



## FCL-600 LOW PROFILE CONSTANT VOLUME FAN TERMINAL UNIT

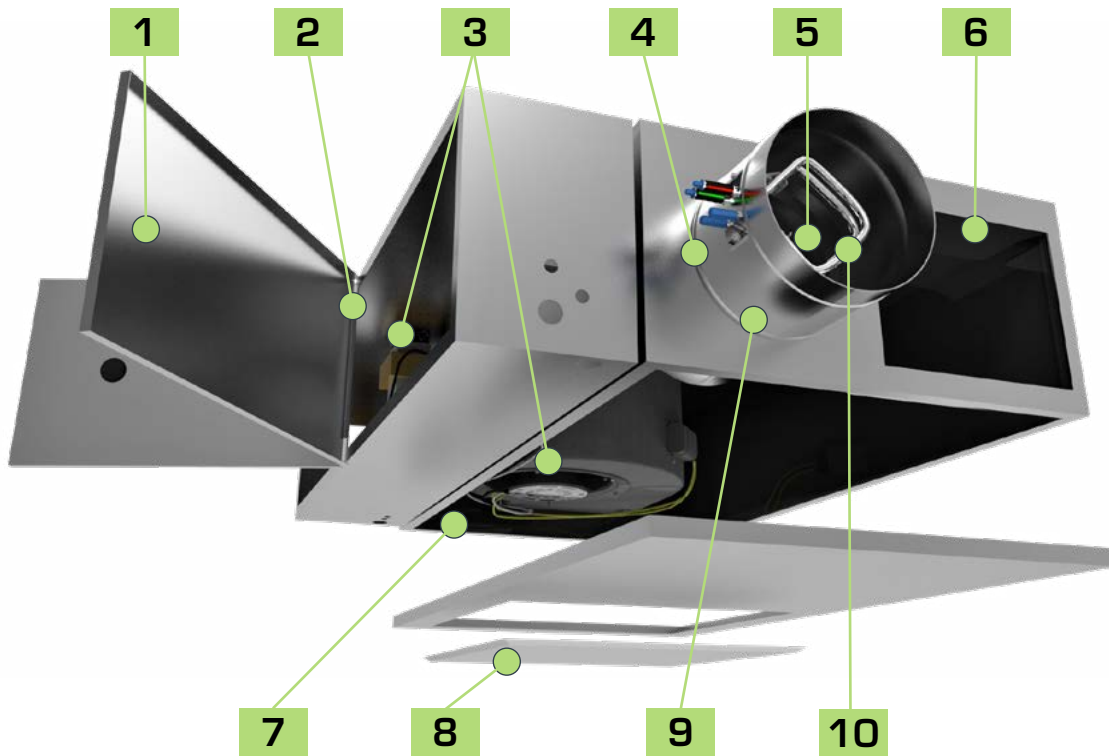
The METALAIRE FCL low profile series fan-powered terminal unit has been engineered to provide a balance between quiet operation, minimal footprint, and a broad flow range with a reduced height for low clearance ceiling applications. The FCL is constructed from 22 gauge metal construction designed to 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.
- Metalaire inlet flow sensor provides +/- 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 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).

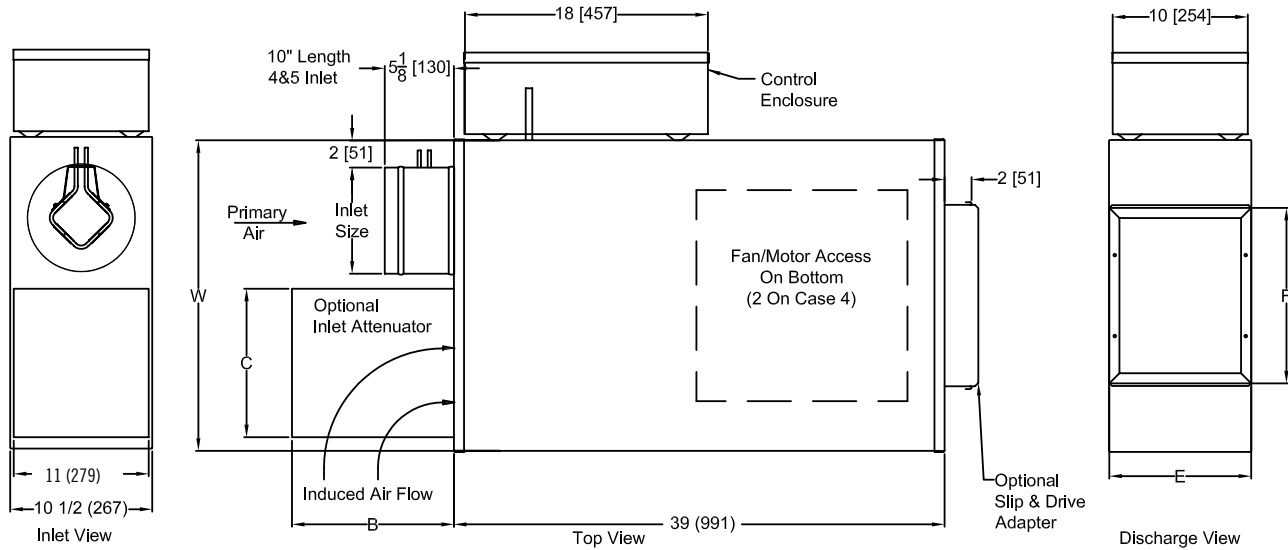


## FCL-600 LOW PROFILE CONSTANT VOLUME FAN TERMINAL UNIT

### 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** Continuous welded 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** Hand adjustable restrictor plates top and bottom for balancing.
- 7** Discharge panel is manufactured with 18 gauge galvanized steel to mitigate vibration.
- 8** Bottom access panel provided for easy motor / blower servicing.
- 9** Damper assembly rotates in long life, low friction, self lubricating thermoplastic bearing.
- 10** Metal construction inlet flow sensor with extra balancing taps.

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

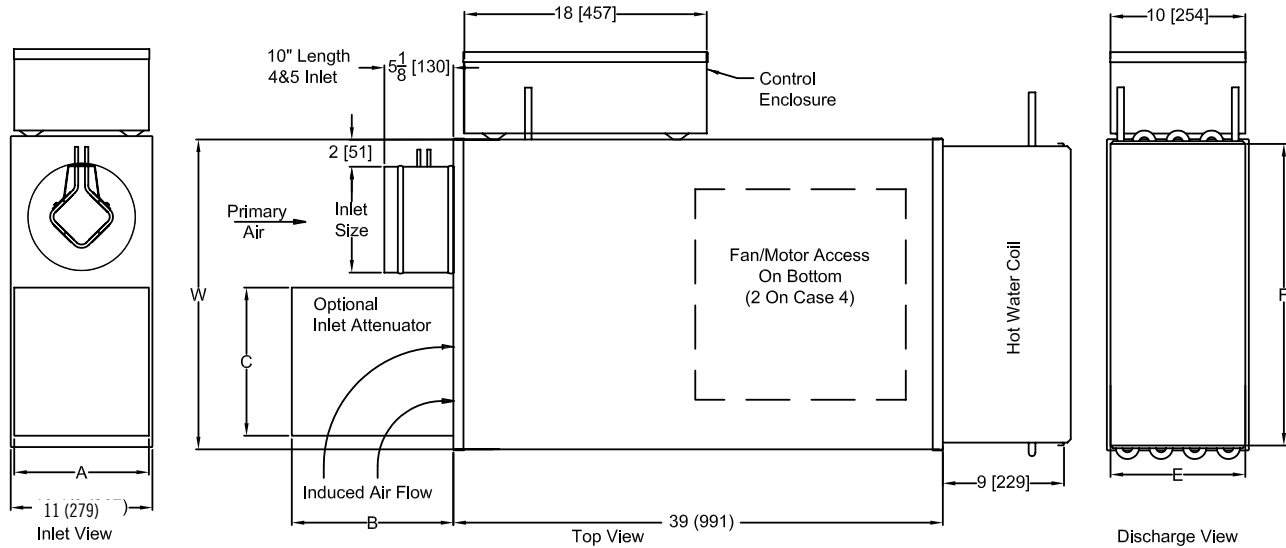


The standard location for control enclosure is Left Hand on Model FCL. Looking in the direction of airflow, the control enclosure is on the left.

Case size	Inlet Size	Horse-power PSC	Rated Motor Amps		Unit Dimensions			Induction Attenuator			Discharge	
	Standard		120 V	277 V	Height H	Width W	Length L	Height A	Width B	Length C	Height E	Width F
2	8 Round	1/4	5.8	1.8	11	23	39	10	12	11	10 1/2	13
4	8 x16 Rect.	1/4 (2)	11.6	3.6	11	42	39	10	12	11	10 1/2	24 1/2
		<b>ECM</b>										
2	8 Round	1/3	6	2.6	11	23	39	10	12	11	10 1/2	13
4	8 x16 Rect.	1/3 (2)	11.3	4.9	11	42	39	10	12	11	10 1/2	24 1/2

Optional inlet sizes 4, 5 and 6 are available on Case Size 2 only.  
 All filter sizes are equal to induction attenuator dimensions A & B.  
 All dimensions are in inches.

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



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

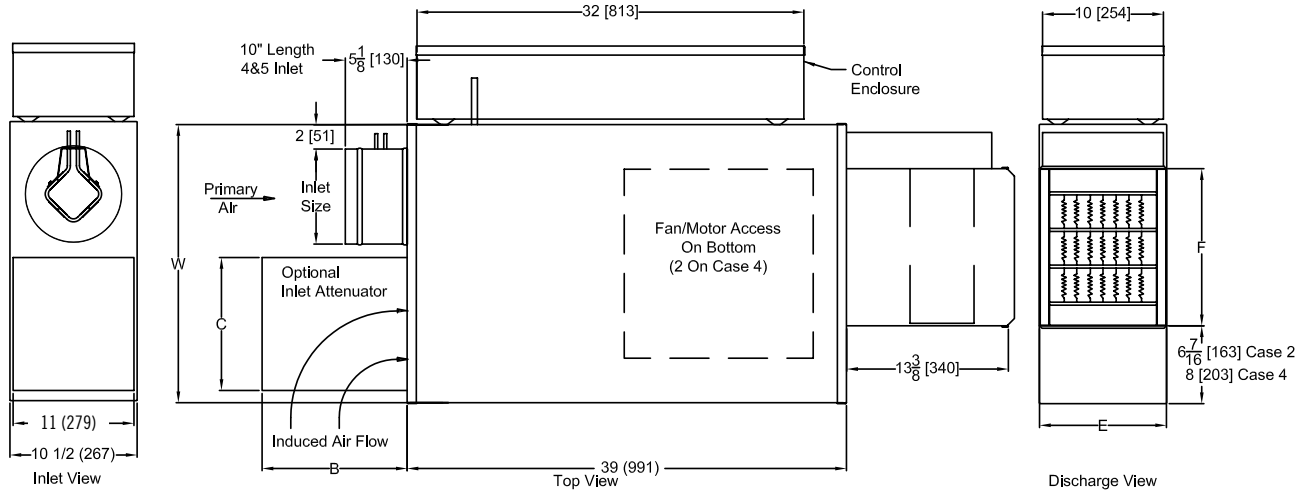
Case size	Inlet Size	Horse-power PSC	Rated Motor Amps		Unit Dimensions			Induction Attenuator			Discharge	
	Standard		120 V	277 V	Height H	Width W	Length L	Height A	Width B	Length C	Height E	Width F
2	8 Round	1/4	5.8	1.8	11	23	39	10	12	11	10	22
4	8 x16 Rect.	1/4 (2)	11.6	3.6	11	42	39	10	12	11	10	32
		<b>ECM</b>										
2	8 Round	1/3	6	2.6	11	23	39	10	12	11	10	22
4	8 x16 Rect.	1/3 (2)	11.3	4.9	11	42	39	10	12	11	10	32

Optional inlet sizes 4, 5 and 6 are available on Case Size 2 only.  
 All filter sizes are equal to induction attenuator dimensions A & B.  
 All dimensions are in inches.

## FCL-600 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 on Model FCL. Looking in the direction of airflow, the control enclosure is on the left.

Case size	Inlet Size	Horse-power PSC	Rated Motor Amps		Unit Dimensions			Induction Attenuator			Discharge	
	Standard		120 V	277 V	Height H	Width W	Length L	Height A	Width B	Length C	Height E	Width F
2	8 Round	1/4	5.8	1.8	11	23	39	10	12	11	10 1/2	13
4	8 x16 Rect.	1/4 (2)	11.6	3.6	11	42	39	10	12	11	10 1/2	26
			<b>ECM</b>									
2	8 Round	1/3	6	2.6	11	23	39	10	12	11	10 1/2	13
4	8 x16 Rect.	1/3 (2)	11.3	4.9	11	42	39	10	12	11	10 1/2	26

Optional inlet sizes 4, 5 and 6 are available on Case Size 2 only.  
 All filter sizes are equal to induction attenuator dimensions A & B.  
 All dimensions are in inches.

## FCL-600 APPROXIMATE SHIPPING WEIGHTS

Case	FCL
2	118 lbs.
4	197 lbs.

## FCL-600 FILTER SIZES PER CASE SIZE

Case Size	Filter Dimensions
2	10" x 20"
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 1995 and CSA 236.
- 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<sup>-12</sup> 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	58	54	56	52	44	40	31
	600	0.04	54	51	52	48	41	36	26	57	54	55	51	44	39	30	58	55	56	52	45	40	31	59	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<sup>-12</sup> 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<sup>-12</sup> 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 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	1/4	4.8	1.9	1.9
4	1/4 (two motors)	9.6	3.8	3.8

## FCL-600 ECM FAN MOTOR AMPERAGE RATINGS

Case Size	Motor HP	ECM 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	4.2	2.7	2.1
4	1/3 (two motors)	8.4 (two motors)	5.4 (two motors)	4.2 (two motors)

## 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

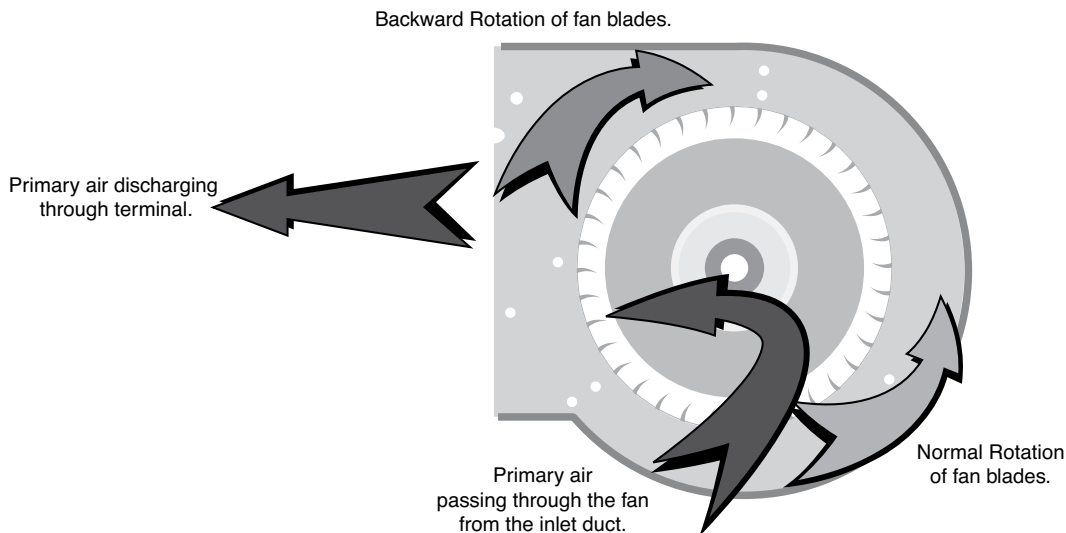
## PERFORMANCE NOTES

- 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<sup>3</sup>/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 AIR TERMINALS OPTIONAL ELECTRONIC ANTI-REVERSE ROTATION DEVICE

The fan wheel in a constant fan box may rotate backward whenever the fan motor is not running and primary air from the inlet duct is passing through the fan. In some cases the torque developed by the fan wheel when rotating backward cannot be overcome by the starting torque of the fan motor. In this condition the fan motor will run in reverse rotation, resulting in insufficient airflow delivery.



Constant fan boxes must have means to coordinate energizing the fan motor with start up of the Primary Fan System to prevent the reverse rotation or a positive method to create enough motor torque to reverse the rotation of the fan wheel.

Other manufacturers choose to deal with this issue by running their motors with larger capacitors than recommended by the motor manufacturer. The oversized capacitor will cause the motor to run less efficiently, run hotter than normal and draw more current than with a proper capacitor. All of this will result in reduced motor life and increased energy costs.

METALAIRE'S Model FCL-600 is available with an optional Electronic Anti-Reverse Rotation Device which will positively prevent the reverse rotation of any fan. This option does not draw additional current while running and will not cause the motor to run at higher temperatures.

The results are greater efficiency, quieter motors, longer motor life and happier building owners.

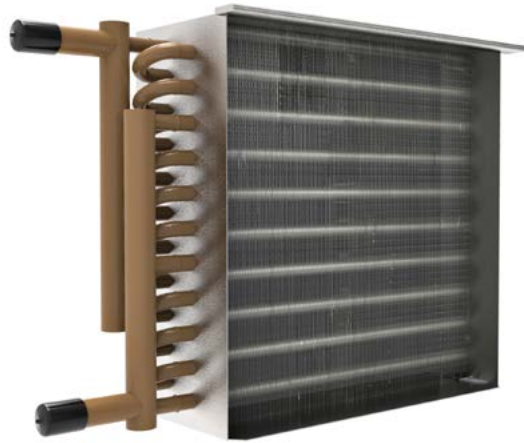
## FCL-600 HOT WATER COILS

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*

**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 <sub>2</sub> 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 <sub>2</sub> 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

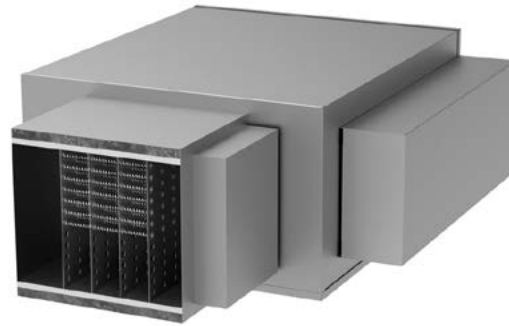
ΔT	50	60	70	80	90	100	115	125	140	150
Factor	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30

## 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® Standard 1995, CSA-C22.2 No. 236 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

Single Phase FCL kW Limits				
Case Size	Heater Voltage	Min. kW per Step	Max. kW	Max. Steps
2	120	0.5	5.0	3
2	208	0.5	8.0	3
2	240	0.5	8.0	3
2	277	0.5	8.0	3
2	480	0.5	8.0	3
4	120	0.5	5.0	3
4	208	0.5	8.5	3
4	240	0.5	10.0	3
4	277	0.5	11.0	3
4	480	0.5	15.0	3

Three Phase FCL kW Limits				
Case Size	Heater Voltage	Min. kW per Step	Max. kW	Max. Steps
2	208	0.5	8.0	3
2	480	0.5	8.0	3
4	208	1.5	13.0	3
4	480	1.5	15.0	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:

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

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

\* 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 CONTROL SEQUENCE OFFERINGS



### PPD-PNEUMATIC PRESSURE DEPENDENT

- 910 Direct Acting / Normally Closed (DA / NC)
- 912 Reverse Acting / Normally Open (RA / NO)



### PPI-PNEUMATIC PRESSURE INDEPENDENT

- 914 Direct Acting / Normally Closed (DA / NC)
- 915 Direct Acting / Normally Open (DA / NO)
- 916 Reverse Acting / Normally Closed (RA / NC)
- 917 Reverse Acting / Normally Open (RA / NO)



### EPD-ELECTRIC PRESSURE DEPENDENT

- 960 Cooling Only
- 961 Cooling with Heat
- 964 Night Shutdown / Morning Warm-up
- 965 Heating / Cooling Changeover



### API-ANALOG PRESSURE INDEPENDENT

- Consult Factory



### DDC-DIRECT DIGITAL CONTROL

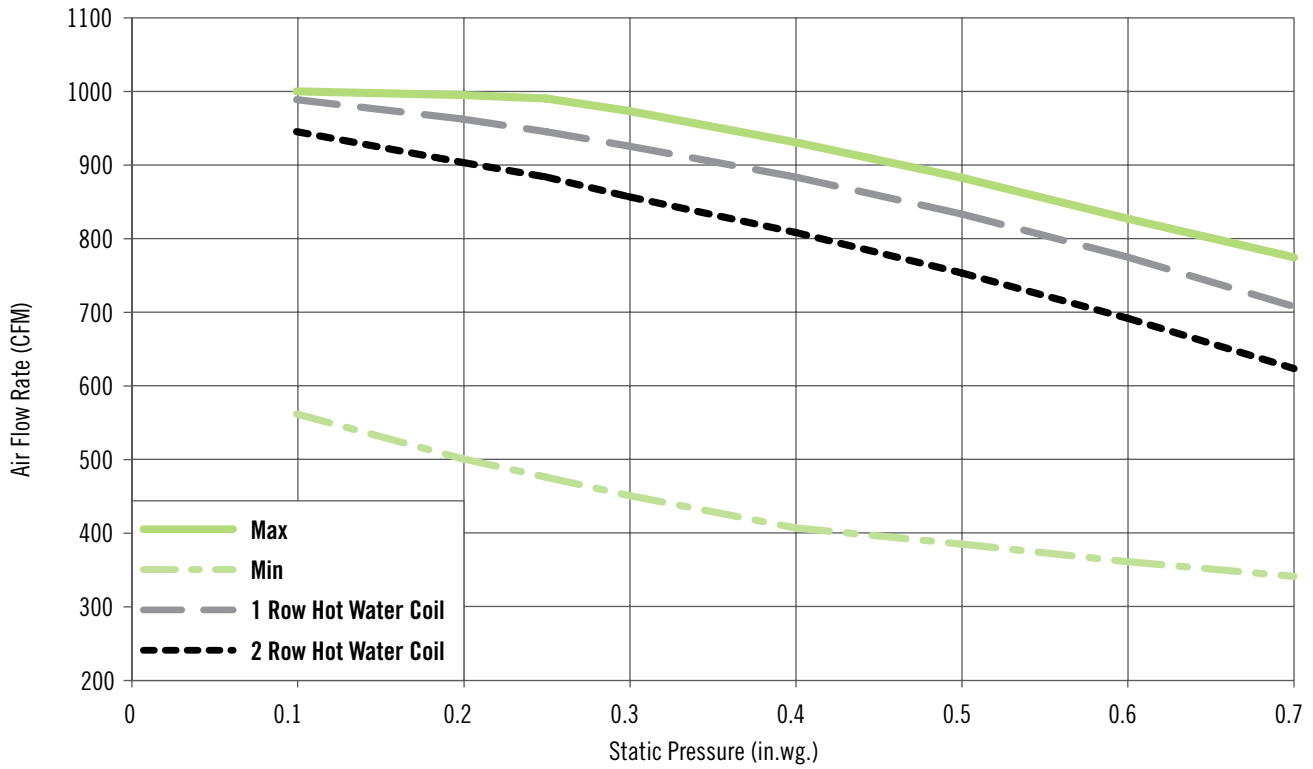
#### BACnet

- 990 Constant Fan—No Auxiliary Heating
- 992 Constant Fan—Modulating Floating Control—Hot Water Heat
- 993-E Electric Heat

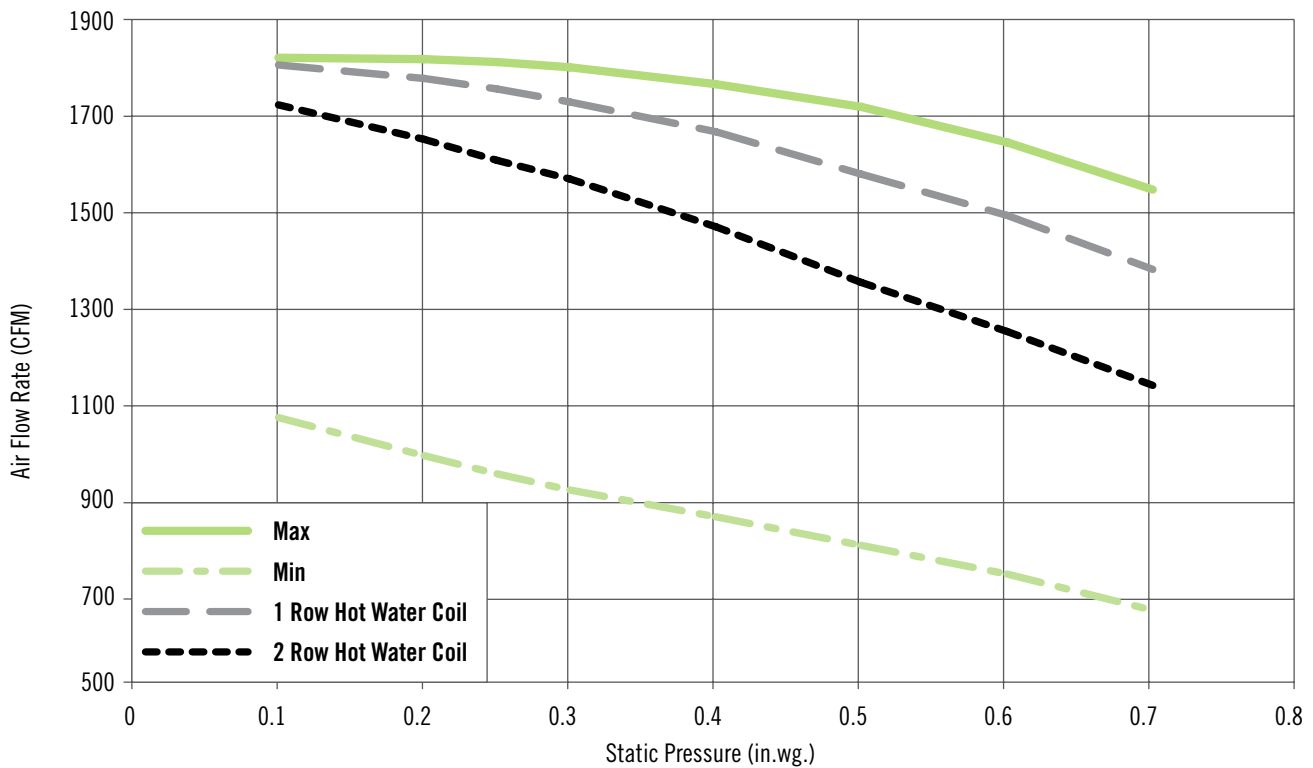
Refer to ACC 24 for complete description.



## FCL-600 FAN PERFORMANCE CURVES CASE 2

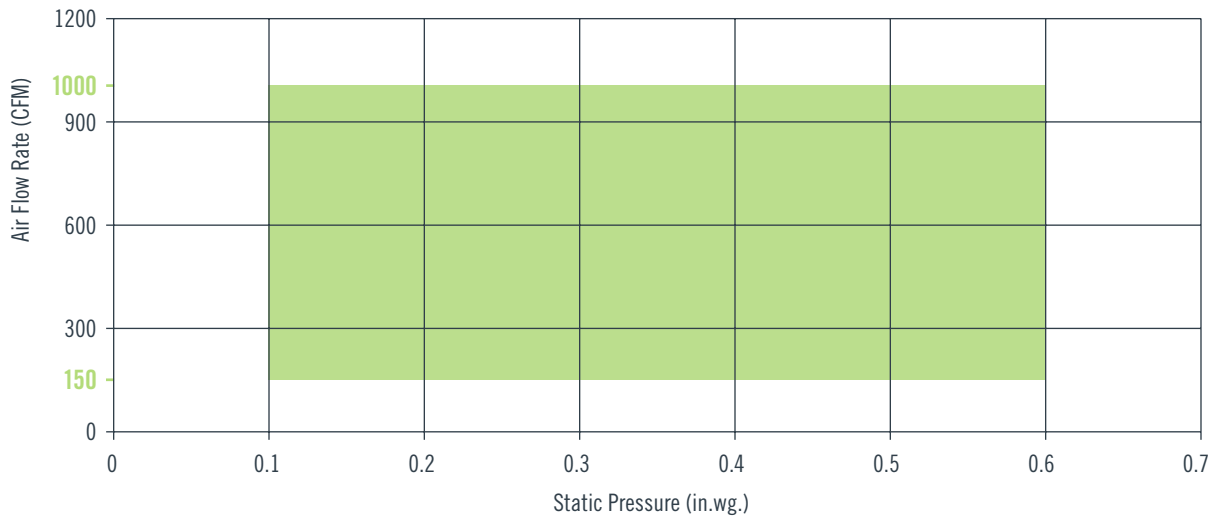


## FCL-600 FAN PERFORMANCE CURVES CASE 4





## FCL-600 ECM FAN PERFORMANCE CURVES CASE 2



## FCL-600 ECM FAN PERFORMANCE CURVES CASE 4

