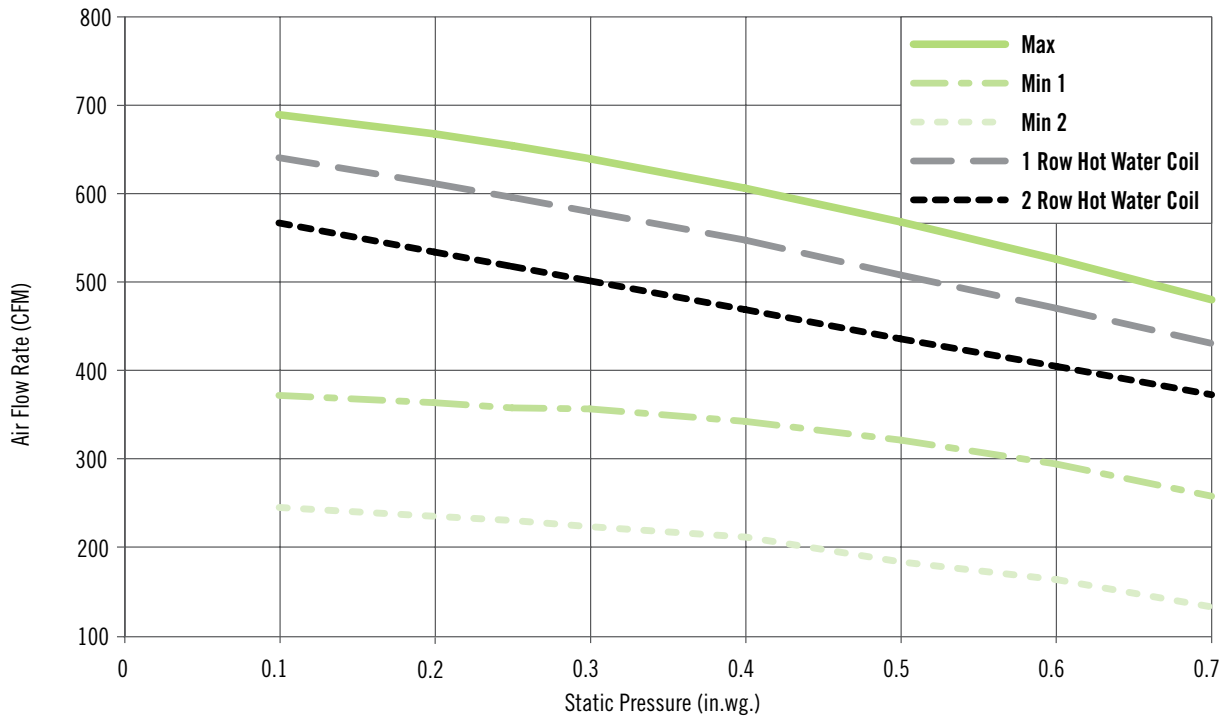
Where: BTU / Hr = Required heating capacity

CFM = volume of air during heating. Typically 100% of maximum cooling air volume

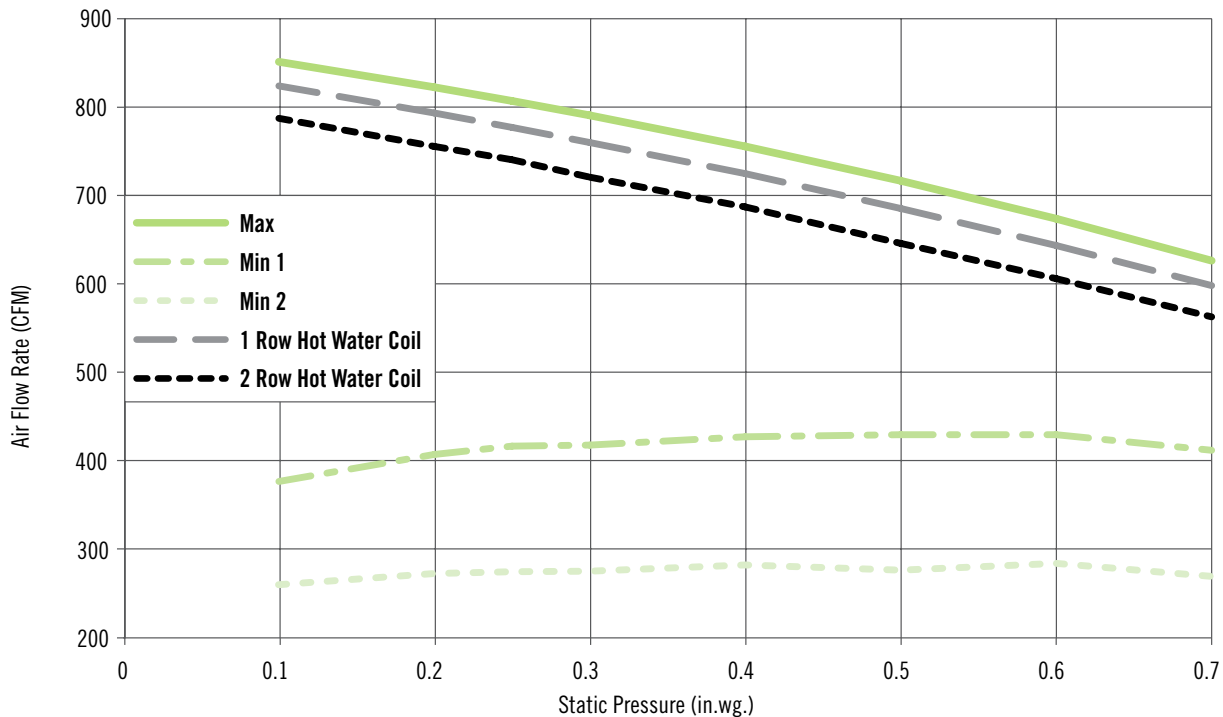
Δ = desired air temperature rise across the electric heater

Inlet air temperature = primary air temperature, usually 55°F

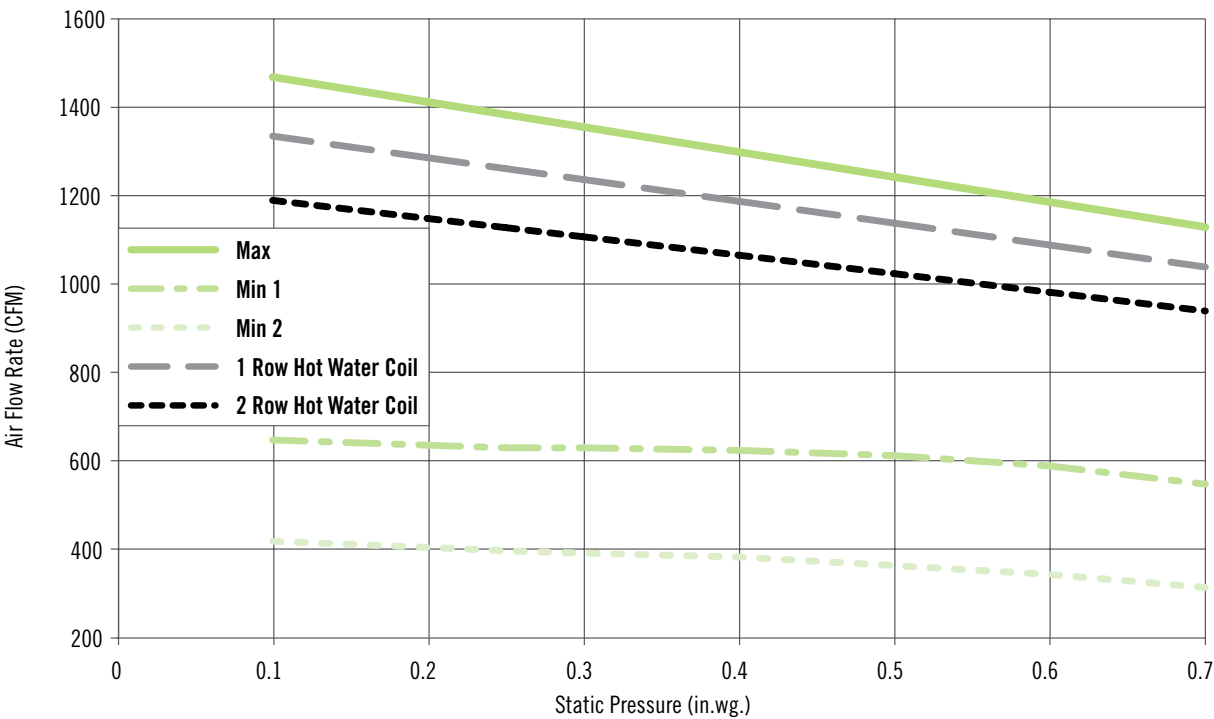
FVL-600 FAN PERFORMANCE CURVES CASE SIZE 2 - STANDARD HW COIL



FVL-600 FAN PERFORMANCE CURVES CASE SIZE 4 - STANDARD HW COIL



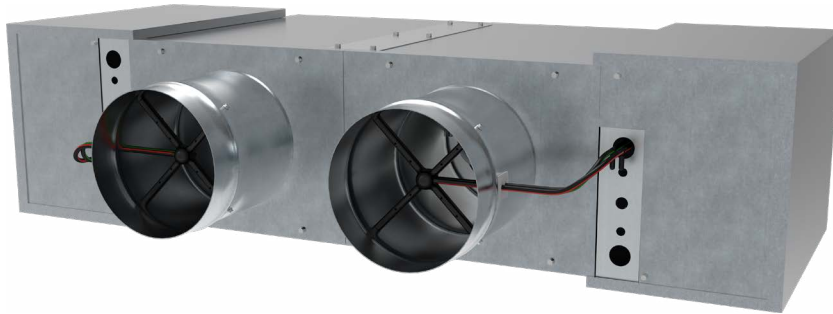
FVL-600 FAN PERFORMANCE CURVES
CASE SIZE 6 - STANDARD HW COIL



PARALLEL FAN POWERED

FVL-600 LOW PROFILE VARIABLE VOLUME

DUAL DUCT AIR TERMINAL UNITS



**DD-500
DUAL DUCT
AIR TERMINAL UNIT
PAGES DD1 - DD9**



**DH-500
HIGH PERFORMANCE
MIXING DUAL DUCT
AIR TERMINAL UNIT
PAGES DH1 - DH8**



**DS-600
SHORT MIXING
DUAL DUCT
AIR TERMINAL UNIT
PAGES DS1 - DS8**

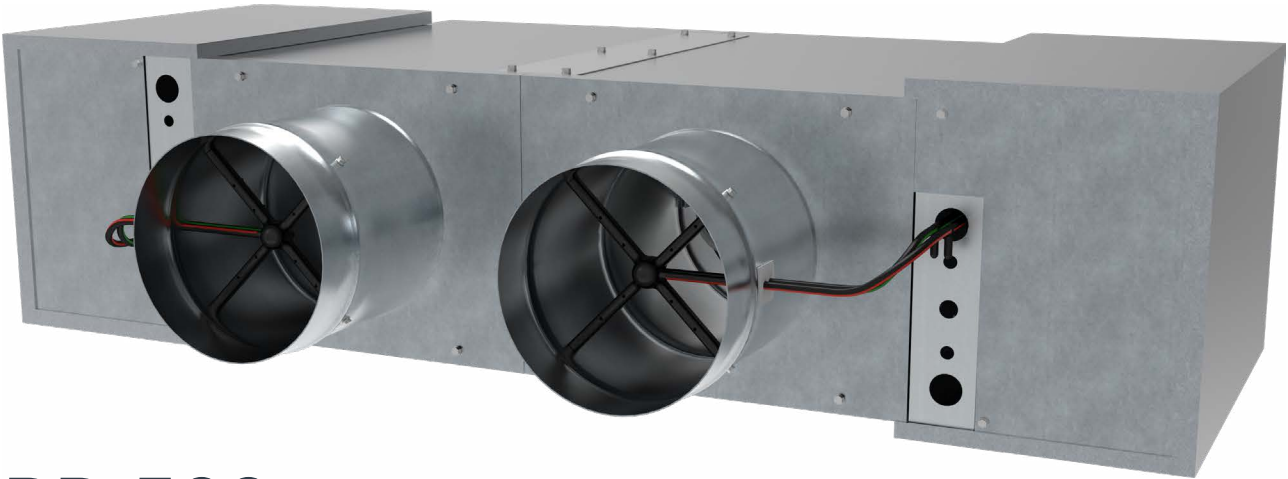


DUAL DUCT AIR TERMINAL UNITS

METALAIRE's dual duct terminal units are a complete line of dual duct units that meet any design criteria in a dual duct variable air volume (VAV) system. The dual duct terminal unit varies the air flow of the hot and cold decks as well as the discharge temperature of the terminal unit in order to maintain optimum conditions in the occupied zone.

METALAIRE dual duct terminal units are available in three models. The DD-500 varies the airflow in the hot and cold air streams and provides no mixing in the terminal unit. The DS-600 is a short mixing box with an integral attenuator designed for limited space applications. The DH-500 includes a high efficiency mixing section and integral sound attenuator which provide an industry leading 1:30 mixing ratio, with less than 1°F temperature variation at the discharge with a 30°F inlet temperature difference. METALAIRE dual duct terminal units are available with a wide range of control options to suit any application. These include pneumatic and direct digital control (DDC) by others. METALAIRE dual duct terminal units can be applied in duct systems with static pressures up to 3" wg.

With the demands of today's building designs to reduce energy in smaller mechanical spaces, without sacrificing performance or value, the METALAIRE dual duct terminal unit is the perfect choice.

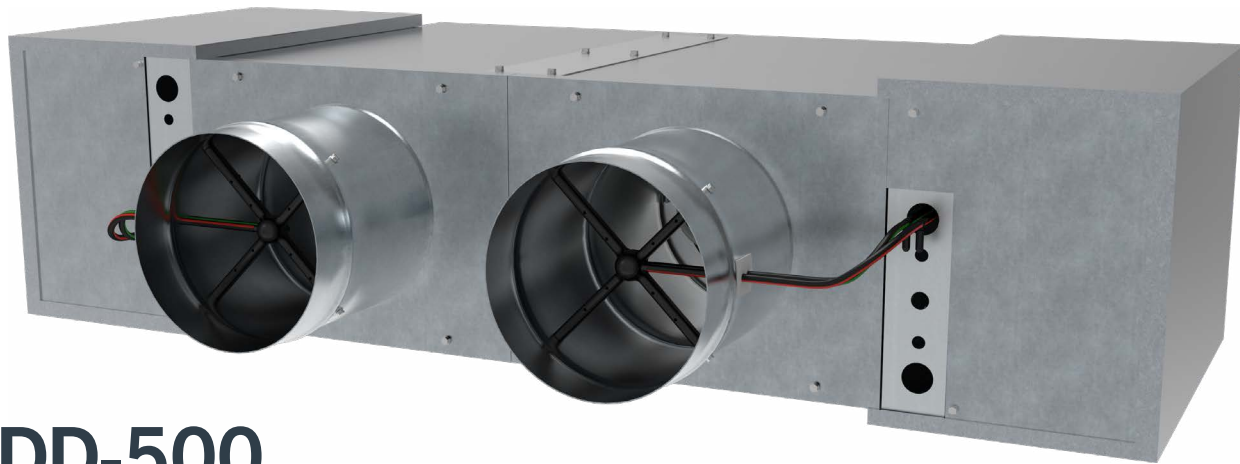


DD-500 DUAL DUCT AIR TERMINAL UNIT

SPECIFIABLE FEATURES

- ▶ 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- ▶ Damper construction of double layer 18 gauge equivalent with integral blade seal.
- ▶ Riveted round primary inlet duct to minimize leakage.

INDEX OF SECTIONS	PAGE
Dimensional Data	4
AHRI Certified Rating Points	5
Sound Performance Data	6
Casing Leakage / Damper Leakage	8
Certifications and Standards	8
Recommended Min/Max Airflow Ranges	9

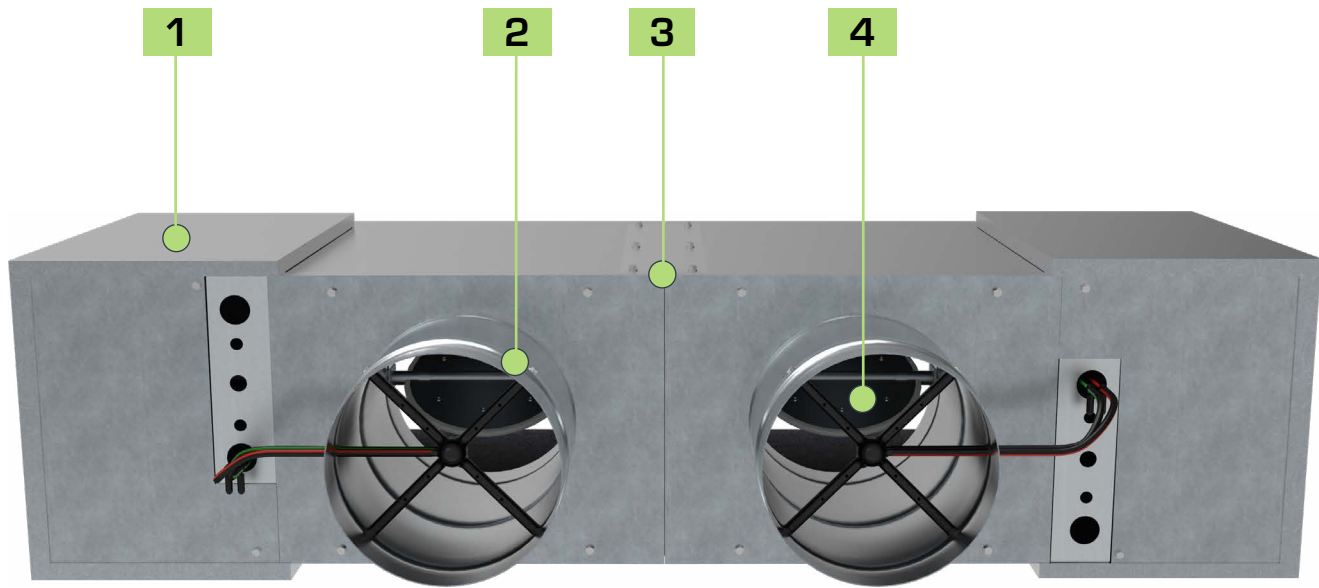


DD-500 DUAL DUCT AIR TERMINAL UNIT

The METALAIRE DD-500 air terminal units are designed to regulate the flow of conditioned air in a dual duct air distribution system. Both heated and cooled air are provided to the air terminal and mixed in a plenum provided by others to reach the desired discharge temperature.

STANDARD FEATURES

- ▶ Available in multiple unit sizes to handle 30–5020 CFM.
- ▶ Unequal inlet sizes are available as an option.
- ▶ Variable or constant volume applications.
- ▶ 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- ▶ Mechanically fastened damper assembly is double layer, 18 gauge equivalent, galvanized steel with integral blade seal. (<1% at 3" static pressure).
- ▶ Optional factory calibrated controls per each job requirement.
- ▶ Multi-point center averaging flow sensor for highly accurate (+/-5%) flow readings with varying inlet duct configurations after certified balancer has balanced terminal.
- ▶ External control cabinets for hot and cold deck with offset mounting plate.
- ▶ 3-beaded inlet connection tube for added rigidity and secure flex duct connections.
- ▶ 1/2" thick, dual density (1.5lb / ft³ min.) fiberglass insulation with edges coated. Meets NFPA 90A and UL 181.
- ▶ Rectangular discharge with slip and drive cleat duct connection.
- ▶ Independently tested and certified laboratory performance data.
- ▶ Full range of liners / insulation available.

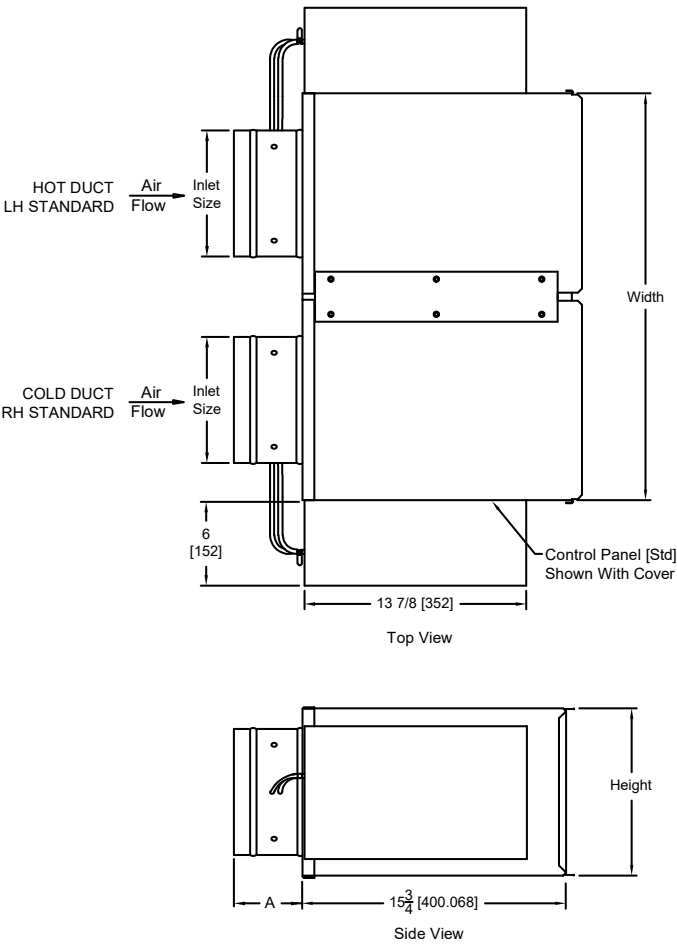


DD-500 DUAL DUCT AIR TERMINAL UNIT

FEATURES AND BENEFITS

- 1** NEMA TYPE 1 rated control enclosures for both hot and cold decks with stand-off to prevent penetration of casing are standard on all terminal units.
- 2** Riveted primary inlet duct to minimize leakage with three stiffening beads for added rigidity.
- 3** Galvanized steel casing, mechanically sealed for low leakage construction.
- 4** Damper rotates in a self-lubricating, long life, low friction thermoplastic bearing.

DD-500 DUAL DUCT AIR TERMINAL UNIT



The control panels will overhang the top and bottom of Models DD504–DD506 1 13/16" (46 mm) or 13/16" (20 mm) on DD508. Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".

Unit Size	Inlet Size		A		Width		Height		Unit wt.	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lb.	kg.
4	3 7/8	99	5	254	24 1/4	305	8	203	24	11
5	4 7/8	124	5	127	24 1/4	305	8	203	24	11
6	5 7/8	149	5	127	24 1/4	305	8	203	24	11
7	7 7/8	200	5	127	24 1/4	305	10	254	30	14
8	7 7/8	200	5	127	24 1/4	305	10	254	30	14
9	9 7/8	251	5	127	28 1/4	356	12 1/2	318	36	16
10	9 7/8	251	5	127	28 1/4	356	12 1/2	318	36	16
12	11 7/8	302	5	127	32 1/4	406	15	381	44	20
14	13 7/8	353	5	127	40 1/4	508	17 1/2	445	48	22
16	15 7/8	403	5	127	48 1/4	610	18	457	58	26

DD-500 AHRI CERTIFIED RATING POINTS



RADIATED SOUND

Power Levels @ 1.5" w.g. ΔPs

Unit Size	CFM	Min Ps	Octave Band					
			2	3	4	5	6	7
4	150	0.03	48	40	32	28	23	20
5	250	0.06	54	46	42	34	31	30
6	400	0.10	56	52	46	40	38	36
7	550	0.06	59	53	46	41	34	31
8	700	0.09	62	56	48	44	36	32
9	900	0.02	56	57	51	43	37	31
10	1100	0.04	58	58	52	44	38	32
12	1600	0.08	64	58	54	46	42	36
14	2100	0.08	62	52	50	42	38	38
16	2800	0.08	64	63	58	52	48	46

DISCHARGE SOUND

Power Levels @ 1.5" w.g. ΔPs

Unit Size	CFM	Min Ps	Octave Band					
			2	3	4	5	6	7
4	150	0.03	61	57	54	49	43	37
5	250	0.06	63	59	56	50	46	41
6	400	0.10	62	58	54	46	42	44
7	550	0.06	69	66	60	57	52	47
8	700	0.09	70	68	62	59	56	52
9	900	0.02	69	66	62	58	54	50
10	1100	0.04	71	68	63	59	55	52
12	1600	0.08	72	72	62	63	58	54
14	2100	0.08	68	64	62	58	56	54
16	2800	0.08	77	77	73	70	65	60

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge

- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation

RADIATED SOUND MODEL DD

OCTAVE BAND SOUND POWER, Lw, dB																														
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
4	50	0.01	38	29	20	19	15	15	<15	42	33	20	19	15	15	<15	43	34	22	20	17	16	<15	45	38	25	24	23	18	<15
	100	0.02	40	31	20	16	13	10	<15	44	35	24	22	19	16	<15	45	36	26	24	21	18	<15	47	40	29	27	27	24	<15
	150	0.03	43	35	26	20	15	11	<15	47	39	30	26	21	17	<15	48	40	32	28	23	20	<15	50	44	35	31	29	27	<15
	200	0.04	46	38	32	23	17	13	<15	50	42	36	29	23	19	<15	51	44	38	30	25	22	<15	53	47	41	34	31	29	<15
	250	0.06	48	40	36	26	22	21	<15	52	44	40	32	28	27	<15	53	46	42	34	30	30	15	55	49	45	37	36	37	19
5	150	0.03	46	38	29	26	21	16	<15	48	40	31	28	23	18	<15	48	41	32	28	24	20	<15	50	44	35	31	29	27	<15
	200	0.04	49	41	35	29	23	18	<15	51	43	37	31	25	20	<15	52	44	38	32	26	22	<15	53	47	41	34	31	29	<15
	250	0.06	51	43	39	32	28	26	<15	53	45	41	34	30	28	<15	54	46	42	34	31	30	15	55	49	45	37	36	37	19
	300	0.07	53	46	43	35	32	30	16	55	48	45	37	34	32	19	56	49	46	38	35	34	20	57	52	49	40	40	41	23
	350	0.09	54	48	46	38	35	33	20	56	50	48	39	37	35	22	57	51	48	40	38	37	22	58	53	51	42	42	42	25
6	200	0.04	46	38	31	23	17	13	<15	50	42	35	29	23	19	<15	51	44	37	30	25	22	<15	53	47	41	34	31	29	<15
	300	0.07	50	43	36	29	26	25	<15	54	47	40	35	32	31	15	55	48	44	36	34	34	18	57	52	49	40	40	41	23
	400	0.10	51	46	38	31	28	27	<15	55	50	42	37	34	33	18	56	52	46	40	38	36	20	59	56	52	46	46	43	26
	500	0.14	54	50	41	35	30	29	18	58	54	45	41	36	35	22	60	56	48	44	40	38	25	61	59	54	49	48	45	29
	600	0.15	54	51	42	36	31	30	19	58	55	46	42	37	36	24	60	57	49	45	41	38	26	61	60	55	50	49	46	30
7	350	0.03	50	42	38	30	24	20	<15	54	46	42	36	30	26	15	55	48	43	38	32	28	16	58	50	46	43	36	33	20
	450	0.04	51	44	39	31	24	21	<15	55	48	43	37	30	27	16	57	50	45	40	34	30	19	59	53	47	44	38	34	21
	550	0.06	53	48	40	32	26	22	15	57	52	44	38	32	28	20	59	53	46	41	34	31	21	61	56	48	46	38	35	25
	650	0.08	55	50	42	34	27	24	18	59	54	46	40	33	30	22	61	55	47	43	35	32	24	63	58	50	47	40	36	28
	750	0.10	57	52	44	36	28	24	20	61	56	48	42	34	30	25	63	57	49	44	37	33	26	65	60	52	48	42	38	30
8	400	0.04	50	43	38	30	24	20	<15	54	47	42	36	30	26	15	56	49	44	39	33	29	18	58	52	46	44	37	34	20
	550	0.06	53	48	40	32	26	22	15	57	52	44	38	32	28	20	59	53	46	41	34	31	21	61	56	48	46	38	35	25
	700	0.09	56	51	43	35	28	24	19	60	55	47	41	34	30	24	62	56	48	44	36	32	25	64	60	51	48	42	37	30
	850	0.11	58	52	45	36	30	26	20	62	56	49	42	36	32	25	64	58	51	45	39	34	28	66	60	53	50	44	38	30
	1000	0.13	61	54	47	39	33	27	24	65	58	51	45	39	33	29	66	60	52	48	42	36	30	69	62	55	52	46	40	34
9	500	0.01	48	48	42	30	25	19	15	52	52	46	36	31	25	20	53	53	48	38	33	27	22	56	56	50	42	38	32	25
	700	0.01	50	50	44	32	27	20	18	54	54	48	38	33	26	22	55	55	50	41	35	29	24	58	58	52	46	40	34	28
	900	0.02	50	52	46	34	28	22	20	54	56	50	40	34	28	25	56	57	51	43	37	31	26	58	60	54	48	42	35	30
	1100	0.04	52	52	46	35	29	23	20	56	56	50	41	35	29	25	58	58	52	44	38	32	28	60	60	54	48	42	36	30
	1300	0.06	55	54	48	37	31	25	22	59	58	52	43	37	31	28	60	60	53	45	39	33	30	63	62	56	50	44	38	32
10	700	0.01	50	50	44	32	27	20	18	54	54	48	38	33	26	22	55	55	50	41	35	29	24	58	58	52	46	40	34	28
	900	0.02	50	52	46	34	28	22	20	54	56	50	40	34	28	25	56	57	51	43	37	31	26	58	60	54	48	42	35	30
	1100	0.04	52	52	46	35	29	23	20	56	56	50	41	35	29	25	58	58	52	44	38	32	28	60	60	54	48	42	36	30
	1300	0.06	55	54	48	37	31	25	22	59	58	52	43	37	31	28	60	60	53	45	39	33	30	63	62	56	50	44	38	32
	1500	0.08	58	56	49	39	33	28	25	62	60	53	45	39	34	30	63	62	55	47	41	36	32	66	64	57	52	46	40	35
12	800	0.02	51	45	43	31	26	26	16	55	49	47	37	32	32	21	56	50	48	40	34	34	22	59	53	51	44	39	39	25
	1200	0.04	53	49	46	34	29	28	20	57	53	50	40	35	34	24	58	54	52	42	38	36	26	61	57	54	47	42	41	29
	1600	0.08	58	53	49	38	33	28	23	62	57	53	44	39	34	28	64	58	54	46	42	36	29	66	61	57	51	46	41	32
	2000	0.12	56	52	50	38	35	33	24	60	56	54	44	41	39	29	62	58	56	46	44	42	31	64	60	58	51	48	46	33
	2400	0.17	57	55	49	40	37	33	24	62	58	56	47	44	42	31	64	59	57	49	46	45	32	66	62	60	54	50	49	35
14	1000	0.02	50	38	36	25	21	15	<15	54	42	40	31	27	21	15	56	43	41	33	30	24	18	58	46	44	38	34	28	20
	1600	0.05	52	43	40	29	24	19	<15	56	47	44	35	30	25	18	58	48	46	38	32	28	20	60	51	48	42	37	32	22
	2100	0.08	56	47	44	34	30	29	18	60	51	48	40	36	35	22	62	52	50	42	38	38	25	64	55	52	47	43	42	28
	2600	0.12	59	53	51	37	34	30	25	63	57	55	43	40	36	30	64	58	56	46	42	38	31	67	61	59	50	47	43	34
	3100	0.16	60	56	53	39	37	33	28	64	60	57	45	43	39	32	66	61	59	47	45	41	34	68	64	61	52	50	46	36
16	1400	0.02	54	50	44	34	30	25	18	58	54	48	40	36	31	22	60	56	50	44	40	36	25	62	60	56	52	47	44	31
	2100	0.05	56	54	48	39	35	31	22	60	58	52	45	41	37	28	62	60	55	49	45	42	30	68	64	61	52	50	46	36
	2800	0.08	58	56	50	41	38	35	25	62	60	5	44	44	41	30	64	63	58	52	48	46	34	69	69	65	62	61	59	40
	3500	0.11	61	58	53	44	41	38	28	65	62	57	50	47	44	32	67	64	60	54	52	48	35	71	70	67	64	63	62	42
	4200	0.14	62	60	54	46	44	41	30	66																				

DISCHARGE SOUND MODEL DD

OCTAVE BAND SOUND POWER, Lw, dB																														
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
4	50	0.01	54	50	46	43	35	27	<15	58	54	50	47	39	31	<15	59	55	51	48	40	32	<15	62	58	51	51	43	35	18
	100	0.02	55	51	48	43	36	30	<15	59	55	52	47	40	34	<15	60	56	53	48	41	35	15	63	59	54	51	44	38	19
	150	0.03	56	52	49	44	38	32	<15	60	56	53	48	42	36	15	61	57	54	49	43	37	16	64	60	55	52	46	40	20
	200	0.04	57	53	49	45	40	33	<15	61	57	53	49	44	37	16	62	58	54	50	45	38	18	65	61	55	53	48	41	21
	250	0.06	58	54	51	45	41	36	<15	62	58	55	49	45	40	18	63	59	56	50	46	41	19	66	62	59	53	49	44	22
5	150	0.03	56	52	49	44	38	32	<15	60	56	53	48	42	36	15	61	57	54	49	43	37	16	64	60	55	52	46	40	20
	200	0.04	57	53	49	45	40	33	<15	61	57	53	49	44	37	16	62	58	54	50	45	38	18	65	61	55	53	48	41	21
	250	0.06	58	54	51	45	41	36	<15	62	58	55	49	45	40	18	63	59	56	50	46	41	19	66	62	59	53	49	44	22
	300	0.07	58	56	53	46	42	39	<15	62	60	57	50	46	43	18	63	61	58	51	47	44	19	66	64	61	54	50	47	22
	350	0.09	58	57	54	47	43	41	<15	62	60	58	50	47	44	18	62	61	58	51	48	45	19	65	63	61	53	50	48	21
6	200	0.04	54	49	43	38	29	30	<15	58	53	47	42	33	34	<15	60	54	48	44	35	36	15	62	57	51	48	39	40	18
	300	0.07	55	52	47	39	34	36	<15	59	56	51	43	38	40	<15	60	58	52	45	40	42	15	63	60	55	49	44	46	18
	400	0.10	57	52	48	40	36	38	<15	61	56	52	44	40	42	<15	62	58	54	46	42	44	15	65	60	56	50	46	48	18
	500	0.14	59	56	52	45	39	41	<15	63	60	56	49	43	45	18	64	62	58	51	45	47	20	67	64	60	55	49	51	22
	600	0.15	59	57	53	47	40	42	<15	63	61	57	51	44	46	19	65	63	59	53	46	48	21	67	65	61	57	50	52	24
7	350	0.03	60	58	52	48	43	38	15	64	62	56	52	47	42	20	65	63	58	54	50	44	21	69	65	61	58	57	52	24
	450	0.04	60	60	52	49	44	38	18	64	64	56	53	48	42	22	67	65	59	55	52	46	24	71	68	63	60	58	54	28
	550	0.06	62	62	54	51	46	40	20	66	66	58	55	50	44	25	69	66	60	57	52	47	25	72	70	65	62	56	54	30
	650	0.08	64	62	55	52	47	42	20	68	66	59	56	51	46	25	70	68	61	58	54	50	28	74	71	66	63	60	56	31
	750	0.10	66	64	57	55	49	45	21	70	68	61	59	53	49	26	72	69	63	60	56	52	28	74	72	67	64	61	56	31
8	400	0.04	60	59	52	48	44	38	16	64	63	56	52	48	42	21	66	64	58	54	51	45	22	70	66	62	59	58	53	25
	550	0.06	62	62	54	51	46	40	20	66	66	58	55	50	44	25	69	66	60	57	52	47	25	72	70	65	62	56	54	30
	700	0.09	65	63	56	53	48	43	20	69	67	60	57	52	47	25	70	68	62	59	56	52	26	74	72	66	63	61	57	31
	850	0.11	69	66	59	58	52	47	24	73	70	63	62	56	51	29	74	71	64	62	57	52	30	76	74	68	66	62	56	34
	1000	0.13	71	68	62	60	54	48	26	75	72	66	64	58	52	31	76	73	67	65	59	53	32	79	75	70	67	63	57	35
9	500	0.01	58	58	52	50	44	42	15	62	62	56	54	48	46	20	64	62	57	54	50	46	20	67	65	60	58	54	52	24
	700	0.01	62	60	55	52	47	44	16	66	64	59	56	51	48	21	67	65	60	56	52	49	22	70	68	63	60	56	54	26
	900	0.02	64	62	56	52	48	46	19	68	66	60	56	52	50	24	69	66	62	58	54	50	24	72	70	64	61	57	54	29
	1100	0.04	66	63	58	54	50	47	20	70	67	62	58	54	51	25	71	68	63	59	55	52	26	73	71	67	62	59	55	30
	1300	0.06	68	66	60	57	52	50	24	72	70	64	61	56	54	29	74	71	66	62	58	54	30	76	73	69	64	62	59	32
10	700	0.01	62	60	55	52	47	44	16	66	64	59	56	51	48	21	67	65	60	56	52	49	22	70	68	63	60	56	54	26
	900	0.02	64	62	56	52	48	46	19	68	66	60	56	52	50	24	69	66	62	58	54	50	24	72	70	64	61	57	54	29
	1100	0.04	66	63	58	54	50	47	20	70	67	62	58	54	51	25	71	68	63	59	55	52	26	73	71	67	62	59	55	30
	1300	0.06	68	66	60	57	52	50	24	72	70	64	61	56	54	29	74	71	66	62	58	54	30	76	73	69	64	62	59	32
	1500	0.08	71	69	62	60	55	52	28	75	73	66	64	59	56	32	76	74	68	66	60	56	34	79	76	70	68	64	61	36
12	800	0.02	59	55	47	51	45	42	<15	63	59	51	55	49	46	15	64	60	52	57	51	48	16	67	63	55	61	55	52	20
	1200	0.04	62	61	52	54	48	45	18	66	65	56	58	52	49	22	68	66	58	60	54	51	24	70	69	60	64	58	55	28
	1600	0.08	66	66	56	57	52	48	24	70	70	60	61	56	52	29	72	72	62	63	58	54	31	74	74	64	67	62	58	34
	2000	0.12	68	68	60	59	57	55	26	72	72	64	63	61	59	31	74	74	66	65	63	61	34	76	76	68	69	67	65	36
	2400	0.17	71	71	67	65	59	54	30	74	72	66	64	64	62	31	75	74	67	66	66	64	34	78	76	70	70	70	68	36
14	1000	0.02	52	52	49	45	38	39	<15	56	56	53	49	42	43	<15	57	57	54	51	44	45	<15	60	60	57	55	48	49	16
	1600	0.05	58	55	52	49	44	44	<15	62	59	56	53	48	48	15	64	60	58	55	50	50	16	66	63	60	59	54	54	20
	2100	0.08	62	59	57	52	50	48	15	66	63	61	56	54	52	20	68	64	62	58	56	54	21	70	67	65	62	60	58	25
	2600	0.12	67	65	60	60	57	53	22	71	69	64	64	61	57	28	72	70	66	66	63	59	29	75	73	68	70	67	63	32
	3100	0.16	70	68	62	65	61	55	26	74	72	66	69	65	59	31	76	74	67	71	67	61	34	78	76	70	75	71	65	36
16	1400	0.02	65	67	63	62	56	50	25	69	71	67	66	60	54	30	70	72	68	67	62	56	31	71	74	71	70	67	61	34
	2100	0.05	70	70	66	65	58	54	29	74	74	70	69	62	58	34	74	76	71	70	64	58	36	78	76	70	75	71	65	36
	2800	0.08	72	72	68	65	60	55	31	76	76	72	69	64	59	36	77	77	73	70	65	60	37	80	80	76	76	71	65	40
	3500	0.11	73	73	69	66	61	57	32	77	77	73	70	65	61	37	78	78	74	71	66	62	38	81	81	78	76	72	66	41
	4200	0.14	75	74	70	69	64	59	34	79	78	74	73	68	63	38	80	78												

DD-500 STANDARD CONSTRUCTION CASING AND DAMPER LEAKAGE

Standard Construction				
Inlet Diameter	Static Pressure " w.g.	Maximum Airflow	Max Casing Leakage	Max Damper Leakage
4	3	300	5	5
5	3	375	5	5
6	3	540	5	5
7	3	760	7	7
8	3	990	9	9
9	3	1250	12	12
10	3	1640	16	16
12	3	2350	22	22
14	3	3250	32	32
16	3	4100	41	41
20	3	6430	64	64
24	3	7270	72	72

PERFORMANCE NOTES

- 1) Leakage testing conducted in accordance with ASHRAE 130-2016
- 2) Per ASHRAE Standard 130-2016 "terminal casing leakage: the amount of the air in ft 3/min (L/s) leaking from the terminal unit at a given inlet pressure with the outlet(s) and inlet(s) blocked and with the damper/valve fully opened"
- 3) Per ASHRAE Standard 130-2016 "terminal damper leakage: the amount of air in ft 3/min (L/s) leaking through a fully closed damper/valve of a supply/exhaust terminal unit at a given inlet pressure"opened"
- 4) Casing and Damper leakage shall not exceed 1% of the maximum rated airflow at 3" w.g.
- 5) 4" and 5" inlets are built with 6" casings

CERTIFICATIONS AND STANDARDS

- Units tested per ASHRAE Standard 130-2016.
- All model sizes certified in accordance with AHRI 880-2017 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A/90B.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.
- Hot water coils are manufactured in accordance to AHRI Standard 410.

DD-500 RECOMMENDED MIN/MAX AIRFLOW RANGES

DD-500 Recommended Minimum and Maximum Airflow Ranges				
Unit Size	Pneumatic		Digital Controls - DDC	
			Transducer Min ΔP / Min	Transducer Max ΔP / Max
	Min CFM	Max CFM	0.01	1
4	50	300	30	300
5	65	375	40	375
6	95	540	55	540
7	130	760	75	760
8	170	990	100	990
9	220	1250	125	1250
10	285	1640	165	1640
12	410	2350	235	2350
14	565	3250	325	3250
16	710	4100	410	4100

PERFORMANCE NOTES

- 1) Actual minimum and maximum airflow ranges depend on the transducer differential pressure range and accuracy.
- 2) Contact the manufacturer of installed DDC equipment for transducer minimum and maximum differential pressure, ΔP , limits.
- 3) Minimum CFM for Pneumatic controls are based on a sensor differential pressure of 0.03 in. w.g.
- 4) Maximum CFM for Pneumatic controls are based on a sensor differential pressure of 1.00 in. wg.
- 5) $CFM = (\sqrt{\Delta P}) * K \text{ Factor}$
- 6) K Factor is the airflow at 1" ΔP
- 7) Recommendations are for pressure independent units.
- 8) Pressure dependent units minimum CFM is always zero and there is no maximum.

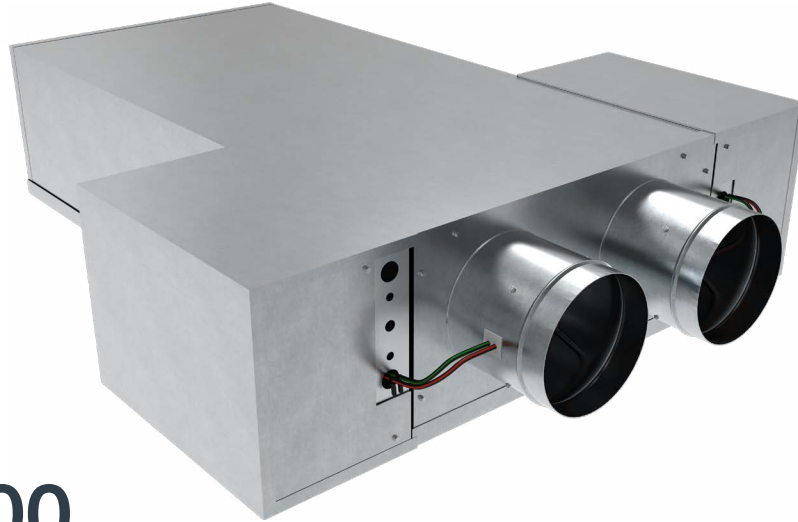


DH-500 HIGH PERFORMANCE DUAL DUCT AIR TERMINAL UNIT

SPECIFIABLE FEATURES

- 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- Damper construction of double layer 18 gauge equivalent with integral blade seal.
- Riveted round primary inlet ducts to minimize leakage.
- Mixing section with 1:30 mixing ratio.
- Integral mixing sound attenuator.

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DH-500 HIGH PERFORMANCE DUAL DUCT AIR TERMINAL UNIT

The METALAIRE DH-500 high performance air terminal units are designed to regulate the flow of conditioned air in dual duct air distribution systems. Both heated and cooled air are provided to the air terminal and mixed in an integral plenum to reach the desired discharge temperature. The DH-500 has been engineered to provide a 1:30 mixing ratio.

STANDARD FEATURES

- ▶ Available in multiple unit sizes to handle 30–5020 CFM.
- ▶ Unequal inlet sizes are available as an option.
- ▶ Variable or constant volume applications.
- ▶ 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- ▶ Mechanically fastened damper assembly is double layer, 18 gauge equivalent, galvanized steel with integral blade seal. (<1% at 3" static pressure).
- ▶ Optional factory calibrated controls per each job requirement.
- ▶ Multi-point center averaging flow sensor for highly accurate (+/-5%) flow readings with varying inlet duct configurations after certified balancer has balanced terminal.
- ▶ External control cabinets for hot and cold deck with offset mounting plate.
- ▶ 3-beaded inlet connection tube for added rigidity and secure flex duct connections.
- ▶ 1/2" thick, dual density (1.5lb / ft³ min.) fiberglass insulation with edges coated. Meets NFPA 90A and UL 181.
- ▶ Rectangular discharge with optional slip and drive cleat duct connection.
- ▶ Independently tested and certified laboratory performance data.
- ▶ Integral mixing box with 1:30 mixing ratio.
- ▶ Full range of liners / insulation available.

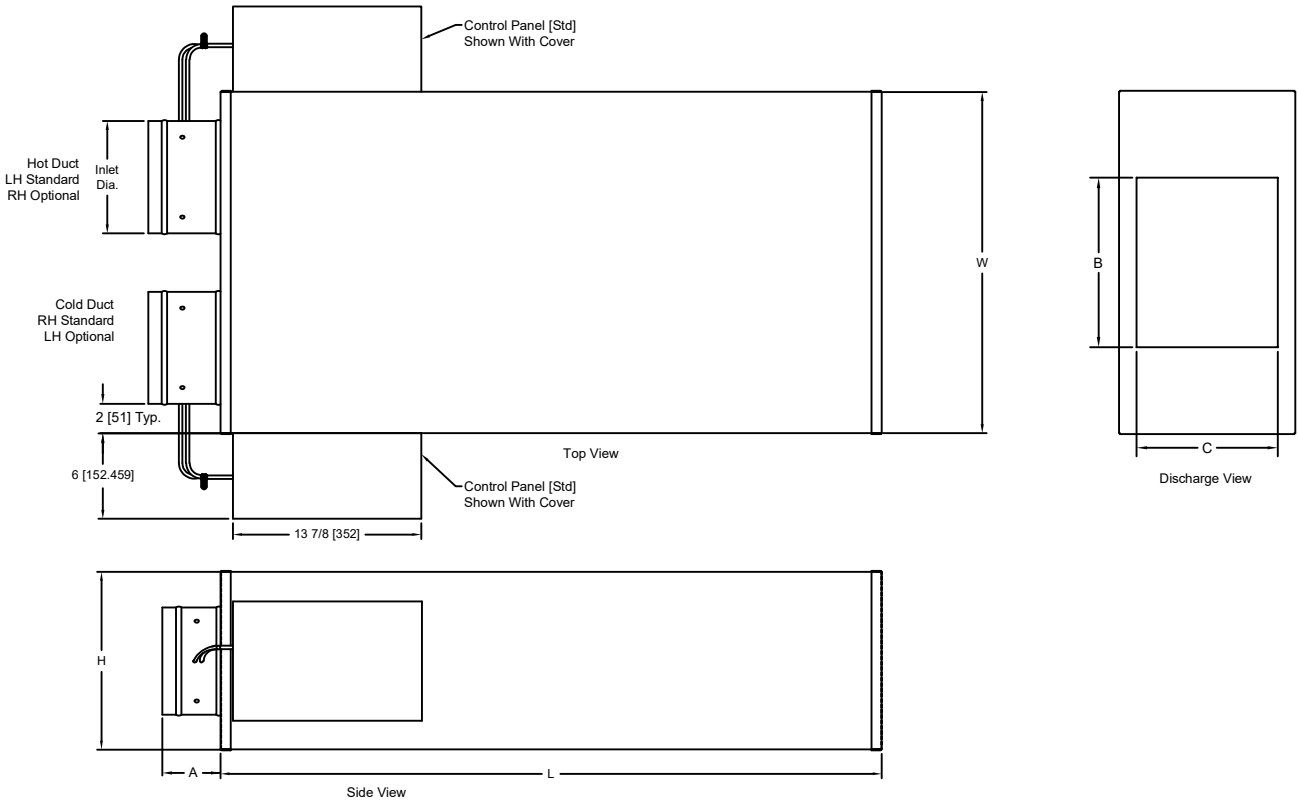


DH-500 HIGH PERFORMANCE DUAL DUCT AIR TERMINAL UNIT

FEATURES AND BENEFITS

- 1** NEMA TYPE 1 rated control enclosures for both hot and cold decks with stand-off to prevent penetration of casing are standard on all terminal units.
- 2** Galvanized steel casing, mechanically sealed for low leakage construction.
- 3** Multi-Point Center Averaging Airflow Sensor.
- 4** Damper rotates in a self-lubricating, long life, low friction thermoplastic bearing.
- 5** Riveted primary inlet duct to minimize leakage with three stiffening beads for added rigidity.
- 6** Integral mixing sound attenuator to help reduce discharge sound.
- 7** DH-500 includes mixing section designed to provide a 1:30 mixing ratio.

DH-500 DUAL DUCT AIR TERMINAL UNIT HIGH EFFICIENCY MIXING



The standard location for control panel is Right Hand on Model DH.
Looking in the direction of airflow, the control panel is on the right.
The control panel will overhang the top and bottom of Models DH504–DH506 1 13 x 16" (46 mm). Control Panel Mounting Surface width by height is 13 7/8" x 9 3/4".

Unit Size	Inlet Diameter		Inlet Duct Length A		Unit Width W		Unit Height H		Unit Length L		Discharge Width B		Discharge Height C		Shipping Weight	
	Standard Both Ducts	Optional Hot Duct	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lbs.	kg
4	4	—	5	254	20	508	10	254	40	1016	12	305	8	203	55	25
5	5	—	5	127	20	508	10	254	40	1016	12	305	8	203	55	25
6	6	—	5	127	20	508	10	254	40	1016	12	305	8	203	55	25
7	7	6	5	127	24	610	12 1/2	318	48	1219	12	305	10	254	72	33
8	8	6	5	127	24	610	12 1/2	318	48	1219	12	305	10	254	72	33
9	9	6,8	5	127	28	711	12 1/2	318	58	1473	14	356	12 1/2	318	94	43
10	10	6,8	5	127	28	711	12 1/2	318	58	1473	14	356	12 1/2	318	94	43
12	12	6,8,10	5	127	32	813	15	381	72	1829	16	406	15	381	124	55
14	14	6,8,10,12	5	127	36	914	17 1/2	445	72	1829	20	508	17 1/2	445	140	64
16	16	6,8,10,12,14	5	127	40	1016	18	457	72	1829	24	610	18	457	164	75

DH-500 AHRI CERTIFIED RATING POINTS



RADIATED SOUND

Power Levels @ 1.5" w.g. ΔPs

Unit Size	CFM	Min Ps	Octave Band					
			2	3	4	5	6	7
4	150	0.05	54	49	38	33	33	25
5	250	0.13	58	51	41	37	35	28
6	400	0.33	62	55	48	44	37	32
7	550	0.26	61	54	43	39	38	32
8	700	0.42	64	57	46	42	41	36
9	900	0.24	66	58	47	42	40	35
10	1100	0.36	68	60	50	45	38	34
12	1600	0.49	68	62	52	49	46	44
14	2100	0.27	68	64	58	52	47	42
16	2800	0.41	72	66	59	52	46	42

DISCHARGE SOUND

Power Levels @ 1.5" w.g. ΔPs

Unit Size	CFM	Min Ps	Octave Band					
			2	3	4	5	6	7
4	150	0.05	71	65	56	48	38	36
5	250	0.13	72	68	58	50	40	36
6	400	0.33	74	69	56	52	43	39
7	550	0.26	74	63	42	39	33	30
8	700	0.42	76	66	45	42	36	34
9	900	0.24	74	66	45	42	38	35
10	1100	0.36	76	68	47	44	40	38
12	1600	0.49	69	54	52	51	47	43
14	2100	0.27	75	68	54	54	54	51
16	2800	0.41	77	66	61	58	54	50

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation

RADIATED SOUND MODEL DH

OCTAVE BAND SOUND POWER, Lw, dB																															
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.							
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	
4	50	0.01	48	43	32	28	28	20	<15	50	45	34	30	30	22	<15	52	48	37	32	32	24	15	60	56	45	40	39	32	25	
	100	0.02	48	43	32	28	28	20	<15	50	45	34	30	30	22	<15	52	48	37	32	32	24	15	60	56	45	40	39	32	25	
	150	0.05	51	44	33	29	29	21	<15	53	46	35	31	31	23	<15	54	49	38	33	33	25	16	62	56	46	41	40	32	25	
	200	0.08	54	45	34	30	30	22	15	56	47	36	32	32	24	18	57	50	38	34	34	26	19	63	57	46	42	40	33	26	
	250	0.13	55	47	36	32	32	24	16	57	49	38	34	34	26	19	58	51	41	37	35	28	20	64	58	49	45	41	34	28	
5	150	0.05	51	44	33	29	29	21	<15	53	46	35	31	31	23	<15	54	49	38	33	33	25	16	62	56	46	41	40	32	25	
	200	0.08	54	45	34	30	30	22	15	56	47	36	32	32	24	18	57	50	38	34	34	26	19	63	57	46	42	40	33	26	
	250	0.13	55	47	36	32	32	24	16	57	49	38	34	34	26	19	58	51	41	37	35	28	20	64	58	49	45	41	34	28	
	300	0.19	56	49	38	41	34	26	18	58	51	40	43	36	28	20	60	53	45	44	36	30	22	66	60	55	49	42	36	30	
	350	0.26	57	50	40	40	34	28	19	60	52	42	42	36	30	22	61	54	46	44	36	31	24	66	60	56	50	42	36	31	
6	200	0.08	54	45	34	30	30	22	15	56	47	36	32	32	24	18	57	50	38	34	34	26	19	63	57	46	42	40	33	26	
	300	0.19	56	49	38	41	34	26	18	58	51	40	43	36	28	20	60	53	45	44	36	30	22	66	60	55	49	42	36	30	
	400	0.33	58	51	41	40	34	29	20	61	54	43	42	36	31	24	62	55	48	44	37	32	25	67	61	58	51	43	37	33	
	500	0.52								63	59	46	45	40	33	29	64	60	51	47	41	34	30	71	66	61	54	47	40	37	
	600	0.61								63	60	47	46	42	35	30	65	61	51	48	42	36	31	71	67	61	55	48	42	38	
7	350	0.11	55	46	35	30	31	23	16	58	50	38	34	34	26	20	60	52	41	36	36	30	22	66	59	49	45	42	40	30	
	450	0.18	56	47	36	31	32	24	18	59	50	40	34	36	28	21	60	53	42	38	37	32	22	66	60	50	45	43	40	30	
	550	0.26	56	49	38	33	24	26	18	60	52	41	36	37	29	22	61	54	43	39	38	32	24	67	61	50	46	44	40	31	
	650	0.36	58	52	40	36	36	28	20	61	54	43	38	39	32	24	63	56	45	41	40	34	26	69	62	52	48	46	42	34	
	750	0.48	61	57	45	40	41	35	26	62	58	46	41	42	35	28	64	58	48	43	42	38	28	70	64	54	50	48	46	35	
8	400	0.15	56	46	36	30	32	24	18	58	50	39	34	35	27	20	60	52	42	37	36	31	22	66	60	50	45	42	40	30	
	550	0.26	56	49	38	33	24	26	18	60	52	41	36	37	29	22	61	54	43	39	38	32	24	67	61	50	46	44	40	31	
	700	0.42	59	53	41	37	37	30	21	62	56	44	40	40	33	25	64	57	46	42	41	36	28	70	63	53	49	47	44	35	
	850	0.61								64	60	48	44	44	38	30	65	61	50	46	45	41	31	72	67	57	52	51	48	38	
	1000	0.84								67	64	53	48	50	43	35	68	64	54	49	50	45	35	74	70	59	55	56	52	41	
9	500	0.08	58	48	37	32	32	24	20	62	52	41	36	36	28	25	64	54	44	40	38	32	28	70	62	52	48	44	42	35	
	700	0.15	59	49	38	33	33	25	21	63	54	43	38	38	30	26	64	56	46	40	39	34	28	70	63	53	48	45	42	35	
	900	0.24	60	51	40	35	35	27	22	64	56	45	40	40	32	28	66	58	47	42	40	35	30	72	65	54	50	46	43	38	
	1100	0.36	62	55	45	39	36	31	25	68	59	50	43	37	33	32	68	60	50	45	38	34	32	74	66	56	52	44	40	40	
	1300	0.51								67	62	50	45	45	39	32	68	63	52	47	46	42	34	75	69	59	54	52	49	41	
10	700	0.15	59	49	38	33	33	25	21	63	54	43	38	38	30	26	64	56	46	40	39	34	28	70	63	53	48	45	42	35	
	900	0.24	60	51	40	35	35	27	22	64	56	45	40	40	32	28	66	58	47	42	40	35	30	72	65	54	50	46	43	38	
	1100	0.36	62	55	45	39	36	31	25	68	59	50	43	37	33	32	68	60	50	45	38	34	32	74	66	56	52	44	40	40	
	1300	0.51								67	62	50	45	45	39	32	68	63	52	47	46	42	34	75	69	59	54	52	49	41	
	1500	0.68								70	66	55	50	51	44	37	72	67	56	52	52	46	38	78	73	62	58	58	54	45	
12	800	0.12	59	47	38	31	32	24	21	63	51	42	35	36	29	26	64	54	45	38	38	33	28	71	61	53	47	44	42	36	
	1200	0.28	62	52	43	36	37	30	25	65	55	46	39	40	35	29	66	57	48	42	40	36	30	73	64	55	49	46	43	39	
	1600	0.49	67	59	48	43	42	36	31	68	61	52	48	46	43	32	68	62	52	49	46	44	32	74	68	58	55	52	49	40	
	2000	0.77								70	64	54	48	48	44	35	72	65	56	50	49	46	38	78	71	62	57	55	53	45	
	2400	0.96								73	67	57	51	52	46	39	74	68	58	52	52	48	40	80	74	64	60	58	56	48	
14	1000	0.06	62	49	42	33	34	27	25	65	52	45	36	37	30	29	66	54	48	40	38	34	30	73	62	56	48	45	44	39	
	1600	0.16	65	54	47	38	39	32	29	67	56	49	40	41	34	31	68	58	51	42	42	37	32	75	65	58	50	47	45	41	
	2100	0.27	67	61	53	46	44	39	31	68	63	57	51	46	41	34	68	64	58	52	47	42	35	74	70	63	57	53	47	41	
	2600	0.42	70	62	53	45	45	41	35	72	65	56	48	48	44	38	74	66	58	50	49	46	40	80	72	65	57	55	54	48	
	3100	0.59								74	68	60	52	52	48	40	76	69	61	53	53	51	42	82	75	67	60	59	58	50	
16	1400	0.10	60	51	46	37	32	26	22	62	53	47	38	34	28	25	64	55	49	40	35	29	28	69	60	56	47	41	35	34	
	2100	0.23	64	57	52	43	38	32	28	66	59	52	44	40	34	30	68	60	54	46	41	36	32	74	66	62	53	46	41	40	
	2800	0.41	68	62	56	49	41	37	32	71	65	57	50	44	40	36	72	66	59	52	46	42	38	78	72	66	59	51	47	45	
	3500	0.64								73	68	60	53	48	44	39	74	70	62	55	50	46	41	80	76	70	62	54	51	49	
	4200	0.92								77	74	66	58	54	50	46	78	74	68	60	55	51	46	84	80	76	68	61	58	54	

DISCHARGE SOUND MODEL DH

OCTAVE BAND SOUND POWER, Lw, dB																														
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
4	50	0.01	64	59	50	42	32	30	20	67	62	53	45	35	33	24	70	64	56	48	38	36	28	77	72	63	55	45	43	36
	100	0.02	64	59	50	42	32	30	20	67	62	53	45	35	33	24	70	64	56	48	38	36	28	77	72	63	55	45	43	36
	150	0.05	65	60	50	42	32	30	21	68	63	54	46	36	34	25	71	65	56	48	38	36	29	78	73	64	56	46	44	38
	200	0.08	66	61	51	43	33	31	22	69	64	54	46	36	34	26	72	66	56	48	38	36	30	79	74	64	56	45	44	39
	250	0.13	67	62	52	44	34	31	24	70	65	55	47	37	34	28	72	68	58	50	40	36	30	80	75	65	57	47	44	40
5	150	0.05	65	60	50	42	32	30	21	68	63	54	46	36	34	25	71	65	56	48	38	36	29	78	73	64	56	46	44	38
	200	0.08	66	61	51	43	33	31	22	69	64	54	46	36	34	26	72	66	56	48	38	36	30	79	74	64	56	45	44	39
	250	0.13	67	62	52	44	34	31	24	70	65	55	47	37	34	28	72	68	58	50	40	36	30	80	75	65	57	47	44	40
	300	0.19	67	62	52	44	35	32	24	71	66	56	48	38	35	25	74	68	58	50	40	38	29	81	76	66	58	48	45	38
	350	0.26	68	62	49	45	37	33	25	66	64	53	48	40	36	22	69	66	56	50	42	38	25	76	74	64	58	49	46	35
6	200	0.08	66	61	51	43	33	31	22	69	64	54	46	36	34	26	72	66	56	48	38	36	30	79	74	64	56	45	44	39
	300	0.19	67	62	52	44	35	32	24	71	66	56	48	38	35	25	74	68	58	50	40	38	29	81	76	66	58	48	45	38
	400	0.33	68	62	49	45	37	33	25	72	67	52	49	41	37	26	74	69	56	52	43	39	29	82	76	64	59	50	46	39
	500	0.52								74	70	60	53	47	43	30	76	72	62	56	50	46	32	84	80	70	63	57	53	41
	600	0.61								75	71	61	54	48	44	31	77	74	64	57	51	47	35	85	81	71	64	58	54	42
7	350	0.11	69	56	36	30	26	22	22	71	58	38	34	30	24	25	72	60	40	36	30	28	26	79	68	48	45	37	38	35
	450	0.18	70	58	36	32	26	22	24	72	60	38	34	30	26	26	73	62	42	38	32	30	28	79	69	49	45	38	38	35
	550	0.26	70	59	38	32	28	24	24	72	61	40	36	32	27	26	74	63	42	39	33	30	29	80	70	50	46	38	38	36
	650	0.36	72	61	40	34	30	26	26	74	64	42	38	34	30	29	75	65	44	41	35	32	30	82	72	51	48	40	40	39
	750	0.48	73	65	43	37	33	30	25	76	66	44	41	36	33	29	77	68	46	43	38	36	30	84	74	54	50	44	44	39
8	400	0.15	70	57	36	31	27	22	24	72	59	38	34	30	25	26	72	61	41	37	31	29	26	79	68	48	45	38	38	35
	550	0.26	70	59	38	32	28	24	24	72	61	40	36	32	27	26	74	63	42	39	33	30	29	80	70	50	46	38	38	36
	700	0.42	72	62	40	36	31	27	24	75	65	43	40	35	31	28	76	66	45	42	36	34	29	83	72	52	49	42	42	38
	850	0.61								77	69	48	44	40	36	30	79	70	49	46	40	39	32	85	76	56	52	46	46	40
	1000	0.84								79	72	51	47	44	40	32	80	73	52	48	45	42	34	87	79	58	55	51	50	42
9	500	0.08	69	58	37	32	30	25	22	71	60	39	35	33	28	25	72	62	42	38	34	32	26	79	70	50	47	41	42	35
	700	0.15	59	49	38	33	33	25	21	72	62	41	37	35	30	24	73	64	44	40	36	34	25	79	71	51	47	42	42	35
	900	0.24	70	61	40	36	34	29	21	73	64	43	39	37	32	25	74	66	45	42	38	35	26	81	73	52	49	43	43	35
	1100	0.36	71	63	43	37	34	31	22	75	67	45	42	39	35	28	76	68	47	44	40	38	29	83	74	54	51	46	46	38
	1300	0.51								76	70	48	44	42	39	29	78	71	50	46	43	42	31	84	77	57	53	49	49	39
10	700	0.15	59	49	38	33	33	25	21	72	62	41	37	35	30	24	73	64	44	40	36	34	25	79	71	51	47	42	42	35
	900	0.24	70	61	40	36	34	29	21	73	64	43	39	37	32	25	74	66	45	42	38	35	26	81	73	52	49	43	43	35
	1100	0.36	71	63	43	37	34	31	22	75	67	45	42	39	35	28	76	68	47	44	40	38	29	83	74	54	51	46	46	38
	1300	0.51								76	70	48	44	42	39	29	78	71	50	46	43	42	31	84	77	57	53	49	49	39
	1500	0.68								79	74	53	49	48	44	34	80	75	54	50	49	46	35	87	81	60	57	55	54	42
12	800	0.12	53	34	34	31	29	23	<15	55	36	36	33	31	25	<15	58	39	39	36	34	28	<15	66	47	47	44	42	36	16
	1200	0.28	58	41	41	38	36	30	<15	60	43	43	40	38	32	<15	63	46	46	43	41	35	<15	71	54	54	51	49	43	22
	1600	0.49	63	48	46	45	41	37	<15	66	51	49	48	44	40	16	69	54	52	51	47	43	20	77	62	60	59	55	51	30
	2000	0.77								69	56	54	52	49	46	20	72	59	57	55	52	49	24	80	67	65	63	60	57	34
	2400	0.96								70	58	57	55	53	49	21	74	62	61	59	56	53	26	83	70	70	68	65	62	38
14	1000	0.06	66	56	42	42	43	37	16	68	58	44	44	45	39	19	70	60	47	46	46	44	21	76	68	55	56	53	53	29
	1600	0.16	68	60	46	46	47	41	19	70	62	48	48	49	43	21	72	64	50	50	50	46	24	78	71	57	58	55	54	31
	2100	0.27	71	65	49	50	50	46	22	73	67	52	52	52	48	25	75	68	54	54	54	51	28	81	75	61	62	59	59	35
	2600	0.42	72	68	52	53	53	50	26	75	71	55	56	56	53	30	76	72	57	58	57	56	31	83	78	64	65	63	63	38
	3100	0.59								77	74	59	60	60	57	34	79	75	60	61	61	59	35	85	81	66	66	67	67	41
16	1400	0.10	67	56	52	42	39	34	18	69	58	54	47	44	39	20	71	60	56	51	48	43	22	75	64	60	59	56	51	28
	2100	0.23	70	59	54	45	40	36	21	72	62	56	50	46	42	24	74	64	58	54	50	46	26	76	68	62	62	58	54	31
	2800	0.41	72	61	56	47	43	39	24	75	64	59	54	50	46	28	77	66	61	58	54	50	30	81	70	65	66	62	58	35
	3500	0.64								77	67	61	56	53	48	30	79	69	63	60	57	52	32	83	73	67	68	65	60	38
	4200	0.92								78	70	62	56	52	48	31	82	74	66	64	60	56	36	86	78	70	72	68	64	41

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

DH-500 RECOMMENDED MIN/MAX AIRFLOW RANGES

DH-500 Recommended Minimum and Maximum Airflow Ranges				
Unit Size	Pneumatic		Digital Controls - DDC	
			Transducer Min ΔP / Min CFM	Transducer Max ΔP / Max CFM
	Min CFM	Max CFM	0.01	1
4	50	300	30	300
5	65	375	40	375
6	95	540	55	540
7	130	760	75	760
8	170	990	100	990
9	220	1250	125	1250
10	285	1640	165	1640
12	410	2350	235	2350
14	565	3250	325	3250
16	710	4100	410	4100

PERFORMANCE NOTES

- 1) Actual minimum and maximum airflow ranges depend on the transducer differential pressure range and accuracy.
- 2) Contact the manufacturer of installed DDC equipment for transducer minimum and maximum differential pressure, ΔP, limits.
- 3) Minimum CFM for Pneumatic controls are based on a sensor differential pressure of 0.03 in. w.g.
- 4) Maximum CFM for Pneumatic controls are based on a sensor differential pressure of 1.00 in. w.g.
- 5) $CFM = (\sqrt{\Delta P}) * K$ Factor
- 6) K Factor is the airflow at 1" ΔP
- 7) Recommendations are for pressure independent units.
- 8) Pressure dependent units minimum CFM is always zero and there is no maximum.

CERTIFICATIONS AND STANDARDS

- Units tested per ASHRAE Standard 130-2016.
- All model sizes certified in accordance with AHRI 880-2017 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A/90B.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.
- Hot water coils are manufactured in accordance to AHRI Standard 410.



Intertek



DS-600 SHORT MIXING DUAL DUCT AIR TERMINAL UNIT

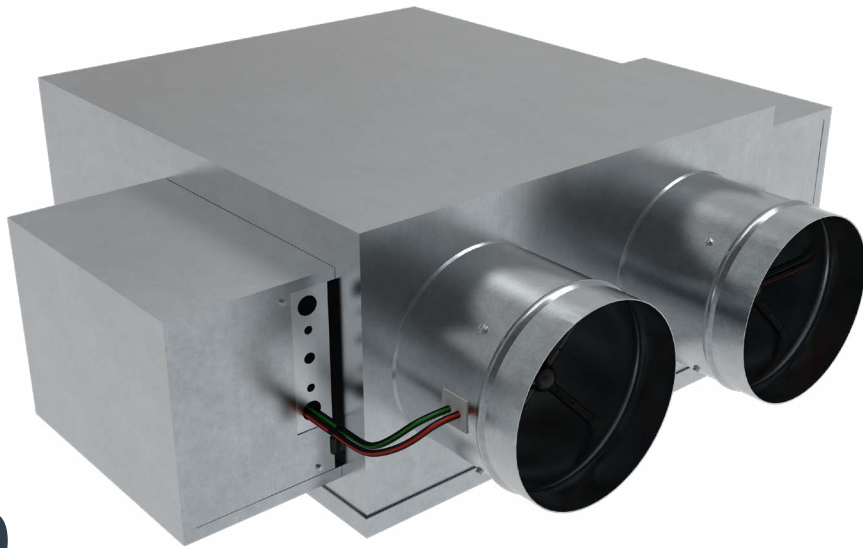
SPECIFIABLE FEATURES

- Designed for limited space applications
- 22 ga. galvanized steel casing, mechanically sealed, low leakage construction
- Damper constructed of double layer 18 ga. equivalent galvanized steel with integral blade seal to provide tight seal (<1% at 3" w.g. static pressure)
- Multi-point center averaging flow sensor in each inlet provides highly accurate (+/-5%) flow readings once a certified balancer has calibrated the sensor
- 3 structural beads machine formed into each inlet connection tube for added rigidity and secure duct connections
- Rectangular discharge for flanged duct connection
- 1:20 mixing ratio

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DS-600 SHORT MIXING DUAL DUCT AIR TERMINAL UNIT

The Metalaire DS-600 Short Mixing Dual Duct Terminals are designed to regulate the flow of conditioned air and/or outside air in air distribution systems. (Both heated and cooled conditioned air are provided to the air terminal and mixed in an integral plenum to reach the desired discharge temperature.) The model DS-600 has been engineered to provide superior mixing at a 1:20 mixing ratio.

STANDARD FEATURES

- ▶ Available in multiple unit sizes to handle 30–5020 CFM.
- ▶ Unequal inlet sizes are available as an option.
- ▶ Variable or constant volume applications.
- ▶ 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- ▶ Damper constructed of double layer 18 ga. equivalent galvanized steel with integral blade seal to provide tight seal (<1% at 3" w.g. static pressure).
- ▶ Multi-point center averaging airflow sensor in each inlet provides highly accurate (+/-5%) flow readings once a certified balancer has calibrated the sensor.
- ▶ External control cabinets for hot and cold deck with offset mounting plate as standard.
- ▶ 3 structural beads machine formed into each inlet connection tube for added rigidity and secure duct connections.
- ▶ ½" thick, dual density (1.5 lb. min.) fiberglass insulation with edges coated. Meets NFPA 90A and UL 181.
- ▶ Rectangular discharge for flanged duct connection.
- ▶ Independently tested and certified laboratory performance data.
- ▶ Full range of options and accessories available.
- ▶ Full range of optional liners/insulation available.

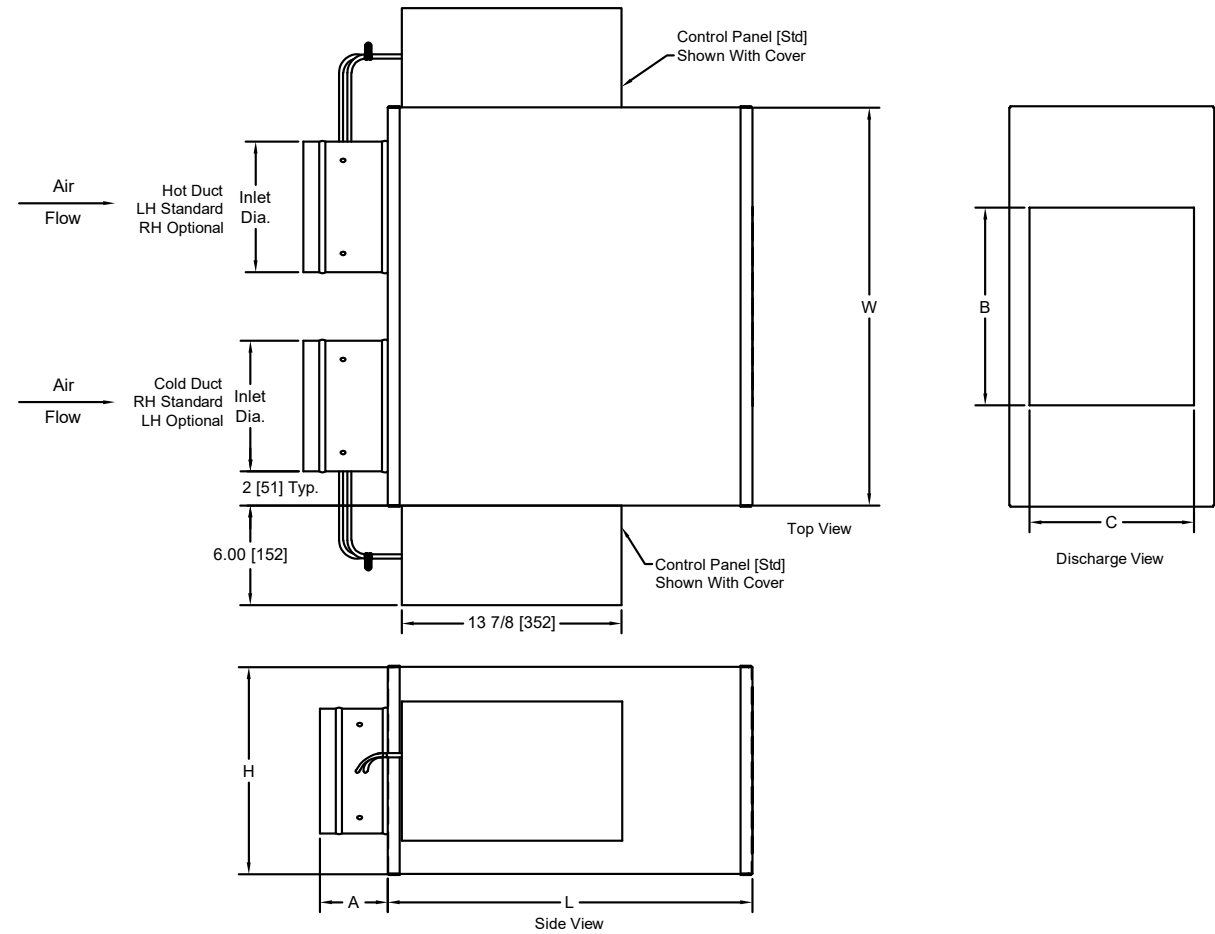


DS-600 SHORT MIXING DUAL DUCT AIR TERMINAL UNIT

FEATURES AND BENEFITS

- 1** NEMA TYPE 1 rated control enclosures for both hot and cold decks with stand-off to prevent penetration of casing.
- 2** Galvanized steel casing, mechanically sealed for low leakage construction.
- 3** Multi-Point Center Averaging Airflow Sensor.
- 4** Damper rotates in a self-lubricating, long life, low friction thermoplastic bearing.
- 5** Riveted primary inlet duct to minimize leakage with three stiffening beads for added rigidity.
- 6** Integral mixing sound attenuator to help reduce discharge sound.
- 7** DS-600 includes a 1:20 mixing ratio.

DS-600 SHORT MIXING DUAL DUCT AIR TERMINAL UNIT



The standard location for control panel is Right Hand on Model DS. Looking in the direction of airflow, the control panel is on the right.

Unit Size	Inlet Diameter		Max CFM	Inlet Duct Length A		Unit Width W		Unit Height H		Unit Length L		Discharge Width B		Discharge Height C		Shipping Weight	
	Standard Both Ducts	Optional Hot Duct		in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	lbs.	kg
4	4	—	300	5	127	20	508	10	254	22	559	8	203	6	152	30	14
5	5	—	375	5	127	20	508	10	254	22	559	8	203	6	152	30	14
6	6	—	540	5	127	20	508	10	254	22	559	8	203	6	152	30	14
7	7	6	760	5	127	24	610	12 1/2	318	26	660	10	254	8	203	41	19
8	8	6	990	5	127	24	610	12 1/2	318	26	660	10	254	8	203	41	19
9	9	6,8	1250	5	127	28	711	12 1/2	318	30	762	12	305	10	254	50	23
10	10	6,8	1640	5	127	28	711	12 1/2	318	30	762	12	305	10	254	50	23
12	12	6,8,10	2350	5	127	32	813	15	381	34	864	14	356	12	305	62	28
14	14	6,8,10,12	3250	5	127	36	914	17 1/2	445	38	965	17	432	14	356	84	38
16	16	6,8,10,12,14	4100	5	127	40	1016	18	457	42	1067	20	508	15	381	100	45

DS-600 AHRI CERTIFIED RATING POINTS



RADIATED SOUND

Power Levels @ 1.5" w.g. ΔPs

Unit Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
4	150	0.09	59	53	47	47	36	32
5	250	0.20	60	54	47	47	38	35
6	400	0.45	62	54	47	47	40	38
7	550	0.47	63	54	47	47	43	42
8	700	0.49	64	54	47	47	45	45
9	900	0.49	66	59	50	50	45	44
10	1100	0.50	68	63	52	52	45	42
12	1600	0.50	68	63	52	52	45	42
14	2100	0.43	68	62	54	55	48	47
16	2800	0.58	70	63	55	55	48	47

DISCHARGE SOUND

Power Levels @ 1.5" w.g. ΔPs

Unit Size	CFM	Min ΔPs	Octave Band					
			2	3	4	5	6	7
4	150	0.09	70	66	58	57	48	45
5	250	0.20	73	67	59	58	49	46
6	400	0.45	77	68	60	59	50	47
7	550	0.47	77	70	61	61	52	49
8	700	0.49	78	71	62	62	53	50
9	900	0.49	79	72	63	62	55	51
10	1100	0.50	79	72	63	62	56	52
12	1600	0.50	80	72	64	63	57	54
14	2100	0.43	80	73	64	64	58	57
16	2800	0.58	81	73	66	66	59	57

PERFORMANCE NOTES

- 1) Radiated sound is the noise transmitted through the unit casing
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017
- 7) Sound performance based on units lined with standard dual density fiberglass insulation

RADIATED SOUND MODEL DS

OCTAVE BAND SOUND POWER, Lw, dB																														
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
4	50	0.03	50	41	37	40	30	27	<15	51	43	34	34	31	29	<15	51	46	37	37	32	31	<15	52	49	45	45	41	41	19
	100	0.06	53	43	38	39	28	24	<15	54	47	41	41	36	32	<15	56	52	39	41	33	31	20	59	59	48	48	43	43	28
	150	0.09	58	48	43	44	36	30	20	57	47	42	42	34	27	<15	59	53	47	47	36	32	21	60	61	50	52	43	44	31
	200	0.12								63	51	46	46	37	30	22	67	57	50	52	41	37	31	65	63	53	56	45	45	33
	250	0.20								68	55	53	54	43	38	29	70	59	55	55	45	38	35	70	65	57	60	48	46	35
5	150	0.09	51	42	37	39	31	28	<15	52	44	36	36	33	32	<15	52	47	40	40	36	36	<15	54	50	46	46	43	44	20
	200	0.12	54	44	39	39	29	25	<15	55	48	42	42	37	33	<15	57	52	41	42	36	34	20	60	58	49	49	44	44	27
	250	0.20	59	49	43	44	36	30	21	58	48	43	43	36	30	16	60	54	47	47	38	35	22	62	61	51	53	44	45	31
	300	0.28								64	52	47	47	38	32	23	67	57	50	52	42	38	31	66	63	54	56	46	46	33
	350	0.37								69	56	53	54	44	39	30	70	59	55	55	46	39	35	71	66	57	60	48	47	37
6	200	0.12	51	42	37	38	31	29	<15	52	44	37	37	34	33	<15	52	47	41	41	38	38	15	55	51	47	47	44	45	21
	300	0.28	55	45	39	39	31	27	16	57	49	42	42	37	34	18	58	52	43	44	39	38	20	61	58	50	50	45	46	27
	400	0.45	60	49	43	43	35	30	22	60	50	44	44	38	34	22	62	54	47	47	40	38	25	64	61	52	53	45	47	31
	500	0.74								65	54	48	48	41	37	29	67	57	50	51	44	41	31	69	64	55	56	47	48	34
	600	1.00								70	58	53	53	45	41	35	70	60	54	54	47	43	35	74	67	58	59	49	49	40
7	350	0.16	53	44	37	37	33	31	<15	53	46	40	40	37	38	<15	54	48	45	45	44	45	19	58	53	49	49	47	49	23
	450	0.28	56	47	40	39	33	29	17	59	50	43	43	38	36	21	60	52	46	46	43	43	22	63	57	52	51	46	48	26
	550	0.47	61	50	43	43	35	30	23	62	52	45	45	41	38	25	63	54	47	47	43	42	26	67	61	54	54	47	49	31
	650	0.68								66	56	49	49	43	40	30	67	57	50	51	45	43	31	71	64	56	56	48	50	36
	750	0.90								71	59	53	53	46	43	36	70	60	54	54	48	45	35	76	68	58	59	49	51	42
8	400	0.17	53	44	37	36	33	32	<15	53	46	41	41	38	39	<15	54	48	46	46	46	47	20	59	54	50	50	48	50	24
	550	0.29	57	48	40	39	35	31	18	61	51	43	43	38	37	23	61	52	48	48	46	47	23	64	57	53	52	47	50	27
	700	0.49	62	50	43	42	34	30	25	64	54	46	46	43	42	27	64	54	47	47	45	45	27	69	61	55	54	48	51	34
	850	0.61								67	58	50	50	46	45	31	67	57	50	50	47	46	31	74	65	57	56	49	52	40
	1000	0.73								72	61	53	52	47	45	38	70	61	53	53	49	49	35	79	69	59	58	50	53	46
9	500	0.19	54	46	38	38	35	32	<15	55	48	42	42	39	39	16	56	50	46	47	45	46	20	61	56	52	52	47	50	26
	700	0.28	58	50	41	41	36	31	20	61	54	45	44	39	37	23	63	55	49	48	45	45	26	66	60	54	53	47	51	30
	900	0.49	63	53	45	44	36	30	26	65	58	48	48	43	41	29	66	59	50	50	45	44	30	70	64	56	55	48	52	35
	1100	0.62								68	60	52	52	44	42	32	69	62	53	53	47	44	34	73	68	58	57	48	53	39
	1300	0.81								73	64	55	54	47	43	39	72	65	56	55	48	46	38	77	73	59	58	49	53	45
10	700	0.23	56	50	40	42	39	31	18	58	53	44	44	40	39	21	59	55	47	48	43	43	24	65	60	55	55	46	50	30
	900	0.27	60	53	43	43	37	30	22	62	58	47	46	41	37	27	65	60	50	49	44	43	29	69	63	56	55	48	53	34
	1100	0.50	64	56	46	46	37	29	27	66	61	50	50	43	39	31	68	63	52	52	45	42	33	71	67	57	56	48	53	38
	1300	0.62								69	62	53	53	43	39	34	71	66	55	55	47	43	37	73	71	58	57	48	53	42
	1500	0.86								73	66	56	55	47	42	39	74	68	58	57	48	44	40	75	75	59	58	48	53	47
12	800	0.12	50	48	41	41	34	30	15	58	53	44	44	40	39	21	59	55	47	48	43	43	24	65	60	55	55	46	50	30
	1200	0.26	56	53	46	46	37	30	21	62	58	47	46	41	37	27	65	60	50	49	44	43	29	69	63	56	55	48	53	34
	1600	0.50	62	58	50	50	39	33	27	66	61	50	50	43	39	31	68	63	52	52	45	42	33	71	67	57	56	48	53	38
	2000	0.69								69	62	53	53	43	39	34	71	66	55	55	47	43	37	73	71	58	57	48	53	42
	2400	1.02								73	66	56	55	47	42	39	74	68	58	57	48	44	40	75	75	59	58	48	53	47
14	1000	0.02	52	44	39	40	35	31	<15	54	50	44	45	42	41	18	55	52	48	49	47	47	22	62	59	57	57	54	55	32
	1600	0.24	58	52	46	46	39	35	20	62	57	49	50	45	44	26	61	57	51	52	48	48	26	69	64	59	61	56	59	34
	2100	0.43	63	57	50	50	42	39	26	67	61	53	54	48	46	31	68	62	54	55	48	47	33	75	68	61	64	58	62	41
	2600	0.67								69	64	58	59	50	47	34	72	66	58	59	50	49	38	81	72	62	68	59	66	49
	3100	0.81								71	67	63	64	52	48	38	76	70	62	63	52	51	43	87	77	64	71	61	69	55
16	1400	0.14	53	47	41	41	34	33	<15	56	52	45	46	41	43	20	58	55	48	49	43	44	24	65	61	56	57	50	52	31
	2100	0.34	59	52	45	45	38	34	21	63	57	49	49	42	42	26	66	60	52	53	46	46	30	72	66	61	62	55	55	38
	2800	0.58	64	56	50	50	41	35	27	68	62	53	53	45	43	32	70	63	55	55	48	47	35	76	66	61	61	57	59	43
	3500	0.82								73	67	57	57	48	44	39	74	66	58	57	50	48	40	80	66	61	60	59	63	48
	4200	1.05								78	72	61	61	51	45	45	78	69	61	59	52	49	45	84	66	61	59	61	67	53

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Radiated sound is the noise transmitted through the unit casing
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the minimum operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge

- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017
- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation

DISCHARGE SOUND MODEL DS

OCTAVE BAND SOUND POWER, Lw, dB																														
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
4	50	0.03	60	49	43	44	33	29	<15	63	56	48	47	36	34	18	64	55	48	47	39	35	20	66	60	50	49	47	43	22
	100	0.06	68	57	51	52	38	30	25	69	60	52	53	43	38	26	71	64	52	53	43	41	29	71	70	56	57	48	47	31
	150	0.09	67	60	52	52	43	38	23	68	55	52	52	39	32	25	70	66	58	57	48	45	27	78	74	62	63	52	51	38
	200	0.12								70	59	52	52	43	37	27	82	68	63	63	53	50	43	86	78	68	69	54	53	48
	250	0.20								81	70	63	64	53	48	41	80	68	61	61	51	48	40	93	81	73	74	56	56	57
5	150	0.09	61	51	44	45	34	30	<15	65	57	49	48	39	36	21	65	57	50	49	41	38	21	68	62	53	52	48	46	25
	200	0.12	69	58	52	52	39	33	22	70	61	53	53	44	39	27	71	64	54	54	45	43	29	73	70	57	58	49	48	31
	250	0.20	69	61	53	53	44	39	25	70	58	53	53	41	35	27	73	67	59	58	49	46	31	79	74	63	64	53	52	39
	300	0.28								72	61	54	54	45	39	26	82	69	63	63	53	50	39	86	78	68	69	55	54	44
	350	0.37								82	71	64	64	54	49	39	81	69	62	62	52	49	38	93	81	73	74	57	57	53
6	200	0.12	62	52	45	45	35	30	17	66	58	50	49	40	37	22	66	58	51	50	42	39	22	69	63	54	53	48	47	22
	300	0.28	69	59	52	52	41	35	22	71	62	54	54	45	40	25	72	65	55	55	46	44	26	74	70	59	59	50	50	29
	400	0.45	71	62	54	54	45	40	25	72	61	55	55	44	38	26	77	68	60	59	50	47	32	80	74	64	64	53	53	40
	500	0.74								75	65	57	57	48	43	30	82	71	64	64	54	51	39	86	78	69	69	56	56	44
	600	1.00								83	73	65	65	55	51	40	83	72	64	64	54	51	40	92	82	74	74	59	59	52
7	350	0.16	64	55	47	47	37	31	16	69	60	52	51	44	40	22	68	61	54	53	45	44	21	72	66	59	58	50	51	26
	450	0.28	70	60	53	52	43	39	23	73	64	55	55	47	42	26	73	66	57	57	48	46	27	76	70	61	61	51	52	31
	550	0.47	74	64	56	56	47	41	29	75	65	57	57	47	42	29	77	70	61	61	52	49	32	81	74	65	65	54	55	38
	650	0.68								78	68	60	59	50	46	34	82	72	64	64	55	52	39	86	78	70	69	57	57	44
	750	0.90								84	74	66	65	56	52	39	84	74	66	66	56	53	40	92	82	74	74	60	60	49
8	400	0.17	65	56	48	47	38	31	17	70	61	53	52	45	41	23	69	62	55	54	46	45	22	73	67	60	59	50	52	27
	550	0.29	70	61	53	52	45	41	23	74	65	56	56	48	43	29	74	67	59	58	50	48	29	78	71	63	62	52	54	34
	700	0.49	76	65	57	57	48	42	31	77	68	59	59	50	45	32	78	71	62	62	53	50	34	82	74	66	65	54	56	39
	850	0.61								81	72	63	63	54	50	35	82	74	65	65	56	53	36	87	79	71	70	58	59	41
	1000	0.73								85	76	67	66	57	54	40	86	77	68	68	58	55	41	91	83	75	74	62	62	48
9	500	0.19	66	57	49	48	39	33	18	70	62	54	53	46	43	23	70	63	55	54	46	45	23	74	68	61	60	51	52	29
	700	0.28	73	64	55	55	48	44	25	74	66	58	57	49	45	29	74	67	59	58	50	48	29	78	71	64	63	54	55	34
	900	0.49	81	72	64	63	55	51	29	78	69	61	61	53	48	31	79	72	63	62	55	51	31	82	75	67	66	56	57	36
	1100	0.62								81	73	64	64	55	51	35	82	75	66	66	57	54	36	86	79	71	70	60	60	41
	1300	0.81								84	76	67	67	58	55	39	86	78	69	69	60	57	41	90	83	74	74	64	64	47
10	700	0.23	68	58	50	49	42	37	23	71	64	57	56	48	46	25	72	64	54	54	47	44	26	75	69	63	63	53	53	30
	900	0.27	77	67	59	58	52	47	32	75	67	60	59	52	48	27	76	68	59	58	52	48	29	79	72	65	65	56	56	31
	1100	0.50	86	79	70	70	62	59	42	79	70	62	62	55	50	32	79	72	63	62	56	52	32	82	75	67	66	58	58	36
	1300	0.62								82	73	65	65	57	53	39	83	76	67	66	59	56	39	86	79	71	70	62	62	44
	1500	0.86								84	76	67	67	59	56	39	86	79	70	70	62	59	41	90	83	74	74	65	65	46
12	800	0.12	63	55	48	47	42	36	<15	66	59	54	52	46	44	16	68	62	57	56	48	47	19	71	66	64	62	52	54	24
	1200	0.26	70	61	54	53	47	42	21	73	65	59	58	51	48	32	74	67	61	60	53	51	26	78	72	66	65	55	58	31
	1600	0.50	76	67	60	59	52	48	29	79	71	63	63	56	52	32	80	72	64	63	57	54	34	84	77	68	67	58	61	39
	2000	0.69								83	75	68	67	60	56	38	84	76	69	68	61	58	39	91	83	70	70	61	65	46
	2400	1.02								87	79	72	71	63	60	43	88	80	73	72	64	61	44	97	88	72	72	64	68	53
14	1000	0.02	61	52	46	46	39	34	<15	66	58	52	52	44	41	16	68	62	56	56	47	45	19	72	67	65	64	53	54	25
	1600	0.24	70	60	53	53	47	43	21	74	65	57	57	51	47	26	75	68	60	60	53	52	27	80	73	66	66	57	58	34
	2100	0.43	77	67	59	59	54	50	30	80	70	62	62	57	52	34	80	73	64	64	58	57	34	86	77	68	67	61	61	42
	2600	0.67								83	74	66	66	60	56	36	84	76	67	67	61	59	39	93	82	70	69	65	64	50
	3100	0.81								85	77	69	69	62	60	40	87	79	70	70	63	60	43	99	87	71	70	68	68	58
16	1400	0.14	68	58	52	52	46	39	18	70	62	55	55	49	45	21	71	64	59	59	51	49	22	75	70	66	67	55	55	28
	2100	0.34	75	65	58	59	53	47	27	78	68	61	61	56	51	31	80	70	63	63	57	54	34	82	74	67	67	60	58	36
	2800	0.58	76	65	58	59	54	48	29	81	72	64	65	58	54	35	81	73	66	66	59	57	35	89	78	68	67	65	61	45
	3500	0.82								84	76	67	69	60	57	39	82	76	69	69	61	60	36	96	82	69	67	70	64	54
	4200	1.05								87	80	70	73	62	60	43	83	79	72	72	63	63	39	103	86	70	67	75	67	63

- 1) AHRI certified data is highlighted while all other data are application ratings
- 2) Discharge sound is noise emitted from unit discharge into downstream ductwork
- 3) Sound power levels expressed in decibels, (dB) re 10⁻¹² Watts
- 4) Min ΔPs is the min. operating pressure requirement of the unit with the damper full open and is the static pressure drop from the unit inlet to the unit discharge
- 5) Performance data based on laboratory tests conducted in accordance with ASHRAE 130-2016 and AHRI 880-2017

- 6) NC values are calculated using attenuation credits outlined in AHRI 885-2008 Appendix E
- 7) Blank spaces indicate Minimum Ps if unit exceeds the ΔPs across the unit
- 8) Sound performance based on units lined with standard dual density fiberglass insulation
- 9) Discharge sound power levels include duct end reflection corrections per AHRI Standard 880-2017

DS-600 RECOMMENDED MIN/MAX AIRFLOW RANGES

DS-600 Recommended Minimum and Maximum Airflow Ranges				
Unit Size	Pneumatic		Digital Controls - DDC	
			Transducer Min ΔP / Min CFM	Transducer Max ΔP / Max CFM
	Min CFM	Max CFM	0.01	1
4	50	300	30	300
5	65	375	40	375
6	95	540	55	540
7	130	760	75	760
8	170	990	100	990
9	220	1250	125	1250
10	285	1640	165	1640
12	410	2350	235	2350
14	565	3250	325	3250
16	710	4100	410	4100

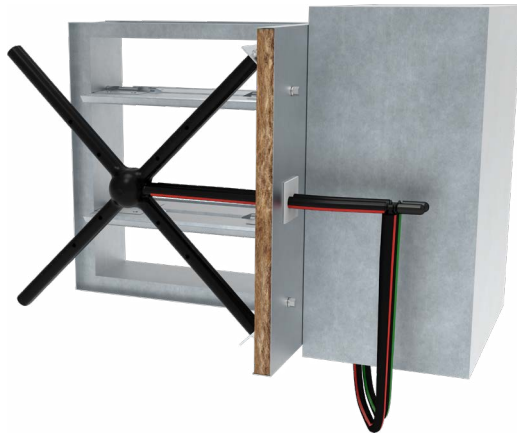
PERFORMANCE NOTES

- 1) Actual minimum and maximum airflow ranges depend on the transducer differential pressure range and accuracy.
- 2) Contact the manufacturer of installed DDC equipment for transducer minimum and maximum differential pressure, ΔP , limits.
- 3) Minimum CFM for Pneumatic controls are based on a sensor differential pressure of 0.03 in. w.g.
- 4) Maximum CFM for Pneumatic controls are based on a sensor differential pressure of 1.00 in. w.g.
- 5) $CFM = (\sqrt{\Delta P}) * K \text{ Factor}$
- 6) K Factor is the airflow at 1" ΔP
- 7) Recommendations are for pressure independent units.
- 8) Pressure dependent units minimum CFM is always zero and there is no maximum.

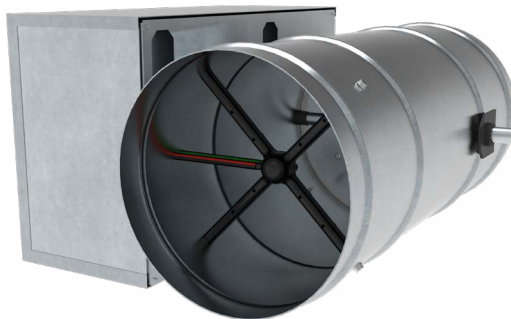
CERTIFICATIONS AND STANDARDS

- Units tested per ANSI / ASHRAE Standard 130.
- All model sizes certified in accordance with AHRI 880 certification program.
- ETL listed to meet requirements of UL 60335 and CSA C22.2.
- Dual-density fiberglass insulation meets UL 181 and NFPA 90A requirements.
- Insulation meets ASHRAE 62.1 requirements for resistance to mold growth and erosion.

RETROFIT AIR TERMINAL UNITS



**SR-500
SQUARE RETROFIT
AIR TERMINAL**
PAGES SR1 - SR5



**RT-500
ROUND RETROFIT
AIR TERMINAL**
PAGES RT1 - RT5



**RA-500
CUSTOMIZED RETROFIT
AIR TERMINAL UNIT**
PAGES RA1 - RA8



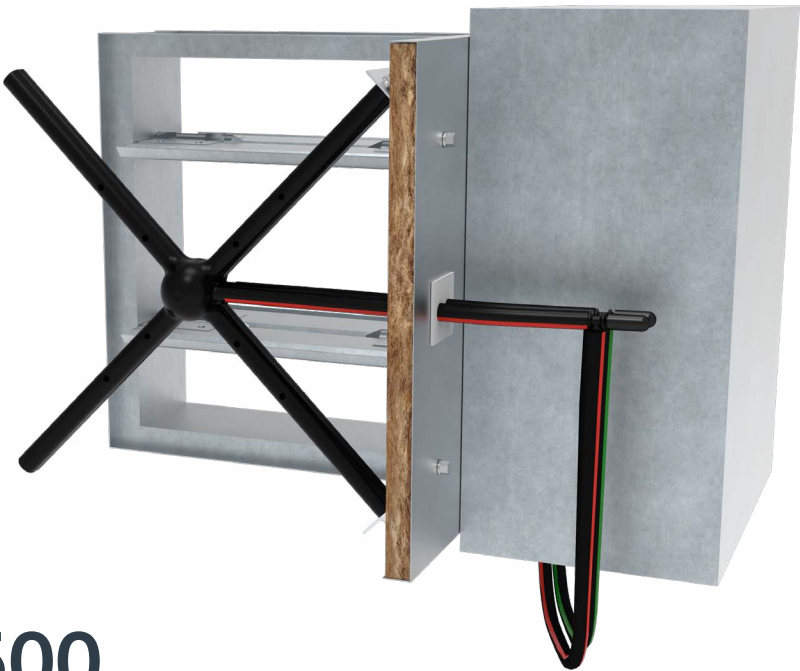
RETROFIT AIR TERMINAL UNITS

METALAIRE's series of retrofit terminal units enable the conversion of existing constant volume systems to more energy efficient variable air volume (VAV) systems. By converting to a VAV system, owners can take advantage of the inherent diversity of their buildings. This diversity allows the reduction of total system air volume which reduces central fan energy and refrigeration energy. In existing dual duct and reheat systems, wasted energy can be saved by conversion to VAV.

The primary function of the METALAIRE series of retrofit terminal unit is to regulate the flow of conditioned air into an occupied zone in response to a control signal. Retrofit terminals are available with a wide range of control options to suit any application. These include pneumatic and direct digital control (DDC). METALAIRE retrofit terminals can be applied in constant volume single duct, dual duct, and multi-zone systems.

With the demands of today's building designs to reduce energy in smaller mechanical spaces with little downtime, the METALAIRE retrofit terminal unit is the perfect choice.

Retrofit units are not certified by AHRI and do not currently fall in the scope of the AHRI Standard 880 Certification program.

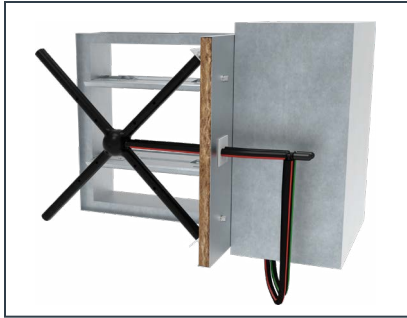


SR-500 SQUARE RETROFIT AIR TERMINAL UNIT

SPECIFIABLE FEATURES

- ▶ Minimum 20 gauge galvanized steel frame and opposed damper blades
- ▶ Standard 20 gauge control mounting panel and cover
- ▶ Available in sizes 10"W x 6"H to 36"W x 24"H (1" increments) handling capacities from 100 CFM – 18,000 CFM
- ▶ Available with optional factory provided pneumatic or DDC controls

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SR-502B



SR-502D



SR-502EX

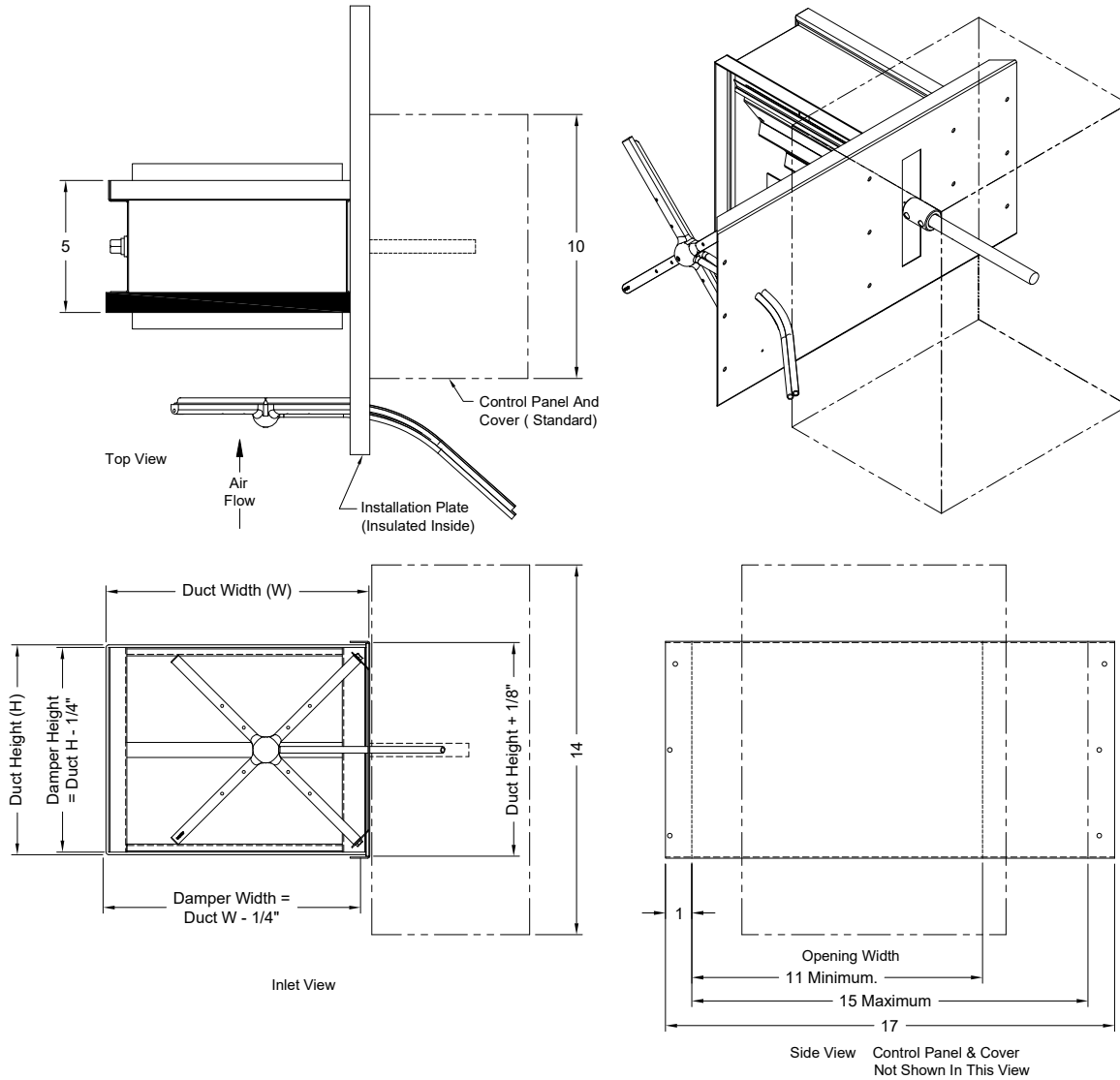
SR-500 SQUARE RETROFIT AIR TERMINAL UNITS

The METALAIRE series SR-500 products are designed to fit into existing low pressure square or rectangular duct systems. The SR-500 is available in three versions: Model 502B is a slip-in unit for existing ductwork. Model 502D is designed for use in 24" duct sections as a basic VAV terminal. Model 502EX is a 46" exhaust unit with inlet sound attenuator and flow sensor.

STANDARD FEATURES

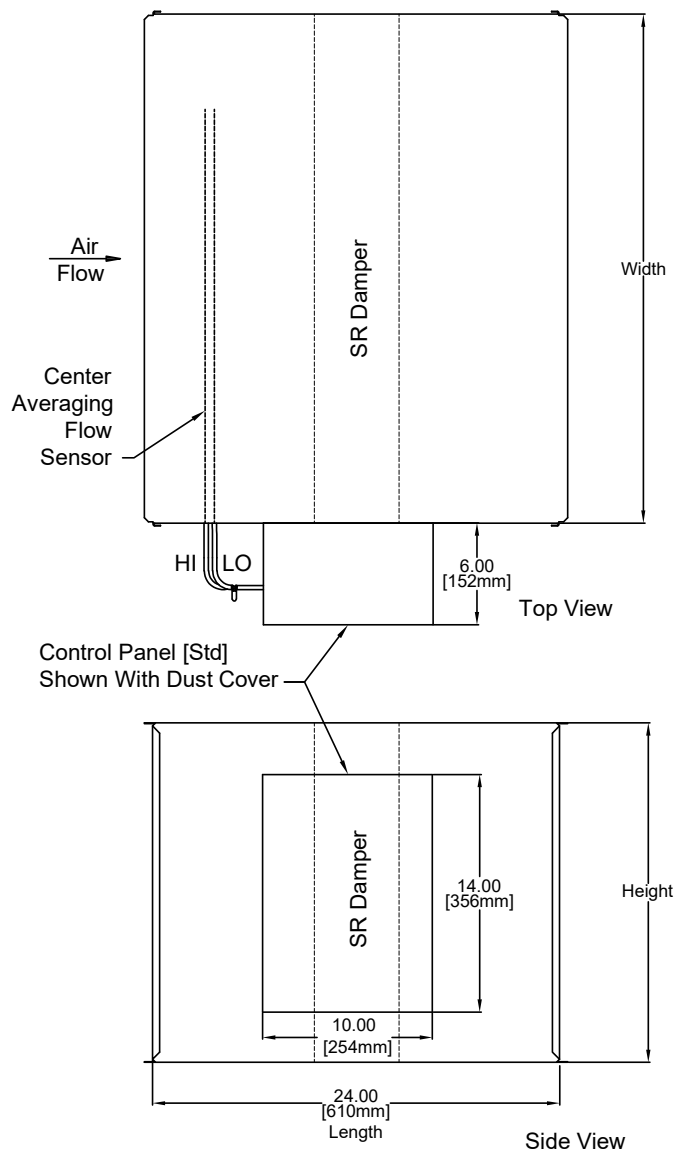
- SR-500 is available in multiple sizes up to 24" x 36" to handle 100–18,000 CFM.
- Minimum 20 ga. galvanized steel casing.
- Galvanized steel damper with minimum 20 ga. 3V style opposed blades.
- Optional blade seals and jamb seals available.
- Optional factory calibrated controls per each job requirement.
- Multi-point center averaging airflow sensor for highly accurate (+/-5%) flow readings with varying inlet duct configurations after certified balancer has balanced terminal.
- External control cabinet with offset mounting plate as standard.

SR-500 SQUARE RETROFIT



1. $X = \text{Nominal duct height} + 1/2$ (8" Minimum)
2. Installation plate material – 20 ga. steel
3. Dampers available in 1" increments between minimum / maximum limits.
4. When ordering, specify nominal duct width (W) first, then height (H).
Example: Series SR-500 20" x 12" = 20" wide x 12" high unit.

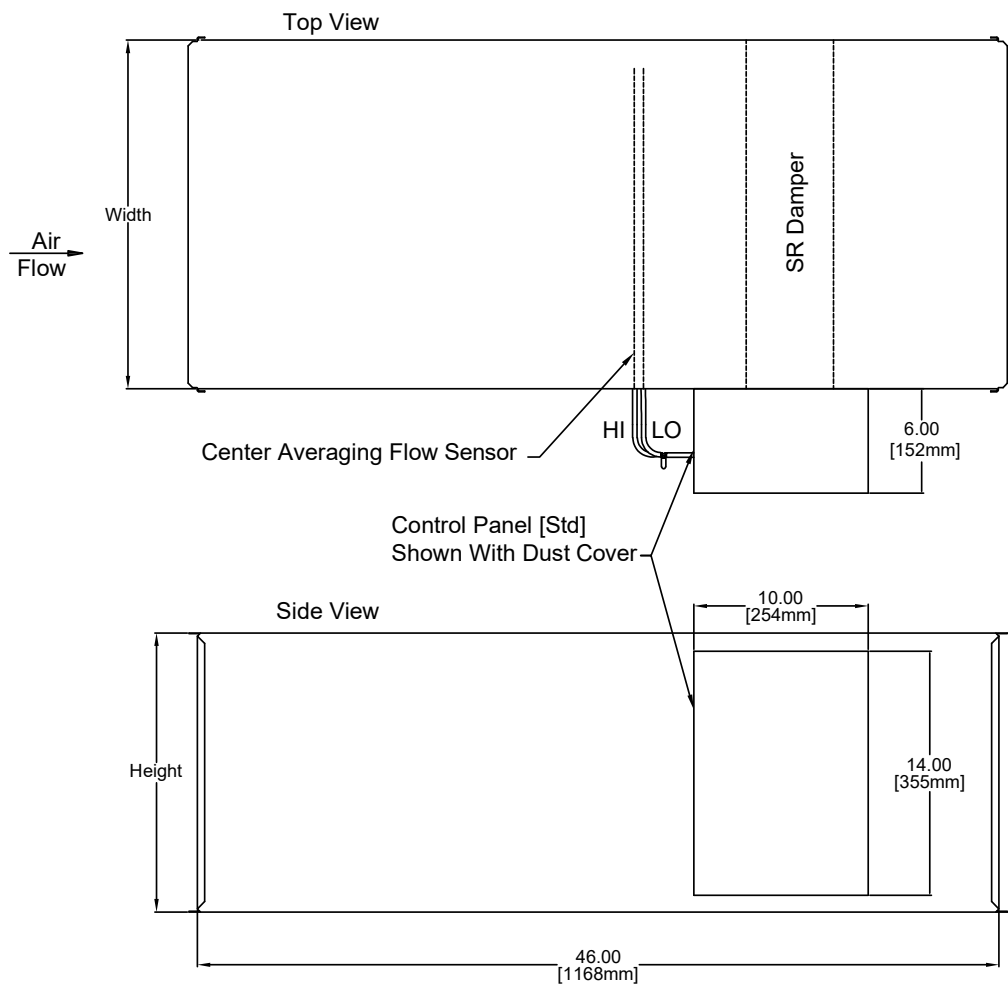
SR-502-D RECTANGULAR RETROFIT



The standard location for control panel is Right Hand on Model SR-502-D. Looking in the direction of airflow, the control panel is on the right.

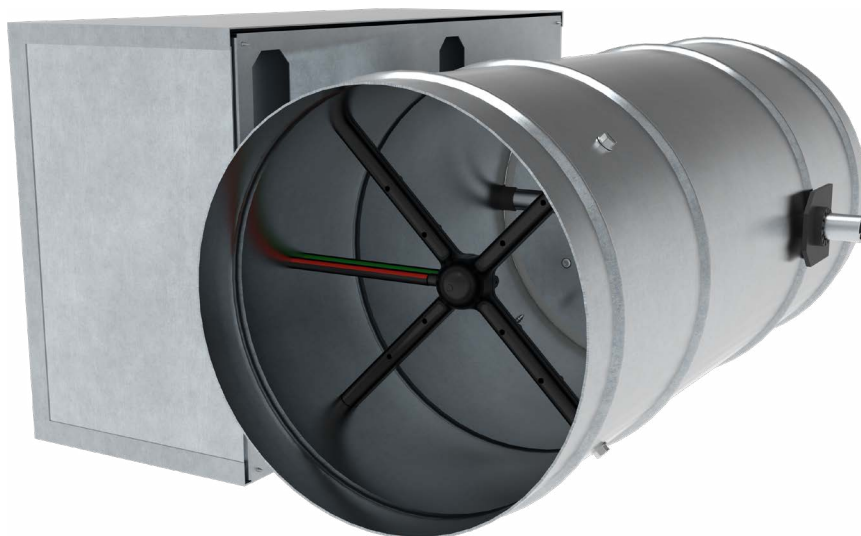
Width		Height	
Min	Max.	Min.	Max.
6" (152)	36" (914)	6" (152)	24" (610)

SR-502-EX SQUARE RETROFIT WITH INLET SOUND ATTENUATOR
FOR EXHAUST APPLICATIONS



Width		Height	
Min.	Max.	Min.	Max.
6" (152)	36" (914)	6" (152)	24" (610)

The standard location for control panel is
Right Hand on Square Retrofit Air Terminal.
Looking in the direction of airflow,
the control panel is on the right.



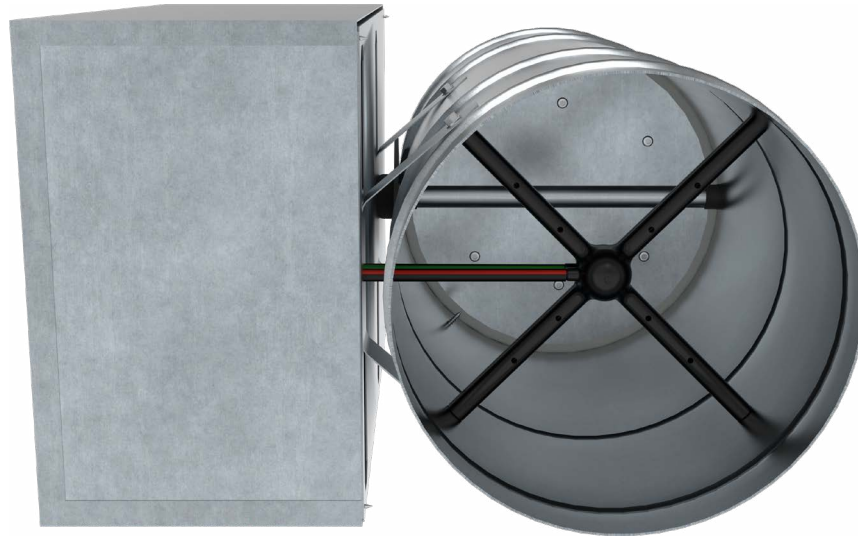
RT-500 ROUND RETROFIT AIR TERMINAL UNIT

SPECIFIABLE FEATURES

- 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- Readily installed into existing ductwork with minimal ductwork modifications.
- 3-beaded inlet connection tube for added rigidity and secure flex duct connections.
- Available with optional factory provided pneumatic or DDC controls.
- Externally accessible balancing taps.
- 20 ga. control mounting plate and enclosure are standard.

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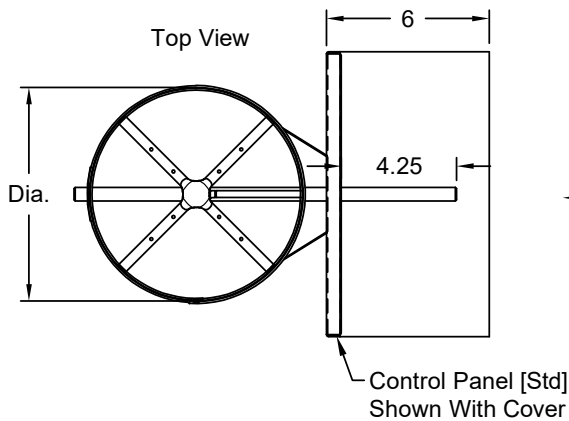
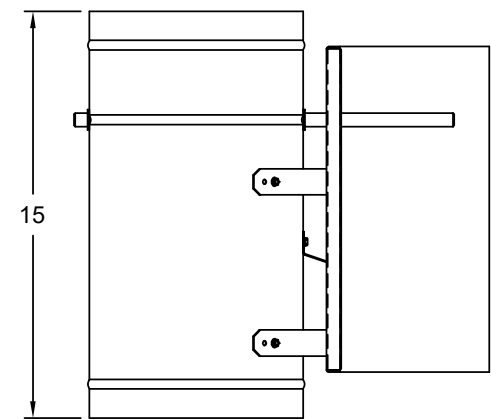


RT-500 ROUND RETROFIT AIR TERMINAL UNIT

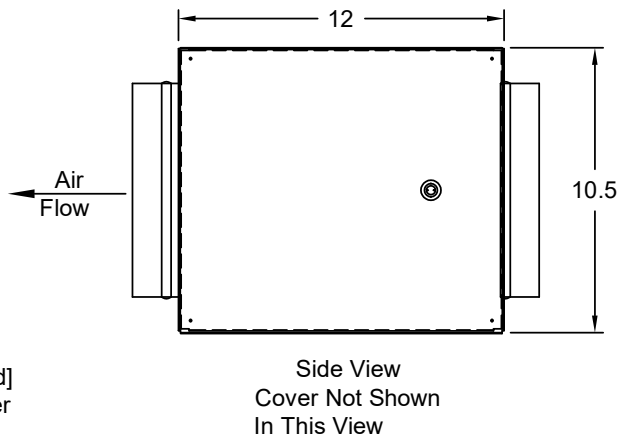
STANDARD FEATURES

- ▶ RT-500 is available in ten sizes from 6" to 16" to handle 30 CFM – 5,020 CFM.
- ▶ 22 ga. galvanized steel casing, mechanically sealed, low leakage construction.
- ▶ Mechanically fastened damper assembly is double layer, 18 gauge equivalent, galvanized steel with integral blade seal. (<1% at 3" static pressure).
- ▶ Optional factory calibrated job-specific controls.
- ▶ Multi-point center averaging airflow sensor for highly accurate (+/-5%) flow readings with varying inlet duct configurations after certified balancer has balanced terminal.
- ▶ Easily accessible, steel balancing taps.
- ▶ External control cabinet with offset mounting plate as standard.
- ▶ RT-500 has beaded inlet and discharge for added rigidity and aids in secure flex duct connections.

RT-500 ROUND RETROFIT



Unit Size	Inlet Diameter	
	In.	mm
4	3.88	99
5	4.88	124
6	5.88	149
7	6.88	175
8	7.88	200
9	8.88	225
10	9.88	251
12	11.88	302
14	13.88	353
16	15.88	403



RADIATED SOUND MODEL RT

OCTAVE BAND SOUND POWER, Lw, dB																														
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
4	50	0.01	41	32	19	19	15	7	<15	43	34	21	21	17	9	<15	44	35	22	22	18	11	<15	45	38	25	24	23	18	<15
	100	0.01	43	34	23	22	19	13	<15	45	36	25	24	21	15	<15	46	37	26	25	22	17	<15	47	40	29	27	27	24	<15
	150	0.03	46	38	29	26	21	16	<15	48	40	31	28	23	18	<15	49	41	32	29	24	20	<15	50	44	35	31	29	27	<15
	200	0.04	49	41	35	29	23	18	<15	51	43	37	31	25	20	<15	52	44	38	32	26	22	<15	53	47	41	34	31	29	<15
	250	0.06	51	43	39	32	28	26	<15	53	45	41	34	30	28	<15	54	46	42	35	31	30	15	55	49	45	37	36	37	19
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	250	0.06	51	43	39	32	28	26	<15	53	45	41	34	30	28	<15	54	46	42	35	31	30	15	55	49	45	37	36	37	19
	300	0.07	53	46	43	35	32	30	17	55	48	45	37	34	32	19	56	49	46	38	35	34	20	57	52	49	40	40	41	23
	350	0.08	54	48	45	38	35	31	19	56	50	47	40	37	33	20	57	51	47	41	38	35	22	58	54	50	43	43	42	25
6	200	0.04	49	41	35	29	23	18	<15	51	43	37	31	25	20	<15	52	44	38	32	26	22	<15	53	47	41	34	31	29	<15
	300	0.07	53	46	43	35	32	30	17	55	48	45	37	34	32	19	56	49	46	38	35	34	20	57	52	49	40	40	41	23
	400	0.08	55	50	46	41	38	32	20	57	52	48	43	40	34	22	58	53	49	44	41	36	23	59	56	52	46	46	43	26
	500	0.10	57	53	48	44	40	34	22	59	55	50	46	42	36	24	60	56	51	47	43	38	25	61	59	54	49	48	45	29
	600	0.18	58	55	50	46	42	36	24	60	57	52	48	44	38	26	61	58	53	49	45	40	27	62	61	56	51	50	47	31
7	350	0.01	51	40	33	25	20	19	<15	55	46	42	36	28	24	16	55	46	43	38	32	29	17	56	47	45	42	40	38	19
	450	0.01	52	41	34	27	22	19	<15	57	48	42	37	29	25	18	58	50	45	40	33	30	20	59	53	49	45	42	39	24
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	650	0.01	55	45	38	34	26	20	<15	60	53	44	39	32	29	22	61	56	48	43	36	33	25	63	60	55	50	44	41	30
	750	0.01	57	47	41	36	28	21	17	62	54	46	41	34	29	24	63	58	50	45	38	34	27	65	62	57	52	45	42	32
8	400	0.01	52	41	34	26	21	19	<15	56	47	42	37	29	25	17	57	49	44	39	32	29	19	58	52	48	44	41	38	23
	550	0.01	53	42	35	29	24	20	<15	58	50	43	37	29	26	19	60	55	47	42	35	32	24	61	59	54	49	43	41	29
	700	0.01	56	46	40	35	27	21	17	61	53	45	40	33	28	23	62	57	49	44	37	33	26	64	61	56	51	44	41	31
	850	0.01	58	49	43	38	31	24	20	63	55	47	43	36	31	26	65	59	51	46	39	34	28	67	63	58	53	45	42	34
	1000	0.01	60	52	46	42	34	27	22	65	57	50	45	39	33	29	67	60	53	48	42	36	31	70	66	60	54	47	42	37
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	700	0.01	48	47	39	32	27	22	<15	53	52	47	37	32	26	21	56	56	51	42	36	30	26	62	59	58	47	43	41	28
	900	0.01	49	49	41	35	29	23	16	54	54	48	40	34	28	22	57	57	52	44	38	31	27	64	64	58	51	46	43	37
	1100	0.02	51	50	44	38	30	24	18	55	55	49	41	35	29	24	58	58	52	44	38	32	27	65	68	61	53	48	47	39
	1300	0.03	54	53	46	40	32	26	23	58	57	50	42	36	30	26	62	61	53	46	40	34	31	70	69	62	55	49	48	40
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	1600	0.01	54	48	46	39	33	32	20	58	53	51	42	38	37	25	61	56	54	45	41	40	29	65	65	63	55	49	48	38
	2000	0.02	56	52	51	43	39	37	25	61	55	53	45	42	40	27	62	58	56	47	44	42	31	66	67	64	56	50	49	39
	2400	0.03	57	52	44	36	38	38	20	62	58	56	48	45	43	31	65	61	59	51	48	46	34	69	68	67	60	54	51	43
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	1600	0.01	56	46	44	35	31	26	18	58	48	46	37	33	28	20	58	49	46	38	33	28	20	60	50	48	39	35	30	22
	2100	0.02	59	54	51	42	36	31	25	61	56	53	44	38	33	27	62	57	54	45	39	34	29	63	58	55	46	40	35	30
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	3100	0.04	64	60	57	46	44	40	32	66	62	59	48	46	42	34	67	63	60	49	47	43	35	68	64	61	50	48	44	36
16	1400	0.01	58	51	41	35	31	26	20	59	55	46	40	36	30	24	60	57	51	45	41	36	26	63	61	57	53	49	47	32
	2100	0.02	60	53	44	40	37	33	22	60	57	49	43	40	35	26	62	60	54	48	44	40	28	66	65	61	58	55	53	36
	2800	0.03	61	54	47	42	39	35	23	62	58	51	45	42	37	27	64	62	56	50	47	44	32	69	69	65	62	61	59	41
	3500	0.04	62	57	52	46	42	39	26	64	60	55	49	44	41	30	67	64	59	54	50	47	34	71	70	67	64	63	62	43
	4200	0.05	65	61	57	50	46	43	32	67	63																			

DISCHARGE SOUND MODEL RT

OCTAVE BAND SOUND POWER, Lw, dB																														
Unit Size	CFM	Min ΔPs	ΔPs = 0.50 in. wg.							ΔPs = 1.0 in. wg.							ΔPs = 1.5 in. wg.							ΔPs = 3.0 in. wg.						
			2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
4	50	0.01	67	57	40	37	33	26	23	70	63	57	51	41	33	27	71	64	56	51	42	33	29	73	66	55	53	44	35	31
	100	0.02	69	58	42	39	34	28	26	71	64	58	51	42	36	29	72	65	58	51	43	36	30	74	67	58	53	45	38	32
	150	0.03	71	59	44	41	35	30	29	72	65	59	52	44	38	30	73	66	59	52	45	38	31	75	68	59	54	47	40	34
	200	0.04	72	60	45	43	36	31	30	73	66	59	53	46	39	31	74	67	59	53	47	39	32	76	69	59	55	49	41	35
	250	0.06	74	61	48	44	38	33	32	74	67	60	53	47	42	32	75	68	61	53	48	42	34	77	70	63	55	50	44	36
5	150	0.03	71	59	44	41	35	30	29	72	65	59	52	44	38	30	73	66	59	52	45	38	31	75	68	59	54	47	40	34
	200	0.04	72	60	45	43	36	31	30	73	66	59	53	46	39	31	74	67	59	53	47	39	32	76	69	59	55	49	41	35
	250	0.06	74	61	48	44	38	33	32	74	67	60	53	47	42	32	75	68	61	53	48	42	34	77	70	63	55	50	44	36
	300	0.07	76	63	50	47	39	35	31	74	69	62	54	48	45	32	75	70	63	54	49	45	30	77	72	65	56	51	47	32
	350	0.09	77	64	51	48	40	36	32	75	70	63	55	49	46	33	76	71	64	55	50	46	31	78	73	66	57	52	48	33
6	200	0.02	68	57	43	42	35	31	25	69	63	57	52	45	39	26	70	64	57	52	46	39	27	72	66	57	54	48	41	30
	300	0.04	72	60	48	46	38	35	26	70	66	60	53	47	45	25	71	67	61	53	48	45	26	73	69	63	55	50	47	28
	400	0.08	73	65	53	51	42	40	27	71	67	61	54	48	49	26	72	68	62	54	49	49	27	74	70	64	56	51	51	29
	500	0.12	74	68	58	55	47	44	29	74	71	65	59	53	52	31	75	72	66	59	54	52	32	77	74	68	61	56	54	34
	600	0.15	76	72	62	59	51	48	32	75	73	67	63	56	53	33	76	74	68	63	57	53	34	78	76	70	65	59	55	37
7	350	0.04	68	60	50	45	39	34	21	72	67	60	55	50	46	26	71	66	61	56	53	48	25	73	67	62	57	57	52	27
	450	0.06	70	62	52	48	40	36	23	74	69	60	57	41	47	28	74	69	63	59	55	50	28	76	70	65	60	58	53	31
	550	0.08	72	65	55	52	43	39	26	76	71	62	59	53	48	31	76	71	65	61	56	51	31	78	72	67	62	59	54	34
	650	0.10	73	66	56	53	44	40	27	77	72	63	60	56	52	32	78	72	66	62	57	52	33	80	74	68	64	60	55	36
	750	0.12	75	68	58	56	46	41	28	78	73	65	62	60	57	33	79	74	67	63	60	57	35	81	76	69	65	62	58	37
8	400	0.05	69	61	51	47	39	35	22	73	68	59	56	40	46	27	73	68	62	58	54	49	27	75	69	64	59	57	52	30
	550	0.08	72	65	55	52	43	39	26	76	71	62	59	53	48	31	76	71	65	61	56	51	31	78	72	67	62	59	54	34
	700	0.10	74	67	57	55	45	40	29	77	72	64	61	59	56	32	78	73	66	62	59	56	34	80	75	68	64	61	57	36
	850	0.12	76	70	60	58	49	44	30	80	74	66	64	59	56	34	81	75	68	65	60	55	36	83	77	70	66	62	57	38
	1000	0.14	78	72	63	61	52	47	31	82	76	68	66	58	53	36	83	77	70	67	60	54	38	85	78	72	68	63	57	40
9	500	0.01	64	60	49	45	37	35	18	69	66	57	53	48	45	25	70	67	60	56	51	48	26	72	69	62	58	54	52	28
	700	0.01	67	63	52	48	40	38	20	71	69	59	55	50	47	27	72	69	62	58	53	50	28	74	71	64	60	56	54	31
	900	0.02	70	65	54	51	41	39	21	73	70	61	57	53	50	28	74	71	64	59	55	52	29	76	73	66	61	57	54	32
	1100	0.02	71	66	57	53	45	43	24	75	71	63	58	53	51	29	76	72	65	60	56	53	31	77	74	68	62	59	55	33
	1300	0.03	74	71	61	58	51	49	30	78	75	66	63	57	55	35	79	76	68	64	59	56	40	81	77	70	65	62	59	43
10	700	0.01	67	63	52	48	40	38	20	71	69	59	55	50	47	27	72	69	62	58	53	50	28	74	71	64	60	56	54	31
	900	0.02	70	65	54	51	41	39	21	73	70	61	57	53	50	28	74	71	64	59	55	52	29	76	73	66	61	57	54	32
	1100	0.02	71	66	57	53	45	43	24	75	71	63	58	53	51	29	76	72	65	60	56	53	31	77	74	68	62	59	55	33
	1300	0.03	74	71	61	58	51	49	30	78	75	66	63	57	55	35	79	76	68	64	59	56	40	81	77	70	65	62	59	43
	1500	0.03	76	73	63	60	53	51	32	80	77	68	65	59	57	36	81	78	70	66	61	58	38	83	79	72	67	64	61	39
12	800	0.01	61	54	46	43	39	33	<15	67	64	57	55	52	49	21	69	66	60	59	58	55	24	70	67	61	62	63	60	25
	1200	0.01	64	58	50	47	43	39	17	69	66	60	58	56	53	24	72	69	64	62	61	58	27	73	70	66	66	65	63	29
	1600	0.01	66	62	53	50	47	45	19	71	68	63	60	59	57	26	74	71	67	64	63	61	29	75	73	70	69	67	65	32
	2000	0.02	69	63	58	55	52	51	22	74	70	65	63	62	60	28	77	73	69	66	65	64	31	78	75	71	71	69	67	33
	2400	0.02	72	65	63	59	58	57	25	76	71	67	65	65	63	30	79	74	70	67	67	66	33	80	76	72	73	70	68	35
14	1000	0.50	68	57	52	46	40	39	18	63	60	55	51	48	45	16	63	60	56	52	49	46	16	64	62	59	58	50	49	19
	1600	0.01	75	70	65	61	57	50	28	67	65	66	59	55	49	22	67	65	67	60	56	50	22	68	67	70	66	57	53	25
	2100	0.01	76	71	68	63	60	54	29	70	69	73	63	58	53	27	70	69	74	64	59	54	27	71	71	77	70	60	57	31
	2600	0.01	77	75	69	65	61	57	34	76	75	76	67	63	57	34	76	75	77	68	64	58	34	77	77	80	74	65	61	37
	3100	0.04	81	76	73	69	63	61	36	83	78	78	72	67	61	38	84	79	80	74	69	63	39	85	81	83	80	70	66	41
16	1400	0.01	70	67	61	54	48	43	26	73	73	69	65	58	53	32	75	76	71	70	64	58	35	75	77	74	72	69	63	37
	2100	0.02	74	71	65	58	53	48	29	77	76	71	67	61	56	35	78	78	73	71	65	60	37	79	79	76	74	70	64	39
	2800	0.03	78	74	68	62	57	53	33	80	78	73	68	63	58	38	81	79	75	71	66	61	39	83	81	77	76	71	65	41
	3500	0.04	78	75	71	64	59	56	34	81	78	74	69	64	60	38	82	80	76	72	67	63	40	84	82	79	76	72	66	42
	4200	0.06	81	77	75	68	62	59	37	84	80	77	73	68	64	40	84													



RA-500 CUSTOMIZED RETROFIT AIR TERMINAL UNIT

SPECIFIABLE FEATURES

- ▶ Customized retrofit valves for existing single or dual duct systems
- ▶ Optional flow controllers available on satellite mounted panels
- ▶ Pneumatic control sequences available

INDEX OF SECTIONS

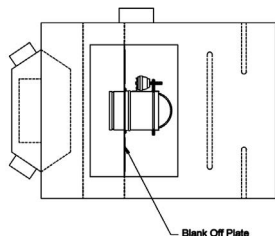
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RA-500 CUSTOMIZED RETROFIT AIR TERMINAL UNITS

Series RA-500 retrofit assemblies are customized retrofit valves designed to slip into existing mechanically regulated single or dual duct terminals. The units allow the conversion of constant volume systems to more energy efficient, variable volume systems. RA-500 assemblies are currently available to fit most brands of terminals manufactured from the 1960s to the 1980s. The RA-500 valves can be installed, in most applications, without disrupting existing ductwork. Units are installed by removing existing volume regulators and inserting the RA valve. One or two valves in a single panel may be controlled by a single actuator.

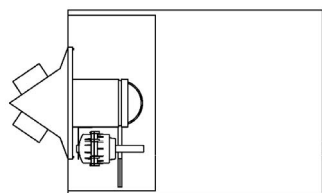
RA-500 TECHNICAL DATA



Titus® HD,TDH,TDL,TSH, LD, HS Series
Replace all mechanical regulators with combination of flanged retrofit assembly(ies) and blank off plate(s) through bottom access panel. One actuator per valve, field or factory mounts on valve body. Flow controller panel is mounted in the field on outside of HD air terminal casing.

TITUS®

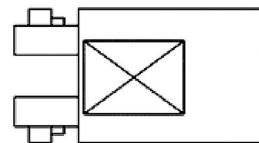
The Titus® Series of single and dual duct mechanical air terminals may have as many as ten mechanical regulators. They were originally manufactured in a variety of sizes to deliver from 50 to 3120 CFM. Retrofitting these air terminals requires the removal of all mechanical regulators. The regulators are replaced with up to 4 METALAIRE RA retrofit valves to achieve the desired CFM. The remaining holes left as a result of removing the mechanical regulators are covered with blank-off plates. Retrofit is achieved through a bottom access panel. Control submittal 590 illustrates the METALAIRE Retrofit Assembly for Titus® Series air terminals. A chart detailing the number of nominal 8 retrofit valves and blank-off plates required to retrofit each size air terminal is presented on the submittal. Each valve is furnished with a multi-point air flow sensor. Order RA Assembly 590A for sizes 4 thru 7. Order 590B for larger sizes in multiples depending on CFM desired. Blank-off plates can be field fabricated, or ordered as 590X.



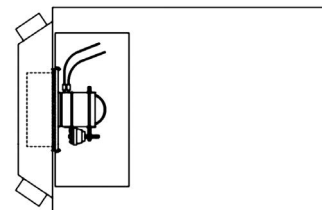
Tuttle & Bailey® MVC Series
Replace mechanical regulator(s) with panel mounted single round retrofit valve through bottom access panel. A divider panel, if present, must be cut to provide clearance for the new valve. One actuator per valve, field or factory mounted on valve body. Flow Controller panel mounted on MVC air terminal casing in the field.

TUTTLE & BAILEY®

Tuttle & Bailey® Series MPM-MVC mechanical air terminals require a single METALAIRE RA retrofit valve per air terminal. Tuttle & Bailey® air terminals were built in a variety of sizes to deliver from 100 to 2600 CFM. Retrofitting these Tuttle & Bailey® air terminals requires removing the mechanical regulator(s) and replacing it (them) with a single, panel mounted retrofit valve equipped with a multi-point air flow sensor. The size of the valve and the panel it is mounted on varies with the size of the retrofitted air terminal. Retrofit is achieved through a bottom access panel. A divider panel, if present, must be cut to provide clearance for the new valve. Control sequence drawings 591A through 591F illustrate the dimensions of the panel and valve required for each MVC air terminal model.



MPM Series and alternate method for MVC series. Replace inlet damper assembly with dual flange mounted RA valves. Remove and discard internal regulator.

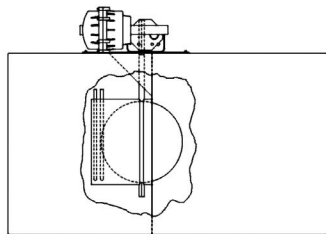


Anemostat® HV-C Series
Replace mechanical regulator(s) with panel mounted single or dual round retrofit valves. Retrofit is achieved through a bottom access panel. One actuator per valve or pair of valves, field or factory mounted on valve body. Flow Controller panel mounted on HVC air terminal casing in the field.

ANEMOSTAT®

Anemostat® Series HV-C mechanical air terminals may require 1, 2, 4, 5, 7 or 8 METALAIRE RA retrofit valves mounted on 1 or 4 panels. Each valve is equipped with a multi-point air flow sensor. Anemostat® HV-C air terminals were originally manufactured in a variety of sizes to deliver from 150 to 5400 CFM. Retrofitting the Anemostat® air terminals requires removing the mechanical regulator(s) and replacing it (them) with the appropriate number of retrofit valves usually mounted in a single panel, but in the case of the largest air terminal, 6 valves in 4 panels are required. Retrofit is achieved through a bottom access panel. Control sequence drawings 592A through 592G illustrate the dimensions of the panel and valve(s) required for each HV-C air terminal model.

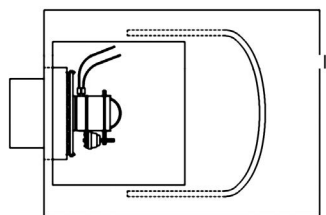
RA-500 TECHNICAL DATA continued



Barber-Colman® HS and HD Series
Replace mechanical regulator(s) with panel mounted single or dual round or oval retrofit valves. Retrofit is achieved through a side access panel. One actuator and flow controller are mounted on outside of the HS or HD side access panel in the field.

BARBER-COLMAN®

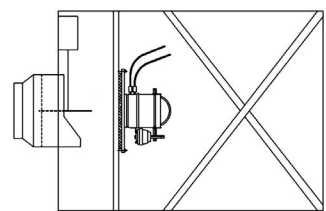
Barber-Colman® HS, and HD mechanical air terminals require 1 or 2 METALAIRE RA round or oval retrofit valves mounted on a single panel. Each valve is equipped with a multi-point air flow sensor. Barber Colman®'s HS and HD air terminals were originally manufactured in a variety of sizes to deliver from 100 to 5000 CFM. Retrofitting the Barber-Colman® air terminals requires removing the mechanical regulator(s) and replacing it (them) with 1 or 2 valves mounted in an appropriately sized panel. Each replacement valve is furnished with a multi-point flow sensor. Retrofit is achieved through a side access panel. Controls, including the actuator, are mounted on the outside of this panel. Control sequence drawings 593A through 593G illustrate the dimensions of the panel and valve(s) required for each HS or HD air terminal model.



Buensod® H and HL Series
Replace mechanical regulator(s) with 1, 2, or 3 panel mounted round or oval retrofit valves. Retrofit is achieved through a bottom access panel. One panel mounted round or oval retrofit valve(s). One actuator per air terminal field or factory mounted on 1 valve body. Flow controller panel mounted on H or HL air terminal in the field.

BUENSOD®

Buensod® Model H and HL mechanical air terminals require from 1 to 3 METALAIRE RA round retrofit valves, each valve mounted on a single panel and furnished with a multi-point air flow sensor. Buensod® Model H and HL air terminals were originally manufactured in a variety of sizes to deliver from 50 to 4800 CFM. Retrofitting the Buensod® air terminals requires removing the mechanical regulator(s) and replacing it (them) with the appropriate number of panel mounted retrofit valves. Retrofit is achieved through a bottom access panel. Control sequence drawings 594B through 594I illustrate the number and dimensions of panels and valves required for each H or HL air terminal.

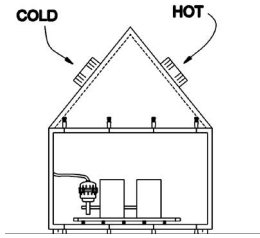


Krueger® CVM Series
Replace mechanical regulator(s) with 1 or 2 panels, each supporting 1 or 2 round retrofit valves. One actuator per panel, field or factory mounted on 1 valve body. Flow Controller panel mounted on CVM air terminal casing in the field.

KRUEGER®

Krueger® Model CVM mechanical air terminals require 1 or 2 METALAIRE RA round retrofit valves mounted in a single panel or 4 valves mounted in two panels. Each valve is furnished with a multi-point air flow sensor. Krueger® CVM air terminals were originally manufactured in a variety of sizes to deliver from 100 to 3900 CFM. Retrofitting the Krueger® air terminals requires removing the mechanical regulator(s) and replacing it (them) with a panel containing the appropriate number and size retrofit valves. Control sequence drawings 595A through 595D illustrate the number of valves and the dimensions of the panel required for each CVM air terminal.

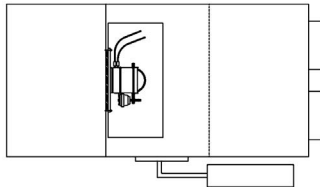
RA-500 TECHNICAL DATA continued



Connor® Series
Replace mechanical regulator(s) with panel mounted single or dual round retrofit valves. Retrofit is achieved through a bottom access panel. One actuator per valve or pair of valves, field or factory mounted on valve body. Flow Controller panel mounted on HVE air terminal casing in the field.

CONNOR®

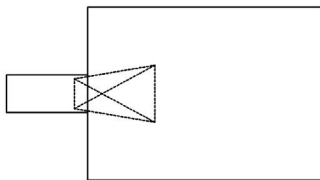
Connor® Series HV, SD, DD, DS, RH and DC mechanical air terminals may require 1 or 2 METALAIRE RA retrofit valves mounted on 1 to 4 panels. Each valve is equipped with a multi-point air flow sensor. Connor® HV air terminals were originally manufactured in a variety of sizes to deliver from 100 to 4000 CFM. Retrofitting the Connor® air terminals requires removing the mechanical regulator(s) and replacing it (them) with the appropriate number of retrofit valves usually mounted in a single panel, but in the case of the largest air terminal, 8 valves in 4 panels are required. Retrofit is achieved through a bottom access panel. Control sequence drawings 596A through 596F illustrate the dimensions of the panel and valve(s) required for each air terminal model.



Carnes® Series
Replace mechanical regulator(s) with 1 or 2 panels, each supporting 1 or 2 round retrofit valves. One actuator per panel, field or factory mounted on 1 valve body. Flow Controller panel mounted on air terminal casing in the field.

CARNES®

Carnes® Models MH, SH and TH mechanical air terminals require 1, 2 or 3 METALAIRE RA round retrofit valves mounted in a single panel. Each valve is furnished with a multi-point air flow sensor. Carnes® air terminals were originally manufactured in a variety of sizes to deliver from 100 to 2000 CFM. Retrofitting the Carnes® air terminals requires removing the mechanical regulator(s) and replacing it (them) with a panel containing the appropriate number and size retrofit valves. Control sequence drawings 597A through 597H illustrate the number of valves and the dimensions of the panel required for each air terminal.



Trane® Series
Replace mechanical regulator (inlet valve) with a flanged retrofit valve. Flow controller is factory mounted on retrofit unit.

TRANE® SERIES

Trane® models VD, VC and VF mechanical air terminal require a single retrofit valve, the same nominal size as the terminal inlet. Retrofit valve is equipped with a flow sensor. Retrofitting requires removing the original inlet mechanical regulator and replacing it with a retrofit unit. Trane® retrofit can be shipped with controls mounted and wired.

RA-500 SELECTION DATA

Mechanical Air Terminal Data				METALAIRE Model RA-500 Retrofit Assembly Data*			
Manufacturer's Name (Models)	Size	Inlet Size	Flow Range	Quantity Needed	Order Number	Valve Size(s)	Total Capacity
Anemostat® HV-C	5	5"	150-174	1	592A	6"	600
	5	5"	175-300	1	592B	6"	600
	6	6"	200-300	1	592B	6"	600
	6	6"	300-500	1	592C	6"	600
	7	7"	300-500	1	592C	6"	600
	7	7"	450-750	1	592D	6"	1200
	8	8"	450-750	1	592D	6"	1200
	8	8"	700-1150	1	592E	6"	1200
	10	10"	700-1150	1	592E	6"	1200
	10	10"	1000-1300	1	592F	10"	1600
	12	12"	1000-1500	1	592F	10"	1600
	12	12"	1501-2100	1	592G	10"	2200
	14	14"	1600-2200	2	592E	2-6"	2400
	14	14"	2201-4000	4	2-592D&E	4-6"	4800
	16	16"	3000-4000	3	1-592D,F&G	2-6", 3-10"	5000
	16	16"	4001-5400	4	1-592D,E,F,G	4-6", 3-10"	6200
Barber-Coleman® HS, HD	5	5"	100-400	1	593A	6"	600
	6	6"	300-600	1	593B	8"	1000
	8	8"	600-900	1	593C	8"	1000
	10	10"	900-1600	1	593D	10"	1600
	12	12"	1600-2400	1	593E	10"	3200
	14	14"	2400-3400	1	593F	2-12" Oval	4400
	16	16"	3400-5000	1	593G	2-14" Oval	6000

* One RA unit may have multiple valves. Since RA valves have higher capacities than existing mechanical regulators, select quantity of RA units by retrofitted CFM desired and blank off extra openings. RA assemblies are offered as basic units (502B), units with pneumatic actuators (510N) and units with 24V floating electric actuators (550N). All RA units include the METALAIRE®, multipoint, averaging and amplifying flow sensor. See submittal drawings for full descriptions.

Caution: Manufacturers sometimes vary mounting dimensions without changing model numbers. It is recommended that several RA assemblies be tested at the installation site before large orders are manufactured.

RA-500 SELECTION DATA continued

Mechanical Air Terminal Data				METALAIRE Model RA-500 Retrofit Assembly Data*			
Manufacturer's Name (Models)	Size	Inlet Size	Flow Range	Quantity Needed	Order Number	Valve Size(s)	Total Capacity
Buensod® H, HL	4H	4"	50-230	1	594B	6"	600
	5H	5"	200-350	1	594B	6"	600
	6H	6"	300-450	1	594B	6"	600
	7H	7"	400-650	1	594C	8"	1000
	8H	8"	600-850	1	594D	8"	1000
	9H	9"	800-1050	1	594D	8"	1000
	10H	10"	1000-1300	1	594E	10"	1600
	HLA	30x14"	1200-2000	2	594D	2-8"	2000
	HLB	30x14"	2000-2500	2	594E	2-10"	3200
	HLC	40x16"	2500-3000	1	594H	3-8"	3000
	HLD	40x16"	3000-4000	1	594I	3-10"	4800
Krueger® CVM	4	4"	100-200	1	595A	6"	600
	5	5"	175-300	1	595A	6"	600
	6	6"	300-450	1	595A	6"	600
	7	7"	400-600	1	595B	8"	1000
	8	8"	500-800	1	595B	8"	1000
	9	9"	700-1000	1	595B	8"	1000
	10	10"	800-1200	1	595C	2-6"	1200
	12	12"	1000-1600	1	595D	6", 8"	1600
	1212	12 1/2"x12"	1500-2500	2	595C	4-6"	2400
	1614	16 1/2"x16"	1800-3000	2	595D	2-6", 2-8"	3200
	2014	20 1/2"x20"	2400-3900	2	595D	2-6", 2-8"	3200
Titus® HD, LD, HS, TD, TS	A	4-5-6"	50-240	1	590B	8"	1000
	B	6-7-8"	100-480	1	590B	8"	1000
	C	7-8-9-10"	150-720	2	590B	8"	2000
	D	9-10-12"	200-960	2	590B	8"	2000
	E	12-14"	250-1200	2	590B	8"	2000
	F	14-16"	350-1680	2	590B	8"	2000
	G	20x16"	450-2160	3	590B	8"	3000
	H	20x16 / 24x16	550-2640	3	590B	8"	4000
	J	24x16	650-3120	4	590B	8"	4000

* One RA unit may have multiple valves. Since RA valves have higher capacities than existing mechanical regulators, select quantity of RA units by retrofitted CFM desired and blank off extra openings. RA assemblies are offered as basic units (502B), units with pneumatic actuators (510N) and units with 24V floating electric actuators (550N). All RA units include the METALAIRE®, multipoint, averaging and amplifying flow sensor. See submittal drawings for full descriptions.

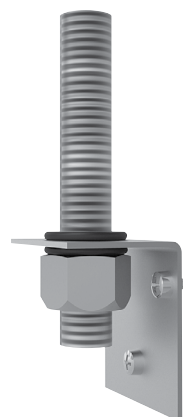
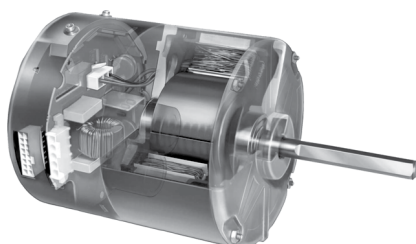
Caution: Manufacturers sometimes vary mounting dimensions without changing model numbers. It is recommended that several RA assemblies be tested at the installation site before large orders are manufactured.

RA-500 SELECTION DATA continued

Mechanical Air Terminal Data				METALAIRE Model RA-500 Retrofit Assembly Data*			
Manufacturer's Name (Models)	Size	Inlet Size	Flow Range	Quantity Needed	Order Number	Valve Size(s)	Total Capacity
Turtle & Bailey® MPM-MVC	A	5"	50-200	1	591A	6"	600
	AB	5"	100-350	1	591B	6"	600
	B	6"	150-550	1	591B	6"	600
	C	7"	200-800	1	591C	8"	1000
	D	8"	800-1300	1	591D	10"	1600
	E	10"	500-2000	1	591E	12" Oval	2200
	F	12"	700-2600	1	591F	14" Oval	3000
Connor® SD, DD, DS, RH, DC	4	4"	100-200	1	596A	6"	600
	5	5"	150-325	1	596B	6"	600
	6	6"	250-425	1	596C	6"	600
	7	7"	350-650	1	596D	2-6"	1200
	8	8"	500-850	1	596E	2-6"	1200
	10	10"	650-1200	1	596F	2-6"	1200
	12	12"	800-1800	2	596E	4-6"	2400
	14	14"	1500-3000	4	596E	8-6"	4800
	16	16"	2100-4000	4	596F	8-6"	4800
Carnes® MH, SH, TH	1004-2004	4"	75-200	1	597A	6"	600
	0005	5"	175-350	1	597B	6"	600
	0006	6"	250-500	1	597C	6"	600
	0007	7"	325-650	1	597D	6"	600
	0008	8"	425-850	1	597E	2-6"	1200
	0009	9"	550-1100	1	597F	2-6"	1200
	0010	10"	700-1400	1	597G	3-6"	1800
	0012	12"	1000-2000	1	597H	2-8"	2000
Trane® VD, VC, VF	03	5"	300	1	598A	1-6"	600
	06	6"	600	1	598A	1-6"	600
	11	8"	1100	1	598B	1-8"	1000
	17	10"	1700	1	598C	1-10"	1600
	24	12"	2400	1	598D	1-12"	2400
	32	14"	3200	1	598E	1-14"	3200
	42	16"	4200	1	598F	1-16"	4200

* One RA unit may have multiple valves. Since RA valves have higher capacities than existing mechanical regulators, select quantity of RA units by retrofitted CFM desired and blank off extra openings. RA assemblies are offered as basic units (502B), units with pneumatic actuators (510N) and units with 24V floating electric actuators (550N). All RA units include the METALAIRE®, multipoint, averaging and amplifying flow sensor. See submittal drawings for full descriptions.

Caution: Manufacturers sometimes vary mounting dimensions without changing model numbers. It is recommended that several RA assemblies be tested at the installation site before large orders are manufactured.



OPTIONS, ACCESSORIES AND ENGINEERING

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OPTIONS, ACCESSORIES, AND ENGINEERING OVERVIEW

CONSTRUCTION:

- ▶ 20 gauge construction available on all units, except retrofit units.
- ▶ Hanger brackets available for all units. Metal "L" brackets (4 per unit) which are shipped loose for field installation. Brackets are provided with a 5/8" diameter hole and vibration isolation grommet.
- ▶ Inlet attenuators available for fan powered units. The opening is on the side of the box, and the insulation type will match whatever is chosen for the unit. With an induction mounted coil, the filter is on either the top or bottom.
- ▶ Individual cartoning is available for all TH / TL units.

CONTROL ENCLOSURES:

- ▶ Dust tight control enclosures available for all units. The damper control enclosure is provided sealed to prevent light or dust from entering the enclosure when the cover is in place.
- ▶ Oversized control enclosure and cover available on all single duct, dual duct, and retrofit units when the DDC controls are too large for the standard enclosure.
- ▶ Control enclosures also available with a sliding control cover on all single duct, dual duct, retrofit units, as well as the FCQ. The cover slides towards the primary inlet. This option is available for both the standard and oversized control enclosures.

FILTERS:

- ▶ Fan powered units have optional 1" or 2" filter racks with filters. Filters are installed at the fan air intake and have a MERV 6-7 rating. Spare filters can also be ordered and ship loose.

INSULATION:

- ▶ All units available with dual density fiberglass insulation. Available thicknesses are 1/2" and 1". FCL and FVL can only accommodate 1/2" thickness.
- ▶ All units available with foil-faced fiberglass insulation, 1.5 lbs density. Available thicknesses are 1/2" and 1". FCL and FVL can only accommodate 1/2" thickness.
- ▶ All units except FCL and FVL available with foil-faced fiberglass insulation, 4lbs density. Only available in 1" thickness.
- ▶ All units available with ThermoPure closed cell foam insulation. Available thicknesses are 1/2" and 1". FCL and FVL can only accommodate 1/2" thickness.
- ▶ Single duct (TH, TL) and dual duct (DD, DH) units are available with solid double-wall / metal lined insulation. The double wall is available with either 1/2" or 1" fiberglass insulation between the unit and metal liner.

ACCESS:

- ▶ All units without heat have an optional access panel available for inspection of the damper. The panel is rectangular and gasketed, and is installed with zip screws.
- ▶ Protective screen for TH / TL units with electric heat. This allows an access panel to be installed, but blocks contact with the electric heat elements.
- ▶ Optional standard coil access door can be mounted on the top or the bottom of the unit.
- ▶ Optional quick release access door available for all units. Available for coil access on units with a hot water coil; available for inspection of damper on all units without heat. The panel is heavy gauge galvanized steel, insulated and gasketed, and is closed with quarter-turn latches. For coil access it can be mounted on either the top or the bottom of the unit.
- ▶ Optional high pressure spin-in access door with cam latches available for all units. Available for coil access on units with a hot water coil; available for inspection of damper on all units without heat.

HANDING:

- ▶ All single duct and dual duct units are configured with controls and coil connections on the right as standard (looking in direction of air flow). Optional configurations include controls on left, coil connections on right; controls on right, coil connections on left; and both controls and coil connections on the left.
- ▶ All fan powered units are configured with the controls and coil connections on the left as standard (looking in direction of air flow). Optional configurations include controls on left, coil connections on right; controls on right, coil connections on left; and both controls and coil connections on right. Optional handing not available on the FVI unit if the coil is mounted on the induction.

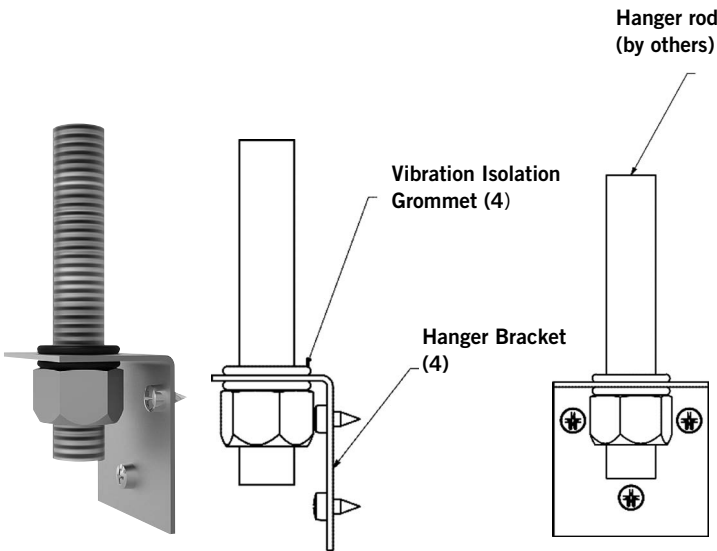
For a complete list of available options, please contact Metal Industries.

CONSTRUCTION OPTIONS

HANGER BRACKETS

Hanger brackets are shipped loose for field installation. The optional hanger brackets (4) are bagged and placed inside the control enclosure on each air terminal. Hanger bracket kit includes:

- ▶ (4) 18 Gauge Hanger Brackets
- ▶ (12) Sheet Metal Screws
- ▶ (4) Isolation Grommets



INLET ELBOW ATTENUATOR FOR FAN POWERED TERMINAL UNITS

The inlet elbow attenuator is designed to reduce the radiated noise of fan powered terminal units. The standard inlet elbow attenuator is manufactured from 22 gauge metal and is lined with the same insulation material as the terminal unit it is mounted to. Optional 20 gauge construction and various types of insulation are also available. The standard inlet elbow attenuator is factory installed and ships as an integral part of the terminal. Depending on the terminal unit model and case size, attenuator lengths vary from 16-24". The table to the right lists the Insertion loss credits for the inlet elbow attenuator.

Insertion Loss for Inlet Elbow Attenuator

dB	CFM					
	125	250	500	1000	2000	4000
	1	4	6	7	10	12

1. 22 ga. Galvanized steel casing
2. 1.5 lb/ft³ dual density coated fiberglass insulation
3. Insulation meets standards UL 181 and NFPA 90A
4. Performance data is obtained from laboratory testing in accordance with AHRI 880-2011



Typical view showing position of filter with induction mounted coil

INSULATION OPTIONS

Many insulation types are available for use in air terminal units. Each type and thickness of insulation has different thermal and acoustical characteristics as well as unit cost. It is important when specifying any type of insulation to specify not only the material, but the thickness and density as well. For instance, a common fiberglass specification is 1" thick, dual density (1.5lb/ft³ min.) fiberglass insulation. For all insulations, the thicker the insulation, the greater the acoustical and thermal performance, and the higher the cost.

Generally, insulation erosion resistance is stated with respect to UL 181 erosion test. Insulation meeting this specification will not erode or otherwise contribute particulate to the airstream at velocities up to 2500 fpm. Also, insulation is regulated regarding the restriction of fire and smoke spread by NFPA 90A, which requires insulation to be tested at a minimum of 250°F. All insulations offered by METALAIRE meet UL 181 and NFPA 90A requirements.

FIBERGLASS

The most common type of insulation applied to ATU boxes is fiberglass. Fiberglass insulation is relatively inexpensive, and provides good thermal and acoustical performance. In most cases, some type of binder is applied to the airstream-facing side of the fiberglass to minimize fiber erosion. This is referred to as 'dual density' insulation as the density of the coated material 'skin' is greater than the core material.

FOIL-FACED FIBERGLASS INSULATION

In situations where erosion resistance above that of dual density is required, foil-faced insulation may be specified. The material, commonly referred to as FSK (foil scrim kraft) facing is adhered to the face of the fiberglass insulation. Critical to the specification is whether or not the FSK material is to be included in the overall material density. Generally, the density of the underlying insulation should be clearly stated.

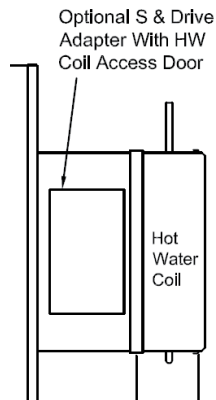
CLOSED-CELL FOAM INSULATION

Closed-cell foam has acoustical and thermal properties at near parity to dual density fiberglass. In addition to its non-fibrous composition, the material resists mold and mildew growth and is easily cleanable. The material will not wick moisture on exposed edges. The material is more costly than dual density fiberglass and this must be considered when specifying the material.

DOUBLE-WALL INSULATION

For very stringent specifications where fiber erosion must be completely eliminated as a possibility, solid or double wall metal liners have been specified. These liners are extremely expensive and negatively affect the sound performance of the terminal unit to which it is applied.

ACCESS OPTIONS



COIL ACCESS

On fan powered terminals with discharge mounted hot water coils that require an access door, a section of insulated duct is added to the discharge of the terminal upstream of the coil.

All coil access doors are insulated with ThermoPure closed cell fiber free insulation. The closed cell foam insulation is used for achieving an air tight seal on the access door. Also, by using the closed cell foam insulation there is no concern for the access door insulation tearing or the edge coating seal being damaged during removal.

INLET FLOW SENSORS

OVERVIEW OF AVAILABLE SENSORS

MULTI-QUADRANT AVERAGING FLOW SENSOR

METALAIRE's standard air flow sensor is a multi-quadrant averaging sensor, suitable for use in most differential pressure feedback air control circuits. The accuracy or minimum-maximum set point is $\pm 5\%$ or less when calibration is accurately performed.

CENTER AVERAGING CROSS FLOW SENSOR

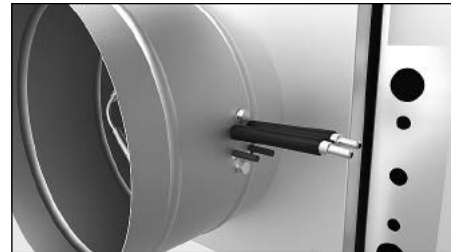
METALAIRE's multi-point center averaging cross flow sensor is one of the most accurate flow sensors on the market today regardless of inlet conditions. The repeatability of generating a large amplification velocity pressure signal allows quick and easy balancing and commissioning of the Air Terminal Unit.

HIGH GAIN "CROSS-BOW" FLOW SENSOR

The optional "cross-bow" sensor is a premium sensor where a K Factor of 3+ is specified to allow register control or air flow set points. It also allows control at lower CFM settings than the standard Multi-Quadrant Averaging Flow Sensor.

INLET FLOW SENSOR PORTS

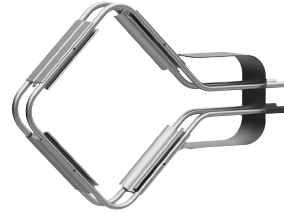
METALAIRE air terminal units are provided with external piping sensor connections, allowing visual verification of inlet sensor piping connections without having to remove the primary duct or relying solely on tubing color coding. The units are shipped with red stripe tubing on the high pressure port and green stripe tubing on the low pressure port of the inlet sensor. The tubing are short pieces with barbed fittings. The "HIGH" pressure side of the inlet flow sensor is what the air hits first and the "LOW" pressure side of the inlet flow sensor is farthest away from the air flow. All pneumatic piping diagrams or digital wiring diagrams display the color of tubing used on the "HIGH" and "LOW" pressure ports of the inlet flow sensor.



MULTI-QUADRANT AVERAGING FLOW SENSOR

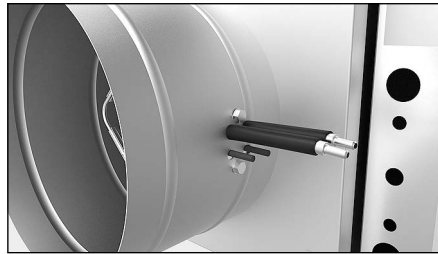
MODEL	INLET SIZE	K FACTOR
TH, FCI, FCQ FVI, DD DH, BP RT, RA TL (4 to 10) FCL C2 (4 to 8) FVL C2 (4 to 8)	04 Rnd	300
	05 Rnd	375
	06 Rnd	540
	07 Rnd	760
	08 Rnd	990
	09 Rnd	1250
	10 Rnd	1640
	12 Rnd	2350
	14 Rnd	3250
	16 Rnd	4100
TL (12)	12 Flat Oval	2270
TL (14) & FVL C6	14 Flat Oval	2850
TL (16)	16 Flat Oval	3550
FVL C4	14x8 Rect	2450
FCL C4	16x8 Rect	2770
FCI, FCQ, & FVI C7	18x16 Rect	6200
TH 20	20x16 Rect	6430
TH 24	24x16 Rect	7270

Note: K-factor is the calibration flow constant at 1" w.g. delta P

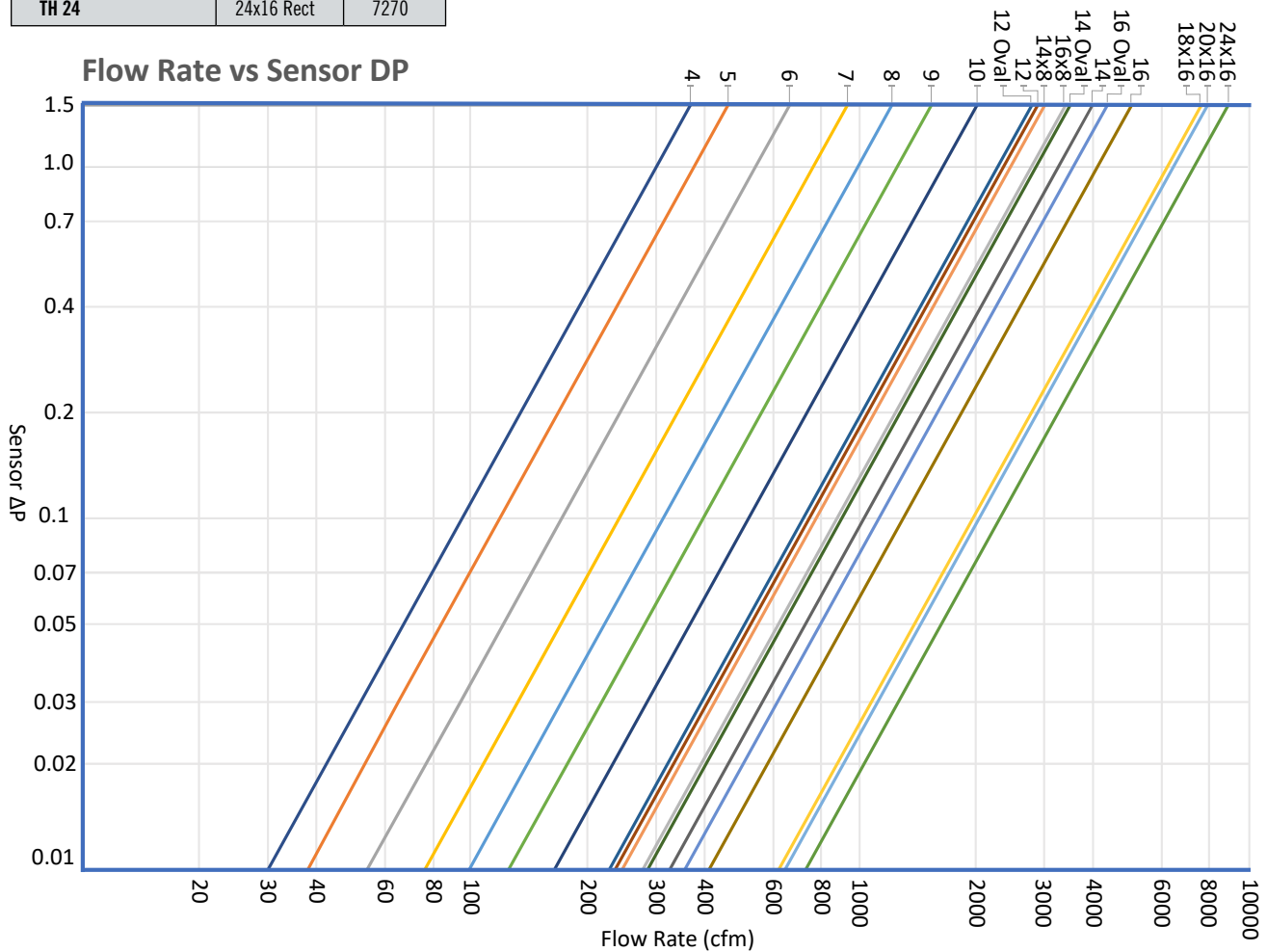


How to tell which sensor you have:

Multi quadrant. Two additional metal balancing taps directly out the inlet tube.



$$Cfm = \sqrt{\Delta p} \times K \text{ Factor}$$



CENTER AVERAGING FLOW SENSOR

INLET SIZE	K FACTOR
4	215
5	345
6	517
7	658
8	929
9	1154
10	1417
12	2082
14	2718
16	3698
120V	2010
140V	2610
160V	3712
16x8	2816
18x16	5297
20x16	5670
24x16	6797

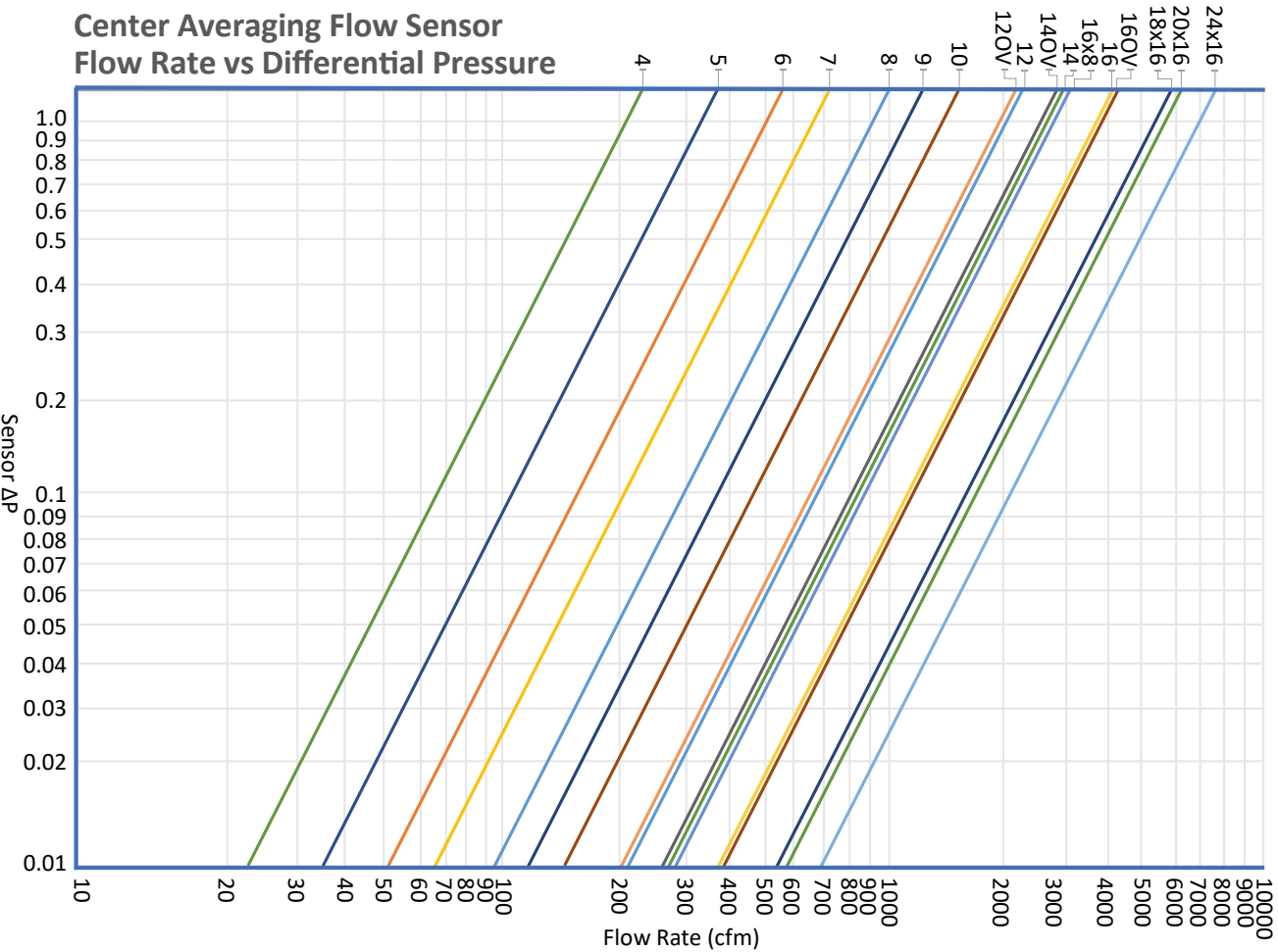
Note: K-factor is the calibration flow constant at 1" w.g. delta P



How to tell which sensor you have:
Center Averaging. Only two tubes coming out the inlet tube with a T in the middle of the tubing.



$$Cfm = \sqrt{\Delta p} \times K \text{ Factor}$$

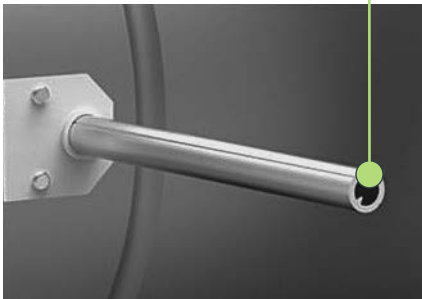


PRIMARY AIR DAMPERS

The METALAIRE damper blade is manufactured with a flexible gasket and mounted without adhesives to provide an excellent close off seal. Mechanically fastened damper assembly is double layer, 18 gauge equivalent, galvanized steel with integral blade seal. Damper leakage is less than 1% of maximum CFM at 3.0"wg static pressure.

METALAIRE has designed the primary air damper shaft assembly for improved performance. The 1/2" diameter shaft is a one-piece, continuous shaft extruded from aluminum alloy. The shaft has a straightness tolerance of 0.010"/ft which provides extremely smooth operation. Determining damper position is straightforward since the shaft has a built-in damper position indicator. The indicating arrows provide a high-contrast against the shaft interior for easily visible damper position confirmation. The continuous shaft is much stronger than multiple-piece shaft assemblies, which rely on a thin damper blade to span the middle part of the damper assembly, thus eliminating the opportunity for flexing and twisting of the damper blade.

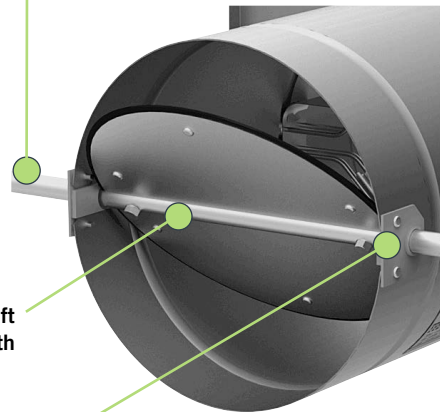
High contrast damper
position indication



Easily withstands
200 in-lbs of torque

Continuous shaft
for added strength

0.010"/ft straightness
tolerance for smooth
operation



HOT WATER COILS

NOTES FOR COIL PERFORMANCE

- Hot water coil data is for discharge mounted coils.
- For water valve sizing, contact your METALAIRE representative.
- METALAIRE coil data is AHRI 410 certified.

IMPERIAL NOTES

- Tabulated values are in MBH (thousands of BTU/hr).
- Head loss is in feet of water.
- MBH values are based on a ΔT (temperature difference) of 115°F between entering air and entering water. For other ΔT s, multiply the MBH value by the factors shown:

$$\text{Air Temperature Rise} = 927 \times \text{MBH} / \text{CFM}$$

$$\text{Water Temperature Drop} = 2.04 \times \text{MBH} / \text{GPM}$$

METRIC NOTES

- Tabulated values are in kW (thousands of Watts).
- Head loss is in kPa.
- kW values are based on a ΔT (temperature difference) between entering air and entering water of 64°C. For other ΔT s, multiply the kW values by the factors shown:

$$\text{Air Temperature Rise} = 579 \times \text{kW} / \text{Air Flow (L/s)}$$

$$\text{Water Temperature Drop} = 0.17 \times \text{kW} / \text{Water Flow (L/s)}$$

STANDARD NOTES FOR HOT WATER COILS

- Hot water coils are factory mounted on the discharge of the air terminal.
- Discharge of coil is slip and drive configuration.
- Hot water coils are enclosed in a 20 gauge galvanized steel casing.
- All hot water coils are shipped uninsulated.
- Standard coil fins are 0.045" thick aluminum mechanically bonded to tubing.
- Coils are leak tested at 300psig with minimum burst of 2000 psig at ambient temperature.



IMPERIAL		METRIC	
ΔT (°F)	Factor	ΔT (°C)	Factor
50	0.44	30	0.48
60	0.52	35	0.55
70	0.61	40	0.63
80	0.70	50	0.78
90	0.79	60	0.94
100	0.88	64	1.00
115	1.00	70	1.08
125	1.07	80	1.24
140	1.20		
150	1.30		

ELECTRIC HEAT

STANDARD FEATURES:

- ▶ Primary automatic reset thermal cutout
- ▶ Secondary manual reset thermal cutout
- ▶ Air pressure switch (standard on non-fan powered boxes, optional on fan powered boxes)
- ▶ 80/20 nickel chrome element wire
- ▶ Magnetic contactor
- ▶ Line terminal block
- ▶ Staged heat - 1, 2, or 3 stages/steps
- ▶ Transformer
- ▶ Interlock fan control relay (fan powered boxes only)

SCR HEAT CONTROL:

- ▶ 2-10Vdc
- ▶ 4-20mA
- ▶ Pulse Width Modulation (PWM)

OPTIONAL FEATURES:

- ▶ SCR heat
- ▶ Door interlocking disconnect switch
- ▶ Line disconnect fusing
- ▶ Transformer with fused primary
- ▶ Transformer with fused secondary
- ▶ Transformer with both fused primary and secondary
- ▶ Insulated control enclosure
- ▶ Dust tight control enclosure
- ▶ Access door

TOTAL AMPS CALCULATION

- ▶ Heater Amps Single Phase = $(kW \times 1000) / (LINE \ VOLTAGE)$
- ▶ Heater Amps Three Phase = $(kW \times 1000) / (LINE \ VOLTAGE \times 1.732)$
- ▶ Motor F.L.A. is the nameplate amp rating of a given motor (depends on HP and Voltage)
- ▶ Total Circuit Amps = (Heater Amps + Motor F.L.A.)
- ▶ Minimum Circuit Ampacity = (Total Circuit Amps X 1.25)
- ▶ Maximum Overcurrent Protection = (Minimum Circuit Ampacity) rounded up to the nearest standard Fuse or HACR Circuit Breaker size.

UL 60335 AND METALAIRE ELECTRIC HEAT DESIGN CRITERIA

All METALAIRE Air Terminal Units with Electric Heat are built to UL 60335 standards. Intertek/ETL is the listing agency we have chosen to enforce UL 60335 requirements. The agency is primarily concerned with safety of the product, especially in regards to fire and electric shock hazards. The following items are governed by the listing agency to ensure safety:

- ▶ Sheet metal thickness and corrosion resistance.
- ▶ All internal components must be either UL listed or recognized.
- ▶ Internal wiring and electrical spacings of live uninsulated parts in regard to Voltage Ratings.
- ▶ Internal Control Enclosure and electrical component temperatures.
- ▶ Primary and Secondary temperature limit ratings.
- ▶ Airflow and Fan Interlock requirements.
- ▶ Discharge and Duct temperature rise. This indirectly influences our minimum airflow requirements.
- ▶ Maximum kW for a given unit size based upon 17 kW/Sq. Ft. and available airflow.
- ▶ Duct insulation and adhesive temperature and flammability ratings.

All Air Terminal Unit models must be tested before the ETL label is issued to our products. The agency representative chooses at least 2 samples of each model to be tested, usually the largest and smallest units with the maximum kW allowable for each size. A specially designed duct with temperature sensing thermocouples is attached to the discharge of the heater to measure temperature rise under various normal and abnormal operating conditions. All of our units with Electric Heat are designed for zero clearance to combustible materials. This limits our maximum discharge temperature to 200° F and the duct surface temperature to 197° F.

To meet the above temperature rise, testing has shown that the primary limit control (auto reset thermal cutout) should be rated at 120° F. The spacing between the return bend of the element and the primary limit control, as well as general placement, is determined by this test.

As the airflow begins to drop, glowing of the return bends send radiant energy to the cutout, adding to the air temperature sensed by this device. The cutout is assured of tripping before the maximum temperature is achieved, by breaking the operating or safety contactors and de-energizing the heating elements.

In the event of primary limit control failure, a backup system is employed that is completely independent of the primary limit control or controlled switching device (operating contactor or safety contactor). This secondary limit control system utilizes a manual reset thermal cutout that controls a backup contactor wired in series with the heating elements. The requirements and placement of the manual reset cutout is also determined by testing to limit the duct temperature to a maximum of 212° F.

To meet the above temperature rise, testing has shown that the secondary limit control (manual reset thermal cutout) should be rated at 160° F maximum. The spacing between the return bend of the element and the primary limit control, as well as general placement, is determined by this test. The cutout is assured of tripping before the maximum temperature is achieved by breaking the backup contactor and deenergizing the heating elements. All tests are conducted under specific duct static pressure conditions.

In addition to temperature rise, a method of fan or airflow interlock system must be provided to prevent heater operation when no airflow is present.

All single duct units with electric heat utilize an airflow-sensing switch that measures supply airflow at the discharge side near the air valve. It must read a total pressure (static + velocity) of at least 0.05" of positive pressure to operate. On Dust Tight applications, the negative port of this switch must be vented outside of the control enclosure to prevent reading pressure buildup within the enclosure.

All fan powered units with electric heat have a fan interlocking relay that will not allow the heater to

energize until power to the fan motor is confirmed. The control transformer is also wired in series with the optional motor fuse, to prevent the heater from energizing by breaking all control voltage to the heater when the fuse opens. The optional airflow-sensing switch can be specified as a secondary device. It requires a probe placed near the blower discharge to sense positive pressure. The fan interlock relay remains operational when the optional airflow switch is chosen.

Units with electric heat should have a minimum airflow of 70 CFM per kW. Also, a maximum leaving air temperature of 115° F should be observed to prevent premature heater coil failure. The Temperature Rise is a function of kW and airflow: $TR = (kW \times 34.13) / (CFM \times 1.085)$. The entering air temperature will determine the leaving air temperature: Entering Air Temperature + Temperature Rise = Leaving Air Temperature. In this case, we want to limit the leaving air temperature to 115° F maximum. Ideally, per an ASHRAE Article published in a 1979 handbook, the leaving air temperature should be around 15° F above the room set point to prevent air stratification. Our catalog recommends no more than 20° F above the set point.

How does this all relate to METALAIRE design? The primary cutout limit was selected to be 120° F to meet the Primary Limit Control test. These cutouts are generally accurate within 5° F. To prevent nuisance tripping of the cutout, and eventual fatigue failure, the leaving air temperature must never exceed 115° F. Also, in the event that either the auto reset or airflow switch trips due to sudden loss of airflow or improperly programmed DDC control systems that allow the heater to function during re-calibration, stored heat will build up within the heater, allowing the temperature to continue to rise above the auto reset set point. To prevent unnecessary tripping of

the manual reset, the setting of 160° F provides a safe temperature spread and prevents this from occurring. At the same time, it prevents duct temperatures above 212° F from being reached in the event that there is total failure of the primary limit system.

The 70 CFM/kW rule assumes that the inlet air temperature does not exceed 70° F. This temperature is usually less for single duct units (55° F typical). If it is known that the inlet temperature will always be below 70° F, calculation of the Catalog program can be used to determine the outlet temperature per the formulas above. As an example, a 5 kW heater will need at least 350 CFM if the inlet air temperature is 70° F, but this same heater can go as low as 265 CFM if the inlet air temperature is 55° F. Since the ideal leaving air temperature is 95° F or less, it is recommended not to go below 70 CFM per kW.

Fan Powered Units use a mix of Primary Air (about 55° F) and Plenum Air (about 75° F). This mix will usually average out to about 70° F or less unless the primary air is set to zero. This further reinforces the need to limit the minimum airflow setting to 70 CFM per kW.

ELECTRIC HEAT WIRING

All units with electric heat are Single Point electrical connection devices. The power supply voltages can be Single or Three Phase. See the chart below for voltage availability and requirements. In all cases of Three Phase power, only 3 wires of a 4-Wire supply will be used. A separate neutral is not required.

- ▶ 120 volts, single phase is derived from a 208 volt, 3-phase, 4-wire supply. The voltage is taken from the grounded neutral and any one of the 3 hot legs.
- ▶ 220 volts, single phase (usually 50 / 60 HZ, Overseas) is derived from a 380 volt, 3-phase, 4-wire supply. The voltage is taken from the grounded neutral and any one of the 3 hot legs.
- ▶ 240 volts, single phase can be derived from 2 possible sources:
 - 1) Domestically, it is usually a stand alone transformer supplying a 3-phase, 3-wire supply and has no neutral.



SINGLE DUCTS		
Supply Volts	Phase	No. of Wires
120	1	2
208	1	2
220	1	2
240	1	2
277	1	2
380	1	2
415	1	2
480	1	2
415	1	2
208	3	3
240	3	3
415	3	3
380	3	3
480	3	3

The exception is the residential market where the transformer has an center tapped grounded neutral to supply 120 volts for normal household usage with 240 volts available for heavy appliances, such as central A/C, Cooking Ranges, and Electric Clothes Dryers.

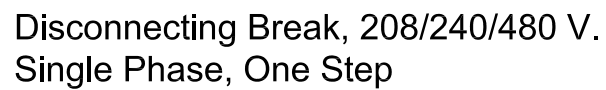
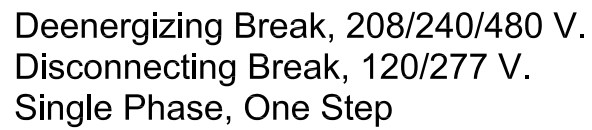
- 2) Commercially, it is usually derived from a 415 volt, 3-phase, 4-wire supply. The voltage is taken from the grounded neutral and any one of the 3 hot legs.
- ▶ 277 volts, single phase, is derived from a 480 volt, 3-phase, 4-wire supply. The voltage is taken from the grounded neutral and any one of the 3 hot legs.
 - ▶ 208 volts and 480 volts, 3-phase may not have a separate neutral available in some older buildings. This is called a Delta connected supply transformer. All 4-wire supplies are Wye connected transformers. This is not a concern with single duct units, since a separate neutral is not required.



FAN POWERED		
Heater Voltage	Motor Voltage	Separate Neutral Required
120 V 1 PH	120 V 1 PH	NO
208 V 1 PH	120 V 1 PH	YES
277 V 1 PH	277 V 1 PH	NO
480 V 1 PH	277 V 1 PH	YES
208 V 1 PH	208 V 1 PH	NO
208 V 3 PH	120 V 1 PH	YES
480 V 3 PH	277 V 1 PH	YES
208 V 3 PH	208 V 1 PH	NO

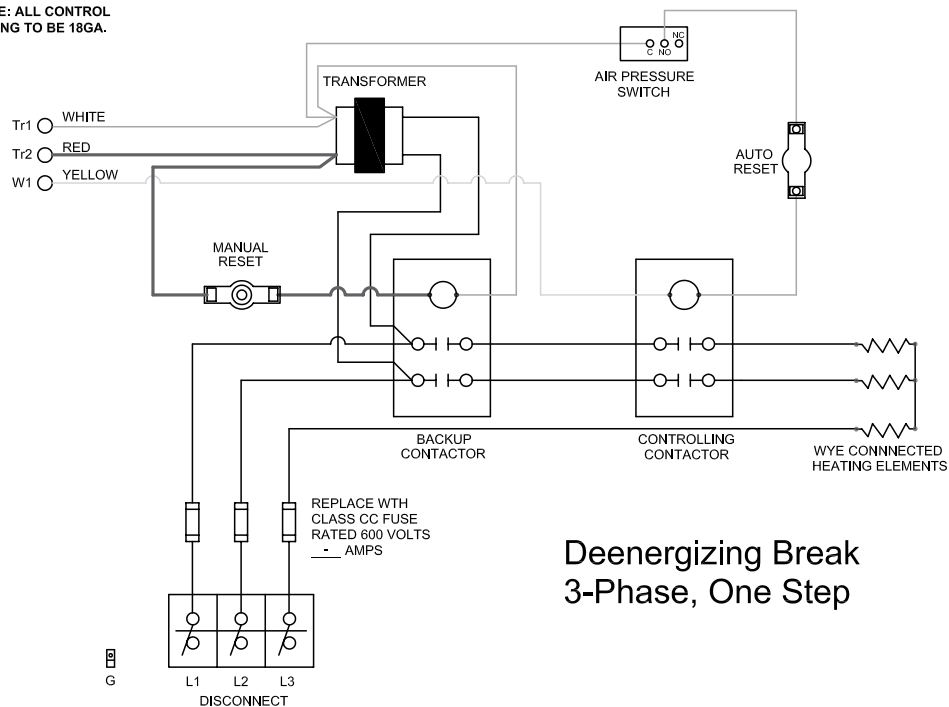
ELECTRIC HEAT

ACC-16



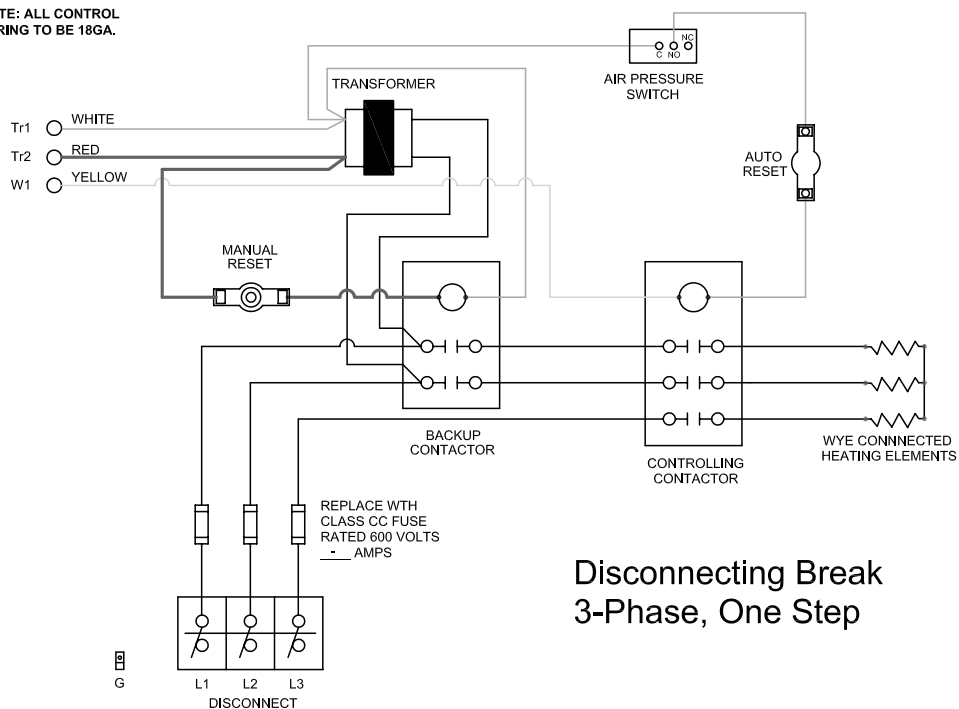
ELECTRIC HEAT – TYPICAL WIRING DIAGRAMS

NOTE: ALL CONTROL
WIRING TO BE 18GA.



Deenergizing Break
3-Phase, One Step

NOTE: ALL CONTROL
WIRING TO BE 18GA.



Disconnecting Break
3-Phase, One Step

MOTORS

PSC MOTORS

The vast majority of motors used in air terminal units are PSC (permanent split capacitor) type motors. They are generally 6-pole AC motors with a nominal speed of 1075 RPM. They have an efficiency of around 50% at full load. The PSC motor can be used with a speed control down to about 50% of max RPM. When utilized at part load conditions, however, the PSC operating efficiency falls off dramatically, to as low as 15%. When a VAV terminal must operate at part load conditions, special consideration should be given to ECM motors.

AVAILABLE VOLTAGES

METALAIRE's motors are available in 3 different voltages, 120v, 208-240v, and 277V. All motors are single phase. Three phase motors or 480V motors are not available.

Model and Motor Type	Case Size	Motor HP	120V	230V	230V
			Full Load Amps	Full Load Amps	Full Load Amps
FCI w/PSC	2	1/8	2.6	0.8	1.1
	3	1/8	2.6	0.8	1.1
	4	1/4	4.8	1.9	1.9
	5	1/3	8.8	3.0	3.6
	6	1	N/A	6.2	6.2
	7	3/4 (2)	22.8	8.0	8.6
FCL w/PSC	2	1/4	4.8	1.9	1.9
	4	1/4 (2)	9.6	3.8	3.8

Model and Motor Type	Case Size	Motor HP	120V	230V	230V
			Full Load Amps	Full Load Amps	Full Load Amps
FCQ w/PSC	2	1/8	2.6	0.8	1.1
	3	1/4	4.8	1.9	1.9
	4	1/3	8.8	3	3.6
	5	1/3	8.8	3	3.6
	6	1/3 (2)	16.6	6	7.2
	7	3/4 (2)	22.8	8	8.6
FVI w/PSC	1	1/8	2.6	0.8	1.1
	2	1/6	3.1	0.8	1.1
	3	1/4	4.8	1.9	1.9
	4	1/4	4.8	1.9	1.9
	5	1/3	8.8	3	3.6
	6	1/2	9.8	3.5	3.9
	7	1	N/A	6.2	6.2
FVL w/PSC	2	1/8	2.6	0.8	1.1
	4	1/4	4.8	1.9	1.9
	6	1/3	8.8	3	3.6
FCI w/ECM	2	1/3	4.7	2.8	2.4
	3	1/3	4.7	2.8	2.4
	4	1/2	6.6	3.9	3.4
	5	1	12	7.1	6.2
	6	1	12	7.1	6.2
	7	1 (2)	24	14.2	12.4
FCL w/ECM	2	1/3	4.7	2.8	2.4
	4	1/3 (2)	9.4	5.6	4.8
FCQ w/ECM	2	1/3	4.7	2.8	2.4
	3	1/2	6.6	3.9	3.4
	4	1	12	7.1	6.2
	6	1/2 (2)	13.2	7.8	4.8
	7	1	12	7.1	6.2
FVI w/ECM	1	1/3	4.7	2.8	2.4
	2	1/3	4.7	2.8	2.4
	3	1/2	6.6	3.9	3.4
	4	1/2	6.6	3.9	3.4
	5	1	12	7.1	6.2
	6	1	12	7.1	6.2
	7	1	12	7.1	6.2
FVL w/ECM	2	1/3	4.7	2.8	2.4
	4	1/3	4.7	2.8	2.4
	6	1/2	6.6	3.9	3.4

ECM MOTOR

METALAIRE offers the optional ECM motor for the FCI, FCL, FVI and FCQ fan powered terminal units. Add the ECM motor to any of these and you have an ultra high efficient air terminal.

WHAT IS AN ECM MOTOR?

ECM stands for Electronically Commutated Motor. The ECM motor is a brushless-DC motor with built in speed and torque controls.

Unlike a conventional induction motor, ECM motor regulates itself by automatically changing its torque and speed to maintain a pre-programmed level of constant airflow over a wide range of external static pressures and does so without the use of airflow sensors. The ECM's regulated airflow output remains constant over that same range of static pressure.

For optimum heating, the ECM system can be programmed to deliver just the right level of airflow for both low and high.

FEATURES AND BENEFITS

ULTRA HIGH EFFICIENCY

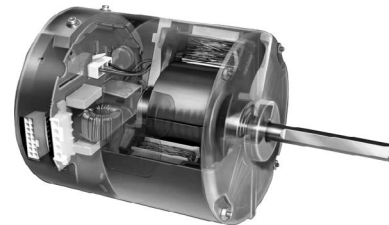
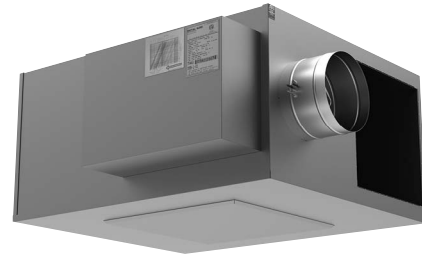
ECM efficiencies are as high as 82%. At full load the ECM is 20% more efficient than a standard induction motor. At low speed the ECM is over 30% more efficient than a standard induction motor. On constant fan speed, the ECM consumes 60-80 Watts as compared to 400 Watts for the induction motor. The permanent magnet DC design allows it to maintain its efficiency over its wide speed range.

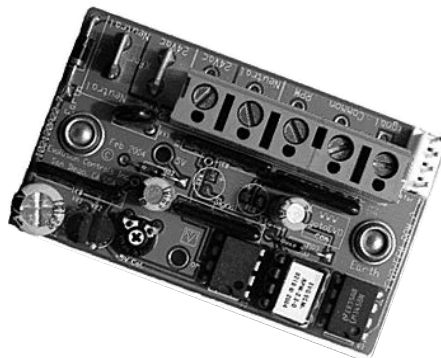
FACTORY PROGRAMMED

Programming options for the ECM include: start/stop ramp rates, on/off blower delays, and many other functions all stored in the motor's memory. Even its speed and torque characteristics can be customized to meet specific performance requirements.

SELF REGULATING CONSTANT AIRFLOW

The ECM variable-speed motor can run in a wide range of speeds. The motor can be programmed to deliver constant airflow into a wide range of external static pressures in an air distribution system. This is all accomplished without the use of external sensors.





MODEL ECM-VCU – MANUAL ADJUSTMENT

The ECM-VCU control allows accurate manual adjustment and monitoring of fans using ECM motor. These are fractional horsepower air moving motors featuring an internal microprocessor. The design provides exceptional efficiency, performance, and motor life. These self regulating motors may be factory configured so the fan will provide constant mass airflow.

OPERATION

ECM motors configured for Vspd operation are factory configured for external torque or airflow adjustment. The configuration data includes the fan manufacturer's specified adjustment range. A numerical flow index accurately adjusts the fan to the desired torque or air-flow. The flow index is a number from 0-100 having a linear relationship to the minimum to maximum torque or airflow range specified by the motor fan.

The ECM-VCU allows local on/off and fan airflow adjustment. Rotating a single screwdriver adjuster changes the variable output signal to the motor from off to full output. While rotating the adjuster, a numerical flow index is locked on the illuminated numerical display. After adjustment, the display shows fan RPM.

The ECM-VCU may also be used where automation systems only turn the fan on or off.

Specifications:

Power NEC Class II Only
24 Vac + / - 20% 50 / 60 Hz
4 W, 6 VA

Flow Index Adjustment 270° rotation
F Off – 0-100



FACTORY PROVIDED CONTROLS

CONTROL SEQUENCE NOMENCLATURE

The control sequences begin with a digit that refers to a model/terminal type. 1 is single duct model TH or TL, 2 is dual duct model DD or DH, etc. See Chart 1. The middle digits are the code for the sequence. 10 is Pneumatic Pressure Dependent, 82 is Direct Digital Control with Heat/Cool controller with Hot Water Re-Heat, etc. See Chart 2.

The last digit, a letter, refers to the transformer. A is 120/24V, N is No transformer, etc. See Chart 3.

EXAMPLES

880A is fan powered model FVI, FVL with a Digital Cooling only controller and a 120/24v transformer. 983E is a fan powered model FCI, FCL, FCQ with a Digital Heat/Cool controller with Electric Heat.

First Digit-Model-Chart 1

First Reference Digit	Model Type
1	TH, TL-Single Duct
2	DD, DH Dual Duct
3	BP-Bypass
4	SR-Retrofit
5	RA-Retrofit
6	RT-Retrofit
8	FVI, FVL-Fan Powered
9	FCI, FCL, FCQ-Fan Powered

Last Letter-Transformer-Chart 3

Last Reference Letter	Transformer
A	120/24 V
C	277/24 V
F	208-240/24 V
N	No Transformer
E	Electric Heat Transformer

Middle Digits-Control Sequence-Chart 2

PPI-Pneumatic Pressure Independent	
14M	DA/NC Multi Function, Includes Controller and Actuator, No T-stat
15M	DA/NO Multi Function, Includes Controller and Actuator, No T-stat
16M	RA/NC Multi Function, Includes Controller and Actuator, No T-stat
17M	RA/NO Multi Function, Includes Controller and Actuator, No T-stat
35M	Retrofit H-NO, Includes Controller and Actuator, No-T-stat
36M	Retrofit C-NO, Includes Controller and Actuator, No-T-stat
38M	Dual Duct DA/C-NO/H-NC, Includes Controller and Actuator, No T-stat
39M	Dual Duct RA/C-NO/H-NC, Includes Controller and Actuator, No T-stat
40M	Static Pressure Control, Includes Controller and Actuator, No T-stat
41M	Dual Duct DA/C-NC/H-NO, Includes Controller and Actuator, No T-stat
42M	Dual Duct DA/C-NO, RA/H-NC, Includes Controller and Actuator, No T-stat
43M	Dual Duct RA/C-NC, DA/H-NO, Includes Controller and Actuator, No T-stat
44M	Dual Duct DA/C-NO/H-NC Includes Controller and Actuator, No T-stat
45M	Dual Duct RA/C-NO/H-NC Includes Controller and Actuator, No T-stat
DDC-Direct Digital Control	
90	Cooling only, Includes Controller and Actuator, No T-stat
91	Heat/Cool Auto Changeover, Includes Controller and Actuator, No T-stat
92	Heat/Cool with Hot Water Heat, Includes Controller and Actuator, No T-stat
93E	Heat/Cool with Electric Heat, Includes Controller and Actuator, No T-stat

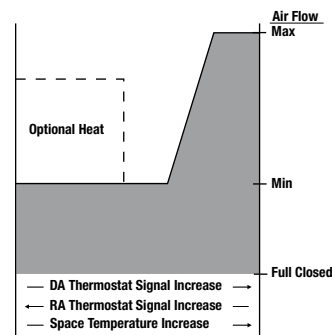
PNEUMATIC CONTROLS

A direct acting thermostat causes an increase in branch pressure as the room temperature rises. A reverse acting thermostat causes a decrease in branch pressure as the room temperature rises. Since the pneumatic actuator is a spring return device, the damper can be connected so that without main pressure it will return to normally closed position to shut off the air to the room or a normally open position to permit unobstructed air flow to the room.

PNEUMATIC PRESSURE INDEPENDENT

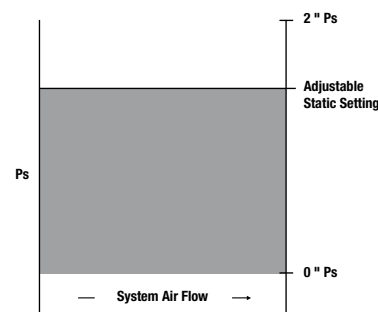
Pressure independent pneumatic air terminal actuators are powered by signals from a flow control device which balances pressure readings from the main air supply and the branch air pressure from the thermostat. The damper's position is regulated by the flow control which operates within preset minimum and maximum flow rates.

Multi-function flow controllers for pressure independent applications can be field modified for use with a direct or reverse acting thermostat and the damper actuator can be switched to either normally open or normally closed position without adding control components.



PNEUMATIC-STATIC CONTROL

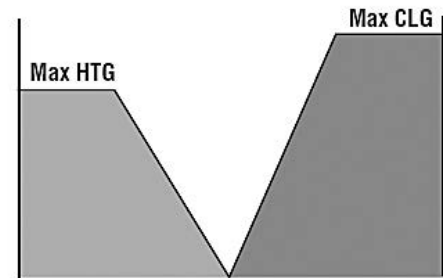
Local or remote pickup senses duct static and signals controller to maintain constant static at sensing point. It may be used for direct static control or as a bypass flow method. 0"-2" range.



TYPICAL DUAL DUCT PNEUMATIC CONTROLS

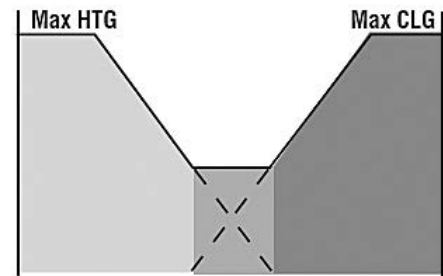
PNEUMATIC PRESSURE INDEPENDENT-VARIABLE VOLUME/DUAL FLOW CONTROLLERS/ZERO MINIMUM

Thermostat signals dual flow controls to regulate hot and cold duct damper positions in sequence. Flow control modulates cold duct damper in response to signals from the room thermostat within preset maximum to 0 CFM range while hot duct remains closed. If room temperature drops below the set point, the cold duct damper is closed and the hot duct damper is modulated between 0 and the maximum CFM range. Once the set point has been reached, neither heating nor cooling occurs.



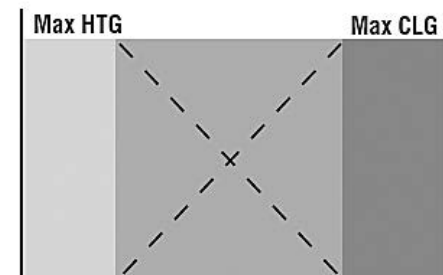
PNEUMATIC PRESSURE INDEPENDENT- VARIABLE VOLUME/DUAL FLOW CONTROLLERS/REDUCED MIXING

Thermostat signals dual flow controls to regulate hot and cold duct damper positions in sequence. Flow control modulates cold duct damper in response to signals from room thermostat within preset maximum and minimum CFM range while hot duct damper remains closed. If the set point is still not reached, the unit switches from the cooling minimum to the heating minimum CFM with hot and cold air blending. If room temperature still remains below the set point, the cold duct damper goes to minimum or closed and the hot duct damper is modulated between its minimum and maximum CFM range until the set point is reached.



PNEUMATIC PRESSURE INDEPENDENT- CONSTANT VOLUME/DUAL FLOW CONTROLLERS/MIXING SENSORS

Flow controllers respond to signals from the room thermostat in a complimentary fashion so that as the hot duct damper closes, the cold duct damper opens and vice versa. In this way varying volumes of hot and cold air are blended to maintain a constant volume of air to the room.



DDC ELECTRONIC CONTROL CAPABILITY

The majority of controls installed in HVAC systems today are direct digital controls (DDC). METALAIRE can mount and wire any manufacturer's control product that fits on our standard control panel, regardless of the brand. Mounting of other manufacturer's control enclosures or transformer is not available.

In those cases where it is desirable to have the controls field mounted and wired, a basic air terminal without controls can be purchased from METALAIRE. The basic unit includes a control panel and cover.

In either case where controls are to be factory mounted and wired by METALAIRE or field installed by the control manufacturer, most types of DDC controllers require a flow sensor. METALAIRE will provide our center averaging flow sensor which is compatible with all electronic control devices currently on the market. We can mount a control manufacturer's compatible sensor for an additional cost.

Visit Metalaire.com for a complete controls offering

SOUND PATH ATTENUATION ASSUMPTIONS

The current AHRI standard for NC calculation is AHRI 885-08

AHRI-885-08 Radiated Sound Path Assumptions

Assumptions	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
Ceiling/Space Effect*	16	18	20	26	31	36
Total dB Reduction	18	19	20	26	31	36

Note: Attenuation assumptions are based upon factors located in the AHRI Standard AHRI-885-08

Parameters: 1) Mineral fiber ceiling tile, 5/8" thick (35 lb / 3 ft density)

2) The plenum space is at least 3 ft. deep and either wide (> 30 ft.) or insulated

* Combined effect including absorption of the ceiling tile, plenum absorption and room absorption. This is new to AHRI-885-08; AHRI-885-90 had separate lines for these absorptions.

AHRI-885-08, Appendix E defines "Small" for applications less than 300 CFM

AHRI-885-08 Discharge Sound Path Assumptions, Small

Assumptions	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
Duct Lining	2	6	12	25	29	18
End Reflection	9	5	2	0	0	0
Flex Duct	6	10	18	20	21	12
Space Effect	5	6	7	8	9	10
Power Split	0	0	0	0	0	0
Total dB Reduction	24	28	39	53	59	40

Note: Attenuation assumptions are based upon factors located in the AHRI Standard AHRI-885-08

Parameters: 1) Fiberglass duct lining is 1" thick, 8 x 8 duct length is 5 feet

2) Flex duct is 8" in diameter and 5 feet in length for run to diffuser

3) Flex duct has vinyl core

4) Room size is 2400 3 ft

5) Unit is located 5 feet from measurement point

6) Sound power split: attenuation credit based on unit feeding one outlet (10 log (# outlets=1)).

AHRI-885-08, Appendix E defines "Medium" for applications from 300-700 CFM

AHRI-885-08 Discharge Sound Path Assumptions, Medium

Assumptions	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
Duct Lining	2	4	10	20	20	14
End Reflection	9	5	2	0	0	0
Flex Duct	6	10	18	20	21	12
Space Effect	5	6	7	8	9	10
Power Split	3	3	3	3	3	3
Total dB Reduction	27	29	40	51	53	39

Note: Attenuation assumptions are based upon factors located in the AHRI Standard AHRI-885-08

- Parameters:
- 1) Fiberglass duct lining is 1" thick, 12 x 12 duct length is 5 feet
 - 2) Flex duct is 8" in diameter and 5 feet in length for run to diffuser
 - 3) Flex duct has vinyl core
 - 4) Room size is 2400 3 ft
 - 5) Unit is located 5 feet from measurement point
 - 6) Sound power split: attenuation credit based on unit feeding one outlet (10 log (# outlets=2)).

AHRI-885-08, Appendix E defines "Large" for applications 700 CFM and greater

AHRI-885-08 Discharge Sound Path Assumptions, Large

Assumptions	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
Duct Lining	2	3	9	18	17	12
End Reflection	9	5	2	0	0	0
Flex Duct	6	10	18	20	21	12
Space Effect	5	6	7	8	9	10
Power Split	5	5	5	5	5	5
Total dB Reduction	29	30	41	51	52	39

Note: Attenuation assumptions are based upon factors located in the AHRI Standard AHRI-885-08

- Parameters:
- 1) Fiberglass duct lining is 1" thick, 15 x 15 duct length is 5 feet
 - 2) Flex duct is 8" in diameter and 5 feet in length for run to diffuser
 - 3) Flex duct has vinyl core
 - 4) Room size is 2400 3 ft
 - 5) Unit is located 5 feet from measurement point
 - 6) Sound power split: attenuation credit based on unit feeding one outlet (10 log (# outlets=3)).

SYSTEM DESIGN AND NOISE GENERATION

The central system equipment and distribution ductwork must be properly designed if the air terminal units are to operate correctly. Noise generated at the central system travels through the duct system to the individual zones and can be objectionable when it is sufficient to 'break out' of the duct system or is carried through the duct system to 'discharge' into the occupied zone.

The most common source of objectionable noise emanating from VAV systems arises from high static pressure in primary (upstream of the terminal unit) duct systems. These pressures have a two-fold effect of increasing the central system sound levels and of causing the terminal units to operate noisily. When the pressure is too high, the primary air damper must close to compensate. The air flowing past the damper must do so at a relatively high pressure drop creating objectionable noise levels.

This is seen quite commonly in VAV systems when the highest inlet static pressure in a distribution duct is used as the default condition for all terminal units served by the trunk duct. The result is over sizing of the upstream VAV terminal units. The result is additional system cost, excessive noise, and inefficient operation of the terminal units. To avoid this condition, the designer would be better suited to provide a balancing damper ahead of the upstream branch ducts serving these terminal units, reducing the inlet pressure at each unit.

System noise is also commonly generated by improper duct design or installation. Particular care should be taken in the excessive and improper use of flex duct as it is more susceptible to break out noise and can cause noisy airflow equipment operation when installed in a 'kinked' fashion. Avoid using 'bullhead' tees and tight elbows before and after terminal units and discharge devices.

In order to ensure proper VAV terminal selection, the system sound pressure levels should be determined. These levels can be used in accordance with AHRI Standard 885 to determine the maximum sound power levels acceptable for each terminal unit. Design engineers should familiarize themselves with the standard and perform an acoustical analysis of each critical path within the system. Standard 885 provides the methodology and data to perform such an analysis for most common applications. Critical applications may require consultation with an acoustical consultant.

SENSOR CALIBRATION FOR SR-500

SR-500 - PRESSURE DROP (Ps) AND FLOW SENSOR (Dp)

To determine the minimum pressure drop (Ps) of a SR Retrofit Damper, multiply the nominal width and height in inches and divide by 144 to calculate the duct/damper area in square feet. Divide the the volume of air, Cfm being handled by the damper by the area of the duct/damper. The result will be the duct velocity in feet per minute (Fpm). Duct velocity, Fpm will be used to calculate pressure drop, Ps and flow sensor differential pressure, Dp.



Example: 18" x 12" Duct handling 2400 Cfm		
Formulae to calculate Duct Area and Fpm:	Width: Height: Duct Area(Ad) = WxH/144 = Fpm = Cfm/Ad =	18 Inches 12 Inches 1.50 Sq.Ft. 1600 Fpm
Formulae to calculate Ps and Dp:	Min. Ps = (Fpm/3110) Squared = Dp = (Fpm/2900) Squared =	0.26 in. w.g. 0.30 in. w.g.
Formulae to calculate Min and Max Cfm and Dp:	Min Duct Velocity = Max Duct Velocity = Q min = Nom. Duct Area x 500 Fpm = Min Dp = (500/2900) Squared = Q max = Nom. Duct Area x 2500 Fpm = Max Dp = (2500/2900) Squared =	500 Fpm 2500 Fpm 750.00 Cfm 0.030 in. w.g. 3750.00 Cfm 0.74 in. w.g.

ECO ULTRA LOW LEAKAGE ATU'S

SINGLE DUCT ECO UNIT, MODEL TH-500 ECO

DUAL DUCT HIGH EFFICIENCY MIXING ECO UNIT, MODELS DH-500 & DS-600 ECO

- The ECO Ultra Low Leakage/High Efficiency Terminal Units are designed and manufactured for quality, performance and very low leakage resulting in improved energy savings.
- For performance characteristics for the TH-500 ECO refer to the corresponding TH-500 size in the catalog.
- For performance characteristics for the DH-500-00 ECO and DS-600-00 ECO, refer to the corresponding DH-500-00 size or DS-600-00 size in the catalog.
- Standard Box is internally lined with ½" fiberglass insulation with a variety of optional insulations available to meet every requirement.
- Standard casing construction is minimum 22 gauge galvanized steel casing and inlet duct. With optional 20 gauge casing.
- Terminals can be provided with hot water coils, Flexmaster Spin-in or Metalaire Recessed Quick Release coil access doors and damper access doors, electric heaters, sound attenuators, and other optional accessories.
- Units are AHRI certified
- Member of US Green Building Council-USGBC
- Hot water coils are available in standard 20 gauge or optional 18 gauge wrapper.
- Optional hot water coil insulated coil covers insulating exposed tubing on both ends.
- Riveted leak proof primary inlet.
- Optional certified casing and damper leakage is available.
- Casing Leakage: Assembled units shall be so constructed and sealed to limit air leakage to the following listed quantities at 6" static pressure. The following is the maximum allowable casing leakage including all components:

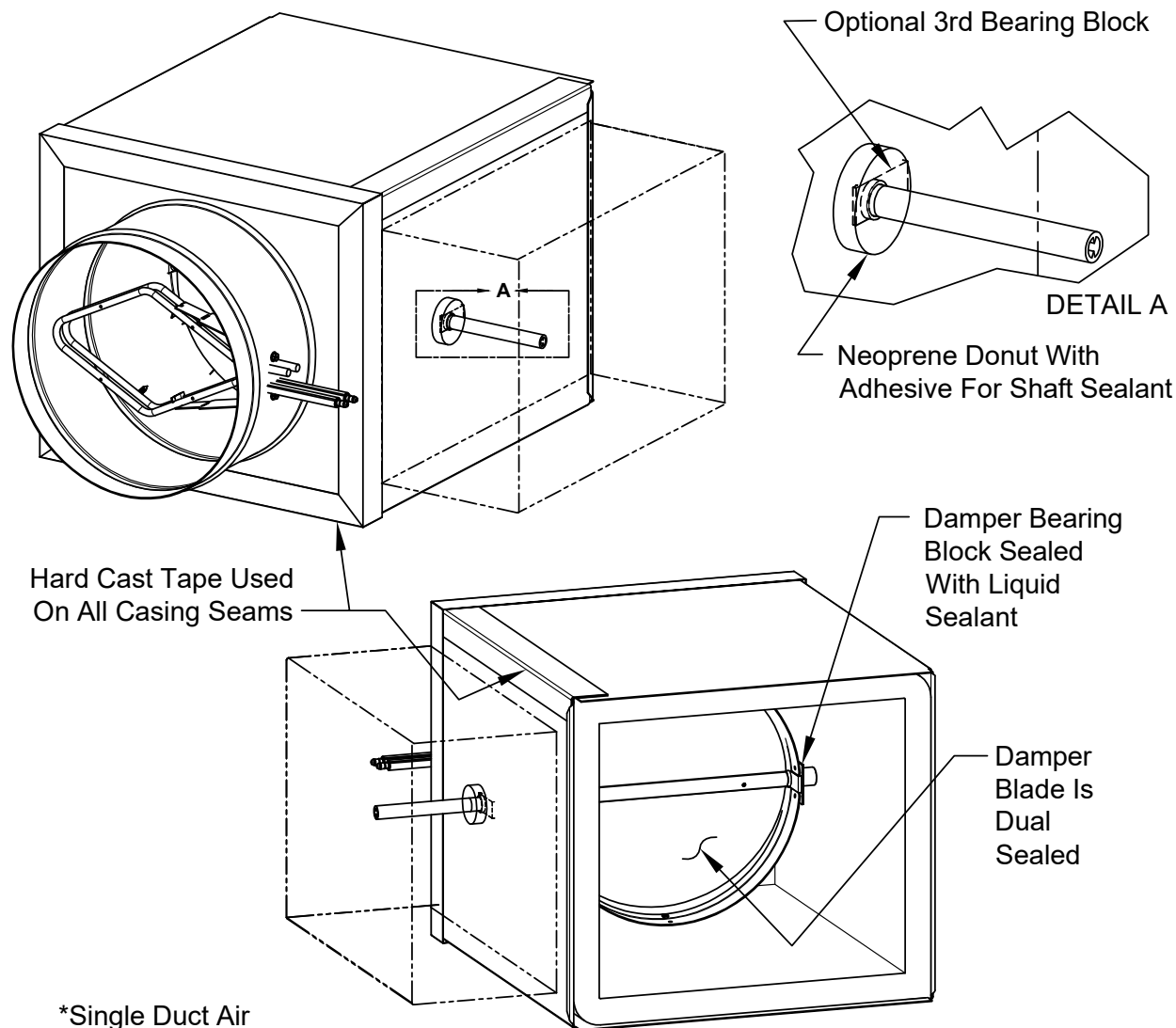
ECO Low Leakage Construction				
Inlet Diameter	Static Pressure w.g.	Maximum Airflow	Max Casing Leakage	Max Damper Leakage
4	6	300	5	5
5	6	375	5	5
6	6	540	5	5
7	6	760	7	7
8	6	990	9	9
9	6	1250	12	12
10	6	1640	16	16
12	6	2350	23	23
14	6	3250	32	32
16	6	4100	41	41
20	6	6430	64	64
24	6	7270	72	72

Notes: 1) Casing and Damper leakage shall not exceed 1 % of the maximum rated airflow at 6" w.g.

2) 4" and 5" inlets are built with 6" casings

Submittal: ECO-001

ECO Ultra Low Leakage Construction



*Single Duct Air
Terminal Unit Shown*

Standard Construction		Optional Construction
• Ultra Low Leakage Casing Construction • Ultra Low Leakage Damper Construction • Damper Blade Is Dual Sealed	• Damper Bearing Block Sealed With Liquid Sealant • Neoprene Donut With Adhesive For Shaft Sealant • Hard Cast Tape Used On All Casing Seams	• Optional 3rd Bearing Block • Optional Bronze Bearing On Damper Box • Optional Certified Leakage Test

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