METALAIRE™

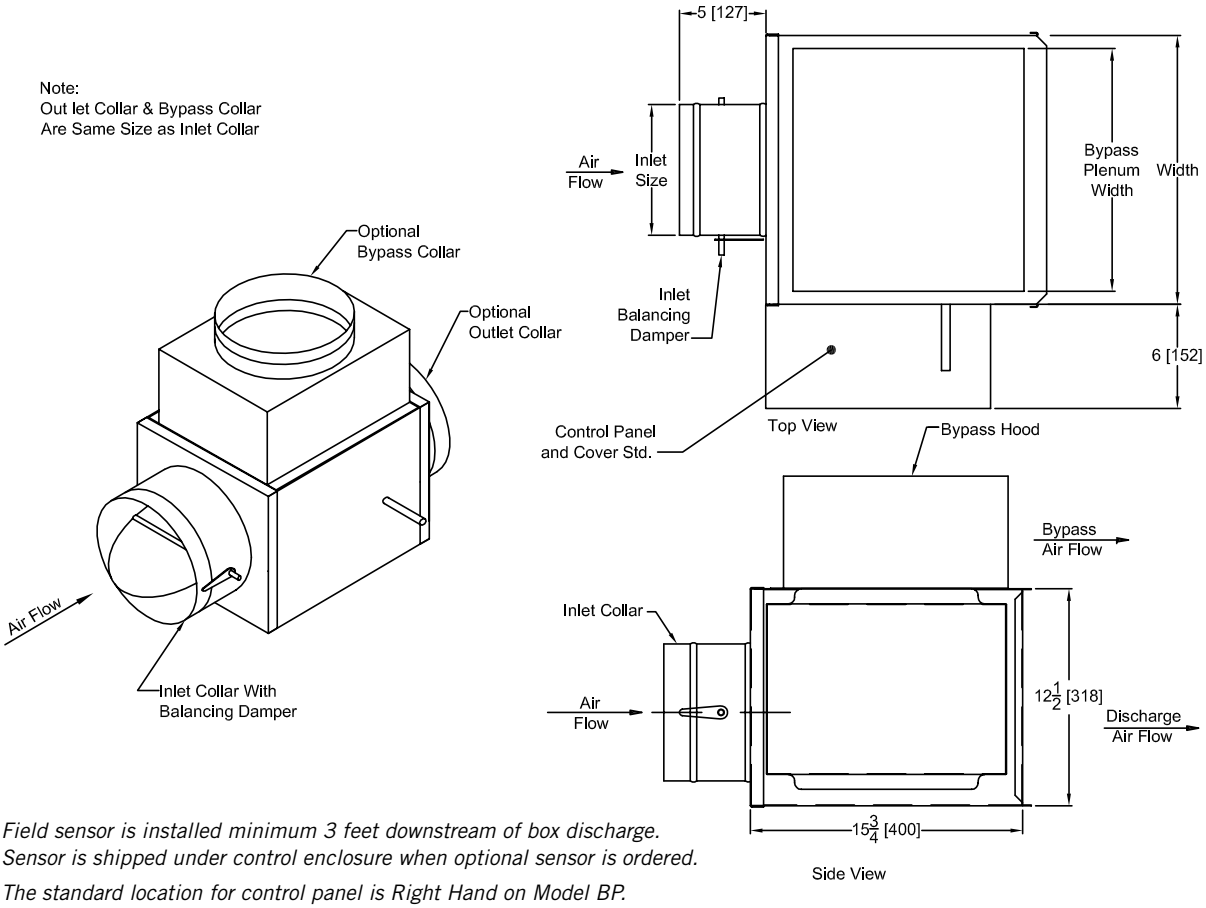
BP-600 BYPASS TERMINAL UNIT

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 / ft^3 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
BYPASS AIR TERMINAL UNIT



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

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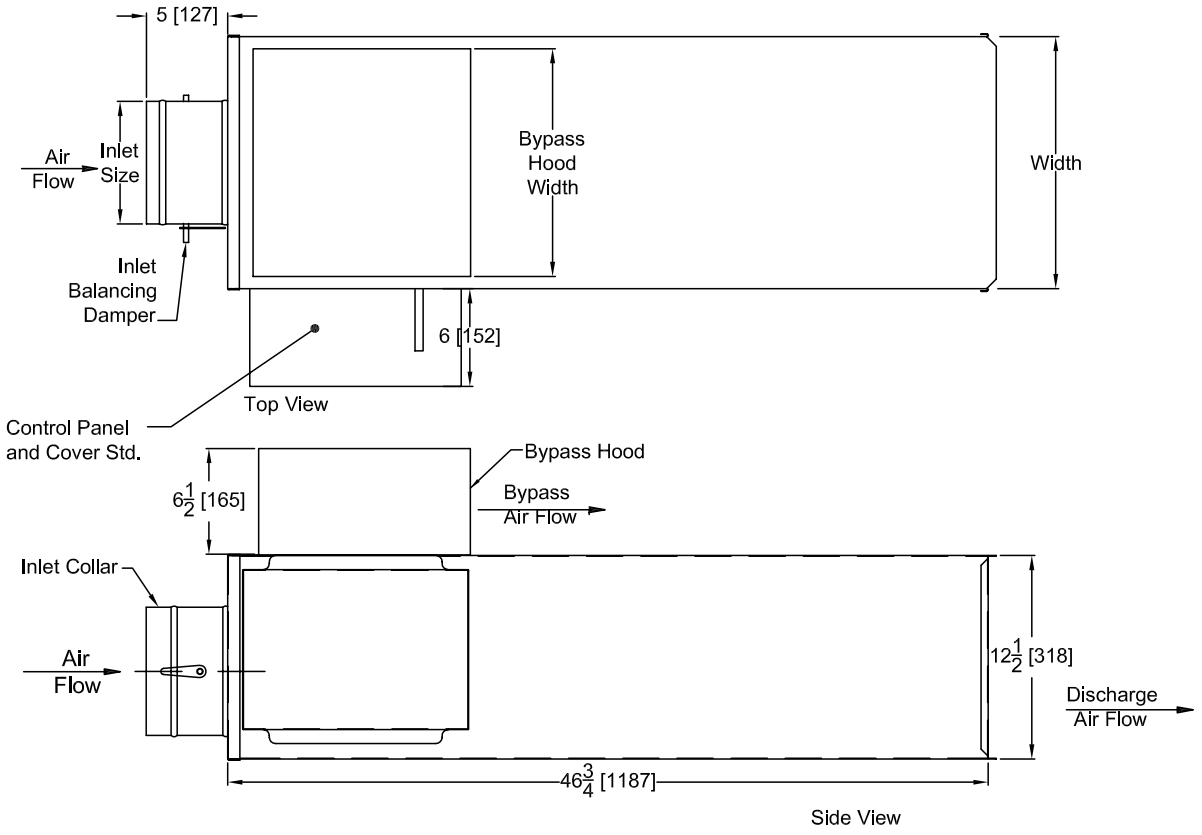
BP-600
BYPASS AIR TERMINAL UNIT WITH INTEGRAL SOUND ATTENUATOR



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

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

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*

METALAIRE™

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

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

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*
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, ft^2, 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 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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BP-600 CONTROL SEQUENCE OFFERINGS

PPD–PNEUMATIC PRESSURE DEPENDENT

- 310N Direct Acting / Normally Closed (DA / NC)
- 312N Reverse Acting / Normally Open (RA / NO)

PPI–PNEUMATIC PRESSURE INDEPENDENT

- 314M Direct Acting / Normally Closed (DA / NC)
- 315M Direct Acting / Normally Open (DA / NO)
- 316M Reverse Acting / Normally Closed (RA / NC)
- 317M Reverse Acting / Normally Open (RA / NO)
- 340M Static Pressure Control

EPD–ELECTRIC PRESSURE DEPENDENT

- 352 Cooling Only
- 353 Cooling with Reheat
- 356 Static Control
- 357 Actuator Only

API–ANALOG PRESSURE INDEPENDENT

- 360 Cooling Only
- 361 Cooling with Heat
- 364 Night Setback / Morning Warm-up
- 365 Heating / Cooling Changeover
- 373 Static Pressure Control

DDC–DIRECT DIGITAL CONTROL

BACnet

- 390 Cooling Only
- 391 Cooling or Heating
- 392 Hot Water Reheat
- 393-E Electric Reheat

Refer to page ACC-24 for a complete description of all control sequences

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FAN POWERED TERMINAL UNITS

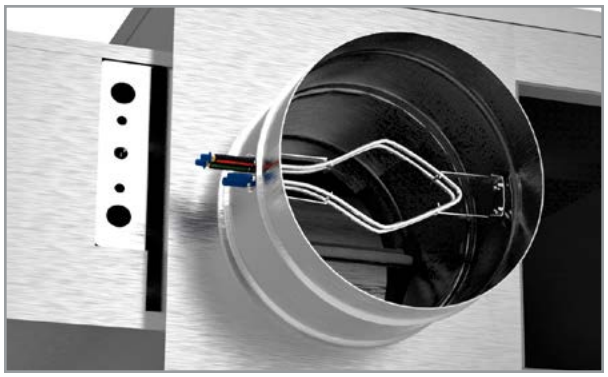
FCI-600
SERIES FAN TERMINAL
PAGES FCI1 - FCI27

FVI-500
PARALLEL FAN TERMINAL
PAGES FVI1 - FVI33

FCL-600
LOW-PROFILE SERIES FAN TERMINAL
PAGES FCL1 - FCL20

FVL-600
LOW-PROFILE PARALLEL FAN TERMINAL
PAGES FVL1 - FVL21

FCQ-700
ULTRA QUIET SERIES FAN TERMINAL
PAGES FCQ1 - FCQ23



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	PARALLEL 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.	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.

MODEL NUMBER LEGEND

EXAMPLE: FCI C5 614C-900B

FXX XX XXXX -XXXX

- **FXX**
  - C Series Unit
  - V Parallel Unit
- **XX**
  - Case Size (C1, C2, C3, etc.)
- **XXXX**
  - Inlet Size (04, 05, 06, etc.)
  - Generation 5, 6, 7
  - Fan Motor Voltage
    - A 120
    - C 277
    - F 208-240
  - I Improved
  - Q Ultra Quiet
  - L Low Profile
- **-XXXX**
  - Terminal Type:
    - 8 FVI, FVL
    - 9 FCI, FCL, FCQ
  - Control Sequence:
    - 00B No Controls
    - 1 Pneumatic
    - 5 Electric
    - 05 DDC by others
    - 6 Analog
    - 8 Factory DDC
  - A 120 / 24 Transformer Voltage
  - C 277 / 24 Transformer Voltage
  - F 208 / 24 Transformer Voltage
  - N No Transformer
  - E Electric Heat

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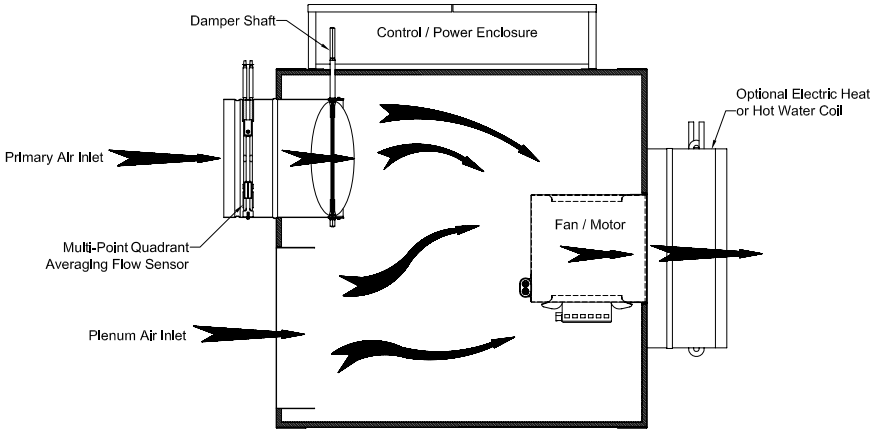
TYPES OF FAN POWERED TERMINAL UNITS

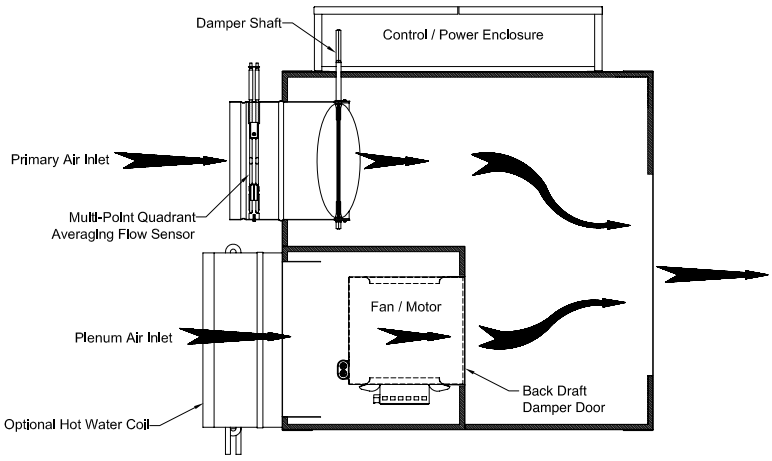
FCI-600 SERIES FAN POWERED UNIT

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 1995 and CSA 236.
- 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.
- Mercury contactors for quiet operation of the electric heater.
- Inlet attenuator for quiet applications.