Nailor® Industries Inc.

FAN POWERED TERMINAL UNIT WITH EPIC ECM MOTOR

SERIES FLOW • CONSTANT OR VARIABLE VOLUME

MODELS: 35S, 35SW AND 35SE • UNIT SIZES 1 – 6

DESCRIPTION:

- 18 ga. (1.31) galvanized steel channel frame with 20 ga. (1.00) casing components.
- 16 ga. (1.61) galvanized steel inclined opposed blade damper. 45° rotation. CW to close.
- Ultra-high efficiency ECM fan motor. EPIC fan volume controller.
- Multi-point averaging Diamond Flow sensor. Supplied with balancing tees.
- Full size access panels on three sides.
- 3/4" (19) dual density insulation, exposed edges coated to prevent air erosion. Meets requirements of NFPA 90A and UL 181.
- Single point electrical and /or pneumatic main air connection.
- Discharge opening for flanged duct connection.
- Full primary air valve low voltage NEMA 1 type enclosure for factory mounted DDC and analog electronic controls.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

OPTIONS:

Digital Controls:

Factory mounted (supplied by others)

Field mounted (supplied by others)

Nailor EZvav. See separate submittal.

Liner:

Steri-liner

Steri-liner + Perforated metal

Fiber-free

Perforated metal

Solid metal

1" (25) fiberglass

Low temperature construction

Other:

Left-hand controls location

Toggle disconnect switch

Fan unit fusing

24/24V Isolation transformer

Cross Flow Sensor

'Q' Option – Induced Air Inlet Attenuator

Top entry induced air inlet

1" (25) Throwaway

2" (51) Filter rack only

Hanger brackets.

1/4-turn fasteners (access panel)

FN2 90° Line Voltage Enclosure

FN3 Remote Line Voltage Controls Enclosure (See submittal FN3)

Dust tight enclosure seal

Remote user disconnect

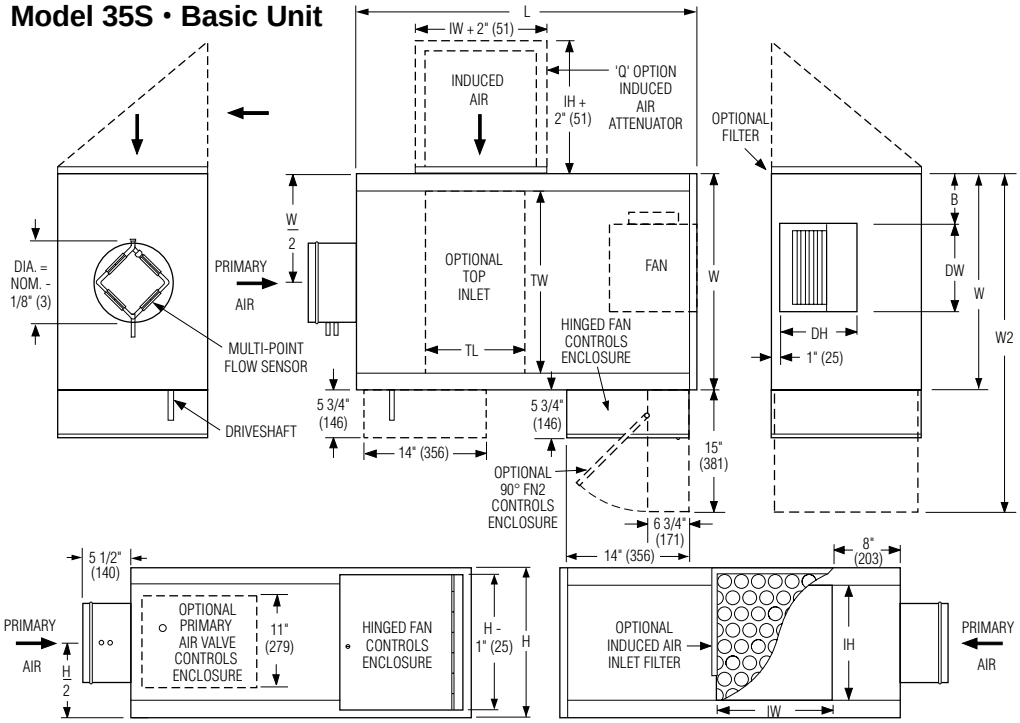
Seismic Certification:

Seismic Source International (Standard)

HCAI (formerly OSHPD, California)

Special Features: _____ .

Model 35S • Basic Unit



Dimensional Data

Unit Size	Inlet Size	W	W2	H	L	B	Induced Air Inlet		Outlet Discharge DW x DH	Filter Size	
							Side (std.) IW x IH	Top (opt.) TL x TW		Side Inlet (std.)	Top Inlet (opt.)
1	5, 6, 8** (127, 152, 203)	20 (508)	35 (889)	14 (356)	36 (914)	6 (152)	8 x 10 (203 x 254)	10 x 14 (254 x 356)	8 1/8 x 4 1/4 (206 x 108)	10 x 12 (254 x 305)	14 x 16 (356 x 406)
2	6, 8 (152, 203)	18 (457)	33 (838)	14 (356)	36 (914)	3 1/2 (89)	8 x 10 (203 x 254)	10 x 14 (254 x 356)	9 1/4 x 10 1/2 (235 x 267)	10 x 12 (254 x 305)	14 x 16 (356 x 406)
3	6, 8, 10, 12 (152, 203, 254, 305)	18 (457)	33 (838)	18 (457)	36 (914)	3 1/2 (89)	12 x 14 (305 x 356)	14 x 14 (356 x 356)	9 1/4 x 10 1/2 (235 x 267)	14 x 16 (356 x 406)	16 x 16 (406 x 406)
4	8, 10, 12, 14 (203, 254, 305, 356)	26 (660)	41 (1041)	18 (457)	41 (1041)	6 (152)	14 x 14 (356 x 356)	12 x 22 (305 x 559)	12 x 10 1/2 (305 x 267)	16 x 16 (406 x 406)	16 x 25 (406 x 635)
5	10, 12, 14 (254, 305, 356)	26 (660)	41 (1041)	18 (457)	41 (1041)	5 (127)	14 x 14 (356 x 356)	12 x 22 (305 x 559)	13 1/4 x 11 1/2 (337 x 292)	16 x 16 (406 x 406)	16 x 25 (406 x 635)
6	12, 14, 16 (305, 356, 406)	30 (762)	45 (1143)	19 (483)	44 (1118)	6 (152)	16 x 15 (406 x 381)	14 x 26 (356 x 660)	13 1/4 x 11 1/2 (337 x 292)	17 x 18 (432 x 457)	18 x 28 (457 x 711)

**ECM Only.

Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
1	*	2.1	1.4	1.3	1.2
2	*	4.0	2.7	2.6	2.6
3	*	5.0	3.4	3.3	3.3
4	*	6.9	4.6	4.5	4.2
5	*	9.0	6.1	5.8	5.6
6	*	11.9	7.3	7.3	7.2

* The ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption. FLA = Full load amperage. All motors are single phase/60 Hz.

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 6 - 23**	**3500**	**11 - 15 - 22**	**35S-1**

Page 1 of 2. For heat options; see page 2.

Dimensions are in inches (mm).

Nailor® Industries Inc.

FAN POWERED TERMINAL UNIT WITH EPIC ECM MOTOR • HEAT ACCESSORIES

SERIES FLOW • CONSTANT OR VARIABLE VOLUME

MODELS: 35S, 35SW AND 35SE • UNIT SIZES 1 – 6

Hot Water Coil Section Model 35SW

Standard Features:

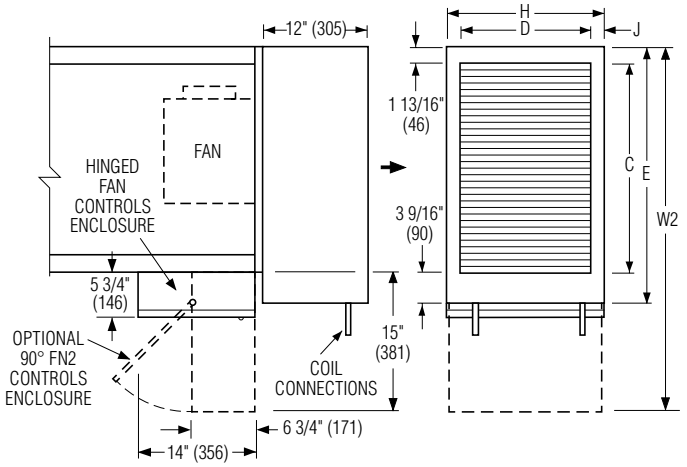
- Coil section installed on unit discharge.
- Coil (and header on multi-circuit units) is installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- Sweat Connections:
  Size 1 – 3: 1 Row 1/2" (13), 2 and 3 Row 7/8" (22); O.D. male solder.
  Size 4 – 6: 1, 2, and 3 Row 7/8" (22); O.D. male solder.
- Top and bottom access panels for inspection and coil cleaning.
- Flanged outlet duct connection.

Coil Rows:

1-Row 2-Row 3-Row

Coil Hand Connections:

(Looking in direction of airflow).
Right hand (illustrated). Standard.
Left hand. Optional.



Unit Size	Outlet Duct Size C x D	W2	E	H	J
1	16 x 12 1/8 (406 x 308)	35 (889)	21 3/8 (543)	14 (356)	1 (25)
2	16 x 12 1/8 (406 x 308)	33 (838)	21 3/8 (543)	14 (356)	1 (25)
3	16 x 14 7/8 (406 x 378)	33 (838)	21 3/8 (543)	18 (457)	1 1/2 (38)
4, 5	24 x 14 7/8 (610 x 378)	41 (1041)	29 3/8 (746)	18 (457)	1 1/2 (38)
6	28 x 17 1/8 (711 x 435)	45 (1143)	33 3/8 (848)	19 (483)	1 (25)

Electric Coil Section Model 35SE

Standard Features:

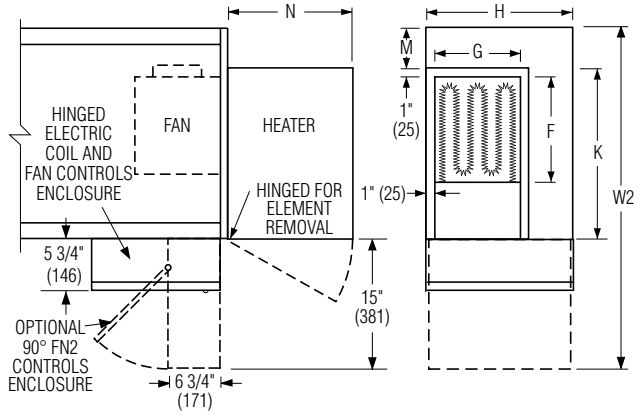
- Unique hinged heater design permits easy access, removal and replacement of heater element without disturbing ductwork.
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection (except 600V).
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Class A 80/20 Ni/Cr wire.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Voltage:

Single phase, 60 Hz.
208V 240V 277V
Three phase, 60 Hz.
208V 480V (4 wire wye).
600V (dual point connection). _____ .

Options:

Toggle disconnect switch (includes fan).
SCR control.
Door interlock disconnect switch.
Quiet type contactors.
Mercury contactors.
Power circuit fusing.
Dust tight construction.
Manual reset secondary thermal cut out.



Unit Size	Outlet Duct Size F x G	W2	K	H	M	N
1	10 1/4 x 10 1/2 (260 x 267)	35 (889)	16 (406)	14 (356)	4 (102)	12 1/2 (318)
2	10 1/4 x 10 1/2 (260 x 267)	33 (838)	15 1/2 (394)	14 (356)	2 1/2 (64)	12 1/2 (318)
3	10 1/4 x 10 1/2 (260 x 267)	33 (838)	15 1/2 (394)	18 (457)	2 1/2 (64)	15 1/4 (387)
4	13 x 10 1/2 (330 x 267)	41 (1041)	21 (533)	18 (457)	5 (127)	15 1/4 (387)
5	14 1/4 x 11 3/4 (362 x 298)	41 (1041)	22 (559)	18 (457)	4 (102)	15 1/4 (387)
6	14 1/4 x 11 3/4 (362 x 298)	45 (1143)	25 (635)	19 (483)	5 (127)	15 1/4 (387)

SCHEDULE TYPE:	Page 2 of 2. Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 6 - 23**	**3500**	**10 - 28 - 22**	**35S-1**

FAN POWERED TERMINAL UNIT WITH EPIC ECM MOTOR

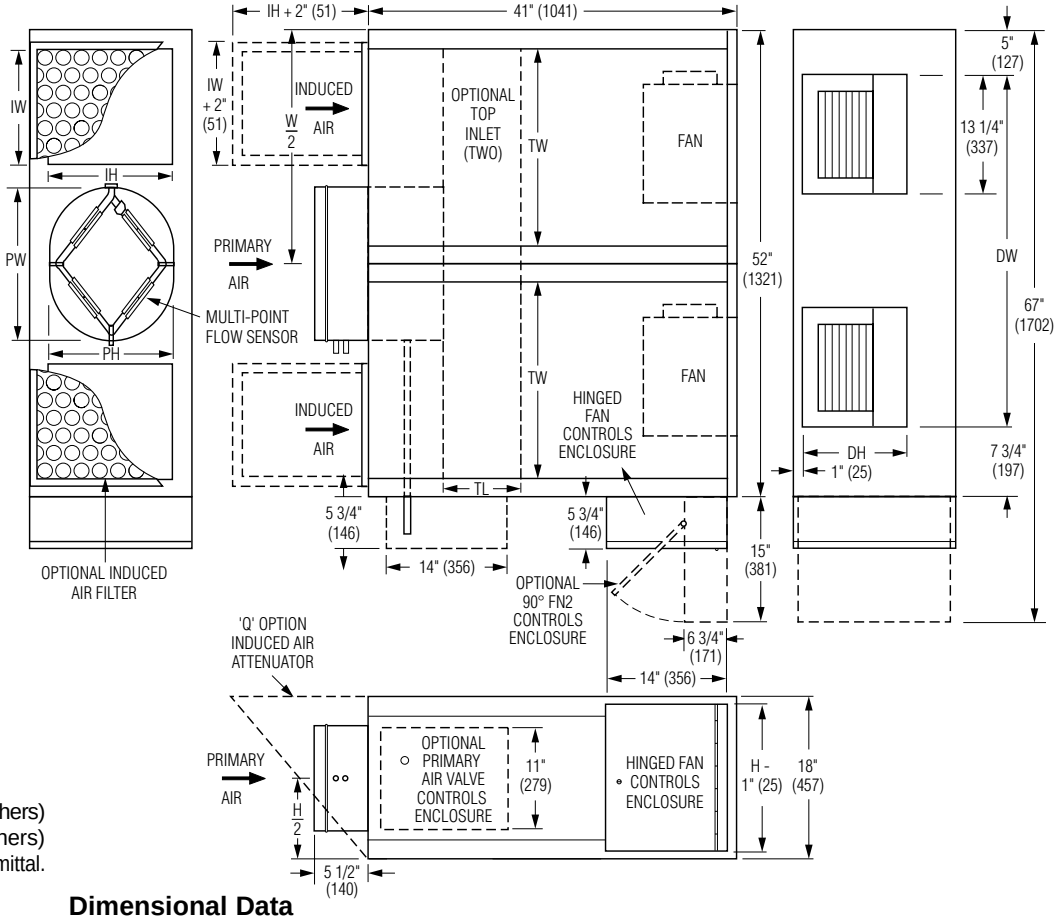
SERIES FLOW • CONSTANT OR VARIABLE VOLUME

MODELS: 35S, 35SW AND 35SE • UNIT SIZE 7

DESCRIPTION:

- 18 ga. (1.31) galvanized steel channel frame with 20 ga. (1.00) casing components.
- 16 ga. (1.61) galvanized steel inclined opposed blade damper. 45° rotation. CW to close.
- Ultra-high efficiency ECM fan motor. EPIC fan volume controller.
- Multi-point averaging Diamond Flow sensor. Supplied with balancing tees.
- Full size access panels on three sides.
- 3/4" (19) dual density insulation, exposed edges coated to prevent air erosion. Meets requirements of NFPA 90A and UL 181.
- Single point electrical and /or pneumatic main air connection.
- Discharge opening for flanged duct connection.
- Full primary air valve low voltage NEMA 1 type enclosure for factory mounted DDC and analog electronic controls.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Model 35S • Basic Unit



OPTIONS:

Digital Controls:
- Factory mounted (supplied by others)
- Field mounted (supplied by others)
- Nailor EZvav. See separate submittal.

Liner:
- Steri-liner
- Steri-liner + Perforated metal
- Fiber-free
- Perforated metal
- Solid metal
- 1" (25) fiberglass
- Low temperature construction

Other:
- Left-hand controls location
- Toggle disconnect switch
- Fan unit fusing
- 24/24V Isolation transformer
- Cross Flow Sensor
- 'Q' Option – Induced Air Inlet Attenuator
- Top entry induced air inlet
- 1" (25) Throwaway filter
- 2" (51) MERV 8 filter
- Hanger brackets.
- 1/4-turn fasteners (access panel)
- FN2 90° Line Voltage Enclosure
- FN3 Remote Line Voltage Controls Enclosure (See submittal FN3)
- Dust tight enclosure seal
- Remote user disconnect

Dimensional Data

Unit Size	Inlet		Induced Air Inlet		Outlet	Filter Size	
	Size	PW x PH	Side (std.) IW x IH	Top (opt.) TL x TW	Discharge DW x DH	Side Inlet (std.)	Top Inlet (opt.)
7	14 (356) Rd. 16 (406) Rd. 18 (457) Oval	13 7/8 (352) 15 7/8 (403) 20 3/16 x 13 7/8 (513 x 352)	12 x 14 (305 x 356) Qty. of 2	8 1/2 x 22 (216 x 559) Qty. of 2	39 1/4 x 11 1/2 (997 x 292)	14 x 16 (356 x 406) Qty. of 2	16 x 25 (406 x 635) Qty. of 2

Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
7	*	15.9	10.5	9.9	10.0

* The ECM is a variable horsepower motor.
Refer to Selectworks schedule for actual power consumption.
FLA = Full load amperage. All motors are single phase/60 Hz.

Seismic Certification:
- Seismic Source International (Standard)
- HCAI (formerly OSHPD, California)
- Special Features: _____ .

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**4 - 25 - 23**	**3500**	**2 - 6 - 23**	**35S-2**

Page 1 of 2.
For heat options; see page 2.
Dimensions are in inches (mm).

Nailor Industries Inc.

FAN POWERED TERMINAL UNIT WITH EPIC ECM MOTOR • HEAT ACCESSORIES

SERIES FLOW • CONSTANT OR VARIABLE VOLUME

MODELS: 35SW AND 35SE • UNIT SIZE 7

Hot Water Coil Section Model 35SW

Standard Features:

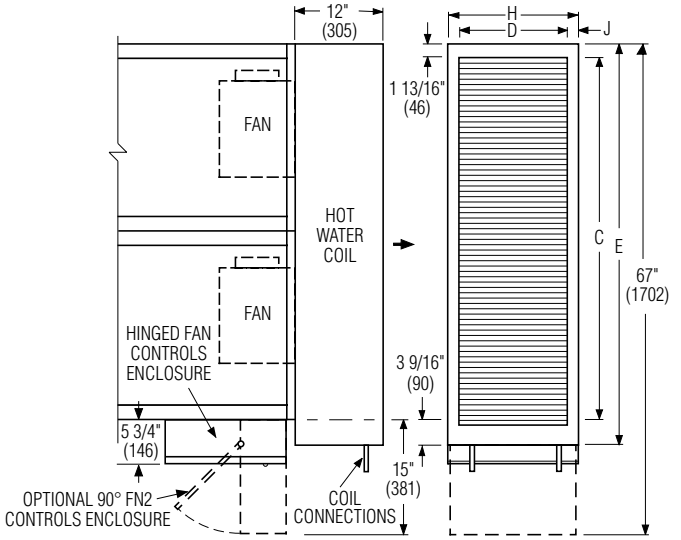
- Coil section installed on unit discharge.
- Coil and header are installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- Sweat connections: 1 and 2 row, 7/8" (22) O. D. male solder. 3 row 1 3/8" (35) O.D. male solder.
- Top and bottom access panels for inspection and coil cleaning.
- Flanged outlet duct connection.

Coil Rows:

1-Row 2-Row 3-Row

Coil Hand Connections:

(Looking in direction of airflow).
Right hand (illustrated). Standard.
Left hand. Optional.



Unit Size	Outlet Duct Size C x D	E	H	J
7	50 x 14 7/8 (1270 x 378)	55 3/8 (1407)	18 (457)	1 9/16 (40)

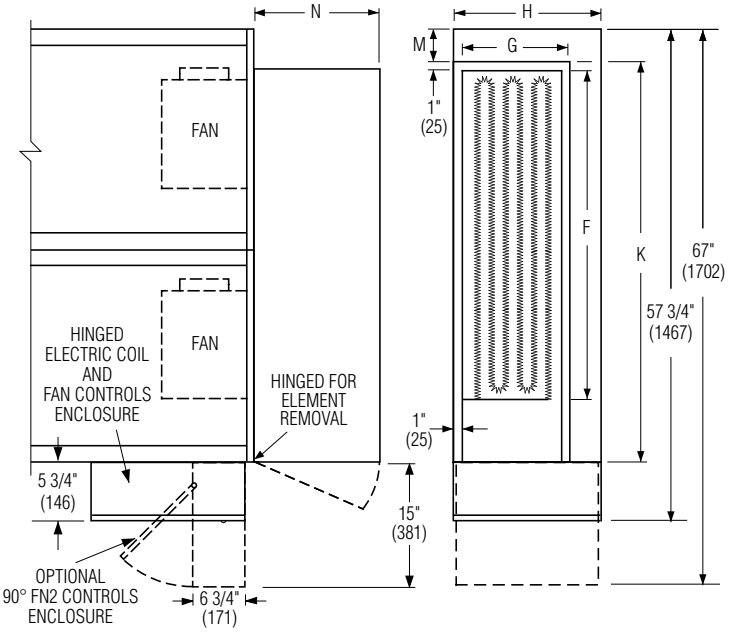
Electric Coil Section Model 35SE

Standard Features:

- Unique hinged heater design permits easy access, removal and replacement of heater element without disturbing ductwork.
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection (except 600V).
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Class A 80/20 Ni/Cr wire.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Voltage:

Single phase, 60 Hz.
208V 240V 277V
Three phase, 60 Hz.
208V 480V (4 wire wye).
600V (dual point connection).



Unit Size	Outlet Duct Size F x G	K	H	M	N
7	40 1/4 x 11 3/4 (1022 x 298)	48 (1219)	18 (457)	4 (102)	15 1/4 (387)

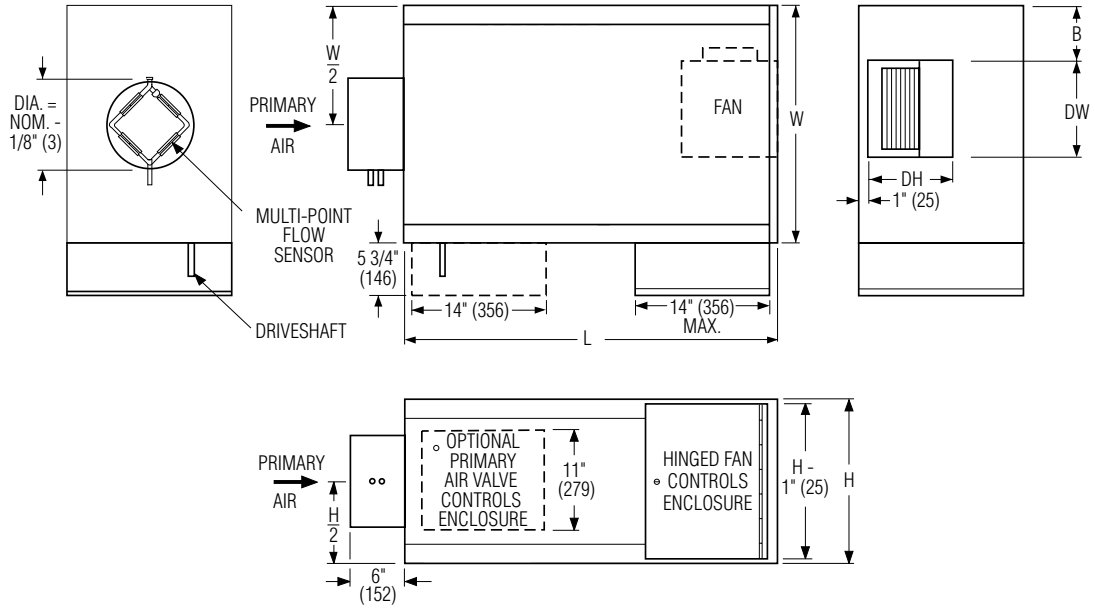
Options:

Toggle disconnect switch (includes fan).
SCR control.
Door interlock disconnect switch.
Mercury contactors.
Power circuit fusing.
Dust tight construction.
Manual reset secondary thermal cut out.

SCHEDULE TYPE:	Page 2 of 2. Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**4 - 25 - 23**	**3500**	**2 - 6 - 23**	**35S-2**

FAN POWERED PRESSURIZATION TERMINAL UNIT
EPIC ECM MOTOR
SERIES FLOW • CONSTANT VOLUME
MODELS: 35S-CVP, 35SW-CVP AND 35SE-CVP
UNIT SIZES 3 & 5

Model 35S-CVP



Dimensional Data

Unit Size	Inlet Size	W	H	L	B	Outlet Discharge DW x DH
3	6, 8, 10 (152, 203, 254)	18 (457)	18 (457)	36 (914)	3 1/2 (89)	9 1/4 x 10 1/2 (235 x 267)
5	8, 10, 12 (203, 254, 305)	26 (660)	18 (457)	41 (1041)	5 (127)	13 1/4 x 11 1/2 (337 x 292)

Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
3	*	4.8	3.3	3.2	3.1
5	*	9.6	6.2	5.9	5.8

* The EPIC ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption.
FLA = Full load amperage.
All motors are single phase/60 Hz.

APPLICATION:

'Smart' Brushless DC motor technology provides continuous monitoring, automatic compensation and precise control and maintenance of discharge airflow regardless of discharge static pressure variations incurred by a HEPA filter. Available in three unit sizes, suitable for 200 – 3000 cfm (94 – 1416 l/s) zone designs with up to a maximum total external discharge static pressure of 1.0" w.g. (250 Pa).
Ideally suited to clean room applications such as hospital isolation wards, operating rooms, pharmaceutical and biotechnology manufacturing and research facilities.

DESCRIPTION:

- 18 ga. (1.31) galv. steel channel frame with 20 ga. (1.00) casing components.
- 16 ga. (1.61) galvanized steel inclined opposed blade primary air damper. 45° rotation. CW to close.
- Multi-point averaging 'Diamond' flow sensor.
- Low leakage access panels on all 4 sides.
- Ultra Energy efficient ECM fan motor with overload protection and Nailor EPIC volume controller.
- Solid metal 'IAQ' liner. Meets requirements of NFPA 90A and UL 181.
- Single point electrical connection.
- Discharge opening for flanged duct connection.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

OPTIONS:

Fan unit fusing. Toggle disconnect switch.
Hanger brackets. Left hand control location option.
Special features _____ .

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Intertek

SCHEDULE TYPE:	Page 1 of 2. Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**3 - 25 - 17**	**3500**	**2 - 8 - 16**	**35S-CVP-1**

Nailor® Industries Inc.

FAN POWERED PRESSURIZATION TERMINAL UNIT
EPIC ECM MOTOR • HEAT ACCESSORIES
SERIES FLOW • CONSTANT VOLUME
MODELS: 35SW-CVP AND 35SE-CVP • UNIT SIZES 3 & 5

Hot Water Coil Section Model 35SW-CVP

Standard Features:

- Coil section installed on unit discharge.
- Coil (and header on multi-circuit units) is installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- Sweat Connections: Size 3 one row 1/2" (13) O.D. male solder. All others 7/8" (22) O.D. male solder.
- Top and bottom access panels for inspection and coil cleaning. Caulked for low leakage.
- Flanged outlet duct connection.

Coil Rows:

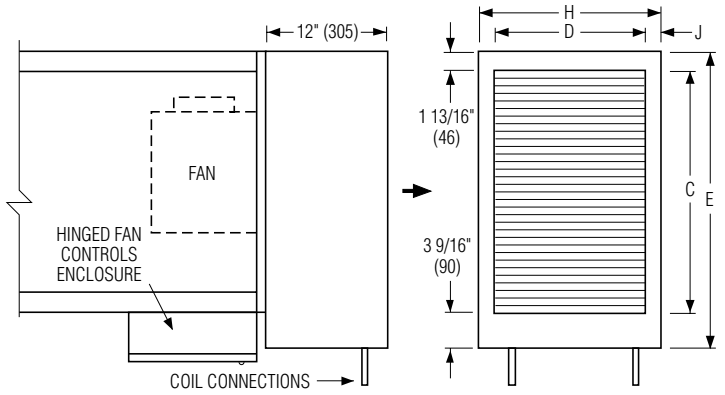
1-Row 2-Row 3-Row

Coil Hand Connections:

(Looking in direction of airflow).

Right hand (illustrated). Standard.

Left hand. Optional.

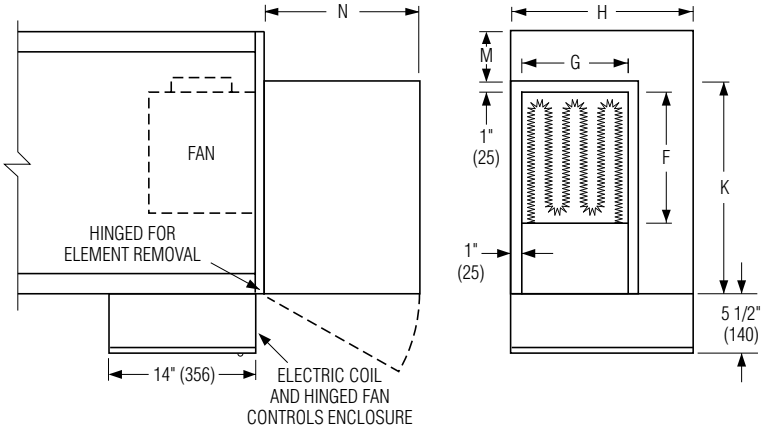


Unit Size	Outlet Duct Size C x D	E	H	J
3	16 x 14 7/8 (406 x 378)	21 3/8 (543)	18 (457)	1 9/16 (40)
5	24 x 14 7/8 (610 x 378)	29 3/8 (746)	18 (457)	1 9/16 (40)

Electric Coil Section Model 35SE-CVP

Standard Features:

- Unique hinged heater design permits easy access, removal and replacement of heater element without disturbing ductwork.
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection (except 600V).
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Class A 80/20 Ni/Cr wire.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.



Voltage:

Single phase, 60 Hz.

120V 208V 240V 277V

Three phase, 60 Hz.

208V 480V (4 wire wye).

600V (Dual Point Connection). _____ .

Unit Size	Outlet Duct Size F x G	K	H	M	N
3	10 1/4 x 10 1/2 (260 x 267)	15 1/2 (394)	18 (457)	2 1/2 (64)	15 1/4 (387)
5	14 1/4 x 11 3/4 (362 x 298)	22 (559)	18 (457)	4 (102)	15 1/4 (387)

Options:

Toggle disconnect switch (includes fan).

Door interlock disconnect switch.

Mercury contactors.

Power circuit fusing.

Dust tight construction.

Manual reset secondary thermal cut out.

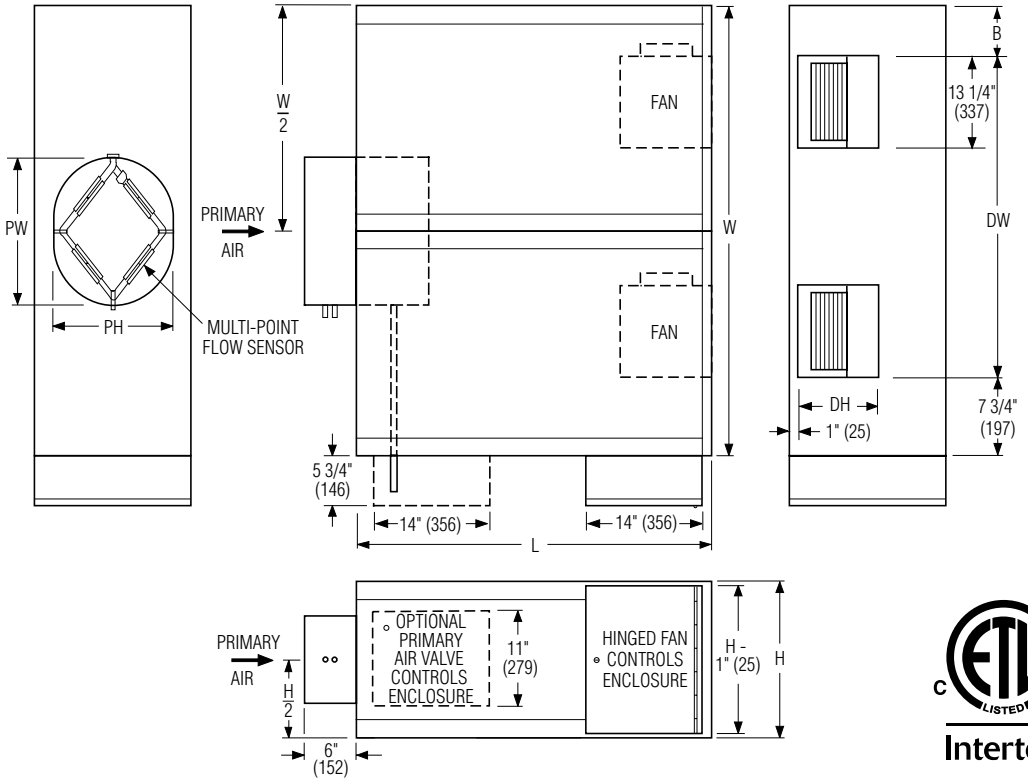
SCR Control.

Dimensions are in inches (mm).

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	DATE	B SERIES	SUPERSEDES	DRAWING NO.
CONTRACTOR:	3 - 25 - 17	3500	2 - 8 - 16	35S-CVP-1

FAN POWERED PRESSURIZATION TERMINAL UNIT
EPIC ECM MOTOR
SERIES FLOW • CONSTANT VOLUME
MODELS: 35S-CVP, 35SW-CVP AND 35SE-CVP
UNIT SIZE 7

Model 35S-CVP



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Dimensional Data

Unit Size	Inlet Size	PW x PH	W	H	L	B	Outlet Discharge DW x DH
7	14 (356) rnd. 16 (407) rnd. *18 (457) oval	13 7/8 (352) 15 7/8 (403) 20 3/16 x 13 7/8 (513 x 352)	52 (1321)	18 (457)	41 (1041)	5 (127)	39 1/4 x 11 1/2 (997 x 292)

*Flat oval inlets

Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
7	*	17.5	11.1	11.4	11.4

* The EPIC ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption.
FLA = Full load amperage.
All motors are single phase/60 Hz.

APPLICATION:

'Smart' Brushless DC motor technology provides continuous monitoring, automatic compensation and precise control and maintenance of discharge airflow regardless of discharge static pressure variations incurred by a HEPA filter. Available in three unit sizes, suitable for 200 – 3000 cfm (94 – 1416 l/s) zone designs with up to a maximum total external discharge static pressure of 1.0" w.g. (250 Pa).
Ideally suited to clean room applications such as hospital isolation wards, operating rooms, pharmaceutical and biotechnology manufacturing and research facilities.

DESCRIPTION:

- 18 ga. (1.31) galv. steel channel frame with 20 ga. (1.00) casing components.
- 16 ga. (1.61) galvanized steel inclined opposed blade primary air damper. 45° rotation. CW to close.
- Multi-point averaging 'Diamond' flow sensor.
- Low leakage access panels on all 4 sides.
- Ultra Energy efficient ECM fan motor with overload protection and Nailor EPIC volume controller.
- Solid metal 'IAQ' liner. Meets requirements of NFPA 90A and UL 181.
- Single point electrical connection.
- Discharge opening for flanged duct connection.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

OPTIONS:

Fan unit fusing. Toggle disconnect switch.
Hanger brackets. Left hand control location option.
Special features _____ .

SCHEDULE TYPE:	Page 1 of 2. Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**3 - 25 - 17**	**3500**	**2 - 8 - 16**	**35S-CVP-2**

Nailor® Industries Inc.

FAN POWERED PRESSURIZATION TERMINAL UNIT
EPIC ECM MOTOR • HEAT ACCESSORIES
SERIES FLOW • CONSTANT VOLUME
MODELS: 35SW-CVP AND 35SE-CVP • UNIT SIZE 7

Hot Water Coil Section Model 35SW-CVP

Standard Features:

- Coil section installed on unit discharge.
- Coil (and header on multi-circuit units) is installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- Sweat Connections: 1 and 2 Row 7/8" (22); 3 Row 1 3/8" (35); male solder.
- Top and bottom access panels for inspection and coil cleaning. Caulked for low leakage.
- Flanged outlet duct connection.

Coil Rows:

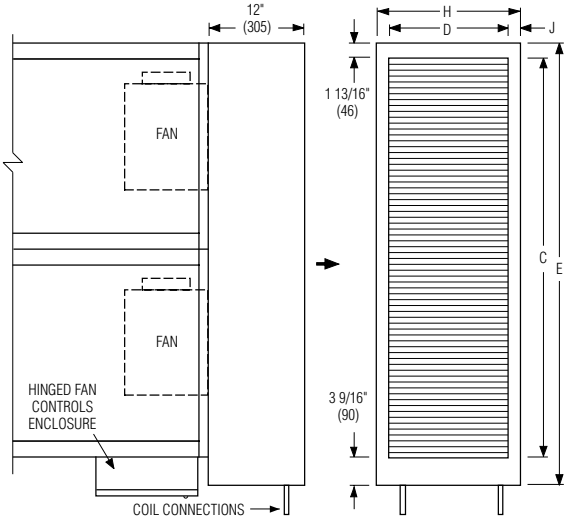
1-Row 2-Row 3-Row

Coil Hand Connections:

(Looking in direction of airflow).

Right hand (illustrated). Standard.

Left hand. Optional.



Unit Size	Outlet Duct Size C x D	E	H	J
7	50 x 14 7/8 (1270 x 378)	55 3/8 (1407)	18 (457)	1 9/16 (40)

Electric Coil Section Model 35SE-CVP

Standard Features:

- Unique hinged heater design permits easy access, removal and replacement of heater element without disturbing ductwork.
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection for (except 600V).
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Class A 80/20 Ni/Cr wire.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Voltage:

Single phase, 60 Hz.

208V 240V 277V

Three phase, 60 Hz.

208V 480V (4 wire wye).

600V (Dual Point Connection). _____ .

Options:

Toggle disconnect switch (includes fan).

Door interlock disconnect switch.

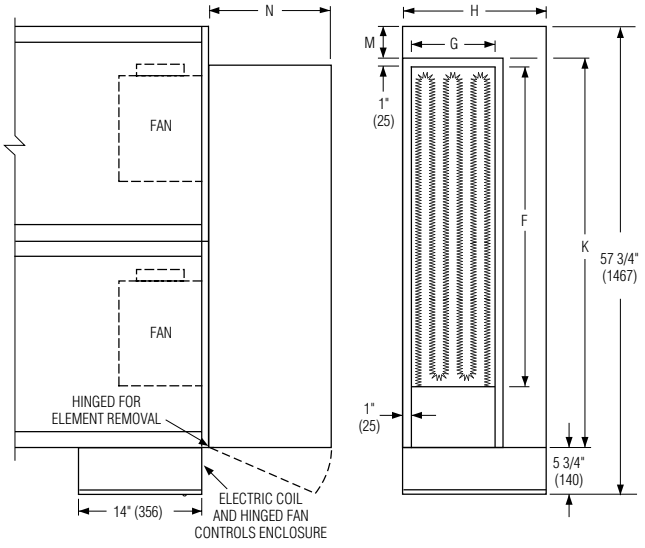
Mercury contactors.

Power circuit fusing.

Dust tight construction.

Manual reset secondary thermal cut out.

SCR Control.



Unit Size	Outlet Duct Size F x G	K	H	M	N
7	40 1/4 x 11 3/4 (1022 x 298)	48 (1219)	18 (457)	4 (102)	15 1/4 (387)

SCHEDULE TYPE:	Page 2 of 2. Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**3 - 25 - 17**	**3500**	**2 - 8 - 16**	**35S-CVP-2**

FAN POWERED TERMINAL UNIT WITH OUTSIDE AIR INLET • EPIC ECM MOTOR

SERIES FLOW • CONSTANT OR VARIABLE VOLUME

MODELS: 35S-OAI, 35SW-OAI AND 35SE-OAI

UNIT SIZES 2 – 6

Nailor Industries Inc.

DESCRIPTION:

- 18 ga. (1.31) galvanized steel channel frame with 20 ga. (1.00) casing components.
- 16 ga. (1.61) galvanized steel inclined opposed blade dampers. 45° rotation. RH CW to close. LH CCW to close.
- Separate outside ventilation air inlet.
- Ultra-high efficiency ECM fan motor. EPIC fan volume controller.
- Multi-point averaging Diamond Flow sensor. Supplied with balancing tees.
- Universal access panels on all 4 sides.
- 3/4" (19) dual density insulation, coated to prevent air erosion, meets requirements of NFPA 90A and UL 181.
- Single point electrical and/or pneumatic main air connection.
- Discharge opening for flanged duct connection.
- Full enclosure for factory mounted DDC and analog electronic controls.
- Choice of right or left-hand primary inlet location. Hand of unit is determined by location of primary inlet looking in direction of airflow. Right-hand illustrated.

OPTIONS:

Digital Controls:

Factory mounted (supplied by others)
Field mounted (supplied by others)

Liner:

Fiber-free
Steri-liner
Steri-liner + Perforated metal
Perforated metal
Solid metal
1" (25) fiberglass

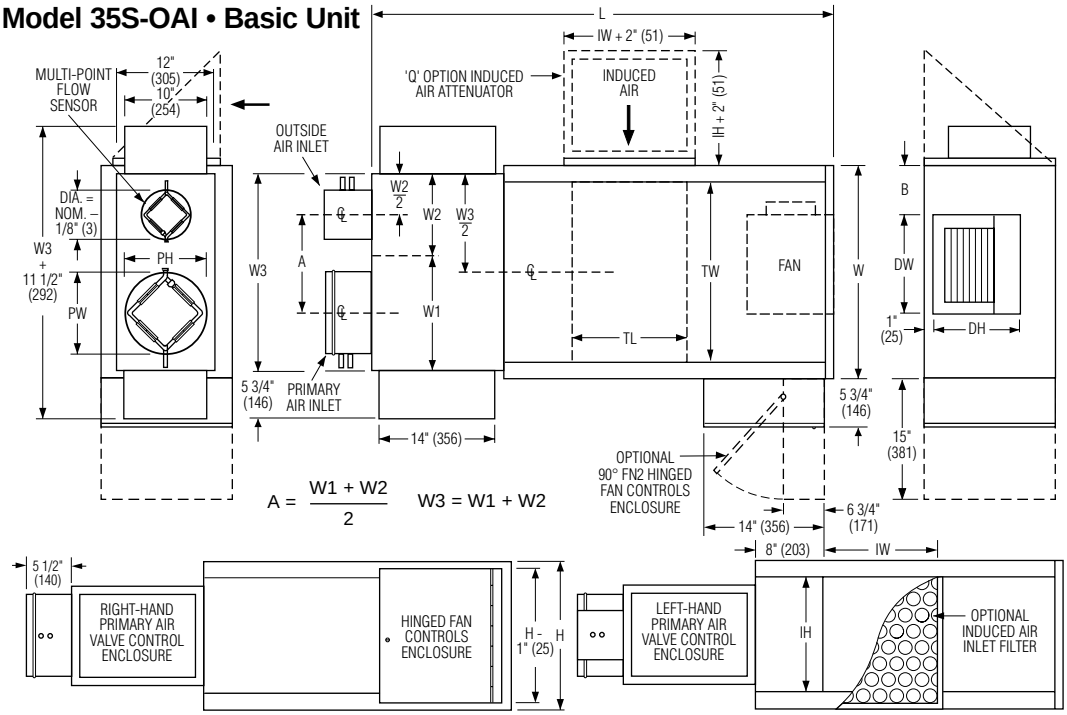
Other:

Left-hand controls location
Left-hand primary inlet location
Toggle disconnect switch
Fan unit fusing
24/24V Isolation transformer
Cross Flow Sensor (not on primary inlet)
'Q' Option – Induced Air Inlet Attenuator. (not available w/FN2 option).
Top entry induced air inlet
1" (25) Throwaway filter
2" (51) MERV 8 filter
Hanger brackets.
1/4-turn fasteners (access panel)
FN2 90° Line Voltage Enclosure
FN3 Remote Line Voltage Controls Enclosure. (See submittal FN3)
Dust tight enclosure seal
Remote user disconnect

Seismic Certification:

Seismic Source International (Standard)
HCAI (formerly OSHPD, California)
Special Features: _____ .

Model 35S-OAI • Basic Unit



Dimensional Data

Unit Size	Inlet Size	Outside Inlet Size	W	H	L	B	Induced Air Inlet Side (std.) IW x IH	Induced Air Inlet Top (opt.) TL x TW	Outlet Discharge DW x DH	Filter Size Side Inlet (std.)	Filter Size Top Inlet (opt.)
2	6, 8 (152, 203)	4, 5, 6 (102, 127, 152)	18 (457)	14 (356)	51 1/2 (1308)	6 (152)	8 x 10 (203 x 254)	10 x 14 (254 x 356)	9 1/4 x 10 1/2 (235 x 267)	10 x 12 (254 x 305)	14 x 16 (356 x 406)
3	6, 8, 10 (152, 203, 254)	4, 5, 6 (102, 127, 152)	18 (457)	18 (457)	51 1/2 (1308)	3 1/2 (89)	12 x 14 (305 x 356)	14 x 14 (356 x 356)	9 1/4 x 10 1/2 (235 x 267)	14 x 16 (356 x 406)	16 x 16 (406 x 406)
4	8, 10, 12** (203, 254, 305)	6, 7, 8 (152, 178, 203)	26 (660)	18 (457)	56 1/2 (1435)	6 (152)	14 x 14 (356 x 356)	12 x 22 (305 x 559)	12 x 10 1/2 (305 x 267)	16 x 16 (406 x 406)	16 x 25 (406 x 635)
5	10, 12**, 14** (254, 305, 356)	6, 7, 8 (152, 178, 203)	26 (660)	18 (457)	56 1/2 (1435)	5 (127)	14 x 14 (356 x 356)	12 x 22 (305 x 559)	13 1/4 x 11 1/2 (337 x 292)	16 x 16 (406 x 406)	16 x 25 (406 x 635)
6	10, 12**, 14** (254, 305, 356)	6, 7, 8 (152, 178, 203)	30 (762)	19 (483)	59 1/2 (1511)	6 (152)	16 x 15 (406 x 381)	14 x 26 (356 x 660)	13 1/4 x 11 1/2 (337 x 292)	17 x 18 (432 x 457)	18 x 28 (457 x 711)

Primary/Inlet Dimensions

**Flat oval inlets

Size	W1 or W2
4, 5, 6	12 (305)
7, 8	14 (356)
10	16 (406)
12**	19 (483)
14**	20 (508)

Oval Inlet Dimensions

Size	PW x PH
12**	12 13/16 x 9 13/16 (325 x 249)
14**	16 1/16 x 9 13/16 (408 x 249)

Electrical Data

Unit Size	EPIC ECM Motor FLA Motor HP	120V	208V	240V	277V
2	*	4.0	2.7	2.6	2.6
3	*	5.0	3.4	3.3	3.3
4	*	6.9	4.6	4.5	4.2
5	*	9.0	6.1	5.8	5.6
6	*	11.9	7.3	7.3	7.2

*The ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption. FLA = Full load amperage. All motors are single phase/60 Hz.

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

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	DATE	B SERIES	SUPERSEDES	DRAWING NO.
CONTRACTOR:	2 - 6 - 23	3500	11 - 15 - 22	35S-OAI-1

Page 1 of 2. For heat options; see page 2.
Dimensions are in inches (mm).

Nailor® Industries Inc.

FAN POWERED TERMINAL UNIT WITH OUTSIDE AIR INLET • EPIC ECM MOTOR HEAT ACCESSORIES

SERIES FLOW • CONSTANT OR VARIABLE VOLUME

MODELS: 35SW-OAI AND 35SE-OAI • UNIT SIZES 2 – 6

Hot Water Coil Section Model 35SW-OAI

Standard Features:

- Coil section installed on unit discharge.
- Coil (and header on multi-circuit units) is installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- Sweat Connections:
  Size 2 – 3: 1 Row 1/2" (13), 2 and 3 Row 7/8" (22); O.D. male solder.
  Size 4 – 6: 1, 2, and 3 Row 7/8" (22); O.D. male solder.
- Top and bottom access panels for inspection and coil cleaning.
- Flanged outlet duct connection.

Coil Rows:

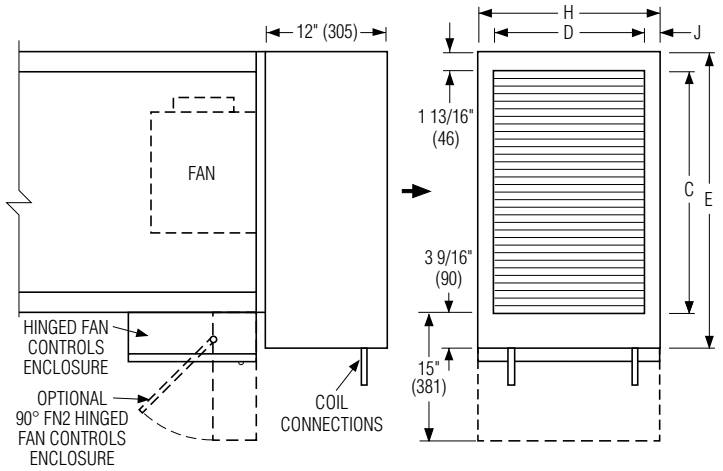
1-Row 2-Row 3-Row

Coil Hand Connections:

(Looking in direction of airflow).

Right hand (illustrated). Standard.

Left hand. Optional.



Unit Size	Outlet Duct Size C x D	E	H	J
2	16 x 12 1/8 (406 x 308)	21 3/8 (543)	14 (356)	15/16 (24)
3	16 x 14 7/8 (406 x 378)	21 3/8 (543)	18 (457)	1 9/16 (40)
4, 5	24 x 14 7/8 (610 x 378)	29 3/8 (746)	18 (457)	1 9/16 (40)
6	28 x 17 1/8 (711 x 435)	33 3/8 (848)	19 (483)	15/16 (24)

Electric Coil Section Model 35SE-OAI

Standard Features:

- Unique hinged heater design permits easy access, removal and replacement of heater element without disturbing ductwork.
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection (except 600V).
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Class A 80/20 Ni/Cr wire.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Voltage:

Single phase, 60 Hz.

120V 208V 240V 277V

Three phase, 60 Hz.

208V 480V (4 wire wye).

600V (Dual point connection) _____ .

Options:

Toggle disconnect switch (includes fan).

Door interlock disconnect switch.

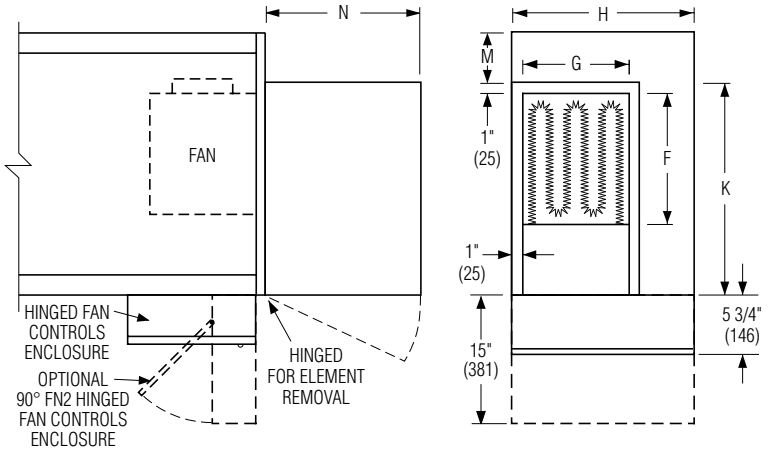
SCR Control.

Mercury contactors.

Power circuit fusing.

Dust tight construction.

Manual reset secondary thermal cut out.



Unit Size	Outlet Duct Size F x G	K	H	M	N
2	10 1/4 x 10 1/2 (260 x 267)	15 1/2 (394)	14 (356)	2 1/2 (64)	12 1/2 (318)
3	10 1/4 x 10 1/2 (260 x 267)	15 1/2 (394)	18 (457)	2 1/2 (64)	15 1/4 (387)
4	13 x 10 1/2 (330 x 267)	21 (533)	18 (457)	5 (127)	15 1/4 (387)
5	14 1/4 x 11 3/4 (362 x 298)	22 (559)	18 (457)	4 (102)	15 1/4 (387)
6	14 1/4 x 11 3/4 (362 x 298)	25 (635)	19 (635)	5 (127)	15 1/4 (387)

Dimensions are in inches (mm).

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 6 - 23**	**3500**	**11 - 15 - 22**	**35S-OAI-1**

FAN POWERED TERMINAL UNIT WITH OUTSIDE AIR INLET • EPIC ECM MOTOR

SERIES FLOW • CONSTANT OR VARIABLE VOLUME

MODELS: 35S-OAI, 35SW-OAI AND 35SE-OAI

UNIT SIZE 7

Nailor Industries Inc.

DESCRIPTION:

- 18 ga. (1.31) galvanized steel channel frame with 20 ga. (1.00) casing components.
- 16 ga. (1.61) galvanized steel inclined opposed blade dampers. 45° rotation. RH CW to close. LH CCW to close.
- Separate outside ventilation air inlet.
- Ultra-high efficiency ECM fan motor. EPIC fan volume controller.
- Multi-point averaging Diamond Flow sensor. Supplied with balancing tees.
- Universal access panels on all 4 sides.
- 3/4" (19) dual density insulation, coated to prevent air erosion, meets requirements of NFPA 90A and UL 181.
- Single point electrical and/or pneumatic main air connection.
- Discharge opening for flanged duct connection.
- Full enclosure for factory mounted DDC and analog electronic controls.
- Choice of right or left-hand primary inlet location. Hand of unit is determined by location of primary inlet looking in direction of airflow. Right-hand illustrated.

OPTIONS:

Digital Controls:

Factory mounted (supplied by others)

Field mounted (supplied by others)

Liner:

Steri-liner

Steri-liner + Perforated metal

Fiber-free

Perforated metal

Solid metal

1" (25) fiberglass

Other:

Left-hand controls location

Left-hand primary inlet location

Toggle disconnect switch

Fan unit fusing

24/24V Isolation transformer

Cross Flow Sensor (not on primary inlet)

'Q' Option – Induced Air Inlet Attenuator. (not available w/FN2 option).

Top entry induced air inlet

1" (25) Throwaway filter

2" (51) MERV 8 filter

Hanger brackets.

1/4-turn fasteners (access panel)

FN2 90° Line Voltage Enclosure

FN3 Remote Line Voltage Controls Enclosure (See submittal FN3)

Dust tight enclosure seal

Remote user disconnect

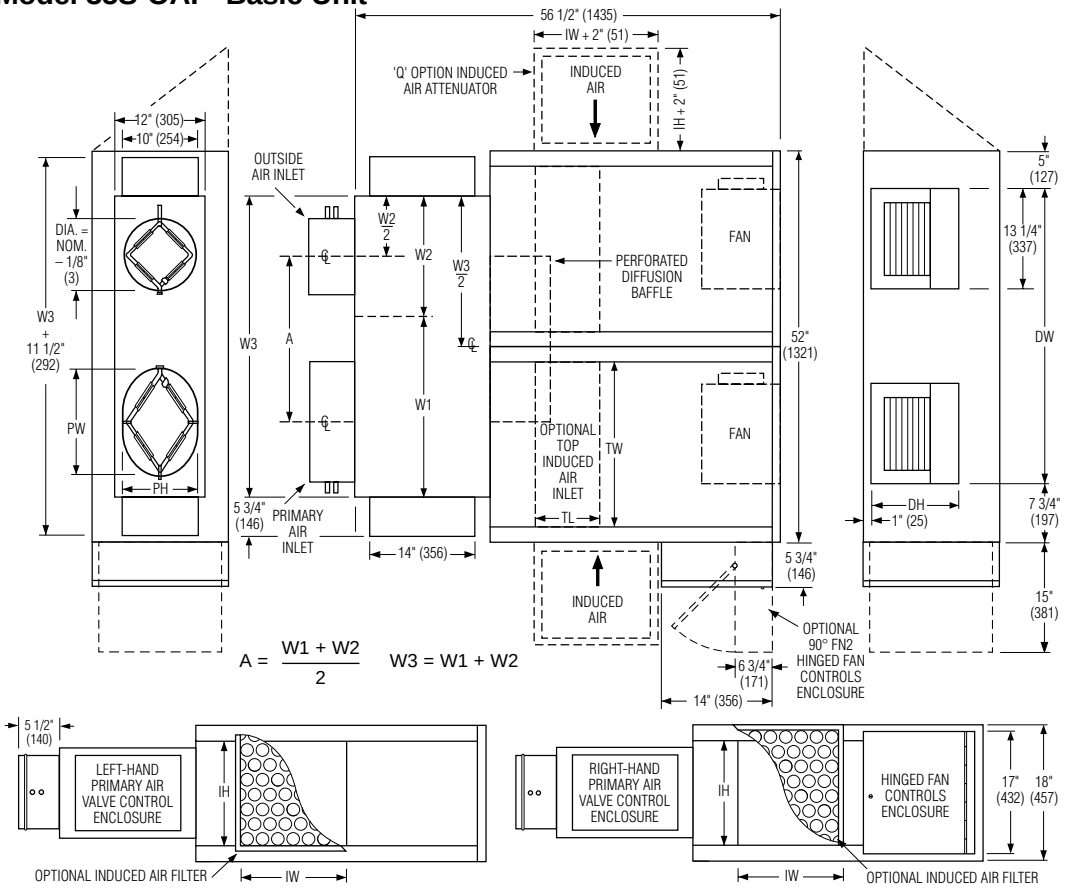
Seismic Certification:

Seismic Source International (Standard)

HCAI (formerly OSHPD, California)

Special Features: _____ .

Model 35S-OAI • Basic Unit



Dimensional Data

Unit Size	Primary Inlet Size	Outside Inlet Size	Induced Air Inlet		Outlet Discharge DW x DH	Filter Size	
			Side (std.) IW x IH	Top (opt.) TL x TW		Side Inlet (std.)	Top Inlet (opt.)
7	12**, 14**, 16** (203**, 254**, 305**)	6, 7, 8, 10 (152, 178, 203, 254)	12 x 14 (305 x 356) Qty. of 2	8 1/2 x 22 (216 x 559) Qty. of 2	39 1/4 x 11 1/2 (997 x 292)	14 x 16 (356 x 406) Qty. of 2	10 x 25 (254 x 635) Qty. of 2

**Flat oval inlets

Primary/Inlet Dimensions

Size	W1 or W2
6	12 (305)
7, 8	14 (356)
10	16 (406)
12**	19 (483)
14**	20 (508)
16**	24 (610)

Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
7	*	15.9	10.5	9.9	10.0

* The ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption.

FLA = Full load amperage. All motors are single phase/60 Hz.

Oval Inlet Dimensions

Size	PW x PH
12**	12 13/16 x 9 13/16 (325 x 249)
14**	16 1/16 x 9 13/16 (408 x 249)
16**	19 3/16 x 9 13/16 (487 x 249)

SSI Listed

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

ETL LISTED c US Intertek

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 6 - 23**	**3500**	**11 - 15 - 22**	**35S-OAI-2**

Page 1 of 2. For heat options; see page 2.
Dimensions are in inches (mm).

Nailor® Industries Inc.

FAN POWERED TERMINAL UNIT WITH OUTSIDE AIR INLET • EPIC ECM MOTOR HEAT ACCESSORIES

SERIES FLOW • CONSTANT OR VARIABLE VOLUME

MODELS: 35SW-OAI AND 35SE-OAI • UNIT SIZE 7

Hot Water Coil Section Model 35SW-OAI

Standard Features:

- Coil section installed on unit discharge.
- Coil (and header on multi-circuit units) is installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- Sweat connections: 1 and 2 row, 7/8" (22) O. D. male solder. 3 row 1 3/8" (35) O.D. male solder.
- Top and bottom access panels for inspection and coil cleaning.
- Flanged outlet duct connection.

Coil Rows:

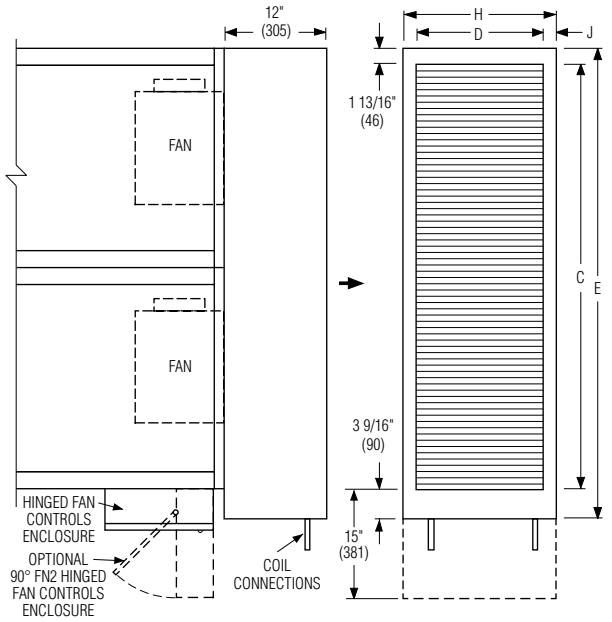
1-Row 2-Row 3-Row

Coil Hand Connections:

(Looking in direction of airflow).

Right hand (illustrated). Standard.

Left hand. Optional.



Unit Size	Outlet Duct Size C x D	E	H	J
7	50 x 14 7/8 (1270 x 378)	55 3/8 (1407)	18 (457)	1 9/16 (40)

Electric Coil Section Model 35SE-OAI

Standard Features:

- Unique hinged heater design permits easy access, removal and replacement of heater element without disturbing ductwork.
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection (except 600V).
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Class A 80/20 Ni/Cr wire.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Voltage:

Single phase, 60 Hz.

120V 208V 240V 277V

Three phase, 60 Hz.

208V 480V (4 wire wye).

600V (Dual point connection) _____ .

Options:

Toggle disconnect switch (includes fan).

Door interlock disconnect switch.

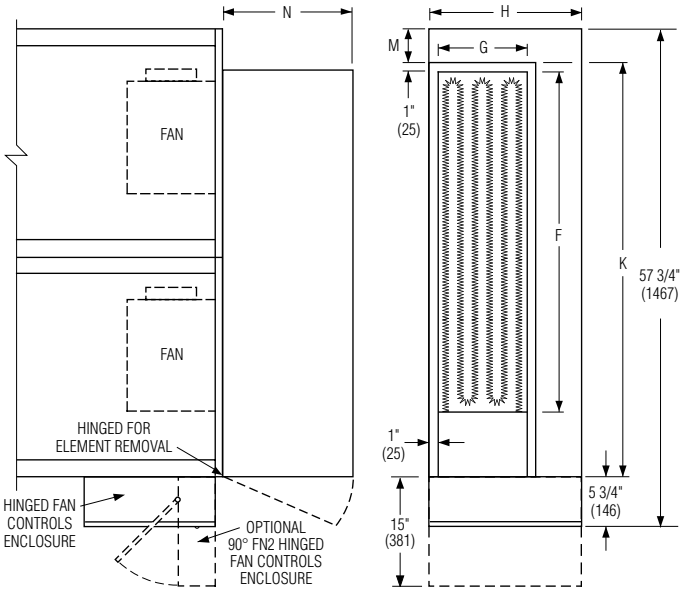
SCR Control.

Mercury contactors.

Power circuit fusing.

Dust tight construction.

Manual reset secondary thermal cut out.



Unit Size	Outlet Duct Size F x G	K	H	M	N
7	40 1/4 x 11 3/4 (1022 x 298)	48 (1219)	18 (457)	4 (102)	15 1/4 (387)

Dimensions are in inches (mm).

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 6 - 23**	**3500**	**11 - 15 - 22**	**35S-OAI-2**

FAN POWERED TERMINAL UNIT WITH EPIC ECM MOTOR

STEALTH • SERIES FLOW

CONSTANT OR VARIABLE VOLUME

MODELS: 35SST, 35SWST AND 35SEST • UNIT SIZES 1 – 6

DESCRIPTION:

- 18 ga. (1.31) galvanized steel channel frame with 20 ga. (1.00) casing components.
- 16 ga. (1.61) galvanized steel inclined opposed blade damper. 45° rotation. CW to close.
- Ultra-high efficiency ECM fan motor. EPIC fan volume controller.
- Multi-point averaging Diamond Flow sensor. Supplied with balancing tees.
- Full size access panels on three sides.
- 3/4" (19) dual density insulation, exposed edges coated to prevent air erosion. Meets requirements of NFPA 90A and UL 181.
- Single point electrical and /or pneumatic main air connection.
- Discharge opening for flanged duct connection.
- Full primary air valve low voltage NEMA 1 type enclosure for factory mounted DDC and analog electronic controls.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

OPTIONS:

Digital Controls:

Factory mounted (supplied by others)

Field mounted (supplied by others)

Nailor EZvav. See separate submittal.

Liner:

Steri-liner

Steri-liner + Perforated metal

Fiber-free

Perforated metal

Solid metal

1" (25) fiberglass

Low temperature construction

Other:

Left-hand controls location

Toggle disconnect switch

Fan unit fusing

24/24V Isolation transformer

Cross Flow Sensor

'Q' Option – Induced Air Inlet Attenuator

Top entry induced air inlet

1" (25) Throwaway filter

2" (51) MERV 8 filter

Hanger brackets.

1/4-turn fasteners (access panel)

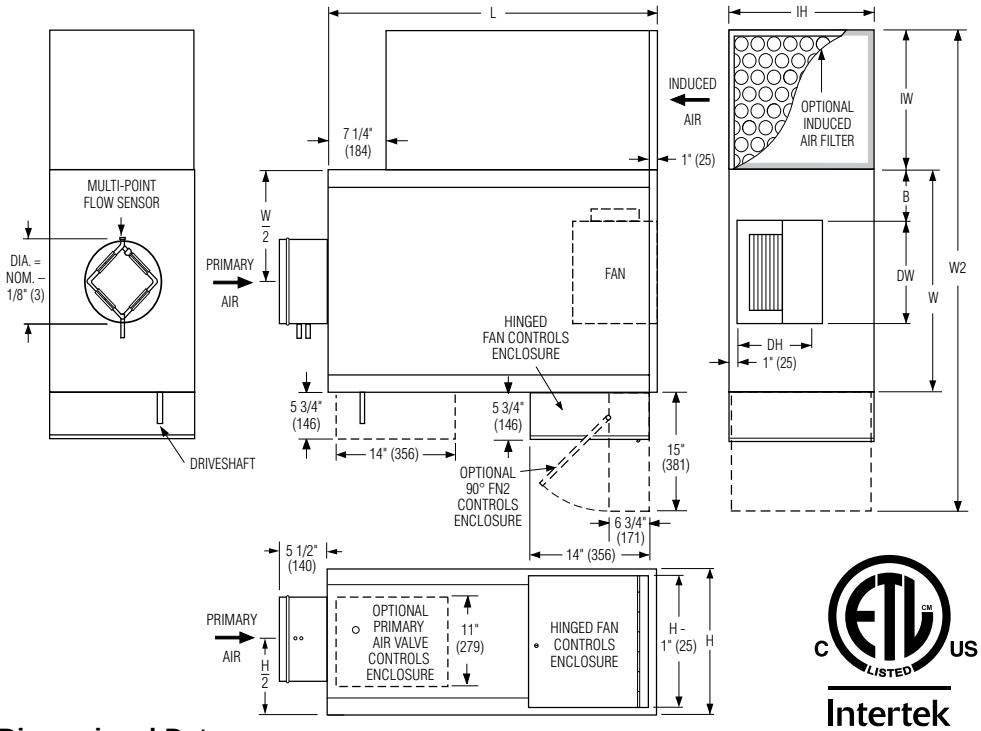
FN2 90° Line Voltage Enclosure

FN3 Remote Line Voltage Controls Enclosure (See submittal FN3)

Dust tight enclosure seal

Remote user disconnect

Model 35SST • Basic Unit



Dimensional Data

Unit Size	Inlet Size	W	W2	H	L	B	Induced Air Inlet IW x IH	Outlet Discharge DW x DH	Filter Size
1	5, 6, 8** (127, 152, 203)	20 (508)	44 (1118)	14 (356)	36 (914)	6 (152)	9 x 14 (229 x 356)	8 1/8 x 4 1/4 (206 x 108)	10 x 14 (254 x 356)
2	6, 8 (152, 203)	18 (457)	42 (1067)	14 (356)	36 (914)	3 1/2 (89)	9 x 14 (229 x 356)	9 1/4 x 10 1/2 (235 x 267)	10 x 14 (254 x 356)
3	6, 8, 10, 12 (152, 203, 254, 305)	18 (457)	44 (1118)	18 (457)	36 (914)	3 1/2 (89)	11 x 18 (279 x 457)	9 1/4 x 10 1/2 (235 x 267)	12 x 18 (305 x 457)
4	8, 10, 12, 14 (203, 254, 305, 356)	26 (660)	56 3/4 (1441)	18 (457)	41 (1041)	6 (152)	15 3/4 x 14 (400 x 356)	12 x 10 1/2 (305 x 267)	16 x 14 (406 x 356)
5	10, 12, 14 (254, 305, 356)	26 (660)	55 1/2 (1410)	18 (457)	41 (1041)	5 (127)	14 1/2 x 18 (368 x 457)	13 1/4 x 11 1/2 (337 x 292)	14 x 18 (356 x 457)
6	12, 14, 16 (305, 356, 406)	30 (762)	62 1/2 (1588)	19 (483)	44 (1118)	6 (152)	17 1/2 x 19 (445 x 483)	13 1/4 x 11 1/2 (337 x 292)	18 x 19 (457 x 483)

** ECM Only.

Seismic Certification:

Seismic Source International (Standard)

HCAI (formerly OSHPD, California)

Special Features: _____ .

Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
1	*	2.1	1.4	1.3	1.2
2	*	4.0	2.7	2.6	2.6
3	*	5.0	3.4	3.3	3.3
4	*	6.9	4.6	4.5	4.2
5	*	9.0	6.1	5.8	5.6
6	*	11.9	7.3	7.3	7.2

* The ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption. FLA = Full load amperage. All motors are single phase/60 Hz.

Page 1 of 2. For heat options; see page 2.

Dimensions are in inches (mm).

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	DATE	B SERIES	SUPERSEDES	DRAWING NO.
CONTRACTOR:	2 - 6 - 23	3500	11 - 15 - 22	35SST-1

Nailor® Industries Inc.

FAN POWERED TERMINAL UNIT WITH EPIC ECM MOTOR • HEAT ACCESSORIES

STEALTH • SERIES FLOW

CONSTANT OR VARIABLE VOLUME

MODELS: 35SST, 35SWST AND 35SEST • UNIT SIZES 1 – 6

Hot Water Coil Section Model 35SWST STEALTH

Standard Features:

- Coil section installed on unit discharge.
- Coil (and header on multi-circuit units) is installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- Sweat Connections:
  Size 1 – 3: 1 Row 1/2" (13), 2 and 3 Row 7/8" (22); O.D. male solder.
  Size 4 – 6: 1, 2, and 3 Row 7/8" (22); O.D. male solder.
- Top and bottom access panels for inspection and coil cleaning.
- Flanged outlet duct connection.

Coil Rows:

1-Row 2-Row 3-Row

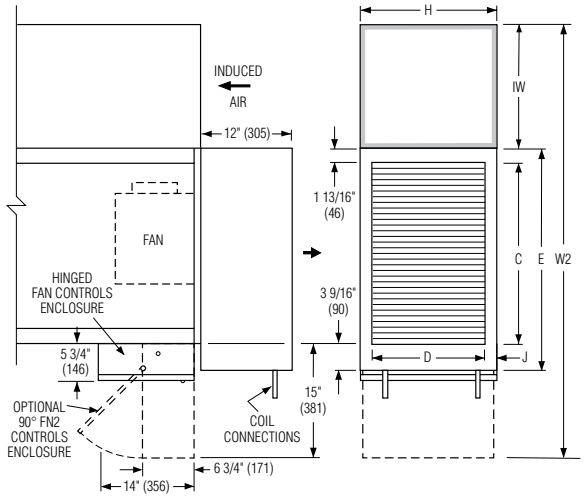
Coil Hand Connections:

(Looking in direction of airflow).

Right hand (illustrated). Standard.

Left hand (terminals are inverted). Optional.

Connections must be selected same hand as controls enclosure location.



Unit Size	Outlet Duct Size C x D	W2	E	H	J
1	16 x 12 1/8 (406 x 308)	44 (1118)	21 3/8 (543)	14 (356)	1 (25)
2	16 x 12 1/8 (406 x 308)	42 (1067)	21 3/8 (543)	14 (356)	1 (25)
3	16 x 14 7/8 (406 x 378)	44 (1118)	21 3/8 (543)	18 (457)	1 1/2 (38)
4, 5	24 x 14 7/8 (610 x 378)	56 3/4 (1441)	29 3/8 (746)	18 (457)	1 1/2 (38)
6	28 x 17 1/8 (711 x 435)	62 1/2 (1588)	33 3/8 (848)	19 (483)	1 (25)

Electric Coil Section Model 35SEST STEALTH

Standard Features:

- Unique hinged heater design permits easy access, removal and replacement of heater element without disturbing ductwork.
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection (except 600V).
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Class A 80/20 Ni/Cr wire.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Voltage:

Single phase, 60 Hz.

120V 208V 240V 277V

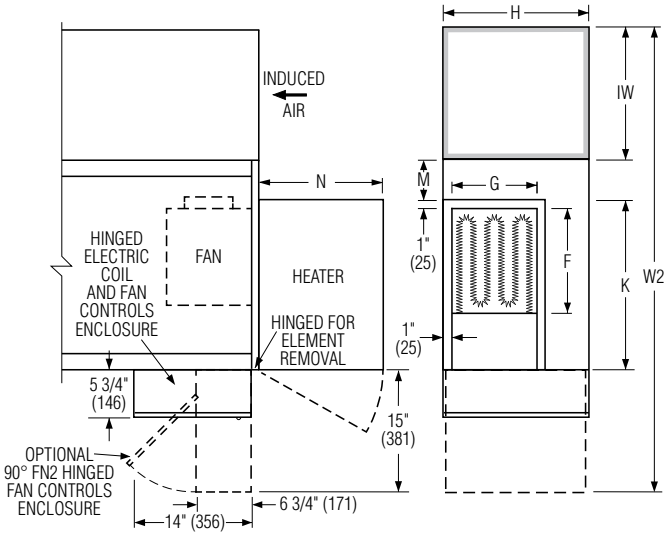
Three phase, 60 Hz.

208V 480V (4 wire wye).

600V (dual point connection). _____ .

Options:

Toggle disconnect switch (includes fan).
SCR control.
Door interlock disconnect switch.
Mercury contactors.
Power circuit fusing.
Dust tight construction.
Manual reset secondary thermal cut out.



Unit Size	Outlet Duct Size F x G	W2	K	H	M	N
1	10 1/4 x 10 1/2 (260 x 267)	44 (1118)	16 (406)	14 (356)	4 (102)	12 1/2 (318)
2	10 1/4 x 10 1/2 (260 x 267)	42 (1067)	15 1/2 (394)	14 (356)	2 1/2 (64)	12 1/2 (318)
3	10 1/4 x 10 1/2 (260 x 267)	44 (1118)	15 1/2 (394)	18 (457)	2 1/2 (64)	15 1/4 (387)
4	13 x 10 1/2 (330 x 267)	56 3/4 (1441)	21 (533)	18 (457)	5 (127)	15 1/4 (387)
5	14 1/4 x 11 3/4 (362 x 298)	55 1/2 (1410)	22 (559)	18 (457)	4 (102)	15 1/4 (387)
6	14 1/4 x 11 3/4 (362 x 298)	62 1/2 (1588)	25 (635)	19 (483)	5 (127)	15 1/4 (387)

SCHEDULE TYPE:	Page 2 of 2. Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 6 - 23**	**3500**	**11 - 15 - 22**	**35SST-1**

FAN POWERED TERMINAL UNIT WITH EPIC ECM MOTOR

STEALTH • SERIES FLOW

CONSTANT OR VARIABLE VOLUME

MODELS: 35SST, 35SWST AND 35SEST • UNIT SIZE 7

DESCRIPTION:

• 18 ga. (1.31) galvanized steel channel frame with 20 ga. (1.00) casing components.

• 16 ga. (1.61) galvanized steel inclined opposed blade damper. 45° rotation. CW to close.

• Stealth tuned inlet attenuators. Shipped loose for field mounting.

• Ultra-high efficiency ECM fan motor. EPIC fan volume controller.

• Multi-point averaging Diamond Flow sensor. Supplied with balancing tees.

• Universal access. Panels on all 4 sides.

• 3/4" (19) dual density insulation, exposed edges coated to prevent air erosion. Meets requirements of NFPA 90A and UL 181.

• Single point electrical and/or pneumatic main air connection.

• Discharge opening for flanged duct connection.

• Full primary air valve low voltage NEMA 1 type enclosure for factory mounted DDC and analog electronic controls.

• Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

OPTIONS:

Digital Controls:

Factory mounted (supplied by others)

Field mounted (supplied by others)

Nailor EZvav. See separate submittal.

Liner:

Steri-liner

Steri-liner + Perforated metal

Fiber-free

Perforated metal

Solid metal

1" (25) fiberglass

Low temperature construction

Other:

Left-hand controls location

Toggle disconnect switch

Fan unit fusing

24/24V Isolation transformer

Cross Flow Sensor

'Q' Option – Induced Air Inlet Attenuator

Top entry induced air inlet

1" (25) Throwaway filter

2" (51) MERV 8 filter

Hanger brackets.

1/4-turn fasteners (access panel)

FN2 90° Line Voltage Enclosure

FN3 Remote Line Voltage Controls Enclosure (See submittal FN3)

Dust tight enclosure seal

Remote user disconnect

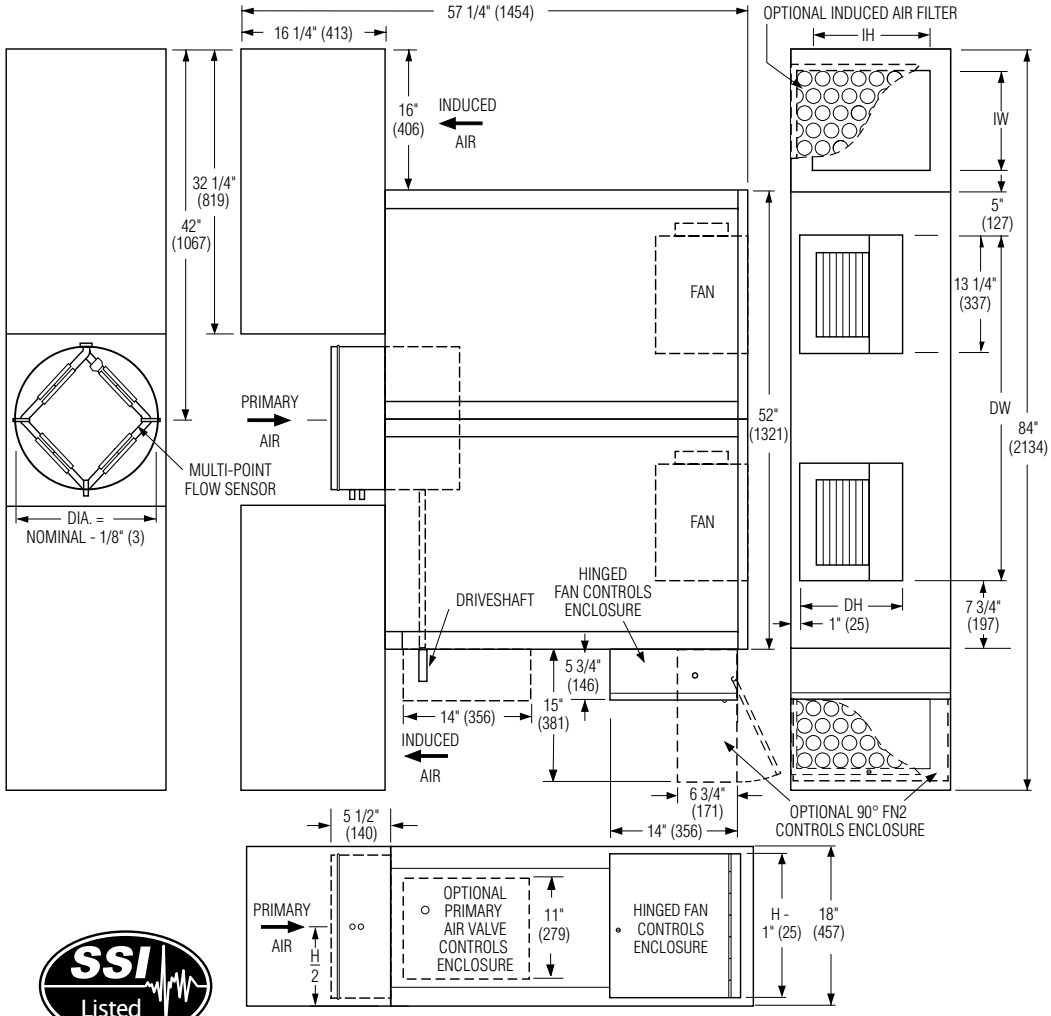
Seismic Certification:

Seismic Source International (Standard)

HCAI (formerly OSHPD, California)

Special Features: _____ .

Model 35SSST • Basic Unit



Dimensional Data

Unit Size	Inlet Size	Induced Air Inlet IW x IH	Outlet Discharge DW x DH	Filter Size
7	14, 16 (356, 406)	11 1/4 x 13 1/4 (286 x 337) Qty. of 2	39 1/4 x 11 1/2 (997 x 292)	14 x 14 (356 x 356) Qty. of 2

Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
7	*	15.9	10.5	9.9	10.0

* The ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption.

FLA = Full load amperage. All motors are single phase/60 Hz.

Intertek

Page 1 of 2.
For heat options; see page 2.
Dimensions are in inches (mm).

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	DATE	B SERIES	SUPERSEDES	DRAWING NO.
CONTRACTOR:	2 - 6 - 23	3500	6 - 6 - 22	35SST-2

Nailor® Industries Inc.

FAN POWERED TERMINAL UNIT WITH EPIC ECM MOTOR • HEAT ACCESSORIES

STEALTH • SERIES FLOW

CONSTANT OR VARIABLE VOLUME

MODELS: 35SWST AND 35SEST • UNIT SIZE 7

Hot Water Coil Section Model 35SWST STEALTH

Standard Features:

- Coil section installed on unit discharge.
- Coil (and header on multi-circuit units) is installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- Sweat connections: 1 and 2 row, 7/8" (22) O.D. male solder. 3 row 1 3/8" (35) O.D. male solder.
- Top and bottom access panels for inspection and coil cleaning.
- Flanged outlet duct connection.

Coil Rows:

1-Row 2-Row 3-Row

Coil Hand Connections:

(Looking in direction of airflow).

Standard Line Voltage Enclosure:

Right hand (illustrated). Standard.

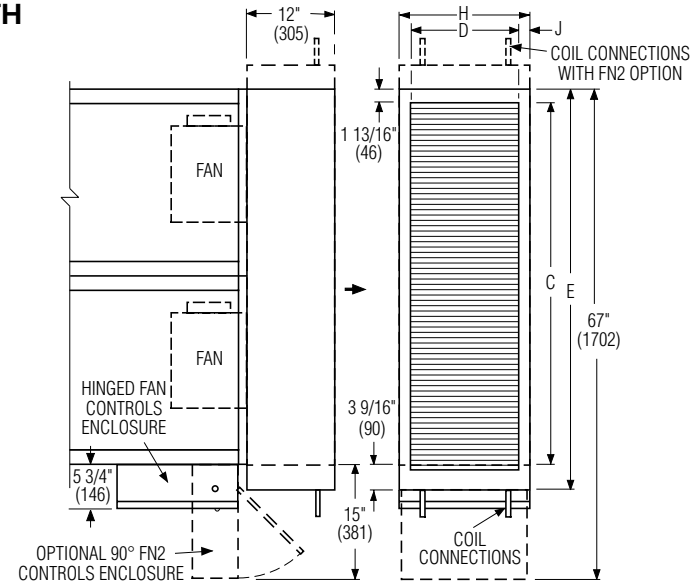
Left hand. Optional.

With 90° Line Voltage Enclosure (FN2 option):

Connections must be selected opposite hand to FN2 controls enclosure location.

Left hand (illustrated with dotted line). Standard.

Right hand (terminals are inverted). Optional.



Unit Size	Outlet Duct Size C x D	E	H	J
7	50 x 14 7/8 (1270 x 378)	55 3/8 (1407)	18 (457)	1 9/16 (40)

Electric Coil Section Model 35SEST STEALTH

Standard Features:

- Unique hinged heater design permits easy access, removal and replacement of heater element without disturbing ductwork.
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection (except 600V).
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Class A 80/20 Ni/Cr wire.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Voltage:

Single phase, 60 Hz.

208V 240V 277V

Three phase, 60 Hz.

208V 480V (4 wire wye).

600V (dual point connection). _____ .

Options:

Toggle disconnect switch (includes fan).

SCR control.

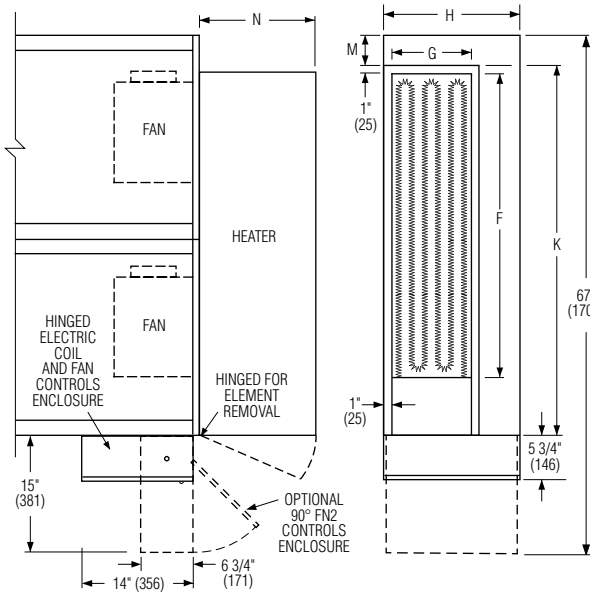
Door interlock disconnect switch.

Mercury contactors.

Power circuit fusing.

Dust tight construction.

Manual reset secondary thermal cut out.



Unit Size	Outlet Duct Size F x G	K	H	M	N
7	40 1/4 x 11 3/4 (1022 x 298)	48 (1219)	18 (457)	4 (102)	15 1/4 (387)

SCHEDULE TYPE:	Page 2 of 2. Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 6 - 23**	**3500**	**6 - 6 - 22**	**35SST-2**

FAN POWERED TERMINAL UNIT WITH OUTSIDE AIR INLET • EPIC ECM MOTOR • STEALTH™
SERIES FLOW • CONSTANT OR VARIABLE VOLUME
MODELS: 35SST-OAI, 35SEST-OAI AND 35SWST-OAI
UNIT SIZES 2 – 6

Nailor® Industries Inc.

DESCRIPTION:

- 18 ga. (1.31) galvanized steel channel frame with 20 ga. (1.00) casing components.
- 16 ga. (1.61) galvanized steel inclined opposed blade dampers. 45° rotation. RH CW to close. LH CCW to close.
- Separate outside ventilation air inlet.
- Ultra-high efficiency ECM fan motor. EPIC fan volume controller.
- Multi-point averaging Diamond Flow sensor. Supplied with balancing tees.
- Universal access panels on all 4 sides.
- 3/4" (19) dual density insulation, coated to prevent air erosion, meets requirements of NFPA 90A and UL 181.
- Single point electrical and/or pneumatic main air connection.
- Discharge opening for flanged duct connection.
- Full enclosure for factory mounted DDC and analog electronic controls.
- Choice of right or left-hand primary inlet location. Hand of unit is determined by location of primary inlet looking in direction of airflow. Right-hand illustrated.

OPTIONS:

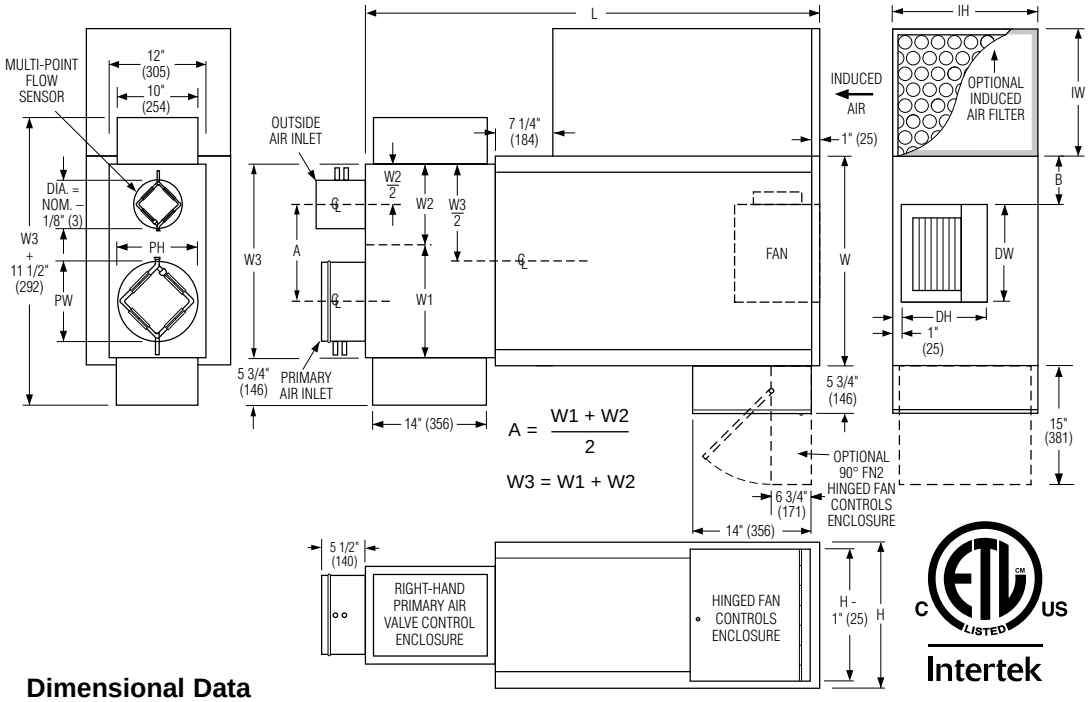
Digital Controls:
- Factory mounted (supplied by others)
- Field mounted (supplied by others)

Liner:
- Fiber-free
- Steri-liner
- Steri-liner + Perforated metal
- Perforated metal
- Solid metal
- 1" (25) fiberglass

Other:
- Left-hand controls location
- Left-hand primary inlet location
- Toggle disconnect switch
- Fan unit fusing
- 24/24V Isolation transformer
- Cross Flow Sensor (not on primary inlet)
- Top entry induced air inlet
- 1" (25) Throwaway filter
- 2" (51) MERV 8 filter
- Hanger brackets.
- 1/4-turn fasteners (access panel)
- FN2 90° Line Voltage Enclosure
- FN3 Remote Line Voltage Controls Enclosure. (See submittal FN3)
- Dust tight enclosure seal
- Remote user disconnect

Seismic Certification:
- Seismic Source International (Standard)
- HCAI (formerly OSHPD, California)
- Special Features: _____ .

Model 35SST-OAI • Basic Unit



Dimensional Data

Unit Size	Inlet Size	Outside Inlet Size	W	H	L	B	Induced Air Inlet IW x IH	Outlet Discharge DW x DH	Filter Size Side Inlet (std.)
2	6, 8 (152, 203)	4, 5, 6 (102, 127, 152)	18 (457)	14 (356)	51 1/2 (1308)	6 (152)	9 x 14 (229 x 356)	9 1/4 x 10 1/2 (235 x 267)	10 x 14 (254 x 356)
3	6, 8, 10 (152, 203, 254)	4, 5, 6 (102, 127, 152)	18 (457)	18 (457)	51 1/2 (1308)	3 1/2 (89)	11 x 18 (279 x 457)	9 1/4 x 10 1/2 (235 x 267)	12 x 18 (305 x 457)
4	8, 10, 12** (203, 254, 305)	6, 7, 8 (152, 178, 203)	26 (660)	18 (457)	56 1/2 (1435)	6 (152)	15 3/4 x 14 (400 x 356)	12 x 10 1/2 (305 x 267)	16 x 14 (406 x 356)
5	10, 12**, 14** (254, 305, 356)	6, 7, 8 (152, 178, 203)	26 (660)	18 (457)	56 1/2 (1435)	5 (127)	14 1/2 x 18 (368 x 457)	13 1/4 x 11 1/2 (337 x 292)	14 x 18 (356 x 457)
6	10, 12**, 14** (254, 305, 356)	6, 7, 8 (152, 178, 203)	30 (762)	19 (483)	59 1/2 (1511)	6 (152)	17 1/2 x 19 (445 x 483)	13 1/4 x 11 1/2 (337 x 292)	18 x 19 (457 x 483)

Primary/Inlet Dimensions

**Flat oval inlets

Size	W1 or W2
4, 5, 6	12 (305)
7, 8	14 (356)
10	16 (406)
12**	19 (483)
14**	20 (508)

Oval Inlet Dimensions

Size	PW x PH
12**	12 13/16 x 9 13/16 (325 x 249)
14**	16 1/16 x 9 13/16 (408 x 249)

Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
2	*	4.0	2.7	2.6	2.6
3	*	5.0	3.4	3.3	3.3
4	*	6.9	4.6	4.5	4.2
5	*	9.0	6.1	5.8	5.6
6	*	11.9	7.3	7.3	7.2

*The ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption. FLA = Full load amperage. All motors are single phase/60 Hz.

Intertek

SSI Listed

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

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 6 - 23**	**3500**	**11 - 15 - 22**	**35SST-OAI-1**

Page 1 of 2. For heat options; see page 2.
Dimensions are in inches (mm).

Nailor® Industries Inc.

FAN POWERED TERMINAL UNIT WITH OUTSIDE AIR INLET • EPIC ECM MOTOR • STEALTH™ HEAT ACCESSORIES

SERIES FLOW • CONSTANT OR VARIABLE VOLUME

MODELS: 35SWST-OAI AND 35SEST-OAI • UNIT SIZE 2 – 6

Hot Water Coil Section Model 35SWST-OAI STEALTH™

Standard Features:

- Coil section installed on unit discharge.
- Coil (and header on multi-circuit units) is installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- Sweat Connections:
  Size 2 – 3: 1 Row 1/2" (13), 2 and 3 Row 7/8" (22); O.D. male solder.
  Size 4 – 6: 1, 2, and 3 Row 7/8" (22); O.D. male solder.
- Top and bottom access panels for inspection and coil cleaning.
- Flanged outlet duct connection.

Coil Rows:

1-Row 2-Row 3-Row

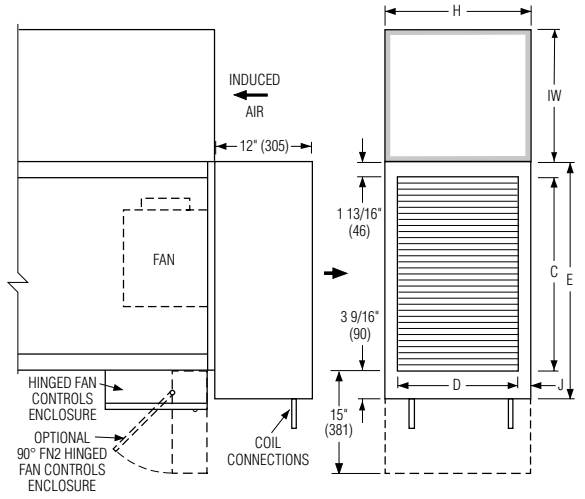
Coil Hand Connections:

(Looking in direction of airflow).

Right hand (illustrated). Standard.

Left hand (terminals are inverted). Optional.

Connections must be selected same hand as controls enclosure location.



Unit Size	Outlet Duct Size C x D	E	H	J
2	16 x 12 1/8 (406 x 308)	21 3/8 (543)	14 (356)	15/16 (24)
3	16 x 14 7/8 (406 x 378)	21 3/8 (543)	18 (457)	1 9/16 (40)
4, 5	24 x 14 7/8 (610 x 378)	29 3/8 (746)	18 (457)	1 9/16 (40)
6	28 x 17 1/8 (711 x 435)	33 3/8 (848)	19 (483)	15/16 (24)

Electric Coil Section Model 35SEST-OAI STEALTH™

Standard Features:

- Unique hinged heater design permits easy access, removal and replacement of heater element without disturbing ductwork.
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection (except 600V).
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Class A 80/20 Ni/Cr wire.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Voltage:

Single phase, 60 Hz.

120V 208V 240V 277V

Three phase, 60 Hz.

208V 480V (4 wire wye).

600V (Dual point connection) _____ .

Options:

Toggle disconnect switch (includes fan).

Door interlock disconnect switch.

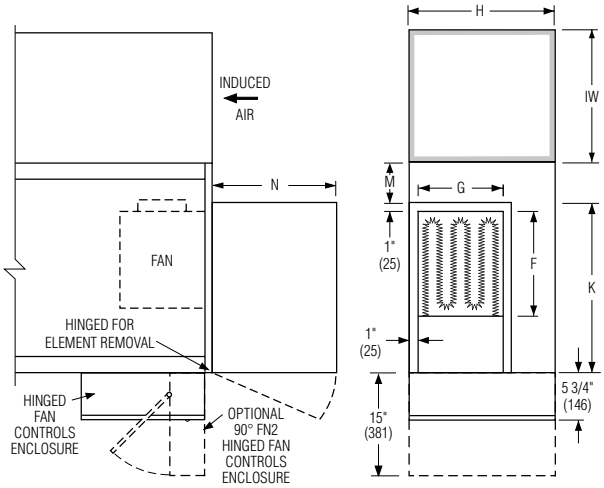
SCR Control.

Mercury contactors.

Power circuit fusing.

Dust tight construction.

Manual reset secondary thermal cut out.



Unit Size	Outlet Duct Size F x G	K	H	M	N
2	10 1/4 x 10 1/2 (260 x 267)	15 1/2 (394)	14 (356)	2 1/2 (64)	12 1/2 (318)
3	10 1/4 x 10 1/2 (260 x 267)	15 1/2 (394)	18 (457)	2 1/2 (64)	15 1/4 (387)
4	13 x 10 1/2 (330 x 267)	21 (533)	18 (457)	5 (127)	15 1/4 (387)
5	14 1/4 x 11 3/4 (362 x 298)	22 (559)	18 (457)	4 (102)	15 1/4 (387)
6	14 1/4 x 11 3/4 (362 x 298)	25 (635)	19 (635)	5 (127)	15 1/4 (387)

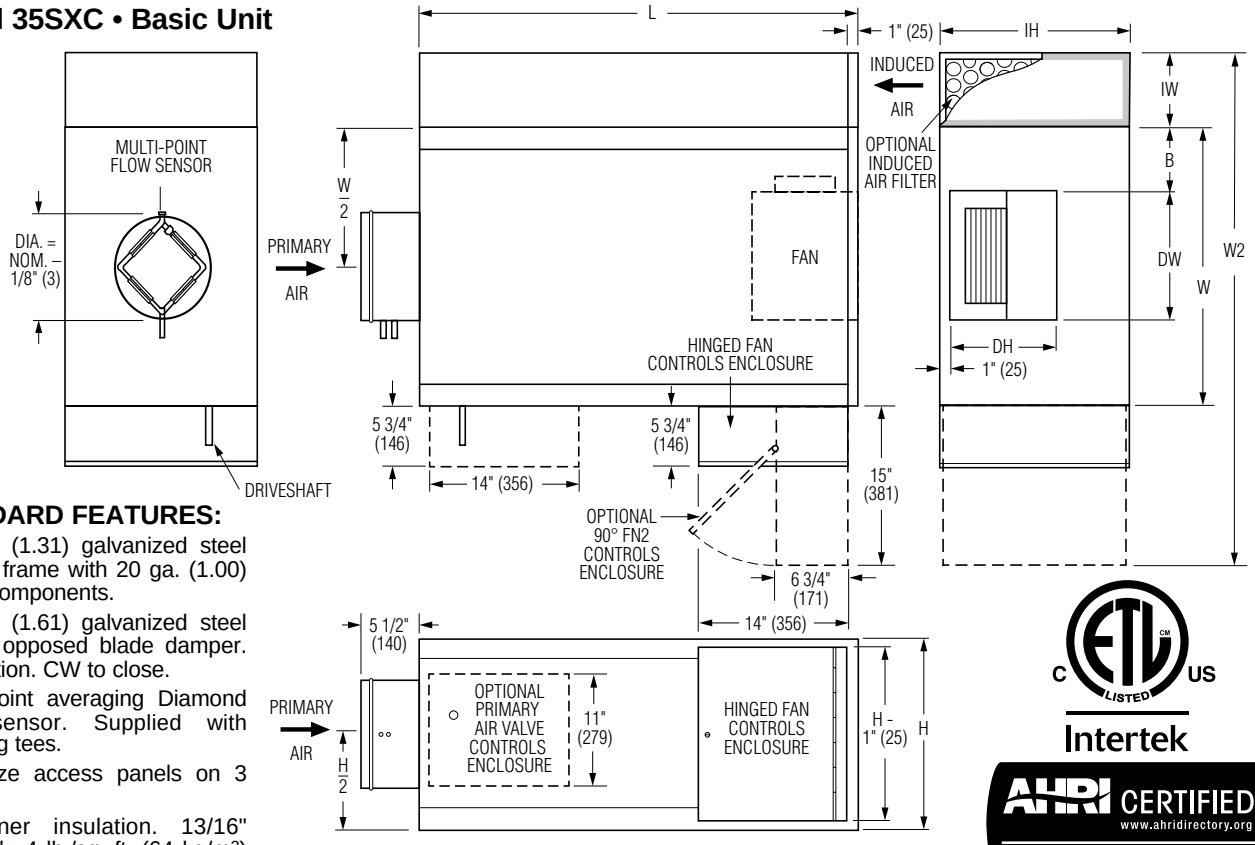
Dimensions are in inches (mm).

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	DATE	B SERIES	SUPERSEDES	DRAWING NO.
CONTRACTOR:	2 - 6 - 23	3500	11 - 15 - 22	35SST-OAI-1

FAN POWERED TERMINAL UNIT W/ EPIC ECM MOTOR

STEALTH XC • SERIES FLOW • SUPER QUIET
EXPOSED CEILING APPLICATIONS
VARIABLE VOLUME FAN OPERATION
MODELS: 35SXC, 35SWXC & 35SEXC • UNIT SIZES 1, 3 & 5

Model 35SXC • Basic Unit



STANDARD FEATURES:

- 18 ga. (1.31) galvanized steel channel frame with 20 ga. (1.00) casing components.
- 16 ga. (1.61) galvanized steel inclined opposed blade damper. 45° rotation. CW to close.
- Multi-point averaging Diamond Flow sensor. Supplied with balancing tees.
- Full size access panels on 3 sides.
- Steri-liner insulation. 13/16" (21) thick, 4 lb./sq. ft. (64 kg/m³) density rigid fiberglass with alum. FSK facing. Meets requirements of NFPA 90A and UL 181.
- Stealth XC tuned inlet silencer. Perforated galvanized steel liner with fiberglass acoustic media.
- Single point electrical connection.
- Discharge opening for flanged duct connection.
- Full primary air valve low voltage NEMA 1 type enclosure for factory mounted DDC controls.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.
- Ultra-high efficiency ECM fan motor. EPIC fan volume controller.

OPTIONS:

Digital Controls:
Factory mounted (supplied by others)
Field mounted (supplied by others)

Terminal Liner:
Steri-liner
Steri-liner + Perforated metal

Silencer Liner:
Fiberglass acoustic media
Steri-Liner/Polymer film

Other:
Left-hand controls location
Toggle disconnect switch
Fan unit fusing
24/24V Isolation transformer
Cross Flow Sensor
1" (25) Throwaway filter
2" (51) Filter rack only
Hanger brackets
1/4-turn fasteners (access panel)
FN2 90° Line Voltage Enclosure
FN3 Remote Line Voltage Controls Enclosure (See submittal FN3)
Dust tight enclosure seal
Remote user disconnect
Special features:
_____.

Dimensional Data

Unit Size	Inlet Size	W	W2	H	L	B	Induced Air Inlet IW x IH	Outlet Discharge DW x DH	Filter Size
1	4, 5, 6, 8 (102, 127, 152, 203)	20 (508)	41 (1041)	14 (356)	36 (914)	6 (152)	6 x 14 (152 x 356)	8 1/8 x 4 1/4 (206 x 108)	6 x 14 (152 x 356)
3	6, 8, 10, 12 (125, 203, 254, 305)	26 (660)	47 (1194)	18 (457)	41 (1041)	7 (178)	6 x 18 (152 x 457)	9 1/8 x 10 1/2 (232 x 267)	6 x 18 (152 x 457)
5	10, 12, 14 (254, 305, 356)	26 (660)	53 (1346)	20 (508)	55 (1397)	7 (178)	12 x 20 (305 x 508)	13 1/8 x 15 5/8 (333 x 397)	12 x 20 (305 x 508)

Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
1	*	2.1	1.4	1.3	1.2
3	*	4.8	3.4	3.1	3.0
5	*	10.5	6.8	6.4	6.2

* The ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption.
FLA = Full load amperage. All motors are single phase/60 Hz.

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**12 - 20 - 23**	**3500**	**11 - 4 - 22**	**35SXC-1**

Page 1 of 2.
For heat options; see page 2.
Dimensions are in inches (mm).

Nailor® Industries Inc.

FAN POWERED TERMINAL UNIT W/ EPIC ECM MOTOR HEAT ACCESSORIES • STEALTH XC • SERIES FLOW SUPER QUIET • EXPOSED CEILING APPLICATIONS VARIABLE VOLUME FAN OPERATION

MODELS: 35SXC, 35SWXC & 35SEXC • UNIT SIZES 1, 3 & 5

Hot Water Coil Section
Model 35SWXC STEALTH XC

Standard Features:

- Coil section installed on unit discharge.
- Coil (and header on multi-circuit units) is installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- Sweat Connections:
  Size 1: 1 Row 1/2" (13), 2 and 3 Row 7/8" (22); O.D. male solder.
  Sizes 3 & 5: 1, 2, and 3 Row 7/8" (22); O.D. male solder.
- Top and bottom access panels for inspection and coil cleaning.
- Flanged outlet duct connection.

Coil Rows:

1-Row 2-Row 3-Row

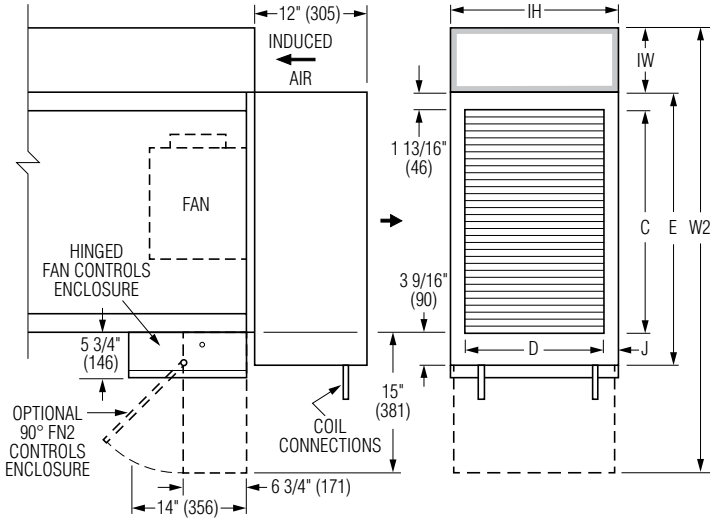
Coil Hand Connections:

(Looking in direction of airflow).

Right hand (illustrated). Standard.

Left hand (terminals are inverted). Optional.

Connections must be selected same hand as controls enclosure location.



Unit Size	Outlet Duct Size C x D	W2	E	H	J
1	16 x 12 1/8 (406 x 308)	41 (1041)	21 3/8 (543)	14 (356)	1 (25)
3	16 x 14 7/8 (406 x 378)	47 (1194)	21 3/8 (543)	18 (457)	1 1/2 (38)
5	24 x 14 7/8 (610 x 378)	53 (1346)	29 3/8 (746)	20 (508)	1 1/2 (38)

Electric Coil Section Model 35SEXC STEALTH XC

Standard Features:

- Unique hinged heater design permits easy access, removal and replacement of heater element without disturbing ductwork.
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection (except 600V).
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Class A 80/20 Ni/Cr wire.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RH side as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Voltage:

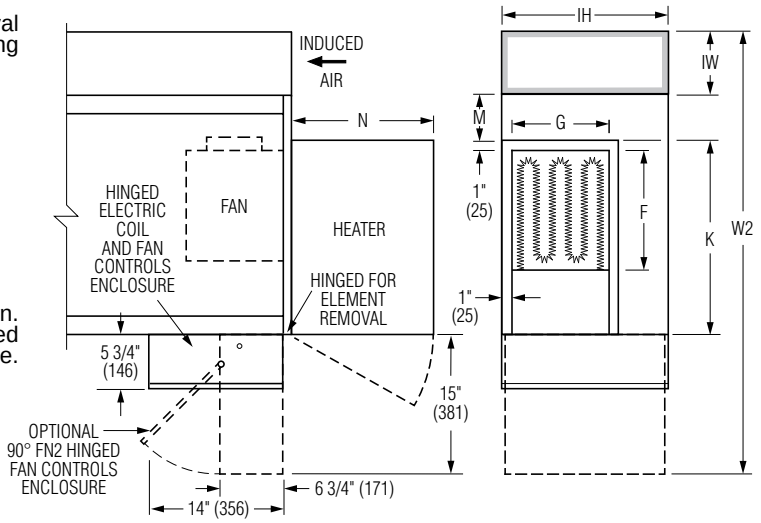
Single phase, 60 Hz.

120V 208V 240V 277V

Three phase, 60 Hz.

208V 480V (4 wire wye).

600V (dual point connection). _____ .



Options:

Toggle disconnect switch (includes fan).
SCR control.
Door interlock disconnect switch.
Mercury contactors.
Power circuit fusing.
Dust tight construction.
Manual reset secondary thermal cut out.

Unit Size	Outlet Duct Size F x G	W2	K	H	M	N
1	10 1/4 x 10 1/2 (260 x 267)	41 (1041)	16 (406)	14 (356)	4 (102)	12 1/2 (318)
3	12 1/4 x 10 3/4 (311 x 273)	47 (1194)	22 (559)	18 (457)	4 (102)	15 1/4 (387)
5	16 1/4 x 15 3/4 (413 x 400)	53 (1346)	22 (559)	20 (508)	4 (102)	15 1/4 (387)

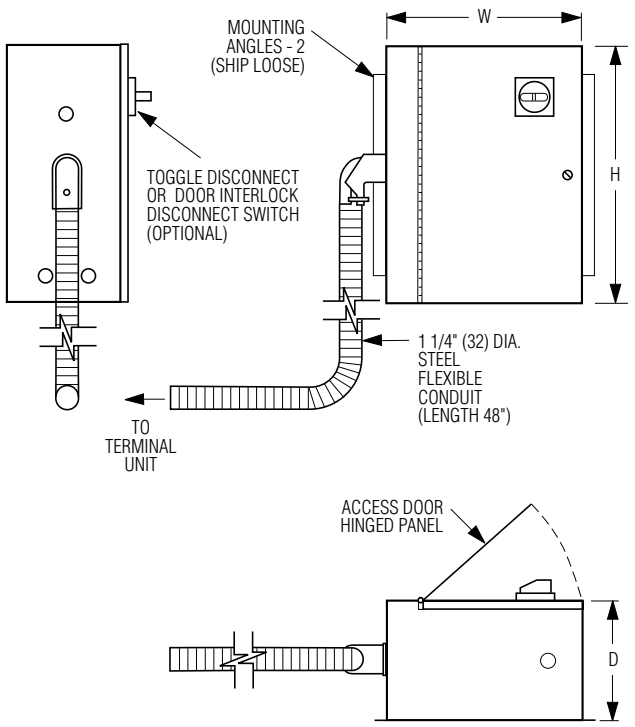
SCHEDULE TYPE:	Page 2 of 2. Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**12 - 20 - 23**	**3500**	**11 - 4 - 22**	**35SXC-1**

Nailor® Industries Inc.

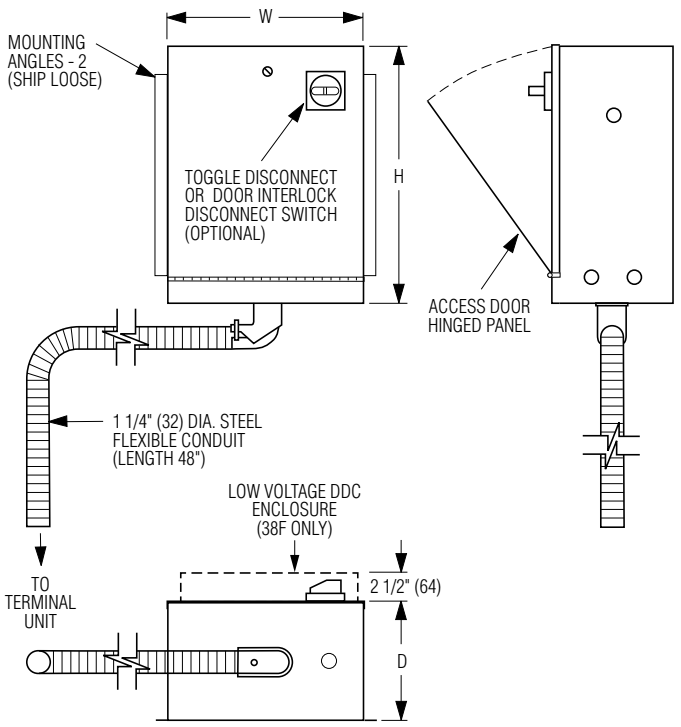
FN3 REMOTE LINE VOLTAGE CONTROLS ENCLOSURE

FAN POWERED TERMINAL UNIT OPTION

MODEL SERIES: 33SZ, 35S(ST), 37S(ST), 38F AND 38S



33SZ / 35S(ST) / 37S(ST) DESIGN
(Ceiling Mounted Terminal Unit)



38F / 38S DESIGN
(Underfloor Terminal Unit)

Dimensional Data

Model Series	Unit Size	W	H	D
33SZ	10	15 (381)	8 1/2 (216)	6 3/4 (171)
	30, 35	15 (406)	11 (279)	6 3/4 (171)
	40, 50, 55	17 (432)	14 (356)	5 3/4 (146)
35S(ST)	1, 2	14 (356)	13 (330)	5 3/4 (146)
	3, 4, 5, 6, 7	14 (356)	17 (432)	5 3/4 (146)
37S(ST)	1, 2, 3, 4	15 (381)	11 (279)	6 3/4 (171)
38F	1, 3, 5, 6, 33, 3S, 3H, 6H, 33H	15 (381)	11 (279)	6 3/4 (171)
38S	1, 3, 5	15 (381)	11 (279)	6 3/4 (171)

C ETL US LISTED Intertek

NOTES:

1. The FN3 line voltage enclosure is an ETL listed option. The FN3 was developed for Nailor fan powered terminal units in order to help meet NEC clearance requirements. Standard enclosures are mounted on the side of the unit and effectively add 42" (1067) to the terminals width footprint. Very often there is insufficient clearance in the ceiling plenum due to physical obstructions to accommodate this. The FN3 provides flexibility in that it may be field positioned in any orientation that provides the NEC clearance requirement.
2. The FN3 Line voltage enclosure ships loose with a 48" (1219) flexible conduit connection to the terminal unit. The enclosure should be field mounted either on or remote from the terminal unit in a position that meets (NEC) clearance requirements.

   The controls enclosure is supplied with mounting angles, which ship loose for field attachment.

SCHEDULE TYPE:	Dimensions are in inches (mm)			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**1 - 12 - 22**	**FN**	**8 - 3 - 21**	**FN3**

Nailor® Industries Inc.

TERMINAL UNITS
LINER OPTIONS
TYPE: FIBERGLASS DUAL DENSITY INSULATION

DESCRIPTION

Tuf-Skin® dual-density fiberglass insulation is the most widely-used insulation for HVAC equipment applications. The combination of high-density skin and low-density core provides high acoustical values in the high and low frequency ranges normally encountered in HVAC equipment.

Application. Tuf-Skin® provides effective thermal and acoustical control in air conditioning and heating equipment.

Advantage. The porosity and inherent structure of the flame-attenuated glass fiber blankets are highly effective in reducing thermal transfer.

Tuf-Skin® readily withstands damage from mechanical abrasion during assembly and from air erosion in service.

INSULATION CHARACTERISTICS

Material:	Dual density fiberglass, surface treated to prevent erosion (Tuf-Skin® II)
Available Thicknesses:	1/2" (13), 3/4" (19), 1" (25) (Consult individual model submittal for thickness used).
Density:	4.0 lb/cu.ft. (64 kg/m^3) skin, 1.5 lb/cu.ft. (24 kg/m^3) core
Thermal Conductance:	1/2" (13) - 0.52 BTU / hr-ft^2-°F @ 75°F (2.95 W / m^2-°C @ 24°C), 3/4" (19) - 0.36 BTU / hr-ft^2-°F @ 75°F (2.04 W / m^2-°C @ 24°C), 1" (25) - 0.26 BTU / hr-ft^2-°F @ 75°F (1.47 W / m^2-°C @ 24°C)
Thermal Resistance: (Effective R-Value)	1/2" (13) - 1.9 hr-ft^2-°F / BTU (0.34 m^2-°C / W), 3/4" (19) - 2.8 hr-ft^2-°F / BTU (0.49 m^2-°C / W), 1" (25) - 3.8 hr-ft^2-°F / BTU (0.68 m^2-°C / W)
Flame Spread Index:	25
Smoke Developed Index:	50

MAXIMUM AIR VELOCITY

3,600 FPM (1,097 mpm). Tested at two and one-half times (9,000 fpm) (2,743 mpm) the maximum recommended service velocity. Meets the erosion requirements of UL 181.

TEMPERATURE LIMIT

250ºF (121ºC).

STANDARD AND CODE COMPLIANCE

- ASTM E84, UL 723 and CAN/ULC S102 Flame/Smoke (25/50)
- NFPA 90A and 90B
- ASTM C 1071

Tuf-Skin® is a registered trademark of Johns Manville.

SCHEDULE TYPE:	Dimensions are in inches (mm)			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**5 - 12 - 22**	**VAV.ACC.**	**3 - 30 - 22**	**VAV-FDD**

Nailor® Industries Inc.

TERMINAL UNITS
LINER OPTIONS
SOUND POWER LEVEL CORRECTION FACTORS
TYPE: FIBER-FREE

INSULATION CHARACTERISTICS

Material:	Engineered Polymer Foam Insulation (EPFI). Closed cell. Zero permeability and water absorption.
Available Thicknesses:	1/2" (13), 3/4" (19), 1" (25) (Consult individual model submittal for thickness used).
Density:	1.5 lb/cu.ft. (24 kg/m^3).
Thermal Conductivity: (K-Factor)	0.27 BTU-in / hr-ft^2-^oF @ 75^oF (0.039 W / m-^oK @ 24^oC).
Thermal Resistance: (R-Value)	1/2" (13): 1.9 hr-ft^2-^oF / BTU (0.33 m^2-^oC / W). 3/4" (19): 2.8 hr-ft^2-^oF / BTU (0.49 m^2-^oC / W). 1" (25): 3.7 hr-ft^2-^oF / BTU (0.65 m^2-^oC / W).
Flame Spread Index:	25
Smoke Developed Index:	50
Mold Growth:	None
Erosion:	None

STANDARD AND CODE COMPLIANCE

- UL 181 Class I
- ASTM E84 and UL 723 Flame/Smoke (25/50)
- NFPA 90A (Heating and Cooling Equipment)
- ASTM C 209
- ASTM C 665

ACOUSTICAL PERFORMANCE

Correction factors to cataloged sound power level data (standard liner) are shown below.

Single Duct Terminal Units • 3000 Series Basic Unit • All sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	0	0	0	0	0	0	0
Radiated Sound	-1	-2	-2	-3	-3	-3	-2

Single Duct Terminal Units with Integral Attenuator • 3000 Series • All Sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	+1	+1	+3	+4	+7	+8	+3
Radiated Sound	-1	-2	-2	-3	-3	-3	-2

Fan Powered Terminal Units • 33SZ, 35N, 35S, 37N and 37S Series • All sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	0	0	0	0	0	0	0
Radiated Sound	+2	+2	+4	+2	+2	+2	+3

Fan Powered Terminal Units • 35SST and 37SST "Stealth" Series • All sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	0	0	0	0	0	0	0
Radiated Sound	+2	+2	+4	+2	+2	+2	+3

SCHEDULE TYPE:	Dimensions are in inches (mm)			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**5 - 12 - 22**	**VAV.ACC.**	**4 - 17 - 20**	**VAV-FF**

Nailor® Industries Inc.

TERMINAL UNITS
LINER OPTIONS
SOUND POWER LEVEL CORRECTION FACTORS
TYPE: STERI-LINER

INSULATION CHARACTERISTICS

Material:	Rigid board form fiberglass with a thermosetting resin. Fire resistant reinforced aluminum foil-scrim-kraft (FSK) facing.
Available Thicknesses:	1/2" (13), 13/16" (21), 1" (25) (Consult individual model submittal for thickness used).
Density:	4.1 lb/cu.ft. (66 kg/m^3).
Thermal Conductivity: (K-Factor)	0.23 BTU-in / hr-ft^2-^oF @ 75^oF (0.033 W / m-^oK @ 24^oC).
Thermal Resistance: (R-Value)	1/2" (13) - 2.2 hr-ft^2-^oF / BTU (0.48 m^2-^oC / W). 13/16" (21) - 3.5 hr-ft^2-^oF / BTU (0.76 m^2-^oC / W). 1" (25) - 4.3 hr-ft^2-^oF / BTU (0.96 m^2-^oC / W).
Flame Spread Index:	25
Smoke Developed Index:	50
Mold Growth:	None

STANDARD AND CODE COMPLIANCE

- UL 181 Class I
- ASTM E84 and UL 723 Flame/Smoke (25/50)
- NFPA 90A and 90B
- ASTM C 1071 Air Velocity (2000 fpm max.)
- ASTM C 665
- ASTM C 1338, G21 and G22 Fungi and Bacteria Resistance

ACOUSTICAL PERFORMANCE

Correction factors to cataloged sound power level data (standard liner) are shown below.

Single Duct Terminal Units • 3000 Series Basic Unit • All sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	0	0	0	0	0	0	0
Radiated Sound	-1	-2	-2	-3	-3	-3	-2

Single Duct Terminal Units with Integral Attenuator • 3000 Series • All Sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	+1	+1	+3	+4	+7	+8	+3
Radiated Sound	-1	-2	-2	-3	-3	-3	-2

Fan Powered Terminal Units • 33SZ, 35N, 35S, 37N and 37S Series • All sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	0	0	0	0	0	0	0
Radiated Sound	+2	+3	+6	+11	+10	+3	+3

Fan Powered Terminal Units • 35SST and 37SST "Stealth" Series • All sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	0	0	0	0	0	0	0
Radiated Sound	-5	-4	-4	0	+3	+5	-4

SCHEDULE TYPE:	Dimensions are in inches (mm)			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**5 - 17 - 22**	**VAV.ACC.**	**1 - 12 - 21**	**VAV-SL**

Nailor® Industries Inc.

VAV TERMINAL UNITS
LINER OPTIONS
TYPE: SOLID METAL LINER
(DOUBLE WALL CONSTRUCTION)

A Solid metal liner completely isolates the standard insulation and its raw edges from the airstream within the terminal. The solid metal liner option, also referred to as double wall construction, offers excellent protection against exposure of fiberglass particles to the airstream. This option is ideal for applications where Indoor Air Quality (IAQ) is a concern and where terminals will be wiped down and cleaned on a regular basis. This option is also resistant to moisture.

ISOLATED INSULATION

Material:	Dual Density flame attenuated glass fiber.
Thickness:	3/4" (19). (37N, 37S, 37SST and 33SZ Size 30 Low Profile Fan Powered Terminal Units use 1/2" (13) material).
Density:	4.0 lb/cu. ft. (64 kg/m^3) skin.
	1.5 lb/cu. ft. (24 kg/m^3) core.
Thermal Conductance: (C)	0.36 BTU / hr-ft^2-°F @ 75°F (2.04 W / m^2-°C @ 24°C). For 1/2" (13) material: 0.52 BTU / hr-ft^2-°F @ 75°F (2.95 W / m^2-°C @ 24°C).

STANDARD AND CODE COMPLIANCE

- UL 181 Class I
- ASTM E84 and UL 723 Flame/Smoke (25/50)
- NFPA 90A and 90B
- ASTM C 1071 Air Velocity (2000 fpm max.)
- ASTM C 665

ACOUSTICAL PERFORMANCE

Correction factors to cataloged sound power level data (standard dual density insulation) are shown below.

Single Duct Terminal Units • 3000 Series Basic Unit • All sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	0	0	0	0	0	0	0
Radiated Sound	-1	-2	-2	-3	-3	-3	-2

Fan Powered Terminal Units • 33SZ, 35N, 35S, 37N and 37S Series • All sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	0	0	0	0	0	0	0
Radiated Sound	+2	+1	+2	+6	+13	+14	+3

Fan Powered Terminal Units • 35SST and 37SST "Stealth" Series • All sizes.

Octave Band	2	3	4	5	6	7	NC Impact
Center Frequency (Hz)	125	250	500	1000	2000	4000	(Average)
Discharge Sound	0	0	0	0	0	0	0
Radiated Sound	-5	-4	-4	0	+3	+5	-4

Dual Duct Terminal Units • 3230 and 3240 "Blendmaster" Series • All sizes.

Nailor has independently tested and cataloged their dual duct sound data based upon the use of Steri-Liner (high density foil back insulation) rather than standard dual density fiberglass insulation as used in the above terminal units. This is because it is the most popular specification for dual duct terminals, where IAQ is frequently a concern. Solid metal liner is acoustically reflective in a manner similar to Steri-Liner. The cataloged data may therefore be used without correction when a solid metal liner is required.

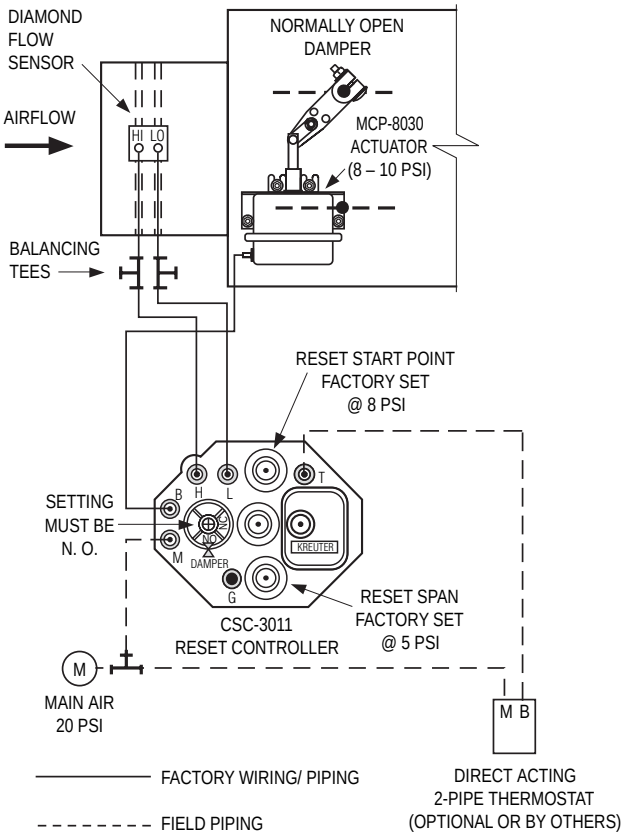
SCHEDULE TYPE				
PROJECT				
ENGINEER	DATE	B SERIES	SUPERSEDES	DRAWING NO.
CONTRACTOR	8 - 19 - 16	VAV.ACC.	11 - 19 - 12	VAV - SML

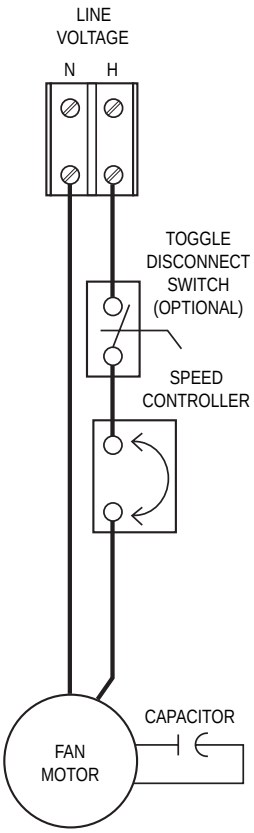
Nailor Industries Inc.

PNEUMATIC CONTROL

FAN POWERED TERMINAL UNIT • SERIES FLOW
CONSTANT VOLUME • PRESSURE INDEPENDENT

MODELS: 35S, 35SST, 37S AND 37SST 1P3





CONTROL SEQUENCE 1P3 • VAV COOLING (CONTINUOUS OPERATION) • DA/NO • 3000 CONTROLLER

Sequence of Operation:

The unit fan will deliver a constant volume to the space at all times. With space temperature at set point, unit delivers minimum cooling airflow and maximum induced plenum air.

On a rise in space temperature, the thermostat regulates the controller to increase primary airflow. As more cold air is supplied to the fan section, less warm air is induced from the ceiling plenum.

When the space temperature is warm, the primary air damper is controlling at the maximum airflow setting (usually the same as the fan volume setting and no plenum air is induced).

As the space temperature decreases, the damper modulates back towards the minimum airflow setting and as less cold air is supplied to the fan section, more warm air is induced. If room temperature continues to drop, minimum primary airflow is maintained.

Primary airflow is held constant in accordance with thermostat demand. Any changes in volume due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

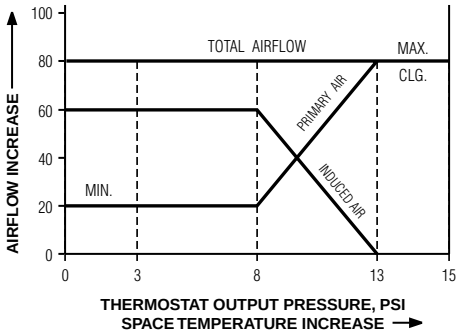
Note:

Constant volume series terminal fans should be electrically or pneumatically field interlocked with the central fan system, to prevent backflow of primary air into the ceiling plenum and to prevent possible backward rotation of the terminal fan.

Options:

Two Pipe Thermostat (Vertical Mount. Includes backing plate for 2" x 4" electrical box).

- ❑ CTC-1621-103 °F scale plate
- ❑ CTC-1621-113 °C scale plate



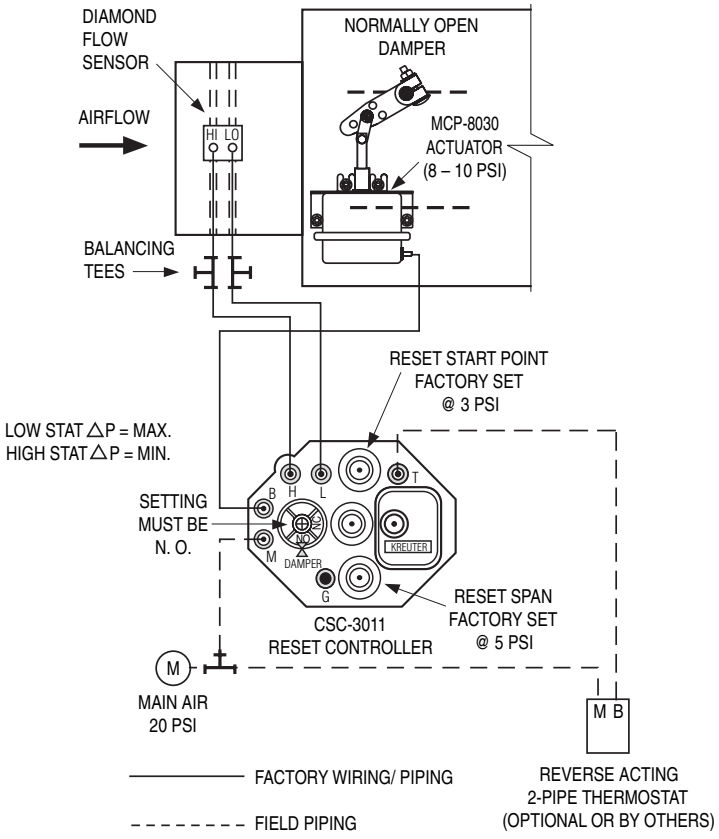
Dimensions are in inches (mm).

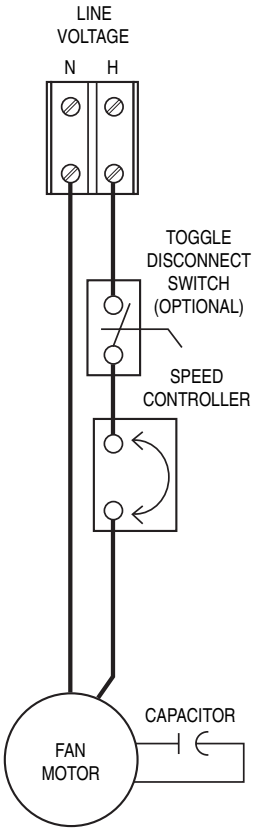
SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**10 - 18 - 07**	**3500**	**12 - 2 - 02**	**35SCD-1P3**

PNEUMATIC CONTROL

FAN POWERED TERMINAL UNIT • SERIES FLOW
CONSTANT VOLUME • PRESSURE INDEPENDENT

MODELS: 35S, 35SST, 37S AND 37SST 2P3





CONTROL SEQUENCE 2P3 • VAV COOLING (CONTINUOUS OPERATION) • REVERSE ACTING/NORMALLY OPEN • 3000 CONTROLLER

Sequence of Operation:

The unit fan will deliver a constant volume to the space at all times. With space temperature at set point, unit delivers minimum cooling airflow and maximum induced plenum air.

On a rise in space temperature, the thermostat regulates the controller to increase primary airflow. As more cold air is supplied to the fan section, less warm air is induced from the ceiling plenum.

When the space temperature is warm, the primary air damper is controlling at the maximum airflow setting (usually the same as the fan volume setting and no plenum air is induced).

As the space temperature decreases, the damper modulates back towards the minimum airflow setting and as less cold air is supplied to the fan section, more warm air is induced. If room temperature continues to drop, minimum primary airflow is maintained.

Primary airflow is held constant in accordance with thermostat demand. Any changes in volume due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

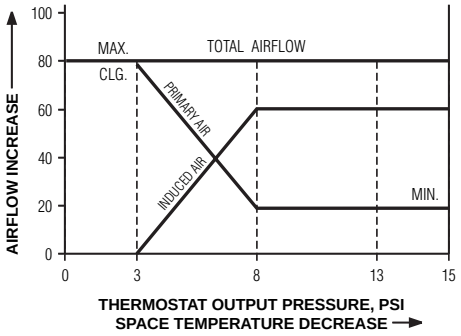
Note:

Constant volume series terminal fans should be electrically or pneumatically field interlocked with the central fan system, to prevent backflow of primary air into the ceiling plenum and to prevent possible backward rotation of the terminal fan.

Options:

Two Pipe Thermostat (Vertical Mount. Includes backing plate for 2" x 4" electrical box).

- ❑ CTC-1622-103 °F scale plate
- ❑ CTC-1622-113 °C scale plate



Dimensions are in inches (mm).

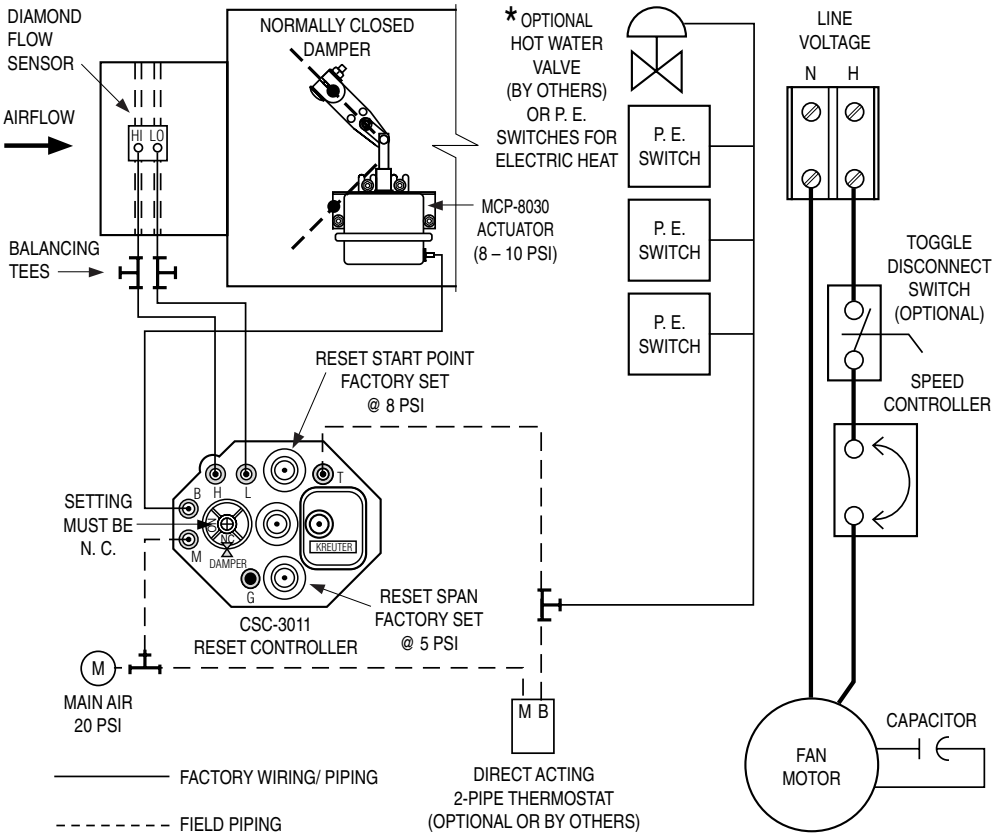
SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**10 - 17 - 07**	**3500**	**NEW**	**35SCD-2P3**

Nailor Industries Inc.

PNEUMATIC CONTROL

FAN POWERED TERMINAL UNIT • SERIES FLOW
CONSTANT VOLUME • PRESSURE INDEPENDENT

MODELS: 35S, 35SST, 37S AND 37SST 3P3



CONTROL SEQUENCE 3P3 • VAV COOLING (CONTINUOUS OPERATION) • DA/NC • 3000 CONTROLLER

Sequence of Operation:

The unit fan will deliver a constant volume to the space at all times. With space temperature at set point, unit delivers minimum cooling airflow and maximum induced plenum air.

On a rise in space temperature, the thermostat regulates the controller to increase primary airflow. As more cold air is supplied to the fan section, less warm air is induced from the ceiling plenum.

When the space temperature is warm, the primary air damper is controlling at the maximum airflow setting (usually the same as the fan volume setting and no plenum air is induced).

As the space temperature decreases, the damper modulates back towards the minimum airflow setting and as less cold air is supplied to the fan section, more warm air is induced. If room temperature continues to drop, minimum primary airflow is maintained.

Primary airflow is held constant in accordance with thermostat demand. Any changes in volume due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

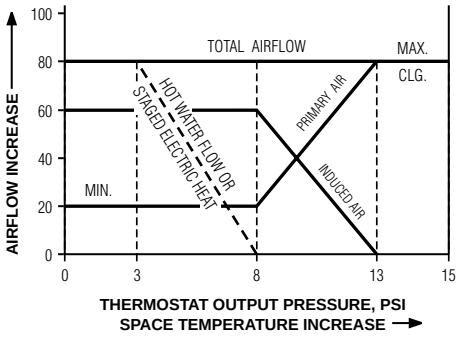
Note:

Constant volume series terminal fans should be electrically or pneumatically field interlocked with the central fan system, to prevent backflow of primary air into the ceiling plenum and to prevent possible backward rotation of the terminal fan.

Options:

Two Pipe Thermostat (Vertical Mount. Includes backing plate for 2" x 4" electrical box).

- ❑ CTC-1621-103 °F scale plate
- ❑ CTC-1621-113 °C scale plate

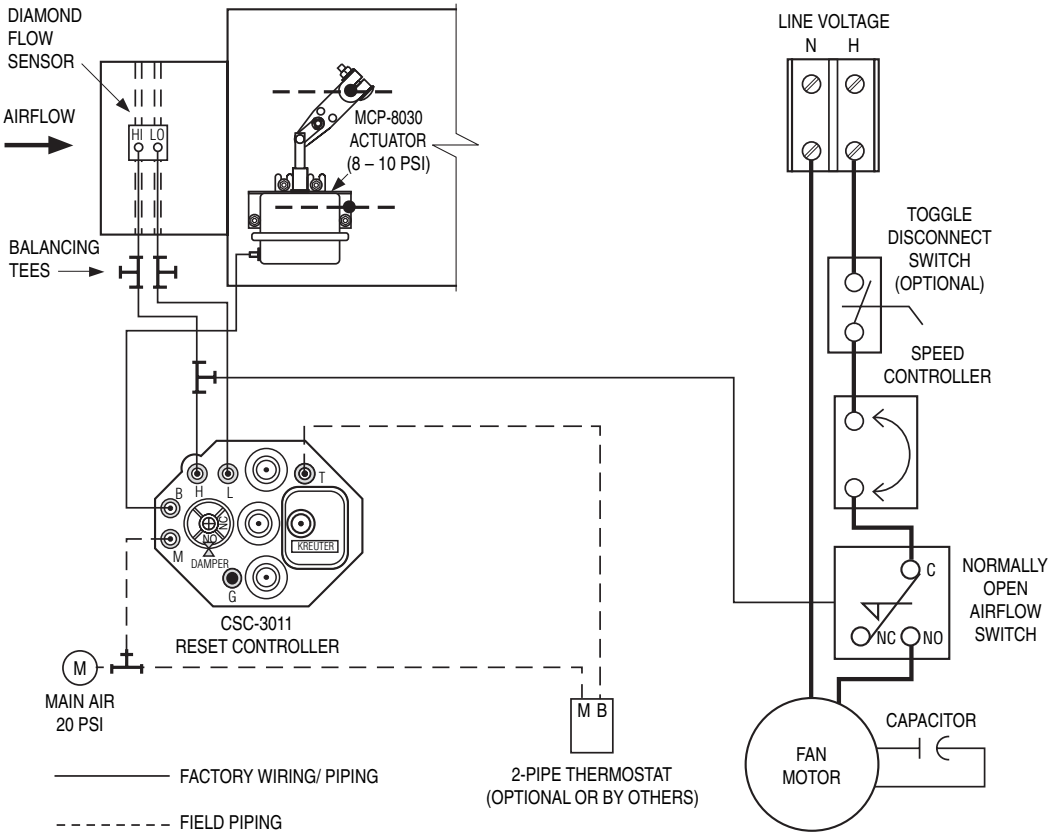


SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**12 - 2 - 02**	**3500**	**7 - 12 - 99R**	**35SCD-3P3**

Nailor Industries Inc.

PNEUMATIC CONTROL

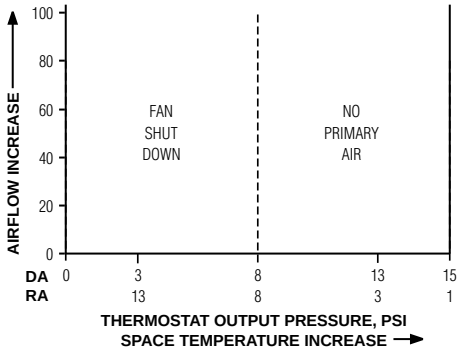
FAN POWERED TERMINAL UNIT • SERIES FLOW
CONSTANT VOLUME • PRESSURE INDEPENDENT
MODELS: 35S, 35SST, 37S AND 37SST OPTION: QK



CONTROL SUBSEQUENCE QK
NIGHT SHUT DOWN WITH AIRFLOW SWITCH
(See main control sequence for daytime operation).

Sequence of Operation:
A positive pressure airflow switch, piped to the high side of the primary inlet Diamond Flow Sensor, de-energizes the terminal fan upon loss of primary (central) air.
The terminal fan will remain off until the primary air is restored.

UNOCCUPIED CYCLE (Central System Off).
Night Shut Down.

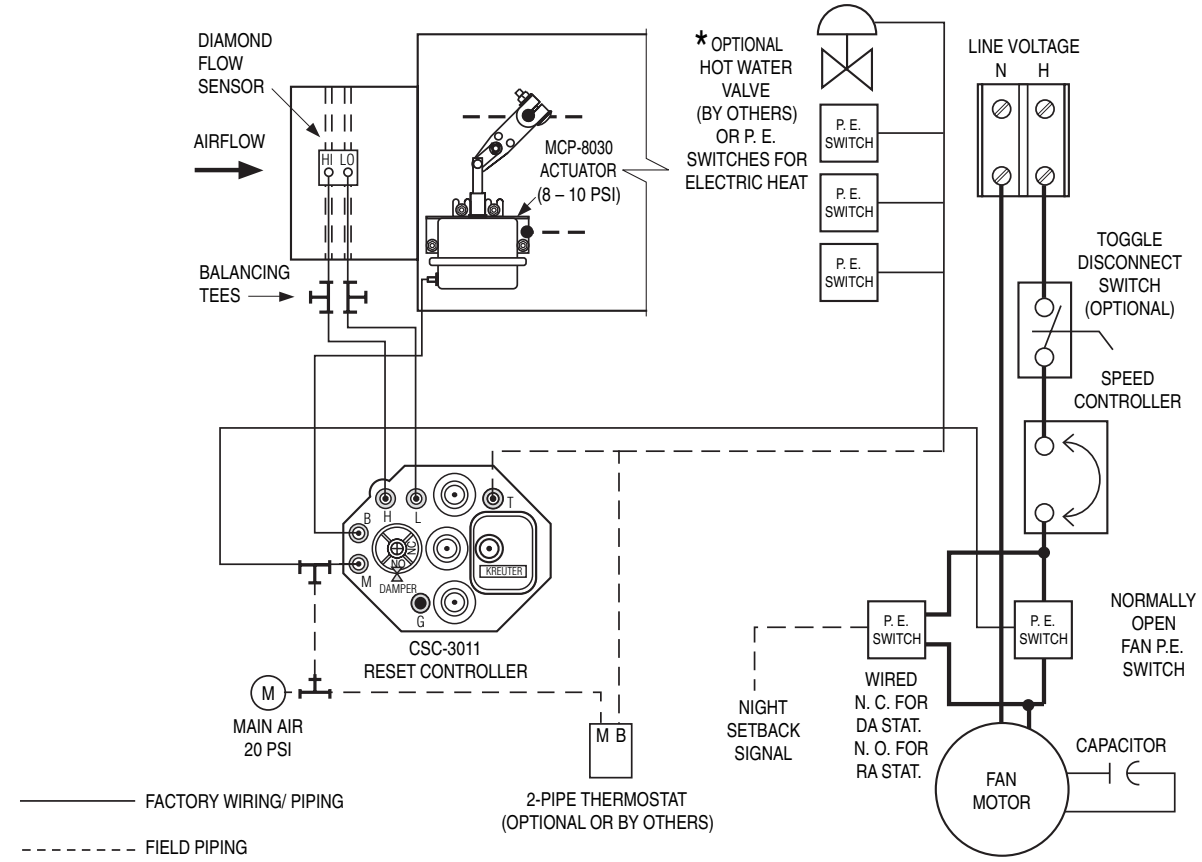


SCHEDULE TYPE:	Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**10 - 18 - 07**	**3500**	**12 - 2 - 02**	**35SCD-QK**

Nailor Industries Inc.

PNEUMATIC CONTROL

FAN POWERED TERMINAL UNIT • SERIES FLOW
CONSTANT VOLUME • PRESSURE INDEPENDENT
MODELS: 35S, 35SST, 37S OPTION:QN

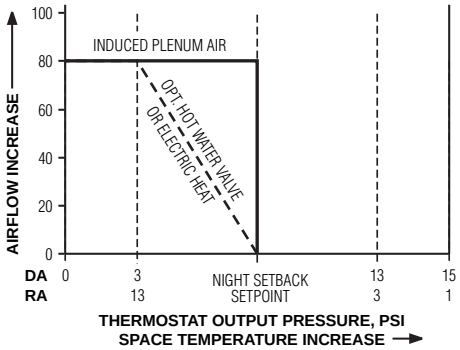


* Hot water valve (by others): 3 – 8 psi N. O. for DA stat. 8 – 13 psi N. C. for RA stat.
P. E. switches (included in electric heater). Wired N. C. for DA stat. N. O. for RA stat.

CONTROL SUBSEQUENCE QN
NIGHT SETBACK WITH P.E. SWITCHES.
(See main control sequence for daytime operation).

Sequence of Operation:
A P. E. Switch de-energizes fan upon loss of main air. Primary air fan must be shut down. A second P.E. switch provides an override upon a call for heating and will cycle the unit fan and supplementary heat in response to a separate pneumatic signal or night setback thermostat.

UNOCCUPIED CYCLE (Central System Off).
Night Setback.



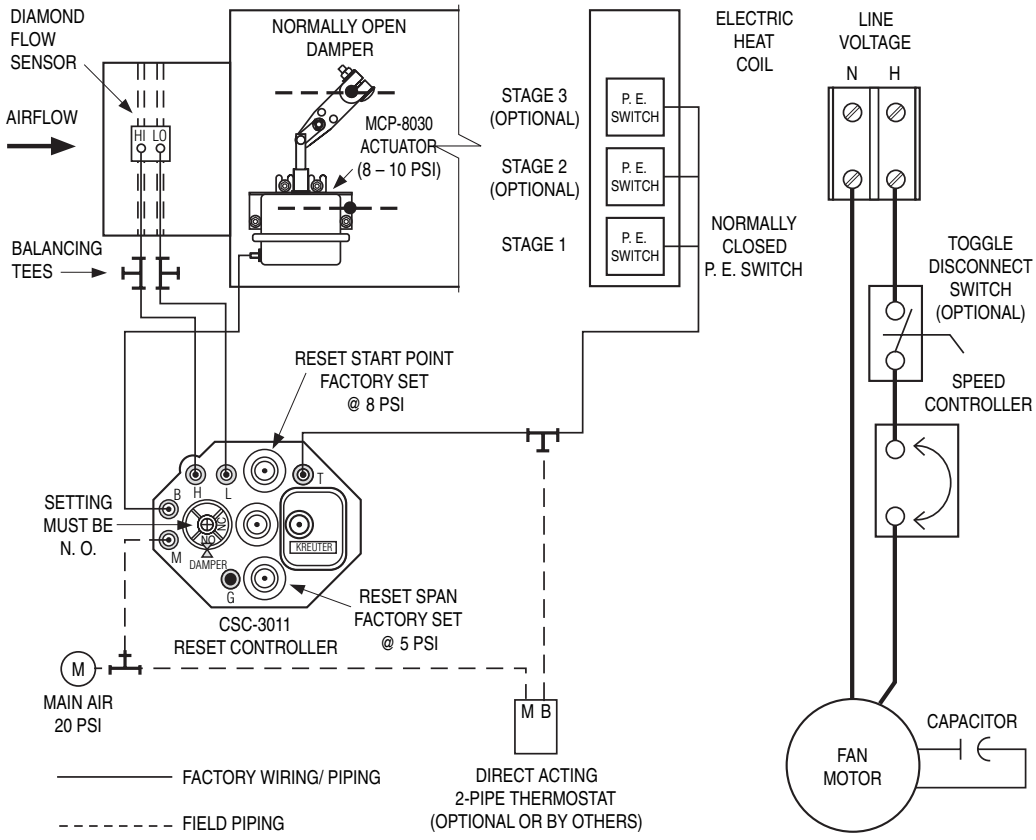
SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**10 - 18 - 07**	**3500**	**NEW**	**35SCD-QN**

Dimensions are in inches (mm).

Nailor Industries Inc.

PNEUMATIC CONTROL

FAN POWERED TERMINAL UNIT • SERIES FLOW
CONSTANT VOLUME • PRESSURE INDEPENDENT
MODELS: 35SE, 35SEST, 37SE AND 37SEST 1P3



CONTROL SEQUENCE 1P3 • VAV COOLING WITH ELECTRIC HEAT (CONTINUOUS OPERATION) • DA/NO • 3000 CONTROLLER

Sequence of Operation:

The unit fan will deliver a constant volume to the space at all times. With space temperature at set point, unit delivers minimum cooling airflow and maximum induced plenum air.

On a rise in space temperature, the thermostat regulates the controller to increase primary airflow. As more cold air is supplied to the fan section, less warm air is induced from the ceiling plenum.

When the space temperature is warm, the primary air damper is controlling at the maximum airflow setting (usually the same as the fan volume setting and no plenum air is induced).

As the space temperature decreases, the damper modulates back towards the minimum airflow setting and as less cold air is supplied to the fan section, more warm air is induced. If room temperature continues to drop, minimum primary airflow is maintained and staged electric heat is energized.

Primary airflow is held constant in accordance with thermostat demand. Any changes in volume due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

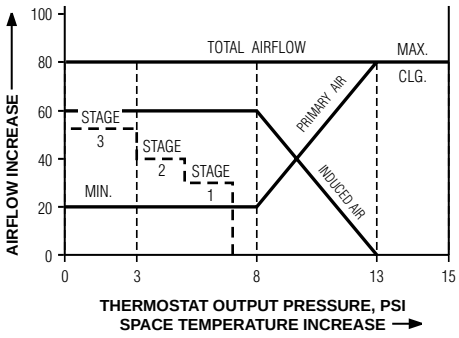
Note:

Constant volume series terminal fans should be electrically or pneumatically field interlocked with the central fan system, to prevent backflow of primary air into the ceiling plenum and to prevent possible backward rotation of the terminal fan.

Options:

Two Pipe Thermostat (Vertical Mount. Includes backing plate for 2" x 4" electrical box).

- ❑ CTC-1621-103 °F scale plate
- ❑ CTC-1621-113 °C scale plate



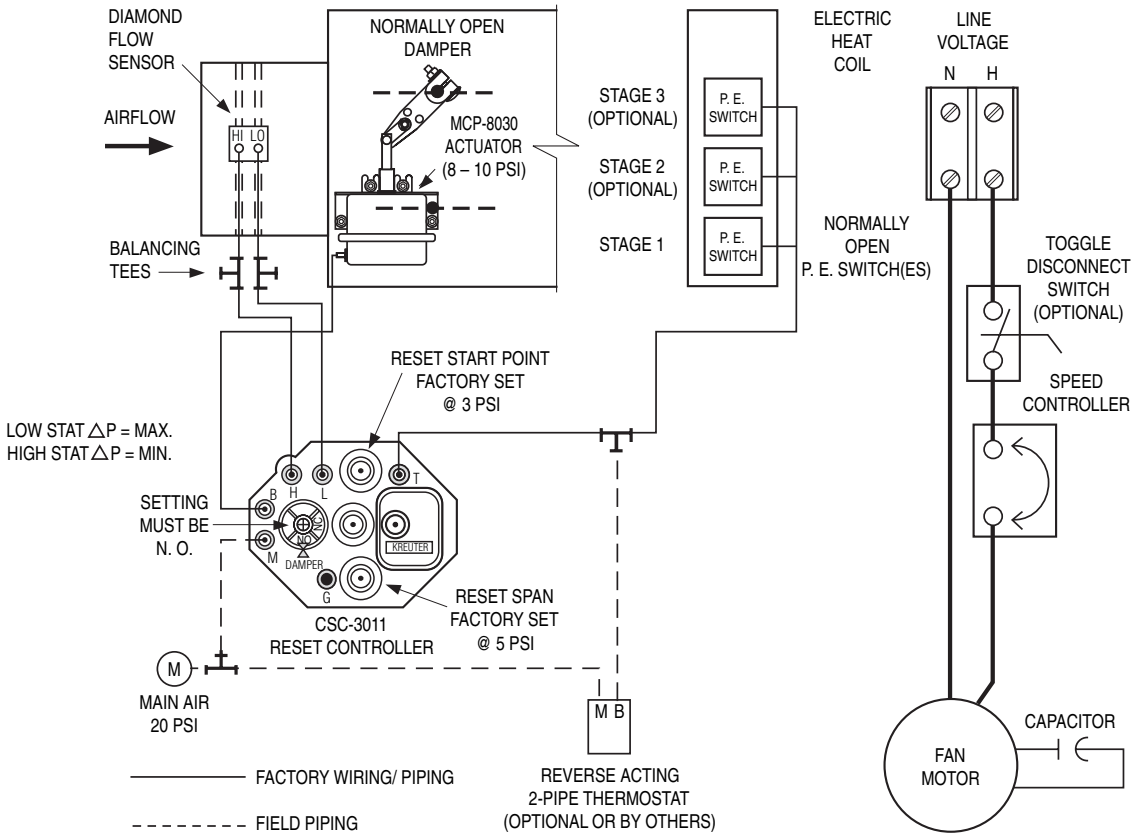
SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**10 - 18 - 07**	**3500**	**12 - 2 - 02**	**35SECD-1P3**

Nailor Industries Inc.

PNEUMATIC CONTROL

FAN POWERED TERMINAL UNIT • SERIES FLOW
CONSTANT VOLUME • PRESSURE INDEPENDENT

MODELS: 35SE, 35SEST, 37SE AND 37SEST 2P3



CONTROL SEQUENCE 2P3 • VAV COOLING WITH ELECTRIC HEAT (CONTINUOUS OPERATION) • REVERSE ACTING/NORMALLY OPEN • 3000 CONTROLLER

Sequence of Operation:

The unit fan will deliver a constant volume to the space at all times. With space temperature at set point, unit delivers minimum cooling airflow and maximum induced plenum air.

On a rise in space temperature, the thermostat regulates the controller to increase primary airflow. As more cold air is supplied to the fan section, less warm air is induced from the ceiling plenum.

When the space temperature is warm, the primary air damper is controlling at the maximum airflow setting (usually the same as the fan volume setting and no plenum air is induced).

As the space temperature decreases, the damper modulates back towards the minimum airflow setting and as less cold air is supplied to the fan section, more warm air is induced. If room temperature continues to drop, minimum primary airflow is maintained and staged electric heat is energized.

Primary airflow is held constant in accordance with thermostat demand. Any changes in volume due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

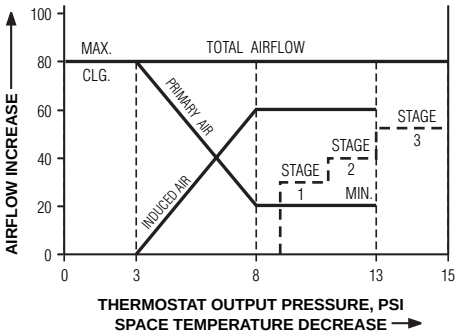
Note:

Constant volume series terminal fans should be electrically or pneumatically field interlocked with the central fan system, to prevent backflow of primary air into the ceiling plenum and to prevent possible backward rotation of the terminal fan.

Options:

Two Pipe Thermostat (Vertical Mount. Includes backing plate for 2" x 4" electrical box).

- ❑ CTC-1622-103 °F scale plate
- ❑ CTC-1622-113 °C scale plate

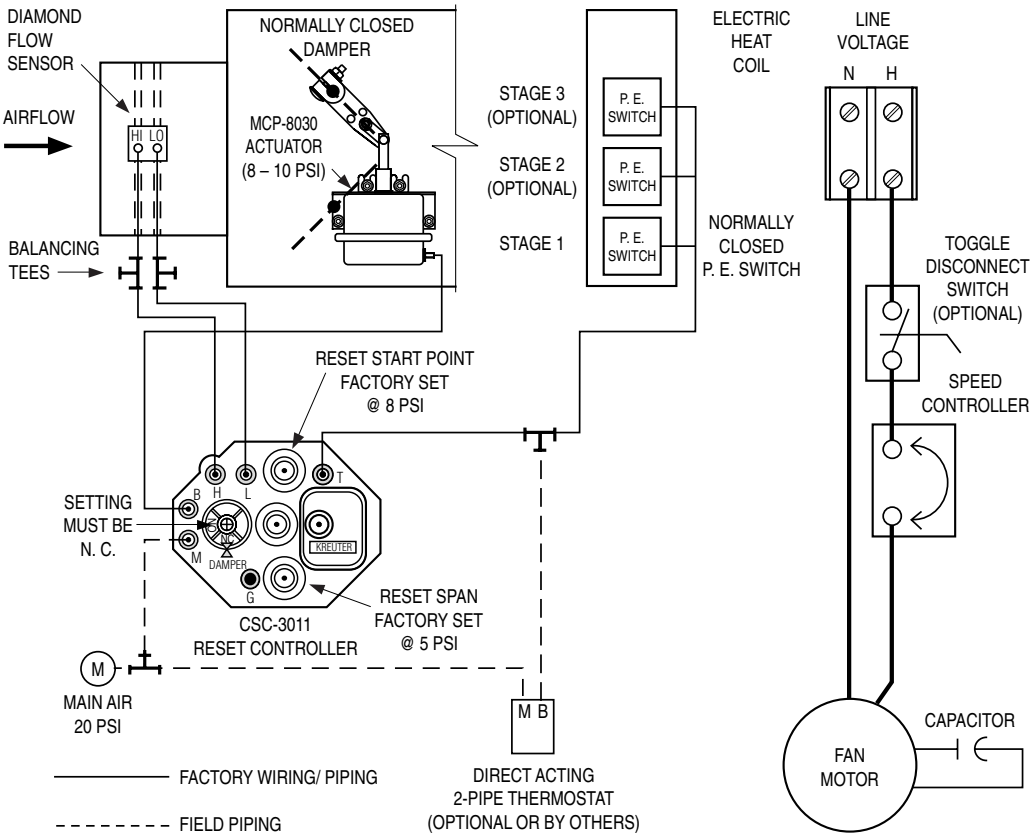


SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**10 - 17 - 07**	**3500**	**NEW**	**35SECD-2P3**

Nailor Industries Inc.

PNEUMATIC CONTROL

FAN POWERED TERMINAL UNIT • SERIES FLOW
CONSTANT VOLUME • PRESSURE INDEPENDENT
MODELS: 35SE, 35SEST, 37SE AND 37SEST 3P3



CONTROL SEQUENCE 3P3 • VAV COOLING WITH ELECTRIC HEAT (CONTINUOUS OPERATION) • DA/NC • 3000 CONTROLLER

Sequence of Operation:

The unit fan will deliver a constant volume to the space at all times. With space temperature at set point, unit delivers minimum cooling airflow and maximum induced plenum air.

On a rise in space temperature, the thermostat regulates the controller to increase primary airflow. As more cold air is supplied to the fan section, less warm air is induced from the ceiling plenum.

When the space temperature is warm, the primary air damper is controlling at the maximum airflow setting (usually the same as the fan volume setting and no plenum air is induced).

As the space temperature decreases, the damper modulates back towards the minimum airflow setting and as less cold air is supplied to the fan section, more warm air is induced. If room temperature continues to drop, minimum primary airflow is maintained and staged electric heat is energized.

Primary airflow is held constant in accordance with thermostat demand. Any changes in volume due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

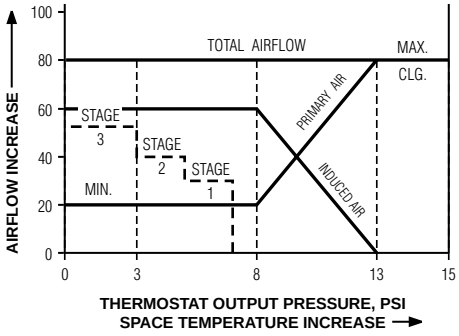
Note:

Constant volume series terminal fans should be electrically or pneumatically field interlocked with the central fan system, to prevent backflow of primary air into the ceiling plenum and to prevent possible backward rotation of the terminal fan.

Options:

Two Pipe Thermostat (Vertical Mount. Includes backing plate for 2" x 4" electrical box).

- ❑ CTC-1621-103 °F scale plate
- ❑ CTC-1621-113 °C scale plate

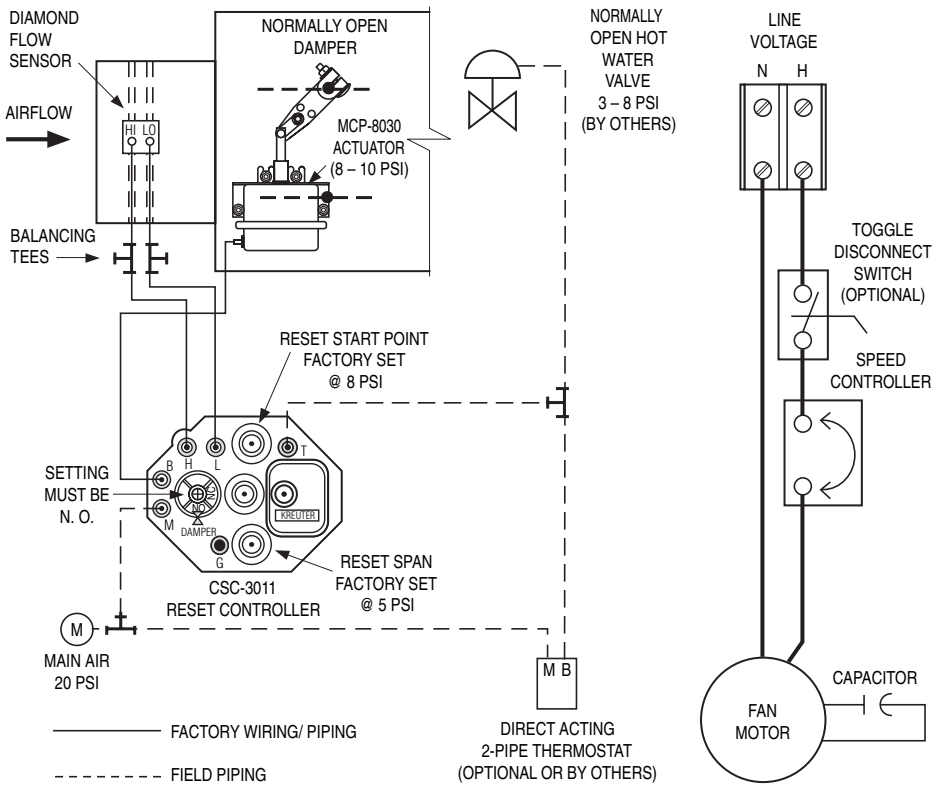


SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**12 - 2 - 02**	**3500**	**9 - 12 - 99RR**	**35SECD-3P3**

PNEUMATIC CONTROL

FAN POWERED TERMINAL UNIT • SERIES FLOW
CONSTANT VOLUME • PRESSURE INDEPENDENT

MODELS: 35SW, 35SWST, 37SW AND 37SWST 1P3



CONTROL SEQUENCE 1P3 • VAV COOLING WITH PROPORTIONAL HOT WATER HEAT (CONTINUOUS OPERATION) • DA/NO • 3000 CONTROLLER

Sequence of Operation:

The unit fan will deliver a constant volume to the space at all times. With space temperature at set point, unit delivers minimum cooling airflow and maximum induced plenum air.

On a rise in space temperature, the thermostat regulates the controller to increase primary airflow. As more cold air is supplied to the fan section, less warm air is induced from the ceiling plenum.

When the space temperature is warm, the primary air damper is controlling at the maximum airflow setting (usually the same as the fan volume setting and no plenum air is induced).

As the space temperature decreases, the damper modulates back towards the minimum airflow setting and as less cold air is supplied to the fan section, more warm air is induced. If room temperature continues to drop, minimum primary airflow is maintained and the hot water valve modulates open.

Primary airflow is held constant in accordance with thermostat demand. Any changes in volume due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

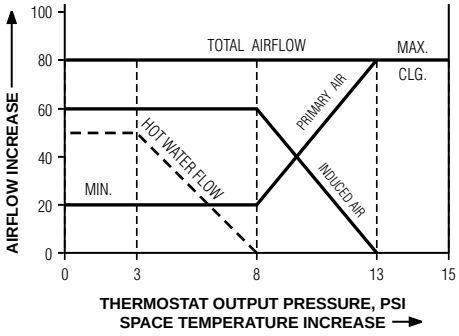
Note:

Constant volume series terminal fans should be electrically or pneumatically field interlocked with the central fan system, to prevent backflow of primary air into the ceiling plenum and to prevent possible backward rotation of the terminal fan.

Options:

Two Pipe Thermostat (Vertical Mount. Includes backing plate for 2" x 4" electrical box).

- ❑ CTC-1621-103 °F scale plate
- ❑ CTC-1621-113 °C scale plate

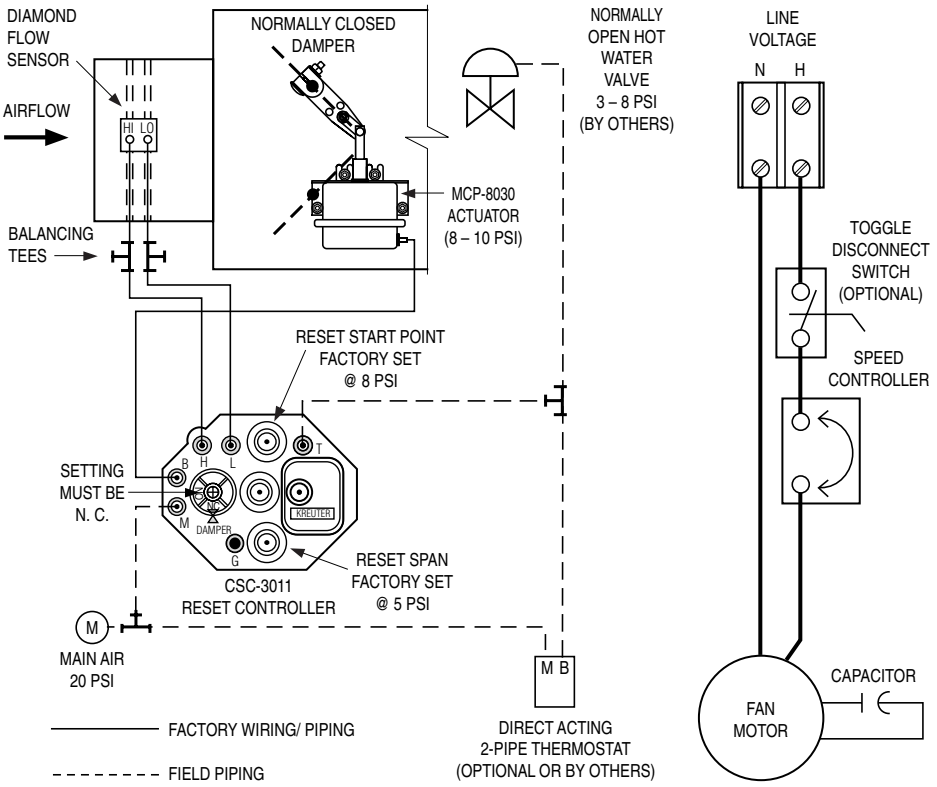


SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**10 - 18 - 07**	**3500**	**12 - 2 - 02**	**35SWCD-1P3**

Nailor Industries Inc.

PNEUMATIC CONTROL

FAN POWERED TERMINAL UNIT • SERIES FLOW
CONSTANT VOLUME • PRESSURE INDEPENDENT
MODELS: 35SW, 35SWST, 37SW AND 37SWST 3P3



CONTROL SEQUENCE 3P3 • VAV COOLING WITH PROPORTIONAL HOT WATER HEAT (CONTINUOUS OPERATION) • DA/NC • 3000 CONTROLLER

Sequence of Operation:

The unit fan will deliver a constant volume to the space at all times. With space temperature at set point, unit delivers minimum cooling airflow and maximum induced plenum air.

On a rise in space temperature, the thermostat regulates the controller to increase primary airflow. As more cold air is supplied to the fan section, less warm air is induced from the ceiling plenum.

When the space temperature is warm, the primary air damper is controlling at the maximum airflow setting (usually the same as the fan volume setting and no plenum air is induced).

As the space temperature decreases, the damper modulates back towards the minimum airflow setting and as less cold air is supplied to the fan section, more warm air is induced. If room temperature continues to drop, minimum primary airflow is maintained and the hot water valve modulates open.

Primary airflow is held constant in accordance with thermostat demand. Any changes in volume due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

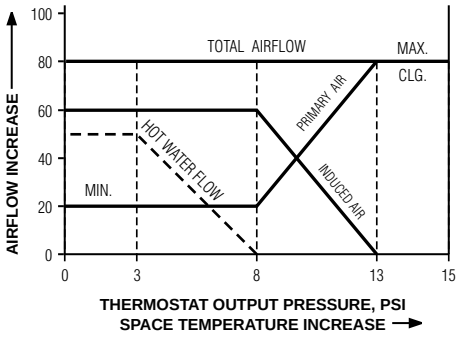
Note:

Constant volume series terminal fans should be electrically or pneumatically field interlocked with the central fan system, to prevent backflow of primary air into the ceiling plenum and to prevent possible backward rotation of the terminal fan.

Options:

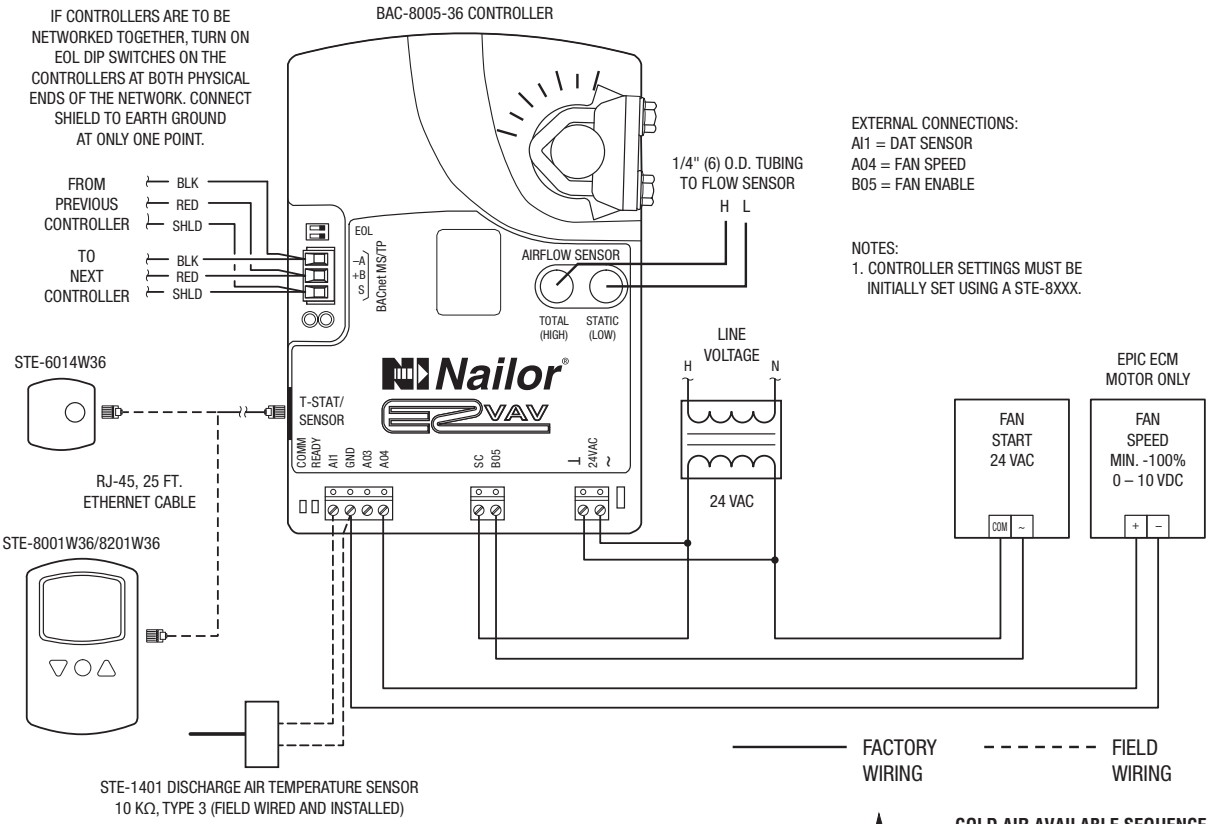
Two Pipe Thermostat (Vertical Mount. Includes backing plate for 2" x 4" electrical box).

- ❑ CTC-1621-103 °F scale plate
- ❑ CTC-1621-113 °C scale plate



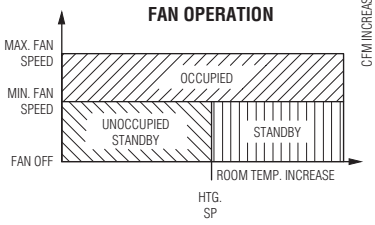
SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**12 - 2 - 02**	**3500**	**7 - 12 - 99R**	**35SWCD-3P3**

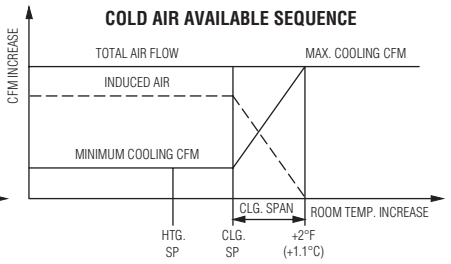
EZVAV DIGITAL CONTROLS
SERIES FAN POWERED (CAV) TERMINAL UNIT
COOLING (PLENUM HEAT ONLY)
PRESSURE INDEPENDENT
MODELS: 35S(ST) AND 37S(ST) N300

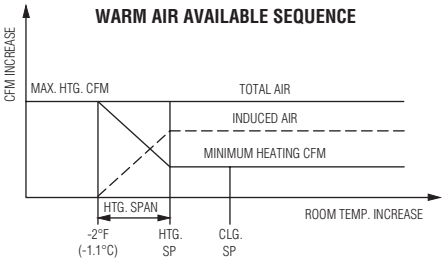


Room Temperature Sensor Option:

- ❑ **TSD** Digital Display (STE-8001W36)
- ❑ **TSDO** Digital Display w/Occupancy Motion Sensor (STE-8201W36)
- ❑ **TSR** Rotary Dial (STE-6014W36)







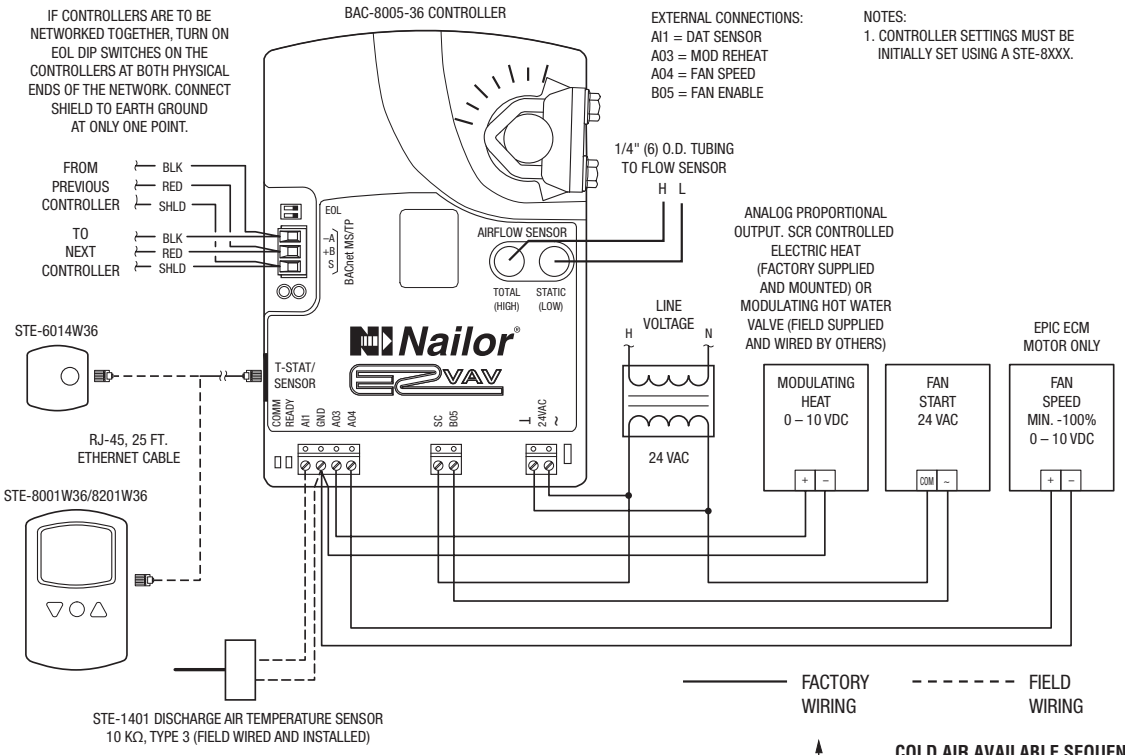
CONTROL SEQUENCE N300

Sequence of Operation:

1. Changeover/Morning Warm-up (Central AHU Heat/Cool): If supply air as measured by the discharge air temperature (DAT) sensor is below 72°F (22.2°C), cool air is said to be available. If supply air is above 76°F (24.4°C), warm air is said to be available.
2. Cool Air Available: As space temperature rises above the cooling setpoint, the controller increases primary airflow. At a space temperature of 2°F (1.1°C) above the cooling setpoint, maximum cooling airflow is maintained. On a decrease in space temperature, the controller reduces airflow. Below cooling setpoint, minimum airflow is maintained.
3. The fan is started during occupied and standby modes and runs continuously at maximum fan speed. The fan induces warm ceiling plenum air as the primary airflow varies and maintains a constant volume to the space. During unoccupied mode, the fan starts on a call for heating only. The fan stops only during unoccupied mode when there is no call for heat. EPIC ECM Motor Only: During standby and unoccupied modes, the fan runs at minimum fan speed.
4. As the space temperature drops below the heating setpoint, the fan continues to recirculate warm ceiling plenum air.
5. Warm Air Available: As space temperature drops below the heating setpoint, the controller increases primary airflow. At a space temperature of 2°F (1.1°C) below the heating setpoint, maximum heating airflow is maintained. On an increase in space temperature, airflow decreases. As space temperature rises above the heating setpoint, minimum heating airflow is maintained.

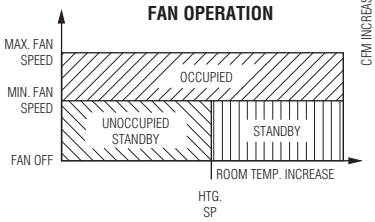
SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 22 - 23**	**3500**	**10 - 20 - 15**	**D35N300**

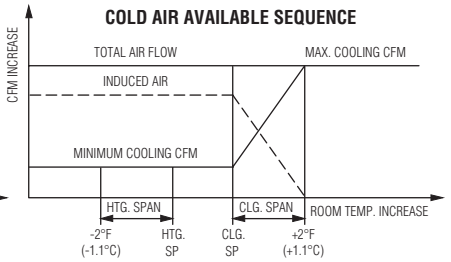
EZVAV DIGITAL CONTROLS
SERIES FAN POWERED (CAV) TERMINAL UNIT
COOLING WITH MODULATING HEAT
PRESSURE INDEPENDENT
MODELS: 35SE(ST), 35SW(ST), 37SE(ST) & 37SW(ST) N302



Room Temperature Sensor Option:

- ❑ **TSD** Digital Display (STE-8001W36)
- ❑ **TSDO** Digital Display w/Occupancy Motion Sensor (STE-8201W36)
- ❑ **TSR** Rotary Dial (STE-6014W36)

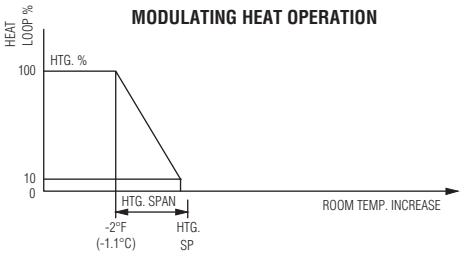


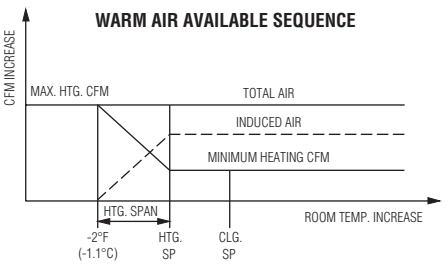


CONTROL SEQUENCE N302

Sequence of Operation:

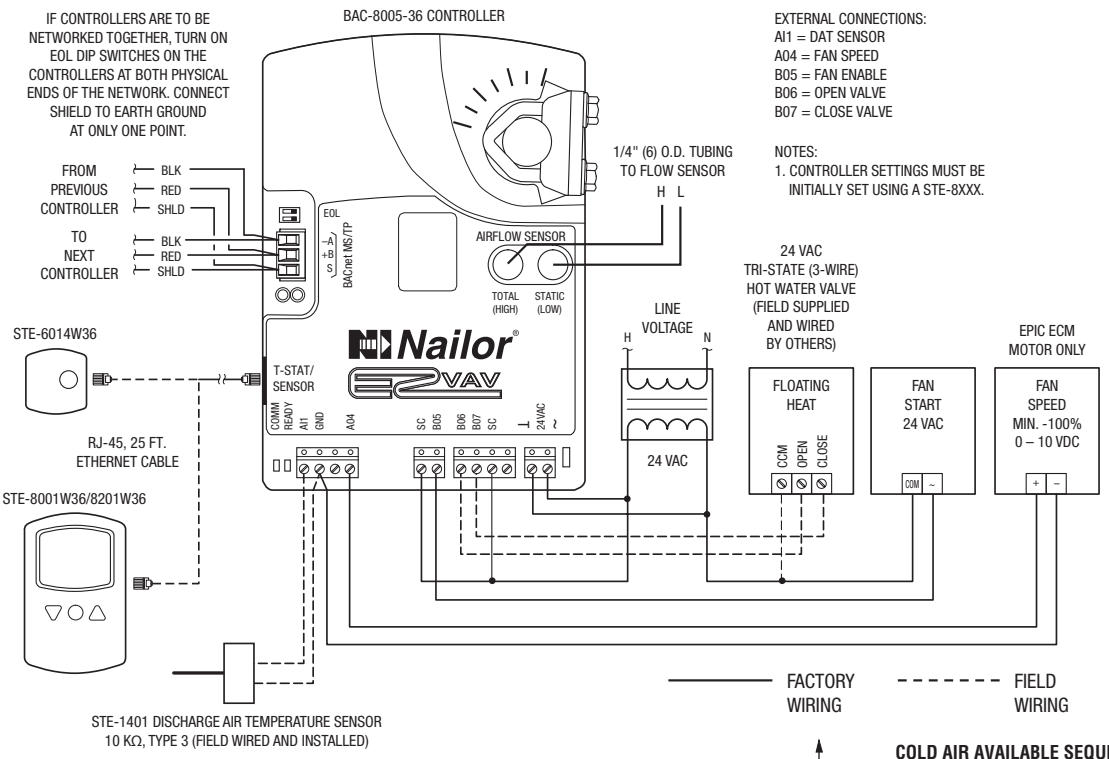
1. Changeover/Morning Warm-up (Central AHU Heat/Cool): If supply air as measured by the discharge air temperature (DAT) sensor is below 72°F (22.2°C), cool air is said to be available. If supply air is above 76°F (24.4°C), warm air is said to be available. Any time warm air is available, auxiliary heat is locked out.
2. Cool Air Available: As space temperature rises above the cooling setpoint, the controller increases primary airflow. At a space temperature of 2°F (1.1°C) above the cooling setpoint, maximum cooling airflow is maintained. On a decrease in space temperature, the controller reduces airflow. Below cooling setpoint, minimum airflow is maintained.
3. The fan is started during occupied and standby modes and runs continuously at maximum fan speed. The fan induces warm ceiling plenum air as the primary airflow varies and maintains a constant volume to the space. During unoccupied mode, the fan starts on a call for heating only. The fan stops only during unoccupied mode when there is no call for heat. EPIC ECM Motor Only: During standby and unoccupied modes, the fan runs at minimum fan speed.
4. Supplemental Heat: As the space temperature drops below the heating setpoint, the heating output modulates open. As the space temperature rises towards the heating setpoint, the heating modulates closed. If the heating loop is less than 10%, the heating output remains at 0%.
5. If DAT limiting is enabled and a DAT sensor is detected, the discharge air heating setpoint is determined based on the heating loop. The discharge temperature is limited to 15°F (8.3°C) above space temperature up to a maximum of 90°F (32.2°C).
6. Warm Air Available: As space temperature drops below the heating setpoint, the controller increases primary airflow. At a space temperature of 2°F (1.1°C) below the heating setpoint, maximum heating airflow is maintained. On an increase in space temperature, airflow decreases. As space temperature rises above the heating setpoint, minimum heating airflow is maintained.





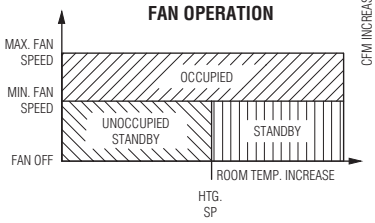
SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 22 - 23**	**3500**	**10 - 14 - 16**	**D35N302**

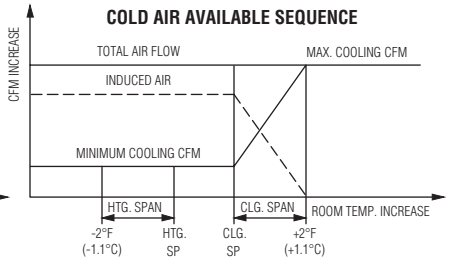
EZVAV DIGITAL CONTROLS
SERIES FAN POWERED (CAV) TERMINAL UNIT
COOLING WITH FLOATING HEAT
PRESSURE INDEPENDENT
MODELS: 35SW(ST) AND 37SW(ST) N303



Room Temperature Sensor Option:

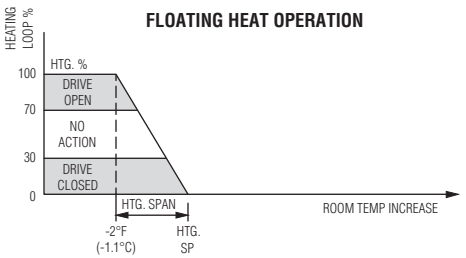
- ❑ **TSD** Digital Display (STE-8001W36)
- ❑ **TSDO** Digital Display w/Occupancy Motion Sensor (STE-8201W36)
- ❑ **TSR** Rotary Dial (STE-6014W36)

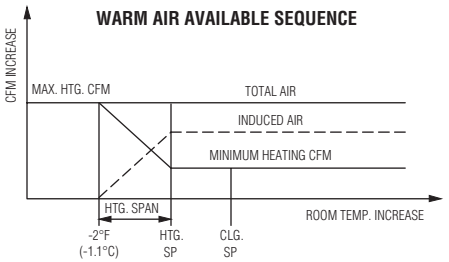




CONTROL SEQUENCE N303
Sequence of Operation:

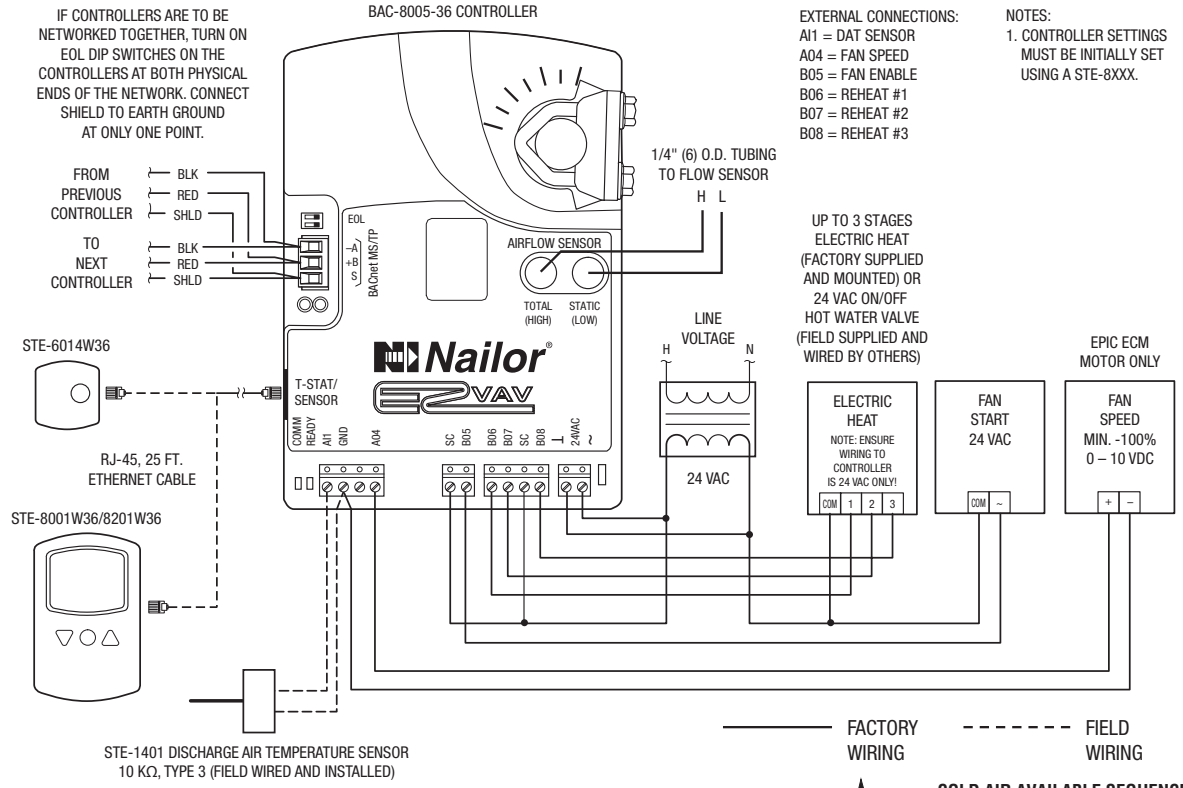
1. Changeover/Morning Warm-up (Central AHU Heat/Cool): If supply air as measured by the discharge air temperature (DAT) sensor is below 72°F (22.2°C), cool air is said to be available. If supply air is above 76°F (24.4°C), warm air is said to be available. Any time warm air is available, auxiliary heat is locked out.
2. Cool Air Available: As space temperature rises above the cooling setpoint, the controller increases primary airflow. At a space temperature of 2°F (1.1°C) above the cooling setpoint, maximum cooling airflow is maintained. On a decrease in space temperature, the controller reduces airflow. Below cooling setpoint, minimum airflow is maintained.
3. The fan is started during occupied and standby modes and runs continuously at maximum fan speed. The fan induces warm ceiling plenum air as the primary airflow varies and maintains a constant volume to the space. During unoccupied mode, the fan starts on a call for heating only. The fan stops only during unoccupied mode when there is no call for heat. EPIC ECM Motor Only: During standby and unoccupied modes, the fan runs at minimum fan speed.
4. Supplemental Heat: As the space temperature drops below the heating setpoint (heating loop is greater than 70%), the valve is driven open. As the space temperature rises back toward the heating setpoint (heating loop is less than 30%), the valve is driven closed. If the loop is in between, there is no valve action.
5. If DAT limiting is enabled and a DAT sensor is detected, the discharge air heating setpoint is determined based on the heating loop. The discharge temperature is limited to 15°F (8.3°C) above space temperature up to a maximum of 90°F (32.2°C).
6. Warm Air Available: As space temperature drops below the heating setpoint, the controller increases primary airflow. At a space temperature of 2°F (1.1°C) below the heating setpoint, maximum heating airflow is maintained. On an increase in space temperature, airflow decreases. As space temperature rises above the heating setpoint, minimum heating airflow is maintained.





SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 22 - 23**	**3500**	**10 - 14 - 16**	**D35N303**

EZVAV DIGITAL CONTROLS
SERIES FAN POWERED (CAV) TERMINAL UNIT
COOLING WITH BINARY HEAT (STAGED ELECTRIC OR ON/OFF HOT WATER) • PRESSURE INDEPENDENT
MODELS: 35SE(ST), 35SW(ST), 37SE(ST) & 37SW(ST) N304



Room Temperature Sensor Option:

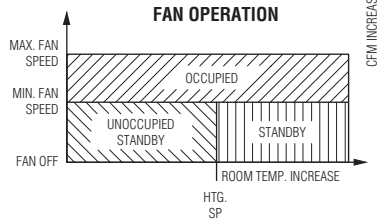
- ❑ **TSD** Digital Display (STE-8001W36)
- ❑ **TSDO** Digital Display w/Occupancy Motion Sensor (STE-8201W36)
- ❑ **TSR** Rotary Dial (STE-6014W36)

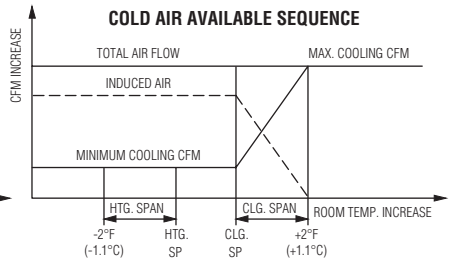
CONTROL SEQUENCE N304

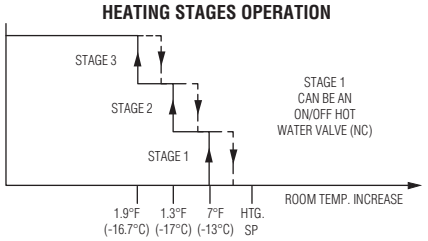
Sequence of Operation:

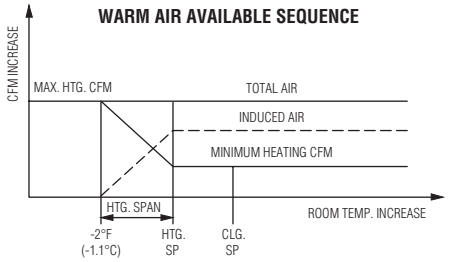
1. Changeover/Morning Warm-up (Central AHU Heat/Cool): If supply air as measured by the discharge air temperature (DAT) sensor is below 72°F (22.2°C), cool air is said to be available. If supply air is above 76°F (24.4°C), warm air is said to be available. Any time warm air is available, auxiliary heat is locked out.
2. Cool Air Available: As space temperature rises above the cooling setpoint, the controller increases primary airflow. At a space temperature of 2°F (1.1°C) above the cooling setpoint, maximum cooling airflow is maintained. On a decrease in space temperature, the controller reduces airflow. Below cooling setpoint, minimum airflow is maintained.
3. The fan is started during occupied and standby modes and runs continuously at maximum fan speed. The fan induces warm ceiling plenum air as the primary airflow varies and maintains a constant volume to the space. During unoccupied mode, the fan starts on a call for heating only. The fan stops only during unoccupied mode when there is no call for heat. EPIC ECM Motor Only: During standby and unoccupied modes, the fan runs at minimum fan speed.
4. Supplemental Heat: As the space temperature drops below the heating setpoint, up to 3 stages of electric heat are energized respectively. As the space temperature rises back toward the heating setpoint, heating stages 3, 2 and 1 turn off respectively (Alternatively, an on/off two position spring return hot water valve can be controlled).
5. Warm Air Available: At a space temperature of 2°F (1.1°C) below the heating setpoint, maximum heating airflow is maintained. On an increase in space temperature, airflow decreases. As space temperature rises above the heating setpoint, minimum heating airflow is maintained.

Note: **DO NOT** enable the DAT Discharge Air Temperature limiting feature for binary staged or on/off reheat as short cycling will occur.









SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**2 - 22 - 23**	**3500**	**10 - 20 - 16**	**D35N304**

Recommended Primary Valve Airflow Ranges For All Fan Powered Terminal Units

The recommended airflow ranges below are for fan powered terminal units with pressure independent controls and are presented as ranges for total and controller specific minimum and maximum airflow. Airflow ranges are based upon maintaining reasonable sound levels and controller limits using Nailor's Diamond Flow Sensor as the airflow measuring device. For a given unit size, the minimum, auxiliary and the maximum flow setting must be within the range limits to ensure pressure independent operation, accuracy and repeatability.

Minimum airflow limits are based upon .02" w.g. (5 Pa) differential pressure signal from Diamond Flow Sensor on analog/digital controls and .03" (7.5) for pneumatic controllers. This is a realistic low limit for many transducers used in the digital controls industry. Check your controls supplier for minimum limits. Setting airflow minimums lower, may cause hunting and failure to meet minimum ventilation requirements.

The high end of the tabulated Total Airflow Range on pneumatic and analog electronic controls represents the Diamond Flow Sensor's differential pressure reading at 1" w.g. (249 Pa). The high end airflow range for digital controls is represented by the indicated transducer differential pressure.

ASHRAE 130 "Performance Rating of Air Terminals" is the method of test for the certification program. The "standard rating condition" (certification rating point) airflow volumes for each terminal unit size are tabulated below per AHRI Standard 880. These air volumes equate to an approximate inlet velocity of 2000 fpm (10.2 m/s).

When digital or other controls are mounted by Nailor, but supplied by others, these values are guidelines only, based upon experience with the majority of controls currently available. Controls supplied by others for factory mounting are configured and calibrated in the field. Airflow settings on pneumatic and analog controls supplied by Nailor are factory preset when provided.

Imperial Units, Cubic Feet per Minute

Inlet Size	Inlet Type	Total Airflow Range, cfm	Airflow at 2000 fpm Inlet Velocity (nom.), cfm	Range of Minimum and Maximum Settings, cfm							
				Pneumatic 3000 Controller		Analog Electronic Controls		Digital Controls			
						Transducer Differential Pressure (w.g.)					
				Min.	Max.	Min.	Max.	Min.	Max.	Max.	
				.03	1.0	.02	1.0	.02	1.0	1.25	≥1.5
4	Round	0 – 225	150	30	180	25	180	25	180	200	225
5		0 – 400	250	55	325	45	325	45	325	360	400
6		0 – 550	400	80	450	65	450	65	450	500	550
7		0 – 800	550	115	650	95	650	95	650	725	800
8		0 – 1100	700	155	900	125	900	125	900	1000	1100
10		0 – 1840	1100	260	1500	215	1500	215	1500	1675	1840
12		0 – 2500	1600	355	2050	290	2050	290	2050	2290	2500
14		0 – 3370	2100	475	2750	390	2750	390	2750	3075	3370
16		0 – 4510	2800	640	3700	520	3700	520	3700	4120	4510
12	Flat Oval	0 – 2500	1600	355	2050	290	2050	290	2050	2300	2500
14		0 – 3125	2100	440	2550	360	2550	360	2550	2850	3125
16		0 – 3725	2800	525	3040	430	3040	430	3040	3400	3725
18		0 – 5265	3500	750	4300	610	4300	610	4300	4800	5265
14 x 8	Rect.	0 – 2450	1560	350	2000	290	2000	290	2000	2240	2450
14 x 10		0 – 2950	1900	420	2400	340	2400	340	2400	2700	2950

Metric Units, Liters per Second

Inlet Size	Inlet Type	Total Airflow Range, l/s	Airflow at 10.2 m/s Inlet Velocity (nom.), l/s	Range of Minimum and Maximum Settings, l/s							
				Pneumatic 3000 Controller		Analog Electronic Controls		Digital Controls			
						Transducer Differential Pressure (Pa)					
				Min.	Max.	Min.	Max.	Min.	Max.		
				7.5	249	5	249	5	249	311	≥374
4	Round	0 – 106	71	14	85	12	85	12	85	94	106
5		0 – 189	118	26	153	21	153	21	153	170	189
6		0 – 260	189	38	212	31	212	31	212	236	260
7		0 – 378	260	54	307	45	307	45	307	342	378
8		0 – 519	330	73	425	59	425	59	425	472	579
10		0 – 868	519	123	708	101	708	101	708	790	868
12		0 – 1180	755	168	967	137	967	137	967	1081	1080
14		0 – 1590	991	224	1298	184	1298	184	1298	1451	1590
16		0 – 2128	1321	302	1746	245	1746	245	1746	1944	2128
12	Flat Oval	0 – 1180	755	168	967	137	967	137	967	1085	1180
14		0 – 1475	991	208	1203	170	1203	170	1203	1345	1475
16		0 – 1758	1321	248	1435	203	1435	203	1435	1604	1758
18		0 – 2485	1652	354	2029	288	2029	288	2029	2265	2485
14 x 8	Rect.	0 – 1156	736	165	944	137	944	137	944	1057	1156
14 x 10		0 – 1392	897	198	1133	160	1133	160	1133	1274	1392

Performance Data Explanation

Sound Power Levels vs. NC Levels

The **Nailor Model Series: 35S, 35SST, 37S, 37SST, 35N and 37N** fan powered terminal unit performance data is presented in two forms.

The laboratory obtained discharge and radiated sound power levels in octave bands 2 through 7 (125 through 4000 Hz) center frequency for each unit size at various flow rates and inlet static pressures is presented. This data is derived in accordance with ANSI/ASHRAE Standard 130 and AHRI Standard 880. This data is raw with no attenuation deductions and includes AHRI Certification standard rating points.

Nailor also provides an "NC Level" table as an application aid in terminal selection, which include attenuation allowances as explained below. The suggested attenuation allowances are typical and are not representative of specific job site conditions. It is recommended that the sound power level data be used and a detailed NC calculation be performed using the procedures outlined in AHRI Standard 885, Appendix E for accurate space sound levels.

Explanation of NC Levels

Tabulated NC levels are based on attenuation values as outlined in AHRI Standard 885 Procedure for Estimating Occupied Space Sound Levels in the Application of Air Terminals and Air Outlets". AHRI Standard 885, Appendix E provides typical sound attenuation values for air terminal discharge sound and air terminal radiated sound.

As stated in AHRI Standard 885, Appendix E, These values can be used as a quick method of estimating space sound levels when a detailed evaluation is not available. The attenuation values are required for use by manufacturers to catalog application sound levels. In product catalogs, the end user environments are not known and the following factors are provided as typical attenuation values. Use of these values will allow better comparison between manufacturers and give the end user a value which will be expected to be applicable for many types of space.

Radiated Sound

Table E1 of Appendix E provides typical radiated sound attenuation values for three types of ceiling: Type 1 – Glass Fiber; Type 2 – Mineral Fiber; Type 3 – Solid Gypsum Board.

Since Mineral Fiber tile ceilings are the most common construction used in commercial buildings, these values have been used to tabulate Radiated NC levels.

The following table provides the calculation method for the radiated sound total attenuation values based on AHRI Standard 885.

	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 Attenuation Deduction	**18**	**19**	**20**	**26**	**31**	**36**

The ceiling/space effect assumes the following conditions:

1. 5/8" (16) tile, 20 lb/ft³ (320 kg/m³) density.
2. The plenum is at least 3 feet (914) deep.
3. The plenum space is either wide [over 30 feet (9 m)] or lined with insulation.
4. The ceiling has no significant penetration directly under the unit.

Discharge Sound

Table E1 of Appendix E provides typical discharge sound attenuation values for three sizes of terminal unit.

1. Small box; Less than 300 cfm (142 l/s) [Discharge Duct 8" x 8" (203 x 203)].
2. Medium box; 300 – 700 cfm (142 - 330 l/s) [Discharge Duct 12" x 12" (305 x 305)].
3. Large box; Greater than 700 cfm (330 l/s) [Discharge Duct 15" x 15" (381 x 381)].

These attenuation values have been used to tabulate Discharge NC levels applied against the terminal airflow volume and not terminal unit size.

The following tables provide the calculation method for the discharge sound total attenuation values based on AHRI Standard 885.

Small Box	Octave Band					
<300 cfm	**2**	**3**	**4**	**5**	**6**	**7**
Environmental Effect	2	1	0	0	0	0
5 ft. (1.5 m) 1" (25) Duct Lining	2	6	12	25	29	18
Branch Power Division (1 outlet)	0	0	0	0	0	0
5 ft. (1.5 m), 8 in. dia. (203) Flex Duct	5	10	18	19	21	12
End Reflection	10	5	2	1	0	0
Space Effect	5	6	7	8	9	10
Total Attenuation Deduction	**24**	**28**	**39**	**53**	**59**	**40**

Medium Box	Octave Band					
300 – 700 cfm	**2**	**3**	**4**	**5**	**6**	**7**
Environmental Effect	2	1	0	0	0	0
5 ft. (1.5 m) 1" (25) Duct Lining	2	4	10	20	20	14
Branch Power Division (2 outlets)	3	3	3	3	3	3
5 ft. (1.5 m), 8 in. dia. (203) Flex Duct	5	10	18	19	21	12
End Reflection	10	5	2	1	0	0
Space Effect	5	6	7	8	9	10
Total Attenuation Deduction	**27**	**29**	**40**	**51**	**53**	**39**

Large Box	Octave Band					
>700 cfm	**2**	**3**	**4**	**5**	**6**	**7**
Environmental Effect	2	1	0	0	0	0
5 ft. (1.5 m) 1" (25) Duct Lining	2	3	9	18	17	12
Branch Power Division (3 outlets)	5	5	5	5	5	5
5 ft. (1.5 m), 8 in. dia. (203) Flex Duct	5	10	18	19	21	12
End Reflection	10	5	2	1	0	0
Space Effect	5	6	7	8	9	10
Total Attenuation Deduction	**29**	**30**	**41**	**51**	**52**	**39**

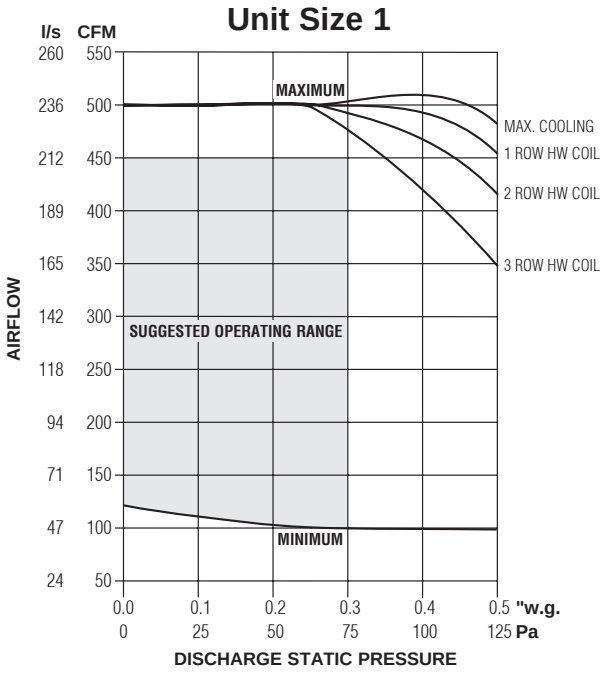
1. Flexible duct is non-metallic with 1" (25) insulation.
2. Space effect (room size and receiver location) 2500 ft.³ (69 m³) and 5 ft. (1.5 m) distance from source.

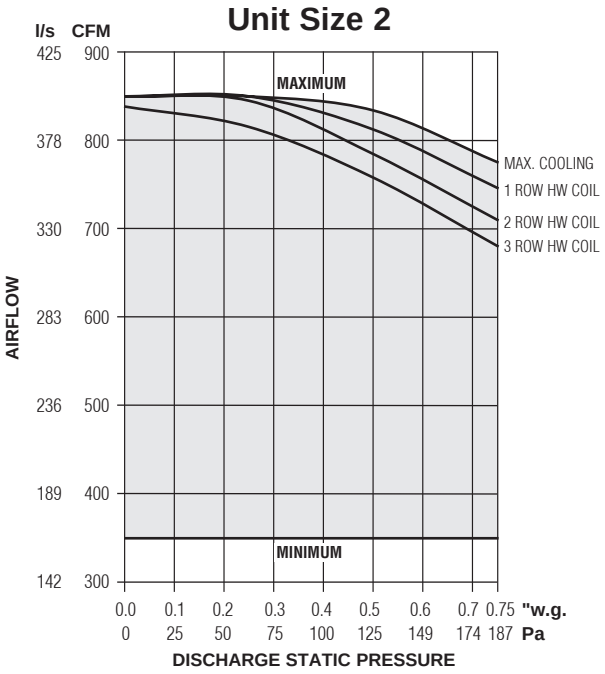
For a complete explanation of the attenuation factors and the procedures for calculating room NC levels, please refer to the acoustical engineering guidelines at the back of this catalog and AHRI Standard 885.

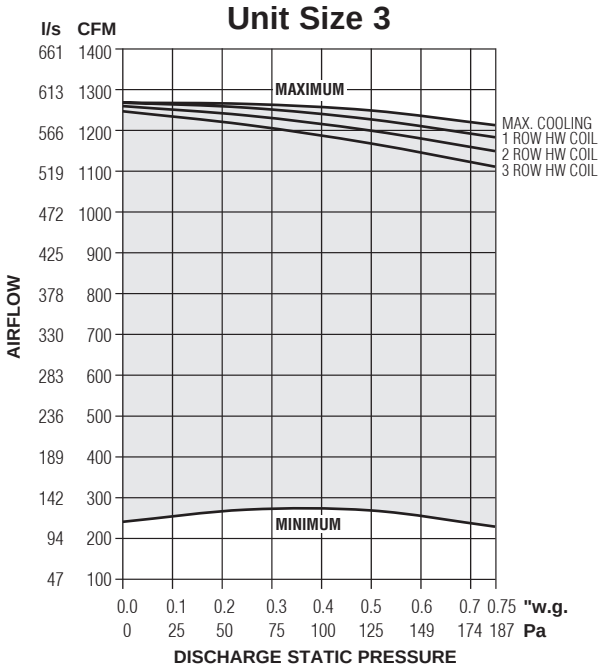
Performance Data

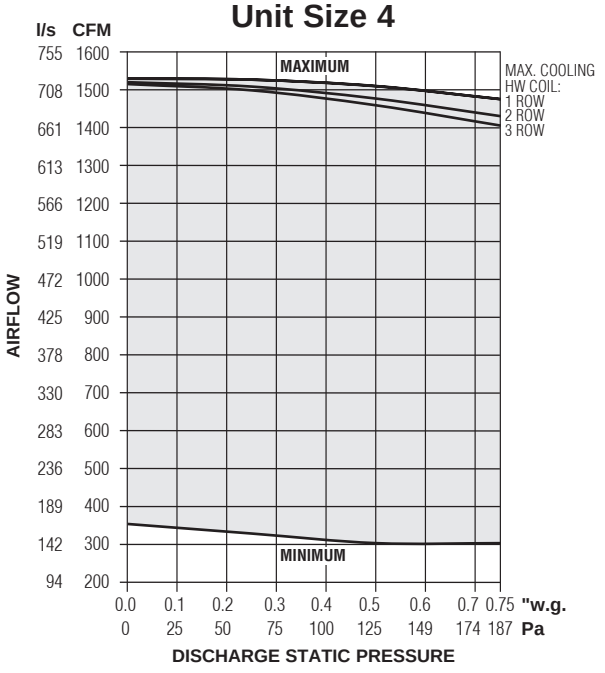
ECM Motor Fan Curves – Airflow vs. Downstream Static Pressure

35S Series • Series Flow









Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
1	*	2.1	1.4	1.30	1.2
2	*	4.0	2.7	2.6	2.6
3	*	5.0	3.4	3.3	3.3
4	*	6.9	4.6	4.5	4.2

* The EPIC ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption.
FLA = Full load amperage.
All motors are single phase/60 Hz.

NOTES:

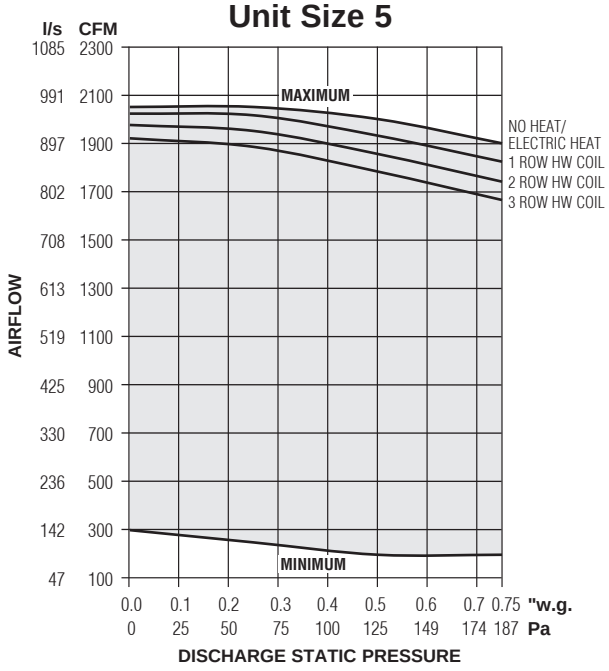
- The ECM is pressure independent and constant volume in operation at factory or field set point within the shaded area. Airflow does not vary with changing static pressure conditions. The motor compensates for any changes in external static pressure or induced air conditions such as filter loading.
- Airflow can be set to operate on horizontal performance line at any point within shaded area using the solid state volume controller provided.
- Fan curves shown are applicable to 120, 208, 240 and 277 volt, single phase ECM's. ECM's, although DC in operation, include a built-in AC/DC converter.

Performance Data

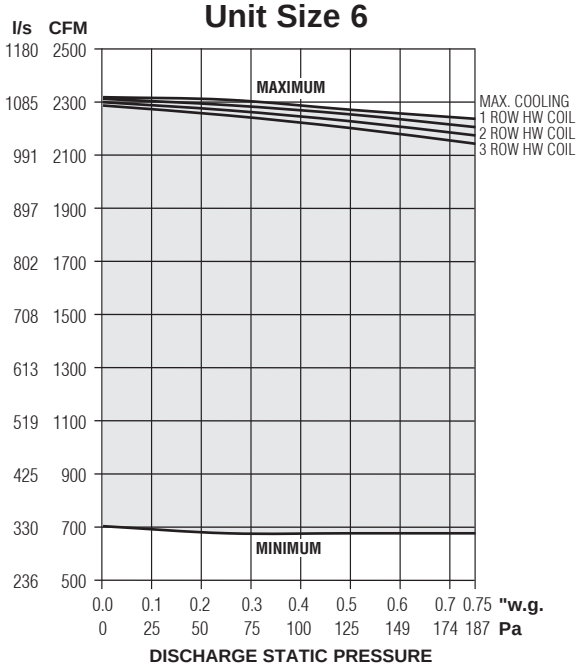
ECM Motor Fan Curves – Airflow vs. Downstream Static Pressure

35S Series • Series Flow

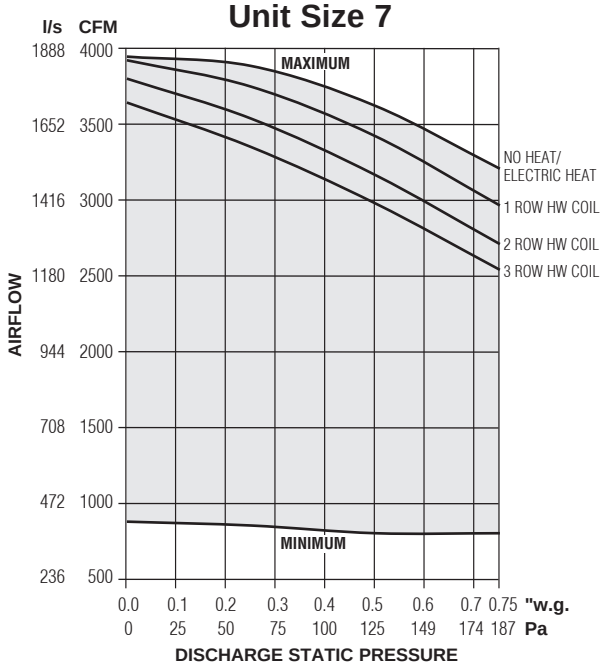
Unit Size 5



Unit Size 6



Unit Size 7



Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
5	*	9.0	6.1	5.8	5.6
6	*	11.9	7.3	7.3	7.2
7	*	15.9	10.5	9.9	10.0

* The EPIC ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption.

FLA = Full load amperage.

All motors are single phase/60 Hz.

NOTES:

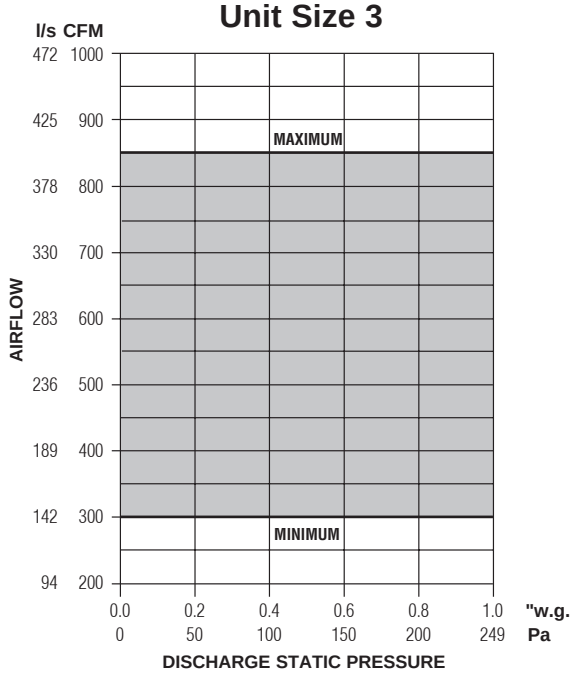
- The ECM is pressure independent and constant volume in operation at factory or field set point within the shaded area. Airflow does not vary with changing static pressure conditions. The motor compensates for any changes in external static pressure or induced air conditions such as filter loading.
- Airflow can be set to operate on horizontal performance line at any point within shaded area using the solid state volume controller provided.
- Fan curves shown are applicable to 120, 208, 240 and 277 volt, single phase ECM's. ECM's, although DC in operation, include a built-in AC/DC converter.

Performance Data

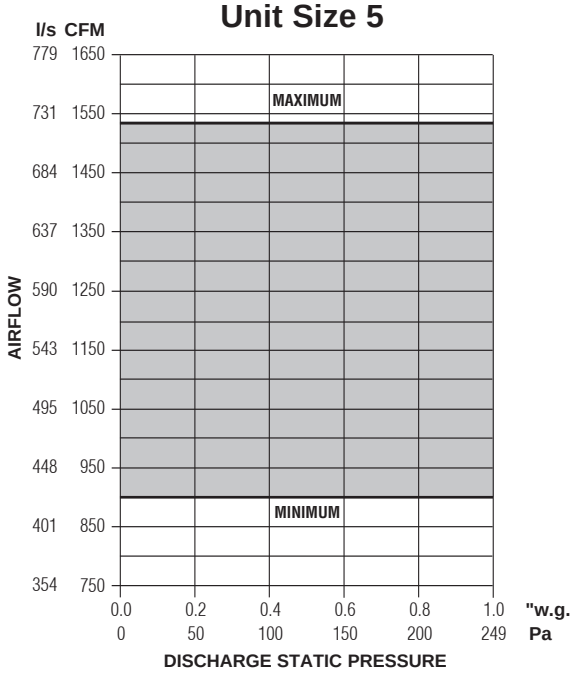
ECM Motor Fan Curves – Airflow vs. Downstream Static Pressure

35S Series with CVP • Constant Volume • Pressurization Unit

Unit Size 3



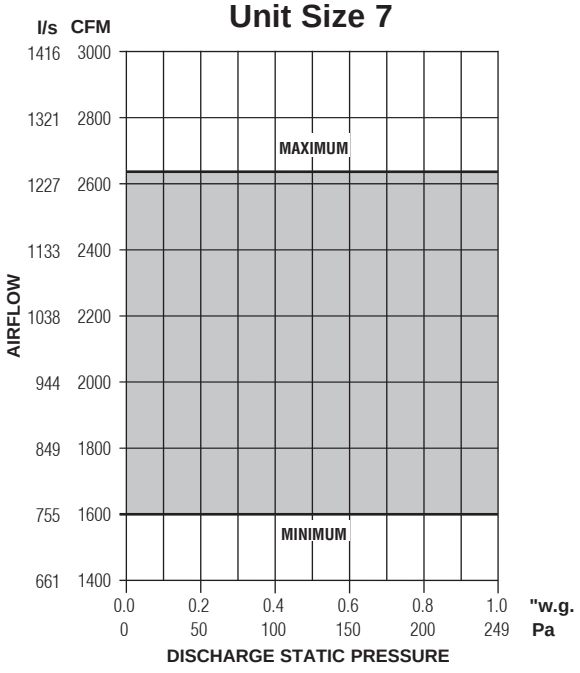
Unit Size 5



NOTES:

- The ECM is pressure independent and constant volume in operation at factory or field set point within the shaded area. Airflow does not vary with changing static pressure conditions. The motor compensates for any changes in external static pressure or induced air conditions such as filter loading.
- Airflow can be set to operate on horizontal performance line at any point within shaded area using the solid state volume controller provided.
- Fan curves shown are applicable to 120, 208, 240 and 277 volt, single phase ECM's. ECM's, although DC in operation, include a built-in AC/DC converter.

Unit Size 7



Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
3	*	4.8	3.3	3.2	3.1
5	*	9.6	6.2	5.9	5.8
7	*	17.5	11.1	11.4	11.4

* The EPIC ECM is a variable horsepower motor.
Refer to Selectworks schedule for actual power consumption.
FLA = Full load amperage.
All motors are single phase/60 Hz.

Performance Data • NC Level Application Guide

Model Series 35S • Series Flow • Basic Unit

Fiberglass Liner

Unit Size	Inlet Size	Airflow		Min. inlet ΔPs		NC Levels @ Inlet Pressure (ΔPs) shown											
						DISCHARGE						RADIATED					
		cfm	l/s	"w.g.	Pa	Fan Only	Min. ΔPs	0.5 w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)	Fan Only	Min. ΔPs	0.5" w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)
1	6	550	260	0.22	54	37	36	36	36	39	39	36	36	35	36	37	37
		400	189	0.12	30	30	26	26	29	30	33	30	30	30	31	33	33
		300	142	0.07	17	20	-	20	25	29	29	25	25	26	28	29	30
		200	94	0.04	9	-	-	-	20	20	20	-	-	-	22	24	25
		100	47	0.01	3	-	-	-	-	-	-	-	-	-	-	-	21
	8	550	260	0.06	15	37	35	35	35	38	38	36	36	35	36	37	37
		400	189	0.03	8	30	26	26	28	29	31	30	30	30	31	33	33
		300	142	0.02	5	20	-	-	24	26	28	25	24	25	28	29	30
		200	94	0.01	2	-	-	-	-	-	-	-	-	-	21	23	24
		100	47	0.01	1	-	-	-	-	-	-	-	-	-	-	-	20
2	6	550	260	0.20	50	23	25	28	29	31	33	24	23	25	29	32	33
		400	189	0.11	27	-	-	-	24	28	29	-	-	21	24	29	30
		200	94	0.04	10	-	-	-	-	-	-	-	-	-	22	25	28
	8	850	401	0.11	28	31	34	36	34	35	36	35	33	34	35	36	36
		700	330	0.08	19	28	30	34	31	34	35	28	30	30	33	34	35
		550	260	0.05	12	23	24	26	26	30	31	24	23	24	28	31	33
		400	189	0.02	6	-	-	-	21	25	26	-	-	20	24	28	30
		200	94	0.01	2	-	-	-	-	-	-	-	-	-	21	24	26
3	6	550	260	0.20	50	23	25	25	28	30	31	26	28	29	32	34	34
		400	189	0.11	27	-	-	-	21	23	24	21	22	23	25	29	29
	8	1100	519	0.12	30	31	31	31	33	35	36	34	34	34	36	38	38
		900	425	0.08	20	26	28	28	30	33	34	30	31	32	34	36	36
		700	330	0.05	12	23	24	24	26	30	30	26	28	29	31	34	34
		400	189	0.02	5	-	-	-	-	20	21	21	22	23	25	29	29
	10	1215	573	0.03	7	34	34	34	35	36	36	35	34	35	37	38	38
		1100	519	0.03	7	31	30	31	33	34	35	34	33	34	36	37	37
		900	425	0.02	4	26	25	26	28	30	33	30	30	31	33	35	35
		700	330	0.01	2	23	21	23	24	28	28	26	26	28	31	33	33
		400	189	0.01	1	-	-	-	-	-	-	21	21	22	24	28	28
4	10	1550	731	0.10	25	39	37	39	41	43	44	35	35	37	39	41	43
		1400	661	0.08	19	35	34	36	38	39	41	33	33	35	37	40	41
		1200	566	0.05	13	31	29	33	35	37	38	30	30	33	36	39	40
		900	425	0.03	7	25	25	28	29	30	31	25	25	30	32	35	36
		700	330	0.02	4	21	23	25	24	26	28	22	22	26	30	33	34
	12	1550	731	0.05	12	39	36	38	40	41	43	35	35	37	39	41	43
		1400	661	0.03	8	35	33	35	37	38	40	33	33	35	37	40	41
		1200	566	0.02	5	31	29	33	35	36	38	30	30	33	35	38	39
		900	425	0.01	3	25	23	26	26	29	30	25	25	29	32	34	36
		700	330	0.01	2	21	21	23	23	24	25	22	21	26	29	32	33
5	12	2050	967	0.06	15	39	38	39	41	43	43	40	38	39	40	41	43
		1850	873	0.05	12	36	35	36	38	39	40	38	36	37	38	39	40
		1600	755	0.04	10	33	31	34	35	37	38	34	34	35	36	38	38
		1350	637	0.03	7	28	26	30	31	34	35	29	30	31	34	36	37
		1100	519	0.02	5	23	24	26	29	30	30	26	25	28	30	33	34
	14	2050	967	0.04	10	39	37	38	40	41	41	40	38	39	40	41	43
		1850	873	0.03	8	36	34	36	37	38	39	38	36	37	38	39	40
		1600	755	0.03	7	33	30	33	35	36	37	34	34	35	36	38	38
		1350	637	0.02	5	28	26	29	30	33	34	29	29	30	34	36	37
		1100	519	0.01	3	23	21	25	26	28	28	26	25	28	30	33	34
6	14	2400	1133	0.08	20	40	38	39	41	43	43	43	39	41	44	46	46
		2100	991	0.06	15	37	36	37	39	40	40	40	37	38	41	44	44
		1700	802	0.04	10	31	29	33	34	36	36	36	33	34	37	40	40
		1400	661	0.03	6	26	25	27	29	30	30	33	28	29	34	37	37
7	16	4000	1888	0.15	38	40	38	39	41	43	44	46	44	44	45	46	47
		3500	1652	0.12	29	37	35	36	38	40	41	43	40	41	43	45	45
		2800	1321	0.08	19	31	30	33	35	37	35	38	36	37	39	41	43
		2100	991	0.04	11	25	24	26	29	29	30	34	33	33	35	38	40
		1600	755	0.03	6	21	-	23	24	24	26	30	28	30	33	36	38
	18	4000	1888	0.10	25	40	38	38	40	41	43	46	44	44	45	46	47
		3500	1652	0.07	18	37	35	35	38	39	40	43	40	41	43	45	45
		2800	1321	0.05	11	31	29	31	34	36	35	38	36	37	39	41	41
		2100	991	0.02	5	25	21	25	28	28	28	34	33	33	35	38	39
		1600	755	0.02	4	21	-	20	21	21	24	30	28	29	32	36	37

Performance Notes: 1. NC Levels are calculated based on procedures as outlined on page C160.
2. Dash (-) in space indicates a NC less than 20.

Performance Data • Discharge Sound Power Levels

Model Series 35S • Series Flow • Basic Unit

Fiberglass Liner

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

Unit Size	Inlet Size	Airflow		Min. inlet ΔPs		Fan Only						Fan and 100% Primary Air–Sound Power Octave Bands @ Inlet pressure (ΔPs) shown																							
												Minimum ΔPs						0.5" w.g. (125Pa) ΔPs						1.0" w.g. (249Pa)ΔPs						1.5" w.g. (375Pa) ΔPs						2.0" w.g. (500Pa) ΔPs					
		cfm	l/s	"w.g.	l/s	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
1	6	550	260	0.22	54	79	76	71	69	66	63	78	75	69	67	64	62	78	75	69	67	64	61	78	75	70	68	64	62	80	78	71	69	65	63	79	78	71	69	65	63
		400	189	0.12	30	74	70	66	64	60	57	70	67	63	60	56	53	70	67	62	60	56	53	71	69	63	60	57	53	72	70	64	60	57	54	72	72	65	60	57	54
		300	142	0.07	17	67	62	59	55	50	46	65	61	56	53	48	44	67	62	57	54	49	45	69	66	59	55	50	46	71	69	61	56	51	48	71	69	62	57	52	49
		200	94	0.04	9	58	52	47	-	-	-	58	51	45	-	-	-	58	52	45	41	-	-	64	59	50	44	38	33	64	60	55	48	42	38	64	61	55	48	43	39
		100	47	0.01	3	57	44	34	-	-	-	56	44	35	-	-	-	57	47	37	28	-	-	58	49	42	32	25	24	58	50	47	35	29	28	59	50	48	37	31	30
	8	550	260	0.06	15	79	76	71	69	66	63	77	74	68	67	64	62	77	74	68	67	64	61	77	74	69	68	64	62	79	77	70	69	65	63	78	77	70	69	65	63
		400	189	0.03	8	74	70	66	64	60	57	69	67	63	59	56	53	69	67	62	59	56	53	70	68	63	59	57	53	71	69	63	59	57	54	71	71	64	60	57	54
		300	142	0.02	5	67	62	59	55	50	46	63	60	55	52	48	44	65	61	56	53	49	45	67	65	58	54	50	46	69	67	60	55	51	48	69	68	61	56	52	49
		200	94	0.01	2	58	52	47	-	-	-	56	49	44	-	-	-	56	50	45	40	-	-	62	58	49	43	37	33	62	58	54	47	41	38	62	60	54	47	42	39
		100	47	0.01	1	57	44	34	-	-	-	54	43	34	-	-	-	55	46	36	28	-	-	56	48	41	31	25	23	56	49	45	34	29	28	57	49	47	36	31	29
2	6	550	260	0.20	50	66	64	61	58	55	52	70	66	62	58	54	51	72	68	62	59	55	52	72	69	62	58	54	50	74	71	63	58	54	51	75	72	63	58	54	52
		400	189	0.11	27	63	60	57	54	50	45	63	60	56	52	48	42	64	61	56	52	48	42	69	65	57	52	48	43	71	68	58	53	48	44	71	69	59	53	48	45
		200	94	0.04	10	57	52	48	44	37	28	58	52	46	42	34	26	62	55	47	42	35	27	63	58	49	43	36	29	63	59	51	44	37	32	63	59	52	45	38	33
	8	850	401	0.11	28	74	72	67	68	64	63	76	74	68	67	64	62	78	76	70	68	65	63	76	74	68	66	63	61	77	75	68	66	63	61	78	76	68	66	63	61
		700	330	0.08	19	70	68	64	63	60	57	73	70	65	63	60	57	76	73	67	65	62	59	73	71	64	62	59	56	75	73	65	62	59	57	76	74	65	62	59	57
		550	260	0.05	12	66	64	61	58	55	52	68	65	60	58	54	51	70	67	61	59	55	52	70	67	61	57	54	50	72	70	61	58	54	51	73	71	62	58	54	52
		400	189	0.02	6	63	60	57	54	50	45	61	58	55	52	47	42	63	60	55	51	47	42	67	63	56	52	47	42	69	66	57	52	48	44	69	67	58	52	48	44
		200	94	0.01	2	57	52	48	44	37	28	56	50	45	41	34	26	59	53	46	41	34	27	60	57	48	42	36	29	61	58	50	43	36	31	60	57	50	44	37	33
3	6	550	260	0.20	50	66	64	63	59	55	51	68	66	64	59	54	49	69	66	65	60	54	50	73	68	65	60	54	50	73	70	65	60	54	51	75	71	65	60	54	51
		400	189	0.11	27	62	56	55	51	45	36	65	59	57	51	45	36	65	60	57	51	46	36	68	63	57	51	46	37	68	64	58	51	46	39	69	65	58	52	46	40
	8	1100	519	0.12	30	73	72	71	69	65	63	73	72	71	68	64	62	73	72	71	69	64	62	75	73	71	69	64	62	76	75	71	69	64	62	76	76	71	68	64	62
		900	425	0.08	20	70	68	67	64	60	58	69	69	68	64	59	56	71	69	68	64	60	57	72	71	68	64	60	57	74	73	68	64	60	57	74	74	68	64	60	57
		700	330	0.05	12	66	64	63	59	55	51	66	65	63	59	54	50	67	65	64	59	55	50	70	67	64	59	55	50	71	70	64	59	55	51	72	70	64	59	55	51
		400	189	0.02	5	62	56	55	51	45	36	64	58	56	51	45	36	64	58	57	51	45	36	66	61	57	51	45	37	67	62	57	51	45	39	67	63	58	52	46	40
	10	1215	573	0.03	7	75	74	73	72	68	66	74	74	72	70	67	65	73	74	72	70	67	65	75	75	73	71	67	65	76	76	73	71	67	65	76	76	73	70	67	65
		1100	519	0.03	7	73	72	71	69	65	63	71	71	70	68	64	62	72	72	70	68	64	62	73	73	70	68	64	62	74	74	70	68	64	62	75	75	71	68	64	62
		900	425	0.02	4	70	68	67	64	60	58	67	67	66	63	59	56	69	68	66	63	60	57	70	69	67	63	60	57	72	71	67	63	60	57	72	73	67	63	60	57
		700	330	0.01	2	66	64	63	59	55	51	64	63	62	58	54	49	65	64	62	58	54	50	68	65	62	58	54	50	69	68	63	59	54	51	70	68	63	58	54	51
		400	189	0.01	1	62	56	55	51	45	36	62	56	55	50	44	35	62	57	55	50	45	36	64	59	55	50	45	37	64	61	56	50	45	38	65	61	56	51	45	39
4	10	1550	731	0.10	25	80	79	74	74	70	69	78	77	74	73	70	68	82	79	75	74	70	69	83	81	76	74	71	70	85	82	76	75	72	71	86	83	77	75	72	71
		1400	661	0.08	19	77	75	71	71	67	66	76	74	71	69	66	65	79	76	73	71	67	66	81	78	73	71	68	67	83	79	74	72	69	67	84	81	75	73	69	68
		1200	566	0.05	13	74	72	69	67	64	62	73	70	69	67	63	61	77	73	70	68	64	63	80	75	71	69	65	63	81	77	72	69	66	64	83	78	73	70	66	65
		900	425	0.03	7	69	67	64	61	57	54	69	67	64	61	56	53	74	69	66	63	58	55	74	70	65	62	58	54	76	71	66	63	58	55	77	72	67	63	59	56
		700	330	0.02	4	65	63	60	57	53	48	66	64	61	57	53	48	71	66	62	59	55	51	69	65	61	57	53	48	71	67	62	58	53	49	72	68	62	58	54	50
	12	1550	731	0.05	12	80	79	74	74	70	69	78	76	73	73	70	68	81	78	74	74	70	69	83	80	75	74	71	70	84	81	76	75	72	71	85	82	76	75	72	71
		1400	661	0.03	8	77	75	71	71	67	66	75	73	71	69	66	65	78	75	72	71	67	66	80	77	73	71	68	67	82	78	73	72	69	67	83	80	74	73	69	68
		1200	566	0.02	5	74	72	69	67	64	62	72	70	68	66	63	61	76	73	69	67	64	63	78	75	70	68	65	63	79	76	71	69	66	64	81	78	72	70	66	65
		900	425	0.01	3	69	67	64	61	57	54	67	65	63	61	56	53	72	68	65	62	58	55	72	68	64	61	58	54	73	70	65	62	58	55	75	71	65	63	59	56
		700	330	0.01	2	65	63	60	57	53	48	64	63	60	57	52	47	69	64	61	58	54	51	67	64	60	57	52	48	69	65	61	57	53	49	70	66	61	58	53	49
5	12	2050	967	0.06	15	82	79	74	75	72	71	82	78	74	73	71	70	82	79	75	74	71	71	84	81	76	75	73	72	86	82	77	76	73	72	86	82	78	76	73	73
		1850	873	0.05	12	79	76	72	72	69	68	79	75	72	70	67	66	80	76	73	71	69	68	82	78	74	72	70	69	83	79	75	73	70	69	84	80	75	73	70	70
		1600	755	0.04	10	77	73	69	68	65	64	76	72	69	68	64	63	79	74	71	69	66	65	80	75	71	70	67	66	82	77	72	71	67	66	82	78	72	71	67	66
		1350	637	0.03	7	74	69	66	65	62	60	73	68	65	64	60	59	76	71	67	66	62	61	78	72	68	66	63	62	79	74	69	67	64	62	80	75	69	67	64	63
		1100	519	0.02	5	70	65	62	61	57	54	71	66	63	60	56	54	74	68	64	62	58	56	76	70	65	63	59	57	77	71	66	63	60	58	77	71	65	62	59	56
	14	2050	967	0.04	10	82	79	74	75	72	71	81	77	73	73	71	70	81	78	74	74	71	71	83	80	75	75	73	72	85	81	76	76	73	72	85	81	77	76	73	73
		1850	873	0.03	8	79	76	72	72	69	68	78	74	71	70	67	66	79	76	72	71	69	68	81	77	73	72	70	69	82	78	74	73	70	69	83	79	74	73	70	70
		1600	755	0.03	7	77	73	69	68	65	64	75	71	68	67	64	63	77	73	70	68	66	65	79	75	71	69	67	66	80	76	71	70	67	66	80	77	72	70	67	66
		1350	637	0.02	5	74	69	66	65	62	60	72	68	65	63	60	59	74	70	67	65	62	61	76	71	68	66	63	62	78	73	68	66	64	62	78	74	69	67	64	63
		1100	519	0.01	3	70	65	62	61	57	54	69	64	61	60	56	54	71	67	63	61	58	56	73	68	64	62	59	57	75	69	64	63	60	58	74	69	64	62	59	56
6	14	2400	1133	0.08	20	81	80	78	80	77	76	80	78	77	78	76	75	80	79	78	79	76	75	82	81	79	80	78	77	83	82	80	80	78	77	84	82	80	81	78	77
		2100	991	0.06	15	77	77	75	77	74	73	76	76	74	76	72	71	77	77	75	76	74	73	79	79	76	78	75	74	80	79	77	78	75	74	81	80	77	78	75	75
		1700	802	0.04	10	73	72	71	72	68	67	70	70	70	70	67	66	73	73	72	72	69	68	74	74	73	72	70	69	76	76	74	73	70	69	77	76	74	73	71	70
		1400	661	0.03	6	68	67	68	67	63	62	68	66	67	66	62	61	70	68	69	67	65	63	72	70	70	68	65	64	73	71	70	69	66	65	73	71	70	68	65	63
7	16	4000	1888	0.15	38	83	80	77	78	75	74	80	78	76	75	73	72	81	79	76	75	73	72	83	81	77	77	74	73	85	82	78	78	75	74	86	83	79	78	76	75
		3500	1652	0.12	29	80	77	74	74	71	70	78	75	73	72	70	69	79	76	73	72	70	69	81	78	75	74	72	70	83	80	76	75	73	72	84	81	76	76	73	72
		2800	1321	0.08	19	76	72	70	69	66	64	74	71	69	68	65	63	76	73	70	69	66	64	79	75	71	70	68	66	80	77	72	71	69	67	80	75	71	70	67	65
		2100	991	0.04	11	71	67	65	64	61	57	70	66	64	62	59	56	73	68	66	64	61	58	75	70	67	66	62	60	75	70	66	64	61	58	76	71	65	64	61	58
		1600	755	0.03	6	68	64	62	60	56	51	67	62	61	59	54	49	70	65	62	60	56	51	71	66	62	61	57	53	72	66	62	60	56	52	73	68	63	60	57	53
	18	4000	1888	0.10	25	83	80	77	78	75	74	79	78	75	75	73	72	81	78	75	75	73	72	82	80	76	77	74	73	84	81	78	78	75	74	85	82	78	78	76	75
		3500	1652	0.07	18	80	77	74	74	71	70	77	75	72	72	70	69	78	75	73	72	70	69	81	78	74	74	72	70	83	79	75	75	73	72	83	80	76	76	73	72
		2800	1321	0.05	11	76	72	70	69	66	64	73	70	68	67	65	63	75	72	69	68	66	64	77	74	71	70	68	66	79	76	72	71	69	67	79	75	70	69	67	65
		2100	991	0.02	5	71	67	65	64	61	57	68	64	63	62	59	56	71	67	64	64	61	58	73	69	65	65	62	60	73	69	64	64	61	58	74	69	64	63	61	58
		1600	755	0.02	4	68	64	62	60	56	51	65	60	60	58	54	49	68	63	60	59	55	50	69	64	61	60	56	52	70	64	61	59	55	52	71	66	61	60	56	53

For performance table notes, see page C61; highlighted numbers indicate embedded AHRI certification points.

Performance Data • Radiated Sound Power Levels

Model Series 35S • Series Flow • Basic Unit

Fiberglass Liner

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

Unit Size	Inlet Size	Airflow		Min. inlet ΔPs		Fan Only						Fan and 100% Primary Air–Sound Power Octave Bands @ Inlet pressure (ΔPs) shown																							
												Minimum ΔPs						0.5" w.g. (125Pa) ΔPs						1.0" w.g. (249Pa)ΔPs						1.5" w.g. (375Pa) ΔPs						2.0" w.g. (500Pa) ΔPs					
		cfm	l/s	"w.g.	l/s	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
1	6	550	260	0.22	54	68	65	60	54	49	45	67	65	59	54	49	46	68	64	59	53	53	52	69	65	60	56	56	57	69	66	62	58	58	61	70	66	62	59	59	63
		400	189	0.12	30	**64**	**60**	**55**	**48**	**44**	**40**	64	60	55	48	43	39	65	60	55	50	50	49	66	61	56	52	54	54	**67**	**62**	**57**	**54**	**57**	**58**	67	62	57	55	58	60
		300	142	0.07	17	61	56	51	44	40	36	61	55	51	44	40	36	61	56	52	47	48	47	62	58	53	49	52	51	63	59	54	51	55	54	63	60	54	52	56	55
		200	94	0.04	9	51	47	43	35	31	25	51	47	43	34	30	25	54	49	45	41	43	40	55	51	48	44	47	44	56	53	50	47	50	47	56	54	51	48	51	48
		100	47	0.01	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	34	31	-	-	-	38	37	35	-	-	45	42	39	38	-	-	47	44	40	39
	8	550	260	0.06	15	68	65	60	54	49	45	67	65	59	53	49	46	68	64	59	52	52	51	69	65	60	55	55	56	69	66	62	57	57	60	70	66	62	58	58	62
		400	189	0.03	8	64	60	55	48	44	40	64	60	54	48	43	38	65	60	54	50	50	48	66	61	55	51	53	52	67	62	56	53	56	57	67	62	57	54	58	59
		300	142	0.02	5	61	56	51	44	40	36	61	55	50	43	39	35	61	56	51	46	47	46	62	58	52	48	50	49	63	59	53	50	54	52	63	60	54	51	55	54
		200	94	0.01	2	51	47	43	35	31	25	51	46	43	33	29	24	54	49	45	40	42	39	55	51	47	43	45	42	55	53	49	46	49	46	56	54	50	47	50	47
		100	47	0.01	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	33	30	-	-	-	37	35	33	-	-	44	41	38	37	-	-	46	42	39	38
2	6	550	260	0.20	50	60	55	50	45	39	34	59	54	49	43	38	33	60	54	51	47	49	51	62	58	54	51	54	56	64	61	57	55	58	61	65	62	58	57	60	63
		400	189	0.11	27	55	49	45	39	32	26	53	48	44	37	31	25	57	51	47	44	48	48	59	55	50	48	53	53	62	59	54	53	58	58	63	60	55	54	60	60
		200	94	0.04	10	52	46	41	34	25	18	51	46	41	34	25	-	54	49	44	43	44	42	56	51	48	46	48	46	57	53	51	49	52	50	58	54	53	51	53	52
	8	850	401	0.11	28	68	64	58	54	49	45	67	62	57	52	48	44	68	63	57	53	53	53	68	64	59	56	55	57	69	65	60	58	58	61	69	65	61	59	58	63
		700	330	0.08	19	**62**	**58**	**53**	**51**	**44**	**40**	65	60	54	49	44	39	66	60	54	50	51	51	67	62	56	53	54	56	**68**	**63**	**58**	**56**	**57**	**61**	69	64	59	57	58	62
		550	260	0.05	12	60	55	50	45	39	34	59	54	49	42	37	32	60	54	50	46	48	49	62	58	53	50	53	54	64	61	56	54	57	60	65	62	57	56	59	62
		400	189	0.02	6	55	49	45	39	32	26	53	48	43	36	30	24	56	50	46	43	46	46	59	54	50	47	51	51	61	58	53	52	56	57	62	60	55	53	58	59
		200	94	0.01	2	52	46	41	34	25	18	51	45	41	33	25	-	54	48	43	41	43	40	55	51	47	45	47	44	57	53	50	48	50	48	57	54	52	49	52	50
3	6	550	260	0.20	50	59	55	52	48	43	38	57	54	53	49	44	39	59	56	54	53	52	52	61	59	57	56	57	58	64	62	59	59	61	64	64	62	59	59	61	64
		400	189	0.11	27	55	50	47	42	36	28	57	51	48	43	37	28	57	52	49	47	50	48	59	55	51	51	55	53	61	58	54	54	59	58	61	58	54	54	59	58
	8	1100	519	0.12	30	65	62	59	56	52	48	64	60	59	56	52	48	65	62	59	57	55	55	66	63	61	60	58	59	68	65	63	63	61	63	68	65	63	63	61	63
		900	425	0.08	20	62	58	55	52	48	43	60	57	56	53	48	44	62	59	57	55	53	53	64	61	59	58	57	58	65	64	61	61	60	63	65	64	61	61	60	63
		700	330	0.05	12	59	55	52	48	43	38	58	54	53	48	43	38	60	56	54	52	51	51	62	60	56	55	56	56	64	63	58	58	61	62	64	63	58	58	61	62
		400	189	0.02	5	55	50	47	42	36	28	56	50	48	42	36	28	57	52	49	47	49	47	58	55	51	50	53	52	60	57	54	54	57	56	60	57	54	54	57	56
	10	1215	573	0.03	7	67	63	60	58	54	50	66	62	59	57	53	49	67	63	60	58	56	55	68	65	62	61	59	59	69	66	63	63	61	62	69	66	63	63	61	62
		1100	519	0.03	7	**65**	**62**	**59**	**56**	**52**	**48**	64	60	58	56	51	47	65	62	59	57	55	54	66	63	61	59	58	58	**68**	**65**	**62**	**62**	**61**	**62**	68	65	62	62	61	62
		900	425	0.02	4	62	58	55	52	48	43	60	57	55	52	47	42	62	59	56	54	52	51	64	61	58	57	56	56	65	64	60	59	59	61	65	64	60	59	59	61
		700	330	0.01	2	59	55	52	48	43	38	57	54	52	47	42	37	59	56	53	51	50	49	61	59	56	54	54	55	64	62	58	57	59	60	64	62	58	57	59	60
		400	189	0.01	1	55	50	47	42	36	28	56	50	47	41	35	27	56	51	48	46	47	45	58	54	50	49	51	50	59	57	53	52	55	54	59	57	53	52	55	54
4	10	1550	731	0.10	25	68	64	58	57	55	53	68	64	58	57	54	53	70	66	61	59	58	56	72	68	64	63	60	60	73	70	66	66	63	63	74	70	67	67	64	65
		1400	661	0.08	19	67	62	57	56	53	51	66	62	57	55	52	51	69	64	59	57	56	54	70	66	62	61	59	58	72	68	65	65	62	63	73	69	66	67	64	64
		1200	566	0.05	13	65	60	55	53	50	48	63	59	55	52	49	48	67	61	57	55	53	53	68	64	61	59	57	57	70	66	64	64	61	62	71	67	65	66	63	64
		900	425	0.03	7	61	56	51	49	45	42	60	56	51	48	44	42	63	58	55	53	51	50	64	60	57	57	55	55	65	62	60	61	60	61	65	63	61	62	61	63
		700	330	0.02	4	59	53	48	45	41	36	57	52	48	44	39	34	61	55	52	51	49	47	62	57	55	54	54	52	63	59	58	58	58	58	63	60	59	59	60	60
	12	1550	731	0.05	12	**68**	**64**	**58**	**57**	**55**	**53**	68	64	58	57	54	52	70	66	61	59	57	56	72	68	64	62	59	59	**73**	**70**	**66**	**65**	**62**	**63**	74	70	67	67	63	64
		1400	661	0.03	8	67	62	57	56	53	51	66	62	57	55	52	50	69	64	59	57	55	54	70	66	62	61	58	58	72	68	65	65	62	62	73	69	66	66	63	64
		1200	566	0.02	5	65	60	55	53	50	48	63	59	55	52	49	47	67	61	57	54	53	52	68	64	60	59	57	56	70	66	63	63	61	61	71	67	64	65	62	63
		900	425	0.01	3	61	56	51	49	45	42	60	56	51	47	43	40	63	58	54	52	50	48	64	60	57	56	54	53	65	62	59	60	59	59	65	63	61	61	60	61
		700	330	0.01	2	59	53	48	45	41	36	56	51	47	43	38	33	61	55	52	50	48	46	61	57	54	53	52	51	62	59	57	56	57	56	62	60	58	58	59	58
5	12	2050	967	0.06	15	74	69	62	60	57	54	70	67	62	60	56	54	71	68	62	61	58	56	72	69	64	62	60	60	73	70	65	63	62	64	73	71	65	63	63	65
		1850	873	0.05	12	71	67	60	58	55	52	68	65	60	57	53	51	68	66	60	58	56	54	70	67	62	59	59	59	71	68	63	61	61	63	71	69	64	62	62	65
		1600	755	0.04	10	68	63	57	54	51	47	68	63	58	54	51	48	68	64	59	55	54	53	69	65	61	57	58	58	70	67	62	60	61	63	70	67	63	61	62	65
		1350	637	0.03	7	65	59	54	51	47	43	64	59	55	50	46	43	65	60	56	52	52	51	67	63	58	55	56	56	68	65	61	58	60	62	68	66	62	59	62	64
		1100	519	0.02	5	62	57	50	47	42	38	61	56	51	46	42	38	63	58	52	50	50	49	64	60	55	53	55	55	65	62	58	57	60	61	65	63	59	58	62	63
	14	2050	967	0.04	10	**74**	**69**	**62**	**60**	**57**	**54**	70	67	62	59	56	53	71	68	62	60	58	56	72	69	64	61	60	60	**73**	**70**	**65**	**62**	**62**	**63**	73	71	65	63	63	65
		1850	873	0.03	8	71	67	60	58	55	52	68	65	60	56	53	50	68	66	60	57	56	54	70	67	62	59	58	58	71	68	63	61	61	62	71	69	64	61	62	64
		1600	755	0.03	7	68	63	57	54	51	47	68	63	58	53	50	47	68	64	58	55	54	52	69	65	60	57	57	57	70	67	62	59	60	61	70	67	62	60	61	63
		1350	637	0.02	5	65	59	54	51	47	43	64	59	54	49	46	42	65	60	55	52	52	50	67	63	58	55	55	55	68	65	60	58	59	60	68	66	61	59	61	62
		1100	519	0.01	3	62	57	50	47	42	38	61	56	50	46	41	37	63	58	52	49	50	48	64	60	55	52	54	53	65	62	58	56	59	59	65	63	59	57	60	61
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		2100	991	0.06	15	**72**	**69**	**62**	**60**	**59**	**57**	69	66	60	59	55	52	72	67	61	61	57	54	74	70	63	62	60	59	**77**	**72**	**65**	**63**	**63**	**64**	77	72	65	63	63	64
		1700	802	0.04	10	69	65	59	57	55	53	66	62	56	55	50	47	68	63	57	57	52	49	71	66	60	59	57	56	73	69	63	61	61	63	73	69	63	61	61	63
		1400	661	0.03	6	66	62	55	54	52	50	63	58	53	51	46	42	64	59	54	53	48	43	67	63	57	56	54	52	70	66	60	58	60	61	70	66	60	58	60	61
7	16	4000	1888	0.15	38	77	74	68	62	58	58	74	72	66	60	56	56	74	72	67	62	58	57	75	73	69	63	60	60	76	74	70	65	62	63	76	74	71	65	62	64
		3500	1652	0.12	29	74	71	65	59	55	55	71	69	64	58	53	52	72	70	65	59	56	55	73	71	67	61	58	58	74	72	69	63	60	61	74	72	69	64	61	62
		2800	1321	0.08	19	**70**	**67**	**61**	**55**	**50**	**49**	67	65	60	53	48	47	68	66	61	55	52	51	70	68	64	58	55	55	**71**	**69**	**66**	**61**	**58**	**59**	72	70	67	62	59	61
		2100	991	0.04	11	66	63	57	50	45	43	63	62	55	48	43	41	64	62	57	51	49	47	66	64	60	55	53	52	68	67	63	58	56	57	69	68	65	59	58	59
		1600	755	0.03	6	62	60	54	47	41	39	59	58	52	44	38	34	62	60	54	48	47	44	64	62	58	52	51	50	66	64	61	56	55	56	67	65	63	57	57	58
	18	4000	1888	0.10	25	77	74	68	62	58	58	74	72	66	60	56	55	74	72	67	61	57	57	75	73	69	63	59	59	76	74	70	64	61	62	76	74	71	65	62	63
		3500	1652	0.07	18	74	71	65	59	55	55	71	69	64	57	53	52	72	70	65	58	55	54	73	71	67	60	57	57	74	72	69	62	59	61	74	72	69	63	60	62
		2800	1321	0.05	11	70	67	61	55	50	49	67	65	59	52	48	46	68	66	61	54	52	50	70	68	63	57	55	54	71	69	65	60	58	58	72	70	66	61	59	60
		2100	991	0.02	5	66	63	57	50	45	43	63	62	55	47	42	40	64	62	56	50	48	45	66	64	59	53	52	50	68	67	63	57	55	55	69	68	64	58	57	57
		1600	755	0.02	4	62	60	54	47	41	39	59	58	51	43	37	33	61	59	54	47	45	43	63	61	57	51	50	48	65	64	61	55	54	54	66	65	62	56	55	57

For performance table notes, see page C61; highlighted **numbers** indicate embedded AHRI certification points.

Performance Data • AHRI Certification and Performance Notes

Model Series 35S • Series Flow • Basic Unit • AHRI Certification Rating Points

Fiberglass Liner

Unit Size	Inlet Size	Fan Airflow		Fan$^{\Sigma}$ Watts	Fan Only* @ .25" w.g. (62 Pa) ΔPs												Primary Airflow		Min. Inlet ΔPs		Fan + 100% Primary @ 1.5" w.g. (375 Pa) ΔPs w/ .25" w.g. (62 Pa) Discharge ΔPs					
					Discharge						Radiated										Radiated					
		cfm	l/s		2	3	4	5	6	7	2	3	4	5	6	7	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7
1	6	400	189	105	74	70	66	64	60	57	64	60	55	48	44	40	400	189	0.12	30	67	62	57	54	57	58
2	8	700	330	155	70	68	64	63	60	57	62	58	53	51	44	40	700	330	0.08	19	68	63	58	56	57	61
3	10	1100	519	270	73	72	71	69	65	63	65	62	59	56	52	48	1100	519	0.03	7	68	65	62	62	61	62
4	12	1550	731	430	80	79	74	74	70	69	68	64	58	57	55	53	1550	731	0.05	12	73	70	66	65	62	63
5	14	2050	967	800	82	79	74	75	72	71	74	69	62	60	57	54	2050	967	0.04	10	73	70	65	62	62	63
6	14	2100	991	790	77	77	75	77	74	73	72	69	62	60	59	57	2100	991	0.06	15	77	72	65	63	63	64
7	16	2800	1321	760	76	72	70	69	66	64	70	67	61	55	50	49	2800	1321	0.08	19	71	69	66	61	58	59

$^{\Sigma}$ Motor = ECM.

* Primary air valve is closed and therefore primary cfm is zero.

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

Ratings are certified in accordance with AHRI Standards.

Performance Notes for Sound Power Levels:

1. Discharge (external) static pressure is 0.25" w.g. (63 Pa) in all cases, which is the difference (ΔPs) in static pressure from terminal discharge to the room.

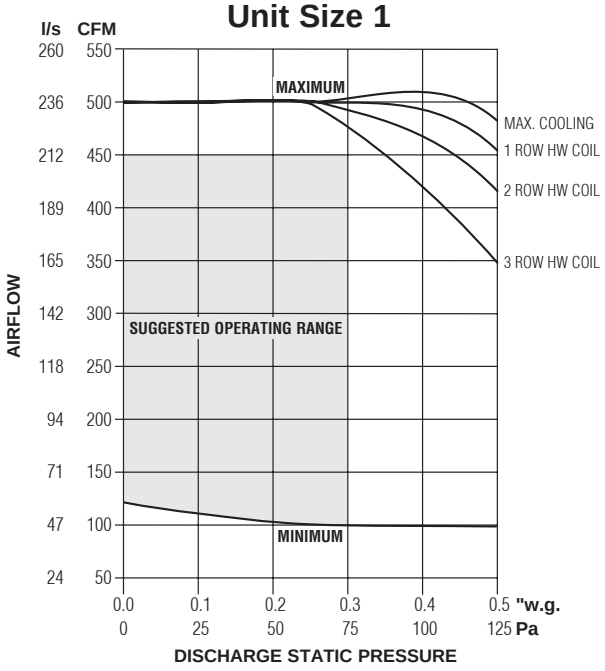
   Discharge Sound Power Levels (SWL) now include duct end reflection energy as part of the standard rating. Including the duct end correction provides sound power levels that would normally be transmitted into an acoustically, non-reflective duct. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI certified data. For more information on duct end reflection calculations see AHRI Standard 880.
2. Radiated sound power is the breakout noise transmitted through the unit casing walls.
3. Sound power levels are in decibels, dB re 10^{-12} watts.
4. All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation. Dash (-) in space indicates sound power level is less than 20 dB or equal to background.
5. Min. inlet ΔPs is the minimum operating pressure of the primary air valve section.
6. Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.
7. Data derived from independent tests conducted in accordance with ANSI / ASHRAE Standard 130 and AHRI Standard 880.

Performance Data

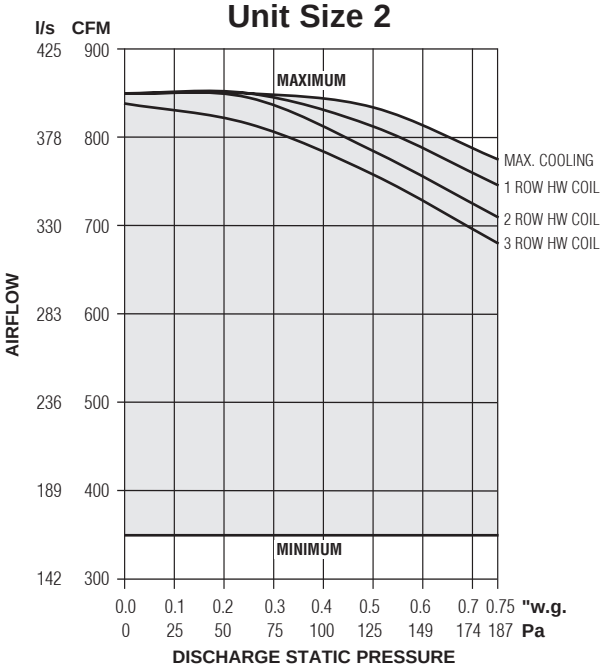
ECM Motor Fan Curves – Airflow vs. Downstream Static Pressure

35SST Stealth™ Series • Series Flow

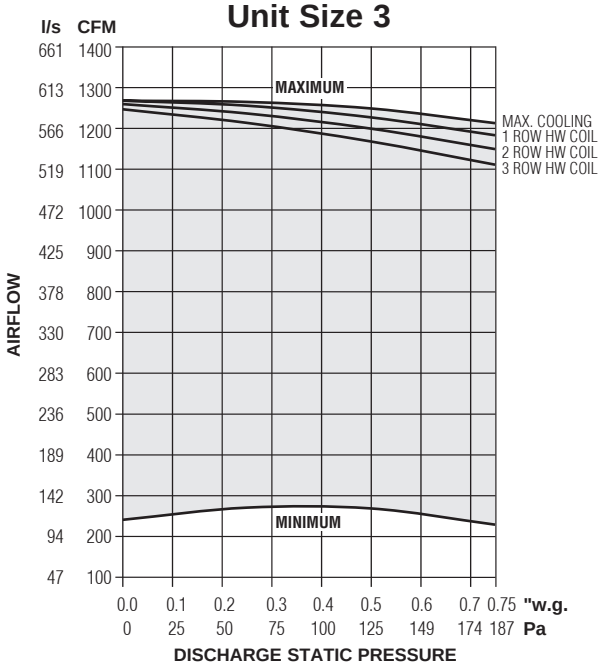
Unit Size 1



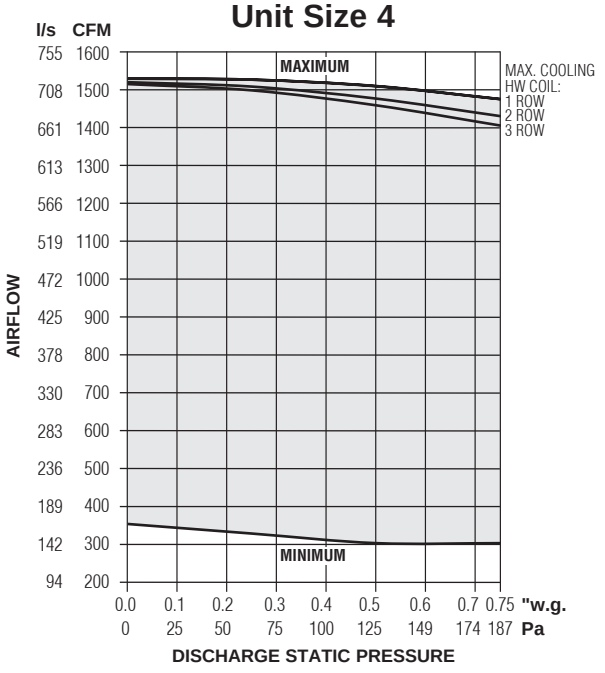
Unit Size 2



Unit Size 3



Unit Size 4



Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
1	*	2.1	1.4	1.30	1.2
2	*	4.0	2.7	2.6	2.6
3	*	5.0	3.4	3.3	3.3
4	*	6.9	4.6	4.5	4.2

* The EPIC ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption.

FLA = Full load amperage.

All motors are single phase/60 Hz.

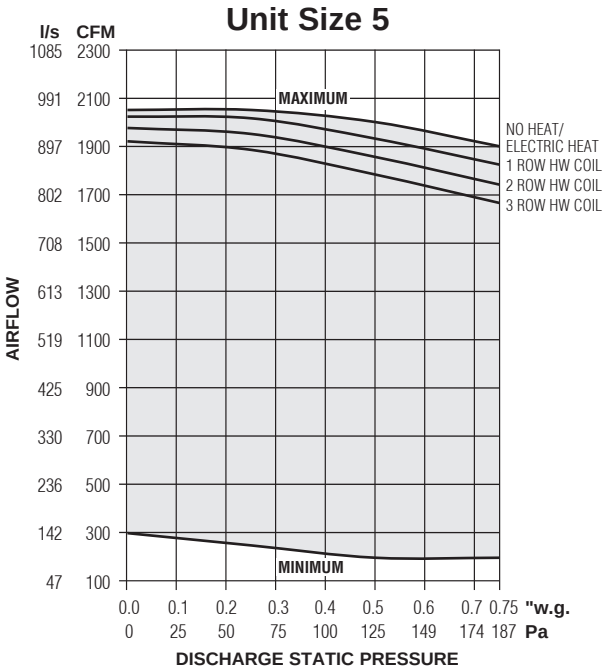
NOTES:

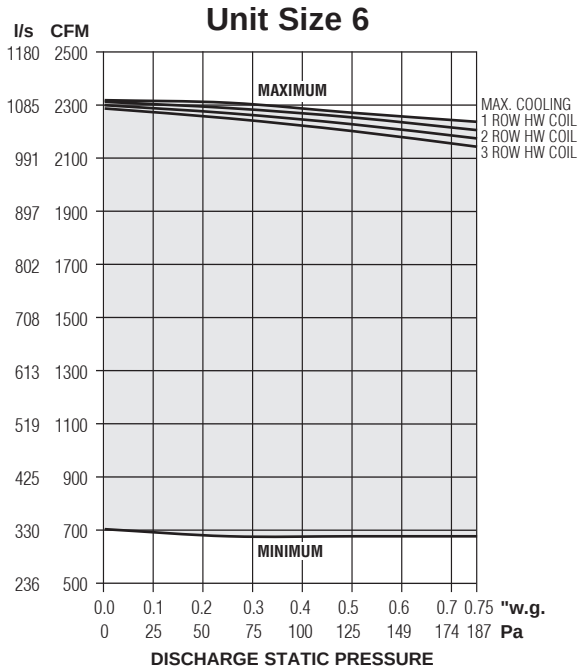
- The ECM is pressure independent and constant volume in operation at factory or field set point within the shaded area. Airflow does not vary with changing static pressure conditions. The motor compensates for any changes in external static pressure or induced air conditions such as filter loading.
- Airflow can be set to operate on horizontal performance line at any point within shaded area using the solid state volume controller provided.
- Fan curves shown are applicable to 120, 208, 240 and 277 volt, single phase ECM's. ECM's, although DC in operation, include a built-in AC/DC converter.

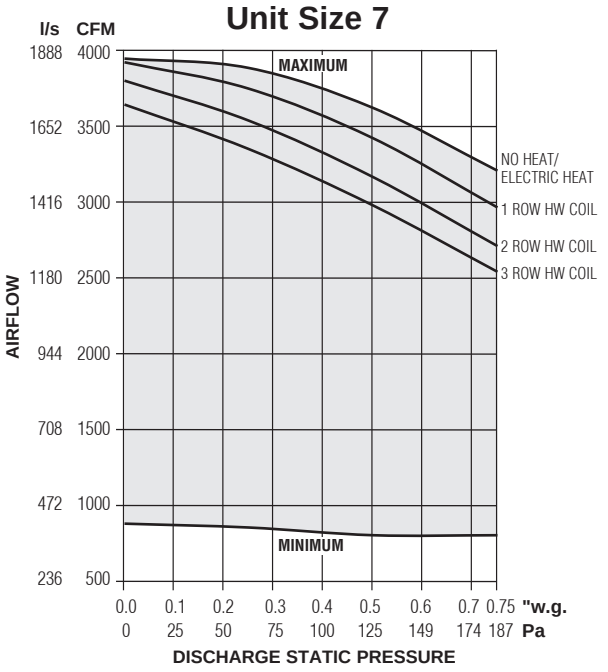
Performance Data

ECM Motor Fan Curves – Airflow vs. Downstream Static Pressure

35SST Stealth™ Series • Series Flow







Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
5	*	9.0	6.1	5.8	5.6
6	*	11.9	7.3	7.3	7.2
7	*	15.9	10.5	9.9	10.0

* The EPIC ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption.

FLA = Full load amperage.

All motors are single phase/60 Hz.

NOTES:

- The ECM is pressure independent and constant variable volume in operation at factory or field set point within the shaded area. Airflow does not vary with changing static pressure conditions. The motor compensates for any changes in external static pressure or induced air conditions such as filter loading.
- Airflow can be set to operate on horizontal performance line at any point within shaded area using the solid state volume controller provided.
- Fan curves shown are applicable to 120, 208, 240 and 277 volt, single phase ECM's. ECM's, although DC in operation, include a built-in AC/DC converter.

Performance Data • NC Level Application Guide

Model Series 35SST Stealth™ • Series Flow

Fiberglass Liner

Unit Size	Inlet Size	Airflow		Min. inlet ΔPs		NC Levels @ Inlet Pressure (ΔPs) shown											
						DISCHARGE						RADIATED					
		cfm	l/s	"w.g.	Pa	Fan Only	Min. ΔPs	0.5 w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)	Fan Only	Min. ΔPs	0.5" w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)
1	6	550	260	0.22	54	36	36	34	35	36	36	36	35	35	36	38	38
		400	189	0.12	30	28	26	26	28	29	29	29	29	30	31	33	34
		300	142	0.07	17	-	-	20	20	21	23	24	25	25	28	29	30
		200	94	0.04	9	-	-	-	-	-	-	-	-	-	-	21	23
		100	47	0.01	3	-	-	-	-	-	-	-	-	-	-	-	-
	8	550	260	0.06	15	36	35	33	34	35	35	36	35	35	36	38	38
		400	189	0.03	8	28	25	25	26	28	29	29	29	30	31	33	34
		300	142	0.02	5	-	-	-	-	20	21	24	25	25	28	29	30
		200	94	0.01	2	-	-	-	-	-	-	-	-	-	-	21	23
		100	47	0.01	1	-	-	-	-	-	-	-	-	-	-	-	-
2	6	550	260	0.20	50	21	24	25	28	30	31	21	23	25	29	33	34
		400	189	0.11	27	-	-	-	23	25	26	-	-	-	24	30	33
		200	94	0.04	10	-	-	-	20	-	20	-	-	-	-	23	24
	8	850	401	0.11	28	31	34	34	34	35	36	30	34	34	35	36	37
		700	330	0.08	19	26	29	30	30	33	34	26	29	31	33	34	35
		550	260	0.05	12	21	21	24	25	29	30	21	23	25	29	33	34
		400	189	0.02	6	-	-	-	20	23	24	-	-	-	24	29	31
		200	94	0.00	1	-	-	-	-	-	-	-	-	-	-	21	24
3	6	550	260	0.20	50	23	25	25	29	30	30	21	20	23	28	33	33
		400	189	0.11	27	-	-	-	20	23	23	-	-	-	23	26	26
	8	1100	519	0.12	30	33	31	31	33	34	35	31	29	30	33	35	35
		900	425	0.08	20	28	26	28	29	31	33	26	24	26	30	34	34
		700	330	0.05	12	23	24	24	26	29	30	21	20	23	28	33	33
		400	189	0.02	5	-	-	-	-	20	20	-	-	-	21	26	26
	10	1215	573	0.03	7	35	34	34	35	35	36	33	31	33	34	36	36
		1100	519	0.03	7	33	31	31	31	34	35	31	29	30	33	35	35
		900	425	0.02	4	28	25	25	28	30	31	26	24	26	30	34	34
		700	330	0.01	3	23	21	23	24	26	28	21	20	23	28	33	33
		400	189	0.01	1	-	-	-	-	-	-	-	-	-	21	25	25
4	10	1550	731	0.10	25	39	37	40	40	43	44	34	33	35	37	39	40
		1400	661	0.08	19	35	34	37	39	40	40	31	30	33	35	38	38
		1200	566	0.05	13	30	30	33	39	37	38	28	26	30	33	36	37
		900	425	0.03	7	25	25	28	31	30	31	21	21	25	28	31	31
		700	330	0.02	4	21	23	25	26	26	26	-	-	23	25	28	29
	12	1550	731	0.05	12	39	36	39	40	41	43	34	33	35	37	39	40
		1400	661	0.03	8	35	33	36	38	39	40	31	30	33	35	38	38
		1200	566	0.02	5	30	29	33	37	37	37	28	26	30	33	36	37
		900	425	0.01	3	25	23	26	30	29	29	21	21	25	28	31	31
		700	330	0.01	2	21	20	24	25	24	24	-	-	23	24	28	29
5	12	2050	967	0.06	15	39	39	40	41	43	44	37	36	36	37	39	39
		1850	873	0.05	12	36	36	37	39	40	40	34	33	34	36	37	38
		1600	755	0.04	10	33	33	35	37	37	38	30	31	33	34	36	37
		1350	637	0.03	7	29	28	31	33	34	35	28	28	29	31	34	35
		1100	519	0.02	5	25	25	28	29	31	30	24	24	26	29	31	33
	14	2050	967	0.04	10	39	39	39	41	43	43	37	36	36	37	39	39
		1850	873	0.03	8	36	35	37	38	39	40	34	33	34	36	37	38
		1600	755	0.03	7	33	31	34	36	37	38	30	31	33	34	36	37
		1350	637	0.02	5	29	28	30	33	34	35	28	28	29	31	34	35
		1100	519	0.01	3	25	23	25	28	29	29	24	24	26	29	31	33
6	14	2400	1133	0.08	20	40	40	40	43	44	45	38	36	37	39	41	41
		2100	991	0.06	15	37	36	38	39	40	41	36	33	35	37	40	40
		2000	944	0.05	13	36	35	37	38	39	40	36	31	35	37	39	39
		1700	802	0.04	10	33	30	34	35	36	37	33	28	30	34	37	37
		1400	661	0.03	6	26	24	27	29	30	30	28	24	26	30	35	35
7	14	3370	1590	0.20	50	39	37	38	40	41	43	40	36	38	39	40	41
		2800	1321	0.15	37	34	31	34	36	37	36	36	33	33	35	38	39
		2100	991	0.10	25	26	24	28	28	30	30	30	29	29	31	34	36
		1600	755	0.07	17	21	21	23	24	26	28	28	25	26	29	33	34
		1100	519	0.05	12	-	-	-	20	23	25	25	24	24	26	29	31
	16	4000	1888	0.15	38	43	39	40	41	44	45	44	39	40	41	43	44
		3500	1652	0.12	29	39	36	37	39	40	41	40	36	38	39	40	41
		2800	1321	0.08	19	34	30	33	35	37	36	36	33	33	35	38	39
		2100	991	0.04	11	26	24	26	28	29	30	30	29	29	31	34	35
		1600	755	0.03	6	21	-	21	21	24	26	28	25	26	29	32	34

Performance Notes: 1. NC Levels are calculated based on procedures as outlined on page C160
2. Dash (-) in space indicates a NC less than 20.

Performance Data • Discharge Sound Power Levels

Model Series 35SST Stealth™ • Series Flow

Fiberglass Liner

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

Unit Size	Inlet Size	Airflow		Min. inlet ΔPs		Fan Only						Fan and 100% Primary Air–Sound Power Octave Bands @ Inlet pressure (ΔPs) shown																							
												Minimum ΔPs						0.5" w.g. (125Pa) ΔPs						1.0" w.g. (249Pa)ΔPs						1.5" w.g. (375Pa) ΔPs						2.0" w.g. (500Pa) ΔPs					
		cfm	l/s	"w.g.	l/s	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
1	6	550	260	0.22	54	78	75	69	67	64	61	78	75	68	66	63	60	76	73	67	65	62	59	77	74	67	66	62	59	78	75	68	66	62	60	78	75	68	66	62	60
		400	189	0.12	30	71	68	64	60	57	54	71	67	63	60	56	53	71	67	62	59	55	52	71	68	63	59	55	52	72	69	63	59	55	52	73	69	64	60	56	53
		300	142	0.07	17	66	61	59	53	49	45	66	60	57	53	49	45	67	61	57	53	48	44	67	62	58	53	49	45	68	63	59	54	49	45	68	64	60	54	50	46
		200	94	0.04	9	62	53	52	45	39	32	60	52	49	43	38	31	60	54	51	44	38	32	62	56	53	46	40	34	63	58	54	47	41	36	62	58	55	48	42	38
		100	47	0.01	3	59	49	43	37	30	22	58	48	41	35	28	21	58	49	43	36	30	22	59	50	45	38	32	26	60	51	49	40	33	28	58	50	47	40	34	30
	8	550	260	0.06	15	78	75	69	67	64	61	77	74	67	66	63	60	75	72	66	65	62	59	76	73	66	66	62	59	77	74	67	66	62	60	77	74	67	66	62	60
		400	189	0.03	8	71	68	64	60	57	54	70	66	62	59	56	53	70	66	62	58	55	52	70	67	63	59	55	52	70	68	63	59	55	52	71	68	64	59	56	53
		300	142	0.02	5	66	61	59	53	49	45	64	59	56	52	49	45	65	60	56	52	48	44	65	61	57	52	49	45	66	62	57	53	49	45	66	63	59	54	50	46
		200	94	0.01	2	62	53	52	45	39	32	59	51	48	43	38	31	59	52	50	44	38	32	60	54	52	45	40	34	61	56	53	46	41	36	60	57	54	47	42	37
		100	47	0.01	1	59	49	43	37	30	22	55	46	39	35	28	21	55	47	42	36	29	22	56	49	44	38	31	25	57	50	47	39	33	28	56	49	46	39	34	30
2	6	550	260	0.20	50	66	63	59	57	54	51	66	65	61	57	53	49	69	66	62	57	53	50	72	68	62	57	53	50	75	70	62	58	54	51	76	71	63	58	54	51
		400	189	0.11	27	62	59	56	53	49	44	63	61	56	52	48	43	65	61	57	52	48	42	69	64	57	52	48	43	71	66	58	53	48	44	71	67	59	53	49	45
		200	94	0.04	10	58	52	49	44	38	28	59	53	48	44	36	27	62	54	49	44	37	28	64	57	51	45	38	30	63	58	53	46	38	32	64	58	53	46	39	33
	8	850	401	0.11	28	73	72	67	68	64	62	76	74	68	67	64	62	76	74	68	66	63	61	76	74	68	66	63	61	77	75	68	66	63	61	78	76	68	66	63	61
		700	330	0.08	19	69	67	63	62	59	57	70	69	64	62	59	56	72	70	64	61	59	56	73	70	64	61	58	56	75	72	65	62	59	57	76	73	65	62	59	57
		550	260	0.05	12	66	63	59	57	54	51	65	63	59	56	53	49	67	65	60	57	53	50	70	66	61	57	53	50	73	69	61	58	54	51	73	70	62	58	54	51
		400	189	0.02	6	62	59	56	53	49	44	62	59	55	52	47	42	63	59	55	51	47	42	67	62	56	52	47	43	69	64	57	52	48	44	69	65	58	53	48	44
		200	94	0.00	1	58	52	49	44	38	28	57	51	47	43	36	27	59	53	48	43	37	28	61	55	50	44	37	30	61	56	51	45	38	32	61	56	52	45	38	33
3	6	550	260	0.20	50	65	64	63	59	55	51	68	66	64	59	54	49	69	66	65	59	54	50	74	67	65	59	54	50	75	70	65	59	54	51	75	70	65	60	55	51
		400	189	0.11	27	63	57	55	51	45	37	66	60	57	51	45	36	66	61	58	52	46	37	67	61	57	51	46	38	68	64	58	51	47	41	68	64	58	52	48	43
	8	1100	519	0.12	30	73	73	71	69	66	63	73	72	71	68	64	62	73	72	71	68	64	62	75	73	71	68	64	62	77	74	71	68	64	62	77	75	71	68	64	62
		900	425	0.08	20	69	69	68	64	61	58	69	68	68	63	59	56	70	69	68	63	60	57	73	70	68	64	60	57	75	72	68	64	60	57	75	73	68	64	60	57
		700	330	0.05	12	65	64	63	59	55	51	66	65	63	59	54	50	67	65	64	59	55	50	72	67	63	59	55	50	72	69	64	59	55	51	73	70	64	59	55	52
		400	189	0.02	5	63	57	55	51	45	37	65	58	56	51	45	36	64	59	57	52	46	37	66	60	57	51	45	38	66	62	57	51	47	41	66	62	58	52	47	42
	10	1215	573	0.03	7	76	75	73	72	68	66	74	74	72	70	67	64	74	74	72	70	67	65	75	75	72	70	67	65	77	75	73	70	67	65	77	76	73	70	67	65
		1100	519	0.03	7	73	73	71	69	66	63	71	72	70	67	64	62	72	72	70	68	64	62	73	72	70	68	64	62	75	74	70	68	64	62	76	75	71	67	64	62
		900	425	0.02	4	69	69	68	64	61	58	67	67	66	63	59	56	68	67	66	63	60	57	71	69	66	63	60	57	73	71	67	63	60	57	73	72	67	63	60	57
		700	330	0.01	3	65	64	63	59	55	51	64	63	62	58	54	49	65	64	62	58	54	50	70	65	62	58	54	50	70	67	63	58	54	51	70	68	63	59	55	51
		400	189	0.01	1	63	57	55	51	45	37	62	56	55	50	44	35	62	57	56	51	45	37	63	58	55	50	45	37	64	60	56	50	46	40	64	60	56	51	47	42
4	10	1550	731	0.10	25	80	79	74	75	71	70	78	77	74	73	69	69	82	80	75	74	71	70	83	80	76	74	71	70	85	82	77	75	72	71	86	83	77	76	72	71
		1400	661	0.08	19	77	75	72	71	67	66	75	74	71	69	66	65	80	77	73	71	67	66	83	79	75	72	69	68	83	80	74	72	69	68	84	80	75	73	69	68
		1200	566	0.05	13	73	71	69	67	64	62	73	71	69	67	63	61	78	73	70	68	64	63	84	78	73	71	67	66	82	77	72	70	66	65	82	78	72	70	66	65
		900	425	0.03	7	69	67	64	62	58	54	69	67	64	61	56	53	74	69	66	63	58	56	78	72	68	65	60	57	76	71	66	63	58	55	76	72	67	63	58	55
		700	330	0.02	4	66	63	61	58	54	49	66	64	61	57	53	48	71	66	62	59	55	51	72	67	63	60	55	52	71	67	62	58	53	49	71	67	62	58	54	49
	12	1550	731	0.05	12	80	79	74	75	71	70	77	76	73	73	69	69	82	79	74	74	71	70	82	80	75	74	71	70	84	81	76	75	72	71	85	82	77	76	72	71
		1400	661	0.03	8	77	75	72	71	67	66	74	73	71	69	66	65	79	76	72	71	67	66	82	78	74	72	69	68	82	79	74	72	69	68	83	80	74	73	69	68
		1200	566	0.02	5	73	71	69	67	64	62	71	70	68	66	63	61	76	73	69	67	64	63	82	77	73	70	67	66	80	77	71	70	66	65	80	77	72	69	66	65
		900	425	0.01	3	69	67	64	62	58	54	67	65	63	61	56	53	72	68	65	62	58	56	75	71	67	64	60	57	74	70	65	62	58	55	74	70	65	62	58	55
		700	330	0.01	2	66	63	61	58	54	49	64	62	59	57	52	48	69	64	61	59	54	51	70	66	62	59	55	51	69	65	60	57	53	49	69	65	61	58	53	49
5	12	2050	967	0.06	15	82	79	75	76	72	71	82	79	75	74	72	71	83	80	75	75	72	71	85	81	77	76	73	73	86	82	78	77	74	73	87	83	78	77	74	73
		1850	873	0.05	12	79	76	72	72	69	68	79	76	72	71	68	67	80	77	73	72	69	68	82	79	74	73	70	69	83	80	75	73	71	70	84	80	75	74	71	70
		1600	755	0.04	10	77	73	70	69	66	65	77	73	70	69	65	64	79	75	71	70	67	66	81	77	72	71	68	67	82	77	73	71	68	67	82	78	73	72	68	67
		1350	637	0.03	7	73	70	67	65	62	60	73	69	66	65	61	60	77	72	68	67	63	62	78	73	69	67	64	63	79	74	69	68	64	63	80	75	70	68	65	63
		1100	519	0.02	5	69	67	63	62	58	56	72	67	63	61	57	55	74	69	65	63	59	57	76	70	66	63	60	58	77	72	66	64	60	58	76	71	66	63	59	57
	14	2050	967	0.04	10	82	79	75	76	72	71	82	79	74	74	72	71	82	79	75	75	72	71	84	81	76	76	73	73	85	82	77	77	74	73	86	82	77	77	74	73
		1850	873	0.03	8	79	76	72	72	69	68	78	75	72	71	68	67	80	77	73	72	69	68	82	78	73	73	70	69	82	79	74	73	71	70	83	80	75	74	71	70
		1600	755	0.03	7	77	73	70	69	66	65	75	72	69	68	65	64	78	74	71	69	67	66	80	76	71	70	68	67	80	77	72	71	68	67	81	78	72	71	68	67
		1350	637	0.02	5	73	70	67	65	62	60	72	69	65	64	61	60	75	71	67	66	63	62	76	73	68	67	64	63	78	74	69	67	64	63	78	75	69	67	65	63
		1100	519	0.01	3	69	67	63	62	58	56	70	65	62	61	57	55	72	67	64	62	59	57	74	69	64	63	60	58	75	70	65	63	60	58	74	70	64	62	59	57
6	14	2400	1133	0.08	20	81	80	78	79	76	75	80	80	77	78	75	74	81	80	78	78	76	75	83	82	79	80	77	76	84	83	80	80	78	77	85	84	80	80	78	77
		2100	991	0.06	15	78	77	75	77	73	72	77	76	75	75	72	71	78	78	76	76	74	73	80	79	76	77	74	73	81	80	77	78	75	74	82	81	78	78	75	74
		2000	944	0.05	13	76	76	74	75	72	71	75	75	74	74	71	70	77	77	75	76	73	72	79	78	76	76	73	73	80	79	76	77	74	73	81	80	77	77	74	73
		1700	802	0.04	10	73	73	71	72	68	67	72	71	70	71	68	66	75	74	72	72	69	68	76	75	73	73	70	69	78	76	73	73	71	70	78	77	74	74	71	70
		1400	661	0.03	6	69	68	68	67	63	61	69	66	67	65	62	60	71	68	69	67	64	63	73	70	70	68	65	64	74	71	70	68	65	64	73	71	70	67	64	63
7	14	3370	1590	0.2	50	81	79	75	76	72	72	79	77	74	73	70	69	80	78	75	73	71	70	82	80	76	75	72	71	84	81	77	76	73	72	85	82	78	76	74	73
		2800	1321	0.15	37	77	74	71	70	67	66	75	72	70	68	65	64	77	74	71	69	67	65	79	76	73	71	68	67	81	77	73	72	69	68	81	76	72	70	67	66
		2100	991	0.1	25	72	68	66	65	61	58	71	66	65	63	59	56	74	69	66	65	61	58	75	69	66	65	61	57	77	71	67	65	61	58	77	71	66	65	61	58
		1600	755	0.07	17	68	64	62	60	56	51	69	64	62	59	54	49	71	65	63	61	56	51	72	65	62	60	55	51	74	68	63	60	56	52	75	69	64	61	57	53
		1100	519	0.05	12	65	61	59	56	51	45	66	61	59	56	50	44	67	61	59	56	51	44	68	63	59	56	51	46	71	65	60	57	53	48	71	67	61	58	53	49
	16	4000	1888	0.15	38	83	82	78	78	75	75	81	79	76	76	73	73	82	80	76	76	74	73	84	81	78	77	75	74	86	83	79	78	76	75	87	84	79	79	76	76
		3500	1652	0.12	29	81	79	75	76	72	72	78	76	73	73	70	69	80	77	74	73	71	70	81	79	75	75	72	71	84	80	77	76	73	72	84	81	77	76	74	73
		2800	1321	0.08	19	77	74	71	70	67	66	74	71	69	68	65	64	76	73	70	69	67	65	79	75	72	71	68	67	80	77	73	72	69	68	80	76	71	70	67	66
		2100	991	0.04	11	72	68	66	65	61	58	70	66	64	63	59	56	73	68	66	65	61	58	73	69	65	64	61	57	75	70	66	65	61	58	76	71	66	64	61	58
		1600	755	0.03	6	68	64	62	60	56	51	67	62	61	59	54	49	69	64	62	60	56	51	70	64	61	59	55	51	72	66	62	60	56	52	73	68	63	61	57	53

For performance table notes, see page C75; highlighted numbers indicate embedded AHRI certification points.

Performance Data • AHRI Certification and Performance Notes

Model Series 35SST Stealth™ • Series Flow • AHRI Certification Rating Points

Fiberglass Liner

Unit Size	Inlet Size	Fan Airflow		Fan$^{\Sigma}$ Watts	Fan Only* @ .25" w.g. (62 Pa) ΔPs												Primary Airflow		Min. Inlet ΔPs		Fan + 100% Primary @ 1.5" w.g. (375 Pa) ΔPs w/ .25" w.g. (62 Pa) Discharge ΔPs					
					Discharge						Radiated										Radiated					
		cfm	l/s		2	3	4	5	6	7	2	3	4	5	6	7	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7
1	6	400	189	105	71	68	64	60	57	54	62	59	52	45	41	37	400	189	0.12	30	64	62	54	47	45	44
2	8	700	330	155	69	67	63	62	59	57	59	57	50	45	41	37	700	330	0.08	19	67	63	55	49	45	45
3	10	1100	519	270	73	73	71	69	66	63	63	61	53	49	45	42	1100	519	0.03	7	64	64	56	53	49	48
4	12	1550	731	430	80	79	74	75	71	70	68	63	56	53	53	50	1550	731	0.05	12	72	68	62	58	54	53
5	14	2050	967	800	82	79	75	76	72	71	71	66	59	56	52	49	2050	967	0.04	10	72	68	62	57	54	52
6	14	2100	991	790	78	77	75	77	73	72	70	65	59	55	51	47	2100	991	0.06	15	73	69	62	57	54	53
7	16	2800	1321	760	77	74	71	70	67	66	69	65	56	53	50	46	2800	1321	0.08	19	72	66	61	55	51	49

$^{\Sigma}$ Motor = ECM.

* Primary air valve is closed and therefore primary cfm is zero.

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VAV Terminals
AHRI Standard 880

Ratings are certified in accordance with AHRI Standards.

Performance Notes for Sound Power Levels:

1. Discharge (external) static pressure is 0.25" w.g. (63 Pa) in all cases, which is the difference (ΔPs) in static pressure from terminal discharge to the room.

   Discharge Sound Power Levels (SWL) now include duct end reflection energy as part of the standard rating. Including the duct end correction provides sound power levels that would normally be transmitted into an acoustically, non-reflective duct. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI certified data. For more information on duct end reflection calculations see AHRI Standard 880.
2. Radiated sound power is the breakout noise transmitted through the unit casing walls.
3. Sound power levels are in decibels, dB re 10^{-12} watts.
4. All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation. Dash (-) in space indicates sound power level is less than 20 dB or equal to background.
5. Min. inlet ΔPs is the minimum operating pressure of the primary air valve section.
6. Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.
7. Data derived from independent tests conducted in accordance with ANSI / ASHRAE Standard 130 and AHRI Standard 880.

Nailor

Performance Data • Radiated Sound Power Levels

Model Series 35SST Stealth™ • Series Flow

Fiberglass Liner

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

Unit Size	Inlet Size	Airflow		Min. inlet ΔPs		Fan Only						Fan and 100% Primary Air–Sound Power Octave Bands @ Inlet pressure (ΔPs) shown																							
												Minimum ΔPs						0.5" w.g. (125Pa) ΔPs						1.0" w.g. (249Pa)ΔPs						1.5" w.g. (375Pa) ΔPs						2.0" w.g. (500Pa) ΔPs					
		cfm	l/s	"w.g.	l/s	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
1	6	550	260	0.22	54	65	65	57	50	47	42	66	64	57	50	46	42	65	64	56	49	46	43	66	65	57	50	47	45	67	67	58	52	48	47	67	67	58	52	49	48
		400	189	0.12	30	62	59	52	45	41	37	61	59	52	45	41	36	62	60	52	45	42	38	63	61	53	46	43	41	64	62	54	47	45	44	64	63	54	47	45	45
		300	142	0.07	17	58	55	48	42	38	34	58	56	48	42	38	34	58	56	48	42	39	35	59	58	50	43	40	38	60	59	51	44	42	40	60	60	51	44	43	41
		200	94	0.04	9	-	45		32	29	23	-	46	40	32	29	23	52	49	42	34	32	28	53	51	44	36	34	31	54	53	46	38	36	35	54	54	47	39	36	36
		100	47	0.01	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	27	28	-	-	-	32	29	31	-	-	-	34	30	32
	8	550	260	0.06	15	65	65	57	50	47	42	66	64	57	49	46	42	65	64	56	49	46	42	66	65	57	50	47	44	67	67	58	51	48	47	67	67	58	51	48	48
		400	189	0.03	8	62	59	52	45	41	37	61	59	51	44	41	36	62	60	51	45	42	37	63	61	52	46	43	40	64	62	53	47	44	43	64	63	53	47	45	44
		300	142	0.02	5	58	55	48	42	38	34	58	56	48	41	38	33	58	56	48	41	38	34	59	58	49	42	40	37	60	59	50	43	41	39	60	60	51	43	42	40
		200	94	0.01	2	-	45	40	32	29	23	-	45	40	31	28	23	51	48	42	34	31	27	52	50	44	36	33	30	53	53	45	37	35	34	54	54	46	38	35	35
		100	47	0.01	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	26	27	-	-	-	31	28	30	-	-	-	33	29	31
2	6	550	260	0.20	50	57	53	46	39	36	33	57	54	47	40	37	34	58	56	50	45	42	40	60	59	52	46	43	43	63	61	54	47	45	45	63	63	55	48	45	46
		400	189	0.11	27	52	48	41	34	29	23	51	48	41	33	28	21	55	51	43	36	34	31	58	55	47	40	38	36	60	60	51	43	43	42	61	62	52	45	44	44
		200	94	0.04	10	52	45	37	30	24	-	49	44	38	30	25	-	52	48	41	35	33	28	53	51	44	38	35	32	54	54	47	40	37	35	55	55	49	42	38	36
	8	850	401	0.11	28	62	60	54	49	45	42	65	63	55	49	45	41	66	63	54	49	45	42	66	64	56	50	46	44	67	65	57	51	47	46	67	66	57	51	47	47
		700	330	0.08	19	59	57	50	45	41	37	64	59	51	45	41	37	65	61	51	46	43	40	66	62	53	47	44	43	67	63	55	49	45	45	67	64	55	49	46	46
		550	260	0.05	12	57	53	46	39	36	33	57	54	46	40	37	33	58	56	49	44	41	39	60	59	51	45	43	42	63	61	53	46	44	44	63	63	54	47	44	45
		400	189	0.02	6	52	48	41	34	29	23	51	47	40	32	28	21	55	50	43	36	33	30	57	55	47	39	37	35	60	59	50	43	41	41	61	61	52	44	43	43
		200	94	0.00	1	52	45	37	30	24	-	48	43	37	29	24	-	51	47	40	34	32	27	53	50	43	37	34	30	54	53	46	39	36	34	55	55	48	40	37	35
3	6	550	260	0.20	50	55	53	47	41	36	32	56	52	46	41	36	32	56	54	48	44	40	37	58	58	51	47	44	43	60	61	53	50	48	49	60	61	53	50	48	49
		400	189	0.11	27	55	49	43	38	35	27	52	49	42	37	33	26	54	51	43	38	36	32	56	54	46	42	41	39	58	57	49	45	46	46	58	57	49	45	46	46
	8	1100	519	0.12	30	63	61	53	49	45	42	61	59	52	48	44	41	62	60	53	49	45	42	63	62	55	51	47	46	64	64	57	53	49	49	64	64	57	53	49	49
		900	425	0.08	20	59	57	50	45	41	37	58	55	49	44	40	37	59	57	50	46	42	39	61	60	52	49	45	44	63	63	55	51	48	48	63	63	55	51	48	48
		700	330	0.05	12	55	53	47	41	36	32	56	52	46	40	36	32	57	54	47	43	39	36	59	58	50	46	43	42	61	62	53	49	47	47	61	62	53	49	47	47
		400	189	0.02	5	55	49	43	38	35	27	51	48	42	37	32	26	53	50	43	38	35	31	55	53	46	42	40	38	57	57	49	45	45	45	57	57	49	45	45	45
	10	1215	573	0.03	7	64	62	54	51	47	43	62	61	53	50	45	42	64	62	54	51	47	44	64	63	56	52	48	46	65	65	57	54	50	49	65	65	57	54	50	49
		1100	519	0.03	7	63	61	53	49	45	42	61	59	52	48	43	40	62	60	52	48	45	41	63	62	54	50	47	45	64	64	56	53	49	48	64	64	56	53	49	48
		900	425	0.02	4	59	57	50	45	41	37	58	55	49	43	39	36	59	57	50	45	41	38	61	60	52	48	44	43	63	63	54	50	47	47	63	63	54	50	47	47
		700	330	0.01	3	55	53	47	41	36	32	56	52	45	39	35	31	56	54	47	42	38	35	58	58	50	45	42	41	60	61	52	48	46	46	60	61	52	48	46	46
		400	189	0.01	1	55	49	43	38	35	27	51	48	42	36	31	25	53	50	43	37	34	30	55	53	45	40	39	36	57	56	48	44	43	43	57	56	48	44	43	43
4	10	1550	731	0.10	25	68	63	56	53	53	50	66	62	55	52	50	49	69	64	58	55	52	51	71	66	60	57	53	52	72	68	62	59	54	53	73	69	63	60	55	54
		1400	661	0.08	19	66	61	55	51	49	48	65	60	53	49	47	46	68	62	55	51	49	47	69	64	58	54	51	49	71	67	60	58	53	52	71	67	62	59	54	52
		1200	566	0.05	13	63	58	52	48	45	44	62	57	52	47	45	44	66	60	54	49	47	45	67	62	57	53	49	48	69	65	59	56	51	50	69	66	60	57	52	51
		900	425	0.03	7	59	53	47	42	40	37	58	52	47	42	39	37	62	56	50	46	42	40	63	58	53	49	46	44	65	61	55	53	49	47	65	61	56	54	50	49
		700	330	0.02	4	57	50	44	39	35	31	56	49	44	38	35	30	60	53	48	43	39	36	61	56	50	46	43	40	61	58	53	50	47	45	61	59	54	51	48	47
	12	1550	731	0.05	12	68	63	56	53	53	50	66	62	55	51	49	48	69	64	58	54	51	51	71	66	60	56	53	52	72	68	62	58	54	53	73	69	63	59	54	53
		1400	661	0.03	8	66	61	55	51	49	48	65	60	53	49	47	46	68	62	55	51	48	47	69	64	58	54	50	49	71	67	60	57	52	51	71	67	62	59	53	52
		1200	566	0.02	5	63	58	52	48	45	44	62	57	51	46	44	43	66	60	54	49	46	45	67	62	56	52	49	47	69	65	59	55	51	49	69	66	59	57	52	50
		900	425	0.01	3	59	53	47	42	40	37	58	52	47	41	38	36	62	56	50	45	42	39	63	58	52	48	45	42	65	61	55	52	48	46	65	61	56	53	49	48
		700	330	0.01	2	57	50	44	39	35	31	55	49	44	37	34	29	60	53	47	42	38	35	60	55	50	46	42	39	61	57	53	49	45	44	61	58	54	50	47	46
5	12	2050	967	0.06	15	71	66	59	56	52	49	68	65	58	55	51	48	69	65	59	56	52	49	70	66	60	57	53	51	72	68	62	57	54	53	72	68	62	58	54	54
		1850	873	0.05	12	69	63	57	54	49	46	66	62	56	53	49	46	67	63	57	53	49	46	68	65	58	54	51	49	70	66	60	55	52	51	71	67	60	55	53	52
		1600	755	0.04	10	66	60	54	50	46	42	67	60	55	49	45	42	68	61	55	50	47	44	68	63	57	52	49	47	69	65	59	53	51	50	69	66	59	54	51	51
		1350	637	0.03	7	63	58	52	46	42	38	64	58	52	45	42	38	64	59	52	46	44	40	65	61	55	49	47	45	67	63	57	52	50	49	67	64	58	53	51	51
		1100	519	0.02	5	60	55	48	41	37	33	61	54	48	41	37	33	63	56	49	44	41	37	63	59	52	47	45	43	64	61	55	50	49	48	64	62	56	51	51	51
	14	2050	967	0.04	10	71	66	59	56	52	49	68	65	58	55	51	48	69	65	59	55	51	48	70	66	60	56	52	50	72	68	62	57	54	52	72	68	62	57	54	53
		1850	873	0.03	8	69	63	57	54	49	46	66	62	56	52	48	45	67	63	57	53	49	46	68	65	58	54	50	48	70	66	60	54	52	51	71	67	60	55	52	52
		1600	755	0.03	7	66	60	54	50	46	42	67	60	54	49	45	42	68	61	55	50	46	43	68	63	56	51	48	46	69	65	58	53	50	49	69	66	59	53	51	50
		1350	637	0.02	5	63	58	52	46	42	38	64	58	51	45	41	37	64	59	52	46	43	39	65	61	54	49	46	44	67	63	56	51	49	48	67	64	57	52	50	50
		1100	519	0.01	3	60	55	48	41	37	33	61	54	47	41	37	33	63	56	49	43	40	36	63	59	51	46	44	42	64	61	54	49	48	47	64	62	55	50	50	49
6	14	2400	1133	0.08	20	71	67	61	57	54	50	69	65	59	56	52	48	70	66	59	57	53	48	73	68	61	58	54	51	75	70	64	59	56	54	75	70	64	59	56	54
		2100	991	0.06	15	70	65	59	55	51	47	67	62	57	53	49	44	69	64	58	55	50	46	71	66	60	56	52	49	73	69	62	57	54	53	73	69	62	57	54	53
		2000	944	0.05	13	69	65	58	54	50	46	66	61	56	52	47	43	68	64	57	54	50	45	71	66	59	55	52	49	73	68	61	56	54	52	73	68	61	56	54	52
		1700	802	0.04	10	67	62	55	51	47	43	63	58	53	49	44	39	65	60	54	51	45	40	68	63	56	52	48	45	70	66	59	54	52	51	70	66	59	54	52	51
		1400	661	0.03	6	64	58	52	48	43	39	60	55	50	45	39	34	63	57	51	47	42	36	65	60	54	50	46	43	68	64	57	52	50	49	68	64	57	52	50	49
7	14	3370	1590	0.2	50	74	69	61	58	55	52	71	65	58	53	50	47	72	66	60	55	51	48	73	67	62	56	52	50	74	68	63	58	53	52	75	69	64	58	53	52
		2800	1321	0.15	37	69	65	56	53	50	46	67	62	54	48	45	42	68	62	56	50	47	44	70	64	58	53	49	47	72	66	61	56	51	49	73	66	62	57	52	51
		2100	991	0.1	25	65	60	52	47	43	39	62	59	50	43	39	36	64	59	52	45	42	38	66	61	55	49	44	42	69	63	59	52	47	46	70	64	61	53	48	48
		1600	755	0.07	17	61	58	48	42	38	33	60	56	47	40	35	30	61	57	49	43	39	34	64	59	53	47	42	40	67	61	58	50	45	45	68	62	59	52	47	47
		1100	519	0.05	12	58	56	45	38	34	27	55	55	44	36	31	24	59	55	46	40	36	31	61	57	50	44	40	37	64	58	54	48	44	43	65	59	56	50	46	45
	16	4000	1888	0.15	38	76	72	63	61	58	55	73	68	61	56	52	50	73	69	62	57	53	50	75	69	64	58	54	52	76	70	65	60	56	53	77	71	66	60	56	54
		3500	1652	0.12	29	74	69	61	58	55	52	71	65	58	53	49	47	72	66	60	54	51	48	73	67	62	56	52	50	74	68	63	57	53	51	75	69	64	58	53	52
		2800	1321	0.08	19	69	65	56	53	50	46	67	62	54	48	44	41	68	62	56	50	46	43	70	64	58	52	48	46	72	66	61	55	51	49	73	66	62	56	52	50
		2100	991	0.04	11	65	60	52	47	43	39	62	59	49	43	39	35	64	59	51	45	41	37	66	61	55	48	44	41	69	63	59	52	46	45	70	64	60	53	47	47
		1600	755	0.03	6	61	58	48	42	38	33	60	56	46	39	35	29	61	57	49	42	38	33	64	59	53	46	41	38	67	61	57	50	45	44	68	62	59	51	46	46

For performance table notes, see page C75; highlighted numbers indicate embedded AHRI certification points.

Performance Data • AHRI Certification and Performance Notes

Model Series 35SST Stealth™ • Series Flow • AHRI Certification Rating Points

Fiberglass Liner

Unit Size	Inlet Size	Fan Airflow		Fan$^{\Sigma}$ Watts	Fan Only* @ .25" w.g. (62 Pa) ΔPs												Primary Airflow		Min. Inlet ΔPs		Fan + 100% Primary @ 1.5" w.g. (375 Pa) ΔPs w/ .25" w.g. (62 Pa) Discharge ΔPs					
					Discharge						Radiated										Radiated					
		cfm	l/s		2	3	4	5	6	7	2	3	4	5	6	7	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7
1	6	400	189	105	71	68	64	60	57	54	62	59	52	45	41	37	400	189	0.12	30	64	62	54	47	45	44
2	8	700	330	155	69	67	63	62	59	57	59	57	50	45	41	37	700	330	0.08	19	67	63	55	49	45	45
3	10	1100	519	270	73	73	71	69	66	63	63	61	53	49	45	42	1100	519	0.03	7	64	64	56	53	49	48
4	12	1550	731	430	80	79	74	75	71	70	68	63	56	53	53	50	1550	731	0.05	12	72	68	62	58	54	53
5	14	2050	967	800	82	79	75	76	72	71	71	66	59	56	52	49	2050	967	0.04	10	72	68	62	57	54	52
6	14	2100	991	790	78	77	75	77	73	72	70	65	59	55	51	47	2100	991	0.06	15	73	69	62	57	54	53
7	16	2800	1321	760	77	74	71	70	67	66	69	65	56	53	50	46	2800	1321	0.08	19	72	66	61	55	51	49

$^{\Sigma}$ Motor = ECM.

* Primary air valve is closed and therefore primary cfm is zero.

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VAV Terminals
AHRI Standard 880

Ratings are certified in accordance with AHRI Standards.

Performance Notes for Sound Power Levels:

1. Discharge (external) static pressure is 0.25" w.g. (63 Pa) in all cases, which is the difference (ΔPs) in static pressure from terminal discharge to the room.

   Discharge Sound Power Levels (SWL) now include duct end reflection energy as part of the standard rating. Including the duct end correction provides sound power levels that would normally be transmitted into an acoustically, non-reflective duct. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI certified data. For more information on duct end reflection calculations see AHRI Standard 880.
2. Radiated sound power is the breakout noise transmitted through the unit casing walls.
3. Sound power levels are in decibels, dB re 10^{-12} watts.
4. All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation. Dash (-) in space indicates sound power level is less than 20 dB or equal to background.
5. Min. inlet ΔPs is the minimum operating pressure of the primary air valve section.
6. Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.
7. Data derived from independent tests conducted in accordance with ANSI / ASHRAE Standard 130 and AHRI Standard 880.

Performance Data • AHRI Certification and Performance Notes

Model Series 35SST Stealth™ • Series Flow • AHRI Certification Rating Points

Fiberglass Liner

Unit Size	Inlet Size	Fan Airflow		Fan$^{\Sigma}$ Watts	Fan Only* @ .25" w.g. (62 Pa) ΔPs												Primary Airflow		Min. Inlet ΔPs		Fan + 100% Primary @ 1.5" w.g. (375 Pa) ΔPs w/ .25" w.g. (62 Pa) Discharge ΔPs					
					Discharge						Radiated										Radiated					
		cfm	l/s		2	3	4	5	6	7	2	3	4	5	6	7	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7
1	6	400	189	105	71	68	64	60	57	54	62	59	52	45	41	37	400	189	0.12	30	64	62	54	47	45	44
2	8	700	330	155	69	67	63	62	59	57	59	57	50	45	41	37	700	330	0.08	19	67	63	55	49	45	45
3	10	1100	519	270	73	73	71	69	66	63	63	61	53	49	45	42	1100	519	0.03	7	64	64	56	53	49	48
4	12	1550	731	430	80	79	74	75	71	70	68	63	56	53	53	50	1550	731	0.05	12	72	68	62	58	54	53
5	14	2050	967	800	82	79	75	76	72	71	71	66	59	56	52	49	2050	967	0.04	10	72	68	62	57	54	52
6	14	2100	991	790	78	77	75	77	73	72	70	65	59	55	51	47	2100	991	0.06	15	73	69	62	57	54	53
7	16	2800	1321	760	77	74	71	70	67	66	69	65	56	53	50	46	2800	1321	0.08	19	72	66	61	55	51	49

$^{\Sigma}$ Motor = ECM.

* Primary air valve is closed and therefore primary cfm is zero.

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

Ratings are certified in accordance with AHRI Standards.

Performance Notes for Sound Power Levels:

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   Discharge Sound Power Levels (SWL) now include duct end reflection energy as part of the standard rating. Including the duct end correction provides sound power levels that would normally be transmitted into an acoustically, non-reflective duct. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI certified data. For more information on duct end reflection calculations see AHRI Standard 880.
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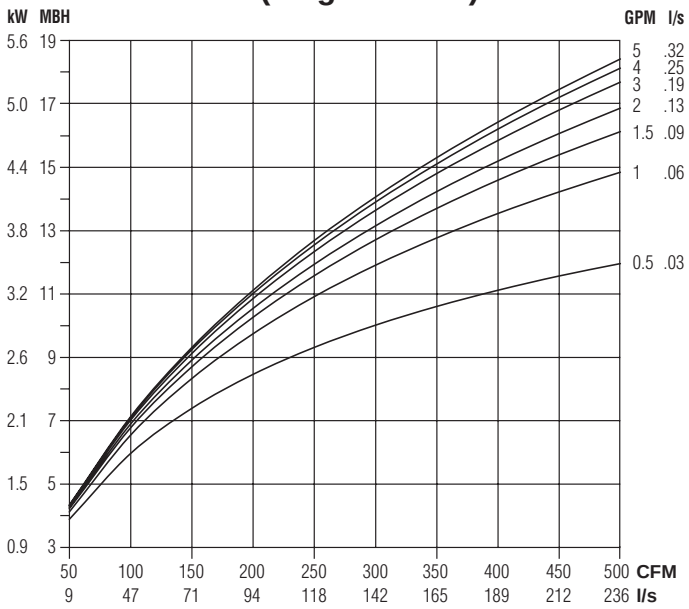
7. Data derived from independent tests conducted in accordance with ANSI / ASHRAE Standard 130 and AHRI Standard 880.

Performance Data • Hot Water Coil

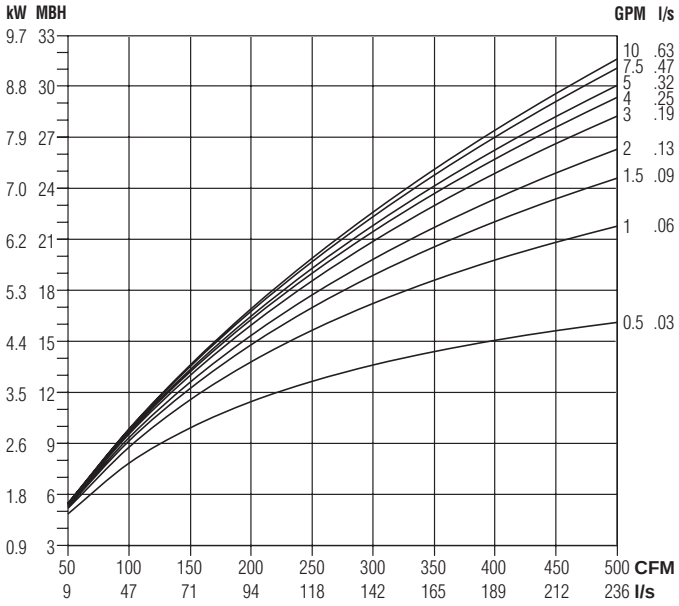
Models: 35SW, 35SWST, 35SW-OAI, 35SWST-OAI, 35SW-CVP • Series Flow

Unit Size 1

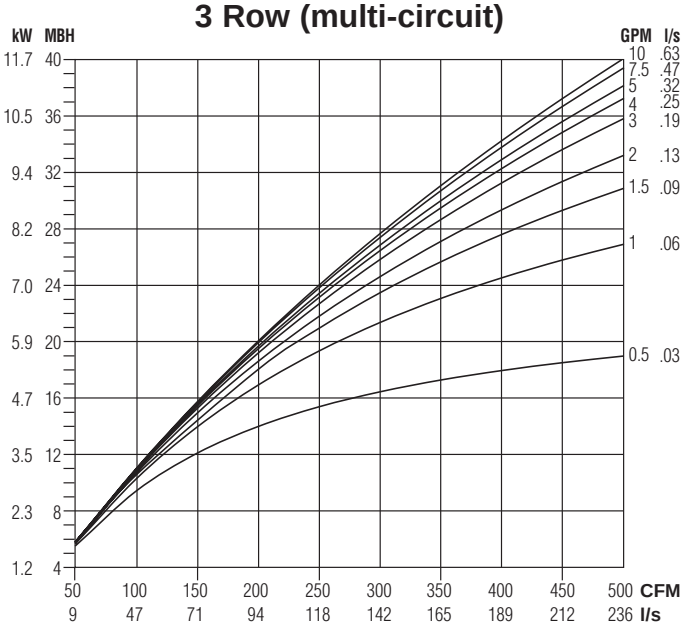
1 Row (single circuit)



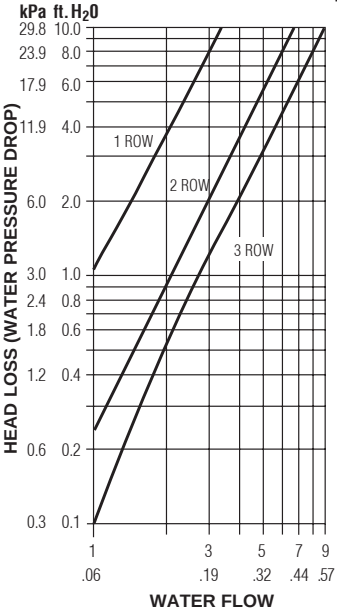
2 Row (multi-circuit)



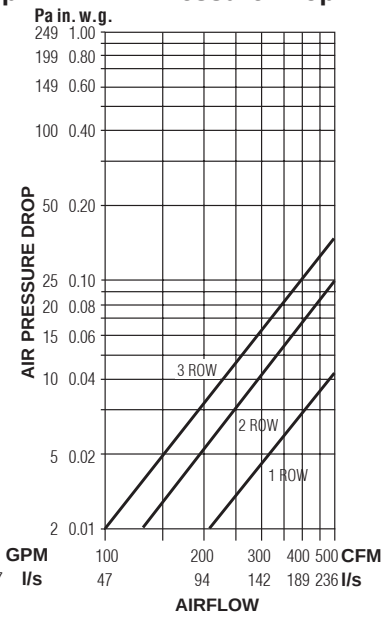
3 Row (multi-circuit)



Water Pressure Drop



Air Pressure Drop



NOTES:

1. Capacities are in MBH (kW), ***thousands of Btu per hour (kiloWatts)***.
2. MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt's; multiply the MBH (kW) values by the factors below.
3. Air Temperature Rise.
   ATR (°F) = 927 x $\frac{MBH}{cfm}$, ATR (°C) = 829 x $\frac{kW}{l/s}$
4. Water Temp. Drop.
   WTD (°F) = 2.04 x $\frac{MBH}{GPM}$, WTD (°C) = .224 x $\frac{kW}{l/s}$
5. Connections: 1 Row 1/2" (13), 2 and 3 Row 7/8" (22); O.D. male solder.

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

Correction factors at other entering conditions:

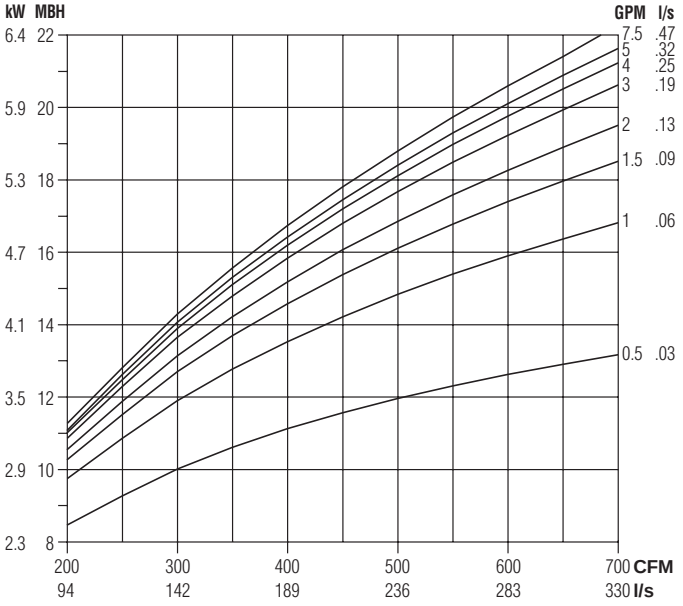
Δt °F (°C)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	120 (67)	130 (72)	140 (78)	150 (83)
Factor	.455 (.459)	.545 (.541)	.636 (.639)	.727 (.721)	.818 (.820)	.909 (.918)	1.00 (1.00)	1.09 (1.10)	1.18 (1.18)	1.27 (1.28)	1.36 (1.36)

Performance Data • Hot Water Coil

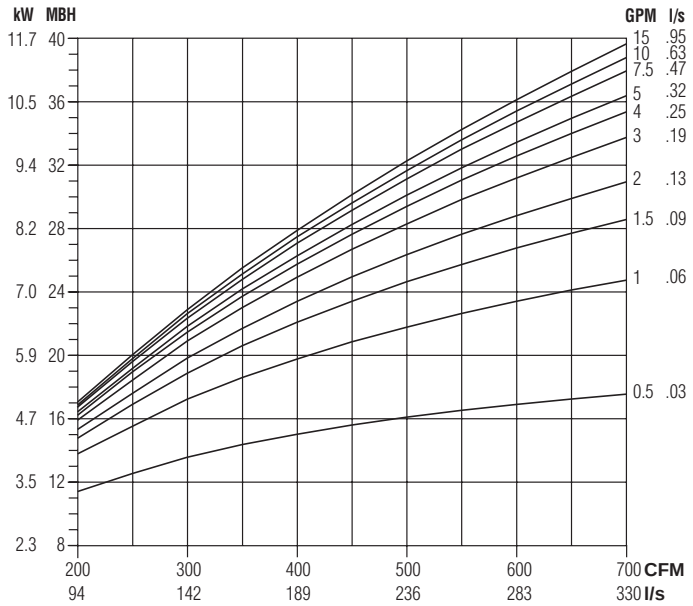
Models: 35SW, 35SWST, 35SW-OAI, 35SWST-OAI, 35SW-CVP • Series Flow

Unit Size 2

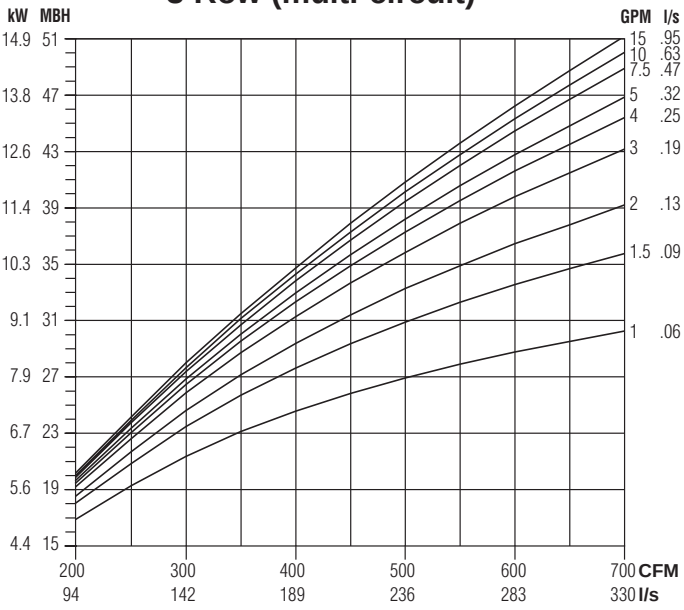
1 Row (single circuit)



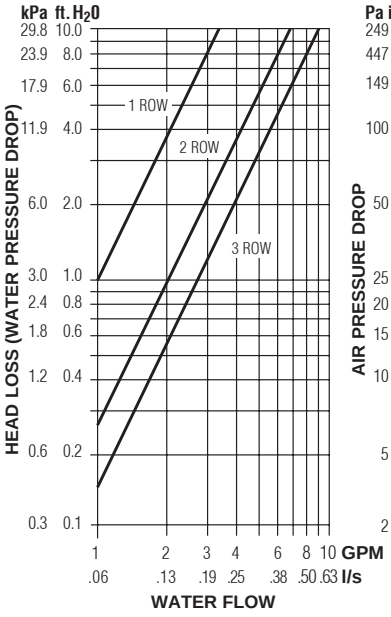
2 Row (multi-circuit)



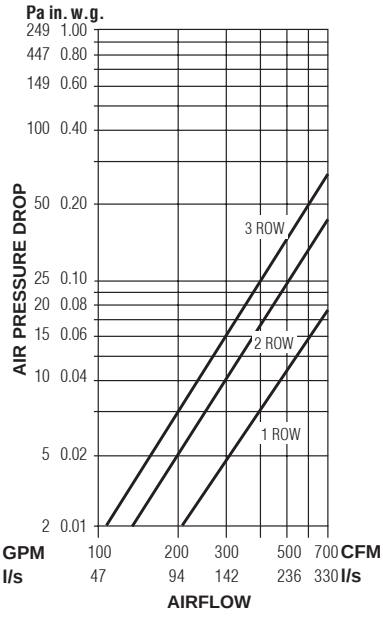
3 Row (multi-circuit)



Water Pressure Drop



Air Pressure Drop



NOTES:

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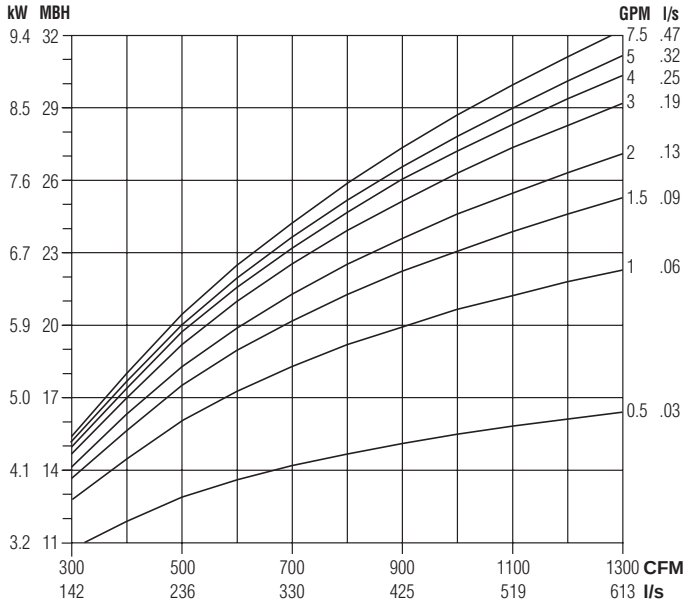
Performance Data • Hot Water Coil

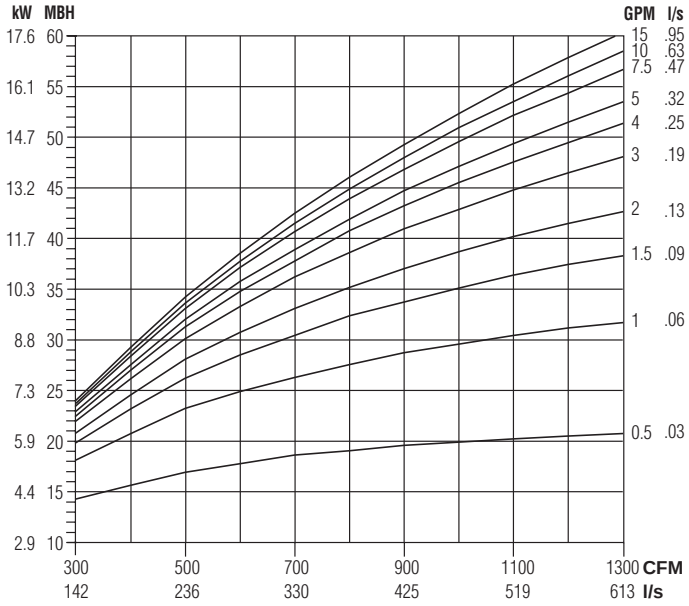
Models: 35SW, 35SWST, 35SW-OAI, 35SWST-OAI, 35SW-CVP • Series Flow

Unit Size 3

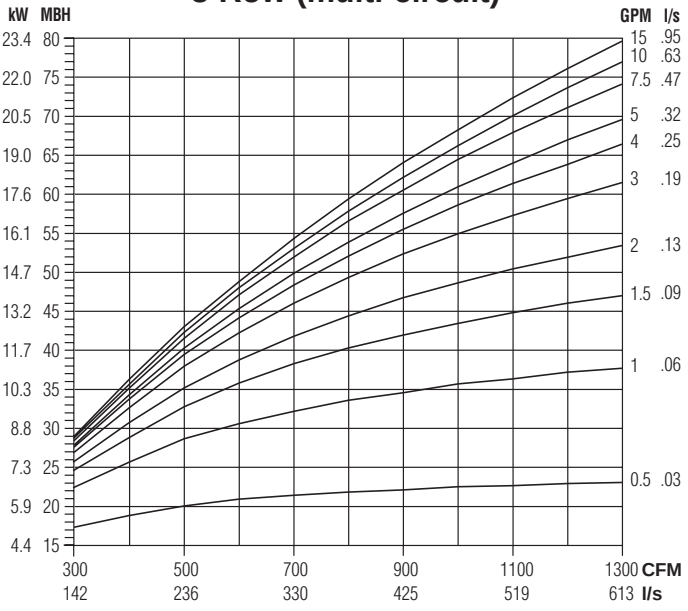
1 Row (single circuit)



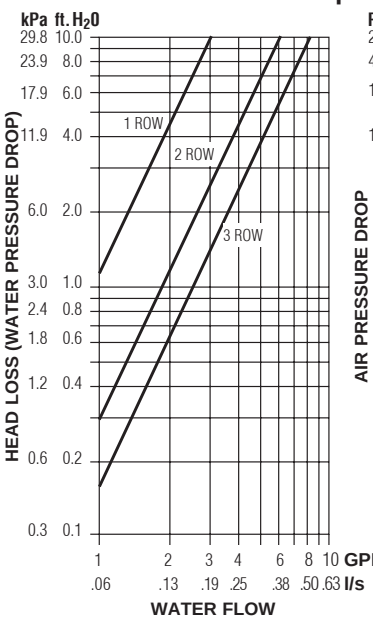
2 Row (multi-circuit)



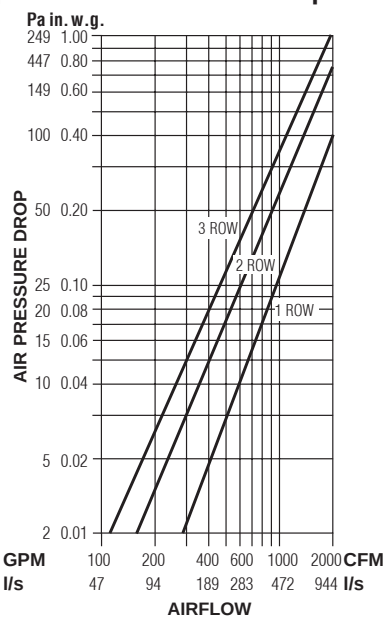
3 Row (multi-circuit)



Water Pressure Drop



Air Pressure Drop



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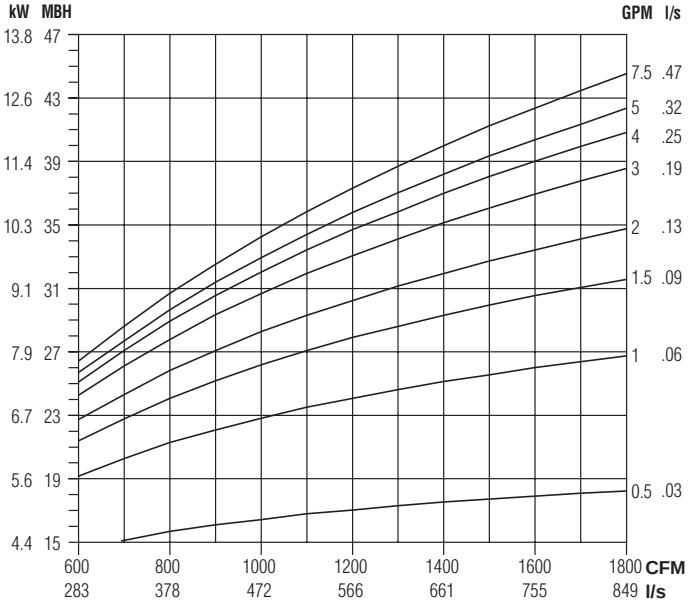
Performance Data • Hot Water Coil

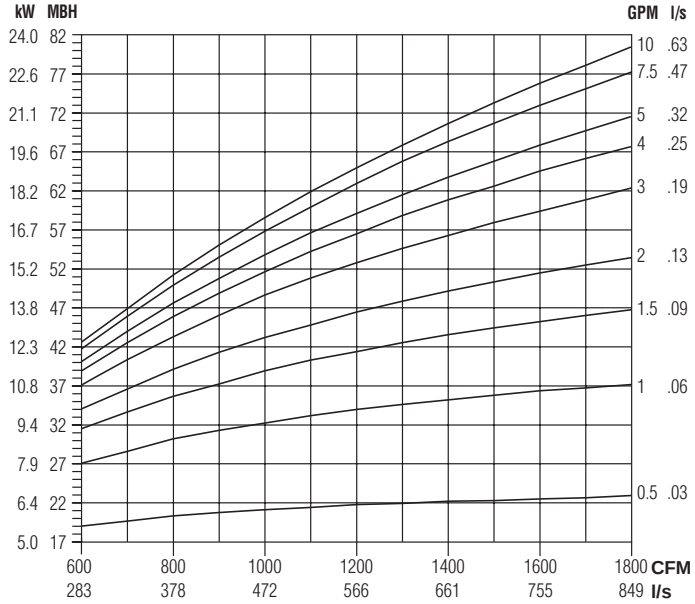
Models: 35SW, 35SWST, 35SW-OAI, 35SWST-OAI, 35SW-CVP • Series Flow

Unit Sizes 4 & 5

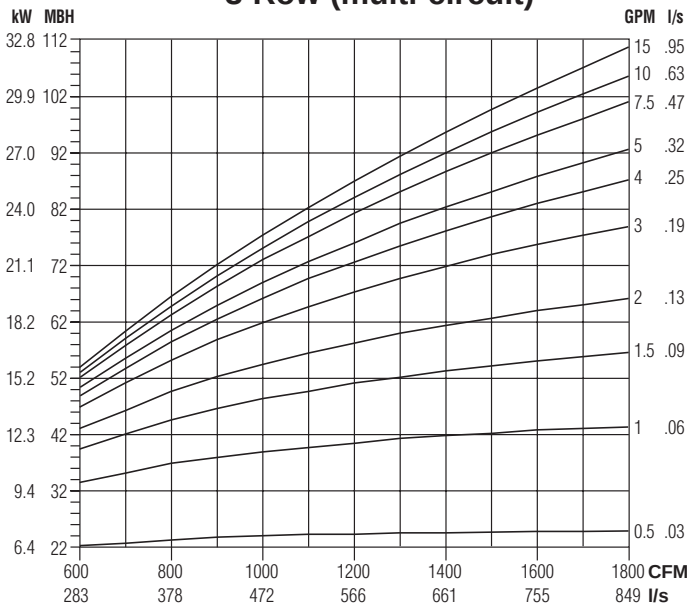
1 Row (multi-circuit)



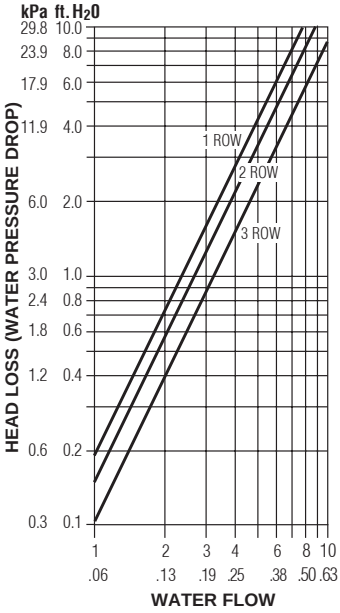
2 Row (multi-circuit)



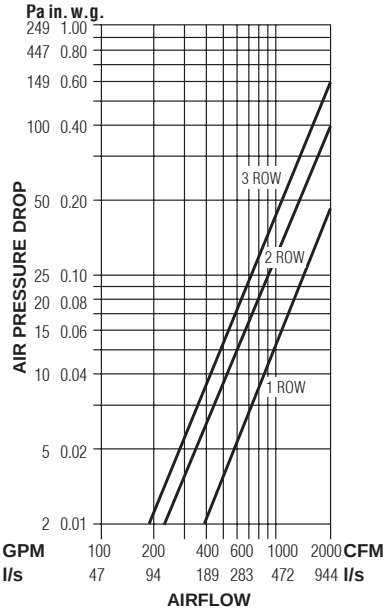
3 Row (multi-circuit)



Water Pressure Drop



Air Pressure Drop



NOTES:

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5. Connections: 1, 2 and 3 Row 7/8" (22); O.D. male solder.

Altitude Correction Factors:

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Correction factors at other entering conditions:

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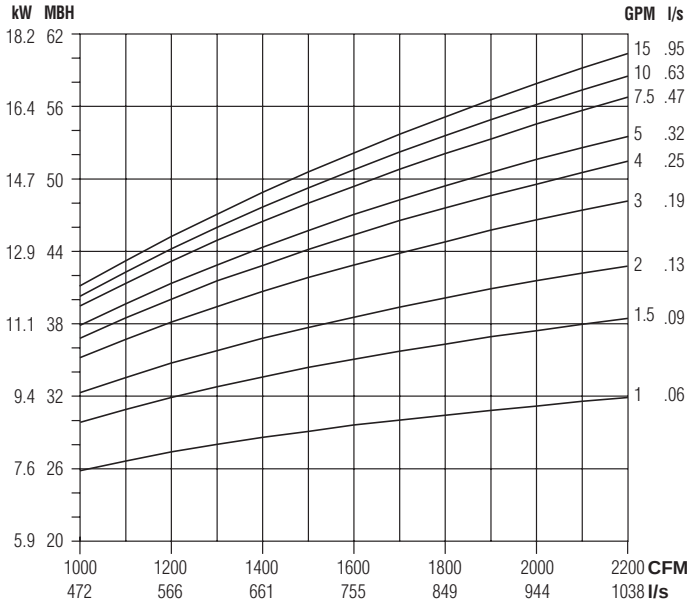
Performance Data • Hot Water Coil

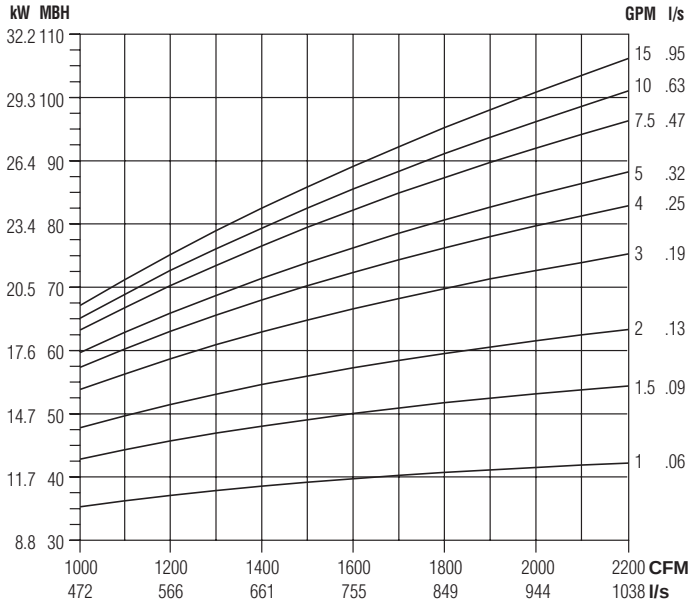
Models: 35SW, 35SWST, 35SW-OAI, 35SWST-OAI, 35SW-CVP • Series Flow

Unit Size 6

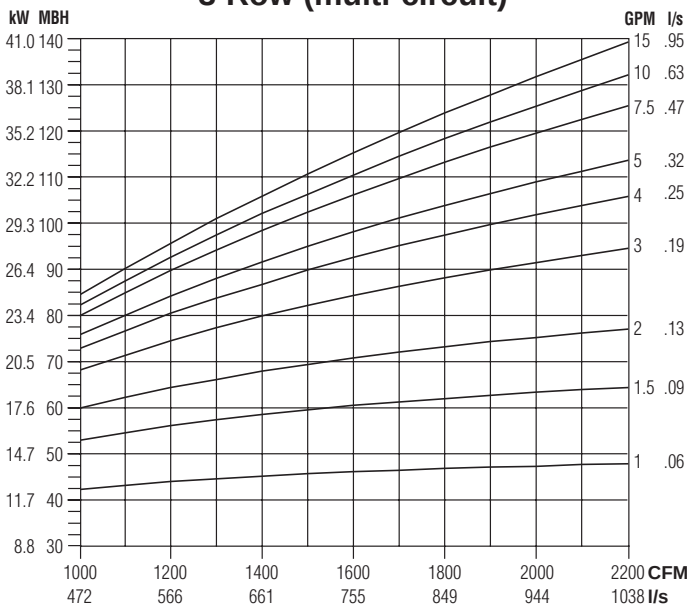
1 Row (multi-circuit)



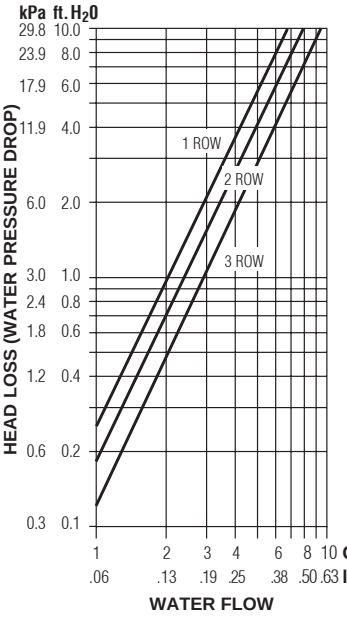
2 Row (multi-circuit)



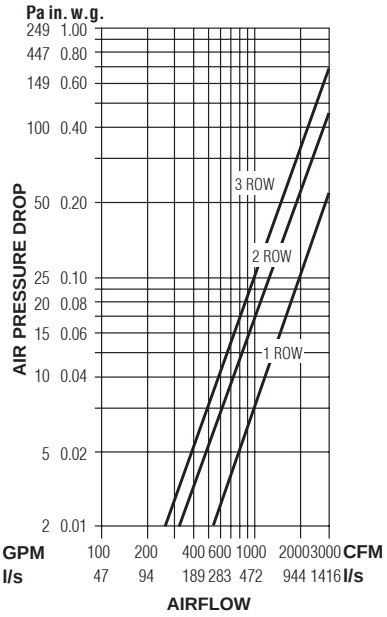
3 Row (multi-circuit)



Water Pressure Drop



Air Pressure Drop



NOTES:

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5. Connections: 1, 2 and 3 Row 7/8" (22); O.D. male solder.

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Correction factors at other entering conditions:

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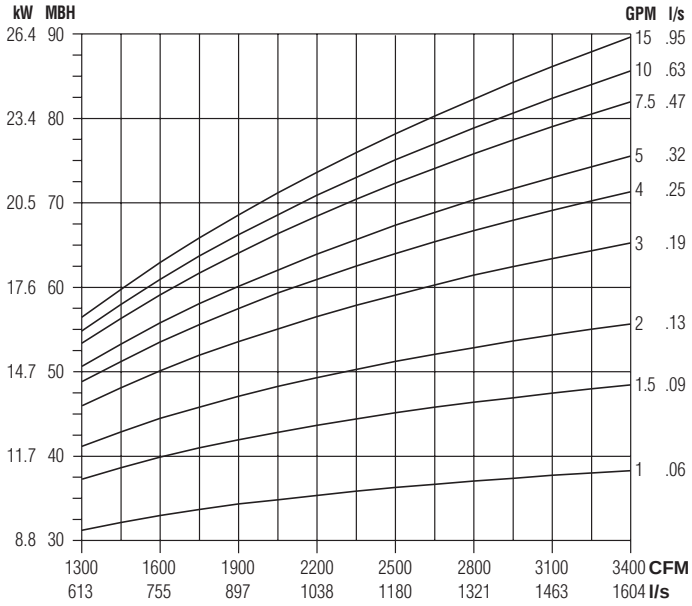
Performance Data • Hot Water Coil

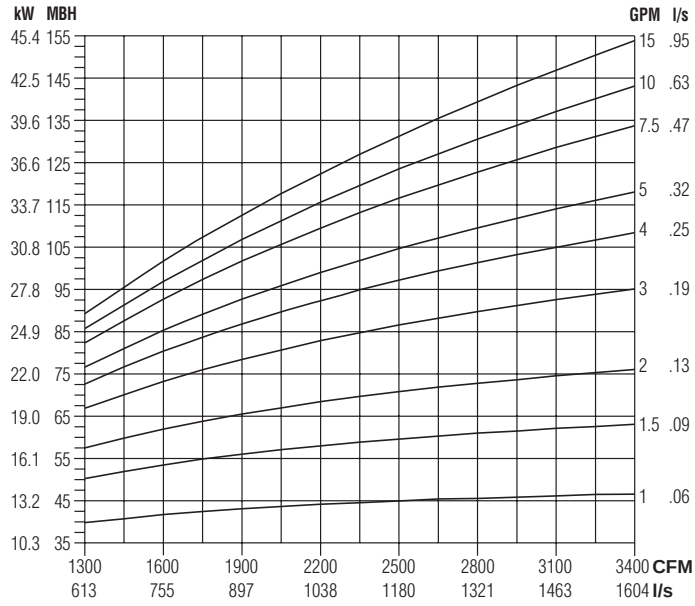
Models: 35SW, 35SWST, 35SW-OAI, 35SWST-OAI, 35SW-CVP • Series Flow

Unit Size 7

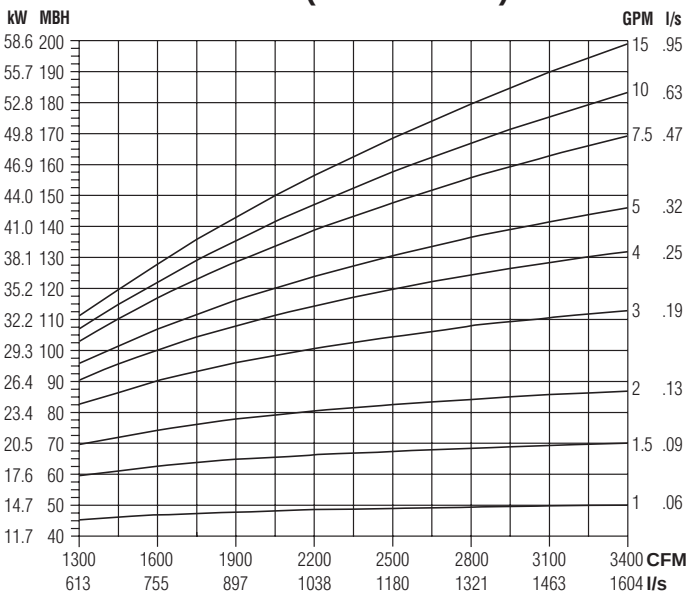
1 Row (multi-circuit)



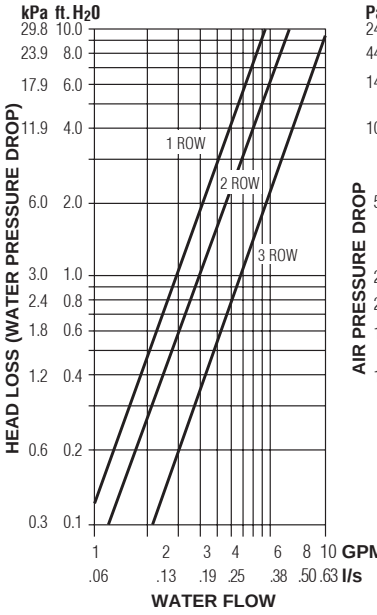
2 Row (multi-circuit)



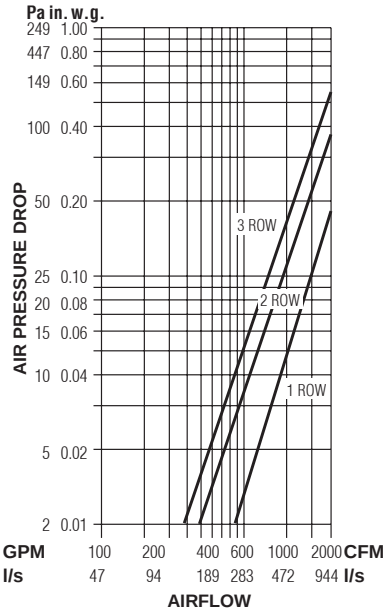
3 Row (multi-circuit)



Water Pressure Drop



Air Pressure Drop



NOTES:

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2. MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt's; multiply the MBH (kW) values by the factors below.
3. Air Temperature Rise.
   ATR (°F) = 927 x $\frac{MBH}{cfm}$, ATR (°C) = 829 x $\frac{kW}{l/s}$
4. Water Temp. Drop.
   WTD (°F) = 2.04 x $\frac{MBH}{GPM}$, WTD (°C) = .224 x $\frac{kW}{l/s}$
5. Connections: 1 and 2 Row 7/8" (22), 3 Row 1 3/8" (35); O.D. male solder.

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

Correction factors at other entering conditions:

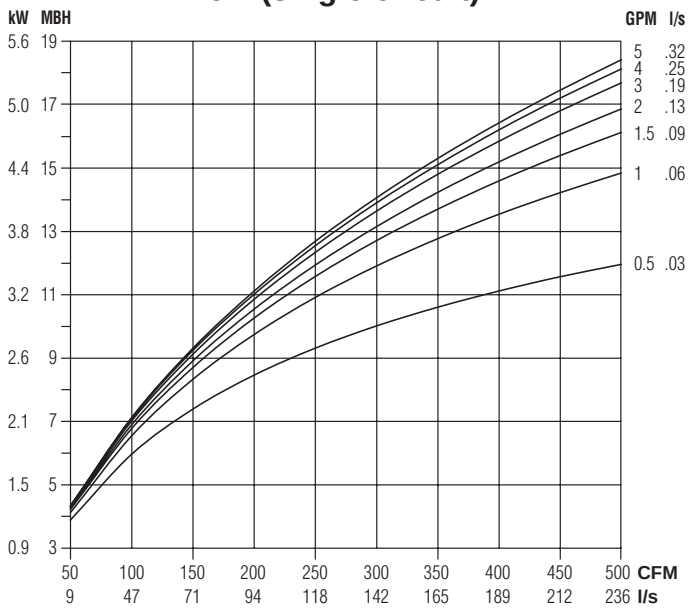
Δt °F (°C)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	120 (67)	130 (72)	140 (78)	150 (83)
Factor	.455 (.459)	.545 (.541)	.636 (.639)	.727 (.721)	.818 (.820)	.909 (.918)	1.00 (1.00)	1.09 (1.10)	1.18 (1.18)	1.27 (1.28)	1.36 (1.36)

Performance Data • Hot Water Coil

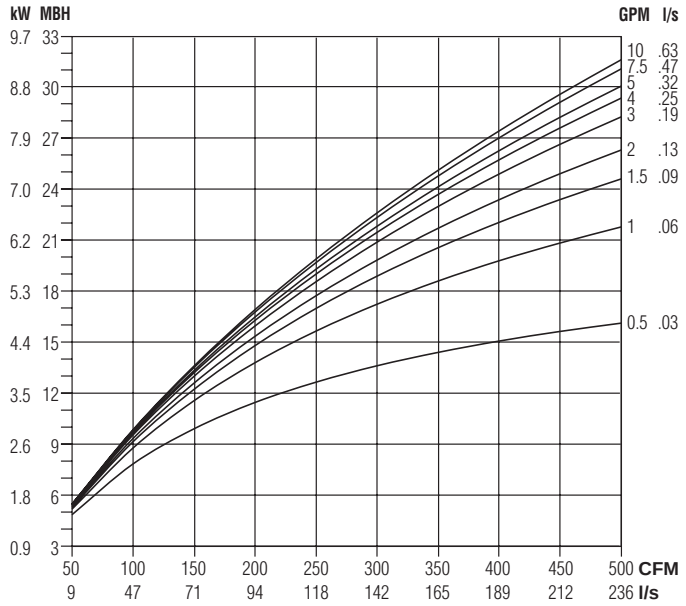
Model: 35SWXC • Series Flow

Unit Size 1

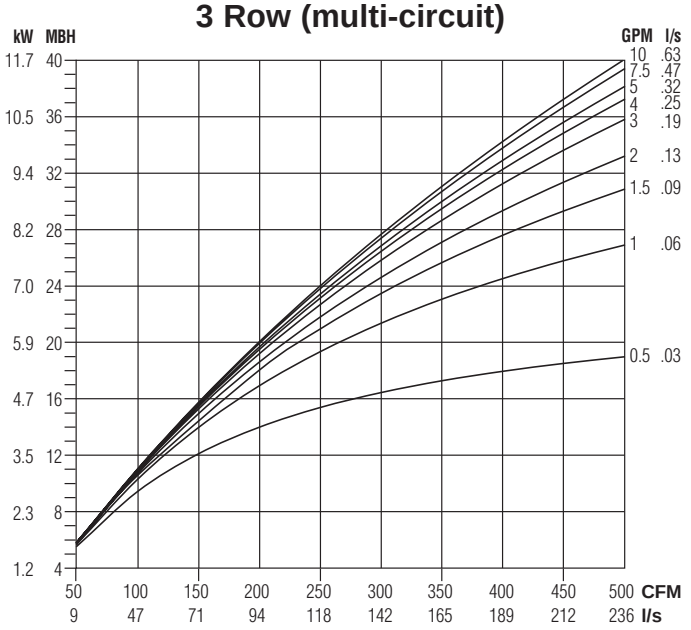
1 Row (single circuit)



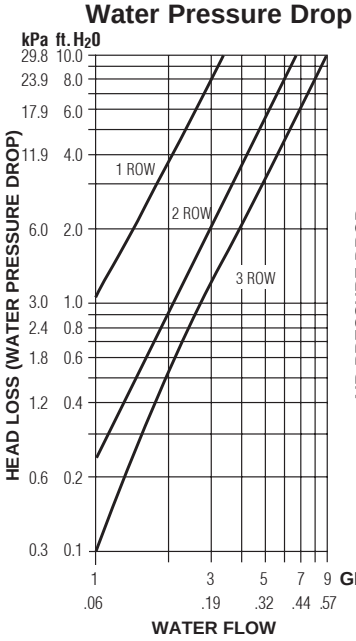
2 Row (multi-circuit)



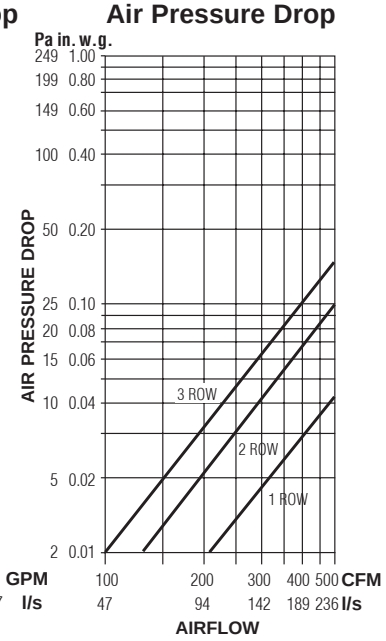
3 Row (multi-circuit)



Water Pressure Drop



Air Pressure Drop



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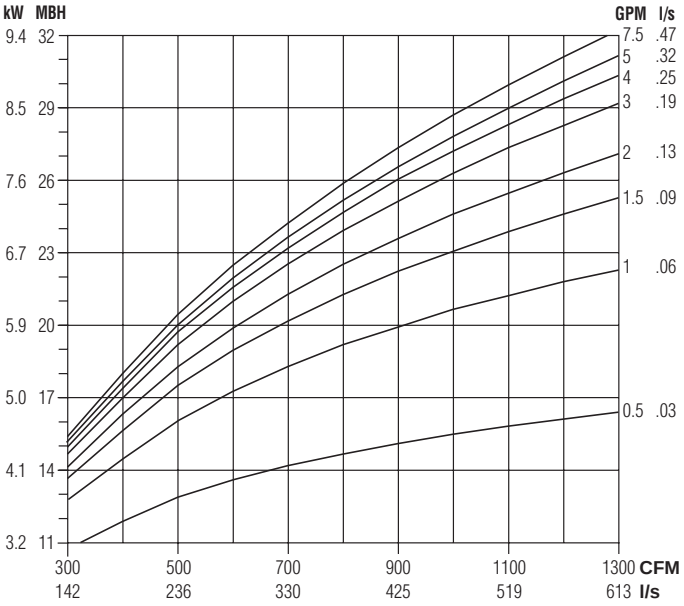
Performance Data • Hot Water Coil

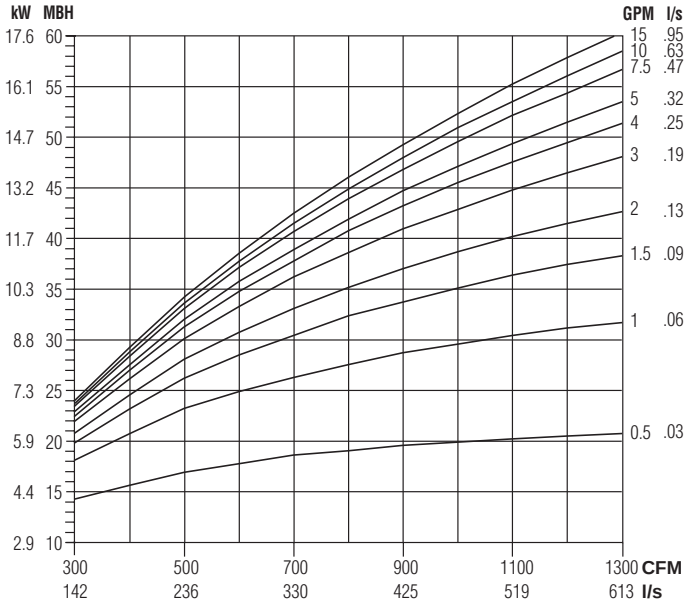
Model: 35SWXC • Series Flow

Unit Size 3

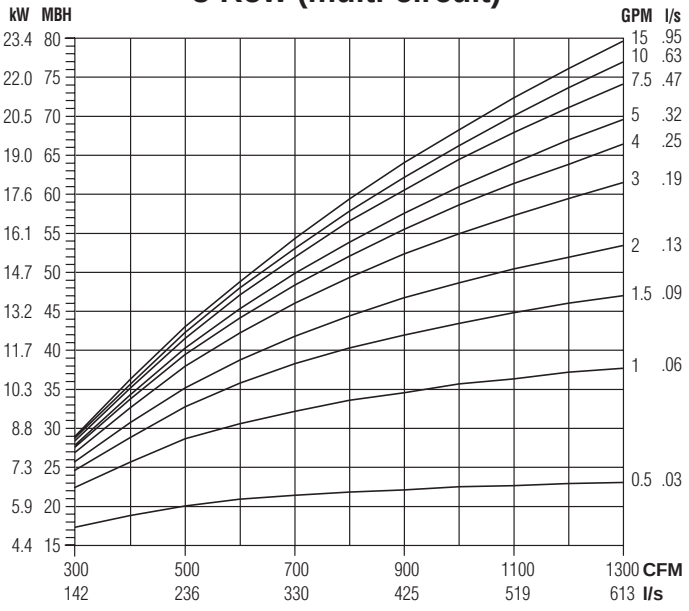
1 Row (single circuit)



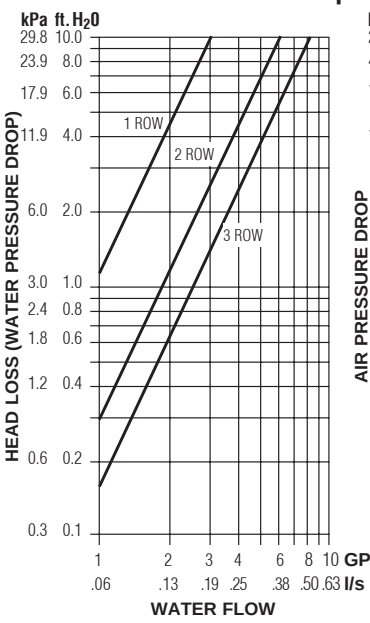
2 Row (multi-circuit)



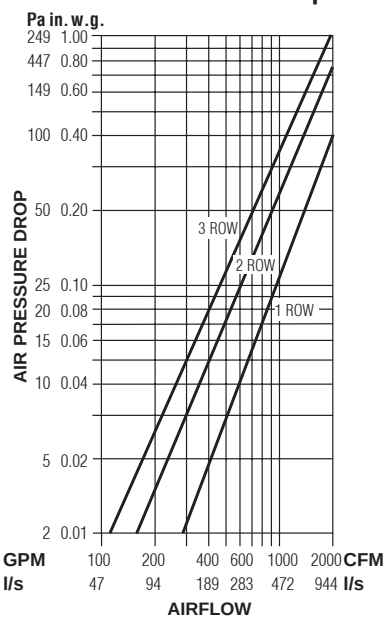
3 Row (multi-circuit)



Water Pressure Drop



Air Pressure Drop



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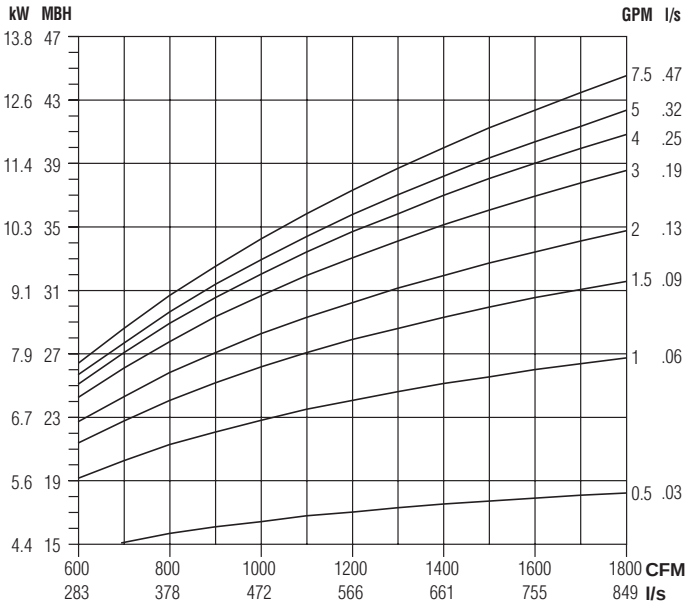
Performance Data • Hot Water Coil

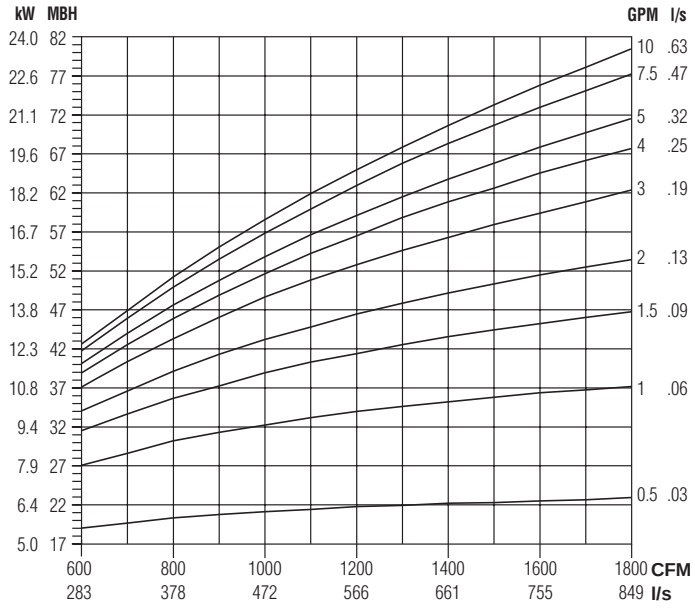
Model: 35SWXC • Series Flow

Unit Size 5

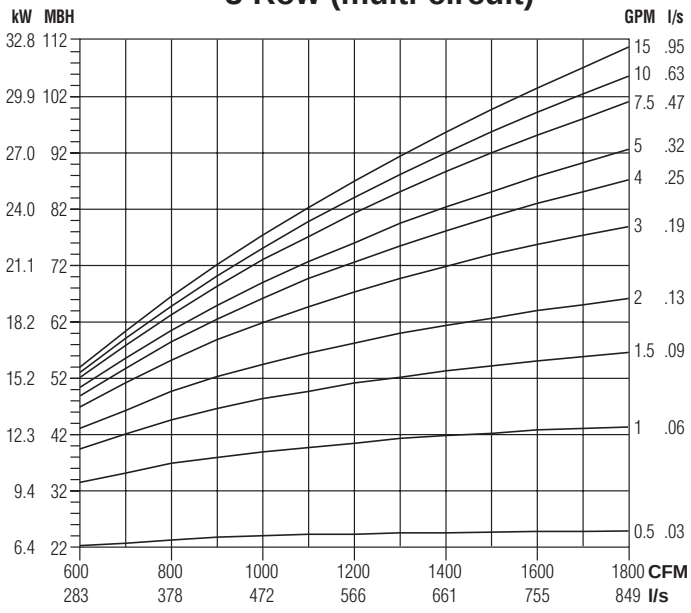
1 Row (multi-circuit)



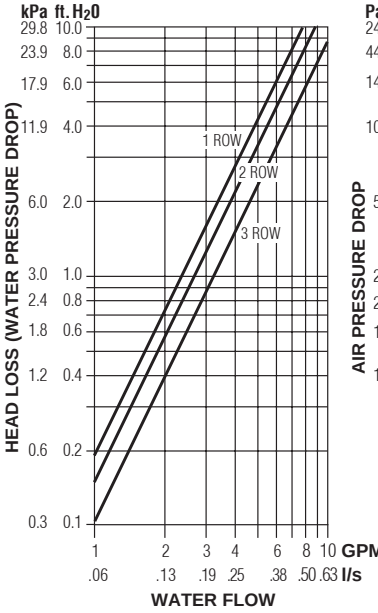
2 Row (multi-circuit)



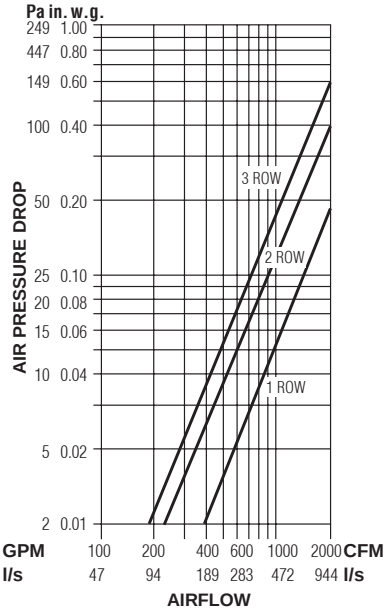
3 Row (multi-circuit)



Water Pressure Drop



Air Pressure Drop



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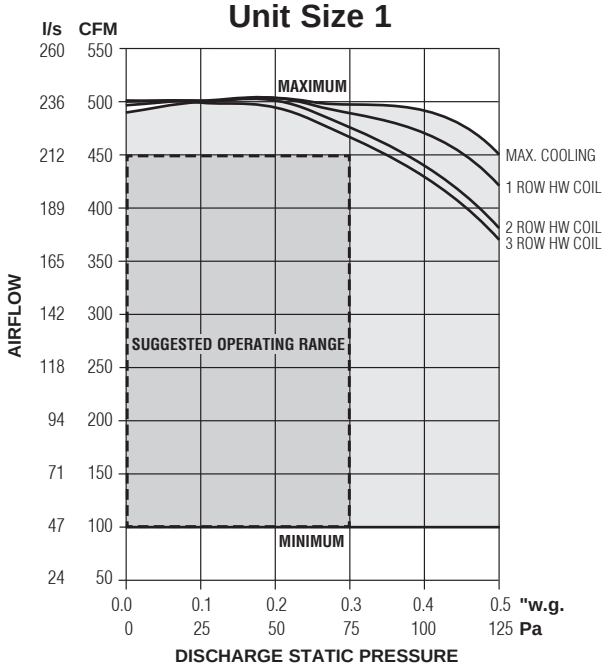
Factor	.455 (.459)	.545 (.541)	.636 (.639)	.727 (.721)	.818 (.820)	.909 (.918)	1.00 (1.00)	1.09 (1.10)	1.18 (1.18)	1.27 (1.28)	1.36 (1.36)

Performance Data

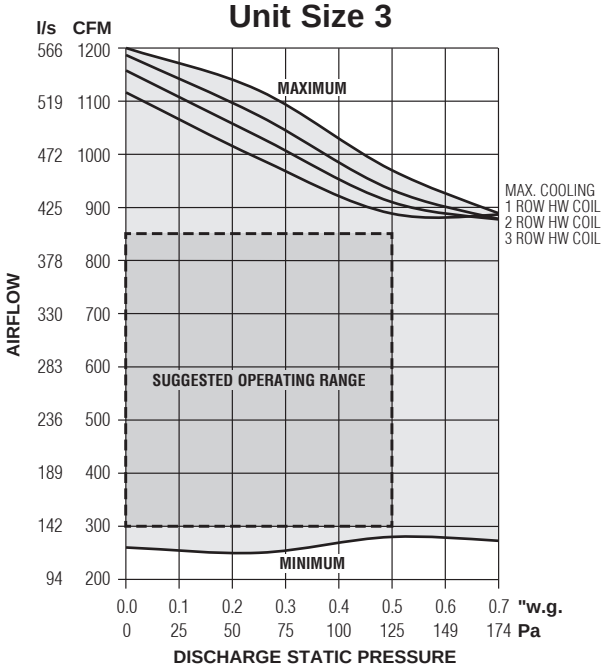
EPIC ECM Motor Fan Curves – Airflow vs. Downstream Static Pressure

Model Series 35SXC Stealth XC • Series Flow

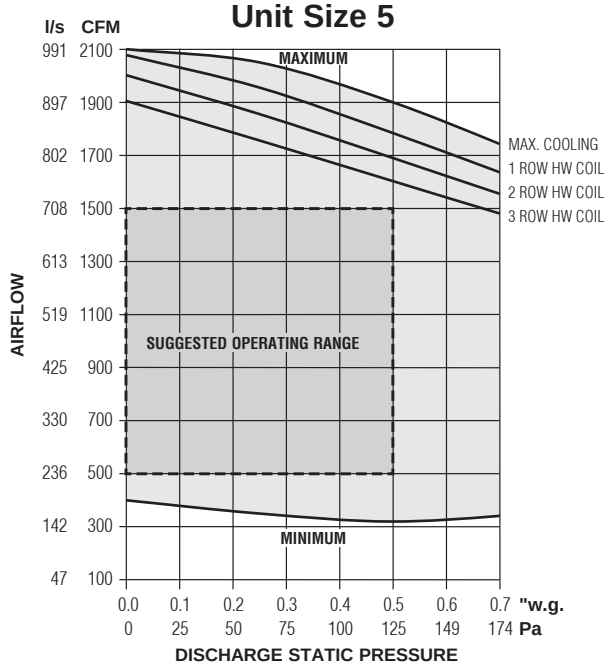
Unit Size 1



Unit Size 3



Unit Size 5



Electrical Data

Unit Size	EPIC ECM Motor FLA				
	Motor HP	120V	208V	240V	277V
1	*	2.1	1.4	1.3	1.2
3	*	4.8	3.4	3.0	3.0
5	*	9.9	6.4	6.1	5.9

* The EPIC ECM is a variable horsepower motor. Refer to Selectworks schedule for actual power consumption.
FLA = Full load amperage.
All motors are single phase/60 Hz.

NOTES:

- The EPIC ECM is a pressure independent constant volume device at set point and airflow does not vary with changing static pressure conditions. The motor compensates for any changes in static pressure such as filter loading.
- Airflow can be set to operate at any point within shaded area under the selected water coil curve using the EPIC volume controller card provided. Manual or Auto/Dynamic fan volume control can be selected on the EPIC card. The manual setting is for constant volume fan operation (adjustment is achieved using a pot. on the card). Dynamic variable volume fan airflow adjustment is achieved by a DDC controller based on room demand using an analog 0-10 VDC input.
- Selections within the suggested operating range (dashed lines) will help ensure acceptable sound levels and optimized energy efficiency.
- Fan curves shown are applicable to 120/208/240 and 277 volt, single phase EPIC ECM (motors).

Performance Data • NC Level Application Guide

Model Series 35SXC Stealth XC • Series Flow

Steri-Liner

Unit Size	Inlet Size	Primary Airflow cfm	Primary Airflow l/s	Fan cfm	Fan l/s	Min. inlet ΔPs "w.g.	Min. inlet ΔPs Pa	NC Levels @ Inlet Pressure (ΔPs) shown: DISCHARGE Fan Only	DISCHARGE Min. ΔPs	DISCHARGE 0.5 w.g. (125 Pa)	DISCHARGE 1.0" w.g. (250 Pa)	DISCHARGE 1.5" w.g. (375 Pa)	RADIATED Fan Only	RADIATED Min. ΔPs	RADIATED 0.5" w.g. (125 Pa)	RADIATED 1.0" w.g. (250 Pa)	RADIATED 1.5" w.g. (375 Pa)
1	4	350	165	400	189	0.01	2.5	23	27	28	28	28	-	-	23	25	25
		300	142	300	142	0.01	2.5	25	28	28	28	28	-	-	22	23	24
		150	71	200	95	0.01	2.5	-	-	-	-	-	-	-	-	20	20
		100	47	100	47	0.01	2.5	-	-	-	-	-	-	-	-	-	-
		75	35	75	35	0.01	2.5	-	-	-	-	-	-	-	-	-	-
	5	400	189	400	189	0.01	2.5	25	29	29	29	29	-	-	22	23	24
		250	118	300	142	0.01	2.5	25	27	27	27	27	-	-	-	21	22
		200	95	200	95	0.01	2.5	20	-	-	-	-	-	-	-	-	-
		100	47	100	47	0.01	2.5	-	-	-	-	-	-	-	-	-	-
		75	35	75	35	0.01	2.5	-	-	-	-	-	-	-	-	-	-
	6	400	189	400	189	0.01	2.5	25	28	28	28	28	-	-	21	22	23
		300	142	300	142	0.01	2.5	25	25	26	26	26	-	-	-	20	20
		200	95	200	95	0.01	2.5	20	-	-	-	-	-	-	-	-	-
		100	47	100	47	0.01	2.5	-	-	-	-	-	-	-	-	-	
		75	35	75	35	0.01	2.5	-	-	-	-	-	-	-	-	-	-
	8	400	189	400	189	0.01	2.5	25	25	26	26	26	-	-	-	20	21
		300	142	300	142	0.01	2.5	25	23	23	23	23	-	-	-	-	-
		200	95	200	95	0.01	2.5	20	-	-	-	-	-	-	-	-	-
		100	47	100	47	0.01	2.5	-	-	-	-	-	-	-	-	-	-
		75	35	75	35	0.01	2.5	-	-	-	-	-	-	-	-	-	-
3	6	550	260	550	260	0.01	2.5	-	28	29	29	29	22	-	26	27	28
		400	189	400	189	0.01	2.5	-	25	26	26	26	-	-	22	24	24
		300	142	300	142	0.01	2.5	-	23	23	23	23	-	-	-	20	21
		250	118	250	118	0.01	2.5	-	25	25	25	25	-	-	-	-	-
		200	95	200	95	0.01	2.5	-	23	23	23	23	-	-	-	-	-
	8	700	331	1100	520	0.01	2.5	22	26	27	27	27	25	-	24	25	26
		650	307	950	449	0.01	2.5	22	28	28	29	29	24	-	23	24	25
		500	236	700	331	0.01	2.5	-	26	26	26	26	21	-	20	21	22
		350	165	450	213	0.01	2.5	-	22	23	23	23	-	-	-	-	-
		200	95	200	95	0.01	2.5	-	21	21	21	22	-	-	-	-	-
	10	1100	520	1100	520	0.01	2.5	31	28	29	29	29	32	-	27	28	29
		950	449	950	449	0.01	2.5	28	27	27	28	28	30	-	25	27	27
		700	331	700	331	0.01	2.5	22	24	25	25	25	25	-	22	23	24
		450	213	450	213	0.01	2.5	-	23	23	23	23	-	-	-	-	-
		200	95	200	95	0.01	2.5	-	-	-	20	20	-	-	-	-	-
5	10	1100	520	1100	520	0.01	2.5	33	30	32	33	33	30	24	31	32	33
		900	425	900	425	0.01	2.5	33	29	32	33	33	25	18	26	27	28
		700	331	700	331	0.01	2.5	31	24	28	28	28	21	-	21	22	23
		650	307	650	307	0.01	2.5	31	23	26	27	27	-	-	-	-	-
		500	236	500	236	0.01	2.5	29	-	22	22	22	-	-	-	-	20
	12	1600	756	1600	756	0.01	2.5	35	33	36	37	37	36	29	36	37	38
		1300	615	1300	615	0.01	2.5	34	30	33	33	33	33	25	33	34	35
		1000	473	1000	473	0.01	2.5	34	28	31	32	32	29	21	28	29	30
		700	331	700	331	0.01	2.5	31	22	25	26	26	23	-	22	23	24
		500	236	500	236	0.01	2.5	29	-	-	20	20	-	-	-	-	-
	14	2100	993	2100	993	0.01	2.5	37	35	38	38	39	40	32	39	40	41
		1600	756	1600	756	0.01	2.5	37	34	37	38	38	36	28	35	36	37
		1350	638	1350	638	0.01	2.5	36	31	34	35	35	33	25	32	33	34
		900	425	900	425	0.01	2.5	33	24	27	27	28	27	-	25	26	27
		500	236	500	236	0.01	2.5	29	-	-	-	-	-	-	-	-	-

Performance Notes:

1. NC Levels are calculated based on procedures as outlined on page C160 (Specific application data requires acoustical evaluation - contact factory).
2. Dash (-) in space indicates a NC less than 20.

Performance Data • Discharge Sound Power Levels

Model Series 35SXC Stealth XC • Series Flow

Steri-Liner

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

Unit Size	Inlet Size	Primary Airflow		Fan		Min. inlet ΔPs		Fan Only						Fan and 100% Primary Air–Sound Power Octave Bands @ Inlet pressure (ΔPs) shown																	
														Minimum ΔPs						0.5" w.g. (125Pa) ΔPs						1.0" w.g. (249Pa)ΔPs						1.5" w.g. (375Pa) ΔPs					
		cfm	l/s	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
1	4	225	106	225	106	0.01	2.5	65	56	53	53	48	44	66	57	52	52	47	41	66	57	52	51	46	42	66	58	52	51	46	42	66	58	52	51	46	42
		200	95	200	95	0.01	2.5	64	55	52	51	46	41	64	54	49	49	44	38	64	55	49	49	44	38	64	55	49	49	44	38	64	55	49	49	44	38
		150	71	150	71	0.01	2.5	61	51	48	47	41	36	59	49	44	43	37	30	59	49	44	43	37	30	59	50	44	43	37	30	59	50	44	42	37	30
		100	47	100	47	0.01	2.5	57	47	44	40	34	28	52	41	36	34	28	19	52	42	36	34	27	19	52	42	36	34	27	19	52	42	36	34	27	19
		75	35	75	35	0.01	2.5	55	43	40	36	29	22	47	35	30	28	21	11	48	36	30	28	21	11	48	36	30	28	21	11	48	36	30	28	21	11
	5	400	189	400	189	0.01	2.5	71	63	60	62	58	55	74	67	62	63	59	56	75	68	62	63	59	56	75	68	62	62	59	56	75	68	62	62	59	56
		300	118	300	142	0.01	2.5	68	60	57	57	53	49	70	61	56	57	53	48	70	62	56	56	52	48	70	62	56	56	52	49	70	62	56	56	52	49
		200	95	200	95	0.01	2.5	64	55	52	51	46	41	63	53	48	48	43	37	63	54	48	48	43	37	63	54	48	48	43	37	63	54	48	48	43	37
		100	47	100	47	0.01	2.5	57	47	44	40	34	28	51	40	35	33	27	18	51	41	35	33	26	18	51	41	35	33	26	18	51	41	35	33	26	18
		75	35	75	35	0.01	2.5	55	43	40	36	29	22	46	34	29	27	20	10	47	35	29	27	20	10	47	35	29	27	20	10	47	35	29	27	20	10
	6	400	189	400	189	0.01	2.5	**71**	**63**	**60**	**62**	**58**	**55**	73	66	61	62	58	55	74	67	61	62	58	55	74	67	61	61	58	55	**74**	**67**	**61**	**61**	**58**	**55**
		300	142	300	142	0.01	2.5	68	60	57	57	53	49	69	60	55	56	52	47	69	61	55	55	51	47	69	61	55	55	51	48	69	61	55	55	51	48
		200	95	200	95	0.01	2.5	64	55	52	51	46	41	62	52	47	47	42	36	62	53	47	47	42	36	62	53	47	47	42	36	62	53	47	47	42	36
		100	47	100	47	0.01	2.5	57	47	44	40	34	28	50	39	34	32	26	17	50	40	34	32	25	17	50	40	34	32	25	17	50	40	34	32	25	17
		75	35	75	35	0.01	2.5	55	43	40	36	29	22	45	33	28	26	19	9	46	34	28	26	19	9	46	34	28	26	19	9	46	34	28	26	19	9
	8	400	189	400	189	0.01	2.5	71	63	60	62	58	55	71	64	59	60	56	53	72	65	59	60	56	53	72	65	59	59	56	53	72	65	59	59	56	53
		300	142	300	142	0.01	2.5	68	60	57	57	53	49	67	58	53	54	50	45	67	59	53	53	49	45	67	59	53	53	49	46	67	59	53	53	49	46
		200	95	200	95	0.01	2.5	64	55	52	51	46	41	60	50	45	45	40	34	60	51	45	45	40	34	60	51	45	45	40	34	60	51	45	45	40	34
		100	47	100	47	0.01	2.5	57	47	44	40	34	28	48	37	32	30	24	15	48	38	32	30	23	15	48	38	32	30	23	15	48	38	32	30	23	15
		75	35	75	35	0.01	2.5	55	43	40	36	29	22	43	31	26	24	17	7	44	32	26	24	17	7	44	32	26	24	17	7	44	32	26	24	17	7
3	6	550	260	550	260	0.01	2.5	76	67	64	63	58	55	72	64	64	59	55	52	74	66	64	60	57	54	74	66	65	60	57	55	75	67	65	61	57	55
		400	189	400	189	0.01	2.5	73	64	60	58	54	50	70	61	60	55	51	47	72	63	61	57	53	50	72	64	61	57	53	50	72	64	61	57	53	50
		300	142	300	142	0.01	2.5	70	60	57	54	50	45	68	59	57	52	48	43	70	61	58	53	49	45	70	61	58	54	50	46	70	61	58	54	50	46
		250	118	250	118	0.01	2.5	68	58	55	51	47	42	66	57	55	50	46	40	69	59	56	51	47	43	69	59	56	52	48	43	69	60	56	52	48	44
		200	95	200	95	0.01	2.5	66	56	52	48	44	38	65	55	52	47	43	36	67	57	53	49	45	39	68	58	54	49	45	40	68	58	54	49	45	40
	8	700	331	700	331	0.01	2.5	79	70	67	66	62	59	73	65	65	60	57	54	74	67	65	61	58	56	75	67	66	62	58	57	75	67	66	62	58	57
		650	307	650	307	0.01	2.5	78	69	66	65	61	58	72	64	64	59	56	53	74	66	65	60	57	55	74	66	65	61	57	56	74	67	65	61	58	56
		500	236	500	236	0.01	2.5	75	66	63	61	57	54	70	62	61	56	53	49	72	64	62	57	54	52	72	64	62	58	54	52	72	64	62	58	54	52
		350	165	350	165	0.01	2.5	72	62	59	56	52	48	67	59	57	52	48	44	69	61	58	54	50	46	70	61	58	54	50	47	70	61	58	54	50	47
		200	95	200	95	0.01	2.5	66	56	52	48	44	38	63	53	51	45	41	35	66	56	52	47	43	38	66	56	52	48	43	38	66	56	52	48	44	39
	10	1100	520	1100	520	0.01	2.5	**83**	**75**	**72**	**73**	**68**	**67**	74	68	68	64	61	60	76	69	69	65	62	62	76	70	69	65	62	62	**76**	**70**	**69**	**65**	**62**	**62**
		950	449	950	449	0.01	2.5	82	73	70	71	66	65	73	66	67	62	59	57	75	68	67	63	60	60	75	68	67	63	60	60	75	68	68	64	61	60
		700	331	700	331	0.01	2.5	79	70	67	66	62	59	71	63	63	58	55	53	73	65	64	60	57	55	73	66	64	60	57	55	73	66	64	60	57	56
		450	213	450	213	0.01	2.5	74	65	62	60	55	52	68	59	58	53	50	46	70	61	59	55	51	48	70	62	59	55	52	49	70	62	59	55	52	49
		200	95	200	95	0.01	2.5	66	56	52	48	44	38	62	52	49	44	40	33	64	54	50	46	42	36	65	55	51	46	42	37	65	55	51	46	42	37
5	10	1100	520	1100	520	0.01	2.5	76	73	71	71	67	66	74	70	69	68	64	61	76	72	71	70	67	65	77	73	71	70	67	66	77	73	72	70	68	67
		900	425	900	425	0.01	2.5	75	71	70	69	66	64	71	67	67	65	61	58	74	70	69	67	64	62	74	70	69	67	64	63	74	70	69	67	65	63
		700	331	700	331	0.01	2.5	73	70	68	67	64	62	68	64	64	61	57	54	70	66	66	63	60	58	71	67	66	63	60	59	71	67	66	64	61	59
		600	284	600	284	0.01	2.5	72	69	67	66	62	et	66	62	62	59	55	51	68	64	64	61	57	55	68	65	64	61	58	56	69	65	64	61	58	57
		500	236	500	236	0.01	2.5	71	68	66	65	61	59	63	60	60	56	52	48	65	62	62	58	55	52	66	62	62	58	55	53	66	62	62	59	55	54
	12	1600	756	1600	756	0.01	2.5	78	75	73	74	70	69	77	73	72	71	68	65	80	76	74	74	71	70	80	76	74	74	71	70	80	76	74	74	71	71
		1300	615	1300	615	0.01	2.5	77	74	72	72	68	67	74	70	69	68	65	62	77	73	71	70	67	66	77	73	71	71	68	67	78	73	72	71	68	67
		1000	473	1000	473	0.01	2.5	75	72	70	70	66	65	71	67	66	64	61	58	73	69	68	66	63	62	74	70	68	67	64	63	74	70	69	67	64	63
		700	331	700	331	0.01	2.5	73	70	68	67	64	62	66	62	62	59	55	52	68	64	64	61	58	56	69	65	64	61	58	57	69	65	64	62	59	57
		500	236	500	236	0.01	2.5	71	68	66	65	61	59	61	58	58	54	50	46	63	60	60	56	53	50	64	60	60	56	53	51	64	60	60	57	53	52
	14	2050	969	2050	969	0.01	2.5	**79**	**77**	**74**	**76**	**72**	**71**	79	75	73	73	70	67	81	77	75	75	73	72	82	77	75	76	73	72	**82**	**78**	**75**	**76**	**73**	**73**
		1600	756	1600	756	0.01	2.5	78	75	73	74	70	69	75	71	70	69	66	63	78	74	72	72	69	68	78	74	72	72	69	68	78	74	72	72	69	69
		1350	638	1350	638	0.01	2.5	77	74	72	72	69	67	73	69	68	67	63	61	75	71	70	69	66	65	76	72	70	69	67	66	76	72	70	70	67	66
		900	425	900	425	0.01	2.5	75	71	70	69	66	64	67	63	63	61	57	54	70	66	65	63	60	58	70	66	65	63	60	59	70	66	65	63	61	59
		500	236	500	236	0.01	2.5	71	68	66	65	61	59	59	56	56	52	48	44	61	58	58	54	51	48	62	58	58	54	51	49	62	58	58	55	51	50

For performance table notes, see page C104; highlighted **numbers** indicate embedded AHRI certification points.

Performance Data • Radiated Sound Power Levels

Model Series 35SXC Stealth XC • Series Flow

Steri-Liner

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VAV Terminals
AHRI Standard 880

Unit Size	Inlet Size	Primary Airflow		Fan		Min. inlet ΔPs		Fan Only						Fan and 100% Primary Air–Sound Power Octave Bands @ Inlet pressure (ΔPs) shown																	
														Minimum ΔPs						0.5" w.g. (125Pa) ΔPs						1.0" w.g. (249Pa)ΔPs						1.5" w.g. (375Pa) ΔPs					
		cfm	l/s	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
1	4	225	106	225	106	0.01	2.5	54	49	43	38	34	30	50	45	38	32	26	22	55	51	44	39	34	33	55	52	45	40	35	35	56	52	46	41	36	36
		200	95	200	95	0.01	2.5	52	47	40	35	30	27	49	43	36	30	25	21	53	49	42	37	32	31	54	50	43	39	33	33	54	50	44	39	34	35
		150	71	150	71	0.01	2.5	50	44	37	31	25	23	47	40	33	27	22	18	51	46	39	35	29	29	51	47	40	36	31	31	52	47	41	37	31	32
		100	47	100	47	0.01	2.5	47	39	32	23	16	16	43	35	28	23	18	14	47	40	34	30	25	25	47	41	35	31	26	27	48	42	35	32	27	28
		75	35	75	35	0.01	2.5	45	37	30	20	13	13	41	32	26	21	16	13	45	38	32	28	23	23	46	39	33	30	25	25	46	40	33	30	25	27
	5	400	189	400	189	0.01	2.5	54	49	43	38	34	30	53	48	41	35	29	25	58	54	47	42	37	36	58	55	48	43	38	38	59	55	49	44	39	39
		250	118	300	142	0.01	2.5	52	47	40	35	30	27	52	46	39	33	28	24	56	52	45	40	35	34	57	53	46	42	36	36	57	53	47	42	37	38
		200	94	200	95	0.01	2.5	50	44	37	31	25	23	50	43	36	30	25	21	54	49	42	38	32	32	54	50	43	39	34	34	55	50	44	40	34	35
		100	47	100	47	0.01	2.5	47	39	32	23	16	16	46	38	31	26	21	17	50	43	37	33	28	28	50	44	38	34	29	30	51	45	38	35	30	31
		75	35	75	35	0.01	2.5	45	37	30	20	13	13	44	35	29	24	19	16	48	41	35	31	26	26	49	42	36	33	28	28	49	43	36	33	28	30
	6	400	189	400	189	0.01	2.5	**54**	**49**	**43**	**38**	**34**	**30**	52	47	40	34	28	24	57	53	46	41	36	35	57	54	47	42	37	37	**58**	**54**	**48**	**43**	**38**	**38**
		300	142	300	142	0.01	2.5	52	47	40	35	30	27	51	45	38	32	27	23	55	51	44	39	34	33	56	52	45	41	35	35	56	52	46	41	36	37
		200	94	200	95	0.01	2.5	50	44	37	31	25	23	49	42	35	29	24	20	53	48	41	37	31	31	53	49	42	38	33	33	54	49	43	39	33	34
		100	47	100	47	0.01	2.5	47	39	32	23	16	16	45	37	30	25	20	20	49	42	36	32	27	27	49	43	37	33	28	29	50	44	37	34	29	30
		75	35	75	35	0.01	2.5	45	37	30	20	13	13	43	34	28	23	18	15	47	40	34	30	25	25	48	41	35	32	27	27	48	42	35	32	27	29
	8	400	189	400	189	0.01	2.5	54	49	43	38	34	30	50	45	38	32	26	22	55	51	44	39	34	33	55	52	45	40	35	35	56	52	46	41	36	36
		300	142	300	142	0.01	2.5	52	47	40	35	30	27	49	43	36	30	25	21	53	49	42	37	32	31	54	50	43	39	33	33	54	50	44	39	34	35
		200	94	200	95	0.01	2.5	50	44	37	31	25	23	47	40	33	27	22	18	51	46	39	35	29	29	51	47	40	36	31	31	52	47	41	37	31	32
		100	47	100	47	0.01	2.5	47	39	32	23	16	16	43	35	28	23	18	14	47	40	34	30	25	25	47	41	35	31	26	27	48	42	35	32	27	28
		75	35	75	35	0.01	2.5	45	37	30	20	13	13	41	32	26	21	16	13	45	38	32	28	23	23	46	39	33	30	25	25	46	40	33	30	25	27
3	6	550	260	550	260	0.01	2.5	60	53	46	41	37	33	57	50	44	34	28	22	63	57	50	43	40	38	64	58	51	44	42	41	65	59	52	45	43	43
		400	189	400	189	0.01	2.5	56	49	42	36	31	26	54	47	41	31	25	19	60	54	47	40	37	36	61	55	48	41	39	38	62	56	49	42	41	40
		300	142	300	142	0.01	2.5	53	46	39	31	25	20	51	44	38	29	23	17	57	51	44	37	35	33	59	52	45	39	37	36	59	53	46	40	38	38
		250	118	250	118	0.01	2.5	52	43	37	28	21	16	50	42	37	27	21	16	56	49	43	36	33	32	57	50	44	37	36	35	58	51	44	38	37	36
		200	94	200	95	0.01	2.5	49	41	34	25	17	11	48	40	35	25	20	14	54	47	40	33	32	30	55	48	41	35	34	33	56	49	42	36	35	35
	8	700	330	700	331	0.01	2.5	62	56	49	45	42	38	53	48	41	35	29	25	58	54	47	42	37	36	58	55	48	43	38	38	59	55	49	44	39	39
		650	307	650	307	0.01	2.5	61	55	48	43	41	37	52	46	39	32	27	23	56	51	45	40	35	34	56	52	46	41	36	36	57	53	47	42	37	37
		500	236	500	236	0.01	2.5	59	52	45	39	35	31	50	43	36	30	25	21	54	49	42	38	32	32	54	50	43	39	34	34	55	50	44	40	34	35
		350	165	350	165	0.01	2.5	55	48	41	33	28	23	46	38	31	26	21	17	50	43	37	33	28	28	50	44	38	34	29	30	51	45	38	35	30	31
		200	94	200	95	0.01	2.5	49	41	34	25	17	11	44	35	29	24	19	16	48	41	35	31	26	26	49	42	36	33	28	28	49	43	36	33	28	30
	10	1100	519	1100	520	0.01	2.5	**67**	**62**	**54**	**52**	**51**	**48**	57	51	45	34	27	21	63	58	51	43	39	38	64	59	52	44	41	41	**65**	**60**	**52**	**45**	**43**	**42**
		950	448	950	449	0.01	2.5	65	60	52	49	48	45	56	49	43	33	26	20	62	56	49	42	38	37	63	57	50	43	40	39	64	58	51	44	41	41
		700	330	700	331	0.01	2.5	62	56	49	45	42	38	53	46	40	30	24	18	59	53	46	39	36	34	60	54	47	40	38	37	61	55	48	41	39	39
		450	212	450	213	0.01	2.5	58	51	44	37	33	29	49	42	36	26	20	20	55	49	42	35	32	31	56	50	43	36	34	33	57	51	44	37	35	35
		200	94	200	95	0.01	2.5	49	41	34	25	17	11	42	34	29	19	14	8	48	41	34	27	26	24	49	42	35	29	28	27	50	43	36	30	29	29
5	10	1100	520	1100	520	0.01	2.5	66	59	49	45	44	41	61	54	44	35	33	31	67	60	51	42	41	40	68	61	52	44	42	41	69	61	53	44	43	42
		900	425	900	425	0.01	2.5	64	56	47	41	39	36	59	51	42	33	31	29	64	57	49	40	38	38	65	58	50	41	40	39	66	59	51	42	41	40
		700	331	700	331	0.01	2.5	61	53	43	37	34	30	55	48	39	30	28	26	61	54	46	37	36	35	62	55	47	39	37	36	63	55	48	39	38	37
		600	284	600	284	0.01	2.5	59	51	41	34	30	26	53	45	37	28	26	24	59	51	44	36	34	33	60	52	45	37	36	34	60	53	46	38	36	35
		500	236	500	236	0.01	2.5	57	49	39	30	26	22	51	43	35	26	24	22	56	49	42	34	32	31	57	50	43	35	34	32	58	51	43	36	34	33
	12	1600	756	1600	756	0.01	2.5	71	64	54	52	52	50	65	58	48	38	36	35	71	64	55	46	43	43	72	65	56	47	45	45	72	66	57	48	46	46
		1300	615	1300	615	0.01	2.5	68	61	51	48	48	45	63	55	45	36	33	32	68	61	52	43	41	41	69	62	53	45	43	43	70	63	54	45	44	43
		1000	473	1000	473	0.01	2.5	65	58	48	43	42	39	59	51	42	33	31	29	65	57	49	40	39	38	66	58	50	42	40	39	66	59	51	42	41	40
		700	331	700	331	0.01	2.5	61	53	43	37	34	30	54	47	38	29	27	25	60	53	45	36	35	34	61	54	46	38	36	35	62	54	47	38	37	36
		500	236	500	236	0.01	2.5	57	49	39	30	26	22	50	42	34	25	23	21	55	48	41	33	31	30	56	49	42	34	33	31	57	50	42	35	33	32
	14	2050	969	2050	969	0.01	2.5	**74**	**67**	**57**	**56**	**58**	**57**	68	60	50	40	37	37	73	66	57	47	45	45	74	67	58	49	46	47	**75**	**68**	**59**	**49**	**47**	**48**
		1600	756	1600	756	0.01	2.5	71	64	54	52	52	50	64	57	47	37	35	34	70	63	54	45	42	42	71	64	55	46	44	44	71	65	56	47	45	45
		1350	638	1350	638	0.01	2.5	69	61	52	49	48	46	62	55	45	36	33	32	68	61	52	43	41	40	69	62	53	44	42	42	69	62	54	45	43	43
		900	425	900	425	0.01	2.5	64	56	47	41	39	36	57	49	40	31	29	29	62	55	47	38	36	36	63	56	48	39	38	37	64	57	49	40	39	38
		500	236	500	236	0.01	2.5	57	49	39	30	26	22	49	41	33	24	22	20	54	47	40	32	30	29	55	48	41	33	32	30	56	49	41	34	32	31

For performance table notes, see page C104; highlighted **numbers** indicate embedded AHRI certification points.

Performance Data • AHRI Certification and Performance Notes

Model Series 35SXC Stealth XC • Series Flow • AHRI Certification Rating Points

Steri-Liner

Unit Size	Inlet Size	Fan Airflow		Fan$^{\Sigma}$ Watts	Fan Only* @ .25" w.g. (62 Pa) ΔPs												Primary Airflow		Min. Inlet ΔPs		Fan + 100% Primary @ 1.5" w.g. (375 Pa) ΔPs w/ .25" w.g. (62 Pa) Discharge ΔPs					
					Discharge						Radiated										Radiated					
		cfm	l/s		2	3	4	5	6	7	2	3	4	5	6	7	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7
1	6	400	189	107	71	63	60	62	58	55	54	49	43	38	34	30	400	189	0.01	2.5	58	54	48	43	38	38
3	10	1100	520	390	83	75	72	73	68	67	67	62	54	52	51	48	1100	520	0.01	2.5	65	60	52	45	43	42
5	14	2050	969	400	79	77	74	76	72	71	74	67	57	56	58	57	2050	969	0.01	2.5	75	68	59	49	47	48

$^{\Sigma}$ Motor = ECM.

* Primary air valve is closed and therefore primary cfm is zero.

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VAV Terminals
AHRI Standard 880

Ratings are certified in accordance with AHRI Standards.

Performance Notes for Sound Power Levels:

1. Discharge (external) static pressure is 0.25" w.g. (63 Pa) in all cases, which is the difference (ΔPs) in static pressure from terminal discharge to the room.

   Discharge Sound Power Levels (SWL) include duct end reflection energy as part of the standard rating. Including the duct end correction provides sound power levels that would normally be transmitted into an acoustically, non-reflective duct. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI certified data. For more information on duct end reflection calculations see AHRI Standard 880.
2. Radiated sound power is the breakout noise transmitted through the unit casing walls and induction port.
3. Sound power levels are in decibels, dB re 10^{-12} watts.
4. All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation. Dash (-) in space indicates sound power level is less than 20 dB or equal to background.
5. Min. inlet ΔPs is the minimum operating pressure of the primary air valve section.
6. Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.
7. Data derived from independent tests conducted in accordance with ANSI / ASHRAE Standard 130 and AHRI Standard 880.

Electric Heating Coils

Features, Selection and Capacities

Nailor Electric Coils are tested with terminal units in accordance with UL Standard 1995 and meet all requirements of the NEC (National Electric Code) and CSA (Canadian Standards Association). Units are listed and labeled by the ETL Testing Laboratory as a total package. All controls are enclosed in a NEMA 1 electrical enclosure on the side of the fan package for easy access.

All wiring for the motor and heater terminates in the enclosure for single point electrical connection in the field. Each unit is supplied with a wiring diagram. Note: NEC requires a means to disconnect the heater power supply within sight or on the terminal.

Standard Features:

- Automatic reset high limit thermal cut-outs.
- Magnetic contactors per stage on terminals with DDC or analog electronic controls.
- P.E. switch per stage to carry load or pilot duty with magnetic contactors as required with pneumatic control.
- Positive pressure airflow safety switch.
- P.E. switch for fan on parallel terminals (P35NE) with pneumatic control.
- Fan relay for DDC fan terminals.
- Control voltage transformer (Class II) for DDC or analog electronic terminals.
- Class A 80/20 Ni/Cr wire.

Options:

- Toggle disconnect switch.
- Door interlocking disconnect switch.
- Mercury contactors.
- Power circuit fusing.
- Dust tight control enclosure.
- Manual reset high limits.
- SCR Control.

SCR Control Option:

The SCR (Silicon Controlled Rectifier) option provides infinite solid state heater control using a proportional signal (0 – 10 Vdc or 4 – 20 mA). This option may be specified compatible with pneumatic, analog electronic or digital (DDC) controls.

Time proportional control of the electric heater provides superior comfort and energy savings. The SCR controller modulates the heater to supply the exact amount of heat based upon the zone requirement. Room set points are maintained more accurately, undershoot and overshoot as associated with staged heat are eliminated, reducing operation costs.

SCR controllers provide silent operation, as mechanical staged contactors are eliminated. Zero cross switching of the thyristor prevents electrical noise.

Models	Unit Size	Maximum KiloWatts - 1 Stage Heat				
		120 Volt 1 phase	208/240 Volt 1 phase	277 Volt 1 phase	208 Volt 3 phase	480 & 600 Volt 3 phase
33SZE	30	4.5	10*	11.5	14.5	15
	40	4.5	10*	11.5	14.5	18
	50	4.5	10*	11.5	14.5	25
35SE 35SEST	1	–	8	8	10	8
	2	–	8	8	10	8
	3	–	8	11.5	10	14
	4	–	8	11.5	10	16
	5	–	8	11.5	14.5	20.5
	6	–	8	11.5	14.5	26
	7	–	8	11.5	14.5	30
37SE 37SEST	1	–	5.5	5.5	5.5	5.5
	2	–	10.5**	12	12	12
	3	–	10***	12	15.5	17
	4	–	8	11.5	14.5	27
35NE	2	–	8	8	10	8
	3	–	8	11.5	10	14
	5	–	8	11.5	14.5	20.5
	6	–	8	11.5	14.5	26
37NE	2	–	8	11.5	11.5	11.5
	3	–	8	11.5	13.5	16
	4	–	8	11.5	14.5	27

*208V max is 8.5
**208V max is 9.0
***208V max is 8.5

Recommended Selection:

The table above is a quick reference guide, to illustrate the relationship between electrical power supply, heater capacity in kiloWatts and terminal unit size that are available for fan powered units.

- Digital and pneumatic control terminals are available with up to 3 stages of heat. Analog electronic control terminals are available with 1 or 2 stages of heat only. A minimum of 0.5 kW per stage is required.
- Voltage and kilowatt ratings are sized so as not to exceed 48 amps, in order to avoid the NEC code requirement for circuit fusing.
- A minimum airflow of 70 cfm (33 l/s) per kW is required for any given terminal in order to avoid possible nuisance tripping of the thermal cutouts.
- Discharge air temperature should not exceed 120°F (49°C).

Intertek

Tested and approved to the following standards:

ANSI/UL 1995, 1st. ed.

CSA C22.2 No. 236.

Electric Heating Coils (continued)

Application Guidelines

Discharge Air Temperature

When considering the capacity and airflow for the heater, discharge air temperature can be an important factor. Rooms use different types of diffusers and they are intended to perform different functions. Slots that blend the air at the glass and set up air curtains within the room, must be able to blow the air very low in the room. Hot air will be too buoyant to be effective in this case. Discharge air temperatures for this application should be in the 85 – 90°F (29 – 32°C) range.

Diffusers in the center of the room blend their discharge air as it crosses the ceiling. Discharge air temperatures in this application can be as high as 105°F (41°C) and still be effective. However, if the return air grilles are in the discharge air pattern, the warm air will be returned to the plenum before it heats the room. Again, the air temperature needs to be blended down to an acceptable temperature that can be forced down into the occupied space by the time the air gets to the walls. Discharging warm air into the room at temperatures above 105°F (41°C) usually will set up stratification layers and will not keep the occupants warm if there is a ceiling return because only the top 12" – 24" (300 – 600 mm) of the room will be heated.

The maximum approved discharge air temperature for any Nailor Fan Powered Terminal Unit with supplemental heat is 120°F (49°C). No heater should be applied to exceed this temperature.

Electric Heater Selection

To properly select an electric heater, three things must be determined: the heat requirement for the room, the entering air temperature and the desired discharge air temperature. The heat requirement for the room is the sum of the heat loss calculation and the amount of heat required to raise the entering air temperature to the desired room temperature. Usually, the second item is small compared to the first for fan powered terminal units in a return air plenum. MBH can be converted to kW by using the chart or by calculation. There are 3.413 MBH in 1 kW. If using the chart, find the MBH on the left scale, then move horizontally to the right and read kW.

Next, the desired discharge air temperature should be ascertained. This will depend on the type of diffusers that are in the room.

The desired heating airflow for the room can then be calculated using the following equation:

$$cfm = \frac{kW \times 3160}{\Delta t \text{ (discharge air temp} - \text{inlet air temp.) °F}}$$

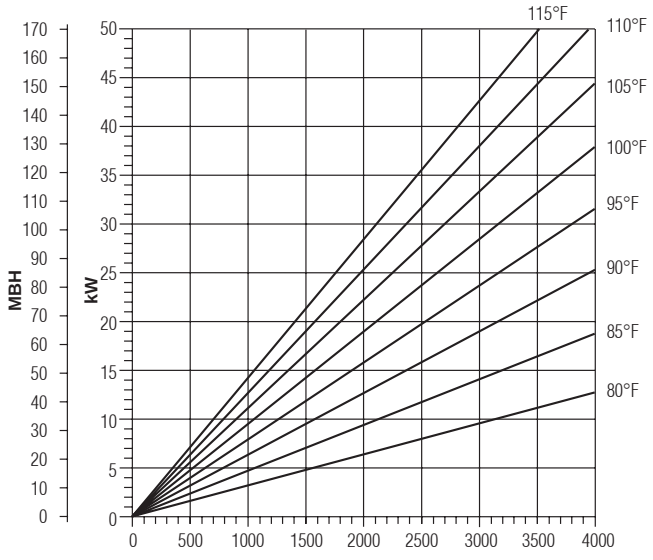
Assuming 70°F (21°C) supply air temperature to the heater, the room airflow can be selected directly from the chart. Start at the left at the design kW. Move horizontally to the desired discharge air temperature. Then, move vertically down to the cfm at the bottom of the chart.

The kW can be selected directly from the chart. Start at the bottom with the design cfm into the room. Move vertically up to the line that represents the desired discharge air temperature. Then, move left to the kW.

The discharge air temperature can also be selected directly from the chart. Start at the bottom with the design cfm into the room. Move to the left side of the chart and find the design kW. Move horizontally and vertically into the chart until the lines intersect. The intersection will be the desired discharge air temperature. Interpolation between the curves is linear.

Heater Selection Chart

Assuming 70°F inlet air temperature at heater.



Diagonal lines are constant output temperature.

Nailor® Industries Inc.

IOM

Installation and Operation Manual

EZvav Digital Controls

www.nailor.com

Date: 7-2016 Supersedes: 6-2016 IOM-EZVAVINST

CONTENTS

CONTENTS (Con't)

Section 1: About the Controllers

This section provides a description of the EZvav series of controllers. It also introduces safety information. Review this material before selecting, installing, or operating the controllers.

The EZvav series of controllers are an easy and unique approach to operating a wide variety of VAV terminal units. The integrated actuators, internal airflow sensors, and wide variety of application programs make these BACnet Application Specific controllers ideal for either new or retrofit installations.

The controllers feature simple, menu driven setup choices when used with a EZvav digital sensor. No special programming skills or software tools are required to choose applications, enter set points, set network addressing, and balance airflow. All options can be set by using a STE-8001W36 sensor and can be installed as the permanent room sensor or temporarily connected as a technician's service tool.

All models are BACnet Application Specific Controllers that are ready to connect to a BACnet MS/TP network. Device instance, MAC address, and baud rate are set from an STE-8001W36 without special software.

Model BAC-8001-36 is supplied with inputs, outputs, and sequences of operation for the following functions.

- Single duct heating and cooling VAV.
- Automatic heating/cooling changeover including morning warm up.
- Occupancy setback—requires STE-8201W36.
- System diagnostic indicators.
- Airflow balancing.

Model BAC-8005-36 and **BAC-8205-36** are supplied with inputs, outputs, and sequences of operation for the following functions.

- Single duct heating and cooling VAV.
- Modulating, floating, and staged reheat.
- Series and parallel fan control.
- Automatic heating/cooling changeover including morning warm up.
- Discharge air temperature limiting.
- Occupancy setback—requires STE-8201W36.
- Actuator position feedback for true damper positioning (BAC-8205-36 only).
- System diagnostic indicators.
- Airflow balancing.

Model BAC-8007-36 is supplied with inputs, outputs, and sequences of operation for the following functions.

- Dual duct VAV heating and cooling.
- Occupancy setback—requires STE-8201W36.
- System diagnostic indicators.
- Airflow balancing.

Additional topics in this section

Specifications

EZvav specifications are subject to change without notice.

Inputs and outputs

All inputs and outputs are factory programmed and application specific. No field configuration is required. For details on input and output connections, see the topic Application drawings on page 29. For a detailed listing of input and output objects, see the topic BACnet objects on 44.

Analog inputs

Analog inputs represent BACnet analog input. Not all input are applicable or required for all models.

Key features	IP/SI standard units of measure. Overvoltage input protection
Connectors	RJ-45 room sensor jack Screw terminals for wire sizes 12 – 26 AWG
Conversion	12 – bit analog–to–digital conversion
Input range	Passive, 10 kΩ pull-up to 3.3 volts DC

Analog outputs

Analog outputs are configured to represent BACnet analog output objects. No field configuration is required. For details on application specific output connections see the section Application drawings on page 29.

Key features	Output short protection IP/SI standard units of measure
Connector	Screw terminals for wire size 12 – 26 AWG
Conversion	12 – bit digital-to-analog conversion
Output voltage	0 – 10 VDC
Output current	30 mA per output, 30 mA total for all analog outputs

Binary outputs

Binary outputs are configured to represent BACnet binary output objects. No field configuration is required. For details on application specific output connections see the section Application drawings on page 29.

Key features	Optically isolated triac output
Connector	Screw terminals for wire size 12 – 26 AWG
Output range	Maximum switching 24 Volts AC 1 ampere per external output, 3 amperes total

Communications—BACnet MS/TP

- EIA – 485 operating at rates up to 76.8 kilobaud.
- Removable screw terminal block.
- Wire size 12 – 26 AWG.
- Switch selected end of line termination.

Memory

- Programs and program parameters are stored in nonvolatile memory.
- Auto restart on power failure.

Air flow sensor features

- Configured as BACnet analog input object.
- CMOS differential pressure 0 – 2 inches of water (0 – 500 Pa) measurement range. Internally linearized and temperature compensated.
- Span accuracy 4.5% of reading.
- Zero point accuracy 0.0008 in. H2O/0.2 Pa at 77°F (25°C).
- Barbed connections for 1/4 inch (6.35 mm) FR tubing.

Actuator Specifications

Torque	40 in-lb. (4.5 N.m)
Angular rotation	0 to 95° Adjustable end stops at 45° and 60° rotation
Motor timing	90 sec./90° at 60 Hz
BAC-8001-36,BAC-8005-36, BAC-8007-36	108 sec./90° at 50 Hz
Motor timing BAC-8205-36	60 sec./90° at 60 Hz
Shaft size	Directly mounts on 3/8 to 5/8 inch (9.5 to 16 mm) round or 3/8 to 7/16 inch (9.5 to 11 mm) square damper shafts.

Regulatory

- UL 916 Energy Management Equipment.
- BACnet Testing Laboratory listed as an application specific controller (ASC).
- CE compliant.
- SASO PCP Registration KSA R-103263.
- FCC Class B, Part 15, Subpart B and complies with Canadian ICES-003 Class B.

  This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

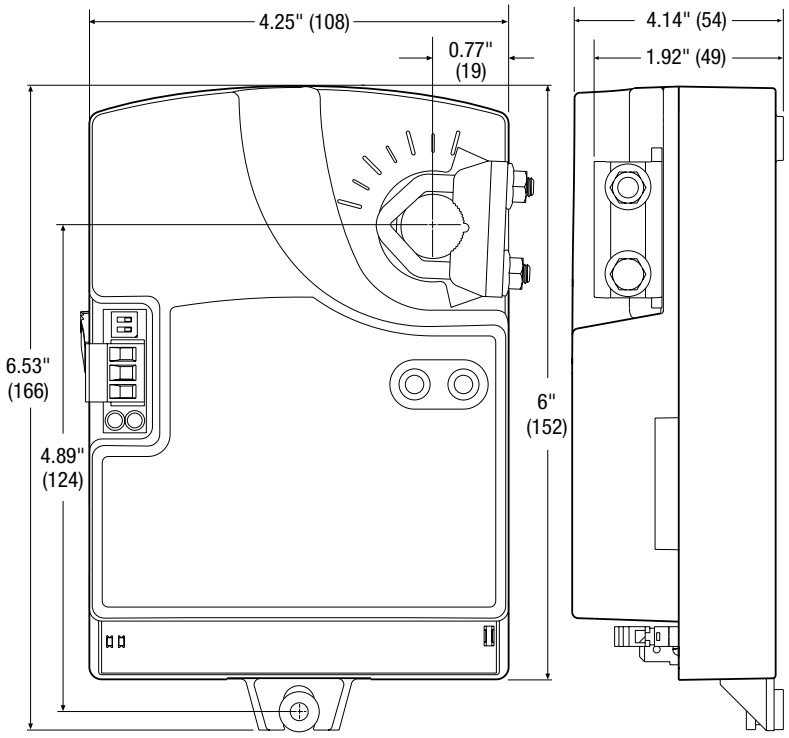
Installation

Supply voltage	24 volts AC, -15%, +20% 5 VA, 50/60 Hz
Weight	13.2 ounces (376 grams)
Case material	Flame retardant plastic

Environmental limits

Operating	32 to 120° F (0 to 49° C)
Shipping	–40 to 140° F (–40 to 60° C)
Humidity	5 – 93% relative humidity (non condensing)

Dimensions



Safety Considerations

Nailor assumes the responsibility for providing you a safe product and safety guidelines during its use. Safety means protection to all individuals who install, operate, and service the equipment as well as protection of the equipment itself. To promote safety, we use hazard alert labeling in this manual. Follow the associated guidelines to avoid hazards.

DANGER represents the most severe hazard alert. Bodily harm or death will occur if danger guidelines are not followed.

WARNING represents hazards that could result in severe injury or death.

CAUTION indicates potential personal injury or equipment or property damage if instructions are not followed.

Note: Notes provide additional information that is important.

Tip: Provides programing tips and shortcuts that may save time.

Section 2: Installing the Controllers

This section provides important instructions and guidelines for installing the Nailor EZvav controllers. Carefully review this information before installing the controller.

Installing Nailor EZvav includes the following topics that are covered in this section.

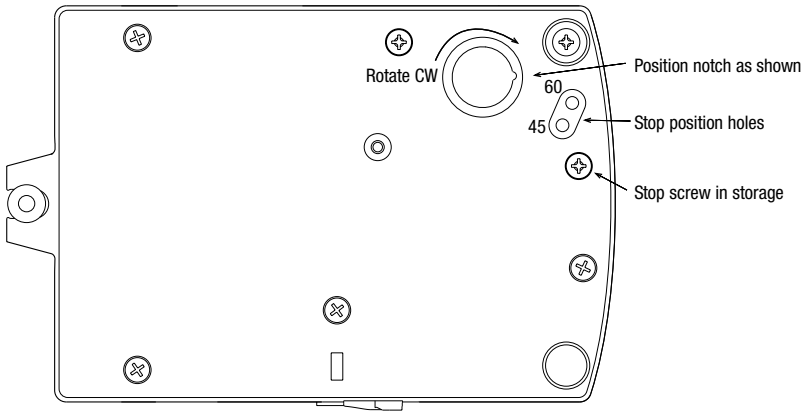
Installation topics in this section

Setting the Rotation Limits

Nailor EZvav controllers are manufactured for a damper that rotates 90 degrees from open to close. If the VAV damper is not a 90 degree damper, set the rotation limits to 45 or 60 degrees before mounting the controller.

CAUTION Setting rotation limits that do not match the VAV damper may result in improper operation or equipment damage.

Figure 2-1 Controller rotation limit selections



To set the rotational limits, do the following:

1. Turn the controller over so you have access to the back.
2. Manually rotate the actuator fully clockwise as viewed from the back.
3. Remove the stop screw from its storage location and clean any debris from the threads.
4. Insert the screw into the correct stop position hole.
5. Tighten the screw only until the head touches the plastic in the bottom of the recess.

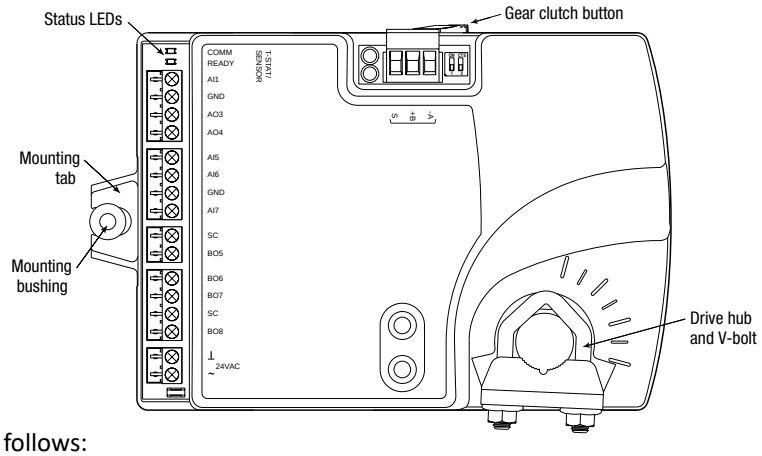
Mounting on a VAV Terminal Unit

Mount the controller inside of a metal enclosure. To maintain RF emissions specifications, use either shielded connecting cables or enclose all cables in conduit.

Mount the controller directly over the damper shaft. A minimum shaft length of 2.0 inch (51 mm) is required.

Note: Nailor EZvav controllers are designed to directly mount to 3/8 to 5/8 inch (9.5 to 16 mm) round or 3/8 to 7/16 inch (9.5 to 11 mm) square damper shafts.

Figure 2-2 Control and indicators



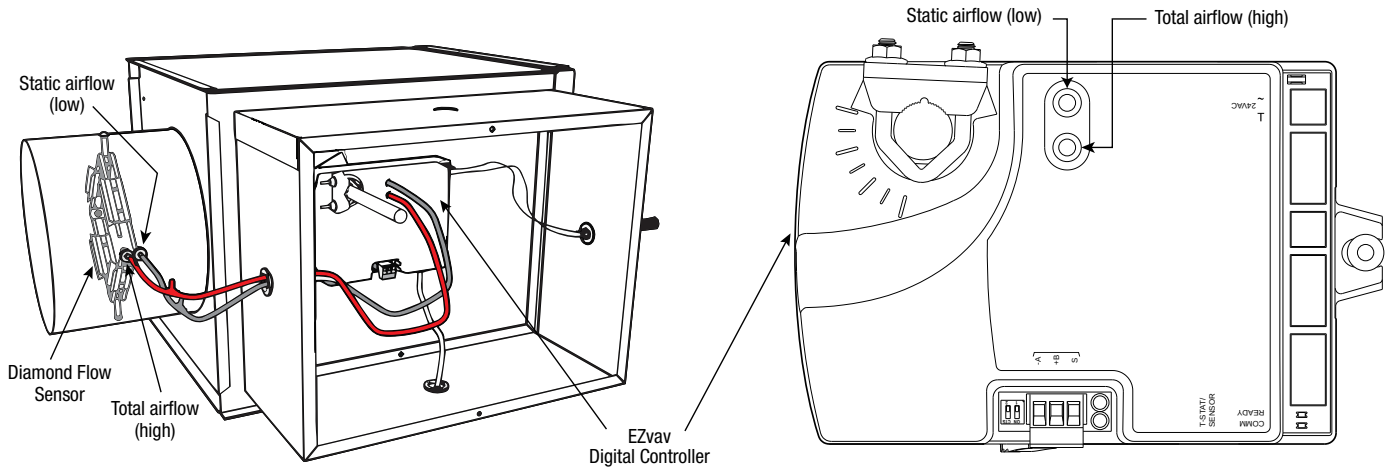
Mount the controller as follows:

1. Manually rotate the damper on the VAV box to the fully closed position.
2. On the controller, press the gear clutch button and rotate the drive hub in the same direction that closed the damper. Turn the hub until it reaches a rotation limit, then rotate 2° in the opposite direction and release clutch.
3. Loosen the nuts on the V-bolt until the damper shaft can fit through the collar.
4. Place the controller over the damper shaft.
5. Finger tighten the nuts on the V-bolt to position the shaft in the drive hub
6. Center the mounting bushing in the mounting tab and fasten it with a #8 sheet metal screw.
7. Evenly tighten the V-bolt nuts on the drive hub to 30-35 in-lbs (3.34 – 3.95 N.m).

Connecting an Airflow Sensor

An airflow sensor is incorporated as one of the inputs to the controller. Remove the plugs and connect the tubing from the pitot assembly to the airflow sensor inputs next to the drive hub.

Figure 2-3 Airflow sensor inputs



Diamond flow sensors are supplied by Nailor as part of the VAV terminal unit. If a sensor is needed, choose a sensor listed in the topic Accessories and Replacement Parts on page 48. For more information on Nailor's 'Diamond Flow' Sensor, see page 48 or refer to Nailor website.

Connecting Inputs and Outputs

Nailor EZvav series controllers have preconfigured inputs and outputs to support only the supplied programs and applications.

- For input and output connection information, see the topic Application drawings on page 29.
- To connect room temperature sensors, see the topic Connecting room temperature sensors on page 9.
- To connect a DAT sensor, see the topic Connecting a DAT sensor on page 10.
- For the BACnet object descriptions of the inputs and outputs, see the topic BACnet objects on page 44.

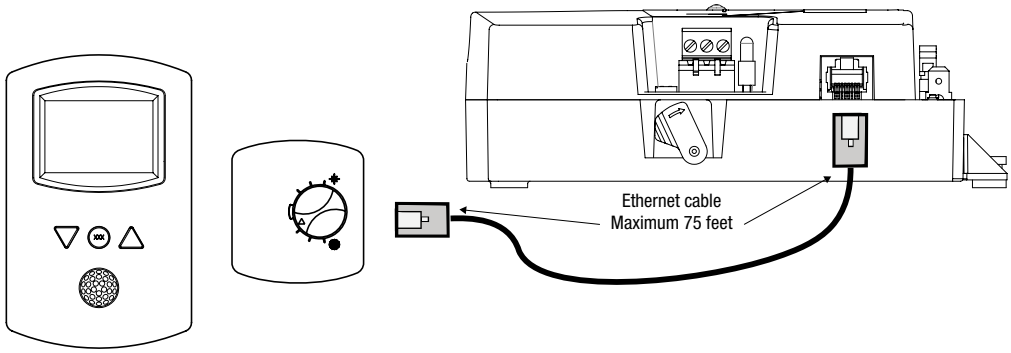
Connecting Room Temperature Sensors

Connect any of the following sensors to the RJ-45 thermostat and sensor jack. The controller automatically detects the type of sensor. No programming or configuration is required.

- STE-6014W36
- STE-8001W36
- STE-8201W36

Connect the controller to sensors with standard Ethernet cables up to 75 feet long.

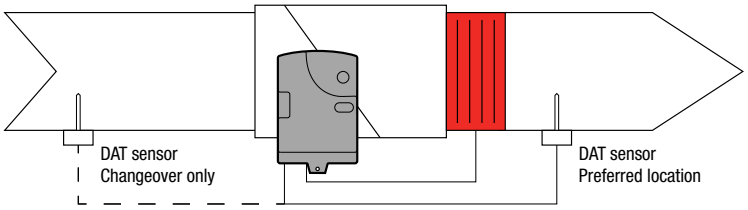
Figure 2-4 Connecting to a sensor



Connecting a DAT Sensor

The Discharge Air Temperature sensor is required for automatic changeover and for VAV terminal units with reheat.

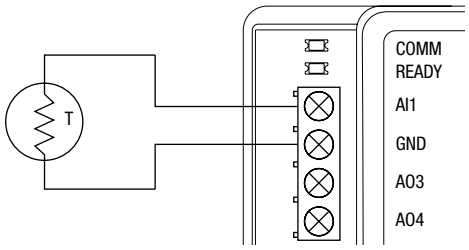
Figure 2-5 Discharge air temperature sensor location



Connect a 10 kΩ, Type 3 thermistor temperature probe to the discharge air temperature input. The input includes the internal pull-up resistor. An STE-1401 sensor is suitable for this application. Follow the instructions supplied with the sensor for installation, or refer to pages 11-12 for this information.

- For DAT limiting and reheat, install the sensor in the airflow after the reheat section. See the topic, Advanced options on page 21 to enable discharge air temperature control.
- When the DAT sensor is used only to detect primary air temperature, the sensor can be placed in either location shown in the Figure Discharge air temperature sensor location.

Figure 2-6 Discharge air temperature input details



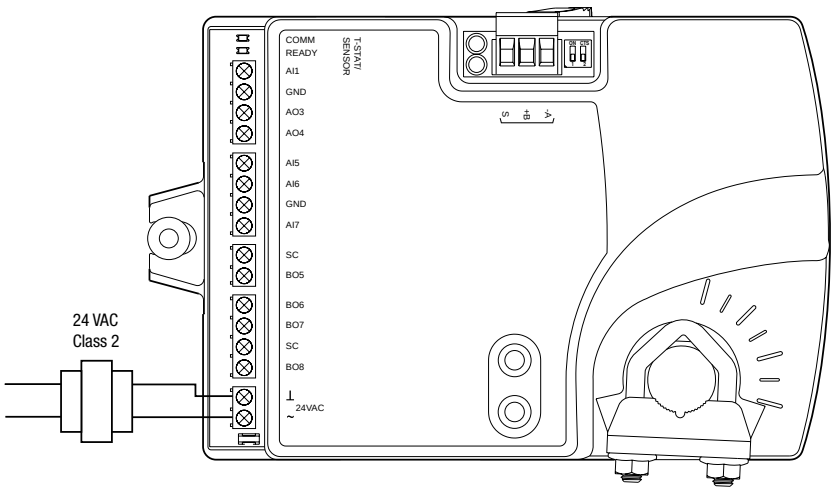
Connecting Power

The controllers require a 24 volt, AC power source. Use the following guidelines when choosing and wiring transformers to the controller.

- A Class – 2 transformer is supplied with each unit.

Connect the 24 volt AC power supply to the power terminal block on the lower right side of the controller. Connect the ground side of the transformer to the ground terminal and the AC phase to the phase terminal. Power is applied to the controller when the transformer is connected to power.

Figure 2-7 Controller power terminals



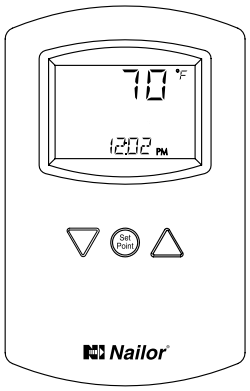
Maintenance

Nailor EZvav controllers require no routine maintenance. If necessary, clean with a damp cloth and mild soap.

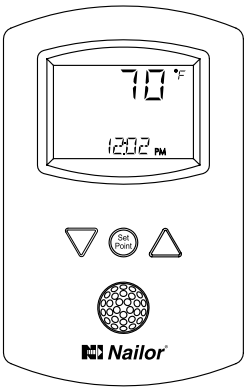
Section 3: Installing the Room Sensors

An airflow sensor is incorporated as one of the inputs to the controller. Remove the plugs and connect the tubing from the pitot assembly to the airflow sensor inputs next to the drive hub.

EZvav Sensors:



STE-8001W36
Digital Display



STE-8201W36
Digital Display with Occupancy Sensor

This applies to EZvav digital display wall sensors connected to EZvav controllers.

Choosing a sensor location

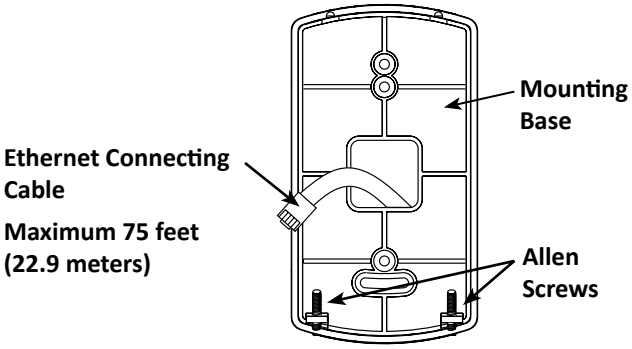
Install the sensor on an inside wall where it can sense the average room temperature. Avoid locations with direct sunlight, heat sources, windows, air vents, and air circulation obstructions such as curtains or furniture.

For models with motion sensing, see the topic on the page 12, Planning for motion sensing.

Rough-in preparation

Complete rough-in wiring at each sensor location prior to sensor installation. This includes the following items:

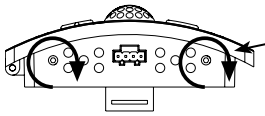
- If required, install an appropriate backplate.
- Route an Ethernet connecting cable from the sensor to the controller location.
- Maximum cable length is 75 feet (22.9 meters). Plenum-rated preassembled cables are recommended.



Mount the sensors

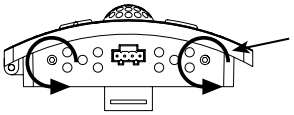
To install the sensor on a mounting base, do the following:

1. Turn the Allen screws in the base of the sensor clockwise until they clear the case. Swing the sensor away from the mounting base to remove it.



Turn screws clockwise to remove sensor case from base.

2. Route the Ethernet cable through the mounting base.
3. Fasten the mounting base directly to a 2 x 4 inch (51 x 102 mm) outlet box or a backplate with the Allen screws toward the floor.
4. Insert the Ethernet cable coming from the base into the sensor.
5. Place the top of the sensor over the top of the mounting base and swing it down over the Allen screw brackets. Be careful not to pinch any wiring.
6. Turn the Allen screws counterclockwise until they back out of the mounting base and engage the case of the sensor.



Turn counterclockwise until the screws engage the case.

Operation

The sensor will become operational as soon as it is connected to an operational controller. See the following pages to change room set points or configure a EZvav controller with the sensor.

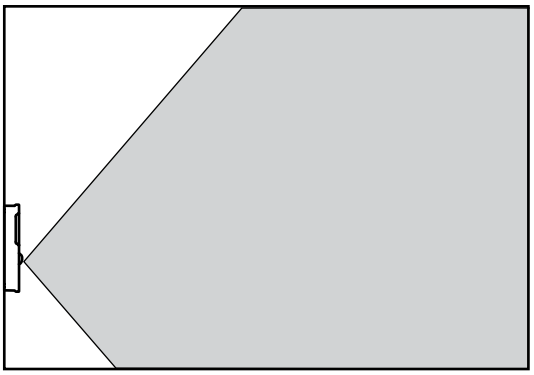
Maintenance

Remove dust as necessary from holes in top and bottom. Clean the display with soft, damp cloth and mild soap.

Planning for motion sensing

For motion sensing models only — Mount the sensor on a wall that will have an unobstructed view of the typical traffic in the coverage area. When choosing a location, do not install the sensor in the following areas.

- Behind curtains or other obstructions.
- In locations that will expose it to direct sunlight or heat sources.
- Near a heating or cooling inlet or outlet.



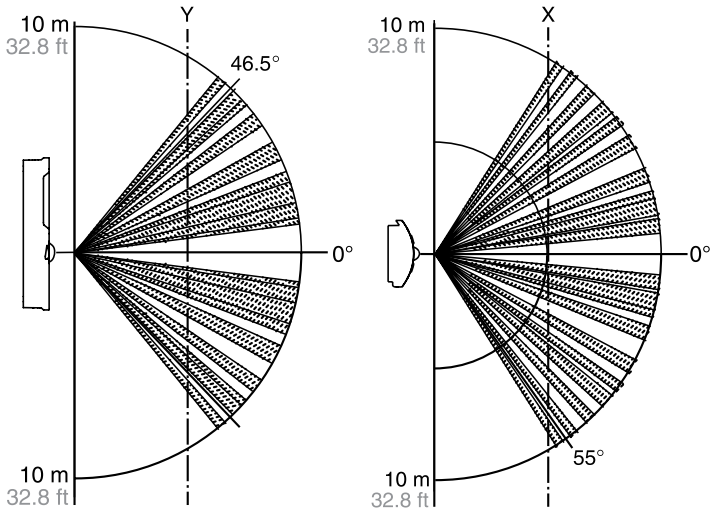
Typical motion sensing coverage

The effective detection range is approximately 33 feet (10 meters). Factors that may reduce the range may include the following items.

- The difference between the surface temperature of the object and the background temperature of the room is too small.
- Object movement in a direct line toward the sensor.
- Very slow or very fast object movement.
- Obstructions in the shaded area of the diagram Typical motion sensing coverage.

False detections may be triggered by any of the following conditions.

- The temperature inside the detection range suddenly changes because of the entry of cold or warm air from an air-conditioning or heating unit.
- The sensor being directly exposed to sunlight, an incandescent light, or other source of far-infrared rays.
- Small animal movement.



Side view **Top view**

Motion sensor vertical and horizontal patterns

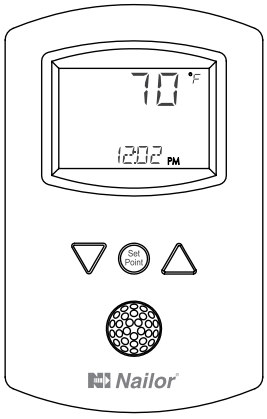
Section 4: Changing the Room Set Point

This section covers topics for the end user.

Changing the EZvav user functions with an STE-8001W36 or STE-8201W36 are limited to changing the active set points in a room. The set points are entered or changed using the buttons and display on the front of the sensor.

Quick start to changing set points

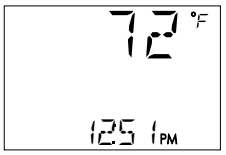
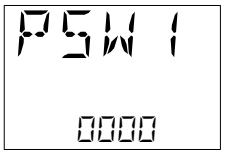
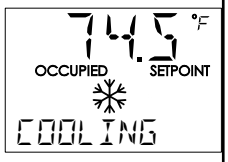
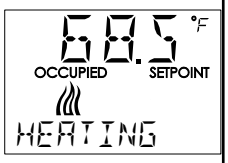
1. Press any button to begin changing set points.
2. If required, enter Password 1.
3. Press the up Δ or down Δ buttons to change a set point value.
4. Press the Set Point button to save the value or advance to the next function.



To enter or change the active set points you may need Password 1 .

Tip: Once the following procedure is started, all steps must be completed in order.

Changing Room Set Points

PROCEDURE	STEPS	STE DISPLAY
1 Starting display	Start from the temperature display.	
2 Enter Password 1	1. Press any button. The display changes to PSW 1. 2. Press the Δ or ∇ buttons to change the first digit. 3. Press the Set Point button to select the next digit. Repeat for all four digits. ***Note: If Password 1 has not previously been entered, the display will change to the occupied cooling set point display after Step 1.***	
3 Set the active cooling set point.	1. Press the Δ or ∇ buttons to change the cooling set point temperature. The set point changes in increments of 0.5 degrees. 2. Press the Set Point button to save the value. The display advances to set the heating set point.	
4 Set the active heating set point.	1. Press the Δ or ∇ buttons to change the heating set point temperature. The set point changes in increments of 0.5 degrees. 2. Press the Set Point button to save the value. The display returns to the temperature display.	

Section 5: Configuring the Controllers

This topics in this section are advanced topics for control technicians and engineers.

The configuration functions that are accessible through an STE-8000 series sensor are all of the values and settings that are entered during the installation and commissioning of a VAV terminal unit. Typically, these functions do not change after the installation and commissioning process.

To set up the configuration functions, you will need the following items and information.

- Details about the VAV terminal unit including the configuration for fans and reheat.
- An STE-8001W36 or STE-8201W36 to use as a configuration tool.
- The building automation system plans for controllers connected to a network.

Users may change the active heating and cooling set points without accessing the configuration functions. This procedure is covered in the topic Changing the Room Set Point on page 13.

Note: The instructions for the configuration functions cover all of the functions that an STE-8000 sensor can set up in the EZvav series of controllers. Not all functions are available on every model of controller.

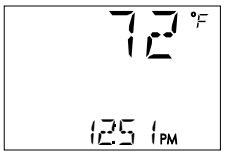
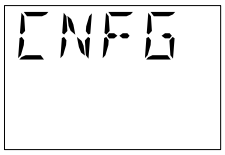
Configuration topics

Getting Started with Configuration

For access to the configuration functions you will need Password 2 .

- If the controller has not been previously set up, no password is required.
- A new Password 2 can be entered or changed in the advance functions. See the topic Advanced options on page 21

Enter the configuration mode

PROCEDURE	STEPS	STE DISPLAY
1 Starting display	1. Start at the temperature display. 2. Press the Δ and ∇ buttons together. • If Password 2 is not required, the display changes to CNFG. • If required, enter Password 2. The display changes to CNFG when Password 2 is correct.	
2 Enter Password 2	1. Press the Δ and ∇ buttons together and hold them down until the display changes to PSW2. 2. Press the Δ or ∇ button to change the first digit. 3. Press the Set Point button to select the next digit. Repeat for all four digits. 4. When the button is pushed for the fourth correct digit, the display changes to COMM. ***Note: If Password 2 has not previously been entered the display will change to the CNFG display after Step 1.***	
3 Select a configuration function.	Access to the configuration functions always start at the CNFG display.	

Entering System Temperature Set Points and Limits

The system temperature set points set the operational parameters and limits for the VAV terminal unit.

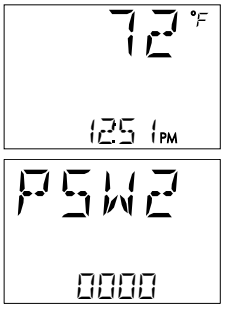
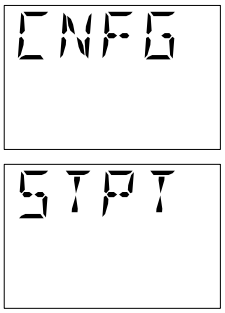
The temperature set points include the following items.

- Minimum cooling and maximum heating set points
- Occupied and unoccupied cooling set points
- Occupied and unoccupied heating set points
- Changeover differential set point
- Standby differential set point

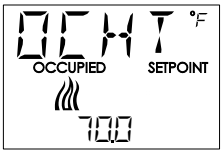
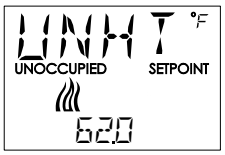
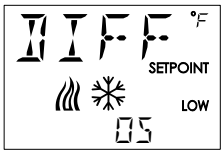
Setting the temperature set points requires entering Password 2 which is described in detail in the topic Getting started with configuration on page 14.

Tip: Once the following procedure is started, all steps must be completed in order.

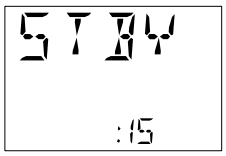
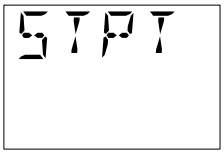
Procedure to set the temperature set points

PROCEDURE	STEPS	STE DISPLAY
1 Start at the temperature display.	1. Start at the temperature display. 2. Press the Δ and ∇ buttons together. • If Password 2 is not required, the display changes to CNFG. • If required, enter Password 2. The display changes to CNFG when Password 2 is correct.	
2 Set the minimum cooling set point.	1. From the CNFG display, press the Δ or ∇ buttons to show STPT. 2. Press the Set Point button to select the CNFG options. The display changes to STPT. 3. Press the Set Point button to select STPT. The display changes to MIN.	
3 Set the maximum heating set point.	This set point limits the highest temperature a user can enter as the active set point. 1. Press the Δ or ∇ buttons to set the maximum heating set point. The set point will change in 0.5° increments. 2. Press the Set Point button to save the set point and advance to the next function.	
4 Set the occupied cooling set point.	This set point is used as the active set point when the space is occupied. 1. Press the Δ or ∇ buttons to set the occupied cooling set point. The set point will change in 0.5° increments. 2. Press the Set Point button to save the set point and advance to the next function.	

Procedure to set the temperature set points (continue)

PROCEDURE	STEPS	STE DISPLAY
5 Set the occupied cooling set point.	This set point is used as the active set point when the space is occupied. 1. Press the Δ or ∇ buttons to set the occupied cooling set point. The set point will change in 0.5° increments. 2. Press the Set Point button to save the set point and advance to the next function. ***Note: This set point can also be changed as described in the topic Changing the room set point on page 13.***	
6 Set the occupied heating set point.	This set point is used as the active set point when the space is occupied. 1. Press the Δ or ∇ buttons to set the occupied heating set point. The set point will change in 0.5° increments. 2. Press the Set Point button to save the set point and advance to the next function. ***Note: This set point can also be changed as described in the section Changing the room set point on page 13.***	
7 Set the unoccupied cooling set point.	This set point is used as the active set point when the space is unoccupied. 1. Press the Δ or ∇ buttons to set the unoccupied cooling set point. The set point will change in 0.5° increments. 2. Press the Set Point button to save the set point and advance to the next function.	
8 Set the unoccupied heating set point.	This set point is used as the active set point when the space is unoccupied. 1. Press the Δ or ∇ buttons to set the unoccupied heating set point. The set point will change in 0.5° increments. 2. Press the Set Point button to save the set point and advance to the next function.	
9 Set the supply air temperature changeover set point. ***Not used in all models.***	This set point sets the supply air temperature at which the controller will change between heating to cooling. 1. Press the Δ or ∇ buttons to set the changeover set point. The set point will change in 1° increments. 2. Press the Set Point button to save the set point and advance to the next function.	
10 Set the minimum temperature differential set point.	The minimum allowable temperature value between the cooling and heating set points. 1. Press the Δ or ∇ buttons to set the differential set point. The set point will change in 1° increments. 2. Press the Set Point button to save the set point and advance to the next function.	

Procedure to set the temperature set points (continue)

PROCEDURE	STEPS	STE DISPLAY
11 Set the standby differential set point.	The standby set point is calculated by adding or subtracting the offset value to or from the value of the occupied set point. 1. Press the Δ or ∇ buttons to set the standby differential set point. The set point will change in 1° increments. 2. Press the Set Point button to save the set point and advance to the next function.	
12 Select a new configuration function or exit.	1. Press the Δ or ∇ buttons to select one of the following: • BOX, FLOW, ADVC, or RSTR options • BACK to choose another configuration function. • EXIT to return to the temperature display. 2. Press the Set Point button to select the next function.	

Configuring the VAV Terminal Unit Options

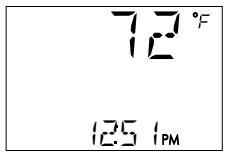
The unit options set the controller for the specific mechanical installation of the VAV terminal unit. The unit options include the following items.

- The K-factor for the VAV terminal unit. If the K-factor is not available, see the topic K-factors on page 47.
- Reheat configuration (optional)
- Fan configuration (optional)
- Direction of damper to close

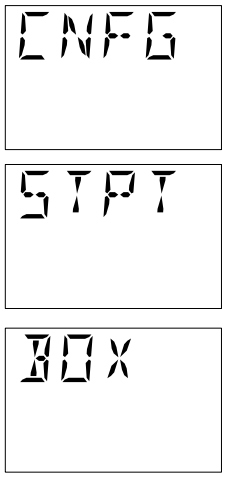
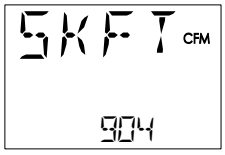
Setting the unit options requires entering Password 2 which is described in the topic Getting started with configuration on page 14.

Tip: Once the following procedure is started, all steps must be completed in order.

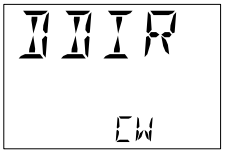
Procedure to set the Terminal Unit functions

PROCEDURE	STEPS	STE DISPLAY
1 Starting display	1. Start at the temperature display. 2. Press the Δ and ∇ buttons together. • If Password 2 is not required, the display changes to CNFG. • If required, enter Password 2. The display changes to CNFG when Password 2 is correct.	 

Procedure to set the Terminal Unit functions (continue)

PROCEDURE	STEPS	STE DISPLAY
2 Select the box settings display.	1. From the CNFG display, press the Δ or ∇ buttons to show the BOX display. 2. Press the Set Point button to select the CNFG options. The display changes to STPT. 3. Press the Δ or ∇ buttons to change the display to BOX. 4. Press the Set Point button to select BOX.	
3 Set the primary VAV terminal unit K factor.	Refer to the K-factor label on the controls enclosure door of the terminal unit for appropriate value. You can also refer to page 43, visit www.nailor.com or contact your local Nailor Representative for more details. 1. Press the Δ or ∇ buttons to set the primary K-factor. 2. Press the Set Point button to save the entry and advance to the next function.	
4 Set the secondary VAV terminal unit K factor. ***Not used in all models.***	1. Press the Δ or ∇ buttons to set the secondary K-factor. 2. Press the Set Point button to save the entry and advance to the next function.	
5 Set the mode of reheat for the terminal unit. ***Not used in all models.***	1. Press the Δ or ∇ buttons to choose one of the following reheat options. **None**—Reheat is not enabled. **Staged**—Enables staged reheat. **Modulating**—The analog reheat output varies from 0—10 volts DC. **Floating**—The reheat outputs control a tristate actuator. 2. Press the Set Point button to save the reheat option and advance to the next function.	
6 Set the fan option. ***Not used in all models.***	1. Press the Δ or ∇ buttons to choose one of the following fan options. **None**—No fan is connected to the controller. • Models: 3001, 30RE and 30RW, 3600 **Series**—The VAV unit includes a series fan. • Model Series: 35S(ST), 35SE(ST), 35SW(ST), 37S(ST), 37SE(ST) and 37SW(ST), 38S/SE/SW **Parallel**—The VAV unit includes a parallel fan. • Models: 35N, 37N, 35NE, 35NW, 37NE and 37NW 2. Press the Set Point button to save the fan option and advance to the next function.	

Procedure to set the Terminal Unit functions (continue)

PROCEDURE	STEPS	STE DISPLAY
7 Set the damper direction to close.	1. Press the Δ or ∇ buttons to which direction to damper moves to close. **CCW**—The actuator turns counterclockwise to close the damper. **CW**—The actuator turns clockwise to close the damper. (Default) 2. Press the Set Point button to save the damper option and advance to the next function.	
8 Select a new configuration function or exit.	1. Press the Δ or ∇ buttons to select one of the following: • STPT, FLOW, ADVC or RSTR options • BACK to choose another configuration function • EXIT to return to the temperature display. 2. Press the Set Point button to select the next function.	

Set the Airflow Set Points

The airflow set points set the airflow limits for the VAV terminal unit.

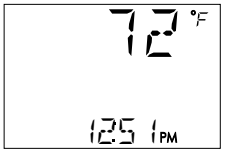
- Airflow heating and cooling minimum and maximum limits
- Auxiliary flow set point (optional)
- Minimum and maximum fan speeds (optional)

Setting the airflow set points requires entering Password 2 which is described in the topic Getting started with configuration on page 14.

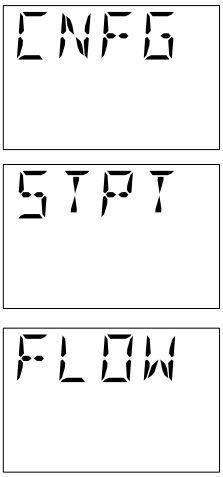
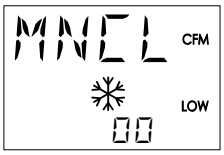
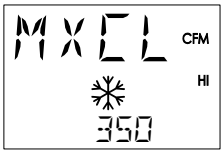
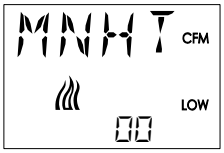
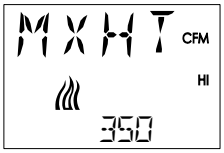
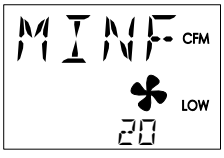
Note: If the VAV unit is a heat only or cooling only unit, the airflow set points for the unused mode must be set within the range of the mode in use. Failure to set the unused set points correctly will result in unpredictable or erroneous air balancing settings.

Tip: Once the following procedure is started, all steps must be completed in order.

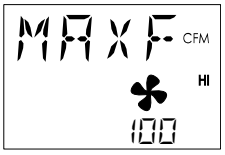
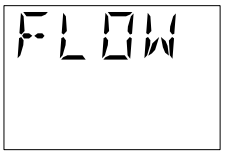
Procedure to set the airflow set points

PROCEDURE	STEPS	STE DISPLAY
1 Starting display	1. Start at the temperature display. 2. Press the Δ and ∇ buttons together. • If Password 2 is not required, the display changes to CNFG. • If required, enter Password 2. The display changes to CNFG when Password 2 is correct.	 

Procedure to set the airflow set points (continue)

PROCEDURE	STEPS	STE DISPLAY
2 Select the set point settings display.	1. From the CNFG display, press the Δ or ∇ buttons to show the CNFG display. 2. Press the Set Point button to select the CNFG options. The display changes to STPT. 3. Press the Δ or ∇ buttons to change the display to FLOW. 4. Press the Set Point button to select FLOW. The display changes to MNCL.	
3 Set the cooling minimum airflow limit.	1. Press the Δ or ∇ buttons to set the minimum limit for cooling airflow. The set point changes in 1 CFM increments. 2. Press the Set Point button to save the set point and advance to the next function.	
4 Set the cooling maximum airflow limit.	1. Press the Δ or ∇ buttons to set the maximum limit for cooling airflow. The set point changes in 1 CFM increments. 2. Press the Set Point button to save the set point and advance to the next function.	
5 Set the auxiliary airflow set point. ***Not used in all models.*** ***Tip: Set value to match Min. Cooling airflow if not required.***	This set point sets the airflow for when reheat is active. 1. Press the Δ or ∇ buttons to set a value for the auxiliary airflow. The set point changes in 1 CFM increments. 2. Press the Set Point button to save the set point and advance to the next function.	
6 Set the heating minimum airflow limit.	1. Press the Δ or ∇ buttons to set the minimum limit for heating airflow. The set point will change in 1 CFM increments. 2. Press the Set Point button to save the set point and advance to the next function.	
7 Set the heating maximum airflow limit.	1. Press the Δ or ∇ buttons to set the maximum limit for heating airflow. The set point will change in 1 CFM increments. 2. Press the Set Point button to save the set point and advance to the next function.	
8 Set the minimum limit for fan speed. ***Not used in all models.***	1. Press the Δ or ∇ buttons to set the minimum limit for the fan speed. The set point will change in 1% increments. 2. Press the Set Point button to save the set point and advance to the next function.	

Procedure to set the airflow set points (continue)

PROCEDURE	STEPS	STE DISPLAY
9 Set the maximum limit for fan speed. ***Not used for all models.***	1. Press the Δ or ∇ buttons to set the maximum limit for the fan speed. The set point will change in 1% increments. 2. Press the (Set Point) button to save the set point and advance to the next function.	
10 Set the dual duct minimum airflow. ***Not used for all models.***	1. This set point is for the minimum airflow when a Dual duct system is at temperature set point. 1. Press the Δ or ∇ buttons. 2. Press the (Set Point) button to save the set point and advance to the next function.	
11 Select a new configuration function or exit.	1. Press the Δ or ∇ buttons to select one of the following: • STPT, BOX, ADVC, or RSTR options • BACK to choose another configuration function EXIT. 2. Press the (Set Point) button to select the next function.	

Advanced Options

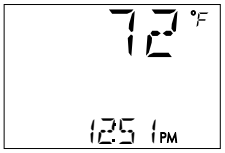
The advanced options set up passwords and special features in the controller.

- Establish or change Password 1 and Password 2
- Set timers for standby and override (optional)
- Enable automatic occupancy (optional)
- Enable discharge air temperature control (optional)
- Calibrate the sensor

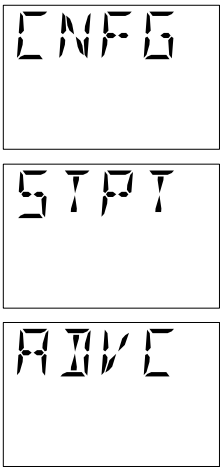
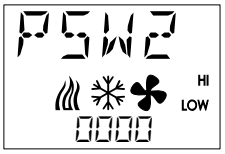
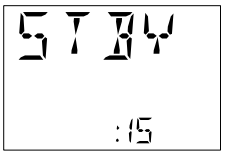
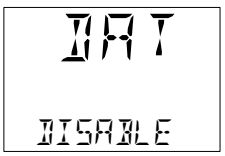
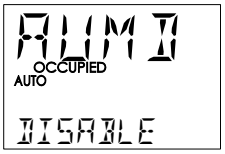
Setting the advance options requires entering Password 2 which is described in the topic Getting started with configuration on page 14.

Tip: Once the following procedure is started, all steps must be completed in order.

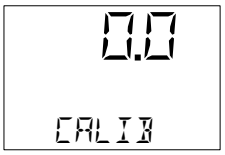
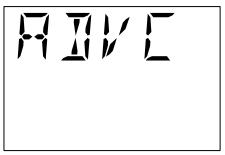
Procedure to set the advanced options

PROCEDURE	STEPS	STE DISPLAY
1 Starting display	1. Start at the temperature display. 2. Press the Δ and ∇ buttons together. • If Password 2 is not required, the display changes to CNFG. • If required, enter Password 2. The display changes to CNFG when Password 2 is correct.	 

Procedure to set the advanced options (continue)

PROCEDURE	STEPS	STE DISPLAY
2 Select the advanced display.	1. From the CNFG display, press the Set Point buttons to show the STPT display. 2. Press the Δ or ∇ buttons to change the display to ADVC. 3. Press the Set Point button to select ADVC.	
3 Change Password 1.	**Note:** Entering four zeros (0000) removes the password. 1. Press the Δ or ∇ buttons to change the first digit. 2. Press the Set Point button to select the next digit. Repeat for all four digits. 3. When the Set Point button is pressed for the last digit, the new password is saved and the display advances.	
4 Change Password 2.	**Note:** Entering four zeros (0000) removes the password. 1. Press the Δ or ∇ buttons to change the first digit. 2. Press the Set Point button to select the next digit. Repeat for all four digits. 3. When the Set Point button is pressed for the last digit, the new password is saved and the display advances.	
5 Set the standby time ***Applies only to STE-8201 sensors.***	1. Press the Δ or ∇ buttons to set the time for the standby time. The value will change in 1 minute increments. 2. Press the Set Point button to save the set point and advance to the next function.	
6 Set the DAT Limiting mode. ***Do not enable for staged heating as short cycling may occur.***	1. Press the Δ or ∇ buttons to enable or disable discharge air temperature limiting. 2. Press the Set Point button to save the set point and advance to the next function.	
7 Set the automatic occupancy mode. ***Not used for all models. Required for reheat.***	1. Press the Δ or ∇ buttons to enable or disable discharge air temperature limiting. 2. Press the Set Point button to save the set point and advance to the next function. **Enable** The controller will automatically changed to the unoccupied state when it detects the loss of primary air supply. **Disable** The controller will remain in the occupied mode regardless of the primary air supply.	

Procedure to set the advanced options (continue)

PROCEDURE	STEPS	STE DISPLAY
8 Set the temperature sensor calibration constant.	1. Press the Δ or ∇ buttons to set the calibration constant. The set point will change in 0.1 minute increments. • For a low input reading enter a positive correction value. • For a high input reading enter a negative correction value. 2. Press the Set Point button to save the set point and advance to the next function.	
9 Select a new configuration function or exit.	1. Press the Δ or ∇ buttons to select one of the following: • STPT, FLOW, BOX, or RSTR options • BACK to choose .another configuration function • EXIT to return to the temperature display. 2. Press the Set Point button to select the next function.	

Restore Application

Choose the RSTR function to reset the EZvav controller to the original configuration and settings. Use it also to change the units of measure to display on a EZvav sensor. There are two versions of the application program in the controller.

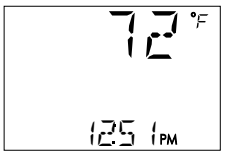
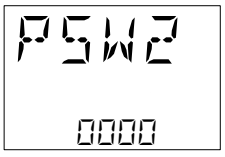
- The Metric version displays temperature in Celsius and uses metric values for units of measure.
- The English version displays temperature in Fahrenheit and uses English values for units of measure.

Access to the Restore Application function requires entering Password 2 which is described in the topic Getting started with configuration on page 14.

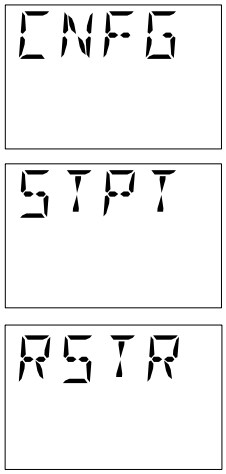
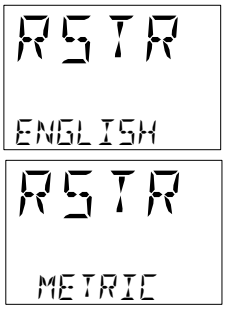
Tip: Once the following procedure is started, all steps must be completed in order.

CAUTION Choosing RSTR deletes all previously configured values including balancing values and passwords. Only the BACnet communications settings will remain unchanged.

Procedure to restore application

PROCEDURE	STEPS	STE DISPLAY
1 Starting display	1. Start at the temperature display. 2. Press the Δ and ∇ buttons together. • If Password 2 is not required, the display changes to CNFG. • If required, enter Password 2. The display changes to CNFG when Password 2 is correct.	 

Procedure to restore application (continue)

PROCEDURE	STEPS	STE DISPLAY
2 Select the restore settings display.	1. From the CNFG display, press the Δ or ∇ buttons to show the CNFG display. 2. Press the Set Point button to select the CNFG options. The display changes to STPT. 3. Press the Δ or ∇ buttons to change the display to RSTR. **Caution:** Choosing RSTR deletes all previously entered values and returns the controller to the manufacturer's settings. Only the BACnet communications settings will remain unchanged. 4. Press the Set Point button to select RSTR.	
3 Choose the application.	1. Press the Δ or ∇ buttons to choose ENGLISH or METRIC. **Metric** The sensor displays temperature in Celsius and uses metric values for units of measure. **English** The sensor displays temperature in Fahrenheit and uses English values for units of measure. 2. Press the Set Point button to save the entry and advance to the next function.	

Section 6: Balancing Airflow

Topics in this section are for control technicians or engineers who will be balancing the airflow in the controllers.

The airflow balancing procedure described in this section requires the following items.

- Accurate method to measure airflow.
- An STE-8001W36 or STE-8201W36 wall sensor. If the system does not include one of these sensors, temporarily disconnect the installed sensor and connect an STE-8001W36 as a service tool.
- The engineering design specifications for the minimum and maximum airflow set points.
- Password 2 which is described in the topic Getting started with configuration on page 14.

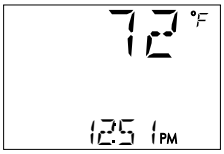
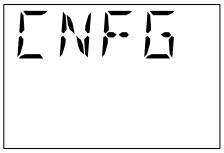
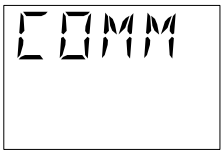
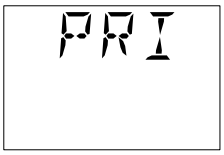
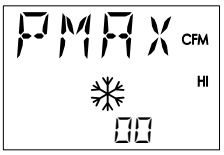
Users may change the active heating and cooling set points without accessing the configuration functions. This procedure is covered in the topic Changing the Room Set Point on page 13.

Note: If the VAV terminal unit is a heat only or cooling only unit, the airflow set points for the unused mode must be set within the range of the mode in use. Failure to set the unused set points correctly will result in unpredictable or erroneous air balancing settings. See Set the airflow set points on page 19 for the procedure to adjust the set points.

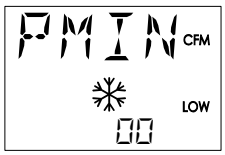
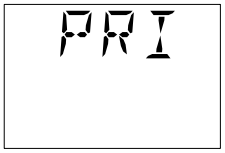
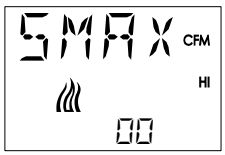
Note: Starting the balancing procedure erases all previous airflow correction factors. The airflow readings displayed by the STE-8001W36 are the actual uncorrected airflow readings as measured by the controller.

Tip: Once the following procedure is started, all steps must be completed in order.

The airflow balancing procedure

PROCEDURE	STEPS	STE DISPLAY
1 Starting display.	1. Start at the temperature display. 2. Press the Δ and ∇ buttons together. • If Password 2 is not required, the display changes to CNFG. • If required, enter Password 2. The display changes to CNFG when Password 2 is correct.	 
2 Select the CNFG display.	1. From the CNFG display, press the Δ or ∇ buttons to advance to COMM and the BLNC display. 2. Press the Set Point button to select BLNC. The display advances to PRI. 3. Press the Set Point button to select PRI.	   
3 Measure and enter the actual maximum primary airflow.	The display begins flashing PMAX and also displays the actual airflow at the bottom. **Note:** The airflow will attempt to stabilize on the highest value for either the cooling or heating maximum airflow even if only one mode is operational. **Note:** The airflow displayed by the STE-8000 in this step is the actual, uncorrected airflow. 1. Wait for the maximum airflow value to stabilize. 2. With a flow hood, measure the actual airflow. 3. Press the Set Point button to advance to the entry display. PMAX stops flashing. 4. Press the Δ or ∇ buttons to enter the measured airflow. 5. Press the Set Point button to save the measured airflow. The display changes to PMIN.	

The airflow balancing procedure (continue)

PROCEDURE	STEPS	STE DISPLAY
4 Measure and enter the actual minimum primary airflow.	The display begins flashing PMIN and also displays the actual airflow at the bottom. **Note:** The airflow will attempt to stabilize on the lowest value for either the cooling or heating minimum airflow even if only one mode is operational. **Note:** The airflow displayed by the STE-8000 in this step is the actual, uncorrected airflow. 1. Wait for the minimum airflow value to stabilize. 2. With a flow hood, measure the actual airflow. 3. Press the Set Point button to advance to the entry display. PMIN stops flashing. 4. Press the Δ or ∇ buttons to enter the measured airflow. 5. Press the Set Point button to save the measured airflow. The display advances to PRI.	
5 Advance or exit.	1. Press the Δ or ∇ buttons to select one of the following: • SEC to balance the secondary VAV for dual duct systems. Choosing SEC advances to the SMAX display. This is available only on dual duct models. • BACK to choose another commissioning function • EXIT to return to the temperature display. 2. Press the Set Point button to select the next function.	 
6 Measure and enter the actual maximum secondary airflow.	The display begins flashing SMAX and also displays the actual airflow at the bottom. **Note:** The airflow displayed by the STE-8000 in this step is the actual, uncorrected airflow. 1. Wait for the maximum airflow value to stabilize. 2. With a flow hood, measure the actual airflow. 3. Press the Set Point button to advance to the entry display. SMAX stops flashing. 4. Press the Δ or ∇ buttons to enter the measured airflow. 5. Press the Set Point button to save the measured airflow. The display advances to SMIN.	
7 Measure and enter the actual minimum secondary airflow.	The display begins flashing SMIN and also displays the actual airflow at the bottom. **Note:** The airflow displayed by the STE-8000 in this step is the actual, uncorrected airflow. 1. Wait for the minimum airflow value to stabilize. 2. With a flow hood, measure the actual airflow. 3. Press the Set Point button to advance to the entry display. SMIN stops flashing. 4. Press the Δ or ∇ buttons to enter the measured airflow. 5. Press the Set Point button to save the measured airflow. The display advances to SEC.	

The airflow balancing procedure (continue)

PROCEDURE	STEPS	STE DISPLAY
8 Advance or exit.	1. Press the Δ or ∇ buttons to select one of the following: • PRI to balance the primary VAV for dual duct systems • BACK to choose another configuration function. • EXIT to return to the temperature display. 2. Press the Set Point button to select the next function.	

Quick Start Configuration Guide – EZvav Sensors & Controllers

Use an STE-8001W36 or STE-8201W36 sensor to configure the EZvav controller. If another type of sensor is installed as the room sensor, temporarily connect an STE-8001W36 as a service tool.

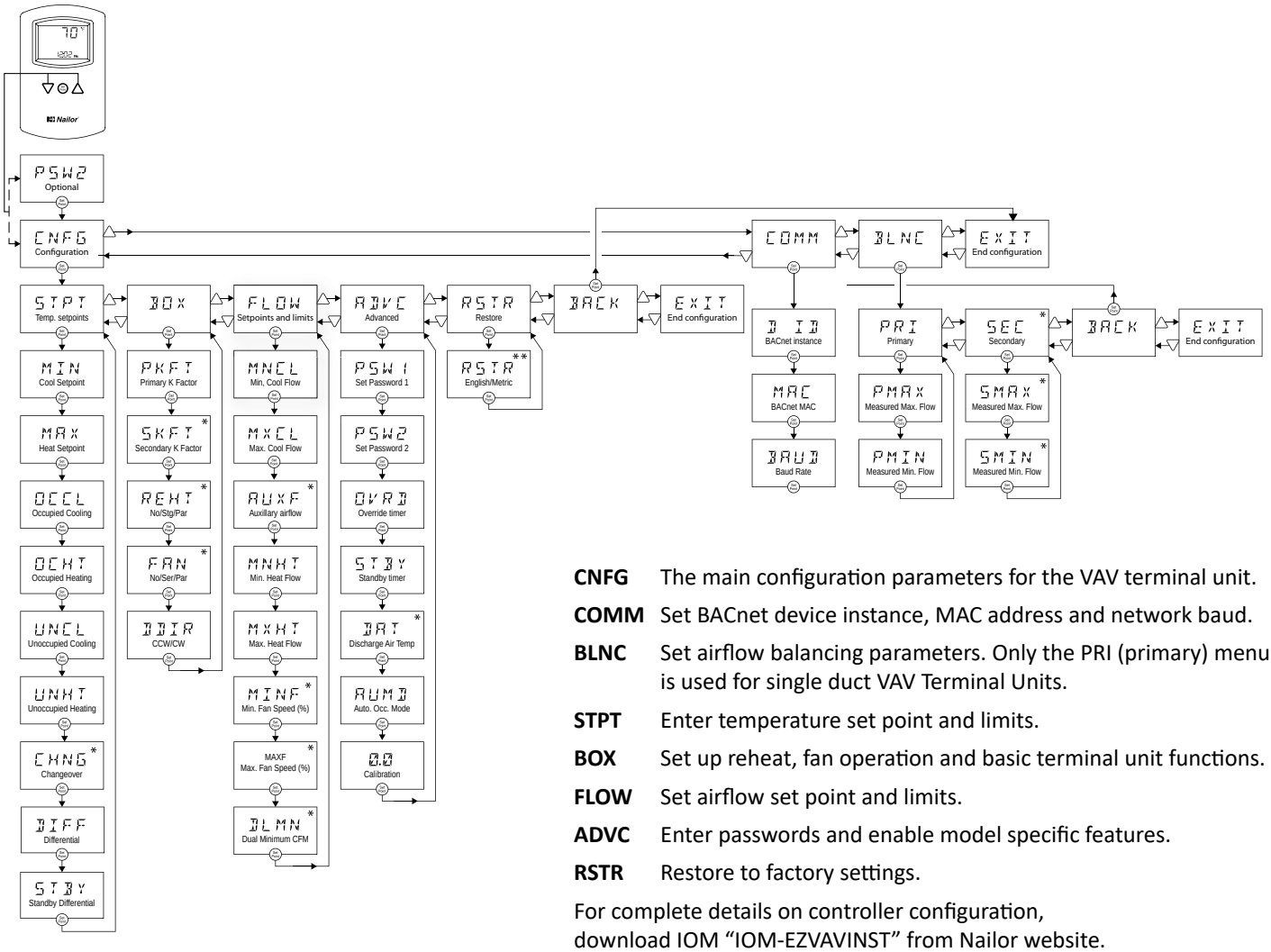
To get started:

Press together the up Δ and down ∇ buttons to start configuration or balancing.

Enter Password 2 if required. New installations do not have a password.

Press the up Δ or down ∇ buttons to move between functions or change values.

Press the set point (Set Point) button to choose a selection or save a value.



CNFG The main configuration parameters for the VAV terminal unit.

COMM Set BACnet device instance, MAC address and network baud.

BLNC Set airflow balancing parameters. Only the PRI (primary) menu is used for single duct VAV Terminal Units.

STPT Enter temperature set point and limits.

BOX Set up reheat, fan operation and basic terminal unit functions.

FLOW Set airflow set point and limits.

ADVC Enter passwords and enable model specific features.

RSTR Restore to factory settings.

For complete details on controller configuration, download IOM "IOM-EZVAVINST" from Nailor website.

**** Not used for all models***

***** Select English (factory setting) or Metric before setting other parameters.***

Section 7: Application Drawings

This section covers the drawings, materials, and instructions for specific VAV applications.

Each EZvav model is designed for a specific set of applications. The following topics are for control technicians and engineers that will plan for and install controllers for EZvav applications.

Submittal sheets for all of these applications are available from the Resources page at www.nailor.com.

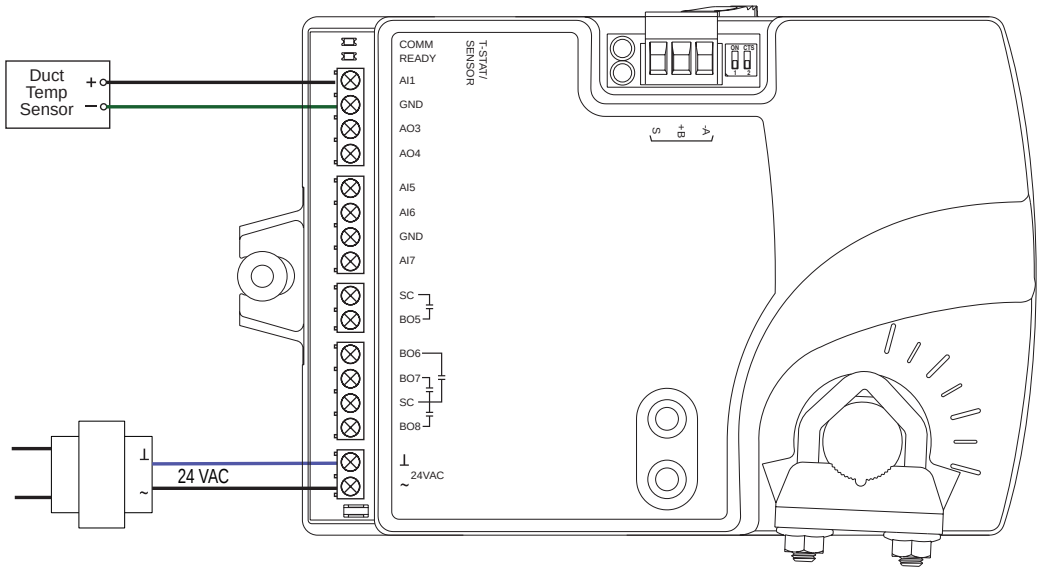
Cooling or Heating without Reheat

The BAC-8001-36 is configured for single duct cooling VAV control without reheat. Connect the controller as shown in the Figure Cooling or heating application drawing as below. A BAC-8005-36 may also be used for this application.

For cooling and heating, a duct temperature sensor is required for Discharge Air Temperature limiting and automatic changeover. See the topic Advanced options on page 21 for instructions to enable Discharge Air Temperature limiting.

Submittal sheets for several variations of this application are available from the Resources page at www.nailor.com.

Figure 7-1 Cooling or heating application drawing



Staged Reheat

This application is for BAC 8005-36 controller. The controller are configured to switch reheat units that are controlled with 24 volts AC. Reheat units with up to three stages of reheat can be controlled by these controllers.

- For one-stage or electric reheat or hot water reheat with an on/off valve, use only output terminal BO6.
- For two-stage reheat use output terminals BO6 and BO7.
- For three-stage reheat use output terminals BO6, BO7 and BO8.

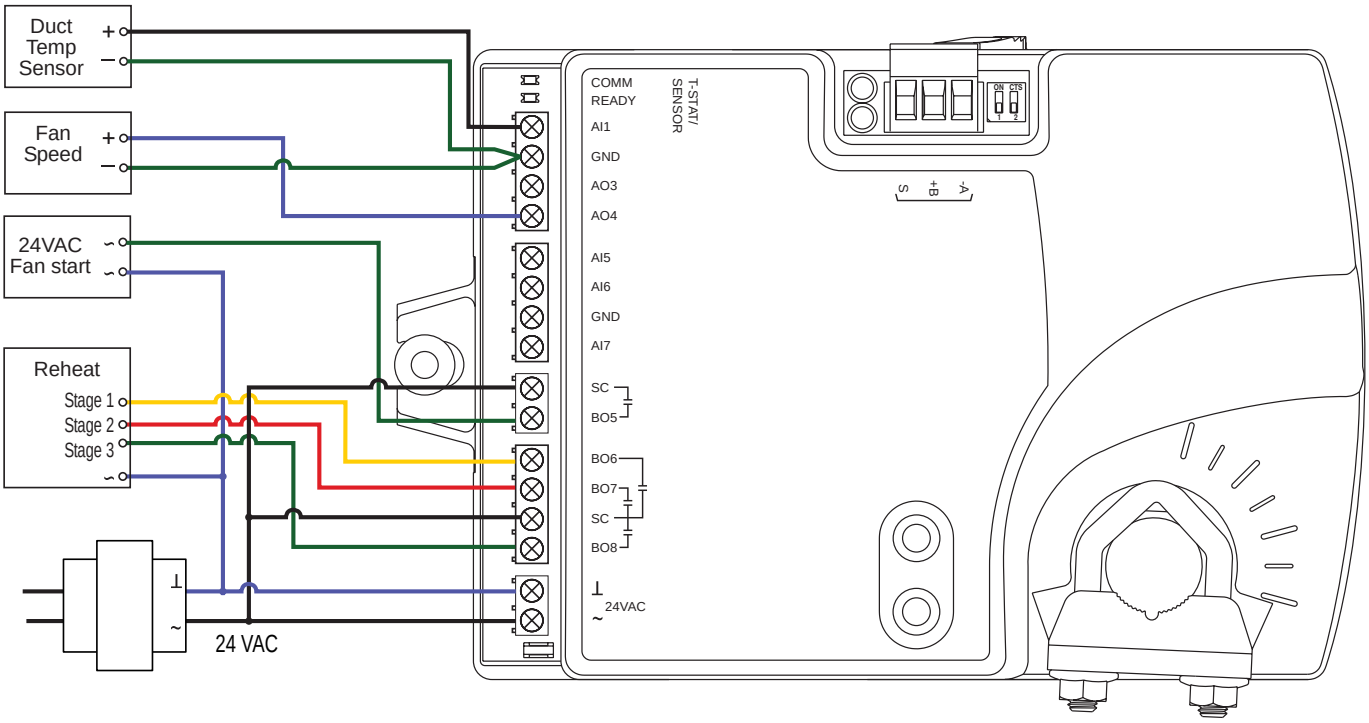
For cooling and heating, a duct temperature sensor is required for automatic changeover.

When connecting the controller to a fan powered VAV terminal unit, the fan circuits must be compatible with the following specifications.

- The fan start circuit is a 24 volt AC pilot duty output.
- The fan speed output is 0 – 10 volts DC.

Submittal sheets for several variations of this application are available from the Resources page at www.nailor.com.

Figure 7-2 BAC-8005-36 (Single Duct) with three-stage reheat



Modulating Reheat

This application is for a BAC-8005-36 controller. The modulating option for reheat can control either an electric reheat unit with an analog input or a modulating hot water valve. The analog reheat output at output terminal AO3 varies between 0 and 10 volts DC.

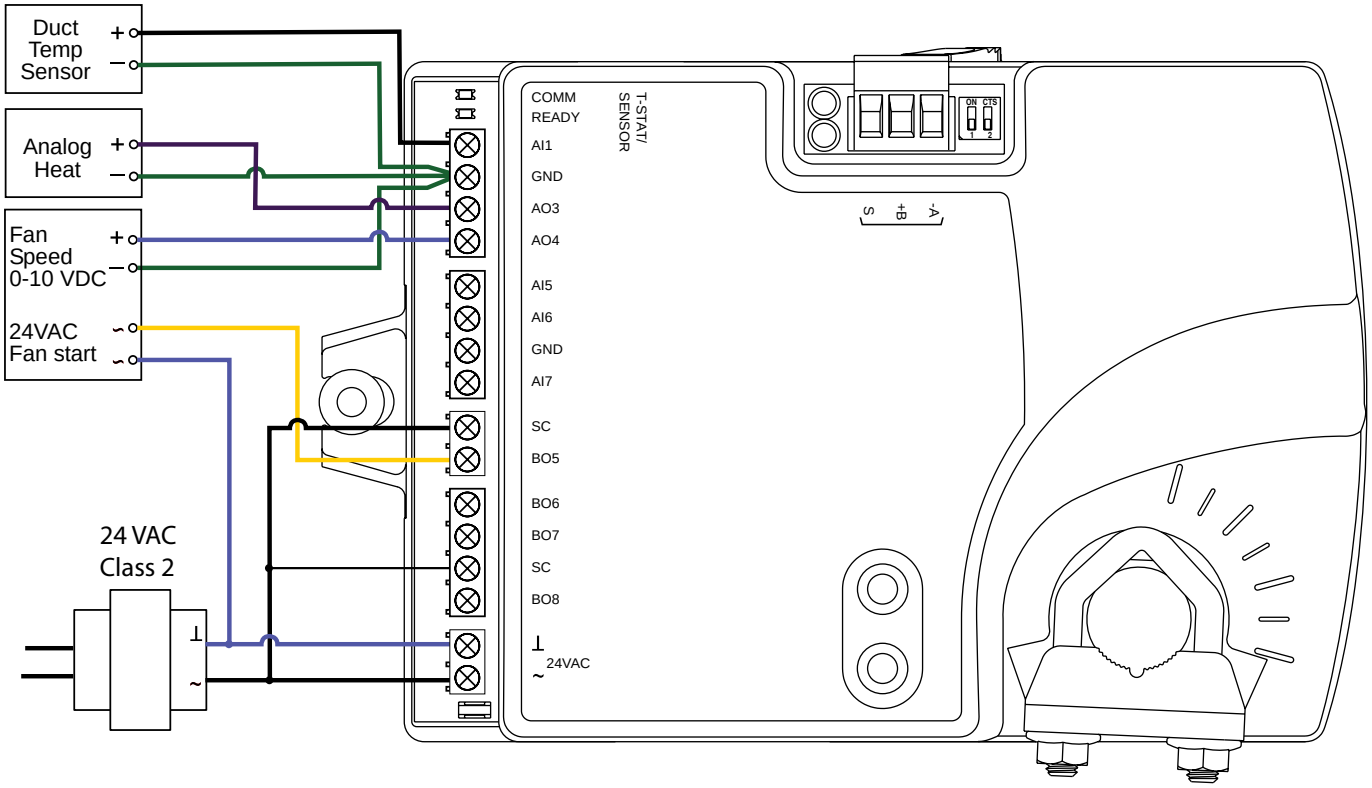
For cooling and heating, a duct temperature sensor is required for Discharge Air Temperature limiting and automatic changeover. See the topic Advanced options on page 21 for instructions to enable Discharge Air Temperature limiting.

When connecting the controller to a fan powered VAV terminal unit, the fan circuits must be compatible with the following specifications.

- The fan start circuit is a 24 volt AC pilot duty output.
- The fan speed output is 0 – 10 volts DC.

Submittal sheets for several variations of this application are available from the Resources page at www.nailor.com.

Figure 7-3 Modulating reheat



Floating Reheat

This application is for a BAC-8005-36 controller. Use the floating reheat option in hydronic systems that are controlled by an actuator with tri-state inputs. The reheat outputs are triacs that can switch up to 1 ampere at 24 volts AC.

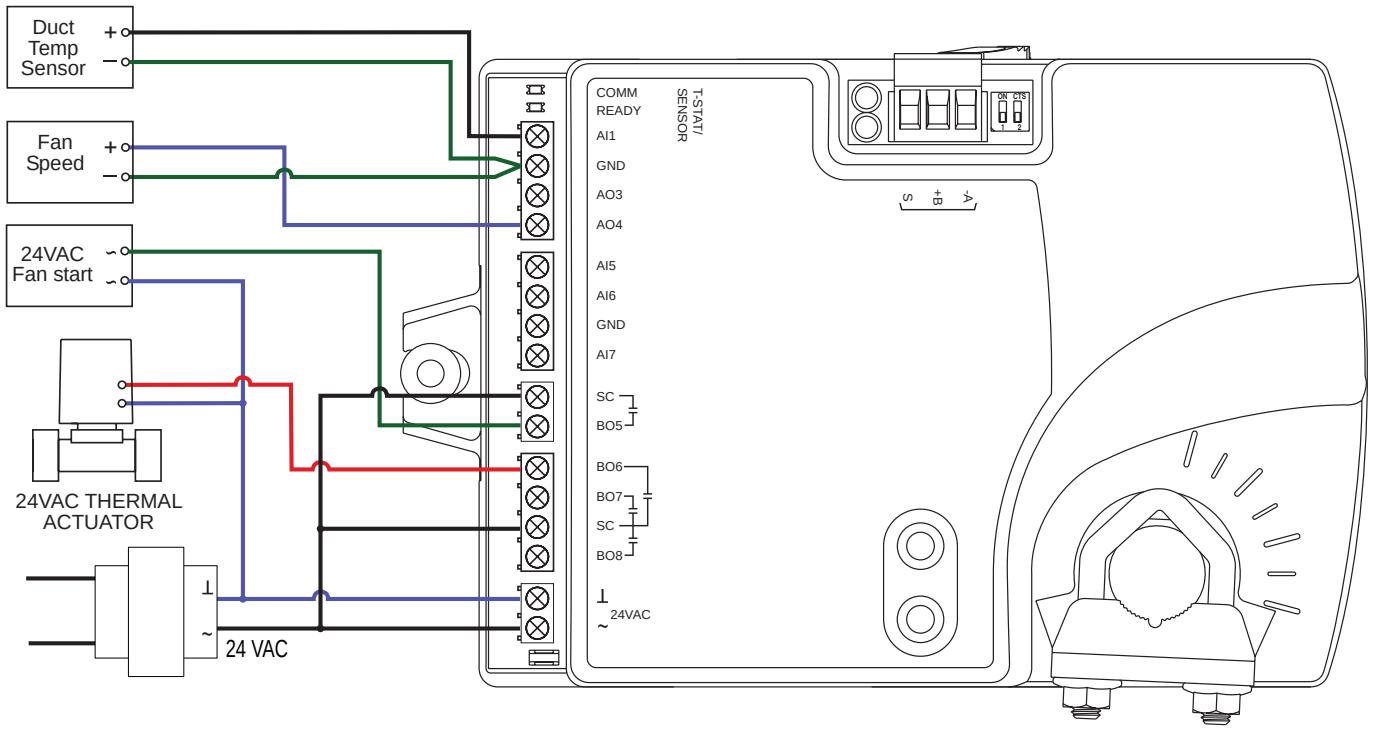
For cooling and heating, a duct temperature sensor is required for Discharge Air Temperature limiting and automatic changeover. See the topic Advanced options on page 21 for instructions to enable Discharge Air Temperature limiting.

When connecting the controller to a fan powered VAV unit, the fan circuits must be compatible with the following specifications.

- The fan start circuit is a 24 volt AC pilot duty output.
- The fan speed output is 0 – 10 volts DC.

Submittal sheets for several variations of this application are available from the Resources page at www.nailor.com.

Figure 7-4 Floating reheat



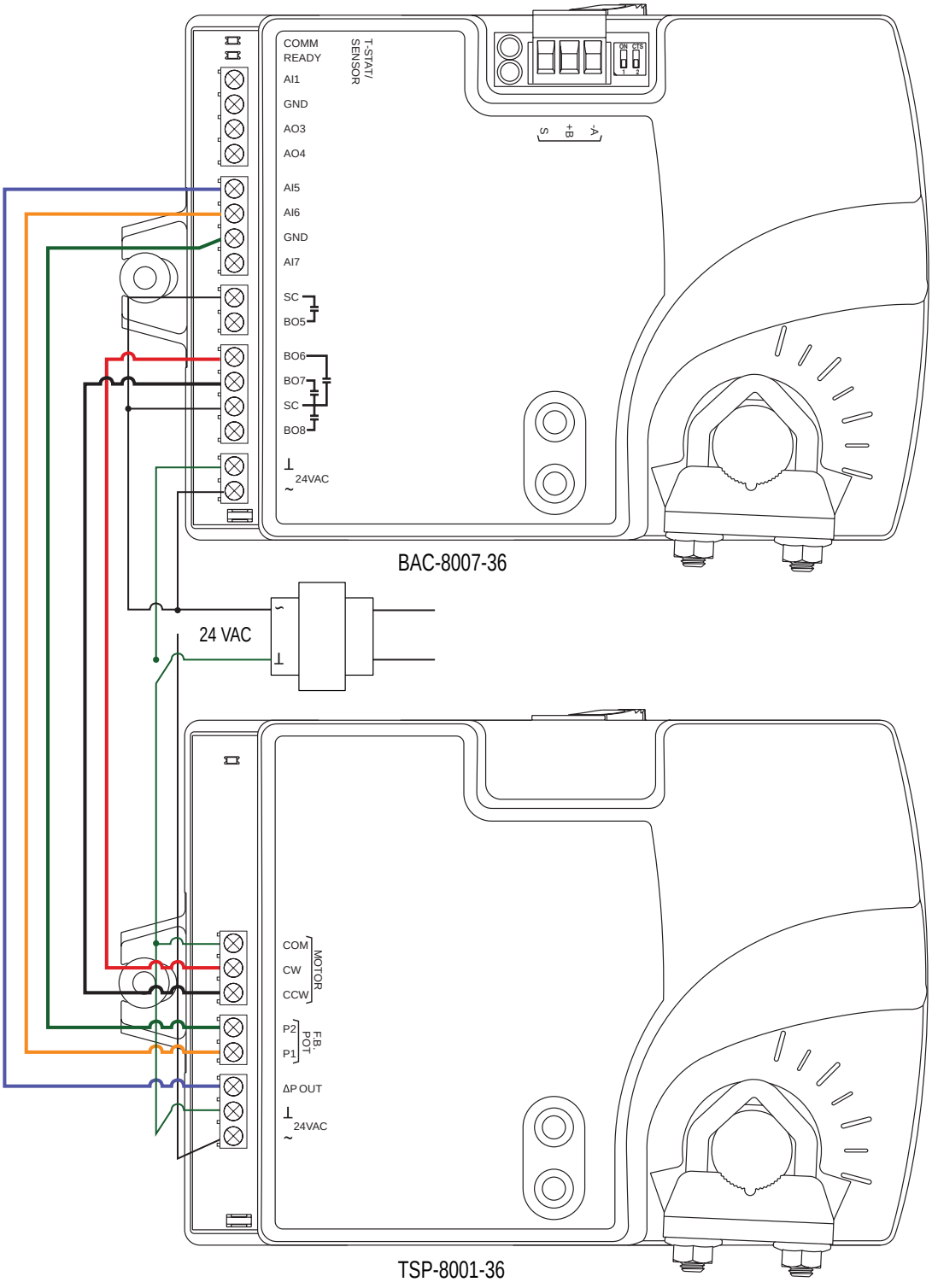
Dual Duct Application

This application is for a BAC-8007-36 controller. The controller is configured for Dual duct operation. Dual duct VAV requires a TSP-8001-36 actuator to be used with the BAC-8007-36 as shown in the Figure 7-5 Dual duct wiring diagram on page 33.

Submittal sheets for several variations of this application are available from the Knowledge Center page at www.nailor.com.

Dual duct wiring diagram

Figure 7-5 Dual duct wiring diagram



Section 8: Sequence of Operation

Topics in this section cover the sequences of operation for the EZvav controllers. These are advanced topics for control technicians and engineers.

These sequences of operation are descriptions of each major component of the EZvav programming. They are provided as an aid to understanding how the controllers operate.

This section covers the following sequences of operation.

Input sources

The EZvav controllers require specific sensors to measure room temperature, airflow, and discharge air temperature. All sensors are automatically detected and the programming is automatically set up for the sensors.

- EZvav digital wall sensors.
- STE-6014W36 thermistor temperature sensor.
- Discharge air temperature sensor.
- Diamond Flow sensor.

EZvav digital wall sensors — The EZvav digital wall sensors include a room temperature sensor, a digital display, and a push button interface for entering set points and configuring the controllers. If a EZvav digital wall sensor is detected, the sensor's temperature is mapped to the Space Temperature Reference value object as the temperature input value. See the topic BACnet objects on page 44 for additional information on value objects.

The model STE-8201W36 EZvav digital wall sensor also includes a motion sensor to detect when the zone is temporary occupied. This is described in the topic Occupancy sequence on page 35.

STE-6014W36 thermistor temperature sensor — STE-6014W36 sensor is compatible with the EZvav controllers. If the sensor is detected, the sensor temperature is mapped to the Space Temperature Reference value object as the temperature input value. See the topic BACnet objects on page 44 for additional information on value objects.

Discharge air temperature sensor — The DAT sensor is an optional Type-III, 10 kΩ thermistor and is required for VAV heating applications. If the controller detects that this sensor is connected, then the controller will use discharge air temperature to determine when to change between heating and cooling. The DAT sensor input is used also to control reheat. See the topics Discharge Air Temperature (DAT) limiting on page 37 and Changeover on page 36.

Diamond Flow sensor — A multi-point airflow sensor that is designed to provide an averaged and accurate signal for use with pressure independent controls. Pick-ups are located in all four quadrants of the inlet. Through amplification of the velocity pressure signal (ΔP), the controller is capable of lower minimums by increasing sensitivity at lower airflows. The high and low pressure measurements along with the K-factor of the VAV terminal unit are used to calculate the airflow through the VAV unit.

Occupancy Sequence

An EZvav controller is designed to operate as a stand-alone controller and determine occupancy based only on the availability of primary airflow and motion in the zone. The controller can be in any one of the following occupancy states.

- Occupied
- Unoccupied
- Standby

Occupancy can also be commanded by another BACnet device or an operator workstation connected to the building automation network. See the topic System Integration and Networking on page 41 for details.

Automatic occupancy

If Automatic Occupancy is enabled, the controller will automatically toggle between Unoccupied, Occupied, and Standby based on the presence of primary airflow and motion in the zone.

The default for Automatic Occupancy is Disabled. See the topic Advanced options on page 21 to change Automatic Occupancy.

Occupied

For controllers without a connected motion sensor, the controller changes to Occupied upon the detection of primary airflow.

Controllers with a connected motion sensor change to Occupied upon the detection of primary airflow and motion in the space. The unit will remain in the Occupied state as long as periodic motion is detected and primary airflow continues. If motion stops, the controller changes to Standby.

Unoccupied

The controller Occupancy mode changes to Unoccupied when it detects a loss of primary airflow. While in the Unoccupied state, the controller will fully open the damper in an attempt to reach the maximum airflow set point.

Loss of primary airflow is defined as less than 25% of the requested flow for at least 5 minutes. The Occupancy mode changes to Occupied or Standby once the actual airflow is at least 30% of the requested flow.

Standby

In units with a connected motion sensor, the controller starts in Standby and changes to Occupied after detecting motion in the space. Motion in the space is defined as two movements detected within 5 minutes. The controller will change back to Standby after a lack of motion for the period specified by the variable Standby Time.

Standby mode is not valid for controllers without a motion sensor, unless commanded by a building management system.

Space Set Points

There are four temperature set points each for heating and cooling for a total of eight set points.

- **Active cooling**
- **Occupied cooling**
- **Unoccupied cooling**
- **Standby cooling**
- **Active heating**
- **Occupied heating**
- **Unoccupied heating**
- **Standby heating**

Types of set points

The EZvav controllers may use any of the following set points based on a user entered set point or the state of occupancy and standby which is described in the topic Occupancy sequence on page 35.

Active set point—The active set point is the current set point. The active set point is determined by the following.

- If the space is occupied, the controller uses the occupied set point as the active set point.
- If the space is unoccupied the controller uses the unoccupied set point as the active set point.
- If controller occupancy is Standby, the controller calculates the standby set point.
- A user with Password 1 can enter an active set point from a EZvav digital wall sensor. This entry will change the occupied set point within the set point limits.
- If a sensor with a dial set point is connect to the controller, the dial position is used for the active set point only when the Occupancy state is Occupied.

Occupied set point—A temperature set point entered by the controls technician during controller setup and system commissioning. This is the set point used when the controller is occupied which is determined by primary airflow and, on controllers equipped with motion sensors, motion in the zone.

Unoccupied set point — A temperature set point entered by the controls technician during controller setup and system commissioning. This is the set point used when the system is unoccupied .

Standby set point — The standby set point is used when the controller is in the standby state. It is a value calculated from the occupied set point and the value of Standby Offset. The standby offset value is entered by the controls technician during controller setup and system commissioning. See the topic Occupancy sequence on page 35.

Set Point Limits

The programming in the EZvav controller limits the set point entry so that no heating set point is set higher than its corresponding cooling set point.

If a user is adjusting a set point and it falls within the range set by the value of Minimum Set point Differential, the corresponding set point will be changed to maintain the differential. For example, the Minimum Set point Differential is 4° F (-15.56° C) and the Occupied Heating set point is 70° F (21.11° C). If the user lowers the Occupied Cooling set point to 71° F (21° C), the controller recalculates the Occupied Heating set point and changes it to 67° F (19.44° C).

PID Control Loops

A PID control loop calculates an error value from the difference between the measured room temperature and the active set point. The error value is expressed as a percentage and is typically used in a BAS controller to control the state of an output. When the difference between the set point and room temperature is large, the error is large. As the system reduces the difference between the set point and space temperature, the error becomes smaller.

The EZvav controllers use up to three PID loops.

- The heating PID loop.
- The cooling PID loop.
- The discharge air temperature (DAT) loop.

For EZvav controllers, the output of either the cooling and heating PID loop is used to calculate the position of the damper. If present, the DAT input and DAT loop controls the Reheat loop.

The PID loops in the EZvav controllers are standard BACnet objects and are described in the topic BACnet objects on page 44.

Airflow Set Points Sequence

Airflow Set point is calculated based on the demand for cooling or heating depending on whether the Cooling loop or Heating loop is greater than zero.

If no room sensor is connected to the controller, the controller uses the Minimum Cooling Airflow set point to maintain airflow.

Cool Air Sequence

As the Cooling loop increases from 0% to 100%, Primary Airflow Set point is proportionally calculated between Minimum Cooling Airflow and Maximum Cooling Airflow.

If there is a call for reheat to maintain room temperature, the primary airflow is set to the value of Auxiliary Flow.

Tip: Auxiliary Flow is only for unit with reheat. Set to Minimum Cooling Airflow unless alternate airflow is desired.

Warm Air Available

In the heating mode, as the Heating Loop increases from 0% to 100%, Primary Airflow Set point is proportionally calculated between Minimum Heating Airflow and Maximum Heating Airflow.

See also the topics, Changeover on page 36 and Input sources on page 34.

Changeover

The Discharge Air Temperature input is used by the controller to determine the type of air that is being supplied by the AHU. The sensor is required for applications that require automatic change over between cooling and heating.

When the Heating loop is inactive, the Discharge Air Temperature input is compared to the SAT Changeover Temp. If the Discharge Air Temperature is below the SAT Changeover Temp minus 2° Fahrenheit (-16.67 Celsius), the SAT Changeover Mode is set to Cool. If the Discharge Air Temperature is above the SAT Changeover Temp plus 2° Fahrenheit (+16.67 Celsius), the SAT Changeover Mode is set to Heat. The default changeover temperature is 74° Fahrenheit (23.33 Celsius).

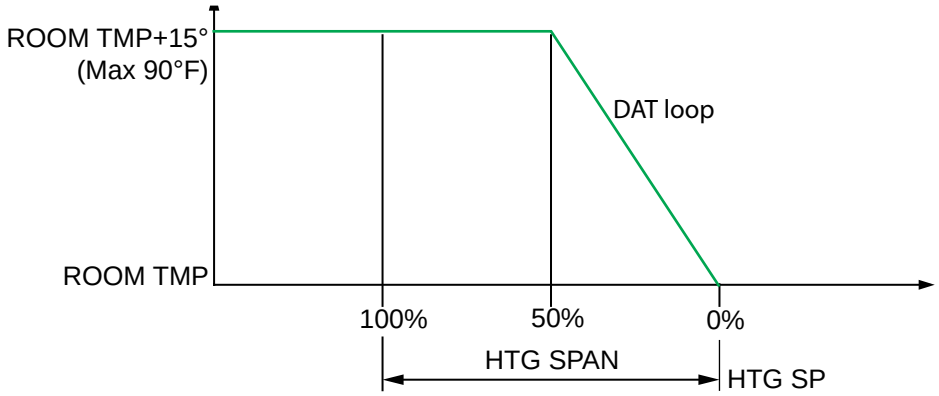
See the topic Discharge Air Temperature (DAT) limiting on page 37 and Input sources on page 34.

Discharge Air Temperature (DAT) Limiting

To utilize Discharge Air Temperature (DAT) Limiting, a Discharge Air Temperature (DAT) sensor is required to control VAV units with reheat. If a DAT sensor is detected and DAT Limiting is enabled, the VAV terminal will be controlled by the DAT loop. The unit will also limit the Discharge Air Temperature to within 15° F of the Space Temp Reference.

When there is a call for heat and the primary air is cool air, the reheat outputs are directly controlled by the DAT Loop and the DAT Set point reset based on the output of the Heating loop. As the Heating loop increases from 0% to 50%, DAT Set point is proportionally calculated between Space Temp Reference and Space Temp Reference + 15° F up to maximum 90° F. This allows the reheat to be controlled by the DAT loop over the first 50% of a call for heating.

Figure 8-1 DAT limiting operation



If DAT Limiting is enabled, and a DAT sensor is not connected, the controller will lockout reheat control only in the cooling mode. The unit will operate this way until a DAT sensor is detected or until the unit is commanded to control to the Active Heating Set point by a supervisory BMS.

If the unit has detected a DAT sensor and DAT Limiting is not enabled, the unit's reheat is controlled by the Heating loop instead of the DAT loop.

If DAT Limiting is not enabled, and a DAT sensor is not connected, the controller will satisfy a call for heat with the auxiliary flow and heating coil.

See also the topics Changeover on page 36 and Input sources on page 34

System Diagnostics

The controller programming includes four system diagnostic indicators in the form of BACnet value objects.

- Need for higher static pressure
- Need for cooler supply air
- Need for warmer supply air
- Need AHU start

These diagnostic indicators or flags are monitored by other BACnet devices connected to the same building automation system as the controller. How the indicators are used is beyond the scope of these instructions.

Need for higher static pressure The Need Higher Static value object is set to True (1) when the damper is fully open and airflow cannot reach the required set point value.

Need for cooler supply air The Need Cooler Supply value object is set to True (1) when the damper is fully open and the Cooling loop is greater than 95% for 30 minutes. The indicator changes to False (0) when the Cooling loop falls below 90%.

Need for warmer supply air The Need Warmer Supply value object is set to True (1) when the damper is fully open and the Heating loop is greater than 95% for 30 minutes. The indicator changes to False (0) when the Heating loop falls below 90%.

Need AHU start The Need AHU Start value object is set to True (1) for any of the following conditions.

- The system mode is Unoccupied and the Cooling loop or the Heating loop reaches 100%.
- The system mode is Occupied.
- The system mode is Standby.

The Need for AHU Start object changes to False (0) when both loops drop below 5%.

Damper Operation

Damper movement is determined by comparing the actual airflow reading to the airflow set points. If the actual airflow is within 5% of the set point, no damper action is initiated. Once within the 5% deadband, the actual airflow must be outside a 7% deadband before damper position changes.

Fan Operation

The EZvav controllers support both series and parallel fan powered VAV units. For either type of fan operation, the fan is controlled through the following terminals.

- A binary output triac controls a 24-volt fan starting circuit. See the topic Configuring the VAV Terminal Unit options on page 17 for the procedure to configure the controller for a fan.
- A 0-10 volt DC analog output controls the speed of the fan. The output controls fan speed at either Min Fan Speed or Max Fan Speed. See the topic Set the airflow set points on page 19 for the procedure to set the fan speeds.

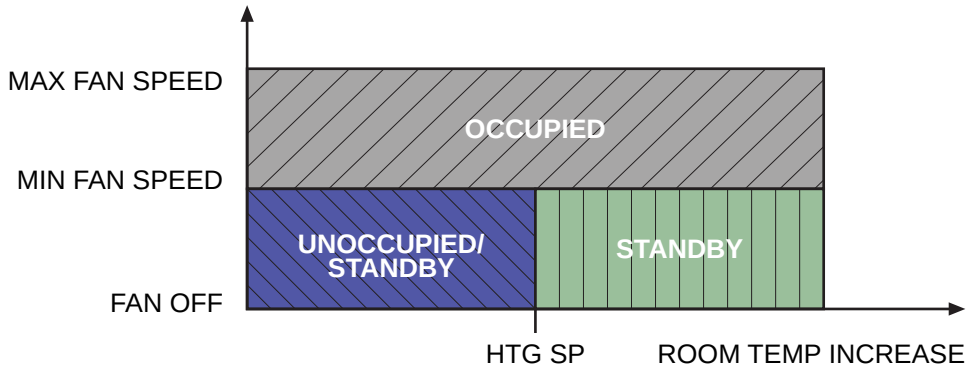
If the VAV unit is not configured for a fan, the two outputs are not used and remain inactive regardless of the occupancy state.

Series Fan

If the controller is configured for a series fan, any time the Occupancy mode of the controller is set to either Occupied or Standby, the fan runs continuously. The fan speed is set to Maximum Fan Speed when the state is Occupied and set to Minimum Fan Speed when the state is Standby.

When the Occupancy state is Unoccupied, the fan starts and runs at minimum speed only on a call for heating. The fan starts when the Heating loop is greater than 5% and stops when the Heating loop is less than 1%.

Figure 8-2 Series fan operation

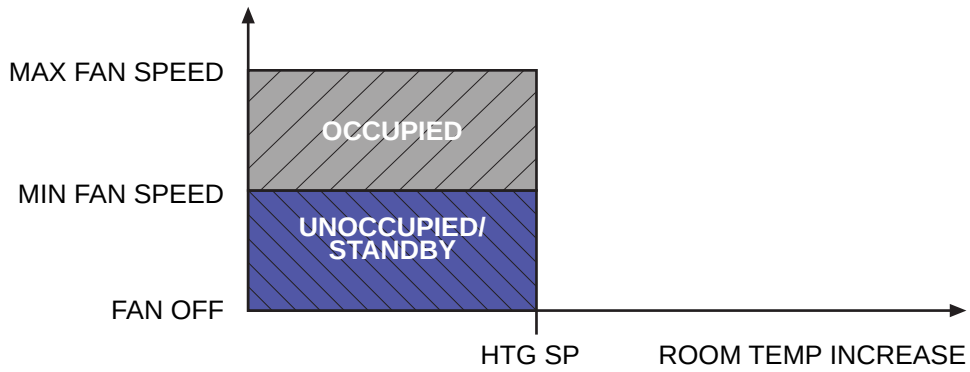


Parallel Fan

If the controller is configured for a parallel fan, any time the Occupancy mode of the controller is set to either Occupied or Standby and there is a call for heat, the fan runs continuously. The fan starts when the Heating loop is greater than 5% and stops when the Heating loop is less than 1%.

When the unit Occupancy state is Unoccupied, the fan starts and runs at minimum speed only on a call for heating. The fan starts when the Heating loop is greater than 5% and stops when the Heating loop is less than 1%.

Figure 8-3 Parallel fan operation



Reheat Sequence

The EZvav controllers can control three types of reheat installations.

- Modulating reheat
- Staged reheat
- Floating reheat

All reheat is controlled by either the Heating loop or the Discharge Air Temp Limiting (DAT) PID loop. Loops are described in the topic PID control loops on page 36.

- If Discharge Air Temp Limiting is enabled, reheat is controlled by the DAT PID loop.
- If DAT control is not enabled, reheat is controlled by the Heating loop.

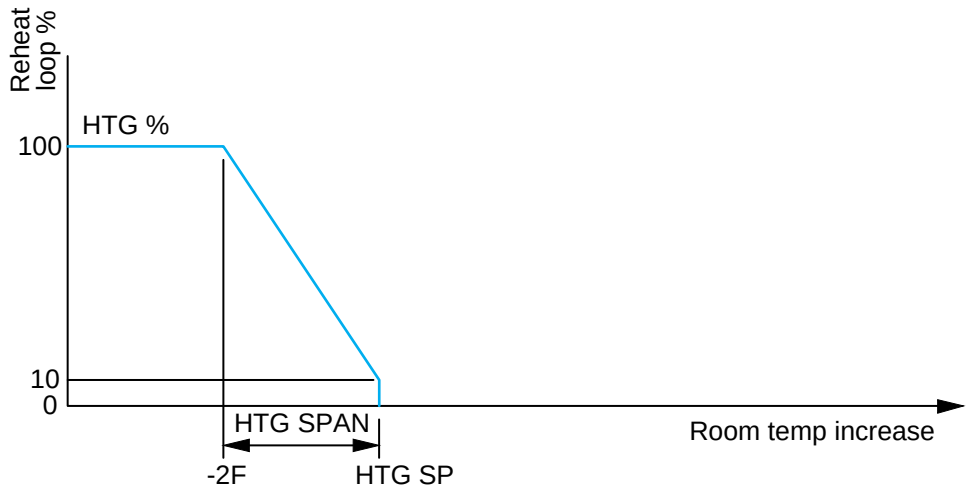
In the following descriptions, the loop controlling reheat is referred to as the Reheat loop.

Modulating reheat

If the controller is configured for modulating reheat, it controls an analog reheat unit with 0-10 volts DC at the analog reheat output. On a call for reheat, the reheat output is modulated over the span of the Reheat loop. If the Reheat loop is less than 10%, the reheat output remains at zero. The reheat is set to zero if the Cooling loop is active.

See the topic Modulating reheat on page 31 for an application drawing.

Figure 8-4 Modulating reheat operation



Staged reheat

If the controller is configured for staged reheat, it can control up to three stages of reheat through binary triac outputs. The reheat outputs are commanded On when the Reheat loop rises above the On threshold and Off when the loop drops below the Off threshold. Thresholds are described in the following chart, Staged reheat thresholds on page 39.

See the topic Staged reheat on page 30 for an application drawing.

Table 8–1 Staged reheat thresholds

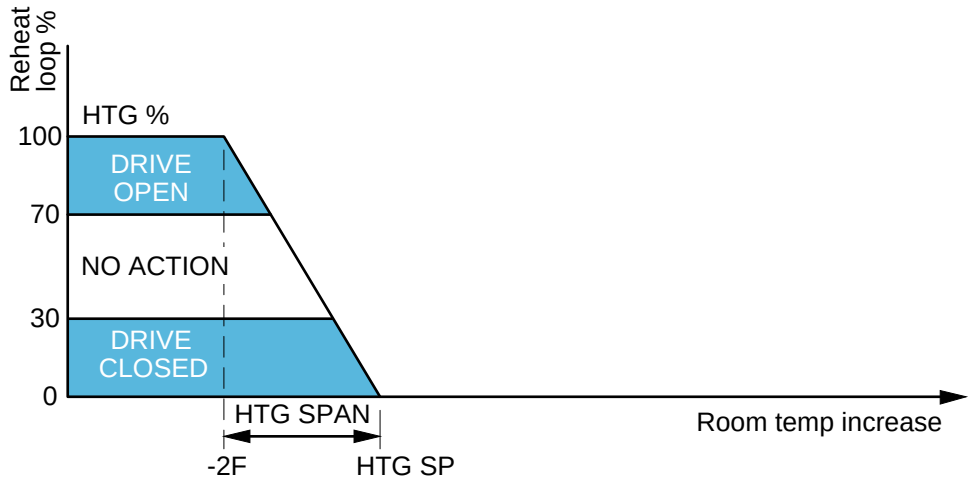
Heating Stage	Output State	
	On threshold	Off threshold
Stage 1	35%	15%
Stage 2	65%	45%
Stage 3	95%	75%

Floating reheat

If the controller is configured for floating reheat, it controls two binary triac outputs to drive the inputs of a tri-state actuator connected to a valve. If the Reheat loop is less than 30%, the valve is driven closed. If the loop is greater than 70%, the valve is driven open. If the loop is in between 30% and 70%, no valve action is taken.

See the topic Floating reheat on page 32 for an application drawing.

Figure 8-5 Floating reheat operation



Balancing Airflow Sequence

Balancing airflow is the process of calibrating the internal airflow sensor to a known standard. In the field, airflow is measured with an airflow hood or other measuring instrument and then compared to the airflow measurements from the sensor in the controller. The balancing process uses an STE-8001W36 or STE-8201W36 as the technicians setup tool for initiating the balancing sequence and entering actual flow measurements.

When the balancing sequence starts, all other functions of the controller are locked out.

At the start of the sequence, the controller drives the damper open until the airflow reaches the highest value of either the cooling or heating maximum airflow set points. An airflow measurement is made with an airflow hood and the actual airflow value is entered into the controller. Once the actual airflow is entered, the controller drives the damper closed to the lower value of either the cooling or heating minimum airflow. Another measurement is made with the flow hood and that measurement is entered into the controller.

After the minimum airflow measurement is entered, the programming in the controller calculates airflow correction factors which are used to adjust measurements from the internal airflow sensor. Balancing is complete and the controller is returned to normal operation.

See the topic Balancing airflow on page 24 for the procedure to balance the airflow with an STE-8001W36.

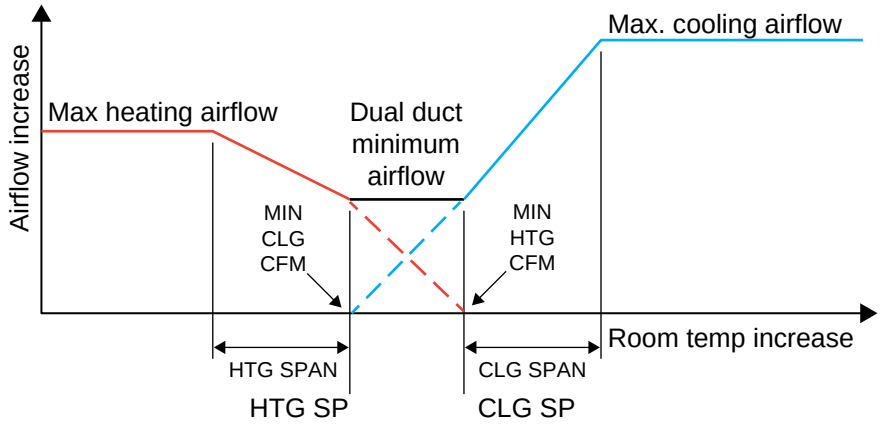
Dual Duct

A dual duct installation consists of separate primary heating and cooling ducts, both with control dampers and airflow monitoring. For this type of installation a EZvav BAC-8007-36 controls the cooling air (primary) damper and a TSP-8001-36 actuator controls the heating air (secondary) damper.

- As the space temperature rises above the cooling set point, the primary airflow is modulated from the Cooling Minimum flow to the Cooling Maximum Flow.
- As the space temperature falls below the heating set point, the secondary airflow is modulated from the Heating Minimum flow to the Heating Maximum Flow.
- Between the heating and cooling set points, both the primary airflow and secondary airflow are modulated to maintain the Dual Duct Minimum airflow.

See the topic, Dual duct application on page 33 for an application drawing.

Figure 8-6 Dual duct sequence



Section 9: System Integration and Networking

Topics in this section cover integrating the controllers into a building automation network. These are advanced reference topics for control technicians and engineers.

The controllers can be installed as standalone controllers or they can be connected to a BACnet MS/TP network. The topics in this section are reference material for control technicians or engineers who are planning, installing, and setting up controllers that are connected to a network.

In addition to the information in this section, you will also need the following information.

- Detailed plans and drawings for the building automation system.
- Information about the facility LAN including routers, switches, and network firewalls.
- Sequences of operation for other BACnet devices that will monitor or interact with EZvav controllers.

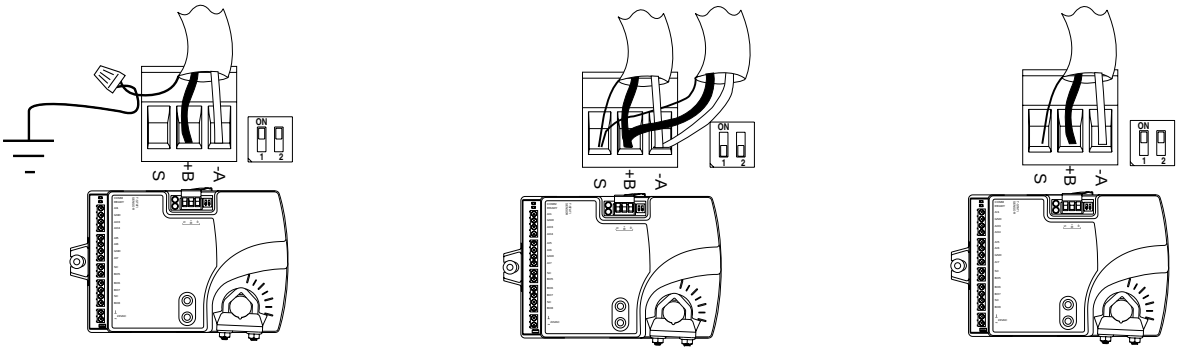
Integration topics

Connecting to an MS/TP network

EZvav controllers are BACnet MS/TP compliant controllers. Connect them only to a BACnet MS/TP network.

To enter the BACnet device instance, MAC address, and network baud, see the topic Setting up network communications on page 42

Figure 9-1 MS/TP network wiring and EOL switches



End of line controller with grounded shield

EOL switches ON

Mid line controller

EOL switches OFF

End of line controller with open shield

EOL switches ON

Connections and wiring

Use the following principles when connecting a controller to an MS/TP network:

- Connect no more than 128 addressable BACnet devices to one MS/TP network. The devices can be any mix of controllers or routers.
- To prevent network traffic bottlenecks, limit the MS/TP network size to 60 controllers.
- Use twisted pair, shielded cable with capacitance of no more than 51 picofarads per foot for all network wiring. Belden cable model #82760 meets the cable requirements.
- Connect the -A terminal in parallel with all other - terminals.
- Connect the +B terminal in parallel with all other + terminals.
- Connect the shields of the cable together at each mid line controller. For EZvav controllers use the S terminal.
- Connect the shield to an earth ground at one end only.
- Use repeater between every 32 MS/TP devices or if the cable length will exceed 4000 feet (1220 meters). Use no more than four repeaters per MS/TP network.
- Place a surge suppressor in the cable where it exits a building.

End of line termination switches

The controllers on the physical ends of the EIA-485 wiring segment must have end of line termination added for proper network operation.

- For controllers at the end of the network set the EOL switches to On
- For mid line controllers at the end of the network set the EOL switches to Off

Network bulbs

- EZvav controllers include network bulbs located near the MS/TP network connector. These bulbs serve three functions:
- Removing both bulbs will disconnect the controller from the MS/TP network.
- If one or both bulbs are lit, it indicates the network connection or controller power is not properly wired.
- If the voltage or current on the network exceeds safe levels, the bulbs may open and protect the controller from damage.

Bulbs are illuminated If one or both bulbs are illuminated, it indicates the network is not phased correctly. The ground potential of the controller is not the same as other controllers on the network. The brighter the isolation bulbs on a controller are illuminated, the closer that controller is to the source of the problem. Remove power and check the network and power connections.

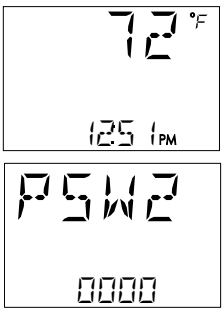
Bulbs are open If one or both bulbs are open – as tested with an ohm meter – it indicates the voltage or current on the network exceeded safe levels. Correct the conditions and replace the bulbs.

Bulbs not inserted correctly One lead from one or both of the bulbs are not inserted into the socket.

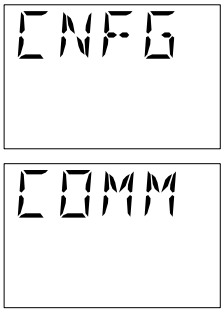
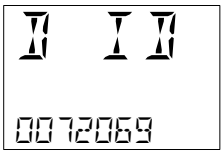
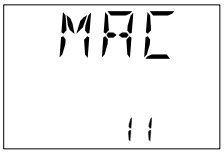
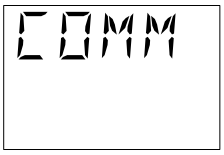
Setting up Network Communications

Set the network communication settings before placing a controller on the network. Setting network settings requires entering Password 2 which is described in the topic Getting started with configuration on page 14.

Procedure to set up network communications

PROCEDURE	STEPS	STE DISPLAY
1 Starting display.	1. Start at the temperature display. 2. Press the Δ and ∇ buttons together. • If Password 2 is not required, the display changes to CNFG. • If required, enter Password 2. The display changes to CNFG when Password 2 is correct.	

Procedure to set up network communications (continue)

PROCEDURE	STEPS	STE DISPLAY
2 Select the CNFG display.	1. From the CNFG display, press the Δ or ∇ buttons to advance to COMM display. 2. Press the Set Point button. The display advances to DID.	
3 Enter the device instance.	1. Press the Δ or ∇ buttons to change the first digit. 2. Press the Set Point button to select the next digit. Repeat for all seven digits. 3. When the Set Point button is pressed for the last digit, the display changes to MAC.	
4 Enter the MAC address.	1. Press the Δ or ∇ buttons to change the MAC address. 2. Press the Set Point button to save the selected MAC address. The display changes to BAUD.	
5 Enter the baud.	1. Press the Δ or ∇ buttons to select a new baud. 2. Press the Set Point button is save the selected baud. The display returns to COMM.	
6 Advance or exit.	1. Press the Δ or ∇ buttons to select one of the following: • BLNC or CNFG options • EXIT to return to the temperature display. 2. Press the Set Point button to select the next function	

BACnet Objects

The EZvav controllers are BACnet Application Specific Controller (ASC) that are composed of standard BACnet objects. This section lists the objects that are likely to be monitored by a standard BACnet operator workstation to verify system operation.

CAUTION Choosing RSTR deletes all previously configured values including balancing values and passwords. Only the BACnet communications settings will remain unchanged.

Input objects

The following BACnet input objects represent values at the physical inputs of the controller. For wiring details, see the topic Application drawings on page 29.

Table 9–2 Input objects

Input	Name	Description	Object Type
AI1	DISCHARGE AIR	Discharge Air Temperature	KMC10K_Type_III
AI2	SPACE SENSOR	Space Sensor	KMC Type II Deg F
AI3	SPACE SET POINT	Space Set point	TABLE_4
AI4	PRIMARY DUCT	Primary Duct Pressure	
AI5	SECONDARY DUCT	Secondary Duct Pressure	

Output objects

The following BACnet output objects represent values at the physical outputs of the controller. For application specific output wiring details, see the topic Application drawings on page 29.

Table 9–3 Output objects

Output	Name	Description	Unit
AO3	ANALOG HEAT	Analog Heat	0_100%
AO4	FAN SPEED	Fan Speed	0_100%
BO1	DAMPER CW	Damper Clockwise	
BO2	DAMPER CCW	Damper Counter Clockwise	
BO5	FAN	Fan	
BO6	HT STAGE 1	Heating Stage 1	
BO7	HT STAGE 2	Heating Stage 2	
BO8	HT STAGE 3	Heating Stage3	

Value objects

BACnet value objects represent set points or other operational conditions in the controller.

Note: Not all objects are present in every model.

Table 9–4 Analog value objects

Object	Name	Description
AV1	SPACE TEMP	Space Temperature
AV2	STPT REFERENCE	Set point Reference
AV3	ACT COOL STPT	Active Cooling Set point
AV4	ACT HEAT STPT	Active Heating Set point
AV5	OCC CL STPT	Occupied Cooling Set point
AV6	OCC HT SPT	Occupied Heating Set point
AV7	UNOCC CL STPT	Unoccupied Cooling Set point

Table 9–4 Analog value objects (continue)

Object	Name	Description
AV8	UNOCC HT STPT	Unoccupied Heating Set point
AV9	MIN CL STPT	Minimum Cooling Set point
AV10	MAX HT STPT	Maximum Heating Set point
AV11	MIN STPT DIFF	Minimum Set point Differential
AV12	STBY DIFF	Standby Differential
AV13	MIN COOL FLOW	Minimum Cooling Flow
AV14	MAX COOL FLOW	Maximum Cooling Flow
AV15	MIN HEAT FLOW	Minimum Heating Flow
AV16	MAX HEAT FLOW	Maximum Heating Flow
AV17	AUXILIARY FLOW	Auxiliary Flow
AV18	PRI K FACT	Primary K Factor
AV19	PRI CORR SLOPE	Primary Correction Slope
AV20	PRI CORR OFFST	Primary Correction Offset
AV21	PRI LO FLOW CORR	Primary Low Flow Correction
AV22	PRI FLOW STPT	Primary Flow Set point
AV23	PRI RAW FLOW	Primary Raw Flow
AV24	PRI ACTUAL FLOW	Primary Actual Flow
AV32	MIN FAN SPEED	Minimum Fan Speed
AV33	MAX FAN SPEED	Maximum Fan Speed
AV36	DAT STPT	Discharge Air Temp Set point
AV37	SAT CHANGEOVER	SAT Changeover Temperature
AV38	LOCAL OVRD TIME	Local Override Timer
AV39	STANDBY TIME	Standby Timer (motion)
AV40	STANDBY TRIGGER	Standby Trigger
AV43	MEASURED MAX	Measured Maximum
AV44	MEASURED MIN	Measured Minimum
AV45	PRI SAVE MIN FLO	Primary Saved Minimum Airflow
AV47	DAT MAXIMUM	Maximum DAT Set point
AV48	CW DMP POS	CW Damper Position (BAC-8205-36 only)
AV49	CCW DMP POS	CCW Damper Position (BAC-8205-36 only)
AV50	DAMPER POSITION	Damper Position (BAC-8205-36 only)
AV55	CHNG_OVER_DELAY	Cooling Change Over Delay
AV56	LOW AUTO OCC	Low Limit for Auto Occupy

Table 9–5 Binary value objects

Object	Name	Description
BV1	NEED AHU	Need For AHU
BV2	NEED COLDER SPLY	Need For Colder Air Supply
BV3	NEED MORE STATIC	Need For AHU
BV4	LOCAL OVRD	Local Override Mode
BV5	MOTION OVRD	Motion Override Mode
BV6	MOTION SENSOR	Motion Sensor (Wall Stat)
BV7	NEED HOTTER SPLY	Need For Hotter Air Supply
BV8	CHANGE OVER MODE	SAT Changeover Mode
BV9	DAT LIMITING	Discharge Air Temp Limiting
BV10	CLOCKWISE CLOSE	Clockwise Close
BV11	AUTO OCCUPANCY	Auto Occupancy Detection
BV12	BALANCE MODE	Balance Mode
BV13	DAT SENSOR	DAT Sensor Present
BV14	PRI BAL TRIGGER	Primary Balance Trigger

Table 9–6 Multistate value objects

Object	Name	Description
MSV1	OCCUPIED MODE	Occupied Mode
MSV2	FAN CONFIG	Fantype Configuration
MSV3	REHEAT	Reheat Type
MSV6	WALL SENSOR	Multi-state Value #6

Loop objects

BACnet PID loops are used for modulating the damper and controlling reheat.

Table 9–7 PID control loop objects

Object	Name	Description
LOOP1	CL LOOP	Cooling Loop
LOOP2	HT LOOP	Heating Loop
LOOP3	DAT Loop	Discharge Air Temp Loop

Diamond Flow Sensor K-Factors for VAV Terminal Units

Model Series:
3000 Single Duct
3210 Dual Duct
35S-OAI Series Fan Powered w/ O.A. Damper
38S Underfloor Fan Powered

Inlet Size	Type	Duct Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	ROUND	0.087	182	2092	3.67
5		0.136	325	2390	2.81
6		0.196	455	2321	2.98
7		0.267	657	2461	2.65
8		0.349	899	2576	2.42
9		0.442	1158	2620	2.34
10		0.545	1497	2747	2.13
12	OVAL	0.754	2058	2729	2.15
14		0.970	2554	2633	2.31
16		1.186	3035	2559	2.45
24 x 16	RECT.	2.667	6797	2549	2.47

Model Series:
36VRS Square/Retangular Retrofit

Unit Size	Type	Damper (valve) Size (inches)	Damper (valve) Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
7	SQUARE OR RECT.	5 x 5	0.174	479	2753	2.12
8		6 x 6	0.250	689	2756	2.11
9		8 x 6	0.333	919	2760	2.11
10		10 x 8	0.555	1531	2759	2.11
11		14 x 8	0.778	2150	2763	2.10
11A		18 x 6	0.750	2068	2757	2.11
12		12 x 10	0.833	2297	2758	2.11
13		18 x 10	1.250	3446	2757	2.11
14		18 x 12	1.500	4135	2757	2.11
15		20 x 14	1.944	5360	2757	2.11
15A		30 x 12	2.500	6892	2757	2.11
16		22 x 16	2.444	6739	2757	2.11
17		24 x 18	3.000	8270	2757	2.11
18		30 x 20	4.167	11486	2756	2.11
19		40 x 20	5.555	15315	2757	2.11

Model Series:
30HQX Single Duct Exhaust (Hospital Grade)
30X Single Duct Exhaust

Unit Size	Type	Valve Inlet Size (inches)	Valve Inet Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	SQUARE OR RECT.	3.4 x 3.4	0.080	210	2625	2.33
5		4.3 x 4.3	0.128	345	2695	2.21
6		5.5 x 5.5	0.210	580	2762	2.10
7		5.8 x 6.3	0.254	680	2677	2.24
8		6.7 x 7.2	0.335	970	2896	1.91
9		8.6 x 7.1	0.424	1209	2851	1.97
10		9.5 x 8.0	0.528	1539	2915	1.89
12		13.6 x 8.1	0.765	2269	2966	1.82
14		12.9 x 10.8	0.968	2521	2604	2.36
16		18.3 x 10.8	1.373	3586	2612	2.35
24 x 16		26.1 x 16.3	2.954	7009	2373	2.85

Model Series:
3100 Single Duct
3230 Dual Duct
3240 "Blendmaster" Dual Duct
35N Parallel Fan Powered
35S Series Fan Powered
35S-CVP Pressurization Series Fan Powered
35SST "Stealth™" Series Fan Powered
36VRR Round Retrofit

Inlet Size	Type	Duct Area (Sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	ROUND	0.087	182	2092	3.67
5		0.136	325	2390	2.81
6		0.196	455	2321	2.98
7		0.267	657	2461	2.65
8		0.349	899	2576	2.42
9		0.442	1158	2620	2.34
10		0.545	1497	2747	2.13
12		0.785	2048	2609	2.36
14		1.069	2742	2565	2.44
16		1.395	3683	2640	2.30
18	OVAL	1.683	4323	2569	2.43

Model Series:
37N Low Profile Parallel Fan Powered
37S Low Profile Fan Powered
37SST Low Profile "Stealth™" Fan Powered

Inlet Size	Type	Duct Area (Sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	ROUND	0.087	182	2092	3.67
5		0.136	325	2390	2.81
6		0.196	455	2321	2.98
8		0.349	899	2576	2.42
10		0.545	1497	2747	2.13
14 x 8	RECT.	0.777	2035	2619	2.34
14 x 10	RECT.	0.972	2417	2487	2.59

Equations:

$$Q = K \times \sqrt{\Delta P} \qquad \Delta P = \left(\frac{Q}{K}\right)^2 \qquad F = \left(\frac{4005 \times A}{K}\right)^2$$

Where: Q = Airflow Rate (cfm)
ΔP = Sensor Differential Pressure ("w.g.)
K = K-Factor Calibration Constant (standard air)
F = Amplification Factor (sensor gain)
A = Nom. Duct Area (sq. ft.)

The K-Factors tabulated in the above tables are the air-flow required to produce a 1.0" w.g. differential pressure at the Diamond Flow Sensor.

For most up to date Diamond Flow Sensor K-Factors for VAV Terminal Units "IOM-VAVK" go to www.nailor.com

Accessories and replacement parts

The following accessories and replacement parts are available from Nailor.

Controllers/Actuators:

BAC-8001-36	EZvav Digital Controller (Single Duct Cooling only)
BAC-8005-36	EZvav Digital Controller (Single Duct ReHeat and Fan Powered)
BAC-8007-36	EZvav Digital Controller (Dual Duct Master)
TSP-8001-36	EZvav Digital Controller (Dual Duct Slave)

Room Temperature Sensors (Thermostat):

STE-8001W36	EZvav Room Temperature Sensor - digital display
STE-8201W36	EZvav Room Temperature Sensor - digital display with motion sensor
STE-6014W36	EZvav Room Temperature Sensor - Rotary dial
STE-1401	Air Temperature sensor (HCCO, DAT)

Communication Cables:

ECRJ45-25	Ethernet cable RJ-45, 25 ft.
ECRJ45-35	Ethernet cable RJ-45, 35 ft.
ECRJ45-50	Ethernet cable RJ-45, 50 ft.
ECRJ45-75	Ethernet cable RJ-45, 75 ft.

Diamond Flow Sensors:

Inlet Size		P/N
4”	3/16” O.D. tube	V1104
5”	3/16” O.D. tube	V1105
6”	3/16” O.D. tube	V1106
7”	3/16” O.D. tube	V1107
8”	3/16” O.D. tube	V1108
9”	3/16” O.D. tube	V1109
10”	3/16” O.D. tube	V1110
12”	3/16” O.D. tube	V1112
14”	3/16” O.D. tube	V1114
16”	3/16” O.D. tube	V1116
18”	3/16” O.D. tube	V1118

Installation and Operation Manual (IOM) Fan Powered Terminal Units Model Series: 35S(ST), 35SXC, 35N, 37S(ST) and 37N

General

Receiving Inspection Checklist

- Visually inspect unit for shipping damage before unwrapping any packaging material. Report any damage immediately to the delivering carrier.
- After unpacking the unit, check it again for shipping damage. If any shipping damage is found, report it immediately to the delivering carrier.
- Notify your local Nailor representative of damage and arrange for repair or replacement.
- Check that the unit is labeled as intended and deliver to appropriate site location.
- Store units in a clean, dry location.

Caution: Do not use the inlet collar, damper shaft, airflow sensor, electrical conduit, water coil extremities, drip pan, or tubing as a handle to lift or move assembly. Damage to the unit, unit accessories or controls may result.

Safety Precautions

a. All person(s) involved in installation process shall be qualified according to all relevant local codes and standards.

b. Beware of other building utilities and electrical wiring during installation process.

c. The unit installed shall be used only as intended. Any unintended use shall therein result in immediate forfeiture of manufacturer assumed warranty, responsibility and liability of product and associated components. Contact your local Nailor representative for questions.

d. **Warning:** Make sure all electrical power to the unit has been disconnected and any capacitors fully discharged before servicing. Failure to do so could result in injury or death.

e. During brazing process, make sure to protect any surrounding flammable materials, using barriers where applicable and always have a fire extinguisher accessible.

Caution: Any improper product handling, installation, servicing, or operation resulting in personal injury and property damage shall void any manufacturer assumed legal responsibility.

Installation

Supporting the Assembly

Suspend the unit from the building structure in the horizontal plane and ensure the unit is level to guarantee proper performance. Hanger rods or straps (by others) should be securely attached to joists or to mounting anchors which are properly secured to slab construction with lugs or poured in place anchors. Be careful not to obstruct the bottom access panel in order to maintain clearance for blower service. When requested, the unit is supplied with optional hanger brackets (shipped loose for field mounting) for use with hanger rod up to 3/8" (9.5) dia. Hanger brackets or straps should be screwed to the top corner posts (35S only) or unit casing sides (other models) or alternatively onto the inlet and outlet ends of the unit. See Figures 1 and 2.

Caution: Nailor Fan Powered Terminal units are too heavy to suspend with the ductwork and must be independently supported.

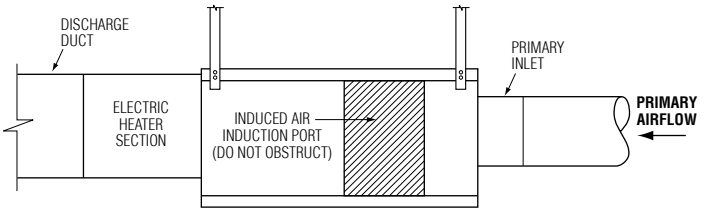
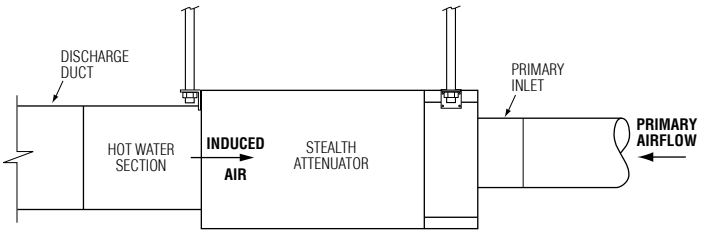


Figure 1: Fan Powered Terminal Unit Support Using Hanger Straps (Model 35SE illustrated).



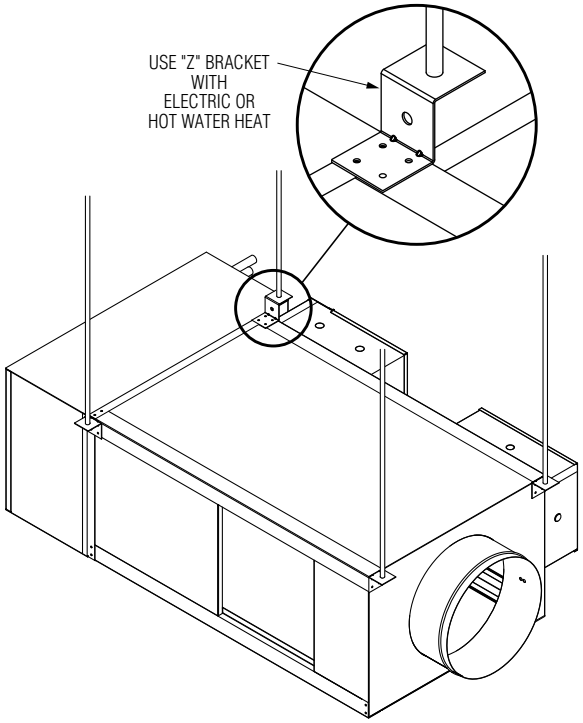


Figure 2: Fan Powered Terminal Unit Support Using Hanger Brackets and Rods (Models 35SWST and 35SW illustrated).

Duct Connections

All ducts should be installed in accordance with SMACNA guidelines. Slip each inlet duct over the inlet collar of the terminal. Fasten and seal the connection by the method prescribed in the job specification. The diameter of the inlet duct in inches must be equal to the nominal size of the terminal inlet. The inlet collar of the terminal is 1/8" (3) smaller than the nominal duct size to allow it to fit inside the duct.

Important: Do not insert ductwork inside the inlet collar of the assembly.

For optimum performance, 2 to 3 equivalent diameters of straight duct should be installed prior to the inlet of the unit. Rectangular discharge opening is designed for a flanged duct connection. A clear area around the opening has been left for screw penetration. Fasten and seal all connections by method prescribed in the job specification.

Minimum Access

Make appropriate accommodations for access panel removal. If unit is to be installed in ***hard ceiling/wall application***, refer to Nailor fan powered terminal unit submittals for specific dimensions before installing to assure there is access to the unit and components after installation is complete. Nailor 35S fan powered VAV terminal units have access panels on the top, bottom and side. Nailor 35N units have only bottom panels. Model 37S and 37N have top and bottom panels. Removable top and bottom access panels are secured as standard with screws. However, if the ¼ turn fastener access panel option is supplied, the bottom panel screws are replaced with two quick-connect latches.

Units with a removable top access panel are secured with two additional screws in the middle for shipping and handling. These additional screws can be removed after the unit is hung for quicker service if needed.

For low voltage control enclosure access, a minimum of 18" (457) is recommended. Specific control enclosure location is indicated on product submittals. Low voltage control enclosures have removable covers that are attached with sheet metal screws. High voltage controls enclosures have access panels that are equipped with hinges. For clearances for full opening of hinged access doors, refer to project specifications, submittal sheets and NEC.

Important: These recommendations do not preclude NEC or local codes that may be in effect, which are the responsibility of the installing contractor.

Field Wiring

All field wiring must comply with NEC and local codes. Disconnect switches are optional. Wiring diagrams can be found on labels affixed to the exterior/interior of the control box enclosure. Unless specifically requested by customer, all units are wired for a single point connection to the fan and electric heater (if present). All electric heaters will be staged per specification. Motors rated for 277 or 120 VAC on units with 480 or 208 VAC ratings respectively are always connected between the neutral and L1 terminals. The installing electrician should rotate the incoming electric service by phase to help balance the building electric load.

Fuse size designates the size of the internal fuse if it is supplied. Maximum Overcurrent Protection (MOP) designates the largest breaker or fuse in the electrical service panel that can be used to protect the unit. See Table 1 for calculation details.

Electrical Suggestions and Requirements

1. Provide a safety disconnect per NEC 424-19, 20, 21.
2. Disconnect the power supply before wiring or servicing unit. If+ a disconnect switch is present, it should be in the OFF position while making power connections or repairs.
3. All units with electric heat should have copper wires sized for minimum circuit ampacity (MCA). See Table 1 for calculation details.
4. Follow wiring diagrams and instructions mounted on the unit. 480V/3 phase heaters, for example, require a neutral wire in addition to the full sized ground wire. NEC 424-15 and 250 also require that all units be grounded.

Water Pipe Connections

Exercise extreme caution during "sweating" or brazing process of coil piping to avoid applying excessive heat to components associated with valve package. This could cause irreversible damage, requiring immediate replacement of parts. Make sure valves are in full open position during brazing process. Heat can be dissipated more effectively by wrapping a wet towel around the valve body during the brazing process.

Control Start-up and Operation

Your local Nailor Representative can provide detailed information about start-up and operating procedures for Nailor's digital, analog, and pneumatic controls. For specific information on controls provided by other manufacturers contact the control manufacturer's local or national office. This applies whether the controls were factory or field installed.

Note: Digital controllers may use specific communication addresses based on Building Management Systems, Architecture and original engineering drawings. Installing the terminal in a location other than that noted on the label may result in excessive start-up labor.

Primary Air Damper and Fan Adjustment

Before starting the fan motor:

a. If filters are required, make sure they are installed as intended.
b. Make sure duct system is clear of all debris and foreign objects.
c. Ensure unit enclosure, blower housing and blower wheel are free of any debris and foreign objects.

Starting the fan motor:

1. Start motor and let it run-in at least 15 minutes. During run-in, check ductwork connections for leaks and repair if necessary.
2. All Nailor fan powered VAV terminal units incorporating PSC motors use a solid state SCR speed controller to adjust motor speed and consequently air volume. Speed controllers have built-in maximum and minimum stops as detailed on the fan performance pages in the Nailor VAV Terminal Unit catalog. Turning the manual fan speed control counterclockwise will increase the fan speed; clockwise will decrease speed. The fan speed control is located on the side of the motor controls enclosure.
3. For series units, set the unit to full cooling. Adjust and set primary maximum cfm by measuring the airflow with a manometer attached between the gauge ports in the pneumatic tube leading to the high and low sides of the inlet air pick-up. A chart is attached to the side of the unit showing airflow vs. pressure for different inlet sizes. Adjust and set remote balancing dampers, if present. Do not worry about airflow at this time; just proportion the outlets with the dampers. Be sure to leave the dampers in the most possible open position. This will generate the minimum noise level. Adjust the fan speed control until the required CFM is obtained (by measuring the air quantity at the room outlets or by zeroing the induction air if primary and fan match). Fan should be adjusted with primary air at maximum set point to ensure that no supply air is discharged at the induction port. Recheck the fan and primary airflows when the damper is reset to the minimum set point.
4. For parallel units, turn the fan off, and set the primary air in the same manner as described for series units. Proportion the diffusers as above. Reset the primary airflow to the design fan turn-on point. Measure the airflow again to verify proper airflow. Turn the fan on. Allow the primary air damper to come under control after the fan is started, and then adjust the fan until the prescribed airflow is achieved by measuring the air quantity at the room outlets. Be sure to allow the primary air damper to stabilize after each fan adjustment and prior to measuring the airflow. Turn the fan off and verify the minimum airflow point on the damper.
5. For units equipped with ECM motors, set the primary air dampers as described in (3). Set the fan as described on the ECM MOTORS IOM, page 1. Proportion the dampers after the fan is set. Remember to adjust the dampers so that they are in the most open condition after proportioning. This will generate the minimum noise.

Maintenance Procedures

Warning: Electrical Hazard!

Before Servicing, disconnect all sources of electrical power, including the complete discharge of any electric current stored in capacitors included in the wiring structure. Practice good lockout/tagout procedures to prevent energizing of the unit during servicing. Failure to comply with previous statements could yield personal injury or even result in death.

Fan and Motor

Nailor fan powered terminal units are equipped with permanently lubricated motors. Inspect fan and motor assembly for dust and dirt as often as dictated by operating environment. Clean assembly if necessary.

If fan motor does not run, do the following:

a. Check for free rotation of blower wheel. Make sure no foreign objects are in fan. Look for signs of freight or job site damage.
b. Check power supply. Disconnects should be in the "ON" position. Optional fusing should also be inspected. Check transformer for proper output.
c. Check for proper control signals and PE switch setting (if provided) and relay function.

Fan motor runs but emits excessive noise

a. Maximum airflow may be too high, or discharge static pressure may be incorrect.
b. Blower may have clearance problems. Make sure all components are securely attached.
c. Verify integrity of ductwork. Leaks or loose connections could cause noise. Check for rattling diffusers or rattling or incorrectly adjusted balancing dampers.

Fan motor runs, but airflow too low:

a. May be due to ductwork restrictions, dirty air filters or clogged water coils.
b. Readjust fan speed control on control card.
c. Discharge static pressure may be incorrect. Check balancing dampers.
d. Confirm signal from the motor card to the motor by measuring the plug at the motor.

If repair or replacement is required

Disconnect all power before servicing. Motor and fan should be removed as an assembly. Remove the four hex nuts from mounting lugs holding the fan assembly to the discharge panel, and remove the assembly through any convenient access panel. Do not allow assembly to hang from wiring. If removing motor from blower, first loosen the set screw holding the blower wheel to the motor shaft. Remove the three screws holding the motor to the fan housing, and slide motor and fan housing apart.

To put the assembly back together, reverse the procedure. Be sure to align the blower set screw with the flat section of motor shaft.

Note: Over-tightening motor mounting screws may crush isolation bushing, causing excessive fan noise.

Primary Air Damper Replacement

Nailor's primary air valve assembly is not repairable. The entire assembly should be replaced if it is damaged.

Labels

Each fan powered terminal unit is shipped with a nameplate label affixed to the control casing. Principle nameplate data on the label typically include Order-Serial number, Model number, Unit Size, Motor horsepower, Amperage, MOP, Heater (if present) data, Supply voltage and Airflows. Also provided are calibration, airflow, as well as other labels as necessary. We suggest that you read all labels before beginning installation. If you have any questions, please contact your local Nailor Representative. Their phone numbers can be found on our website at nailor.com.

Label Example

Nailor Industries Inc.

Fan Powered Terminal Unit *(Unite Terminale @ Ventilateur Intégré)*

Date (Date)	: 5-Jul-2023	**Serial No.** (No. De Série)	:	155258-10
Model (Modèle)	: D35SE	**Tag No.** (No. D'étiquette)	:	42
Unit Size-Inlet Size (Diamètre D'Entrée)	: 3-8	**Voltage** (Voltage)	:	208
Control Voltage (Voltage De Contrôle)	: 24	**Phase** (Phase)	:	1
Control Sequence (Séquence De Contrôle)	: DF	**Stages** (Étapes)	:	2
Volt Amp (Volt-Ampère)	: 50	**HZ** (HZ)	:	60
Hot Water Coil Rows (Nombre De Rangées Serpentin Eau Chaud)	:	**Motor HP** (Moteur HP)	:	0
Chilled Water Coil Rows (Nombre De Rangées Serpentin Eau Froid)	:	**Motor Voltage** (Voltage Du Moteur)	:	208
		Motor Amp (Ampérage Du Moteur)	:	0

	KW/HP			Amps (Ampères)			Ampacity (Ampacitée)			Max. Overcurrent Protection (Resistance Des Fusible Max.)		Internal Fuse Size (If Supplied)
	Total (Totale)	Each Cir. (Chaque Circuit)	Each Stg. (Chaque Étape)	Total (Totale)	Each Cir. (Chaque Circuit)	Each Stg. (Chaque Étape)	Total (Totale)	Each Cir. (Chaque Circuit)	Each Stg. (Chaque Étape)	Total (Totale)	Each Cir. (Chaque Circuit)	
Heater (Chauffage)	13.00	13.00	6.50	62.5	62.5	31.25	78.13	39.07	39.07	80	80	40
Motor (Moteur)	0			0			0.00					15
Total (Totale)				62.50			78.13					N/A

Each Element Rated @ (Chaque Element Classifier A) 3.25 KW @ 208 VAC.

AWG. Min Wire Size (Min Diamètre De Fil) : 4

Min. Heating CFM (Min. PCM) : 910.00

Use wire suitable for at least 75 °C,
L1 is color coded black, L2 is blue, L3 is red,
Control wires coded as marked,
Use copper conductors only.

Utiliser un fil métallique qui convient au moin 75 °C,
L1 est colore noire, L2 est blue, L3 est rouge,
Les fils de contrôle son identifiée comme marque,
Utilise des conducteurs de cuivre seulement.

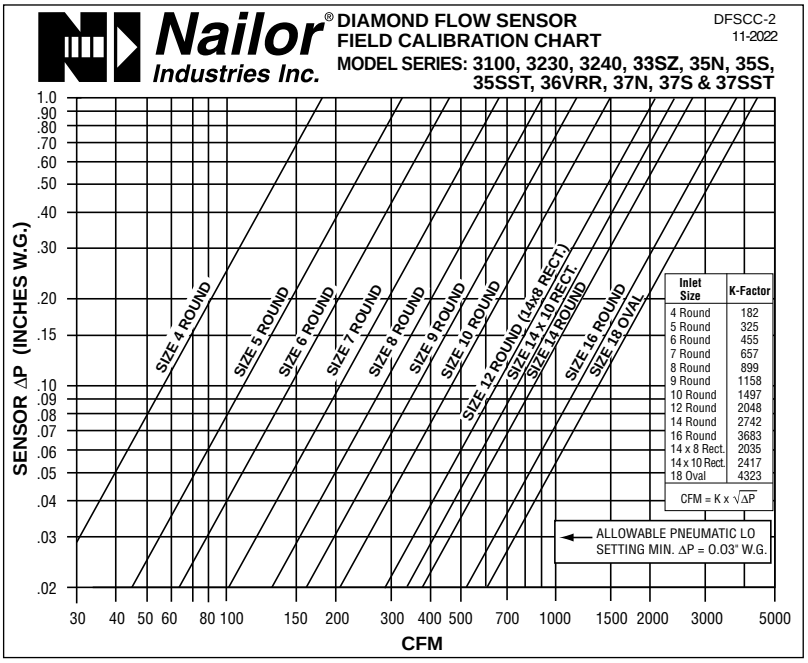
Primary CFM (Max/Min) : 890 / 360
Primaire PCM (Max.Min):

Fan CFM : 890
Ventilateur PCM:

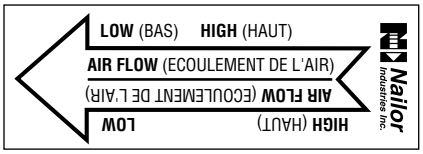
Primary L/S (Max/Min) : 420 / 170
Primaire L/S (Max.Min):

Fan L/S : 420
Ventilateur L/S:

Sample Diamond Flow Sensor Calibration Label



Airflow Direction (affixed to inlet collar)



Application Charts for ECM Motors

Nailor® Industries Inc. — **ECM MOTOR FAN CALIBRATION TABLE**
CFM vs VDC (Imperial Units)

FAN POWERED TERMINAL UNIT
MODEL SERIES: 35S & 35SST • UNIT SIZE 3 • 120/208/230/277 VAC 2/26/23

CFM	0-10 VDC REF.	CFM	0-10 VDC REF.	CFM	0-10 VDC REF.	CFM	0-10 VDC REF.
138	0.50	429	2.89	747	5.29	1023	7.68
146	0.57	438	2.96	756	5.36	1030	7.75
155	0.64	448	3.03	765	5.43	1037	7.82
163	0.71	457	3.10	774	5.50	1044	7.89
171	0.78	466	3.17	783	5.57	1051	7.96
179	0.85	475	3.24	791	5.64	1058	8.03
188	0.92	485	3.31	800	5.71	1065	8.10
196	0.99	494	3.39	809	5.78	1072	8.17
204	1.06	503	3.46	818	5.85	1079	8.24
213	1.13	513	3.53	826	5.92	1086	8.31
221	1.20	522	3.60	835	5.99	1093	8.38
229	1.27	531	3.67	843	6.06	1100	8.45
238	1.34	541	3.74	852	6.13	1108	8.52
246	1.41	550	3.81	860	6.20	1115	8.59
254	1.49	560	3.88	869	6.27	1122	8.66
263	1.56	569	3.95	877	6.34	1129	8.73
271	1.63	579	4.02	885	6.41	1136	8.80
280	1.70	588	4.09	893	6.48	1143	8.87
288	1.77	598	4.16	901	6.55	1151	8.94
297	1.84	607	4.23	909	6.62	1158	9.01
305	1.91	616	4.30	917	6.69	1166	9.09
314	1.98	626	4.37	925	6.76	1173	9.16
322	2.05	635	4.44	933	6.83	1181	9.23
331	2.12	645	4.51	941	6.90	1189	9.30
340	2.19	654	4.58	949	6.97	1197	9.37
349	2.26	663	4.65	956	7.04	1205	9.44
357	2.33	673	4.72	964	7.11	1213	9.51
366	2.40	682	4.79	971	7.19	1222	9.58
375	2.47	691	4.86	979	7.26	1230	9.65
384	2.54	701	4.93	986	7.33	1239	9.72
393	2.61	710	5.00	994	7.40	1248	9.79
402	2.68	719	5.07	1001	7.47	1257	9.86
411	2.75	728	5.14	1008	7.54	1266	9.93
420	2.82	737	5.21	1016	7.61	1276	10.00

THIS UNIT HAS BEEN FACTORY SET AT _____ CFM.

RE-CALIBRATION IS NOT REQUIRED UNLESS THE ZONE DESIGN AIRFLOW REQUIRMENT HAS CHANGED. THE BOLD LINES INDICATE MIN AND MAX CFM FOR THE UNIT. VARIATIONS IN FLOW IS IN +/- 5% or +/- 30 CFM WHICHEVER IS GREATER EXCEPT IN GRAY AREA. DATA REPRESENTED IN THIS CHART IS AT STANDARD CONDITIONS OF TEMPERATURE, PRESSURE AND HUMIDITY I.E. SCFM. FAN TURNS OFF BELOW 0.50Vdc.

www.nailor.com SUBJECT TO CHANGE WITHOUT NOTICE

Digital Control Algorithm:

CFM = 0.027717307(VDC)5 -0.61146699(VDC)4 +4.155391639(VDC)3 -8.60626115(VDC)2 + 124.7107364(VDC) + 77.19940471

VDC = -1.2214E-14(CFM)5 +3.95345E-11(CFM)4 -4.43622E-08(CFM)3 +2.07462E-05(CFM)2 +4.104313E-03(CFM) -0.340841705E+00

MCA and MOP Calculations

Minimum Circuit Ampacity

MCA = 1.25 x (Load 1 + Load 2 + Load 3 + Load 4)

Maximum Overcurrent Protection

MOP = (2.25 x load 1) + load 2 + load 3 + load 4

If the calculated MOP does not equal the standard current rating of an Overcurrent protective device (typically even multiples of 5), then the marked MOP is the next lower standard rating.

Exceptions:

1. The marked MOP will be the next higher standard rating than the computed value, if the next lower standard rating is less than 125 percent of the current rating of an electric heater load when such heater is involved.
2. If the computed value for MOP is less than the MCA, then the marked MOP is increased to the largest MOP appropriate for the MCA.
3. If the MCA does not correspond to a standard protective device rating, the next higher standard rating of the protective device will be marked if this rating does not exceed 800 A.

For Nailor Fan Powered Terminal Units and Fan Powered Terminal Units, **Load 1** is the largest motor current, **Load 2** is the sum of all other motor currents, and **Load 3** is the heater current. **Load 4** is used for other loads greater than 1.0 ampere and can be considered zero for most standard products.

For Nailor Variable Air Volume Units, **Load 1** and **Load 2** are considered zero.

Load 3 is the heater current **Load 4** is used for other loads greater than 1.0 ampere and can be considered zero for most standard products.

(Motor currents are determined by product application test in accordance with UL 1995 and may not be the same as the motor manufacture's FLA marking.)

All formulae, definitions, and exceptions are cited from Underwriters Laboratories Inc. Standard for Safety for Heating and Cooling Equipment, UL 1995 Fifth Edition (Sec. 44.14.44.15) CAN/CSA-C22.2 No. 236 Fifth Edition

Table 1.

Model Series Fan Powered Terminal Units Replacement Parts

NAILOR EZVAV DIGITAL CONTROLS

Code	Description
	Controller/Actuators:
BAC-8001-36	EZVAV Digital Controller (SD Clg only)
BAC-8005-36	EZVAV Digital Controller (SDRH, FP)
BAC-8007-36	EZVAV Digital Controller (DD master)
TSP-8001-36	EZVAV Digital Controller (DD slave)
	Room Temperature Sensors:
STE-8001W36	EZVAV Room Temp Sensor – Digital display
STE-8201W36	EZVAV Room Temp Sensor – Digital display w/ motion sensor
STE-6014W36	EZVAV Room Temp Sensor – Rotary dial
ECRJ45-25	Ethernet cable RJ-45, 25 ft.
ECRJ45-35	Ethernet cable RJ-45, 35 ft.
ECRJ45-50	Ethernet cable RJ-45, 50 ft.
ECRJ45-75	Ethernet cable RJ-45, 75 ft.
STE-1401	Air temp. sensor (HCCO, DAT)

ELECTRIC CONTROLS - Transformers

Code	Description	Part Number
V2072	120 to 24 v. 40VA - foot mount	H1-0669
V2073	- 4" x 4" elec. box	
V2074	208/240 to 24 v. 40VA - foot mount	H1-0671
V2075	277 to 24 v. 40VA - foot mount	H1-0675
V2076	24 to 24 v. 50VA - foot mount	H1-0673

ELECTRICAL COMPONENTS

RAPP Code	Description	Part Number
	Disconnect Switches	
EC-DISTG251P	Toggle Disconnect Switch 1P,600V,25A	H1-0212A
EC-DISTG403P	Toggle Disconnect Switch 3P,600V,40A	H1-0220Z
EC-DISTG603P	Toggle Disconnect Switch 3P,600V,60A	H1-0221Z
EC-DISINT25A	Interlocking Disconnect Switch3P,600V,25A	H1-0215Z
EC-DISINT40A	Interlocking Disconnect Switch3P,600V,40A	H1-0216Z
EC-DISINT60A	Interlocking Disconnect Switch3P,600V,60A	H1-0217Z
EC-DISINTHDL	Interlocking Disconnect Handle	H1-0215C
EC-DISINTSFT	Interlocking Disconnect Shaft	H1-0215D
	Contactors	
EC-CONM50A1P	Contactor MAG 1P,600V,40Amp	H1-0635
EC-CONM40A1P	Contactor MAG 1P,600V,40Amp	H1-0636
EC-CONM30A1P	Contactor MAG 1P,600V,20Amp	H1-0654
EC-CONM50A2P	Contactor MAG 2P,600V,40Amp	H1-0658
EC-CONM40A2P	Contactor MAG 2P,600V,30Amp	H1-0655
EC-CONM30A2P	Contactor MAG 2P,600V,20Amp	H1-0652
EC-CONM50A3P	Contactor MAG 3P,600V,40Amp	H1-0640
EC-CONM40A3P	Contactor MAG 3P,600V,30Amp	H1-0639
EC-CONM30A3P	Contactor MAG 3P,600V,20Amp	H1-0653
	SCR/SSR	
EC-SCR	SCR Elect. Heat controller, 600V, 1ph, 45A	H1-2064
EC-SSR	SSR Elect. Heat controller, 600V, 1ph, 45A	H1-2082
	ECM Motor Wiring harness	
EC-HARNESS1	Wiring Harness, Card to ECM. 16 Pin	H1-1104
EC-HARNESS2	Wiring Harness Power to Motor. 5 Pin	H1-1101
EC-HARNESS3	0-10 VDC wiring harness, 2 Pin	H1-1921
EC-HARNESS4	0-10 VDC wiring harness, 4 Pin, 2W	H1-1921A
	0-10 VDC wiring harness, 4 Pin, 4W	H1-1921H
	Transformers	
EC-TRANS120A	Transformer 120V,24V,50VA	H1-0692
EC-TRANS208A	Transformer 208-240V,24V,50VA	H1-0685
EC-TRANS277A	Transformer 277V,24V,50VA	H1-0674
EC-TRANS480A	Transformer 480V,24V,50VA	H1-0686
EC-TRANS2424	Isolation Transformer 24V,24V,50VA	H1-0673
EC-TRANSB	Transformer 120V/208/240/480 to 24V,75VA	H1-0689
EC-TRANS277B	Transformer 277V,24V,75VA	H1-0677
	MISC	
EC-AFSW	Airflow Switch	H1-0236A
EC-AFSWPB	Airflow Switch Probe 4"	H1-0242
EC-AFSWPBL	Airflow Switch Probe 6"	H1-1924
EC-AUTOLMTSW	Auto Temp. LMT Switch	H1-0006
EC-MANLMTSW	Manual Temp. LMT Switch	H1-0805
EC-FANRELAY	Fan Relay 24V	H1-0666

Model Series Fan Powered Terminal Units Replacement Parts

FILTERS

Model 35S Basic Unit Side Inlet & Q Boot option

Unit Size	RAPP Code	Description	Part Number
1, 2	VH1-0998	Filter 1" 10x12	H1-0998
	VH1-0998B	Filter 2" MERV8 10x12	H1-0998B
3	VH1-0196	Filter 1" 14x16	H1-0196
	VH1-0196C	Filter 2" MERV8 14x16	H1-0196C
4,5	VH1-0199	Filter 1" 16x16	H1-0199
	VH1-3184	Filter 2" MERV8 16x16	H1-3184
6	VH1-1529	Filter 1" 17x18	H1-1529
	VH1-1529B	Filter 2" MERV8 17x18	H1-1529B
7	VH1-0196	Filter 1" 14x16	H1-0196 (2)
	VH1-0196C	Filter 2" MERV8 14x16	H1-0196C (2)

Model 35S Basic Unit Top Inlet

Unit Size	RAPP Code	Description	Part Number
1, 2	VH1-0196	Filter 1" 14x16	H1-0196
	VH1-0196C	Filter 2" MERV8 14x16	H1-0196C
3	VH1-0199	Filter 1" 16x16	H1-0199
	VH1-3184	Filter 2" MERV8 16x16	H1-3184
4,5	VH1-0979	Filter 1" 16x25	H1-0979
	VH1-3167	Filter 2" MERV8 16x25	H1-3167
6	VH1-0200	Filter 1" 18x28	H1-0200
	VH1-3246	Filter 2" MERV8 18x28	H1-3246
7	VH1-0979	Filter 1" 16x25	H1-0979 (2)
	VH1-3167	Filter 2" MERV8 16x25	H1-3167 (2)

Model 35SST Stealth

Unit Size	RAPP Code	Description	Part Number
1, 2	VH1-0974	Filter 1" 10x14	H1-0974
	VH1-2055A	Filter 2" MERV8 10x14	H1-2055A
3	VH1-0977	Filter 1" 12x18	H1-0977
	VH1-1966B	Filter 2" MERV8 12x18	H1-1966B
4	VH1-0196	Filter 1" 14x16	H1-0196
	VH1-0196C	Filter 2" MERV8 14x16	H1-0196C
5	VH1-0975	Filter 1" 14x18	H1-0975
	VH1-1434B	Filter 2" MERV8 14x18	H1-1434B
6	VH1-0197	Filter 1" 18x19	H1-0197
	VH1-0197C	Filter 2" MERV8 18x19	H1-0197C
7	VH1-0928	Filter 1" 14x14	H1-0928 (2)
	VH1-1966A	Filter 2" MERV8 14x14	H1-1996A (2)

Model Series 35SXC

Unit Size	RAPP Code	Description	Part Number
1	VH1-3457	Filter 1" 6x14	H1-3457
3	VH1-2901	Filter 1" 6x18	H1-2901
5	VH1-2902	Filter 1" 12x20	H1-2902

Model 37S Basic Unit

Unit Size	RAPP Code	Description	Part Number
1	VH1-0997	Filter 1" 8x10	H1-0997
	VH1-0997B	Filter 2" MERV8 8x10	H1-0997B
2,3	VH1-0203	Filter 1" 10x18	H1-0203
	VH1-2056A	Filter 2" MERV8 10x18	H1-2056A
4	VH1-0974	Filter 1" 10x14	H1-0974 (2)
	VH1-2055A	Filter 2" MERV8 10x14	H1-2055A (2)

Model 37SST Stealth

Unit Size	RAPP Code	Description	Part Number
1	VH1-0201	Filter 1" 9x11	H1-0201
	VH1-0201B	Filter 2" MERV8 9x11	H1-0201B
2,3	VH1-0202	Filter 1" 11x12	H1-0202
	VH1-2020A	Filter 2" MERV8 11x12	H1-2020A
4	VH1-0974	Filter 1" 10x14	H1-0974 (2)
	VH1-2055A	Filter 2" MERV8 10x14	H1-2055A (2)

Model 35N Basic Unit & Q Boot Option

Unit Size	RAPP Code	Description	Part Number
2	VH1-1282	Filter 1" 13x26	H1-1282
	VH1-1282B	Filter 2" MERV8 13x26	H1-1282B
3	VH1-1283	Filter 1" 17x27	H1-1283
	VH1-1283D	Filter 2" MERV8 17x27	H1-1283D
5	VH1-1284	Filter 1" 17x33	H1-1284
	VH1-1284B	Filter 2" MERV8 17x33	H1-1284B
6	VH1-1285	Filter 1" 19x35	H1-1285
	VH1-1285B	Filter 2" MERV8 19x35	H1-1285B

Model 37N

Unit Size	RAPP Code	Description	Part Number
2	VH1-2254A	Filter 1" 11x14	H1-2254A
	VH1-2255M	Filter 2" MERV8 11x14	H1-2255M
3	VH1-2254B	Filter 1" 11x18	H1-2254B
	VH1-2255N	Filter 2" MERV8 11x18	H1-2255N
4	VH1-2254C	Filter 1" 11x21	H1-2254C
	VH1-2255P	Filter 2" MERV8 11x21	H1-2255P

Model Series Fan Powered Terminal Units Replacement Parts

EPIC ECM MOTORS

Model 35S(ST)

Unit Size	RAPP Code	Description	Part Number	Program
1	MTR35SECMS1	ECM Motor 35S(ST), Size 1, 120V	H1-3146	35S(ST-XC)-1-120V
1	MTR35SECMS1	ECM Motor 35S(ST), Size 1, 277-208V	H1-2267A	35S(ST-XC)-1-277V
2	MTR35SECMS2	ECM Motor 35S(ST), Size 2, 120-277V	H1-2267A	35S_Size2_ALL
3	MTR35SECMS3	ECM Motor 35S(ST), Size 3, 120-277V	H1-2269A	35S_35S-SIZES3-ADSR-REV1
4	MTR35SECMS4	ECM Motor 35S(ST), Size 4, 120-277V	H1-2269A	35S_4ADSR
5	MTR35SECMS5	ECM Motor 35S(ST), Size 5, 120-277V	H1-2270A	35S_5ADSR
6	MTR35SECMS6	ECM Motor 35S(ST), Size 6, 120-277V	H1-2271A	35S_6ADSR
7	MTR35SECMS7	ECM Motor 35S(ST), Size 7, 120-277V	H1-2270A	35S_7ADSR

Model 35N

Unit Size	RAPP Code	Description	Part Number	Program
2	MTR35NECMS2	ECM Motor 35N, Size 2, 120-277V	H1-2267A	35N_Size2_ALL_E
3	MTR35NECMS3	ECM Motor 35N, Size 3, 120-277V	H1-2267A	35N_Size3_ALL_E
5	MTR35NECMS5	ECM Motor 35N, Size 5, 120-277V	H1-2270A	35N_Size5_ALL_E
6	MTR35NECMS6	ECM Motor 35N, Size 6, 120-277V	H1-2270A	35N_Size6_ALL_E

Model Series 35SXC

Unit Size	RAPP Code	Description	Part Number	Program
1	MTR35XECMS1A	ECM Motor 35SXC, Size 1, 120V	H1-3146	35S(ST_XC)_1_120V.ECM
1	MTR35XECMS1B	ECM Motor 35SXC, Size 1, 277V	H1-3145	35S(ST_XC)_1_277V.ECM
3	MTR35XECMS3	ECM Motor 35SXC, Size 3, 120-277V	H1-3098	35SXC-3 HEB.ECM_Application
5	MTR35XECMS5	ECM Motor 35SXC, Size 5, 120-277V	H1-3099	35SXC-5 HEB.ECM_Application

Model 37S(ST)

Unit Size	RAPP Code	Description	Part Number	Program
1	MTR37SECMS1A	ECM Motor 37S(ST), Size 1, 120-277V	H1-2705	37S_Size1_All_R2
2	MTR37SECMS2A	ECM Motor 37S(ST), Size 2, 120V	H1-2706	37S_Size2_120
2	MTR37SECMS2B	ECM Motor 37S(ST), Size 2, 208-277V	H1-2705	37S_Size2_277
3	MTR37SECMS3	ECM Motor 37S(ST), Size 3, 120-277V	H1-2269UA	37S_Size3_ADSR
4	MTR37SECMS4	ECM Motor 37S(ST), Size 4, 120-277V	H1-2267A	37S_Size4_All_R2

Model 37N

Unit Size	RAPP Code	Description	Part Number	Program
2	MTR37NECMS2	ECM Motor 37N, Size 2, 120-277V	H1-2267A	37N_2ADS2
3	MTR37NECMS3	ECM Motor 37N, Size 3, 120-277V	H1-2267A	37N_3ADSR
4	MTR37NECMS4	ECM Motor 37N, Size 4, 120-277V	H1-2269UA	37N_Size4_ALL_R2

Model Series Fan Powered Terminal Units Replacement Parts

PSC MOTORS

Model 35S(ST)

Unit Size	RAPP Code	Description	Part Number	Capacitor
1,2	MTR35SPSCS1A	PSC 35S, Size 1&2, 1/10 HP, 120V+Cap	H1-2584	H1-0875
1,2	MTR35SPSCS1B	PSC 35S, Size 1&2, 1/10 HP, 208V+Cap	H1-2585	H1-0875
1,2	MTR35SPSCS1C	PSC 35S, Size 1&2, 1/10 HP, 277V+Cap	H1-2586	H1-0875
3	MTR35SPSCS3A	PSC 35S, Size 3, 1/4 HP, 120V+Cap	H1-2590S	H1-0878
3	MTR35SPSCS3B	PSC 35S, Size 3, 1/4 HP, 208V+Cap	H1-2591S	H1-0878
3	MTR35SPSCS3C	PSC 35S, Size 3, 1/4 HP, 277V+Cap	H1-2592S	H1-0878
4	MTR35SPSCS4A	PSC 35S, Size 4, 1/3 HP, 120V+Cap	H1-2593	H1-0877
4	MTR35SPSCS4B	PSC 35S, Size 4, 1/3 HP, 208V+Cap	H1-2594	H1-0876
4	MTR35SPSCS4C	PSC 35S, Size 4, 1/3 HP, 277V+Cap	H1-2595	H1-0876
5,7	MTR35SPSCS5A	PSC 35S, Size 5&7, 1/2 HP, 120V+Cap	H1-2596S	H1-0877
5,7	MTR35SPSCS5B	PSC 35S, Size 5&7, 1/2 HP, 208V+Cap	H1-2597S	H1-0876
57	MTR35SPSCS5C	PSC 35S, Size 5&7, 1/2 HP, 277V+Cap	H1-2598S	H1-0876
6	MTR35SPSCS6A	PSC 35S, Size 6, 3/4 HP, 120V+Cap	H1-2599	H1-0877
6	MTR35SPSCS6B	PSC 35S, Size 6, 3/4 HP, 208V+Cap	H1-2600	H1-0877
6	MTR35SPSCS6C	PSC 35S, Size 6, 3/4 HP, 277V+Cap	H1-2601	H1-0877

Model 35N

Unit Size	RAPP Code	Description	Part Number	Capacitor
2	MTR35NPSCS2A	PSC 35N, Size 2, 1/10 HP, 120V+Cap	H1-2584	H1-0875
2	MTR35NPSCS2B	PSC 35N, Size 2, 1/10 HP, 208V+Cap	H1-2585	H1-0875
2	MTR35NPSCS2C	PSC 35N, Size 2, 1/10 HP, 277V+Cap	H1-2586	H1-0875
3	MTR35NPSCS3A	PSC 35N, Size 3, 1/4 HP, 120V+Cap	H1-2590S	H1-0878
3	MTR35NPSCS3B	PSC 35N, Size 3, 1/4 HP, 208V+Cap	H1-2591S	H1-0878
3	MTR35NPSCS3C	PSC 35N, Size 3, 1/4 HP, 277V+Cap	H1-2592S	H1-0878
5	MTR35NPSCS5A	PSC 35N, Size 5, 1/2 HP, 120V+Cap	H1-2596S	H1-0877
5	MTR35NPSCS5B	PSC 35N, Size 5, 1/2 HP, 208V+Cap	H1-2597S	H1-0876
5	MTR35NPSCS5C	PSC 35N, Size 5, 1/2 HP, 277V+Cap	H1-2598S	H1-0876
6	MTR35NPSCS6A	PSC 35N, Size 6, 3/4 HP, 120V+Cap	H1-2599	H1-0877
6	MTR35NPSCS6B	PSC 35N, Size 6, 3/4 HP, 208V+Cap	H1-2600	H1-0877
6	MTR35NPSCS6C	PSC 35N, Size 6, 3/4 HP, 277V+Cap	H1-2601	H1-0877

Model 37S(ST)

Unit Size	RAPP Code	Description	Part Number	Capacitor
2	MTR37SPSCS2A	PSC 37S, Size 2, 1/6 HP, 120V+Cap	H1-2589S	H1-0875
2	MTR37SPSCS2B	PSC 37S, Size 2, 1/6 HP, 208V+Cap	H1-2588	H1-0875
2	MTR37SPSCS2C	PSC 37S, Size 2, 1/6 HP, 277V+Cap	H1-2587	H1-0875
3,4	MTR37SPSCS3A	PSC 37S, Size 3&4, 1/4 HP, 120V+Cap	H1-2590S	H1-0878
3,4	MTR37SPSCS3B	PSC 37S, Size 3&4, 1/4 HP, 208V+Cap	H1-2591S	H1-0878
3,4	MTR37SPSCS3C	PSC 37S, Size 3&4, 1/4 HP, 277V+Cap	H1-2592S	H1-0878

Model 37N

Unit Size	RAPP Code	Description	Part Number	Capacitor
2	MTR37NPSCS2A	PSC 37N, Size 2, 1/6 HP, 120V+Cap	H1-2589S	H1-0875
2	MTR37NPSCS2B	PSC 37N, Size 2, 1/6 HP, 208V+Cap	H1-2588	H1-0875
2	MTR37NPSCS2C	PSC 37N, Size 2, 1/6 HP, 277V+Cap	H1-2587	H1-0875
3	MTR37NPSCS3A	PSC 37N, Size 3, 1/4 HP, 120V+Cap	H1-2590S	H1-0878
3	MTR37NPSCS3B	PSC 37N, Size 3, 1/4 HP, 208V+Cap	H1-2591S	H1-0878
3	MTR37NPSCS3C	PSC 37N, Size 3, 1/4 HP, 277V+Cap	H1-2592S	H1-0878
4	MTR37NPSCS4A	PSC 35N, Size 4, 1/2 HP, 120V+Cap	H1-2596S	H1-0877
4	MTR37NPSCS4B	PSC 35N, Size 4, 1/2 HP, 208V+Cap	H1-2597S	H1-0876
4	MTR37NPSCS4C	PSC 35N, Size 4, 1/2 HP, 277V+Cap	H1-2598S	H1-0876

Model Series Fan Powered Terminal Units Replacement Parts

WATER COILS

Model 35SW(ST)

Unit size	RAPP code	Description	Part Number
1,2	V35SHWC12	HW Coil 35S 1 Row, Size 1,2	H1-0986
3	V35SHWC13	HW Coil 35S 1 Row, Size 3	H1-0987
4,5	V35SHWC15	HW Coil 35S 1 Row, Size 4,5	H1-0988
6	V35SHWC16	HW Coil 35S 1 Row, Size 6	H1-0989
7	V35SHWC17	HW Coil 35S 1 Row, Size 7	H1-0055
1,2	V35SHWC22	HW Coil 35S 2 Row, Size 1,2	H1-0925
3	V35SHWC23	HW Coil 35S 2 Row, Size 3	H1-0926
4,5	V35SHWC25	HW Coil 35S 2 Row, Size 4,5	H1-0927
6	V35SHWC26	HW Coil 35S 2 Row, Size 6	H1-0990
7	V35SHWC27	HW Coil 35S 2 Row, Size 7	H1-0056
1,2	V35SHWC32	HW Coil 35S 3 Row, Size 1,2	H1-0942
3	V35SHWC33	HW Coil 35S 3 Row, Size 3	H1-0943
4,5	V35SHWC35	HW Coil 35S 3 Row, Size 4,5	H1-0944
6	V35SHWC36	HW Coil 35S 3 Row, Size 6	H1-0945
7	V35SHWC37	HW Coil 35S 3 Row, Size 7	H1-1038

Model 35SXCW

Unit size	RAPP code	Description	Part Number
1	V35SHWC12	HW Coil 35S 1 Row, Size 1	H1-0986
3	V35SHWC13	HW Coil 35S 1 Row, Size 3	H1-0987
5	V35SHWC15	HW Coil 35S 1 Row, Size 5	H1-0988
1	V35SHWC22	HW Coil 35S 2 Row, Size 1	H1-0925
3	V35SHWC23	HW Coil 35S 2 Row, Size 3	H1-0926
5	V35SHWC25	HW Coil 35S 2 Row, Size 5	H1-0927
1	V35SHWC32	HW Coil 35S 3 Row, Size 1	H1-0942
3	V35SHWC33	HW Coil 35S 3 Row, Size 3	H1-0943
5	V35SHWC35	HW Coil 35S 3 Row, Size 5	H1-0944

Model 35NW

Unit Size	RAPP Code	Description	Part Number
2	V35NHWC12	HW Coil 35N 1 Row, Size 2	H1-1251
3	V35NHWC13	HW Coil 35N 1 Row, Size 3	H1-1254
5	V35NHWC15	HW Coil 35N 1 Row, Size 5	H1-1257A
6	V35NHWC16	HW Coil 35N 1 Row, Size 6	H1-1260
2	V35NHWC22	HW Coil 35N 2 Row, Size 2	H1-1252
3	V35NHWC23	HW Coil 35N 2 Row, Size 3	H1-1255
5	V35NHWC25	HW Coil 35N 2 Row, Size 5	H1-1258
6	V35NHWC26	HW Coil 35N 2 Row, Size 6	H1-1261
2	V35NHWC32	HW Coil 35N 3 Row, Size 2	H1-1253
3	V35NHWC33	HW Coil 35N 3 Row, Size 3	H1-1256
5	V35NHWC35	HW Coil 35N 3 Row, Size 5	H1-1259
6	V35NHWC36	HW Coil 35N 3 Row, Size 6	H1-1262

Model 37NW

Unit Size	RAPP Code	Description	Part Number
2	V37NHWC12	HW Coil 37N 1 Row, Size 2	H1-2163
3	V37NHWC13	HW Coil 37N 1 Row, Size 3	H1-2165
4	V37NHWC14	HW Coil 37N 1 Row, Size 4	H1-2167
2	V37NHWC22	HW Coil 37N 2 Row, Size 2	H1-2164
3	V37NHWC23	HW Coil 37N 2 Row, Size 3	H1-2166
4	V37NHWC24	HW Coil 37N 2 Row, Size 4	H1-2168

Model 37SW(ST)

Unit Size	RAPP Code	Description	Part Number
1	V37SHWC11	HW Coil 37S 1 Row, Size 1	H1-0091
2,3	V37SHWC13	HW Coil 37S 1 Row, Size 2,3	H1-0094
4	V37SHWC14	HW Coil 37S 1 Row, Size 4	H1-0097
1	V37SHWC21	HW Coil 37S 2 Row, Size 1	H1-0092
2,3	V37SHWC23	HW Coil 37S 2 Row, Size 2,3	H1-0095
4	V37SHWC24	HW Coil 37S 2 Row, Size 4	H1-0098
1	V37SHWC31	HW Coil 37S 3 Row, Size 1	H1-0093
2, 3	V37SHWC33	HW Coil 37S 3 Row, Size 2,3	H1-0096
4	V37SHWC34	HW Coil 37S 3 Row, Size 4	H1-0099

FUSE/FUSE BLOCKS

RAPP Code	Description	Part Number
EC-FSBLK1PA	Fuseblock, 1P, 250V, 30A	H1-0016
EC-FSBLK1PB	Fuseblock, 1P, 250V, 60A	H1-0263
EC-FSBLK1PC	Fuseblock, 1P, 600V, 30A	H1-0973
EC-FSBLK1PD	Fuseblock, 1P, 600V, 60A	H1-0269A
EC-FSBLK2PA	Fuseblock, 2P, 250V, 30A	H1-0920
EC-FSBLK2PC	Fuseblock, 2P, 600V, 30A	H1-0264
EC-FSBLK2PD	Fuseblock, 2P, 600V, 60A	H1-0269B
EC-FSBLK3PA	Fuseblock, 3P, 250V, 30A	H1-0265
EC-FSBLK3PB	Fuseblock, 3P, 250V, 60A	H1-0266
EC-FSBLK3PC	Fuseblock, 3P, 600V, 30A	H1-0268
EC-FSBLK3PD	Fuseblock, 3P, 600V, 60A	H1-0269
EC-FUS250V15	Fuse, 250V, 15A	H1-0320A
EC-FUS250V20	Fuse, 250V, 20A	H1-0321A
EC-FUS250V25	Fuse, 250V, 25A	H1-0322A
EC-FUS250V30	Fuse, 250V, 30A	H1-0323A
EC-FUS250V35	Fuse, 250V, 35A	H1-0324A
EC-FUS250V40	Fuse, 250V, 40A	H1-0325A
EC-FUS250V45	Fuse, 250V, 45A	H1-0326A
EC-FUS250V50	Fuse, 250V, 50A	H1-0327A
EC-FUS250V60	Fuse, 250V, 60A	H1-0328A
EC-FUS600V15	Fuse, 600V, 15A	H1-0329A
EC-FUS600V20	Fuse, 600V, 20A	H1-0330A
EC-FUS600V25	Fuse, 600V, 25A	H1-0331A
EC-FUS600V30	Fuse, 600V, 30A	H1-0332A
EC-FUS600V35	Fuse, 600V, 35A	H1-0333A
EC-FUS600V40	Fuse, 600V, 40A	H1-0334A
EC-FUS600V45	Fuse, 600V, 45A	H1-0335A
EC-FUS600V50	Fuse, 600V, 50A	H1-0336A
EC-FUS600V60	Fuse, 600V, 60A	H1-0337A

Model Series Fan Powered Terminal Units Replacement Parts

BLOWERS AND WHEEL

Model Series 35S(ST) and 35SXC

Unit Size	RAPP Code	Location	Description	Part Number
1	BLW1809X	OL, OR	Blower, 7x7, .5, CW, Dual Inlet (H1-2361 + H1-2361A + H1-2361B + H1-2547):	4 parts below:
1	BLW2361	OL, OR	Blower, Wheel	H1-2361
1	BLW2361A	OL, OR	Blower, Inlet Ring	H1-2361A
1	BLW2361B	OL, OR	Blower, Housing, Beckett 625C, 8.25	H1-2361B
1	BLW2547	OL, OR	Blower, Inlet Ring	H1-2547

Model Series 35S(ST)

Unit Size	RAPP Code	Location	Description	Part Number
2	BLW0902AX	OL, OR	Blower, 9X7T, .5, CW, Dual Inlet	H1-0902AX
3	BLW0900X	OL, OR	Blower, 9X7R, .5, CW, Dual Inlet	H1-0900X
4	BLW1983X	OL, OR	Blower, 9X9R, .5, CW, Dual Inlet	H1-1983X
5	BLW0903X	OL, OR	Blower, 10X10T, .5, CW, Dual Inlet	H1-0903X
6	BLW004X	OL, OR	Blower, 10X10R, .5, CW, Dual Inlet	H1-0904X
7	BLW0903X	OL, OR	Blower, 10X10T, .5, CW, Dual Inlet	H1-0903X (2)

Model Series 35SXC

Unit Size	RAPP Code	Location	Description	Part Number
3	BLW3098	OL, OR	Blower, 9X7 w/EON Spoked Rotor, 48frame,10P,1/2HP	H1-3098
5	BLW3099	OL, OR	Blower, 10X10 w/EON Spoked Rotor,48frame,10P,3/4HP	H1-3099

Model 37S(ST)

Unit Size	RAPP Code	Location	Description	Part Number
1	BLW2730	OL, OR	Blower, 9X4R, .5, CW, Dual Inlet	H1-2730
2	BLW2731	OL, OR	Blower, 10X4R, .5, CW, Dual Inlet	H1-2731
3	BLW2427X	OL, OR	Blower, 11X4R, .5, CW, Dual Inlet	H1-2427X
4	BLW0906	OL, OR	Blower, 10X4R, .5, CW, Dual Inlet	H1-0906 (2)
2, 3	BLW0906	OL, OR	Blower, 10X4R, .5, CW, Dual Inlet	H1-0906

Model 35N

Unit Size	RAPP Code	Location	Description	Part Number
2	BLW0902AX	OL, OR	Blower, 9X7T, .5, CW, Dual Inlet	H1-0902AX
3	BLW0900ZX	OL, OR	Blower, 9X7R, .5, CW, Dual Inlet	H1-0900ZX
5	BLW0903X	OL, OR	Blower, 10X10T, .5, CW, Dual Inlet	H1-0903X
6	BLW0904X	OL, OR	Blower, 10X10R, .5, CW, Dual Inlet	H1-0904X

Model 37N

Unit Size	RAPP Code	Location	Description	Part Number
4	BLW0905AX	OL, OR	Blower, 10X6R, .5, CW, Dual Inlet	H1-0905AX
2, 3	BLW0906X	OL, OR	Blower, 10X4R, .5, CW, Dual Inlet	H1-0906X

INSTALLATION AND OPERATION MANUAL ELECTRIC HEATERS FOR VAV TERMINAL UNITS

GENERAL INFORMATION

- Nailor electric heaters require little or no maintenance. Be sure the heater elements are free of foreign matter, and then check that the connections are tight and proper control interlocks have been made before turning the heater on.
- Heaters are open wire type and, except on very small heaters with element wires less than 1 kW, use special ‘arrowhead’ insulators that expose the entire surface area of the element wires to the air stream. This eliminates the possibility of hot spots on the larger wires that can burn the elements in half or cause spalding that enhances hot spots.
- All electric heaters ordered from Nailor are manufactured in-house.
- All Nailor electric coils are ETL listed for safety under UL 1995 as part of the VAV unit.
- All electric heating units have built-in controls for all options required by the engineer.
- Single point power connection.

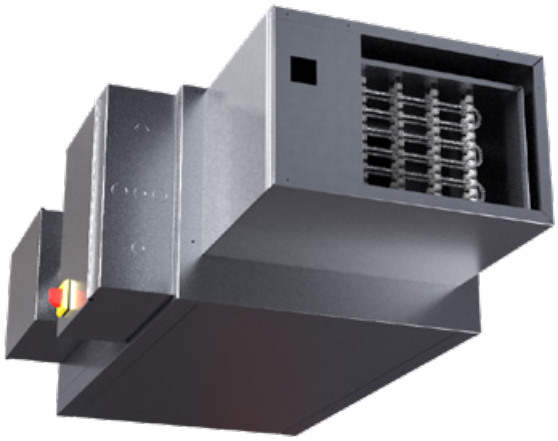


Figure 1. Fan Powered Terminal Unit with Electric Heater

Figure 2. Single Duct Terminal Unit with Electric Heater

INSTALLATION

- All single duct terminal units with electric coils are designed to be mounted in a horizontal plane with respect to the "UP" arrow marked on the product label. Fan powered units can be flipped over in the field and will not have "UP" arrow.
- Before applying power, make sure electric coils are not damaged.
- All field wiring must comply with NEC and local building codes.
- Use copper conductors only.
- Phase rotation of the incoming power is recommended when connecting three-phase electric coils.
- Allow a minimum clearance as specified by NEC in front of all electric coil enclosures.
- Always check product label to determine proper wire size and current protection.
- These recommendations do not preclude NEC or local building codes that may be in effect.

CAUTION: ELECTRIC SHOCK HAZARD
1. Turn off power before servicing unit.
2. Do not operate unit without control cover.

OPERATION

- To avoid possible nuisance tripping of the thermal cutouts due to insufficient airflow, a minimum airflow of 70 cfm (33L/s) per kilowatt must be maintained.
- For Single Duct Terminal Units, A minimum of .1” w.g. (25 Pa) of downstream static pressure is required to ensure proper operation of the heater.

NAMEPLATE LABEL

Electric coil data are incorporated in the nameplate label, which is affixed to the control enclosure cover. The label shows all necessary information required by UL with respect to electrical power and circuit protection requirements.

HEATER CONTROL ENCLOSURE

Figure 4 shows the interior of a typical heater control enclosure. All components within this space work together to provide safe operation of the heater. Although it is not required to meet NEC requirements, Nailor recommends a **door interlocking disconnect switch**. This safety switch must be disconnected before the enclosure can be opened. In the absence of a disconnect switch, a **terminal block** is provided for single point power connection. A **ground lug** ensures the proper grounding of the unit housing and enclosure. **Line fuses and fan motor fuses** provide overcurrent protection, and come as an option. An **airflow switch** de-energizes the heater when it detects no airflow across the elements.

In fan powered VAV terminal units, **auto-reset limit switches** in line with each element provide high temperature protection. A single **auto-reset limit switch** provides protection for single duct terminal unit heaters. These switches automatically cut the heater off when overheating occurs, and turn the heater back on when the elements have cooled down. **Manual-reset limit switches** in line with each element provide secondary over temperature protection in single duct terminal units.

A control **transformer** is provided whenever a 24V circuit is required. **PE switches** (when pneumatic controls are used), like **magnetic contactors**, are used to energize stages of electric heat. Small heaters may often use a load carrying PE switch as the only control component. When control systems require frequent cycling or silent operation, **mercury contactors** are available as an option. An **SCR control** will provide fine space temperature control and highest reliability. For fan-powered terminal units, a **fan relay** is provided when required or requested.

Nailor® Industries Inc.

FAN POWERED TERMINAL UNIT — **(UNITE TERMINALE @ VENTILATEUR INTEGRÉ)**

DATE *(DATE)*	**27-Nov-2001**	**SERIAL NO.** *(NO. DE SÉRIE)*	**150111-2**
MODEL (MODÈLE)	**D35SE**	**TAG NO.** *(NO. DÈTIQUETTE)*	**FPB-1-35**
UNIT SIZE-INLET SIZE *(DIAMETRE D'ENTRÉE)*	**4-10**	**VOLTAGE** *(VOLTAGE)*	**480**
		PHASE *(PHASE)*	**3**
CONTROL VOLTAGE (*VOLTAGE DE CONTRÔLE)*	**24**	**STAGES** *(ÉTAPES)*	**2**
		HZ. *(HZ)*	**50/60**
CONTROL SEQUENCE *(SEQUENCE DE CONTRÔLE)*	**NB**	**MOTOR HP** *(MOTEUR HP)*	**1/3**
		MOTOR VOLTAGE *(VOLTAGE DU MOTEUR)*	**277**
VOLT AMP *(VOLT-AMPÈRE)*	**50**		
HOT WATER COIL ROWS *(NOMBRE DE RANGÉES SERPENTIN EAUCAUDE)*	**N/A**	**MOTOR AMP** *(AMPERAGE DU MOTEUR)*	**2.0**

	KW/HP			AMPS (AMPÈRES)			AMPACITY (AMPACITÉE)			MAX. OVERCURRENT PROTECTION (RESISTANCE DES FUSIBLE MAX.)		MOTOR FUSE SIZE (MOTEUR FUSIBLE)
	TOTAL (TOTALE)	EACH CIR. (CHAQUE CIRCUIT)	EACH STG. (CHAQUE ÉTAPE)	TOTAL (TOTALE)	EACH CIR. (CHAQUE CIRCUIT)	EACH STG. (CHAQUE ÉTAPE)	TOTAL (TOTALE)	EACH CIR. (CHAQUE CIRCUIT)	EACH STG. (CHAQUE ÉTAPE)	TOTAL (TOTALE)	EACH CIR. (CHAQUE CIRCUIT)	
HEATER (CHAUFFAGE)	10.0	10.0	5.0	12.0	12.0	6.0	15.0	15.0	7.5	20	20	N/A
MOTOR (MOTEUR)	1/3				2.0		2.5			3		30
TOTAL (TOTALE)					14.0		17.5			23		

EACH ELEMENT RATED @ 3.3 KW @ 277 VAC. *(CHAQUE ELEMENT CLASSIFIER A)*

AWG. MIN WIRE SIZE (MIN DIAMETRE DE FIL) : 14
MIN. HEATING CFM (MIN. PCM) : 700

USE WIRE SUITABLE FOR AT LEAST 75 ₀C
L1 IS COLOR CODED BLACK , L2 IS BLUE, L3 IS RED
CONTROL WIRES CODED AS MARKED
USE COPPER CONDUCTORS ONLY.

UTILISER UN FIL METALIQUE QUI CONVIENT AU MOIN 75 ₀C
L1 EST COLORÉ NOIRE, L2 EST BLUE , L3 EST ROUGE,
LES FILS DE CONTRÔLE SON INDENTIFIÉE COMME MARQUE,
UTILISÉ DES CONDUCTEURS DE CUIVRE SEULEMENT.

USE CLASS K, RK1, A2D OR A6D FUSE OR HACR BREAKERS. *UTILISÉ DES FUSIBLES CLASS K, RK1, A2D, OU A6D OU HACR DISJONCTEURS.*

PRIMARY CFM (MAX/MIN) : 1000/1000
FAN CFM :

PRIMARY L/S (MAX/MIN) : 472/472
FAN L/S :

Figure 3. Sample Nameplate Label. Fan Powered Terminal Unit

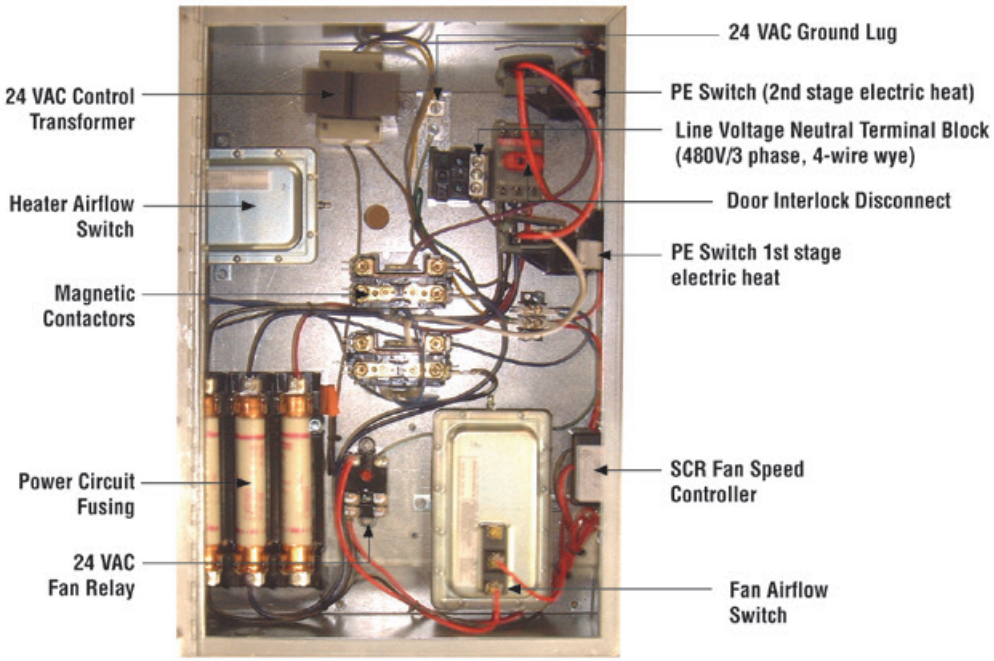


Figure 4: Typical Line Voltage Control Enclosure Box

Wiring Diagrams

A specific wiring diagram for each heater including all controls is glued to the inside of the control panel door. Another wiring diagram is provided loose in the control box.

Heater Element Rack Replacement For Series Fan Powered Terminal Units

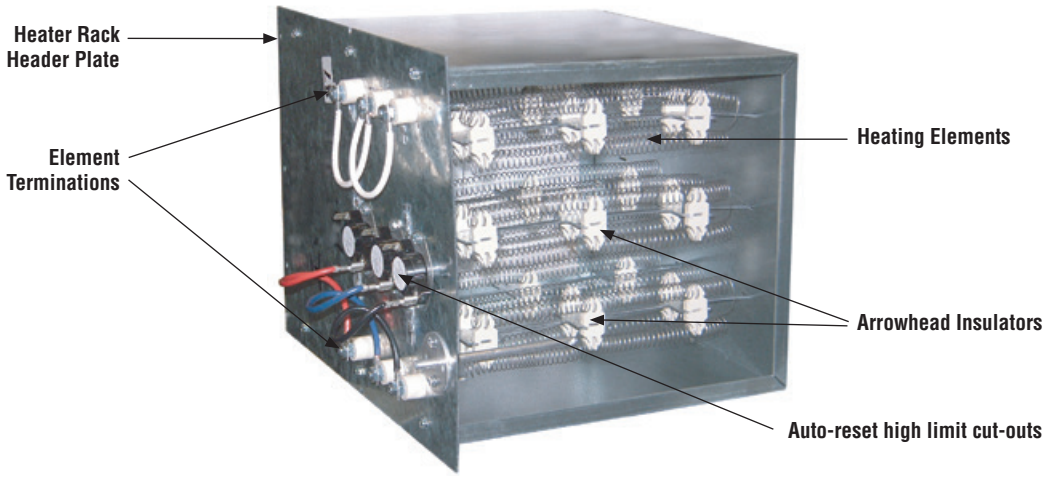


Figure 5. Typical element rack for a series Fan Powered Terminal Unit

On series fan Powered Terminal Units, the element rack is removable for replacement. The header plate is located behind a hinged door enclosure on the side of the terminal electric heater section.

1. Turn off power supply before servicing.
2. Locate the element rack header plate.
3. Before removing wires from the element rack header plate, mark where the wires are connected so they can be reconnected correctly on the new element rack.
4. Remove the wires and screws holding the heater plate in the coil housing.
5. Insert the new element rack into coil housing and replace the screws to secure the element rack.
6. Replace the wires.
7. Replace the enclosure cover before turning on the power.

Electric Heater Replacement Parts

Description	RAPP Code
Disconnect Switches	
Toggle Disconnect Switch 1P, 600V, 25A	EC-DISTG251P
Toggle Disconnect Switch 3P, 600V, 40A	EC-DISTG403P
Toggle Disconnect Switch 3P, 600V, 60A	EC-DISTG603P
Interlocking Disconnect Switch 3P, 600V, 25A	EC-DISINT25A
Interlocking Disconnect Switch 3P, 600V, 40A	EC-DISINT40A
Interlocking Disconnect Switch 3P, 600V, 60A	EC-DISINT60A
Interlocking Disconnect Handle	EC-DISINTHDL
Interlocking Disconnect Shaft	EC-DISINTSFT
Contactors	
Contactor MAG 1P, 600V, 50Amp	EC-CONM50A1P
Contactor MAG 1P, 600V, 40Amp	EC-CONM40A1P
Contactor MAG 1P, 600V, 30Amp	EC-CONM30A1P
Contactor MAG 2P, 600V, 50Amp	EC-CONM50A2P
Contactor MAG 2P, 600V, 40Amp	EC-CONM40A2P
Contactor MAG 2P, 600V, 30Amp	EC-CONM30A2P
Contactor MAG 3P, 600V, 50Amp	EC-CONM50A3P
Contactor MAG 3P, 600V, 40Amp	EC-CONM40A3P
Contactor MAG 3P, 600V, 30Amp	EC-CONM30A3P
SCR/SSR	
SCR Elect. Heat controller, 600V, 1ph, 45A	EC-SCR
SSR Elect. Heat controller, 600V, 1ph, 45A	EC-SSR
Transformers	
Transformer 120V, 24V, 50VA	EC-TRANS120A
Transformer 208-240V, 24V, 50VA	EC-TRANS208A
Transformer 277V, 24V, 50VA	EC-TRANS277A
Transformer 480V, 24V, 50VA	EC-TRANS480A
Isolation Transformer 24V, 24V, 40VA	EC-TRANS2424
Transformer 120V/208/240/480 to 24V, 75VA	EC-TRANSB
Transformer 277V, 24V, 75VA	EC-TRANS277B
MISC	
Airflow Switch	EC-AFSW
Airflow Switch Probe 4"	EC-AFSWPB
Airflow Switch Probe 6"	EC-AFSWPBL
Auto Temp. LMT Swtch	EC-AUTOLMTSW
Manual Temp. LMT Swtch	EC-MANLMTSW
Fan Relay 24V	EC-FANRELAY

Description	RAPP Code
Power Distribution Blocks	
2 pole, 175A, 600V, 1 in / 4 out	H1-0271A
2 pole, 300V, 1 in / 4 out (quick connect)	H1-0293
3 pole, 600V, 1 in / 4 out	H1-0270
Power Terminal Blocks	
1 pole, 600V	H1-0044
2 pole, 600V	H1-0076
3 pole, 600V	H1-0004
Fuse	
Fuse, 250V, 15A	EC-FUS250V15
Fuse, 250V, 20A	EC-FUS250V20
Fuse, 250V, 25A	EC-FUS250V25
Fuse, 250V, 30A	EC-FUS250V30
Fuse, 250V, 35A	EC-FUS250V35
Fuse, 250V, 40A	EC-FUS250V40
Fuse, 250V, 45A	EC-FUS250V45
Fuse, 250V, 50A	EC-FUS250V50
Fuse, 250V, 60A	EC-FUS250V60
Fuse, 600V, 15A	EC-FUS600V15
Fuse, 600V, 20A	EC-FUS600V20
Fuse, 600V, 25A	EC-FUS600V25
Fuse, 600V, 30A	EC-FUS600V30
Fuse, 600V, 35A	EC-FUS600V35
Fuse, 600V, 40A	EC-FUS600V40
Fuse, 600V, 45A	EC-FUS600V45
Fuse, 600V, 50A	EC-FUS600V50
Fuse, 600V, 60A	EC-FUS600V60

OPERATION MANUAL
EPIC FAN CARD VOLUME CONTROLLER
WITH (GENTEQ EON) ECM MOTOR

REFER TO FIGURES 1, 2 & 3 AND USE THESE INSTRUCTIONS IF YOUR FAN CARD RESEMBLES ONE OF THESE. IF YOUR FAN VOLUME CONTROLLER CARD LOOKS DIFFERENT, REFER TO another IOM-ECM. This IOM refers to Nailor Part #'s H1-2272, H1-2272A1 and H1-2273A1.

LED INDICATORS

Power Indicator – A red LED located on the controller circuit board indicates that the control card has 24 VAC present (light will illuminate with higher than 18 VAC).

Airflow Indicator – A green LED located on the controller circuit board flashes to indicate airflow volume. Each pulse is 100 cfm (47.2 l/s). The last pulse is scaled. (ex. ½ pulse = 50 cfm)

RPM Limit Indicator – The green LED (same as airflow indicator LED) will stop pulsing bright green and reduce itself to a solid, dim glow as an indication that the motor is operating at or above the RPM limit for that particular unit. This is not an issue for some Nailor models and/or applications and can be where the unit is designed to run in normal operation, for instance a fan coil with multiple rows and high MERV rating filter at maximum cfm of the model. For some models and application such as Fan Powered Terminal Boxes where the box is not at maximum cfm or multiple rows, this could be an indication that filters should be checked for blockage or abnormally high static pressure. This would be an indication that the RPM limit has been reached. In either case review as needed per application.

SETTING AIRFLOW
(SEE TROUBLESHOOTING SECTION IF ISSUES ARISE)
Setting the Fan Airflow in the Manual Mode

1. Mode Selector Jumper must be in the "Manual" position.
2. Ensure there is a 24 VAC signal at the 24 VAC/GND terminals.
3. Attach the leads of a DC voltmeter to the "TP1+" and "TP2-" pads on the Fan Card. Read the DC volts.
4. Refer to the Fan Calibration Table inside the line voltage enclosure. Select the voltage that corresponds to the desired airflow (cfm or l/s) set point.
5. Adjust the potentiometer on the Fan Card to the desired voltage.
6. Breaking the power on the 24 VAC will cycle the fan.

Setting the Fan Airflow in the Dynamic Automation (0 – 10 VDC) Mode

1. Mode Selector Jumper must be in the "0-10V" position.
2. Ensure there is a 24VAC signal at the 24VAC/GND terminals.
3. A "0-10V" VDC input signal will determine the fan airflow at the unit. Varying this signal will in turn vary the fan airflow. At less than 0.50 VDC, the unit will turn off.
4. Note: When mode selector jumper is in the "0-10V" position and the sequence of operation warrants turning the motor off through the 24 VAC, the "hot" leg of the incoming power **must** be broken. Breaking the GND/common leg will not turn the motor off when the "0-10V" is connected to any controller.

OPTIONAL FSC - FAN STATUS (ON/OFF) CONTACT CLOSURE (MOTOR BLOWER PROVING SIGNAL) ON H1-2272A1 / H1-2273A1

1. A dry contact closure signal is provided at RLY terminals.
2. This signal can be used by the BAS for proving the motor blower is running (200 RPM threshold).

ELECTRIC HEAT FAN INTERLOCK RELAY (FIR) (if equipped)

1. Air proving signal is provided to a relay in the heater control circuit on models equipped with electric heat. This safety interlock prevents the heater from energizing unless the fan is energized and rotating at a minimum of 200 RPM.
2. This signal is used in the control scheme in lieu of a mechanical air pressure switch.

NOTICE:

POWER MUST BE REMOVED FROM THE CONTROLLER WHENEVER CONNECTIONS OR DISCONNECTIONS ARE BEING MADE. FAILURE TO DO SO COULD RESULT IN IRREPARABLE DAMAGE.

BEFORE PROCEEDING WITH ANY ADDITIONAL TROUBLESHOOTING, ENSURE THAT THE POLARITY OF THE 24 VAC SUPPLY TO THE CONTROLLER IS CORRECT. (SEE FIGURE 1). IF THE POLARITY IS NOT CORRECT, REMOVE THE CONNECTORS AND RECONNECT OBSERVING PROPER POLARITY. RECHECK THE SYSTEM FOR PROPER OPERATION.

1. With power off, inspect the unit to make sure that there are no foreign objects blocking fan operation. Turn the blower wheel by hand to verify that it moves freely.
2. Energize the unit at the disconnect switch. Adjust the controls to call for the fan motor to run.
3. Then, turn the unit power back on and wait up to 20 seconds for the motor to start.

TROUBLESHOOTING IN MANUAL ADJUST MODE

1. Confirm the jumper on the Fan Card is in the "MAN" position for adjustment of fan speed at the unit.
2. If the motor does not run, turn off the power to the unit and verify that the power plug and the control plug are firmly and correctly attached to the motor.
3. If the motor still does not start, turn off power and unplug both wiring harnesses from the motor.
4. Energize the unit. Check the AC voltage at the motor power plug. **IMPORTANT: Do not jam the voltmeter leads into the connectors. This will damage the connectors. Insert the probes into the plugs until they touch the pins. Do not penetrate the pins.** You should have full line voltage between the neutral and power lines, or between the two power lines in case of 208/240 VAC. If this is the case, go to step 5. If there is not a full line voltage signal at this point, check the voltage at the incoming power terminal block. If there is not a full line voltage signal at this point, turn off the power to the unit and have the electrician verify the power issue.

5. If there is a full voltage signal, and if the ground wire is properly connected, check the voltage at the Fan Card. Be sure that you have 18-28.5 VAC at the 24 VAC terminals. If you do not have voltage at this point, check the transformer and/or 24 VAC control voltage.

7. Check between "COM" and "PWM" (0-100% duty cycle). Depending on the input signal, it should be a modulating voltage between 0 and 24 VDC. (A 0 PWM signal will turn the motor off). Turn the potentiometer to check this. If you do not have the proper voltage at this point, change the Fan Card.

8. If all the voltages check out, it is possible that the pins may not be connecting properly and it may be a good idea to recheck them at the plug near the motor. If there is a voltage discrepancy anywhere else, each source should be verified for proper voltage readings. Plug both cables back into the motor, turn on the power and wait for the motor to start.

TROUBLESHOOTING IN AUTO/ DYNAMIC "0-10VDC" MODE

1. Confirm the jumper on the Fan Card is in the "0-10VDC" position for dynamic fan speed control via the unit controller signal (BAS).

2. Check to verify that the unit controller leads are properly connected to the Auto Input Signal terminal "+" & "-" at the 2 or 4 pin terminal dependent on model. Ensure that an analog signal from "0-10 VDC" is present at the "+" & "-" terminals at the Fan Card. Correct connections or verify operation of controller, correct where needed. If "0-10VDC" signal is present at Fan Card move to step 3.

3. Check steps 2 – 8 in TROUBLESHOOTING IN MANUAL ADJUST MODE.

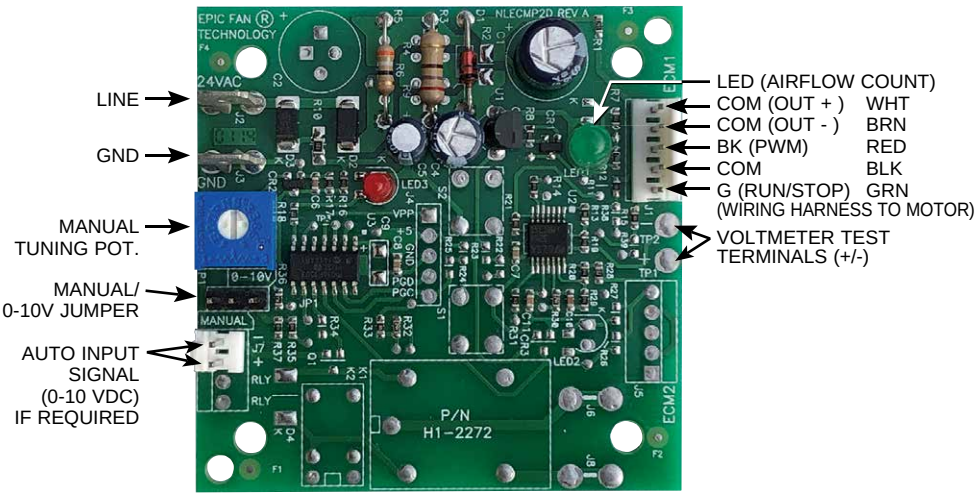


Figure 1. EPIC™ Single Motor Card. (H1-2272)

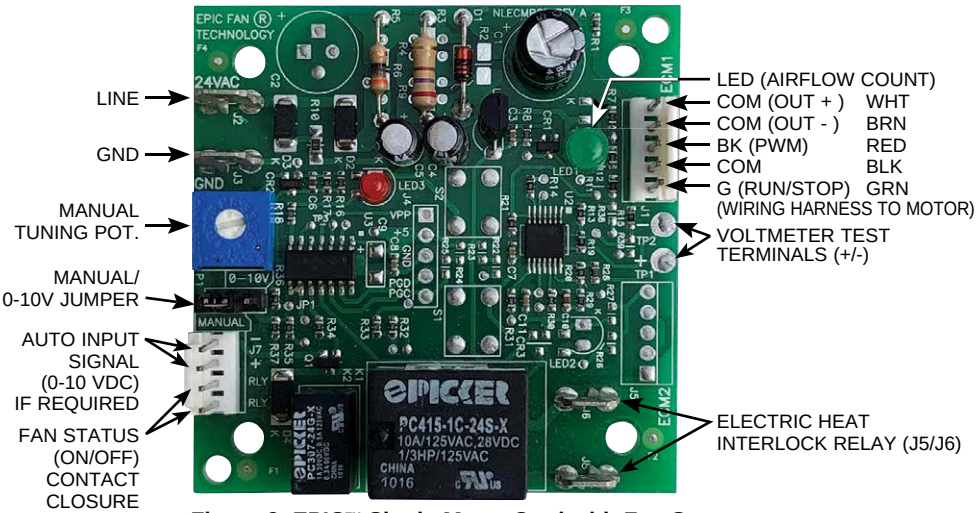


Figure 2. EPIC™ Single Motor Card with Fan Status and Electric Heat Relays. (H1-2272A1)

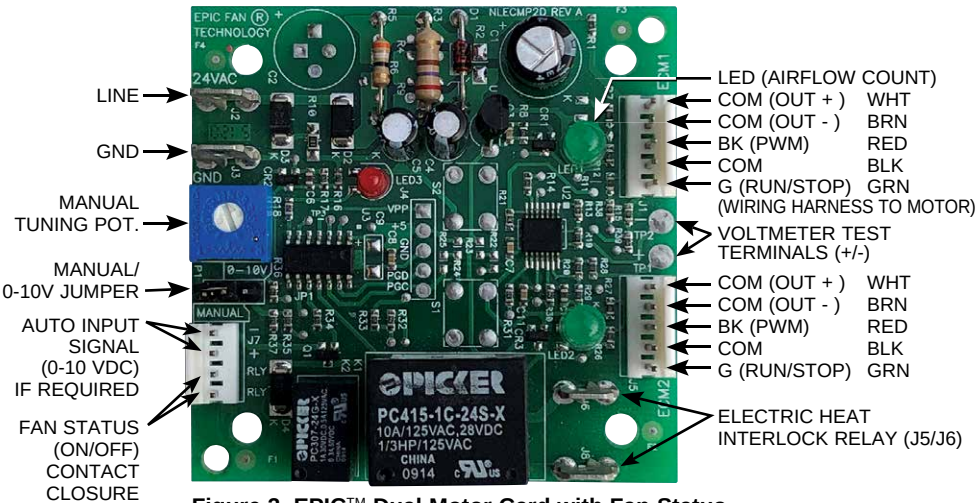


Figure 3. EPIC™ Dual Motor Card with Fan Status and Electric Heat Relay. (H1-2273A1)

Houston, Texas
Tel: 281-590-1172
Fax: 281-590-3086

Las Vegas, Nevada
Tel: 702-648-5400
Fax: 702-638-0400

Toronto, Canada
Tel: 416-744-3300
Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035

INSTALLATION AND OPERATION MANUAL
DIAMOND FLOW SENSOR K-FACTORS FOR VAV TERMINAL UNITS

Nailor® Industries Inc.

Model Series:

3000 Single Duct
3210 Dual Duct
35S-OAI Series Fan Powered w/ O.A. Damper
38S Underfloor Fan Powered

Inlet Size	Type	Duct Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	ROUND	0.087	182	2092	3.67
5		0.136	325	2390	2.81
6		0.196	455	2321	2.98
7		0.267	657	2461	2.65
8		0.349	899	2576	2.42
9		0.442	1158	2620	2.34
10		0.545	1497	2747	2.13
12	OVAL	0.754	2058	2729	2.15
14		0.970	2554	2633	2.31
16		1.186	3035	2559	2.45
24 x 16	RECT.	2.667	6797	2549	2.47

Model Series:

36VRS Square/Retangular Retrofit

Inlet Size	Type	Damper (valve) Size (inches)	Damper (valve) Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
7	SQUARE OR RECT.	5 x 5	0.174	479	2753	2.12
8		6 x 6	0.250	689	2756	2.11
9		8 x 6	0.333	919	2760	2.11
10		10 x 8	0.555	1531	2759	2.11
11		14 x 8	0.778	2150	2763	2.10
11A		18 x 6	0.750	2068	2757	2.11
12		12 x 10	0.833	2297	2758	2.11
13		18 x 10	1.250	3446	2757	2.11
14		18 x 12	1.500	4135	2757	2.11
15		20 x 14	1.944	5360	2757	2.11
15A		30 x 12	2.500	6892	2757	2.11
16		22 x 16	2.444	6739	2757	2.11
17		24 x 18	3.000	8270	2757	2.11
18		30 x 20	4.167	11486	2756	2.11
19		40 x 20	5.555	15315	2757	2.11

Model Series:

3100 Single Duct
3230 Dual Duct
3240 "Blendmaster" Dual Duct
33SZ Chilled Water Fan Powered
35N Parallel Fan Powered
35S Series Fan Powered
35S-CVP Pressurization Series Fan Powered
35SST "Stealth™" Series Fan Powered
36VRR Round Retrofit

Inlet Size	Type	Duct Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	ROUND	0.087	182	2092	3.67
5		0.136	325	2390	2.81
6		0.196	455	2321	2.98
7		0.267	657	2461	2.65
8		0.349	899	2576	2.42
9		0.442	1158	2620	2.34
10		0.545	1497	2747	2.13
12		0.785	2048	2609	2.36
14		1.069	2742	2565	2.44
16		1.395	3683	2640	2.30
18	OVAL	1.683	4323	2569	2.43

Model Series:

37N Low Profile Parallel Fan Powered
37S Low Profile Fan Powered
37SST Low Profile "Stealth™" Fan Powered

Inlet Size	Type	Duct Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	ROUND	0.087	182	2092	3.67
5		0.136	325	2390	2.81
6		0.196	455	2321	2.98
8		0.349	899	2576	2.42
10		0.545	1497	2747	2.13
14 x 8	RECT.	0.777	2035	2619	2.34
14 x 10		0.972	2417	2487	2.59

Equations:

$Q = K \times \sqrt{\Delta P}$ $\Delta P = \left(\frac{Q}{K}\right)^2$ $F = \left(\frac{4005 \times A}{K}\right)^2$

Where: Q = Airflow Rate (cfm)
ΔP = Sensor Differential Pressure ("w.g.)
K = K-Factor Calibration Constant (standard air)
F = Amplification Factor (sensor gain)
A = Nom. Duct Area (sq. ft.)

The K-Factors tabulated in the above tables are the airflow required to produce a 1.0" w.g. differential pressure at the Diamond Flow Sensor.

Model Series:

30HQX Single Duct Exhaust (Hospital Grade)
30X Single Duct Exhaust

Inlet Size	Type	Value Inlet Size (inches)	Valve Inlet Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	SQUARE OR RECT.	3.4 x 3.4	0.080	210	2625	2.33
5		4.3 x 4.3	0.128	345	2695	2.21
6		5.5 x 5.5	0.210	580	2762	2.10
7		5.8 x 6.3	0.254	680	2677	2.24
8		6.7 x 7.2	0.335	970	2896	1.91
9		8.6 x 7.1	0.424	1209	2851	1.97
10		9.5 x 8.0	0.528	1539	2915	1.89
12		13.6 x 8.1	0.765	2269	2966	1.82
14		12.9 x 10.8	0.968	2521	2604	2.36
16		18.3 x 10.8	1.373	3586	2612	2.35
24 x 16		26.1 x 16.3	2.954	7009	2373	2.85

Equations:

$Q = K \times \sqrt{\Delta P}$ $\quad \Delta P = \left(\frac{Q}{K}\right)^2$ $\quad F = \left(\frac{4005 \times A}{K}\right)^2$

Where: Q = Airflow Rate (cfm)

ΔP = Sensor Differential Pressure ("w.g.)
K = K-Factor Calibration Constant (standard air)
F = Amplification Factor (sensor gain)
A = Nom. Duct Area (sq. ft.)

The K-Factors tabulated in the above tables are the airflow required to produce a 1.0" w.g. differential pressure at the Diamond Flow Sensor.

INSTALLATION AND OPERATION MANUAL
CROSS-FLOW SENSOR K-FACTORS
FOR VAV TERMINAL UNITS

Model Series:
3000 Single Duct
3210 Dual Duct
35S-OAI Series Fan Powered w/ O.A. Damper
38S Underfloor Fan Powered

Inlet Size	Type	Duct Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	ROUND	0.087	202	2322	2.98
5		0.136	325	2390	2.81
6		0.196	524	2673	2.24
7		0.267	714	2674	2.24
8		0.349	987	2828	2.01
9		0.441	1235	2800	2.05
10		0.545	1575	2890	1.92
12	OVAL	0.754	2230	2958	1.83
14		0.970	2629	2710	2.18
16		1.186	3247	2738	2.14
24 x 16	RECT.	2.667	7760	2910	1.89

Model Series:
36VRS Square/Rectangular Retrofit

Inlet Size	Type	Damper (valve) Size (inches)	Damper (valve) Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
7	SQUARE OR RECT.	5 x 5	0.174	437	2509	2.82
8		6 x 6	0.250	696	2786	2.25
9		8 x 6	0.333	972	2920	2.01
10		10 x 8	0.555	1621	2920	2.01
11		14 x 8	0.778	2272	2920	2.01
11A		18 x 6	0.750	2089	2786	2.25
12		12 x 10	0.833	2469	2964	1.92
13		18 x 10	1.250	3704	2964	1.92
14		18 x 12	1.500	4612	3075	1.77
15		20 x 14	1.944	5562	2861	2.03
15A		30 x 12	2.500	7687	3075	1.77
16		22 x 16	2.444	7283	2980	1.87
17		24 x 18	3.000	8940	2980	1.87
18		30 x 20	4.167	12349	2964	1.92
19		40 x 20	5.555	16462	2964	1.92

Model Series:
3100 Single Duct
3230 Dual Duct
3240 "Blendmaster" Dual Duct
33SZ Chilled Water Fan Powered
35N Parallel Fan Powered
35S Series Fan Powered
35S-CVP Pressurization Series Fan Powered
35SST Stealth Series Fan Powered
35SXC Stealth XC Series Fan Powered
36VRR Round Retrofit

Inlet Size	Type	Duct Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	ROUND	0.087	202	2315	2.99
5		0.136	325	2509	2.82
6		0.196	524	2669	2.25
7		0.267	714	2672	2.25
8		0.349	987	2828	2.01
9		0.441	1235	2795	2.05
10		0.545	1575	2888	1.92
12		0.785	2363	3009	1.77
14		1.068	3002	2808	2.03
16		1.395	4093	2931	1.87
24 x 16	RECT.	2.667	7760	2910	1.89

Model Series:
37N Low Profile Parallel Fan Powered
37S Low Profile Fan Powered
37SST Low Profile Stealth Fan Powered
37SXC LowProfile Stealth XC Series Fan Powered

Inlet Size	Type	Duct Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	ROUND	0.087	202	2322	2.98
5		0.136	325	2509	2.81
6		0.196	524	2673	2.24
8		0.349	987	2828	2.01
10		0.545	1575	2890	1.92
14 x 8	RECT.	0.777	2197	2828	2.01
14 x 10		0.972	2807	2890	1.92

Equations:

$Q = K \times \sqrt{\Delta P}$ $\quad \Delta P = \left(\frac{Q}{K}\right)^2$ $\quad F = \left(\frac{4005 \times A}{K}\right)^2$

Where: Q = Airflow Rate (cfm)
ΔP = Sensor Differential Pressure ("w.g.)
K = K-Factor Calibration Constant (standard air)
F = Amplification Factor (sensor gain)
A = Nom. Duct Area (sq. ft.)

The K-Factors tabulated in the above tables are the airflow required to produce a 1.0" w.g. differential pressure at the Cross-Flow Sensor.

Model Series:

30HQX Single Duct Exhaust (Hospital Grade)
30X Single Duct Exhaust

Inlet Size	Type	Value Inlet Size (inches)	Valve Inlet Area (sq. ft.)	K-Factor (cfm)	Velocity (fpm)	F-Factor (amp.)
4	SQUARE OR RECT.	3.4 x 3.4	0.080	197	2468	2.98
5		4.3 x 4.3	0.128	316	2468	2.81
6		5.5 x 5.5	0.210	527	2509	2.24
7		5.8 x 6.3	0.254	637	2509	2.24
8		6.7 x 7.2	0.335	933	2786	2.01
9		8.6 x 7.1	0.424	1175	2772	2.05
10		9.5 x 8.0	0.528	1542	2920	1.92
12		13.6 x 8.1	0.765	2234	2920	1.77
14		12.9 x 10.8	0.968	2869	2964	2.03
16		18.3 x 10.8	1.373	3928	2861	2.14
24 x 16		26.1 x 16.3	2.954	8709	2948	1.89

Equations:

$$Q = K \times \sqrt{\Delta P} \qquad \Delta P = \left(\frac{Q}{K}\right)^2 \qquad F = \left(\frac{4005 \times A}{K}\right)^2$$

Where: Q = Airflow Rate (cfm)

ΔP = Sensor Differential Pressure ("w.g.)
K = K-Factor Calibration Constant (standard air)
F = Amplification Factor (sensor gain)
A = Nom. Duct Area (sq. ft.)

The K-Factors tabulated in the above tables are the airflow required to produce a 1.0" w.g. differential pressure at the Cross-Flow Sensor.

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Calgary, Canada
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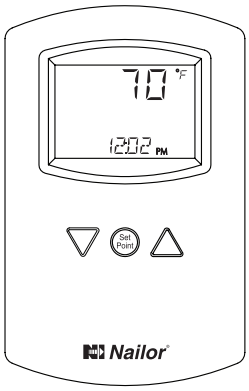
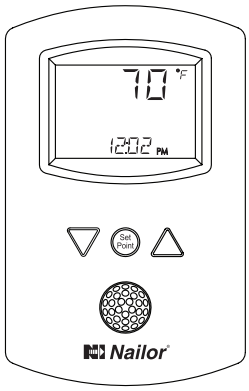
Fax: 403-279-5035

Quick Start Installation Guide – EZvav Sensors & Controllers

EZvav Sensors:



STE-8001W36
Digital Display



STE-8201W36
Digital Display with Occupancy Sensor

This installation guide applies to EZvav digital display wall sensors connected to EZvav controllers.

For complete details, download IOM "IOM-EZVAVINST" from Nailor website.

www.nailor.com

Choosing a sensor location

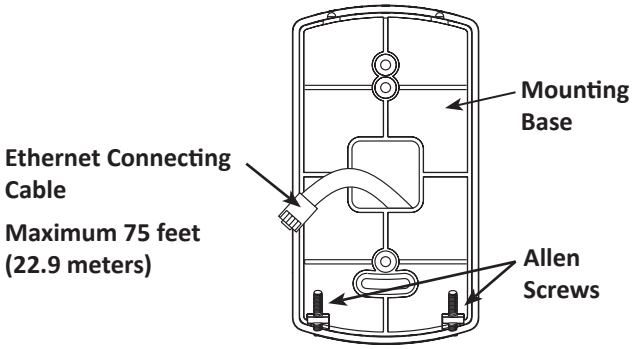
Install the sensor on an inside wall where it can sense the average room temperature. Avoid locations with direct sunlight, heat sources, windows, air vents, and air circulation obstructions such as curtains or furniture.

For models with motion sensing, see the topic on the following page, *Planning for motion sensing*.

Rough-in preparation

Complete rough-in wiring at each sensor location prior to sensor installation. This includes the following items:

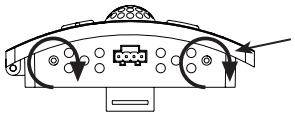
- If required, install an appropriate backplate.
- Route an Ethernet connecting cable from the sensor to the controller location.
- Maximum cable length is 75 feet (22.9 meters). Plenum-rated preassembled cables are recommended.



Mount the sensors

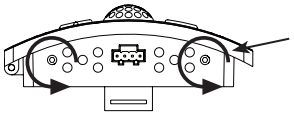
To install the sensor on a mounting base, do the following:

1. Turn the Allen screws in the base of the sensor clockwise until they clear the case. Swing the sensor away from the mounting base to remove it.



Turn screws clockwise to remove sensor case from base.

2. Route the Ethernet cable through the mounting base.
3. Fasten the mounting base directly to a 2 x 4 inch (51 x 102 mm) outlet box or a backplate with the Allen screws toward the floor.
4. Insert the Ethernet cable coming from the base into the sensor.
5. Place the top of the sensor over the top of the mounting base and swing it down over the Allen screw brackets. Be careful not to pinch any wiring.
6. Turn the Allen screws counterclockwise until they back out of the mounting base and engage the case of the sensor.



Turn counterclockwise until the screws engage the case.

Operation

The sensor will become operational as soon as it is connected to an operational controller. See the following pages to change room set points or configure a EZvav controller with the sensor.

Maintenance

Remove dust as necessary from holes in top and bottom. Clean the display with soft, damp cloth and mild soap.

Planning for motion sensing

For motion sensing models only — Mount the sensor on a wall that will have an unobstructed view of the typical traffic in the coverage area. When choosing a location, do not install the sensor in the following areas.

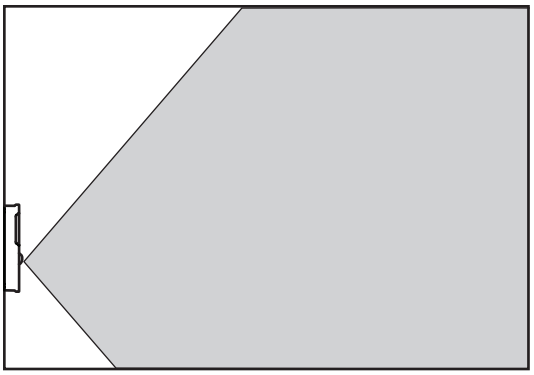
- Behind curtains or other obstructions.
- In locations that will expose it to direct sunlight or heat sources.
- Near a heating or cooling inlet or outlet.

The effective detection range is approximately 33 feet (10 meters). Factors that may reduce the range may include the following items.

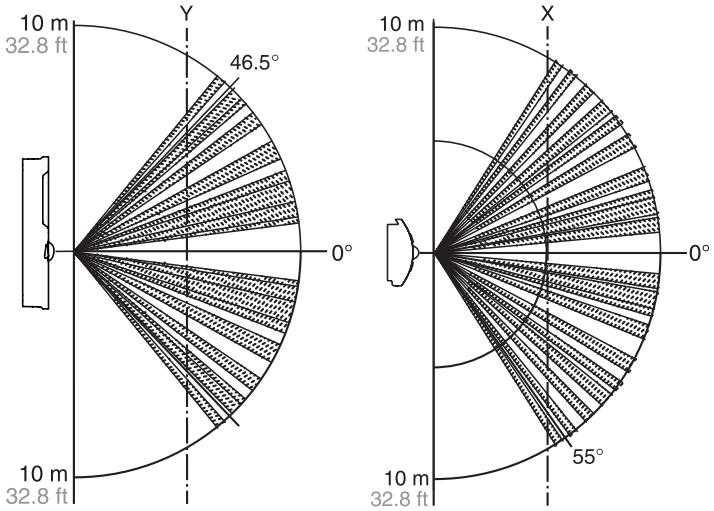
- The difference between the surface temperature of the object and the background temperature of the room is too small.
- Object movement in a direct line toward the sensor.
- Very slow or very fast object movement.
- Obstructions in the shaded area of the diagram *Typical motion sensing coverage*.

False detections may be triggered by any of the following conditions.

- The temperature inside the detection range suddenly changes because of the entry of cold or warm air from an air-conditioning or heating unit.
- The sensor being directly exposed to sunlight, an incandescent light, or other source of far-infrared rays.
- Small animal movement.



Typical motion sensing coverage



Side view **Top view**

Motion sensor vertical and horizontal patterns

Changing room set points

Room set points are changed using the buttons and display on the front of the sensor.

1. Press any button to begin changing set points.
2. If required, enter Password 1. New installations do not have a password.
3. When the display advances to the cooling set point, press the up Δ or down ∇ button to change the cooling set point.
4. Press the set point (Set Point) button to save the cooling set point and advance to the heating set point.
5. Press the button to save the value or advance to the next function.
6. When the display advances to the heating set point, press the up Δ or down ∇ button to change the heating set point.
7. Press the set point (Set Point) button to save the heating set point and return to the temperature display.

EZvav Controllers:

These are brief instructions for installing a EZvav controller.

For complete details, download IOM "IOM-EZVAVINST" from Nailor website.

www.nailor.com

1 Align the damper and drive hub

Manually rotate the damper on the VAV box to the fully closed position.

Press the gear clutch button and rotate the drive hub in the same direction that closed the damper. Turn the hub until it reaches a stop, then rotate the hub back 2 degrees and release clutch.

2 Mount the controller to the VAV box

Place the controller over the damper shaft.

Finger tighten the nuts on the V-bolt to position the shaft in the drive hub.

Center the mounting bushing in the mounting tab and fasten it with a #8 sheet metal screw.

Evenly tighten the V-bolt nuts on the drive hub to 30-35 in-lbs.

3 Connect the room sensor cable

Connect a EZvav sensor to the controller with a standard Ethernet cable. Plug the controller end of the cable into the T'stat connector.

4 Connect the airflow sensors

Connect the airflow sensor on the VAV box to the airflow ports on the controller. Use 0.25 in. FR tubing.

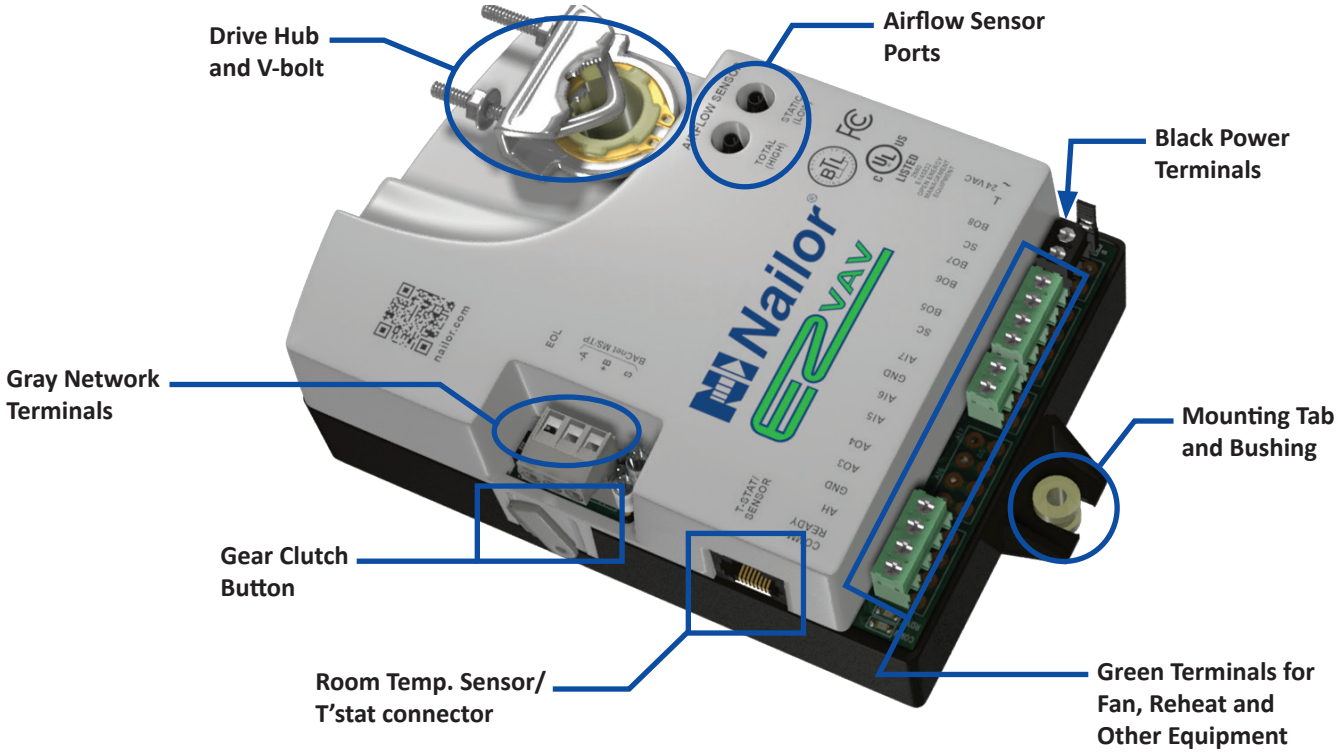
5 Connect auxiliary equipment (optional)

Other VAV equipment such as fans, heaters, reheat valves, and discharge air temperature sensors connect at the green terminals.

If the controller is part of a BACnet network, wire it to the gray MS/TP network terminals.

6 Connect 24 volt power

Connect the controller to a 24 volt, Class 2 transformer at the black power terminals. As soon as power is connected, the controller begins operation.



Quick Start Configuration Guide – EZvav Sensors & Controllers

Use an STE-8001W36 or STE-8201W36 sensor to configure the EZvav controller. If another type of sensor is installed as the room sensor, temporarily connect an STE-8001W36 as a service tool.

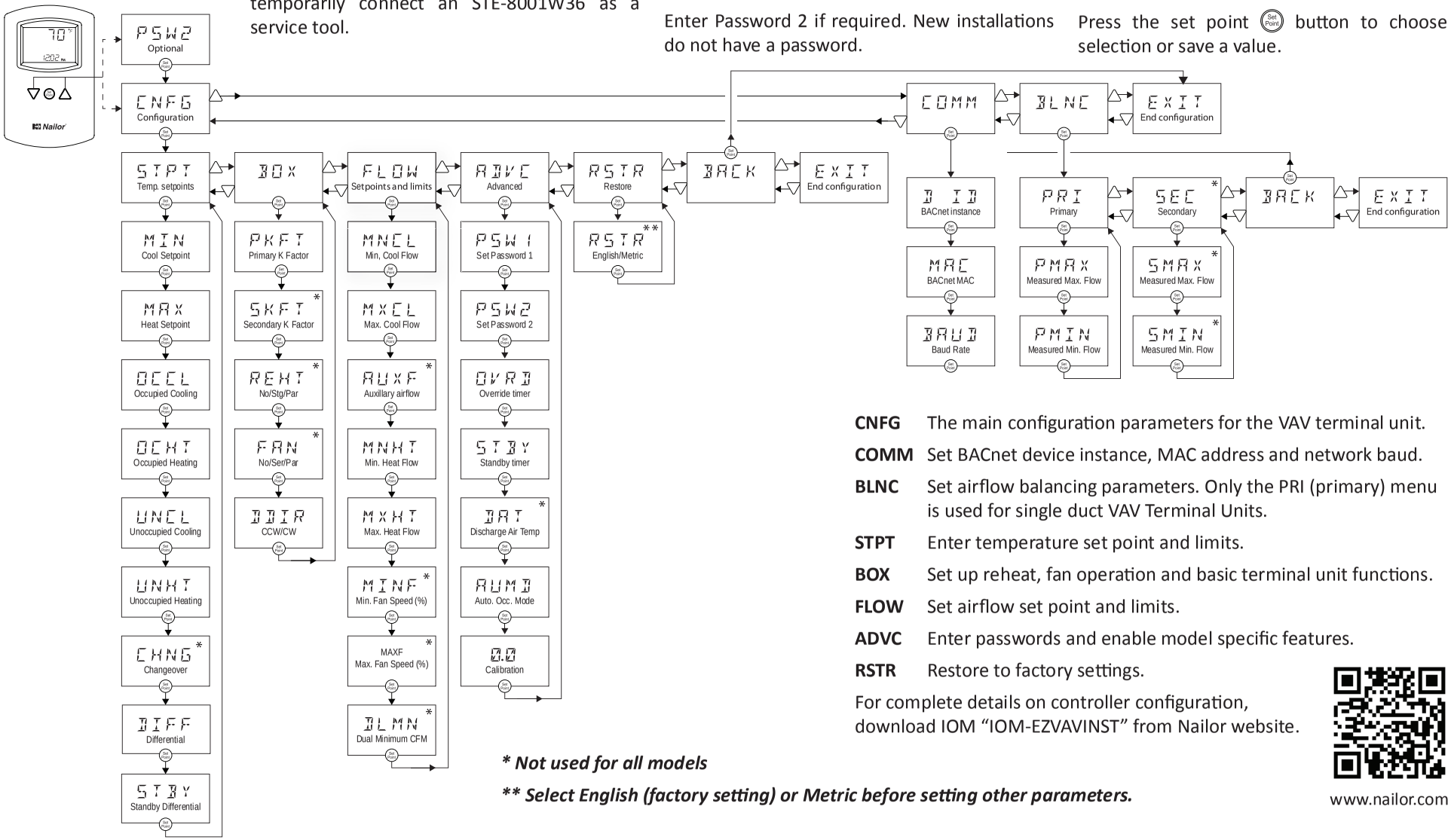
To get started:

Press together the up Δ and down ∇ buttons to start configuration or balancing.

Enter Password 2 if required. New installations do not have a password.

Press the up Δ or down ∇ buttons to move between functions or change values.

Press the set point (Set Point) button to choose a selection or save a value.



CNFG The main configuration parameters for the VAV terminal unit.

COMM Set BACnet device instance, MAC address and network baud.

BLNC Set airflow balancing parameters. Only the PRI (primary) menu is used for single duct VAV Terminal Units.

STPT Enter temperature set point and limits.

BOX Set up reheat, fan operation and basic terminal unit functions.

FLOW Set airflow set point and limits.

ADVC Enter passwords and enable model specific features.

RSTR Restore to factory settings.

For complete details on controller configuration, download IOM "IOM-EZVAVINST" from Nailor website.

www.nailor.com

**** Not used for all models***

***** Select English (factory setting) or Metric before setting other parameters.***