

# Horizontal Room Fan Coils

Catalog







Zehnder decorative radiators



Heating and cooling ceiling systems



Comfortable indoor ventilation



Clean air solutions

**zehnder**

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best climate

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# Versatility and style combine with cooling and heating efficiency

With more than 50 years experience in the design and manufacture of hydronic heating and cooling systems, Zehnder understands your need for efficient heating/cooling equipment that will complement the décor. Zehnder Fan Coils offer the latest in attractive design and are engineered to provide years of reliable operation and energy-efficient comfort.

Zehnder Fan Coils are installed in new building construction, renovated offices, residential complexes and educational institutions across North America. Zehnder Fan Coil products stand out of the crowd based on their unique heavy-duty construction and custom applications capability. All Zehnder Fan Coils are the result of years of research on the latest hydronic coil and fan technology available. Designed for permanent balance and strength for years of trouble free performance. Custom hand-built solutions for retrofit and replacement are part of our everyday life.

Zehnder Fan Coils are available in a wide range of models and air flow arrangements to satisfy the demands of your heating and cooling specifications. In addition to this, Zehnder experts are able to help with complex specification plans through our competent sales team who can visit the site if requested.

“If you can draw it, we can build it.”

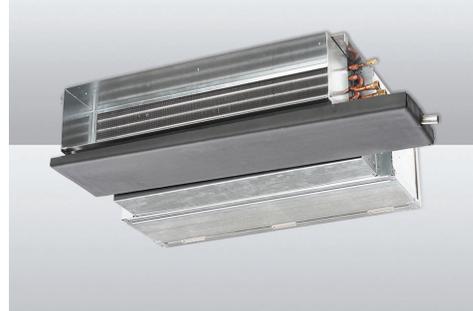
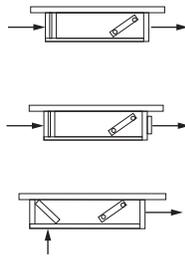
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# Models and airflow arrangements

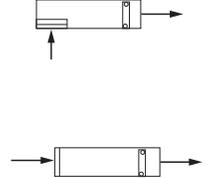
## Ceiling models



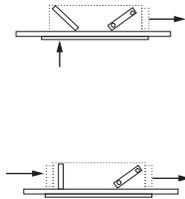
**FC: Ceiling**  
Bottom in, front out shown



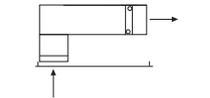
**FCHP: Ceiling hideaway with plenum**  
Back in, front out shown



**FFRC: Fully recessed ceiling**  
Bottom in, front out shown



**FTHP: Telescoping ceiling hideaway**



**FCH: Ceiling hideaway**



# Benefits

## Engineering excellence and contemporary design

With more than 50 years experience in the design and manufacture of hydronic heating and cooling systems, Zehnder understands your need for efficient heating/cooling equipment that will complement the décor. Zehnder Fan Coils offer the latest in attractive design and are engineered to provide years of reliable operation and energy-efficient comfort. All Fan Coils run quietly and feature individual controls.

## Meet specific heating and cooling requirements

Zehnder Fan Coils are available in a wide range of models and air flow arrangements to satisfy the demands of your heating and cooling specifications.

## Design flexibility

The multitude of standard options available provide the versatility for any HVAC system designer during the design phase of a project.

Multiple supply and return air locations, insulation options, coil rows, control packages, electric heat and valve packages fit any application.

EC motor options provide high-efficiency operation with infinite speed variability.

All units are certified to the latest edition of AHRI standard 440 for the testing and rating of fan-coil units.

The low profile horizontal design and telescoping model allow units to be placed in any ceiling layout.

## Uniform appearance

All Zehnder Fan Coils have the same height and the same depth per model—only the length varies for different size units. This provides a consistent, attractive appearance when an installation calls for units of various lengths.

## Convenient installation

All Zehnder Fan Coil units come fully assembled, reducing field installation time and labor. Units simply need to be hung, have power and water brought to the units and you're done.

Plenum units are field convertible between rear and bottom return without any special tools or additional parts.

All horizontal units have a bottom facing electrical compartment with terminal blocks making installation fast and easy. Drain pans are field reversible to opposite side.

Factory pre-assembled valve packages ensure uniform fit up and reduce field labor required to pipe units. Auxiliary drain pan provided to capture all valve package condensate eliminating the need to insulate.

## Quick Ship

All horizontal models are available through quick ship program if the project requires expediting.

## Easy to operate

Zehnder Fan Coils feature three-speed control settings and optional thermostats. The user has fingertip control over fan speed and room temperature.

## Durable

Front panels and tops are constructed of 16-gauge cold rolled steel to withstand impact and rugged treatment. Exterior cabinet surfaces feature an epoxy powder coating to provide a durable, attractive finish. Industry leading 2 year warranty provided on all Zehnder fan-coils

## Serviceability

All Zehnder ceiling models come with a hinged front cover and safety chain(s) for simple and safe maintenance.

The electrical controls compartment is spacious and easily accessible from the ground with all major components supplied with quick connects.

Fan decks are easily removed and broken into 2 separate fan decks on larger sizes to help with safe removal.

The filter is removable from side and bottom on plenum units.

The drain pan is removable without the use of any tools.

# Standard features

## A: Cooling coil

### 3 row

- Sturdy, mechanically-bonded copper/aluminum coil with 12 fins per inch, 1/2" nominal tubes and 0.016" tube wall thickness.
- High BTU/hr capacity with low noise.
- Coil assemblies tested for a maximum of 300 psig working pressure.
- Manual air vent.

## B: Speed control

- Unit or wall mounted, three-speed fan switch allows speed selection for comfort control.

## C: Blower fan housing

- Provides excellent CFM output per unit size.
- Operating ampere ranges from 0.33 amps (126 CFM) to 2.1 amps (1215 CFM), 120 volts.

## D: Motor

- Motors are permanent split capacitor (PSC) for extended, reliable motor life.
- Multispeed motors achieve a wide range of CFM delivered.
- Molex connectors are provided on each motor for ease of removal, located at motor.

## E: Cabinet

- Heavy duty 16-gauge front panel protects against impact. Tamper-resistant, hidden quarter-turn fasteners included as standard. (All exposed or recessed ceiling models come equipped with a hinged front panel and safety chain(s) for safe and easy maintenance.)
- Hideaway units are made of 18-gauge galvanized corrosion resistant steel with flanged outlet for duct connection.
- Coil section fully insulated with 1/4" closed-cell insulation to dampen sound, provide thermal efficiency and ensure superior indoor air quality.

## F: Finish

- Attractive ivory epoxy powder coating.

## G: Blower deck

- Blower deck enhances strength and stability, with easy accessibility.
- Slide out blower deck for ease of maintenance.
- Sizes 08-12 have two separate blower decks to allow for easier removal from ceiling.
- Fully insulated with 1/4" closed cell insulation.

## H: Internal support bracket

- All units are equipped with internal mounting brackets for secure attachment to ceiling. (Isolation by others).

## I: Access area

- Large rough-in area at each one of the unit provides ample room for plumbing.
- 8" piping end pocket featured only on exposed cabinet unit.
- Electrical compartment, located in bottom of unit, is easily accessible from ground.
- Removable front panel provides access to valve/piping connection and electrical wiring area.

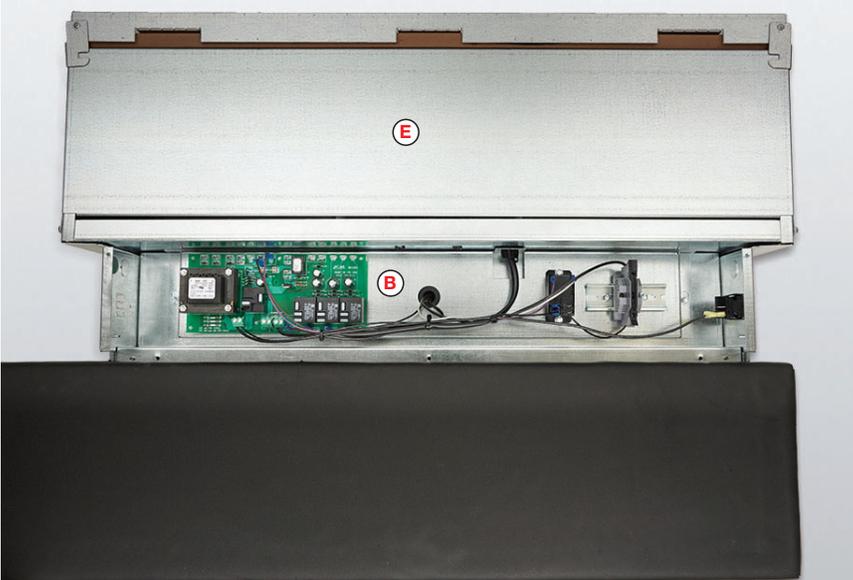
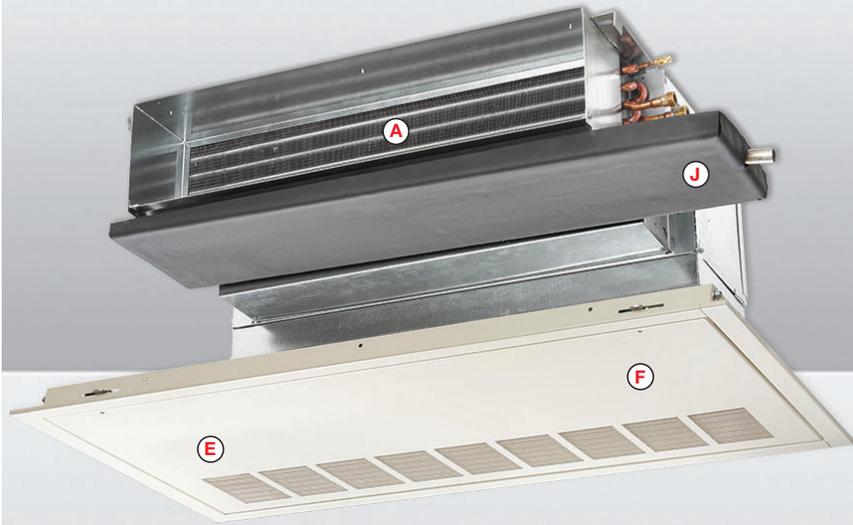
## J: Drain pan

- 18-gauge, epoxy powder coated, galvanized corrosion resistant steel.
- Positively sloped to ensure proper drainage and maximize protection against microbial growth.
- External surface fully insulated with 1/4" closed-cell insulation.
- Removable without the use of any tools.

## K: Filter

- 1" disposable MERV 4 spun glass media slides easily into locating tabs.
- Telescoping ceiling model is provided with field height adjustable filter plenum.
- Filter removable from side and bottom on hideaway models.

# Standard features



# Options and accessory equipment

## Field assembled accessories

### Changeover switch

- Switches a thermostat from heating to cooling based on a change in supply water temperature.
- Mounts to supply piping with a simple spring clip included with the switch.

### Wall seal

- Used to recess ceiling model (included as standard with all fully and partially recessed units).

### Remote temperature sensor

- Operates with all standard Zehnder control packages with the removal of JP1 jumper internal to electronic, non-digital thermostat.

## Factory assembled accessories

### Cabinet

#### Construction

- Torx head security fasteners.

#### End pocket extension

- Increases standard end pocket to 14".
- 6" left hand or right hand end pocket extension for mounting of valve packages and required for 4-pipe valve packages containing three-way control valves.

### Insulation

- 1/2" fiberglass, foil-faced or closed cell insulation.

## Coils

### High capacity chilled water

- 4 row cooling coil available to provide higher cooling output.
- Sturdy, mechanically-bonded copper/aluminum coil with 12 fins per inch, 1/2" nominal tubes and 0.016" tube wall thickness.
- Coil assemblies tested for a maximum of 300 psig working pressure.
- Manual air vent.

### Hot water

- 1 row or 2 row hot water heating coil used in 4-pipe systems.
- Sturdy, mechanically-bonded copper/aluminum coil with 12 fins per inch, 1/2" nominal tubes and 0.016" tube wall thickness.
- Coil assemblies tested for a maximum of 300 psig working pressure.
- Manual air vent.
- Can be mounted in reheat or preheat position.

### Steam

- 1 row steam heating coil also available to provide high heat output for use with 20 psig steam maximum.
- Sturdy, mechanically-bonded copper/aluminum coil with 12 fins per inch, 1/2" nominal tubes and 0.016" tube wall thickness.
- Coil assemblies tested for a maximum of 300 psig working pressure.
- Manual air vent.
- Can be mounted in reheat or preheat position.
- Opposite orientation and opposite end connections for 4-pipe systems available upon request.

### Stainless steel coil casing(s)

- All mounting flanges and structural steel to be 304 stainless steel.

## Automatic air vent

- Efficient way to automatically remove air from the system.

## Motors

### Alternate voltage

- 208/60/1, 230/60/1 and 277/60/1 supply voltage.

### High static motor

- 1550 RPM, 120/60/1 permanent split capacitor (PSC) motor.
- Standard airflow maintained with external static pressure of up to 0.2" water column.

### EC motor

- Electronically commutated motors (ECM).
- High-efficiency, programmable, brushless DC motors that utilize a permanent magnet rotor and built-in inverter.
- Provide low operating cost and ultra-quiet operation.

## Grilles

### Steel bar grille

- Welded steel, epoxy painted, pencil-proof bar grille.

### Double deflection discharge grille

- Aluminum framed grille with adjustable blades in two directions.
- Model FC only.

## Electric heat

- Single stage or intermediate season electric heating.
- Includes grounding terminals, linear limit switch, fusible link(s) and magnetic contactor(s).
- Quiet contactor
- Contact the factory for SCR control or two stage options.

# Options and accessory equipment

## Drain pan

### 304 stainless steel

- External surface fully insulated with 1/4" closed-cell insulation.

## Condensate pump

- 120/60/1 pump for removing up to 5.0 gph @ 33 ft. of head.
- Includes GFCI.
- Contact the factory for other voltages.

## Disconnect switch

- 120/60/1 (15A), 277/60/1 (15A), 277/60/1 (30A) or 600/60/3 (40A).
- Installed on face of electrical junction box.
- Located in electrical compartment.

## Motor starter

- 120/60/1.
- Manual reset motor starter with toggle switch and thermal overload protection.
- Unit can only be restarted by resetting toggle switch.
- Starter comes with an overload protection set at 125% of full load current.
- Located in electrical end pocket of vertical units and on electrical control side of horizontal units.
- Not available with electric heat.
- Contact factory for alternate voltages.

## GFCI

- 120/60/1.
- Ground fault circuit interrupter, unit mounted and wired.
- Requires a disconnect switch.

## Condensate level switch

- 120V or 24V.
- Mounted to horizontal drain pan or vertical auxiliary drain pan.
- De-energizes fan upon rising condensate water level.

## Filters

### Cleanable aluminum mesh

- 1" aluminum mesh filter complete with aluminum frame & drain holes.

### MERV 8

- 1" high efficiency, pleated throwaway filter.

## Controls

- Valve control by air temperature
- Fan control by air temperature
- Valve control by water temperature

## Thermostats

- Electronic, non-digital
- Digital, non-programmable
- Digital, 7-day programmable
- Remote mounted
- Contact the factory for freeze stat.
- See pages 27-30 for more information on control packages.

## Color

- Additional colors are optionally available. Please furnish a color chip for custom color.

## Valve packages

- Shipped loose for field installation. See pages 22-26 for more information.
- Unions will be factory mounted on deluxe valve packages to make field connection of valve package.
- Contact the factory for mounting of customer supplied valves, hose kits or steam control valves.

# Nomenclature

1, 2	3	4, 5	6	7	8	9	10	11	12	13, 14	15	16	17	18	19	20	21	22	23
07	N	02	1	A	L	A	N	A	A	DD	0	0	0	N	A	0	1	V	N

<b>Model</b>		
01 = FC - Ceiling exposed		
04 = FFRC - Ceiling recessed exposed		
06 = FCH - Ceiling hideaway		
07 = FCHP - Ceiling hideaway plenum		
09 = FTHP - Telescoping ceiling hideaway		
<b>Quick ship</b>		
N = No		Y = Yes
<b>Size</b>		
02 = 02	04 = 04	08 = 08
03 = 03	06 = 06	10 = 10
<b>Arrangement</b>		
1 = Back in, front out		2 = Bottom in, front out
<b>Coil</b>		
A = 3-row		I = 4-row
B = 3 & 1-row		J = 4 & 1-row
C = 3 & 1-row steam		K = 4 & 1-row steam
D = 3-row & elec. heat		L = 4-row & elec. heat
E = 3 & 2-row		M = 4 & 2-row
<b>Hand</b>		
L = Left		R = Right
<b>Electric heat</b>		
A = None	P = 3.1 kW	Z = 6.0 kW
B = 1.0 kW	Q = 3.8 kW	0 = 6.2 kW
D = 1.1 kW	T = 4.4 kW	1 = 6.6 kW
E = 1.4 kW	U = 4.5 kW	2 = 7.9 kW
K = 1.9 kW	V = 4.9 kW	3 = 8.1 kW
L = 2.2 kW	W = 5.0 kW	5 = 9.0 kW
M = 2.9 kW	X = 5.1 kW	6 = 9.3 kW
N = 3.0 kW	Y = 5.8 kW	
<b>Air vent</b>		
N = Manual air vent		Y = Auto air vent
<b>Cabinet</b>		
A = Standard gauge		
B = 16 Ga with LH 6" ext end pocket		
C = 16 Ga with RH 6" ext end pocket		
<b>Fastener</b>		
A = Standard front panel		
T = Security front panel		
<b>Inlet / Outlet</b>		
LL = Louver in, louver out		
BB = Bar grille in, bar grille out		
LB = Louver in, bar grille out		
LG = Louver in, double defl grille out		
BG = Bar grille in, double defl out		
LD = Louver in, duct out		
BD = Bar grille in, duct out		
DD = Duct in, duct out		
OD = Open in, duct out		

<b>Control changeover</b>	
N = No changeover	
M = Manual changeover	
A = Auto changeover	
S = Intermediate seasonal auto changeover	
<b>Control cycle</b>	
F = Fan & valve cycle	V = Valve cycle
<b>Control mounting</b>	
N = None	
1 = Wall mount 3-speed switch	
W = Wall mount 3-speed thermostat	
X = Wall mount thermostat with unit mount 3-speed	
R = Unit mount 24V relay only	
S = Unit mount 24V relay with 3-speed switch	
T = Unit mount 24V transformer only	
Z = Unit mount 24V transformer with 3-speed switch	
F = Unit mount 24V fan center (1 transformer & 1 relay) only	
G = Unit mount 24V fan center (1 transformer & 1 relay) with 3-speed	
P = Unit mount 24V relay pack (1 transformer & 3 relays) only	
D = Factory mount DDC with 24V fan center (1 transformer & 1 relay)	
<b>Control voltage</b>	
N = No controls	0 = 120V      4 = 24V
<b>Thermostat</b>	
A = None	
B = Non-digital thermostat	
C = Digital non-programmable thermostat	
D = Digital programmable thermostat	
E = Digital non-programmable modulating thermostat	
<b>Motor control</b>	
N = 3-speed PSC control	
A = 2-10 VDC ECM signal	
B = 3-speed ECM control	
<b>Voltage</b>	
0 = 120/60/1	2 = 230/60/1
1 = 208/60/1	3 = 277/60/1
8 = 220/50/1	
<b>Motor</b>	
0 = PSC	2 = ECM
1 = High static PSC	3 = High static ECM
<b>Drain pan</b>	
0 = Standard galvanized drain pan	
4 = Stainless steel drain pan	

# Nomenclature

24	25	26	27	28	29, 30	31, 32	33	34	35	36, 37	38	39	40	41	42	43, 44	45	46
N	N	N	N	N	ST	NN	1	0	0	NA	1	1	1	0	0	NA	1	1

<b>Disconnect</b>		
N = No disconnect	Y = Disconnect switch	
<b>Motor starter</b>		
N = No motor starter	Y = Motor starter	
<b>GFCI</b>		
N = No GFCI	Y = GFCI	
<b>Condensate overflow switch</b>		
N = No level switch	Y = Condensate level switch	
<b>Condensate Pump</b>		
N = No pump	Y = Condensate pump	
<b>Filter</b>		
XX = No filter		
ST = 1" Throwaway		
MV = 1" MERV 8		
AL = 1" Cleanable aluminum mesh		
<b>Color</b>		
NN = None	BI = Beige	
PR = Prime	DG = Dark gray	
IV = Ivory	AB = Bronze	
GA = Gray	WH = White	
<b>Cooling control valve</b>		
1 = None		
2 = 2-way on/off control valve		
3 = 3-way on/off control valve		
4 = 2-way modulating control valve		
5 = 3-way modulating control valve		
<b>Cooling valve voltage</b>		
0 = None		
1 = 24V, 25 psi close-off		
2 = 120V, 25 psi close-off		
3 = 24V, 3-wire floating		
4 = 24V proportional		
5 = 24V, 75 psi close-off		
6 = 120V, 75 psi close-off		
<b>Cooling isolation valve</b>		
0 = None		
1 = 2 Ball valves		
2 = 1 Ball valve & 1 manual circuit setter		
3 = 2 Ball valves & 1 auto circuit setter		
<b>Heating strainers</b>		
1 = None	2 = Strainer	
<b>Heating unions</b>		
1 = None	2 = 2 Unions	
<b>Heating autoflow rate</b>		
NA = None	25 = 2.5 GPM	50 = 5.0 GPM
05 = 0.5 GPM	30 = 3.0 GPM	60 = 6.0 GPM
10 = 1.0 GPM	35 = 3.5 GPM	70 = 7.0 GPM
15 = 1.5 GPM	40 = 4.0 GPM	80 = 8.0 GPM
20 = 2.0 GPM	45 = 4.5 GPM	90 = 9.0 GPM
<b>Heating isolation valve</b>		
0 = None		
1 = 2 Ball valve		
2 = 1 Ball valve & 1 manual circuit setter		
3 = 2 Ball valves & 1 auto circuit setter		
<b>Heating valve voltage</b>		
0 = None		
1 = 24V, 25 psi close-off		
2 = 120V, 25 psi close-off		
3 = 24V 3-wire floating		
4 = 24V proportional		
5 = 24V, 75 psi close-off		
6 = 120V, 75 psi close-off		
<b>Heating control valve</b>		
1 = None		
2 = 2-way on/off control valve		
3 = 3-way on/off control valve		
4 = 2-way modulating control valve		
5 = 3-way modulating control valve		
<b>Cooling strainers</b>		
1 = None	2 = Strainer	
<b>Cooling unions</b>		
1 = None	2 = 2 Unions	
<b>Cooling autoflow rate</b>		
NA = None	25 = 2.5 GPM	50 = 5.0 GPM
05 = 0.5 GPM	30 = 3.0 GPM	60 = 6.0 GPM
10 = 1.0 GPM	35 = 3.5 GPM	70 = 7.0 GPM
15 = 1.5 GPM	40 = 4.0 GPM	80 = 8.0 GPM
20 = 2.0 GPM	45 = 4.5 GPM	90 = 9.0 GPM

# Table A1: AHRI approved standard ratings

Unit size		02	03	04	06	08	10	12
<b>Certified cooling ratings (3 row main coil)</b>	Total MBH	5.9	8.7	10.5	16.0	21.0	22.9	28.1
	Sensible MBH	4.6	6.1	8.1	12.5	16.6	18.8	22.3
	GPM	1.5	1.8	2.2	3.5	4.2	4.6	5.8
	PD, ft. of H <sub>2</sub> O	3.8	7.3	3.5	6.5	11.6	6.4	10.1
<b>Heating capacity (3 row main coil)</b>	MBH	12.0	16.3	20.0	30.1	38.3	45.9	58.3
	GPM	1.5	1.8	2.2	3.5	4.4	4.6	7.1
	PD, ft. of H <sub>2</sub> O	3.0	6.9	1.6	6.3	8.5	5.9	10.5
<b>Certified cooling ratings (4 row main coil)</b>	Total MBH	7.6	10.5	12.3	18.2	24.1	27.0	33.2
	Sensible MBH	5.3	7.5	8.5	13.7	18.2	20.8	24.9
	GPM	1.8	2.1	2.5	3.6	4.8	5.4	6.7
	PD, ft. of H <sub>2</sub> O	6.9	14.6	3.6	4.3	7.8	6.4	10.1
<b>Heating capacity (4 row main coil)</b>	MBH	13.0	18.1	23.2	33.0	44.9	53.7	60.0
	GPM	1.8	1.9	2.5	3.6	5.1	6.0	7.6
	PD, ft. of H <sub>2</sub> O	5.9	10.1	3.0	4.0	6.9	6.0	11.2
<b>Heating capacity (optional 1 row reheat coil)</b>	MBH	11.2	11.9	17.0	25.1	31.8	36.7	47.7
	GPM	1.3	1.2	1.8	2.6	3.3	3.8	5.0
	PD, ft. of H <sub>2</sub> O	1.0	0.6	2.5	1.2	1.9	2.5	3.9
<b>Heating capacity (optional 2 row reheat coil)</b>	MBH	17.6	24.6	29.8	43.9	55.6	66.0	78.7
	GPM	1.8	2.5	3.1	4.5	5.7	6.8	8.1
	PD, ft. of H <sub>2</sub> O	3.7	7.9	3.4	7.9	6.7	7.1	10.3
<b>CFM: standard</b>	High	230	295	420	590	805	950	1080
	Medium	190	210	310	460	590	760	820
	Low	130	150	220	370	410	430	620
<b>CFM: high static (@ 0.2" ESP)</b>	High	330	400	570	690	1000	1200	1260
	Medium	270	305	410	500	770	915	950
	Low	220	260	305	370	600	680	700
<b>Coil</b>	FPI	12	12	12	12	12	12	12
	Face area, ft <sup>2</sup>	1.0	1.3	1.6	2.2	2.5	3.0	3.5
	Coil connections	1/2" Cu	1/2" Cu	1/2" Cu				
<b>Blower</b>	Quantity	1	1	2	2	3	4	4
	Diameter	5.8	5.8	5.8	5.8	5.8	5.8	5.8
	Width	6.5	7.9	6.5	7.9	7.9	6.5	7.9
<b>Filter (bottom return only)</b>	Number	1	1	1	1	2	2	2
	Length, in.	9.75	9.75	9.75	9.75	9.75	9.75	9.75
	Width, in.	21.25	27.25	33.25	45.25	18.25, 30.25	28.25	33.25
	Thickness, in.	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Filter (rear return only)</b>	Number	1	1	1	1	1	1	1
	Length, in.	9.75	9.75	9.75	9.75	9.75	9.75	9.75
	Width, in.	22	28	34	46	52	60	70
	Thickness, in.	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Minimum louvered free area</b>	Inlet, in <sup>2</sup>	141.4	188.6	212.2	260.3	330.1	377.2	400.8
	Outlet, in <sup>2</sup>	141.4	188.6	212.2	260.3	330.1	377.2	400.8
<b>Shipping weight, lbs.</b>		70	86	100	121	140	165	190

**Notes:**

- Airflow under dry conditions. Inlet air 70-80°F DB
- Cooling capacity based on inlet air 80°F DB, 67°F WB, 45°F entering water, 55°F leaving water, high fan speed
- 3 & 4 Row Heating Capacity based on inlet air 70°F DB, 140°F entering water, GPM from Cooling Test, High Fan Speed
- 1 & 2 Row Heating Capacity based on inlet air 60°F DB, 180°F entering water, 160°F leaving water & High fan speed
- Pressure drop (PD) shown in feet of water
- Shipping weight based on model FCHP, 3 row coil, no valve package.



## Fan performance curves (PSC motors)

Fan curves on the following pages depict actual performance of each motor tap without any additional fan balance adjustment. Actual capacities which fall below each curve can be obtained by adding an adjustment device. Units should not be run prior to installation of downstream ductwork; otherwise, damage to the motor may result.

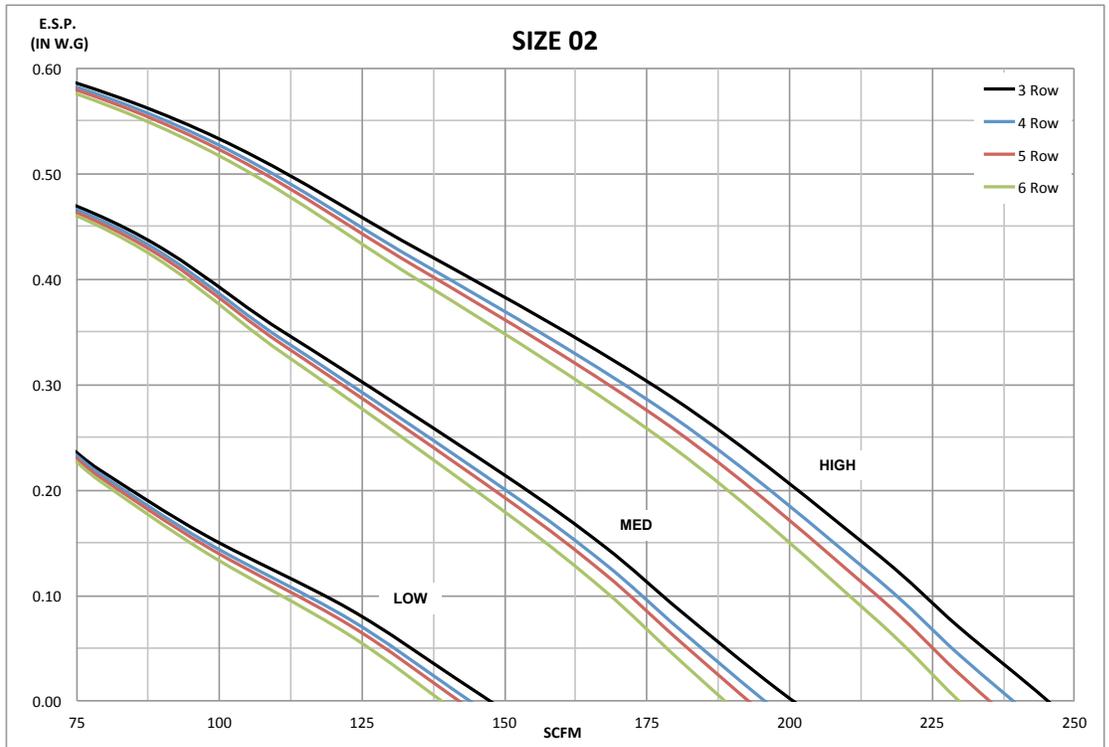
Zehnder Fan Coil units are equipped with permanent split-capacitor (PSC) motors with three taps (high, medium and low) which provides variable horsepower outputs. Most often, size selections are conservative and actual CFM requirements and/or external static pressure requirements are lower than those specified. In this case, the unit fan motor can be run at low or medium tap, substantially reducing the operating cost of the unit.

All fan curves are for 120/60/1 motors and include pressure losses for cabinet, electric heater and 3 row coil. Plenum units include a clean 1" throwaway filter. For other coil configurations, adjust performance curves based on pressure losses for the coils using EZselect.

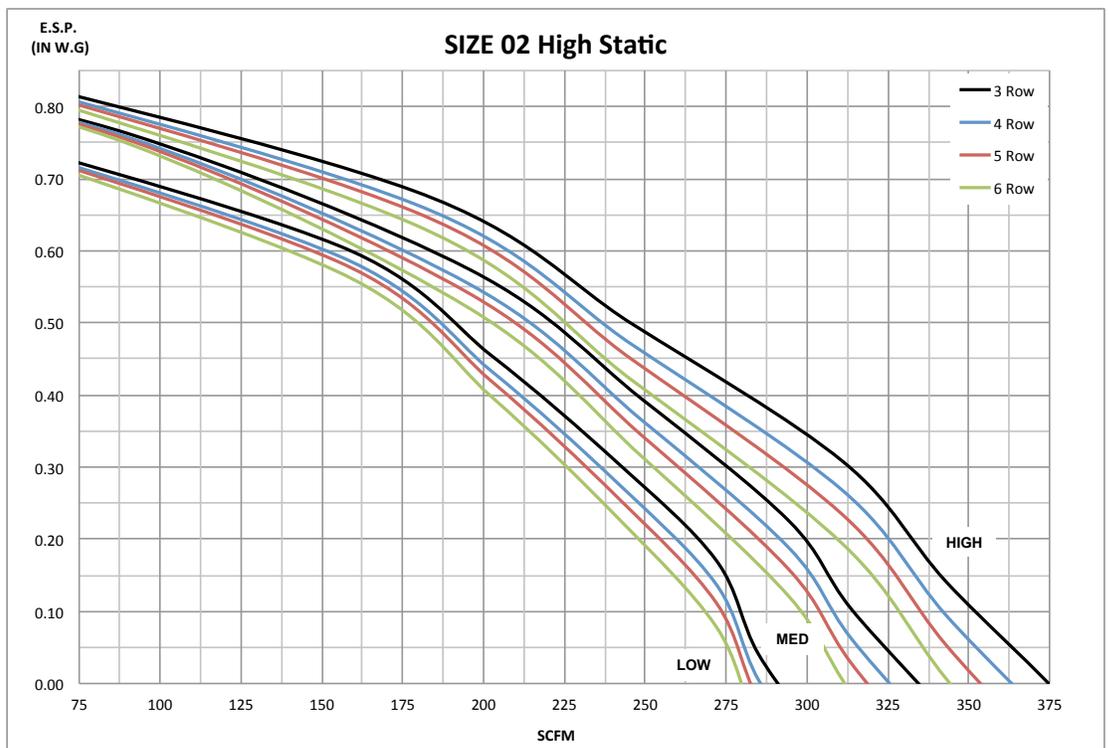


# Fan performance curves (PSC motors)

## Size 02 standard

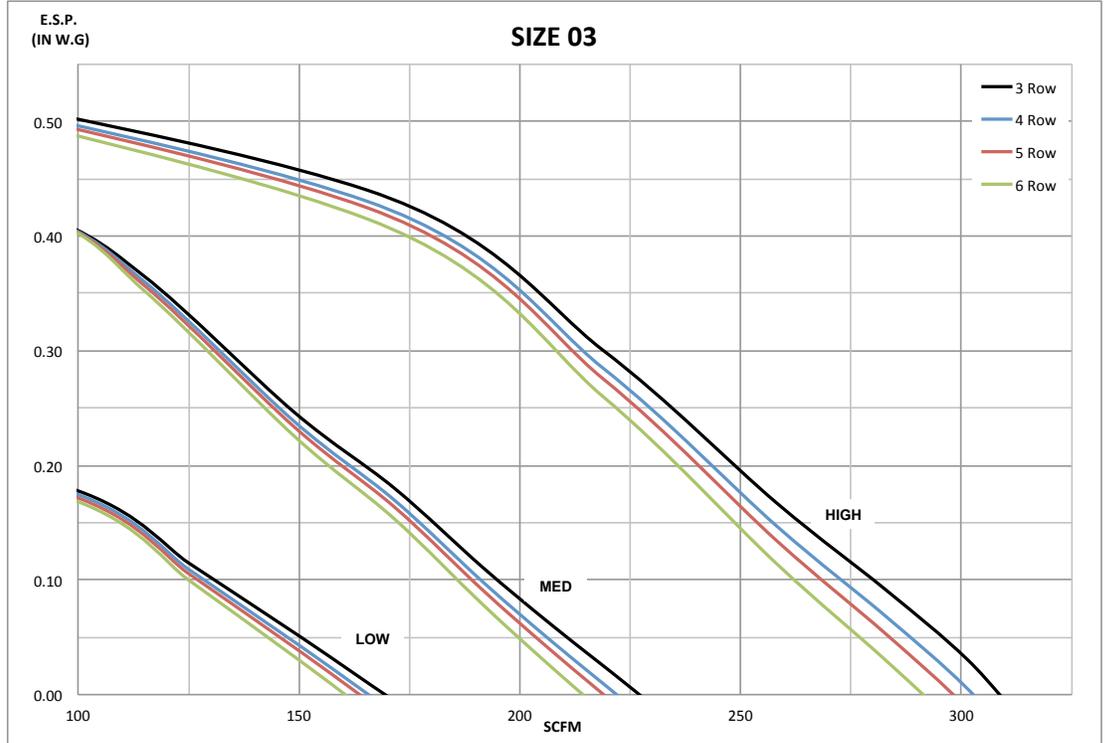


## Size 02 high static

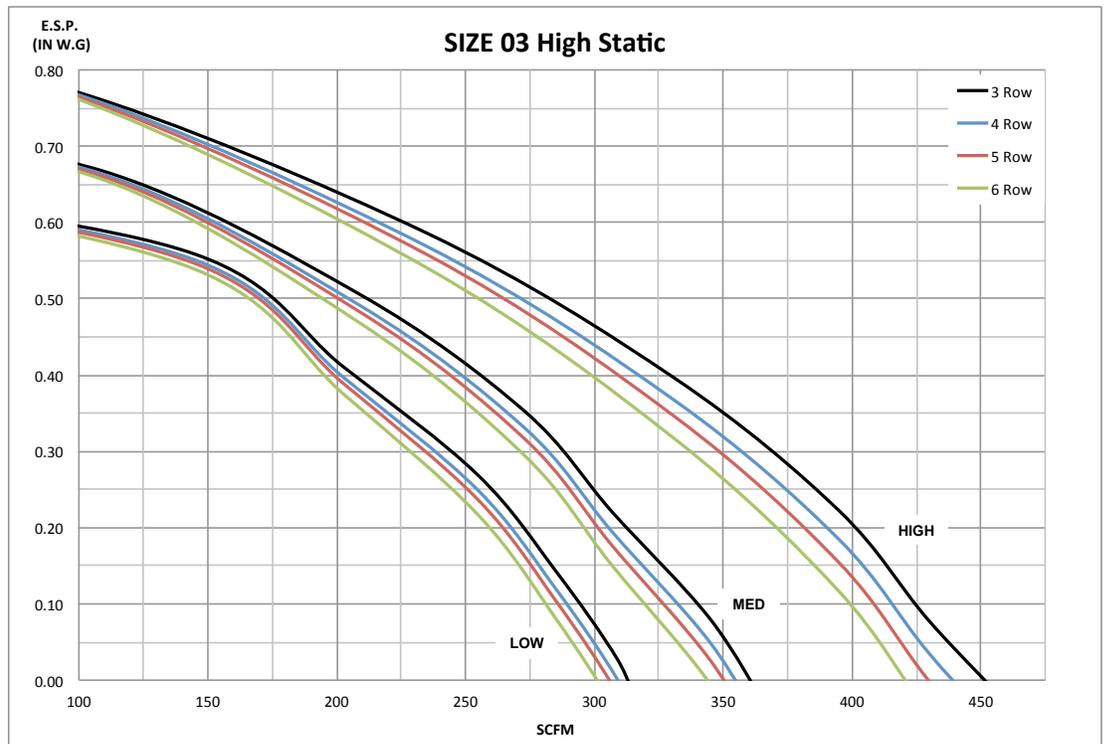


# Fan performance curves (PSC motors)

## Size 03 standard

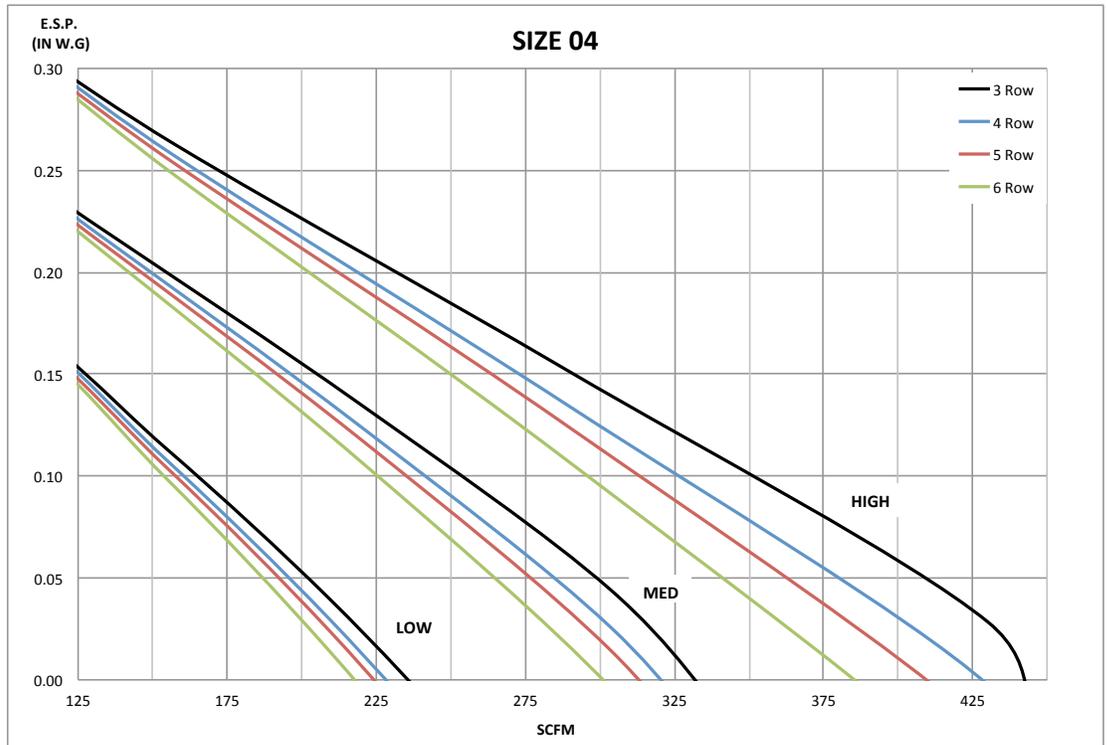


## Size 03 high static

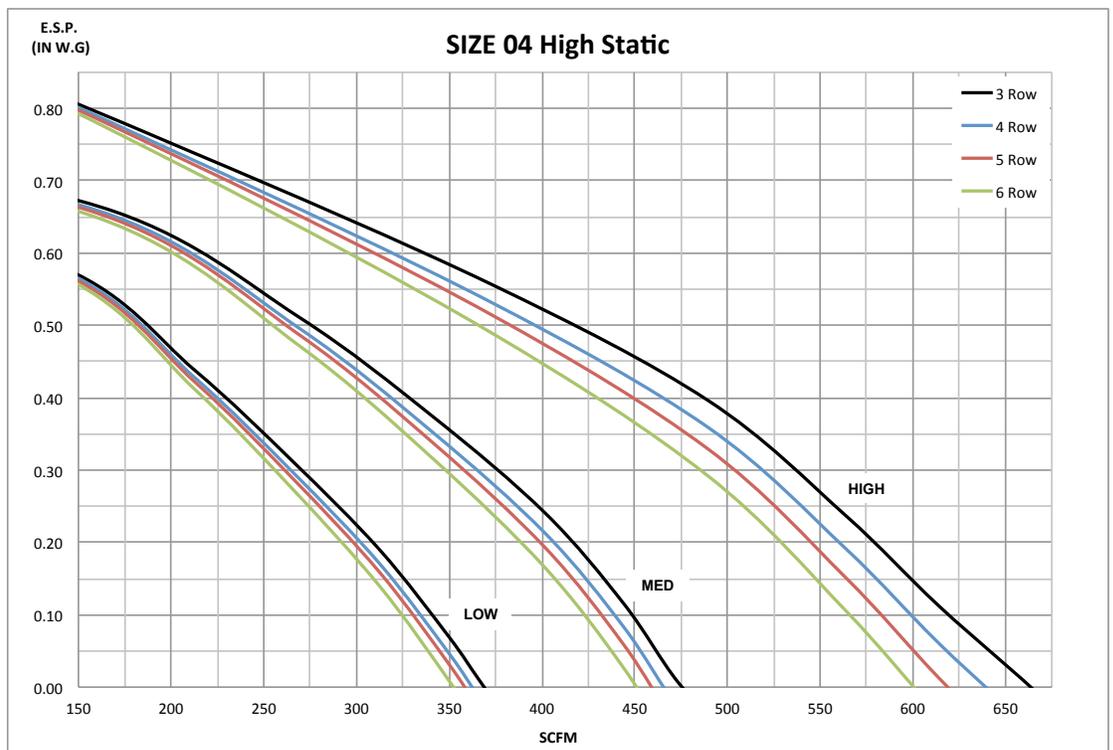


# Fan performance curves (PSC motors)

## Size 04 standard

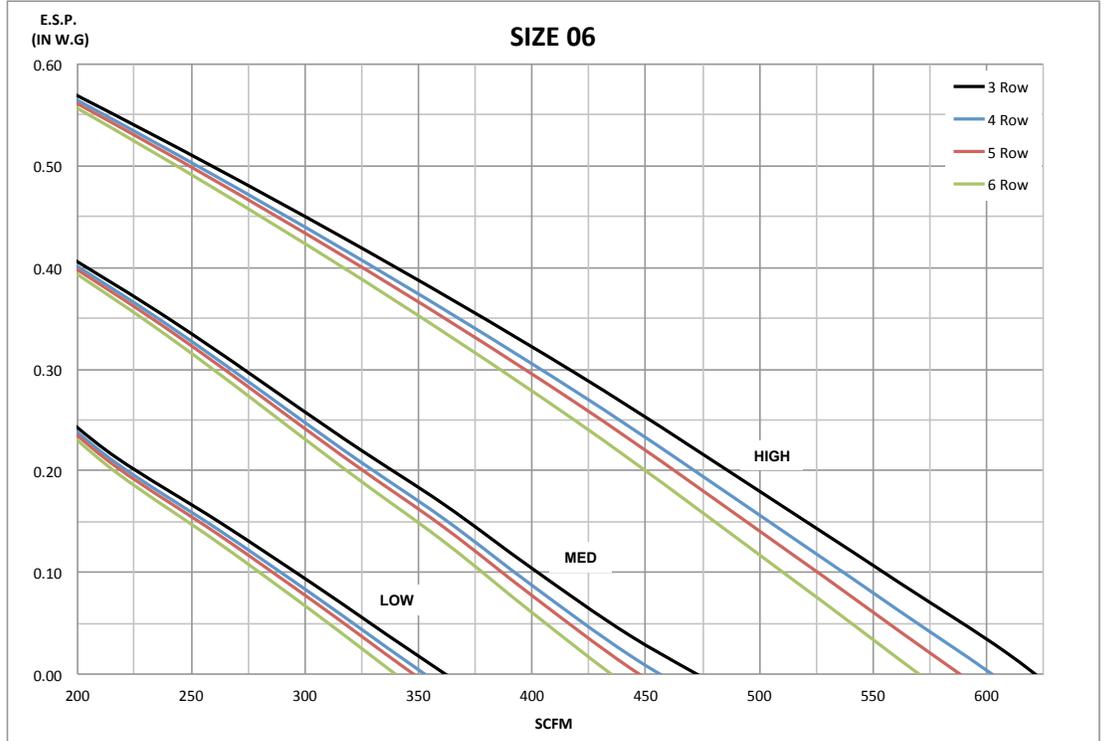


## Size 04 high static

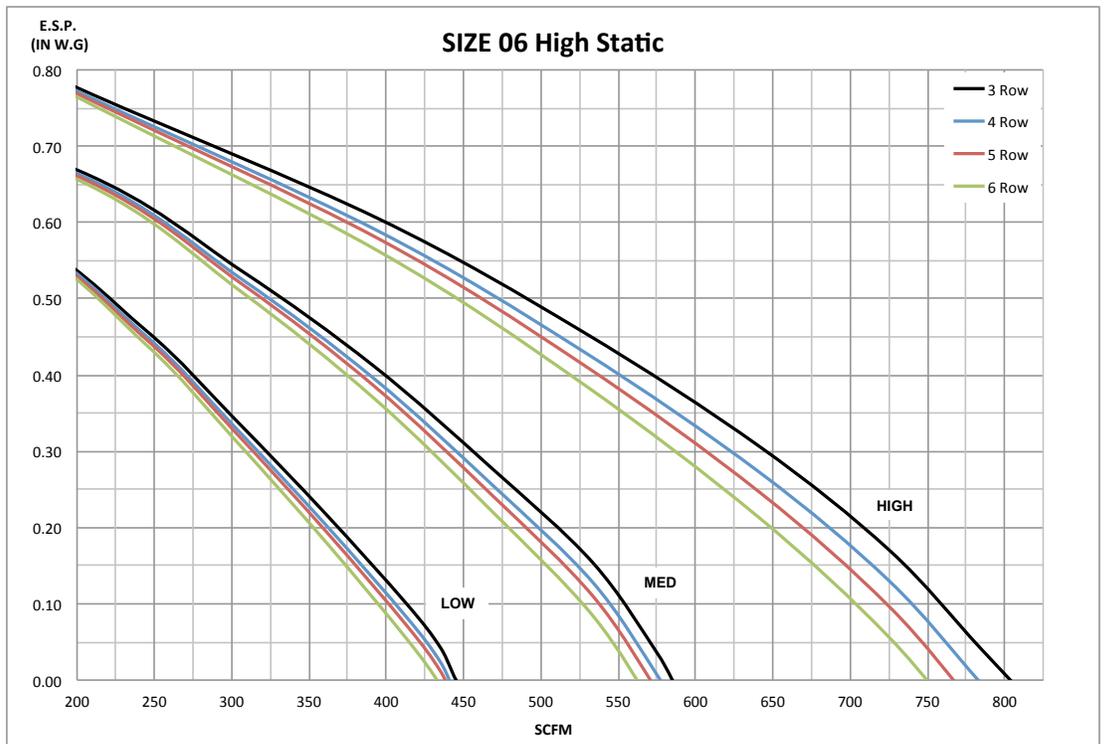


# Fan performance curves (PSC motors)

## Size 06 standard

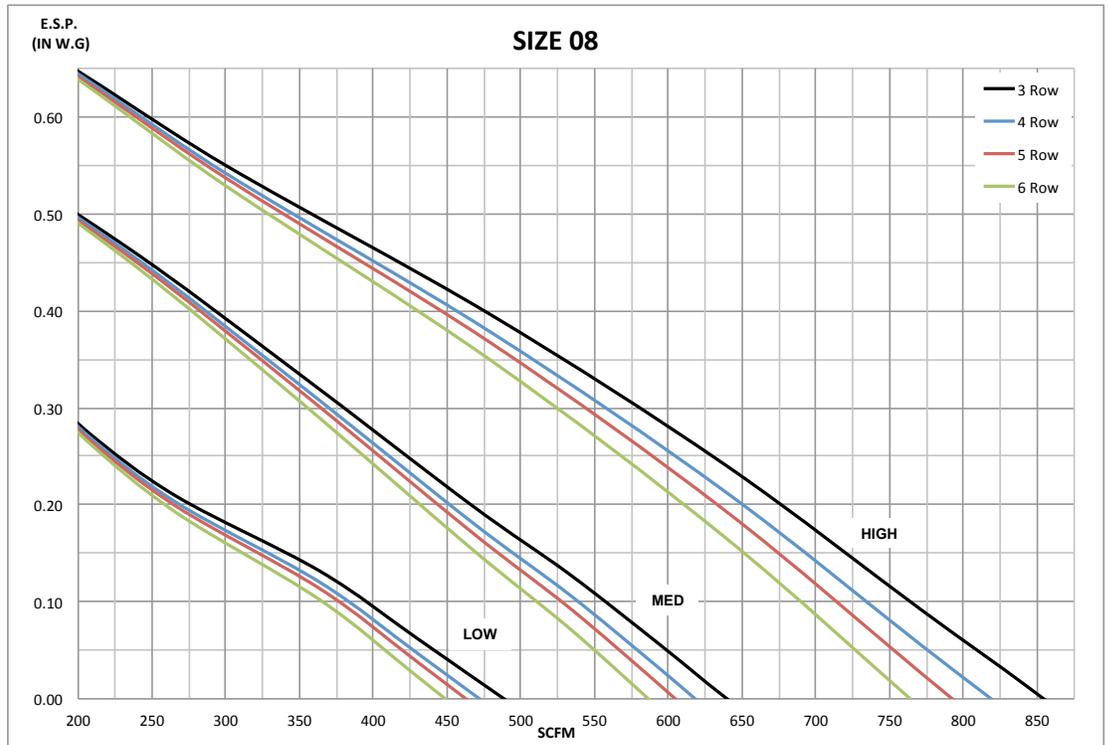


## Size 06 high static

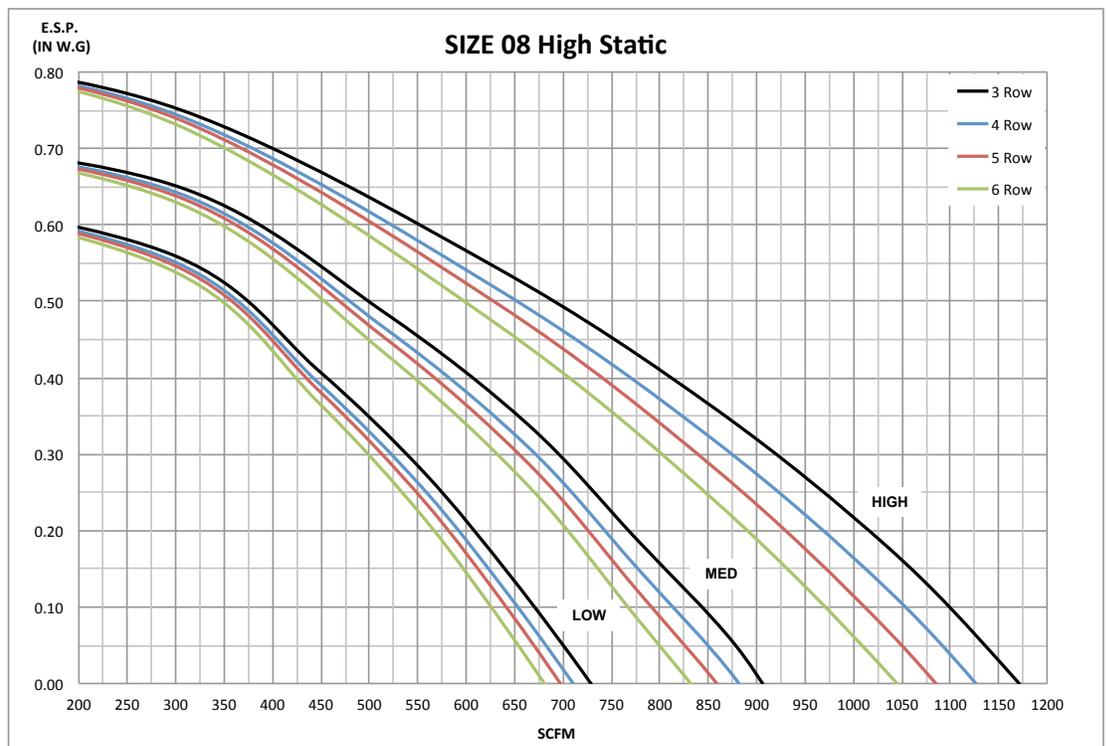


# Fan performance curves (PSC motors)

## Size 08 standard

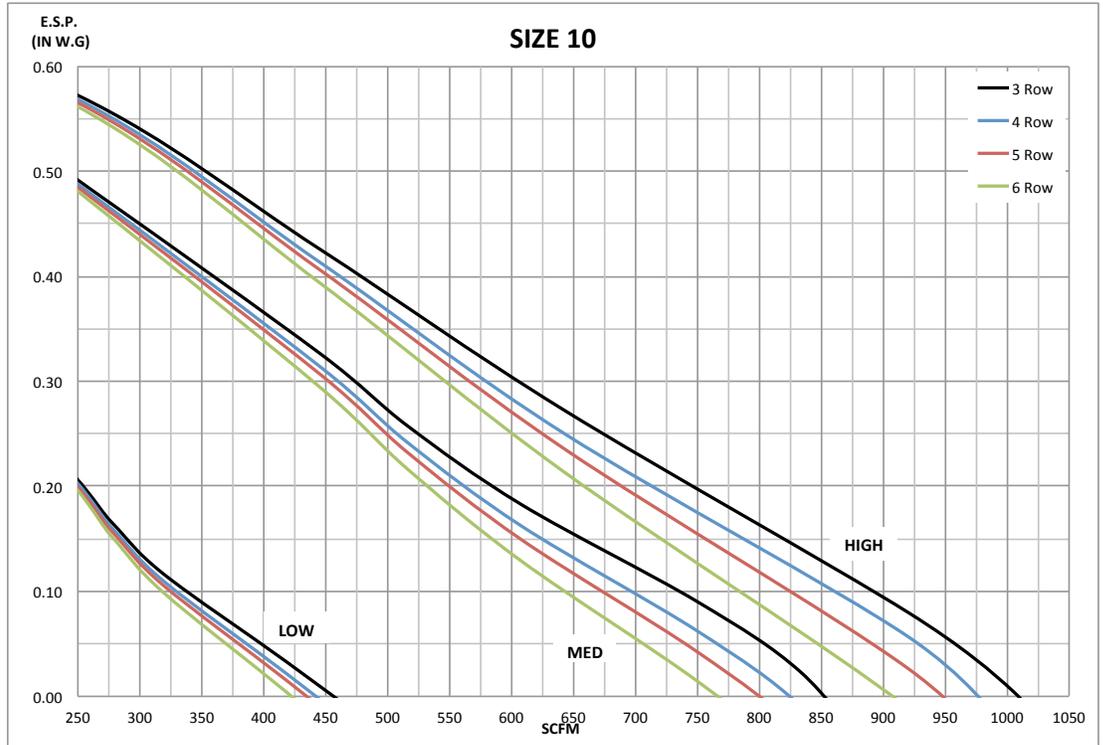


## Size 08 high static

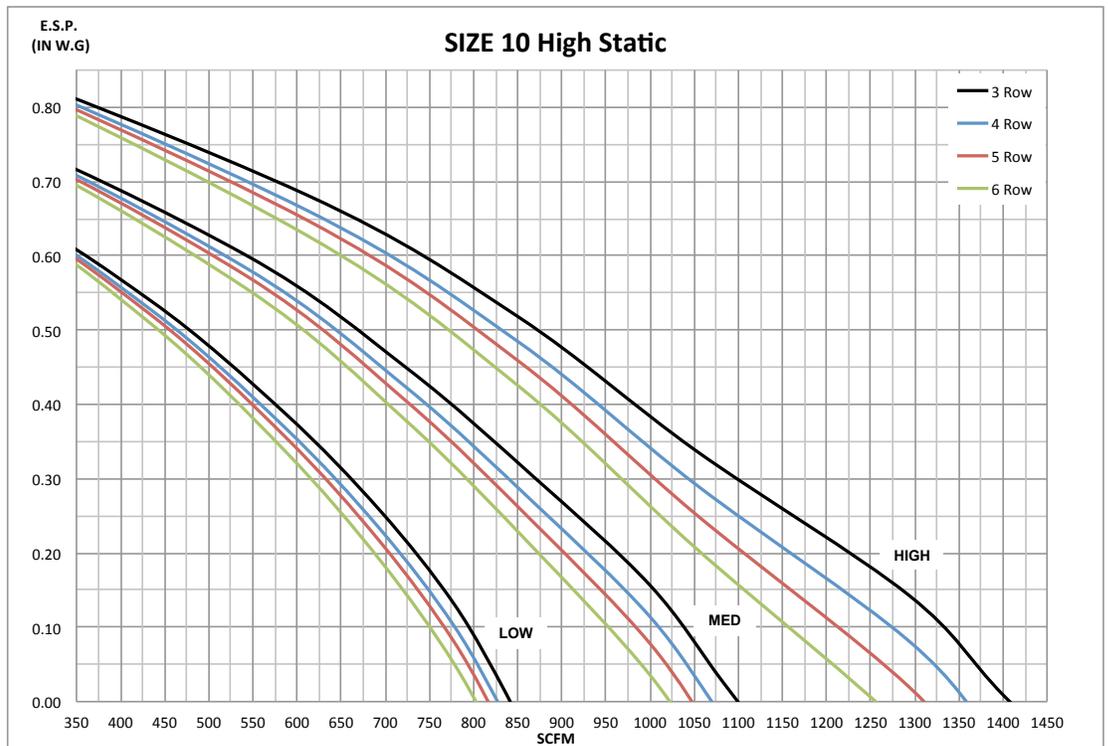


# Fan performance curves (PSC motors)

## Size 10 standard



## Size 10 high static



# Fan performance curves (PSC motors)

## Size 12 standard



## Size 12 high static

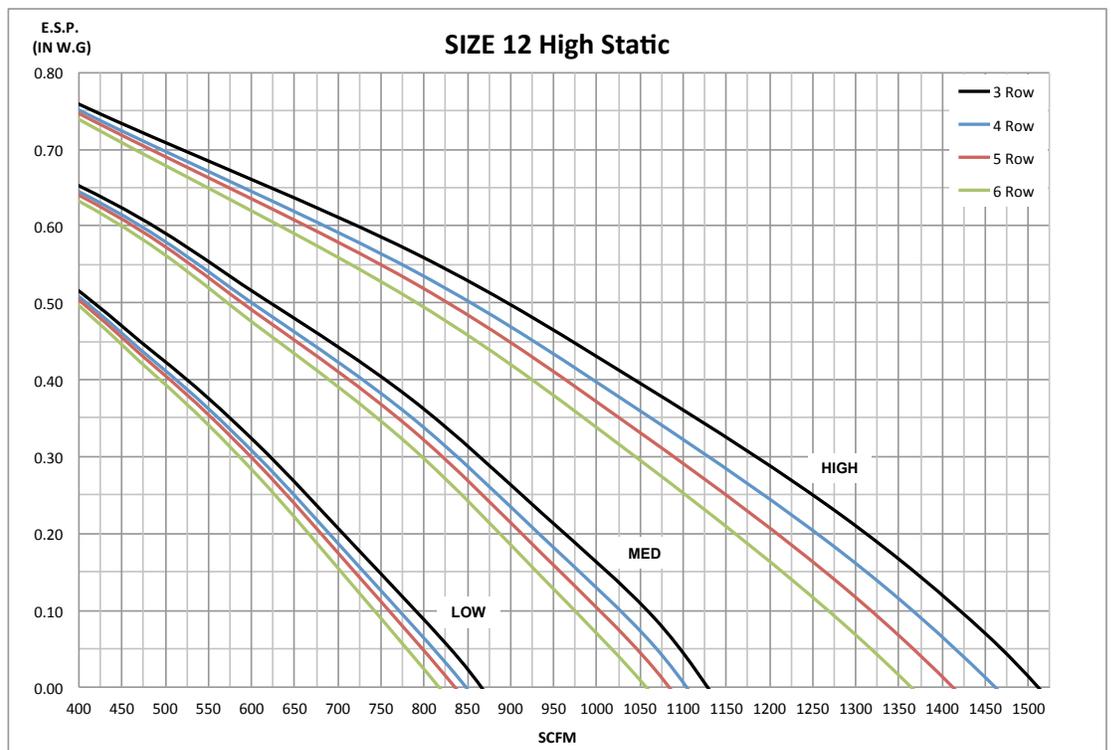


Table B1: Electrical data

		Motor type	02	03	04	06	08	10	12
HP	PSC	Standard	1/30	1/30	1/25	1/15	1/15, 1/30	(2) 1/15	(2) 1/15
		High static	1/12	1/12	1/12	1/7	1/7, 1/12	(2) 1/7	(2) 1/7
	ECM	Standard	1/5	1/5	1/5	1/5	(2) 1/5	(2) 1/5	(2) 1/5
		High static	1/5	1/5	1/5	1/5	(2) 1/5	(2) 1/5	(2) 1/5
RPM high	PSC	Standard	985	995	920	1200	1160	1080	1120
		High static	1505	1510	1370	1450	1470	1490	1445
	ECM	Standard	985	1000	930	1200	1170	1080	1120
		High static	1500	1500	1370	1450	1475	1500	1450
RPM medium	PSC	Standard	833	754	770	1060	930	970	960
		High static	1390	1320	1170	1240	1275	1280	1270
	ECM	Standard	840	760	770	1050	935	970	960
		High static	1400	1320	1170	1240	1270	1280	1270
RPM low	PSC	Standard	620	575	630	730	770	630	730
		High static	1300	1200	1060	1100	1150	1160	1130
	ECM	Standard	640	580	630	730	770	630	735
		High static	1300	1220	1050	1100	1150	1150	1135
Motor FLA 120V/60Hz/1Ph	PSC	Standard	0.60	0.60	0.68	1.13	1.73	2.26	2.26
		High static	1.05	1.05	1.20	1.70	2.75	3.40	3.40
	ECM	Standard	0.78	0.88	1.05	1.60	2.52	2.65	3.20
		High static	1.33	1.33	1.80	2.21	3.16	3.47	3.60
Power input: watts 120V/60Hz/1Ph	PSC	Standard	51	61	66	113	175	217	226
		High static	117	120	172	201	320	391	402
	ECM	Standard	36	43	46	79	123	152	158
		High static	88	90	129	151	240	293	302
Motor FLA 208-230V/60HZ/1PH	PSC	Standard	0.3	0.3	0.32	0.57	0.87	1.14	1.14
		High static	0.52	0.52	0.74	0.74	1.26	1.48	1.48
	ECM	Standard	0.45	0.51	0.61	0.93	1.46	1.54	1.85
		High static	0.77	0.77	1.04	1.28	1.83	2.01	2.09
Power input: watts 208-230V/60HZ/1PH	PSC	Standard	49	58	60	109	160	210	219
		High static	111	114	198	168	275	326	335
	ECM	Standard	34	41	42	76	112	147	153
		High static	83	85	148	126	207	245	252
Motor FLA 277V/60Hz/1Ph	PSC	Standard	0.25	0.25	0.23	0.48	0.73	0.96	0.96
		High static	0.43	0.43	0.58	0.66	1.09	1.32	1.32
	ECM	Standard	0.39	0.44	0.53	0.80	1.27	1.33	1.61
		High static	0.67	0.67	0.91	1.11	1.59	1.74	1.81
Power input: watts 277V/60Hz/1Ph	PSC	Standard	49	59	52	111	162	213	222
		High static	111	113	192	180	287	350	360
	ECM	Standard	34	41	36	78	113	149	155
		High static	83	85	144	135	215	263	270

**Notes:**

- Maximum circuit ampacity (MCA) =  
1.25 x (FLA motor 1 + FLA motor 2 + FLA electric heat)
- Maximum overcurrent protection (MOP) =  
(2.25 x FLA motor 1) + FLA motor 2 + FLA electric heat
- If the calculated MOP is within 10% of the next smaller available fuse size, that fuse size shall be used. If not, the next larger fuse size above the calculated MOP must be used.
- If the selected MOP is smaller than the MCA, the selected MOP must be increased to the next larger available fuse size above the MCA.
- If the MOP is less than 15, it shall be rounded up to 15 amps. This is the minimum fuse or circuit breaker permitted by code.
- EC motor nameplate amperage indicates the motor hardware peak amperage while the motor full load amperage (FLA) is limited by the motor's factory programmed operating range, programmed specifically for each unit size. The programmed operating range is generally only a portion of the motor hardware full potential resulting in the motor FLA being lower than the nameplate FLA. Motor FLA will be reflected on the Fan Coil serial tag and should be used when sizing building electrical requirements.



# Octave band sound power ratings

**Standard**

**Table C1:  
Ceiling models**

Unit size	Motor speed	CFM	Octave bands							
			2	3	4	5	6	7	8	
			Center frequency (Hz)							
			125	250	500	1000	2000	4000	8000	
02	High	230	60.7	53.7	48.7	47.7	44.7	41.7	36.7	
	Medium	190	57.1	50.1	45.1	44.1	41.1	38.1	33.1	
	Low	130	50.9	43.9	38.9	37.9	34.9	31.9	26.9	
03	High	295	61.0	54.0	49.0	48.0	45.0	42.0	37.0	
	Medium	210	55.1	48.1	43.1	42.1	39.1	36.1	31.1	
	Low	150	49.6	42.6	37.6	36.6	33.6	30.6	25.6	
04	High	350	61.9	54.9	49.9	48.9	45.9	42.9	37.9	
	Medium	270	57.7	50.7	45.7	44.7	41.7	38.7	33.7	
	Low	180	52.1	45.1	40.1	39.1	36.1	33.1	28.1	
06	High	550	65.4	58.4	53.4	52.4	49.4	46.4	41.4	
	Medium	410	60.7	53.7	48.7	47.7	44.7	41.7	36.7	
	Low	320	56.3	49.3	44.3	43.3	40.3	37.3	32.3	
08	High	720	68.7	61.7	56.7	55.7	52.7	49.7	44.7	
	Medium	570	64.6	57.6	52.6	51.6	48.6	45.6	40.6	
	Low	400	59.4	52.4	47.4	46.4	43.4	40.4	35.4	
10	High	890	69.6	62.6	57.6	56.6	53.6	50.6	45.6	
	Medium	700	66.4	59.4	54.4	53.4	50.4	47.4	42.4	
	Low	410	56.9	49.9	44.9	43.9	40.9	37.9	32.9	
12	High	1075	70.2	63.2	58.2	57.2	54.2	51.2	46.2	
	Medium	750	65.6	58.6	53.6	52.6	49.6	46.6	41.6	
	Low	550	61.3	54.3	49.3	48.3	45.3	42.3	37.3	

**Notes:**

- The method used in conducting this test was based on the AHRI Standard 350-2008 "Sound Rating of Non-Ducted Indoor Air-Conditioning Equipment".
- Standard PSC and EC motor(s)
- Model FC

**Table C2:  
Ceiling models, ducted**

Unit size	Motor speed	CFM	Octave bands							
			2	3	4	5	6	7	8	
			Center frequency (Hz)							
			125	250	500	1000	2000	4000	8000	
02	High	230	58.6	51.6	46.6	45.6	42.6	39.6	34.6	
	Medium	190	55.0	48.0	43.0	42.0	39.0	36.0	31.0	
	Low	130	48.6	41.6	36.6	35.6	32.6	29.6	24.6	
03	High	295	58.9	51.9	46.9	45.9	42.9	39.9	34.9	
	Medium	210	52.8	45.8	40.8	39.8	36.8	33.8	28.8	
	Low	150	47.3	40.3	35.3	34.3	31.3	28.3	23.3	
04	High	350	60.8	53.8	48.8	47.8	44.8	41.8	36.8	
	Medium	270	56.4	49.4	44.4	43.4	40.4	37.4	32.4	
	Low	180	50.5	43.5	38.5	37.5	34.5	31.5	26.5	
06	High	550	63.8	56.8	51.8	50.8	47.8	44.8	39.8	
	Medium	410	59.0	52.0	47.0	46.0	43.0	40.0	35.0	
	Low	320	54.5	47.5	42.5	41.5	38.5	35.5	30.5	
08	High	720	67.3	60.3	55.3	54.3	51.3	48.3	43.3	
	Medium	570	63.1	56.1	51.1	50.1	47.1	44.1	39.1	
	Low	400	58.1	51.1	46.1	45.1	42.1	39.1	34.1	
10	High	890	68.2	61.2	56.2	55.2	52.2	49.2	44.2	
	Medium	700	64.9	57.9	52.9	51.9	48.9	45.9	40.9	
	Low	410	55.5	48.5	43.5	42.5	39.5	36.5	31.5	
12	High	1075	68.8	61.8	56.8	55.8	52.8	49.8	44.8	
	Medium	750	64.2	57.2	52.2	51.2	48.2	45.2	40.2	
	Low	550	59.9	52.9	47.9	46.9	43.9	40.9	35.9	

**Notes:**

- The method used in conducting this test was based on the AHRI Standard 260-2008 "Sound Rating of Ducted Indoor Air Moving and Conditioning Equipment".
- Standard PSC and EC motor(s)
- Models FFRC, FCHP, FCH and FTHP

# Octave band sound power ratings

High static

**Table C3:**  
High static ceiling models

Unit size	Motor speed	CFM	Octave bands							
			2	3	4	5	6	7	8	
			Center frequency (Hz)							
			125	250	500	1000	2000	4000	8000	
02	High	330	68.8	61.8	56.8	55.8	52.8	49.8	44.8	
	Medium	299	67.0	60.0	55.0	54.0	51.0	48.0	43.0	
	Low	269	65.1	58.1	53.1	52.1	49.1	46.1	41.1	
03	High	401	68.4	61.4	56.4	55.4	52.4	49.4	44.4	
	Medium	328	64.8	57.8	52.8	51.8	48.8	45.8	40.8	
	Low	288	62.6	55.6	50.6	49.6	46.6	43.6	38.6	
04	High	524	70.9	63.9	58.9	57.9	54.9	51.9	46.9	
	Medium	408	66.5	59.5	54.5	53.5	50.5	47.5	42.5	
	Low	323	62.7	55.7	50.7	49.7	46.7	43.7	38.7	
06	High	659	70.4	63.4	58.4	57.4	54.4	51.4	46.4	
	Medium	513	66.2	59.2	54.2	53.2	50.2	47.2	42.2	
	Low	398	62.2	55.2	50.2	49.2	46.2	43.2	38.2	
08	High	896	73.8	66.8	61.8	60.8	57.8	54.8	49.8	
	Medium	727	70.5	63.5	58.5	57.5	54.5	51.5	46.5	
	Low	600	67.6	60.6	55.6	54.6	51.6	48.6	43.6	
10	High	1077	75.0	68.0	63.0	62.0	59.0	56.0	51.0	
	Medium	897	72.1	65.1	60.1	59.1	56.1	53.1	48.1	
	Low	717	68.6	61.6	56.6	55.6	52.6	49.6	44.6	
12	High	1172	74.4	67.4	62.4	61.4	58.4	55.4	50.4	
	Low	721	67.0	60.0	55.0	54.0	51.0	48.0	43.0	

**Notes:**

- The method used in conducting this test was based on the AHRI Standard 350-2008 "Sound Rating of Non-Ducted Indoor Air-Conditioning Equipment".
- High static PSC and EC motor(s)
- Model FC

**Table C4:**  
High static ceiling models, ducted

Unit size	Motor speed	CFM	Octave bands							
			2	3	4	5	6	7	8	
			Center frequency (Hz)							
			125	250	500	1000	2000	4000	8000	
02	High	331	68.8	61.8	56.8	55.8	52.8	49.8	44.8	
	Medium	295	67.2	60.2	55.2	54.2	51.2	48.2	43.2	
	Low	262	65.7	58.7	53.7	52.7	49.7	46.7	41.7	
03	High	396	68.6	61.6	56.6	55.6	52.6	49.6	44.6	
	Medium	313	65.7	58.7	53.7	52.7	49.7	46.7	41.7	
	Low	270	64.0	57.0	52.0	51.0	48.0	45.0	40.0	
04	High	520	71.0	64.0	59.0	58.0	55.0	52.0	47.0	
	Medium	387	67.2	60.2	55.2	54.2	51.2	48.2	43.2	
	Low	292	64.2	57.2	52.2	51.2	48.2	45.2	40.2	
06	High	641	70.7	63.7	58.7	57.7	54.7	51.7	46.7	
	Medium	480	67.3	60.3	55.3	54.3	51.3	48.3	43.3	
	Low	353	64.2	57.2	52.2	51.2	48.2	45.2	40.2	
08	High	904	73.8	66.8	61.8	60.8	57.8	54.8	49.8	
	Medium	697	70.9	63.9	58.9	57.9	54.9	51.9	46.9	
	Low	551	68.4	61.4	56.4	55.4	52.4	49.4	44.4	
10	High	1095	74.9	67.9	62.9	61.9	58.9	55.9	50.9	
	Medium	874	72.3	65.3	60.3	59.3	56.3	53.3	48.3	
	Low	671	69.5	62.5	57.5	56.5	53.5	50.5	45.5	
12	High	1167	74.5	67.5	62.5	61.5	58.5	55.5	50.5	
	Low	647	68.2	61.2	56.2	55.2	52.2	49.2	44.2	

**Notes:**

- The method used in conducting this test was based on the AHRI Standard 260-2008 "Sound Rating of Ducted Indoor Air Moving and Conditioning Equipment".
- High static PSC and EC motor(s)
- Models FFRC, FCHP, FCH and FTHP

# Valve packages general data

## Field mounted valve packages

Zehnder Fan Coils have standard valve packages available as a factory-built assembly, pre-wired and field-installed option for the main cooling coil and optional heating coil. All valve packages are manufactured within strict tolerances and are hydrostatically tested for leaks. Valve packages are shipped loose for field assembly to ensure a leak free system as factory mounted valve packages often become damaged during shipment. All cooling piping and components are located directly above the auxiliary drain pan to allow condensate to be captured and properly drained. Insulation of the factory valve package is not required. However, all field connections downstream of the valve package should be insulated to prevent condensation from missing the auxiliary drain pan.

### ■ Valve package components

Zehnder valve packages consist of a variety of components and selection of each combination is dependent upon the application. The following sections provide a detailed description of each of the components. Following this section are additional schematic illustrations and mechanical specifications and photos.

■ **Piping system/placement** Valve packages are available for two or four-pipe systems with left and/or right hand connections. The heating and cooling connections can be located on the same or opposite sides of the unit in four-pipe systems. All coil connections are left hand as standard unless specified differently.

### ■ Interconnecting piping

Interconnecting piping refers to the copper piping which is attached to the coil connections and to which all other components (i.e. control valves, ball valves, circuit setters, etc.) are attached. Piping is 1/2" nominal (5/8" OD) copper.

### ■ Deluxe or basic packages

The basic valve package includes only the main components of the valve package (i.e. interconnecting piping, control valves, and end valves). The deluxe valve packages also include unions at the coil connections and a strainer on the supply water pipe along with the basic components. All valve package components are solder end connections.

### ■ Unions

Feature cast bronze construction and close with a minimum amount of effort. Used for quick connect and disconnect of valve package components to minimize required field labor during servicing of the unit. Pre-assembled to coil to allow quick field installation.

### ■ Strainer

The Y-type strainer body is constructed of brass with a 16 mesh 304 stainless steel screen. Used for removal of small particles from the water supply pipe during normal system operation. The strainer helps protect the coil and minimizes the chance of control valves clogging. Screens should be regularly removed and cleaned as part of a routine maintenance schedule.

### ■ Balance valves

An accessible port where pressure and temperature can be measured.

■ Accepts standard 1/8" gauge adapter or thermometer stem.

## End valves

Each valve package includes a ball valve for supply water pipe and one of the following end valves on the return water pipe; ball valve, manual circuit setter, or automatic circuit setter. Consult factory for inclusion of other types of valves as end valves.

### ■ Ball valves

Ball valves, a.k.a. end valves, allow the unit to be cut off for servicing purposes. They have a low resistance to water flow, operate easily, and are often used for water balancing. These valves have a compact handle that rotates 90 degrees to a fully open position.

The valve body is forged brass and the ball is polished brass with virgin Teflon seats and seals. Ball valves are available as end valves on both the supply and return water pipes.

### ■ Manual circuit setter

A manual circuit setter, a.k.a. manual flow control valve, acts as both a flow setting device and a stop valve, taking the place of a ball valve. This valve allows water flow through the fan coil unit and can be set quickly and accurately. Manual circuit setter includes two measuring ports in the valve body for pressure drop measurements during system balancing. This pressure drop can be compared to factory supplied curves showing the corresponding flow rate. This valve has a handwheel with memory feature including a locking feature for tamperproof setting.

### ■ Automatic circuit setter

An automatic circuit setter is an automatic flow control device that includes a ball valve cast in the valve body and is located on the return water pipe. The automatic circuit setter consists of a stainless steel/brass flow cartridge and a contoured orifice plate. As the pressure drop increases, the flow cartridge will move into the contoured orifice plate to decrease the flow. This flexing action provides a constant flow, independent of pressure (2-80 psi), makes it difficult to clog and resistant to cavitation damage. This valve sets flow through the coil without any action required by a system balancer.

## Control valves

Valve packages are available with or without control valves.

### ■ 2-way on/off valves

These 1/2" valves are normally closed to the coil as standard and will isolate the coil during a loss of power. Normally open valves are also available upon request. Upon response to a signal from the controller, the valve will be either fully open or fully closed. These valves are located in the water supply pipe and have a  $C_v$  of 3.5, and close off  $\Delta P$  of 25 psi. A high pressure close off valve is offered with a  $C_v$  of 1.0 and close off  $\Delta P$  of 75 psi. A means of relieving head pressure must be accounted for when two-way valves are selected, most notably when used in combination with automatic changeover.

### ■ 3-way on/off valves

These 1/2" valves are normally closed to the coil as standard and will isolate the coil during a loss of power. Normally open configurations are simply achieved by turning the valve around. Upon response to a signal from the controller, the valve will be either fully open allowing full flow to the coil or fully closed to the coil diverting full flow to the bypass line. All three-way valve configurations include a balance fitting in the bypass line to allow proper flow balancing. These valves are located in the water supply pipe and have a  $C_v$  of 4.0, and close off  $\Delta P$  of 25 psi. A high pressure close off valve is offered with a  $C_v$  of 1.5 and close off  $\Delta P$  of 75 psi.

### ■ 2-way modulating valves

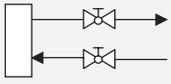
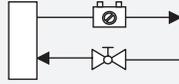
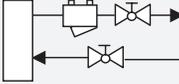
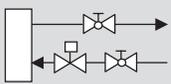
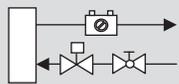
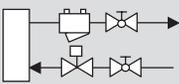
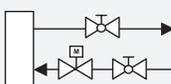
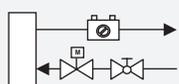
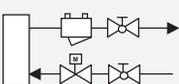
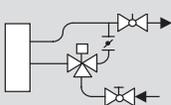
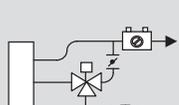
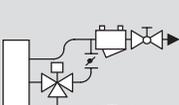
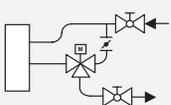
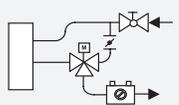
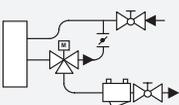
1/2", 24V valves modulate the flow of water (0-100%) through the coil in response to a signal from the controller and are normally closed to the coil as standard. Normally open valves are also available upon request. Modulating valves are either three-wire floating equal percentage valves or proportional (2-10 VDC or 4-20 mA signal), designed for precise temperature control. All valves feature a magnetic clutch to extend the life of the motor and gear train, manual operating lever/position indicator facilitates field setup, and easy to use lever terminal blocks. These valves are located in the water supply pipe, have a  $C_v$  of 4.0, and close off  $\Delta P$  of 20 psi. A means of relieving pump head pressure must be accounted for when two-way valves are selected, most notably when used in combination with automatic changeover.

### ■ 3-way modulating valves

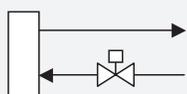
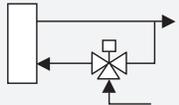
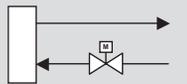
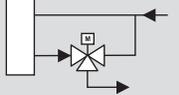
These 1/2", 24V valves modulate the flow of water (0-100%) through the coil in response to a signal from the controller and are normally closed to the coil as standard. Normally open configurations are simply achieved by turning the valve around. Three-way valves allow the water supply from the water supply pipe to mix with bypass water from the bypass line. This mixture exits through the supply water pipe to the coil. Modulating valves are either three-wire floating equal percentage valves or proportional (2-10 VDC or 4-20 mA signal), designed for precise temperature control. All valves feature a magnetic clutch to extend the life of the motor and gear train, manual operating lever/position indicator facilitates field setup, and easy to use lever terminal blocks. These valves are located in the water supply pipe, have a  $C_v$  of 4.0, and close off  $\Delta P$  of 20 psi.

Please contact Zehnder regarding any special valve requirements including hose kits, additional P/T ports, customer supplied valves, etc.

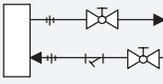
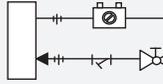
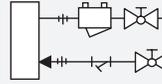
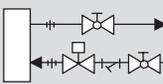
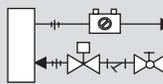
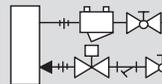
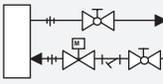
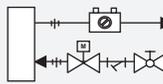
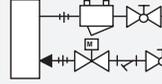
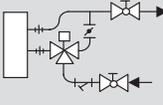
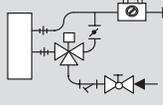
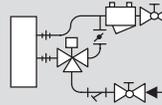
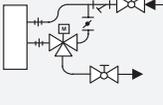
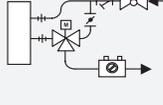
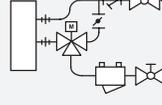
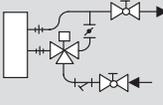
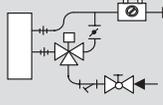
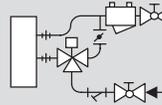
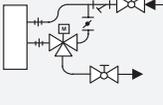
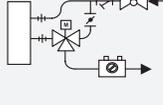
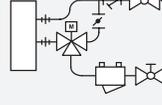
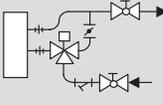
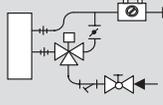
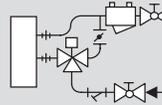
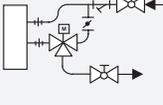
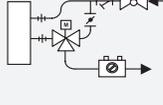
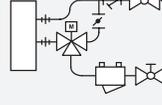
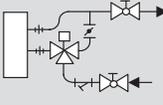
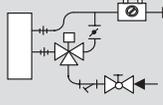
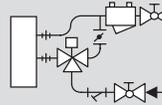
# Basic valve packages

Pre-assembled packages, shipped loose for field mounting			
Control valve	Basic	Manual circuit setter	Automatic circuit setter
None	<b>V-B1</b> Ball valve on supply Ball valve on return 	<b>V-B2</b> Ball valve on supply Manual circuit setter on return 	<b>V-B3</b> Ball valve on supply Auto circuit setter and ball valve on return 
2-way on/off	<b>V-B4E</b> 2-way electric valve and ball valve on supply Ball valve on return 	<b>V-B5E</b> 2-way electric valve and ball valve on supply Manual circuit setter on return 	<b>V-B6E</b> 2-way electric valve and ball valve on supply Auto circuit setter and ball valve on return 
2-way modulating	<b>V-B4M</b> 2-way electric valve and ball valve on supply Ball valve on return 	<b>V-B5M</b> 2-way electric valve and ball valve on supply Manual circuit setter on return 	<b>V-B6M</b> 2-way electric valve and ball valve on supply Auto circuit setter and ball valve on return 
3-way on/off	<b>V-B7E</b> 3-way electric valve and ball valve on supply Balance fitting in bypass Ball valve on return 	<b>V-B8E</b> 3-way electric valve and ball valve on supply Balance fitting in bypass Manual circuit setter on return 	<b>V-B9E</b> 3-way electric valve and ball valve on supply Balance fitting in bypass Auto circuit setter and ball valve on return 
3-way modulating	<b>V-B7M</b> Ball valve on supply Balance fitting in bypass 3-way electric valve and ball valve on return 	<b>V-B8M</b> Ball valve on supply Balance fitting in bypass 3-way electric valve and manual circuit setter on return 	<b>V-B9M</b> Ball valve on supply Balance fitting in bypass 3-way electric valve, Auto circuit setter and ball valve on return 

## Miscellaneous ship loose parts

<b>V-2E</b> 2-way electric on/off valve on supply 	<b>V-3E</b> 3-way electric on/off valve on supply 
<b>V-2M</b> 2-way electric modulating valve on supply 	<b>V-3M</b> 3-way electric modulating valve on return 

# Deluxe valve packages

Pre-assembled packages, shipped loose for field mounting			
Control valve	Basic	Manual circuit setter	Automatic circuit setter
None	<b>V-D1</b> Ball valve, union and strainer on supply Ball valve and union on return 	<b>V-D2</b> Ball valve, union and strainer on supply Manual circuit setter and union on return 	<b>V-D3</b> Ball valve, union and strainer on supply Auto circuit setter, union and ball valve on return 
	<b>V-D4E</b> 2-way electric valve, ball valve, union and strainer on supply Ball valve and union on return 	<b>V-D5E</b> 2-way electric valve, ball valve, union and strainer on supply Manual circuit setter and union on return 	<b>V-D6E</b> 2-way electric valve, ball valve, union and strainer on supply Auto circuit setter, union and ball valve on return 
2-way on/off	<b>V-D4M</b> 2-way electric valve, ball valve, union and strainer on supply Ball valve and union on return 	<b>V-D5M</b> 2-way electric valve, ball valve, union and strainer on supply Manual circuit setter and union on return 	<b>V-D6M</b> 2-way electric valve, ball valve, union and strainer on supply Auto circuit setter, union, and ball valve on return 
	<b>V-D7E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Ball valve and union on return 	<b>V-D8E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Manual circuit setter and union on return 	<b>V-D9E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Auto circuit setter, union and ball valve on return 
2-way modulating	<b>V-D7M</b> Ball valve, strainer and union on supply Balance fitting in bypass 3-way electric valve, ball valve and union on return 	<b>V-D8M</b> Ball valve, strainer and union on supply Balance fitting in bypass 3-way electric valve, manual circuit setter and union on return 	<b>V-D9M</b> Ball valve, strainer and union on supply Balance fitting in bypass 3-way electric valve, auto circuit setter, union and ball valve on return 
	<b>V-D7E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Ball valve and union on return 	<b>V-D8E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Manual circuit setter and union on return 	<b>V-D9E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Auto circuit setter, union and ball valve on return 
3-way on/off	<b>V-D7M</b> Ball valve, strainer and union on supply Balance fitting in bypass 3-way electric valve, ball valve and union on return 	<b>V-D8M</b> Ball valve, strainer and union on supply Balance fitting in bypass 3-way electric valve, manual circuit setter and union on return 	<b>V-D9M</b> Ball valve, strainer and union on supply Balance fitting in bypass 3-way electric valve, auto circuit setter, union and ball valve on return 
	<b>V-D7E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Ball valve and union on return 	<b>V-D8E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Manual circuit setter and union on return 	<b>V-D9E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Auto circuit setter, union and ball valve on return 
3-way modulating	<b>V-D7M</b> Ball valve, strainer and union on supply Balance fitting in bypass 3-way electric valve, ball valve and union on return 	<b>V-D8M</b> Ball valve, strainer and union on supply Balance fitting in bypass 3-way electric valve, manual circuit setter and union on return 	<b>V-D9M</b> Ball valve, strainer and union on supply Balance fitting in bypass 3-way electric valve, auto circuit setter, union and ball valve on return 
	<b>V-D7E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Ball valve and union on return 	<b>V-D8E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Manual circuit setter and union on return 	<b>V-D9E</b> 3-way electric valve, ball valve, union and strainer on supply Balance fitting in bypass Auto circuit setter, union and ball valve on return 

# Valve packages components

## Mechanical specifications

Component	Part	Material	Temperature	Working pressure
<b>Union</b> 	Nut	Forged brass	325 °F maximum	600 psi
	Body			
<b>Balance valve</b> 	Body	Bronze	220 °F maximum	300 psi
	O-ring	EPDM		
<b>Automatic circuit setter and ball valve</b> 	Body	Forged brass	325 °F maximum	600 psi
	Ball	Brass/chrome plated		
	Flow cartridge	Stainless steel/brass		
	Seals	Viton		
	Ball seal	PTFE		
<b>Manual circuit setter</b> 	Body	Bronze	250 °F maximum	200 psi
	Ball	Brass		
	Seat rings	Glass and carbon filled TFE		
	O-ring	EPDM		
<b>Ball valve</b> 	Body	Forged brass	325 °F maximum	600 psi
	Ball	Brass/chrome plated		
	Seat	PTFE		
	Stem	Brass		
	Seals	Viton		
<b>Strainer and ball valve with union</b> 	Body	Forged brass	325 °F maximum	600 psi
	Ball	Brass/chrome plated		
	Seat	PTFE		
	Stem	Brass		
	Seals	Viton		
	Screen	304 stainless steel (20 mesh)		
<b>Control valve</b> 	Body	Forged brass	200 °F maximum	300 psi
	Stem	Nickel plated/chrome plated brass		
	Seat	Brass		
	Paddle/plug	On/off: Buna N Modulating: High temperature thermoplastic/rubber		
	Actuator	On/off: stainless steel base plate, aluminum cove Modulating: high temperature plastic		

# 120 Volt Control packages

## Electronic on-off valve/thermostat

### Two pipe control:

#### Fan cycled or fan/valve cycled

Zehnder provides a control system that includes a thermostat, control board with relays, manually operated three-speed fan switch and changeover switch (when required). For fan cycle operation, the thermostat cycles the fan from the selected speed to off. No control valve is provided in this operation. For fan/valve cycle operation, the thermostat cycles the fan and control valve. The fan runs intermittently unless the speed control switch is in the off position. Valve is not included in the control package price.

Package number	Thermostat description	Fan motor speed switch location	Changeover switch
2F0C	On/off system switch and three-speed fan control but no changeover	Unit mounted, integral to thermostat	No
2F0D		Wall mounted, integral to thermostat	No
2F0E	Manual changeover, heat/off/cool system switch and three-speed fan control	Unit mounted, integral to thermostat	Yes
2F0F		Wall mounted, integral to thermostat	Yes
2F0G	Auto changeover, on/off system switch and three-speed fan control	Unit mounted, integral to thermostat	Yes
2F0H		Wall mounted, integral to thermostat	Yes

#### Notes:

- A means of relieving pump head pressure must be accounted for when two-way valves are used with an automatic thermostat package
- The fan cycles with demand for heating or cooling, but if the system switch is off, the fan is off
- Remote temperature sensors are recommended with all unit mounted thermostats for improved temperature control

### Two pipe control:

#### Valve cycled

Zehnder provides a control system that includes a thermostat, control board, manually operated three-speed fan switch and changeover switch (when required). The thermostat cycles the electric control valve. The fan runs continuously. Valve is not included in the control package price.

Package number	Thermostat description	Fan motor speed switch location	Changeover switch
2V0C	On/off system switch and three-speed fan control but no changeover	Unit mounted, integral to thermostat	No
2V0D		Wall mounted, integral to thermostat	No
2V0E	Manual changeover, heat/off/cool system switch and three-speed fan control	Unit mounted, integral to thermostat	Yes
2V0F		Wall mounted, integral to thermostat	Yes
2V0G	Auto changeover, on/off system switch and three-speed fan control	Unit mounted, integral to thermostat	Yes
2V0H		Wall mounted, integral to thermostat	Yes

#### Notes:

- A means of relieving pump head pressure must be accounted for when two-way valves are used with an automatic thermostat package
- The fan runs continuously, but if the system switch is off, the fan is off
- Remote temperature sensors are recommended with all unit mounted thermostats for improved temperature control

# 120 Volt Control packages

## Electronic on-off valve/thermostat

### Four pipe control: Fan cycled or fan/valve cycled

Zehnder provides a control system that includes a thermostat, control board with relays and manually operated three-speed fan switch. For fan cycle operation, the thermostat cycles the fan from the selected speed to off. No control valve is provided in this operation. For fan/valve cycle operation, the thermostat cycles the fan and control valve. The fan runs intermittently unless the speed control switch is in the off position. Valves are not included in the control package price.

Package number	Thermostat description	Fan motor speed switch location
4F0B	Auto changeover, on/off system switch and three-speed fan control	Unit mounted, integral to thermostat
4F0C		Wall mounted, integral to thermostat
4F0D	Manual changeover, heat/off/cool system switch and three-speed fan control	Unit mounted, integral to thermostat
4F0E		Wall mounted, integral to thermostat

**Notes:**

- A means of relieving pump head pressure must be accounted for when two-way valves are used with an automatic thermostat package
- The fan cycles with demand for heating or cooling, but if the system switch is off, the fan is off
- Remote temperature sensors are recommended with all unit mounted thermostats for improved temperature control

### Four pipe control: Valve cycled

Zehnder provides a control system that includes a thermostat, control board and manually operated three-speed fan switch. The thermostat cycles the electric control valve. The fan runs continuously. Valves are not included in the control package price.

Package number	Thermostat description	Fan motor speed switch location
4V0B	Auto changeover, on/off system switch and three-speed fan control	Unit mounted, integral to thermostat
4V0C		Wall mounted, integral to thermostat
4V0D	Manual changeover, heat/off/cool system switch and three-speed fan control	Unit mounted, integral to thermostat
4V0E		Wall mounted, integral to thermostat

**Notes:**

- A means of relieving pump head pressure must be accounted for when two-way valves are used with an automatic thermostat package
- The fan runs continuously, but if the system switch is off, the fan is off
- Remote temperature sensors are recommended with all unit mounted thermostats for improved temperature control

# 24 Volt Control packages

## Electronic on-off valve/thermostat

### Two pipe control: Fan cycled or fan/valve cycled

Zehnder provides a control system that includes a thermostat, control board with 40VA 120V/24V control transformer and relays, manually operated three-speed fan switch and changeover switch (when required). For fan cycle operation, the thermostat cycles the fan from the selected speed to off. No control valve is provided in this operation. For fan/valve cycle operation, the thermostat cycles the fan and control valve. The fan runs intermittently unless the speed control switch is in the off position. Valve is not included in the control package price.

Package number	Thermostat description	Fan motor speed switch location	Changeover switch
2F4J	On/off system switch and 24V three-speed fan control but no changeover	Unit mounted, integral to thermostat	No
2F4K		Wall mounted, integral to thermostat	No
2F4L	Manual changeover, heat/off/cool system switch and 24V three-speed fan control	Unit mounted, integral to thermostat	Yes
2F4M		Wall mounted, integral to thermostat	Yes
2F4N	Auto changeover, on/off system switch and 24V three-speed fan control	Unit mounted, integral to thermostat	Yes
2F4P		Wall mounted, integral to thermostat	Yes

**Notes:**

- A means of relieving pump head pressure must be accounted for when two-way valves are used with an automatic thermostat package
- The fan cycles with demand for heating or cooling, but if the system switch is off, the fan is off
- Remote temperature sensors are recommended with all unit mounted thermostats for improved temperature control
- Available with EC motors

### Four pipe control: Fan cycled or fan/valve cycled

Package number	Thermostat description	Fan motor speed switch location
4F4F	Auto changeover, on/off system switch and 24V three-speed fan control	Unit mounted, integral to thermostat
4F4G		Wall mounted, integral to thermostat
4F4H	Manual changeover, heat/off/cool system switch and 24V three-speed fan control	Unit mounted, integral to thermostat
4F4J		Wall mounted, integral to thermostat

**Notes:**

- A means of relieving pump head pressure must be accounted for when two-way valves are used with an automatic thermostat package
- The fan cycles with demand for heating or cooling, but if the system switch is off, the fan is off
- Remote temperature sensors are recommended with all unit mounted thermostats for improved temperature control
- Available with EC motors

## 24 Volt Control packages

### Electronic modulating valve/thermostat

#### Two pipe with two-way or three-way modulating valves

Zehnder provides a control system that includes a factory supplied and installed 40VA 120V/24V control transformer, manually operated three-speed fan switch and thermostat. Valves and alternate voltage (208, 230 or 277V) power supply options are not included in the control package price.

Package number	Thermostat description	Fan motor speed switch location
2M4A	No changeover, system switch or fan control	Unit mounted, separate from wall mounted thermostat

**Notes:**

- Fan runs continuously depending on position of unit mounted three-speed fan motor switch
- Available with EC motors

#### Four pipe with two-way or three-way modulating valves

Package number	Thermostat description	Fan motor speed switch location
4M4A	Manual changeover, heat/off/cool system switch and three-speed fan control	Unit mounted, integral to thermostat
4M4B		Wall mounted, integral to thermostat
4M4C	Auto changeover, on/off system switch and three-speed fan control	Unit mounted, integral to thermostat
4M4D		Wall mounted, integral to thermostat

**Notes:**

- The fan runs continuously with system switch on, but if the system switch is off, the fan is off
- Remote temperature sensors are recommended with all unit mounted thermostats for improved temperature control
- Available with EC motors

#### Miscellaneous control packages

Package number	Package description	Fan motor speed switch
24VR	Unit mounted 24V relay, ready for field wiring	No
24R3		Yes, shipped loose on ceiling and hideaway units
24VT*	Unit mounted 40VA, 120V/24V transformer with 120V pre-wired and 24V ready for field wiring	No
24T3*		Yes, shipped loose on ceiling and hideaway units
24FC*	Unit mounted fan center includes a 40VA, 120V/24V transformer and one 24V relay with 120V pre-wired and 24V ready for field wiring	No
24F3*		Yes, shipped loose on ceiling and hideaway units
24RP	Unit mounted relay pack includes a 40VA, 120V/24V transformer and three 24V relays with 120V pre-wired and 24V ready for field wiring	No

**Note:**

\* Available with EC motors

## Optional DDC control

Zehnder can provide a control system which includes 40VA 120V/24V transformer, manually operated three-speed fan switch with off position, fan relay and the factory mounting of a customer supplied DDC controller. The following information regarding the DDC controls and valves must be provided to Zehnder by the DDC manufacturer: The size of the controller must be no larger than 8" wide x 5" high x 2" deep. ETL certification may be affected by mounting of controller. Contact factory for information.

### **Cut sheets**

The cut sheets should include descriptions, mounting instructions, piping schematics and dimensional drawings of the controller, sensors, valves and any component to be field furnished for Zehnder to install.

### **Packing slip**

The packing slip should include model numbers and quantity of each component supplied to Zehnder.

### **Schedule**

The schedule including a listing of unit sizes, model numbers, accessories and tagging instructions should be supplied at the time the order is released.

### **Wiring diagrams**

Wiring diagrams should be provided at the time the order is released instructing Zehnder how to wire the DDC controller and all accessories to meet the required control operation.

# Electric heating element construction information



The electric heating elements are located in the Fan Coils in the preheat position. They are located in such a way as to prevent stratification and air bypass for optimum heating efficiency. The electric heating elements are situated between the fan discharge and the cooling coil. This prevents access by room occupants.

## Cabinets

The fan coil unit is fully insulated to ensure safe, low surface temperatures.

## Sub panel

All fuses, fuse holder, contactors, and terminal blocks are premounted and prewired to the sub panel.

## Magnetic contactors

The magnetic contactors are furnished to break all ungrounded conductors. The contactor(s) are located in the electrical compartment, premounted and wired to the sub panel.

## Grounding

Ring type grounding terminals are provided for each power source.

## Field wiring terminals

Field wiring terminals provide a means to easily connect with a single power source. These are suitable for copper wire and are sized in accordance with National Electrical Code.

## Control systems

There are four two pipe cooling with electric heat control systems available. One must be chosen with electric heating unit. Each of these is described in detail on pages 33-36.

1. **Total electric heat**  
Manual cool/heat changeover
2. **Total electric heat**  
Automatic cool/heat changeover
3. **Intermediate season electric heat**  
Automatic changeover
4. **Total electric heat**  
Automatic changeover, field supplied thermostat

## 1: Mounting platform

The electric heating elements are mounted to a galvanized steel plate. This plate is attached to the electrical compartment by several screws. This allows the electric heat to be removed for servicing.

## 2: Heating elements

The electric heating element has been designed to handle total electric heating and intermediate seasonal heating requirements. Electric heating elements are designed for 60 hertz/1 phase - 120, 208, 230 and 277 supply voltages.

All electric heating elements are constructed of nickel chromium resistance wire and have a maximum operating temperature of 1850°F.

## 3: Coil terminals

Coil terminals are constructed of nickel plated steel with ceramic terminal insulators and bracket bushings.

## 4: Automatic thermal reset

The automatic thermal reset is used as the primary safety protection. It is an automatic reset thermally operated safety device. If the bimetal disc senses an excessive temperature (factory preset) at any point, the electric element is de-energized. The break temperature is non-adjustable. The switch automatically re-energizes the electric heating element after the temperature falls to an acceptable range.

## 5: Fusible link

The fusible link is used as a secondary safety protection device. These cutoffs are manually replaceable with a non-conductive thermal pellet holding spring loaded contacts closed. When a preset temperature is exceeded the pellet will melt, allowing the contacts to open and break the circuit. These cutoffs are installed in the power lines of each electric heating element and open in case of failure of the primary safety device.

## 6: Insulation

High density closed cell insulation prevents heat from being transmitted to the fan coil unit casing.

# Electric heat control packages

Zehnder provides a control system that includes a thermostat with changeover control, manually operated three-speed fan switch, contactor(s), fuse holder with fuses, field wiring terminals, and an electrical block-off plate. The contractor(s), fuse holder with fuses and field wiring terminals are all pre-mounted and pre-wired to a sub panel installed in the end pocket of the fan coil.

## Chilled water cooling: Single stage electric heating

### Manual changeover

**Cooling cycle:** The manual cool-heat switch is in the cool position. When the space temperature rises to the thermostat set point, the thermostat opens the electric cooling water valve until the space temperature is satisfied. (The cooling water valve is not included.)

**Heating cycle:** The manual cool-heat switch is in the Heat position. When the space temperature falls to the thermostat set point, the thermostat energizes the electric heating element(s) until the space temperature is satisfied.

**Fan operation:** A manual fan switch with high, medium and low speeds is integral to the thermostat and controls the fan speed and the thermostat. The fan motor(s) and thermostat are energized in any fan speed position and run continuously. The switch in the “off” position de-energizes the fan and thermostat, closing the electric cooling water valve and breaking the electric heating circuit.

**Thermostat:** All unit mounted thermostats are factory supplied and prewired. All wall mounted thermostats are supplied by the factory and are field wired.

Package number	Component voltage			Fan motor speed switch location	Changeover switch location
	Power supply and electric heating element	Thermostatic valve controls	Motor		
<b>Wall mounted</b>					
EWMA	120	120	120	Integral to thermostat	Wall mounted on thermostat
EWMD*	120	24	120		
EWME*	208		208		
EWMF*	277		277		
EWMH*	230		230		

**Notes:**

- Electric heat control packages include items shown above. The heating elements, high temperature linear limit switch, and fusible link(s) are not included. See electric heating elements pricing.
- \* Available with EC motors

# Electric heat control packages

Zehnder provides a control system that includes a thermostat, manually operated three-speed fan switch, contactor(s), fuse holder with fuses, field wiring terminals, and an electrical block-off plate. The contractor(s), fuse holder with fuses and field wiring terminals are all pre-mounted and pre-wired to a sub panel installed in the end pocket of the fan coil.

## Chilled water cooling: Single stage electric heating

### Automatic changeover on space temperature

**Cooling cycle:** When the space temperature rises to thermostat set point, the thermostat opens the electric chilled water valve until the space temperature is satisfied. The thermostat includes a center dead band which allows the cooling water valve to close and prevent energizing of the electric heating elements. (The cooling water valve is not included.)

**Heating cycle:** When the space temperature falls to the thermostat set point, the thermostat energizes the electric heating element until the space temperature is satisfied. The thermostat includes a center dead band which allows the electric heating element to de-energize and prevents the cooling water valve from opening.

**Fan Operation:** A manual fan switch with high, medium and low speeds is integral to the thermostat and controls the fan speed and the thermostat. The fan motor(s) and thermostat are energized in any fan speed position and run continuously. The switch in the “off” position de-energizes the fan and thermostat, closing the electric cooling water valve and breaking the electric heating circuit.

**Thermostat:** All unit mounted thermostats are factory supplied and prewired. All wall mounted thermostats are supplied by the factory and is field wired.

Package number	Component voltage			Fan motor speed switch location	Changeover switch location
	Power supply and electric heating element	Thermostatic valve controls	Motor		
<b>Wall mounted</b>					
EWAA	120	120	120	Integral to thermostat	None, uses thermostat dead band
EWAD*	120	24	120		
EWAE*	208		208		
EWAF*	277		277		
EWAP*	230		230		

**Notes:**

- Electric heat control packages include items shown above. The heating elements, high temperature linear limit switch, and fusible link(s) are not included. See electric heating elements pricing.
- \* Available with EC motors

# Electric heat control packages

Zehnder provides a control system that includes a thermostat, manually operated three-speed fan switch, changeover switches, contactor(s), fuse holder with fuses, field wiring terminals, and an electrical block-off plate. The contractor(s), fuse holder with fuses and field wiring terminals are all pre-mounted and pre-wired to a sub panel installed in the end pocket of the fan coil.

## Chilled water cooling: Hot water heating, intermediate season electric heating

### Automatic changeover on supply water temperature

**Cooling cycle:** When the space temperature rises to thermostat set point, the thermostat opens the electric cooling water valve until the space temperature is satisfied. The thermostat includes a center dead band which allows the cooling water valve to close and prevent energizing of the electric heating elements. (The cooling water valve is not included.) When the space temperature falls to the thermostat set point, the thermostat energizes the electric heating element until the space temperature is satisfied. The thermostat includes a center dead band to allow both the cooling water valve and the electric heating element to be de-energized when the space temperature is satisfied. A changeover switch is provided on the cold water supply piping to automatically maintain the cooling cycle when chilled water is present.

**Heating cycle:** When the space temperature falls to the thermostat set point, the thermostat energizes the electric heating element until the space temperature is satisfied. The electric heating element is locked out. A changeover switch is provided on the hot water supply piping to automatically maintain the heating cycle when hot water is present.

**Fan operation:** A manual fan switch with high, medium and low speeds is integral to the thermostat and controls the fan speed and the thermostat. The fan motor(s) and thermostat are energized in any fan speed position and run continuously. The switch in the “off” position de-energizes the fan and thermostat, closing the electric water valve and breaking the electric heating circuit.

**Thermostat:** All unit mounted thermostats are factory supplied and prewired. All wall mounted thermostats are supplied by the factory and is field wired.

Package number	Component voltage			Fan motor speed switch location	Changeover switch location
	Power supply and electric heating element	Thermostatic valve controls	Motor		
<b>Wall mounted</b>					
EWAG	120	120	120	Integral to thermostat	Aquastat(s) installed on supply line
EWAK*	120	24	120		
EWAL*	208		208		
EWAM*	277		277		
EWAR*	230		230		

**Notes:**

- Electric heat control packages include items shown above. The heating elements, high temperature linear limit switch, and fusible link(s) are not included. See electric heating elements pricing.
- \* Available with EC motors

## Electric heat control packages

Zehnder provides a control system that includes contactor(s), fuse holder with fuses, field wiring terminals, and an electrical block-off plate. The contractor(s), fuse holder with fuses and field wiring terminals are all pre-mounted and pre-wired to a sub panel installed in the end pocket of the fan coil.

### Chilled water cooling: Single stage electric heating

#### Field furnished thermostat

**Cooling cycle:** On a call for cooling the electric cooling water valve will open. The fan operates continuously. The cooling water valve is not included.

**Heating cycle:** On a call for heating the electric heating elements are energized. The fan operates continuously.

**Fan operation:** A manual fan switch with high, medium and low speeds is integral to the thermostat and controls the fan speed and the thermostat. The fan motor(s) and thermostat are energized in any fan speed position and run continuously. The switch in the “off” position de-energizes the fan and thermostat, closing the electric cooling water valve and breaking the electric heating circuit.

**Thermostat:** Field supplied for wall mounting.

Package number	Component voltage			Fan motor speed switch location	Changeover switch location
	Power supply and electric heating element	Thermostatic valve controls	Motor		
ECSA	120	120	120	Field supplied	Field supplied and mounted
ECSB	208	24	208		
ECSC	277		277		
ECSD	230		230		

**Notes:**

- Electric heat control packages include items shown above. The heating elements, high temperature linear limit switch, and fusible link(s) are not included. See electric heating elements pricing.

# Table D: Electric heat capacities

Unit size	120V/60Hz/1Ph					208V/60Hz/1Ph					230V/60Hz/1Ph					277V/60Hz/1Ph				
	No. of elements	kW	MBH	Temp rise	Amps	No. of elements	kW	MBH	Temp rise	Amps	No. of elements	kW	MBH	Temp rise	Amps	No. of elements	kW	MBH	Temp rise	Amps
02	1	1.0	3.4	13.6	8.3	1	1.1	3.8	15.2	5.3	1	1.0	3.4	13.6	4.3	1	1.4	4.8	19.2	5.1
	1	1.4	4.8	19.2	11.7	1	1.4	4.8	19.2	6.7	1	1.4	4.8	19.2	6.1	1	1.9	6.5	26.0	6.9
	1	1.9	6.5	26.0	15.8	1	2.2	7.5	30.1	10.6	1	1.9	6.5	26.0	8.3	1	3.1	10.6	42.5	11.2
	1	3.0	10.2	40.9	25.0	1	2.9	9.9	39.7	13.9	1	3.0	10.2	40.9	13.0	-	-	-	-	-
03	1	1.0	3.4	10.6	8.3	1	1.1	3.8	11.9	5.3	1	1.0	3.4	10.6	4.3	1	1.4	4.8	15.0	5.1
	1	1.4	4.8	15.0	11.7	1	1.4	4.8	15.0	6.7	1	1.4	4.8	15.0	6.1	1	1.9	6.5	20.3	6.9
	1	1.9	6.5	20.3	15.8	1	2.2	7.5	23.4	10.6	1	1.9	6.5	20.3	8.3	1	3.1	10.6	33.1	11.2
	1	3.0	10.2	31.9	25.0	1	2.9	9.9	30.9	13.9	1	3.0	10.2	31.9	13.0	-	-	-	-	-
04	1	1.0	3.4	9.0	8.3	1	2.2	7.5	19.7	10.6	1	1.9	6.5	17.1	8.3	1	3.1	10.6	27.9	11.2
	1	1.4	4.8	12.6	11.7	1	2.9	9.9	26.1	13.9	1	3.0	10.2	26.9	13.0	2	3.8	13.0	34.2	13.7
	1	1.9	6.5	17.1	15.8	2	4.4	15.0	39.5	21.2	2	3.8	13.0	34.2	16.5	2	4.5	15.4	40.6	16.2
	1	3.0	10.2	26.9	25.0	2	5.1	17.4	45.8	24.5	2	4.9	16.7	44.0	21.3	2	5.0	17.1	45.0	18.1
06	-	-	-	-	-	2	5.8	19.8	52.1	27.9	2	6.0	20.5	54.0	26.1	2	6.2	21.2	55.8	22.4
	1	1.0	3.4	5.7	8.3	1	2.2	7.5	12.6	10.6	1	1.9	6.5	10.9	8.3	1	3.1	10.6	17.8	11.2
	1	1.4	4.8	8.0	11.7	1	2.9	9.9	16.6	13.9	1	3.0	10.2	17.1	13.0	2	3.8	13.0	21.8	13.7
	1	1.9	6.5	10.9	15.8	2	4.4	15.0	25.1	21.2	2	3.8	13.0	21.8	16.5	2	4.5	15.4	25.8	16.2
	1	3.0	10.2	17.1	25.0	2	5.1	17.4	29.2	24.5	2	4.9	16.7	28.0	21.3	2	5.0	17.1	28.7	18.1
08	-	-	-	-	-	2	5.8	19.8	33.2	27.9	2	6.0	20.5	34.4	26.1	2	6.2	21.2	35.5	22.4
	1	1.0	3.4	4.4	8.3	1	2.9	9.9	12.7	13.9	1	3.0	10.2	13.1	13.0	2	4.5	15.4	19.7	16.2
	1	1.4	4.8	6.1	11.7	2	4.4	15.0	19.2	21.2	2	3.8	13.0	16.6	16.5	2	5.0	17.1	21.9	18.1
	1	1.9	6.5	8.3	15.8	2	5.1	17.4	22.3	24.5	2	4.9	16.7	21.4	21.3	2	6.2	21.2	27.1	22.4
	1	3.0	10.2	13.1	25.0	2	5.8	19.8	25.3	27.9	2	6.0	20.5	26.2	26.1	3	8.1	27.6	35.3	29.2
10	-	-	-	-	-	3	6.6	22.5	28.8	31.7	-	-	-	-	-	3	9.3	31.7	40.6	33.6
	1	1.0	3.4	3.5	8.3	2	4.4	15.0	15.5	21.2	2	3.8	13.0	13.5	16.5	2	4.5	15.4	15.9	16.2
	1	1.4	4.8	5.0	11.7	2	5.8	19.8	20.5	27.9	2	4.9	16.7	17.3	21.3	2	5.0	17.1	17.7	18.1
	1	1.9	6.5	6.7	15.8	3	6.6	22.5	23.3	31.7	2	6.0	20.5	21.2	26.1	2	6.2	21.2	22.0	22.4
	1	3.0	10.2	10.6	25.0	-	-	-	-	-	3	7.9	27.0	28.0	34.3	3	8.1	27.6	28.6	29.2
12	2	3.8	13.0	13.5	31.7	-	-	-	-	-	3	9.0	30.7	31.8	39.1	3	9.3	31.7	32.8	33.6
	1	1.0	3.4	2.9	8.3	2	4.4	15.0	12.9	21.2	2	3.8	13.0	11.1	16.5	2	4.5	15.4	13.2	16.2
	1	1.4	4.8	4.1	11.7	2	5.8	19.8	17.0	27.9	2	4.9	16.7	14.3	21.3	2	5.0	17.1	14.7	18.1
	1	1.9	6.5	5.6	15.8	3	6.6	22.5	19.3	31.7	2	6.0	20.5	17.6	26.1	2	6.2	21.2	18.2	22.4
	1	3.0	10.2	8.7	25.0	-	-	-	-	-	3	7.9	27.0	23.1	34.3	3	8.1	27.6	23.7	29.2
2	3.8	13.0	11.1	31.7	-	-	-	-	-	3	9.0	30.7	26.3	39.1	3	9.3	31.7	27.2	33.6	

\*Temp Rise uses CFM from high speed

## Electric heat element selection

### Example selection at free delivery

**Example** Unit size 06, Model FCHP (550 CFM) and a sensible heating loss of 16,500 BTU/hr.

Determine the required heating element kW using 230V incoming voltage.

**Step 1** Determine the room sensible heat loss, in BTU/hr. In this example, the sensible heat loss is 16,500 BTU/hr.

**Step 2** Determine the air temperature rise for the unit size selected. Generally, the unit is selected based on cooling requirements. The CFM for each unit size is listed in Table A1 on page 10. Use the formula below to determine the air temperature rise.

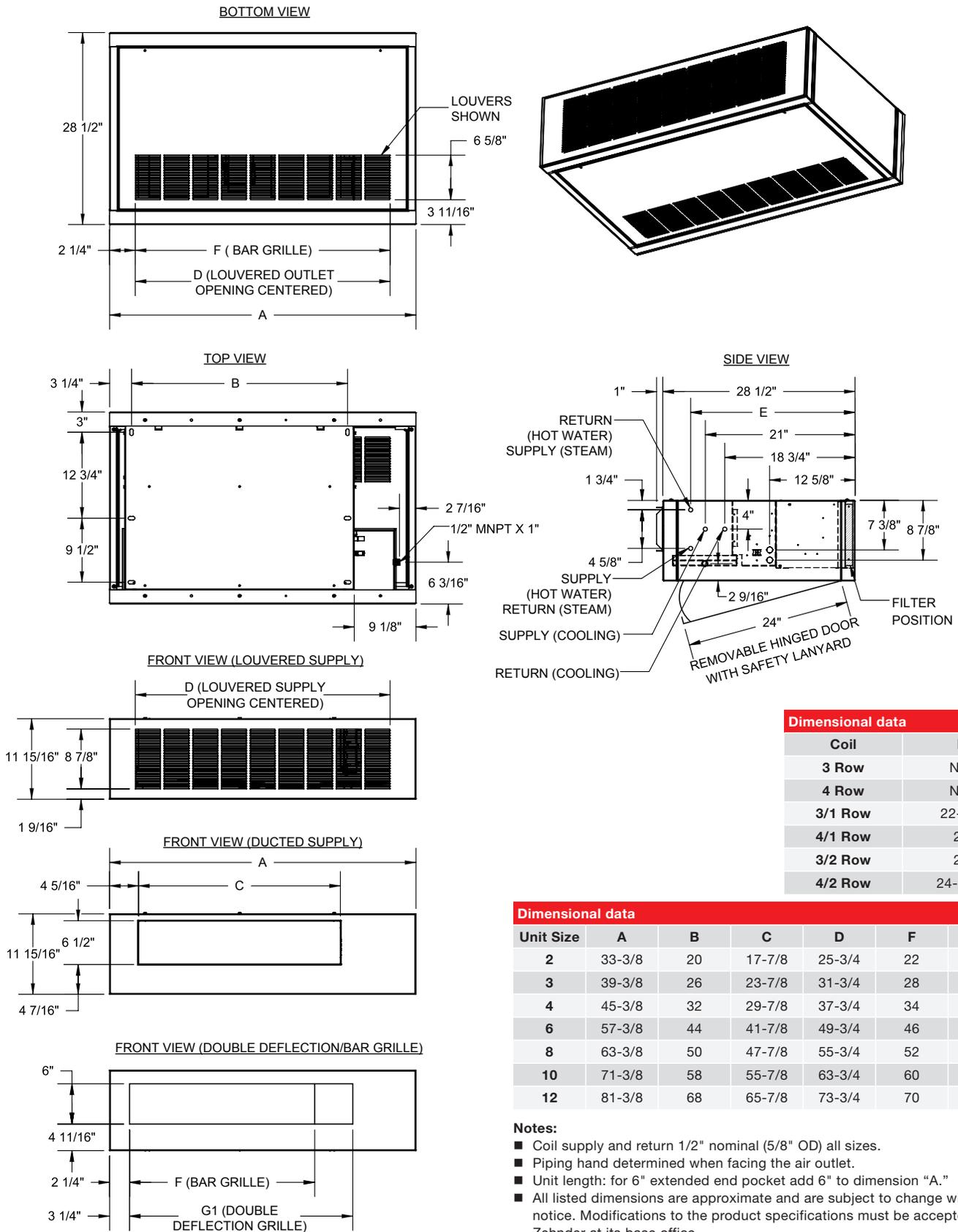
$$\Delta T = \frac{\text{BTU/hr}}{\text{CFM} \times 1.085} = \frac{16,500}{550 \times 1.085} = 27.6^\circ\text{F required}$$

**Step 3** Determine kW and number of heating elements based on air temperature rise required from Electric Heat Capacities table.

**Answer** Based on 27.6°F temperature rise required, use a 4.9 kW heater element with 230V incoming voltage.

# Dimensions and data

Model FC



Dimensional data	
Coil	E
3 Row	N/A
4 Row	N/A
3/1 Row	22-1/8
4/1 Row	23
3/2 Row	23
4/2 Row	24-3/16

Dimensional data						
Unit Size	A	B	C	D	F	G
2	33-3/8	20	17-7/8	25-3/4	22	20
3	39-3/8	26	23-7/8	31-3/4	28	26
4	45-3/8	32	29-7/8	37-3/4	34	30
6	57-3/8	44	41-7/8	49-3/4	46	42
8	63-3/8	50	47-7/8	55-3/4	52	48
10	71-3/8	58	55-7/8	63-3/4	60	56
12	81-3/8	68	65-7/8	73-3/4	70	66

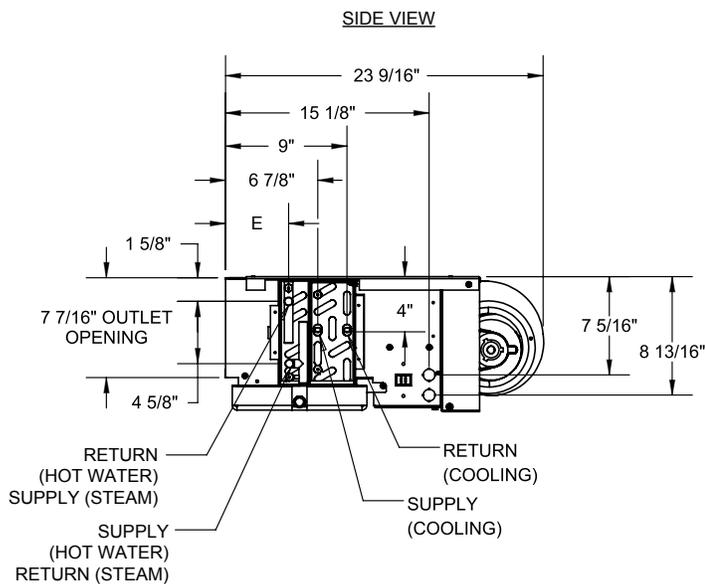
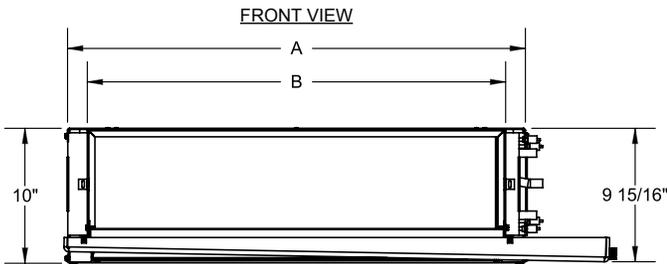
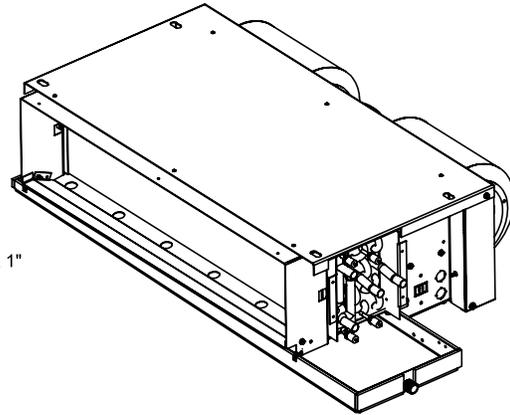
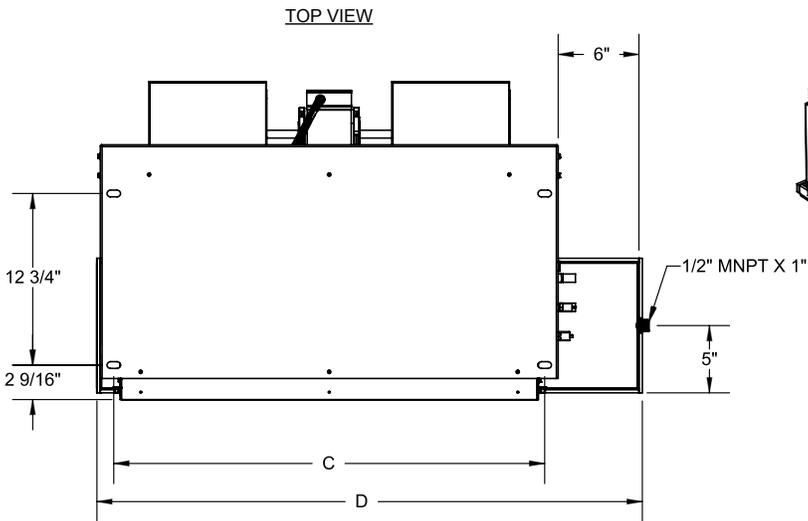
**Notes:**

- Coil supply and return 1/2" nominal (5/8" OD) all sizes.
- Piping hand determined when facing the air outlet.
- Unit length: for 6" extended end pocket add 6" to dimension "A."
- All listed dimensions are approximate and are subject to change without notice. Modifications to the product specifications must be accepted by Zehnder at its base office.



# Dimensions and data

Model FCH



Dimensional data	
Coil	E
3 Row	N/A
4 Row	N/A
3/1 Row	5-3/4
4/1 Row	5-3/4
3/2 Row	4-3/4
4/2 Row	3-7/8

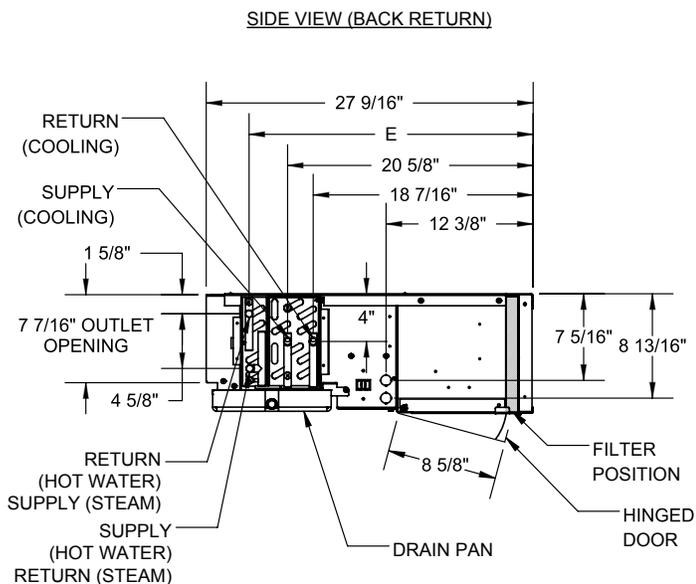
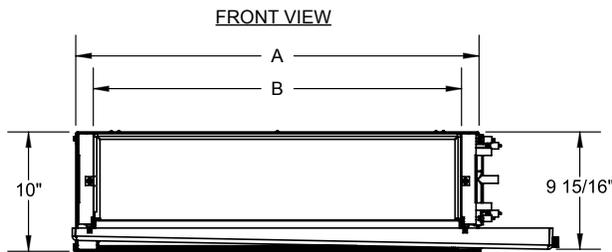
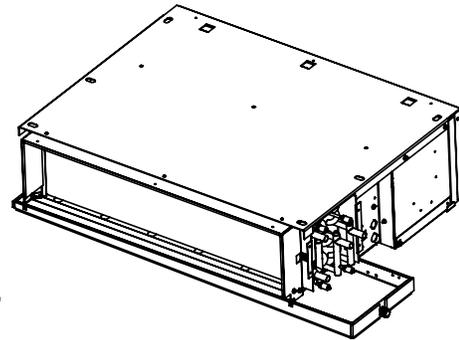
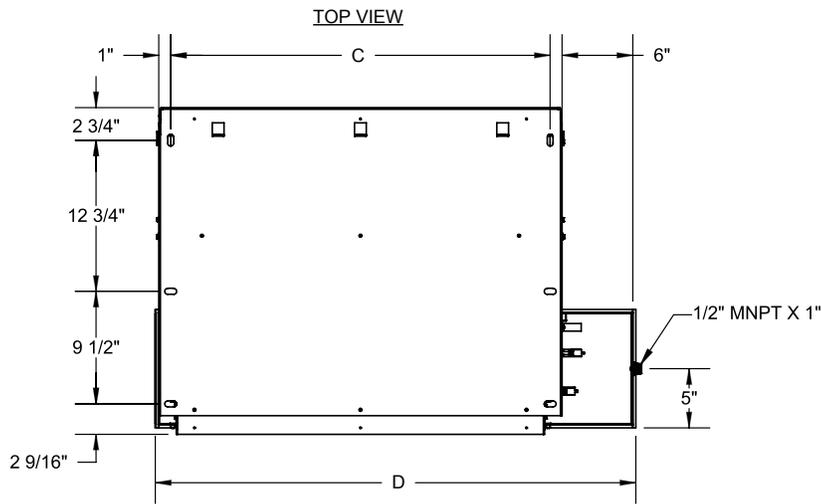
Dimensional data				
Unit Size	A	B	C	D
2	22	19	20	28-1/2
3	28	25	26	34-1/2
4	34	31	32	40-1/2
6	46	43	44	52-1/2
8	52	49	50	58-1/2
10	60	57	58	66-1/2
12	70	67	68	76-1/2

**Notes:**

- Coil supply and return 1/2" nominal (5/8" OD) all sizes.
- Piping hand determined when facing the air outlet.
- All listed dimensions are approximate and are subject to change without notice. Modifications to the product specifications must be accepted by Zehnder at its base office.

# Dimensions and data

## Model FCHP



Dimensional data	
Coil	E
3 Row	N/A
4 Row	N/A
3/1 Row	21-13/16
4/1 Row	22-3/4
3/2 Row	22-3/4
4/2 Row	23-7/8

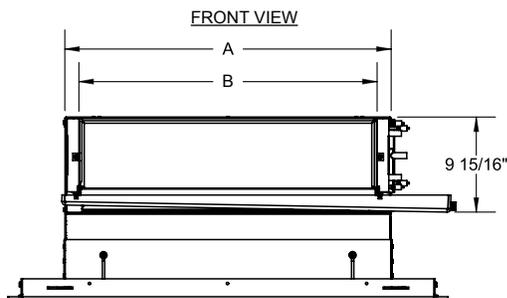
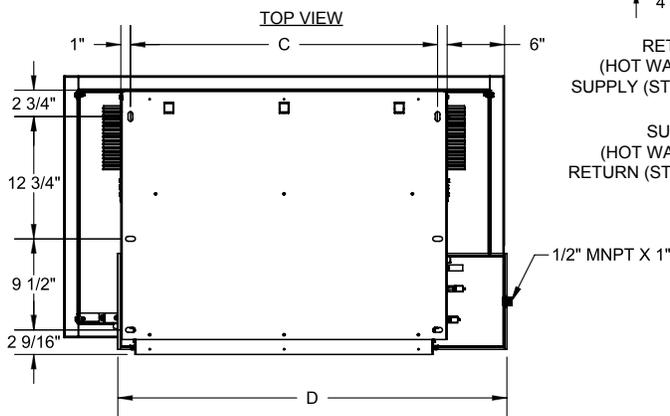
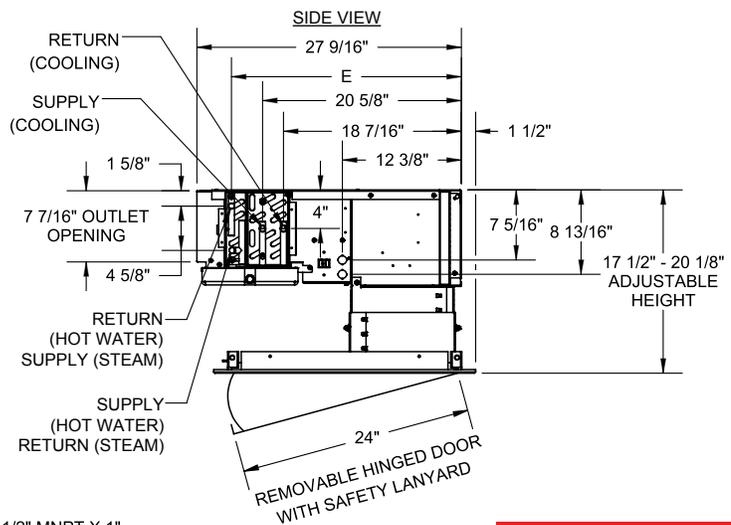
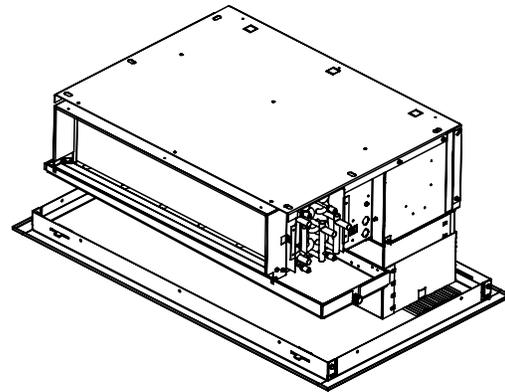
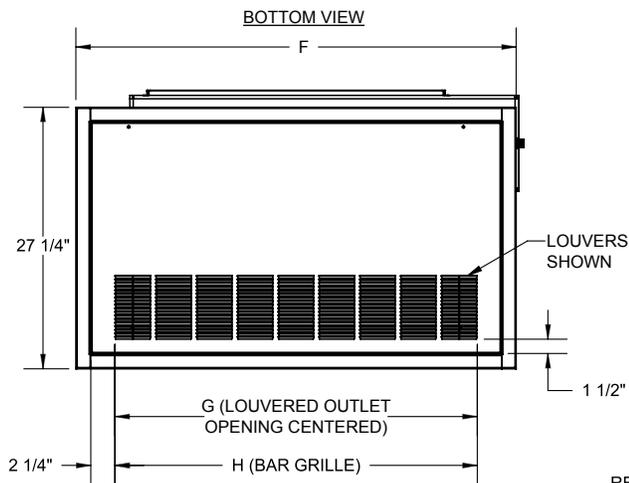
Dimensional data				
Unit Size	A	B	C	D
2	22	19	20	28-1/2
3	28	25	26	34-1/2
4	34	31	32	40-1/2
6	46	43	44	52-1/2
8	52	49	50	58-1/2
10	60	57	58	66-1/2
12	70	67	68	76-1/2

### Notes:

- Coil supply and return 1/2" nominal (5/8" OD) all sizes.
- Piping hand determined when facing the air outlet.
- Back return shown. Bottom return also available with filter positioned horizontally.
- All listed dimensions are approximate and are subject to change without notice. Modifications to the product specifications must be accepted by Zehnder at its base office.

# Dimensions and data

Model FTHP



Dimensional data	
Coil	E
3 Row	N/A
4 Row	N/A
3/1 Row	21-13/16
4/1 Row	22-3/4
3/2 Row	22-3/4
4/2 Row	23-7/8

Dimensional data							
Unit Size	A	B	C	D	F	G	H
2	22	19	20	28-1/2	33-7/8	25-3/4	22
3	28	25	26	34-1/2	39-7/8	31-3/4	28
4	34	31	32	40-1/2	45-7/8	37-3/4	34
6	46	43	44	52-1/2	57-7/8	49-3/4	46
8	52	49	50	58-1/2	63-7/8	55-3/4	52
10	60	57	58	66-1/2	71-7/8	63-3/4	60
12	70	67	68	76-1/2	81-7/8	73-3/4	70

**Notes:**

- Coil supply and return 1/2" nominal (5/8" OD) all sizes.
- Piping hand determined when facing the air outlet.
- Filter removal from bottom through access panel.
- All listed dimensions are approximate and are subject to change without notice. Modifications to the product specifications must be accepted by Zehnder at its base office.

# Mechanical specifications

## General

Furnish and install Room Fan Coil Units where indicated on the plans and in the specifications, with required mounting components and accessories. All units shall be capable of meeting or exceeding the scheduled capacities for cooling, heating and air delivery. Units shall be ETL certified for the United States and Canada in compliance with UL/ANSI Standard 1995 and CSA C22.2 No. 236-95, and be certified as complying with AHRI Standard 440.

## Construction

All unit chassis shall be fabricated of 18-gauge galvanized steel panels. Coil and plenum sections shall be insulated with elastomeric closed cell foam insulation. Insulation shall conform to UL 181 for erosion and NFPA 90A for fire, smoke and melting, and comply with a 25/50 Flame Spread and Smoke Developed Index per ASTM E-84 or UL 723. Additionally, insulation shall comply with Antimicrobial Performance Rating of 0, no observed growth, per ASTM G-21. Polyethylene or fiberglass insulation is not acceptable.

All exposed units shall have exterior front and end panels fabricated of not less than 16-gauge cold rolled steel [14-gauge steel]. The hinged front panel shall be attached with hidden tamper-proof allen-head quarter turn fasteners to allow for easy removal and access for service, including safety chain(s). End pocket shall be no less than 8" [extended end pocket shall be no less than 14"] in width, located on piping side of the unit.

All exposed units shall include a recessed stamped louver discharge grille. Louver discharge grille shall be reverse stamped leaving a smooth exterior surface. [Provide an architectural aluminum double deflection discharge grille with a

powder coated paint finish to match cabinet color. Liquid coat paint shall not be acceptable.] [Provide a steel bar grille with an oxford brown powder coated paint finish. Liquid coat paint shall not be acceptable.]

Recessed units shall be provided with a ceiling seal assembly. The assembly shall provide a finished appearance to the ceiling.

All ducted units shall have a minimum 1" duct collar on the return and/or discharge. The cooling coil face shall be a minimum of 5" from outlet to ensure all condensate is captured during cooling per ASHRAE 62.1-2013.

## Painted finish

All painted cabinet exterior panels shall be finished with a standard ivory epoxy powder coat paint. Optional colors can be selected from the Zehnder Color Chart. Liquid coat paint shall not be acceptable. Custom colors are also available with the submission of a color chip for color match.

## Sound

Units shall have published sound power level data tested in accordance with AHRI Standard 350 for non-ducted units or AHRI Standard 260 for ducted units.

## Power

Units shall not exceed scheduled power consumption.

## Fan and motor

Unit fan shall be dynamically balanced, forward curved, DWDI centrifugal type constructed of galvanized steel for corrosion resistance. Motors shall be permanent split-capacitor [electronically commutated high-efficiency, programmable brushless DC], totally enclosed, tap wound for 3-speed, permanently lubricated sleeve bearing, type with automatic reset integral thermal overload protection. High static motors are available for ducted applications. Shaded pole motors are not acceptable. Single speed motors are not acceptable. Prior to shipping, all motors shall be assembled, factory tested and installed in the unit.

The fan/motor assembly shall be removable and serviceable through the bottom panel. Each fan/motor assembly shall be fastened by no more than 2 screws. The motors shall have quick connects to allow service and removal without the need for tools.

Multiple fan decks shall be supplied on units requiring more than one motor. Fan decks with 3 or more blowers and 2 or more motors will not be accepted.

## Drain pan

Primary condensate drain pans shall be single wall, 18-gauge epoxy powder coat painted, galvanized steel for corrosion resistance and extend under the entire coil section. Drain pans shall be of one piece construction, be positively sloped for condensate removal and be removable without the use of any tools. Drain pan access that requires removal of coils is not acceptable.

# Mechanical specifications

The primary drain pan shall be externally insulated with elastomeric closed cell foam insulation. The insulation shall carry no more than a 25/50 Flame Spread and Smoke Developed Rating per ASTM E-84 and UL 723 and an Antimicrobial Performance Rating of 0, no observed growth, per ASTM G-21. Internally sprayed insulation will not be acceptable.

- Option: Provide a primary drain pan constructed entirely of 20-gauge stainless steel for superior corrosion resistance.
- Option: Provide a condensate level switch to prevent unit from operating if the drain becomes blocked.
- Option: Provide a condensate pump with GFCI to continuously remove up to 5.0 gph.

## Coils

All cooling and heating coils shall optimize rows to meet the specified capacity. Coils shall have 1/2" OD seamless copper tubes and shall be mechanically expanded to provide an efficient, permanent bond between the tube and aluminum fin. Minimum copper tube thickness on water coils shall be 0.016", while steam coils shall be 0.025".

Fins shall have high efficiency aluminum surface optimized for heat transfer, air pressure drop and carryover. Minimum fin thickness shall be 0.0045". Lanced fins shall not be acceptable.

All coils shall be tested at 350 PSIG air pressure under water, and rated for a maximum 300 PSIG working pressure at 200°F. Coils shall be circuited for counter flow to maximize unit efficiency.

All water coils shall be designed to connect with 1/2" nominal pipe connections.

Coil casing shall be fabricated from galvanized steel [stainless steel].

Heating coils shall be furnished in the re-heat position.

Steam coils shall be standard single tube steam type suitable for temperatures above 35°F and 15 PSIG steam pressure.

All water coils shall be provided with a manual air vent [automatic air vent] fitting to allow for coil venting.

## Filters

All units shall be furnished with a minimum 1" nominal glass fiber throwaway [1" pleated MERV 8] [1" cleanable aluminum mesh] filter. Filters shall be tight fitting to prevent air bypass. Filters shall be easily removable from the return air opening without the need for tools.

## Electrical

Units shall be furnished with single point power connection. Provide an electrical control board for motor and other electrical terminations using spade connectors.

- Option: Provide 24 VAC fan relays with 40 VA transformer as integral part of control board. Fan relays designed to operate in conjunction with factory provided [field provided] 24 V thermostat. Fan relays designed to accept 120, 208, 220, 230, or 277 V input power. Relays shall operate with generic non-digital [digital, non-programmable] [digital, programmable] thermostat designed to control up to three independently energized fan speeds.
- Option: Provide a service disconnect switch to isolate power from the unit during maintenance.
- Option: Provide a manual motor starter to provide overload protection for the motor.

Electrical sub panel to be supplied with quick connects to allow for field removal and servicing. Primary internal wiring and testing shall be conducted at the factory. All units shall be shipped with wiring diagrams.

# Mechanical specifications

## Electric heat

Furnish an electric resistance heating assembly as an integral part of the fan coil unit, with the heating capacity, voltage and kilowatts scheduled.

The heater and unit assembly shall be listed for zero clearance and meet all NEC requirements, and be ETL listed with the unit as an assembly in compliance with UL/ANSI Standard 1995.

All heating elements shall be constructed of nickel chromium resistance wire with a maximum operating temperature of 1850°F. Each electric heating element shall be mounted to a galvanized steel plate. The plate shall be attached to the electrical compartment for easy removal. Electric heating elements shall be located in the preheat position and shall be non-accessible to room occupants. All internal wiring shall be rated for 105°C minimum.

All heaters shall include over temperature protection consisting of an automatic reset primary thermal limit safety switch and back-up secondary thermal limit safety device. All heaters shall be single stage.

- Option: Separate fusing is provided for each element for increased protection.

## Piping packages

Provide a standard factory assembled valve piping package to consist of a 2 or 3-way, on/off, motorized electric control valve and two ball isolation valves.

Control valves shall be piped normally closed to the coil. Control valves shall be wired to control board or unit mounted thermostat, when provided, through quick connects to allow service and replacement of valves.

Maximum entering water temperature on the control valve shall be 200°F, and maximum operating pressure shall be 300 PSIG.

- Option: Unions shall be provided to allow easy removal of piping package from unit without the need for brazing or cutting pipe. Half of union to be factory installed.
- Option: Provide 3-wire floating point modulating control valve (fail-in-place), in lieu of standard 2-position control valve with factory assembled valve piping package.
- Option: Provide proportional 0-10 VDC modulating control valve, in lieu of standard 2-position control valve with factory assembled valve piping package.
- Option: Provide high pressure close-off actuator for 2 or 3-way on/off control valve. Maximum close-off pressure is 75 PSIG.
- Option: Provide an adjustable flow control device for each piping package.
- Option: Provide a fixed flow control device for each piping package.
- Option: Provide pressure-temperature ports (P/T) for each piping package to allow measurement across the coil.

Piping packages shall be completely factory assembled including interconnecting pipe, factory tested for leaks and shipped loose for field installation.

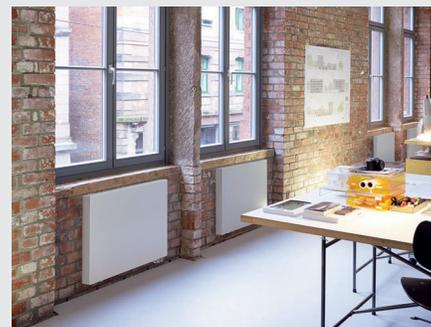
- Option: Piping package will be shipped factory installed.

Units shall be manufactured in accordance with ISO 9001:2015 standards established and maintained by Zehnder.

The brand with the best indoor climate solutions.

## FOUR COMPLEMENTARY PRODUCT LINES

The broad and clearly structured portfolio from the Zehnder Group is split into four product lines. Consequently, we can provide the right product, the perfect system and the matching service for all types of projects - from new builds to renovations, single- or multiple- family homes, as well as commercial projects. This variety ensures that our wealth of experience is continuously expanding, providing tangible added value to our customers on a daily basis.



### Decorative radiators

Our individual decorative radiators for living and bathrooms not only make a home warmer but also more attractive. Created by renowned designers, they impress with excellent functionality.

## NUMBERS THAT SPEAK FOR THEMSELVES

MANUFACTURER OF THE

**1<sup>ST</sup>**

STEEL RADIATOR IN THE WORLD

**121**

YEARS OF INNOVATIVE TRADITION

AROUND

**3,000**

EMPLOYEES

FOUNDED IN

**1895**

REPRESENTED IN COUNTRIES

**19**

**1,800,000**

TONNES OF CO<sub>2</sub> SAVED SINCE 2005

## WARRANTY

Zehnder guarantees its products to be free from defects in material and workmanship for a period of two years from date of shipment from our factory.

Should there be any defects in the good(s), the purchaser should promptly notify Zehnder. Upon receipt of written consent from Zehnder, the purchaser shall return the defective good(s) to the factory for inspection with freight prepaid. If inspection shows the goods to be defective, Zehnder will at its discretion repair or replace the said item(s).

Defects arising from damage due to shipment, improper installation, negligence or misuse by others are not covered by this warranty.



### Comfortable indoor ventilation

Our comfortable indoor ventilation is energy-efficient and provides a healthy indoor climate. It promotes the well-being of the occupants and increases the value of the property.



### Heating and cooling ceiling systems

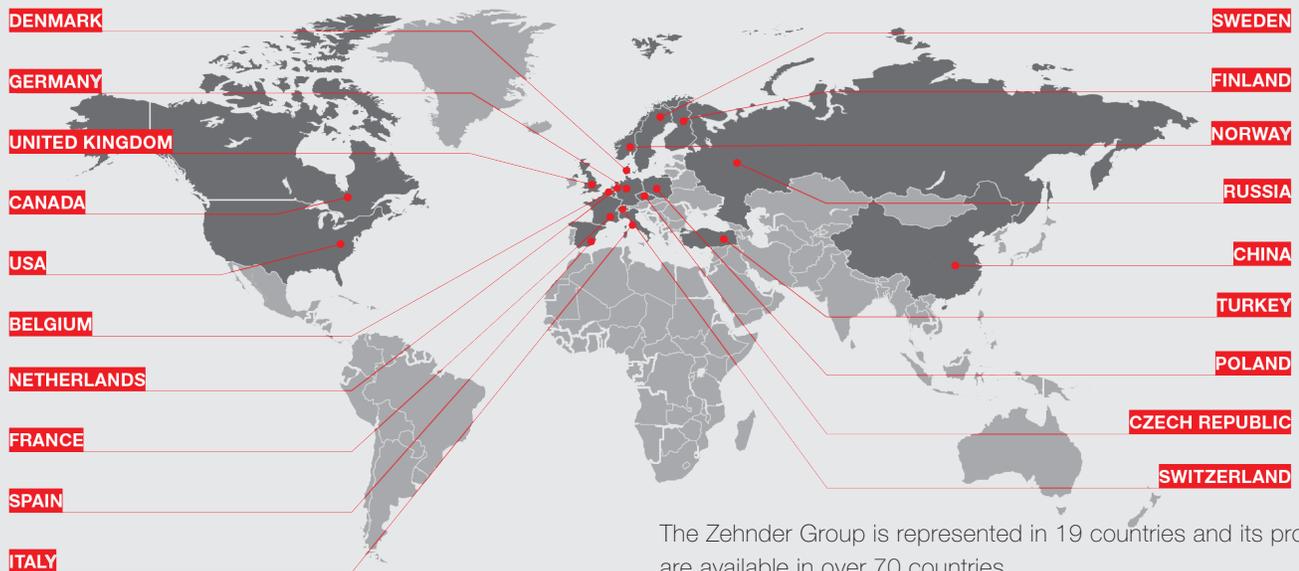
Zehnder heating and cooling ceiling systems are convenient and energy-efficient for heating and cooling. They are perfectly attuned to the relevant environment.



### Clean air solutions

Clean air solutions from Zehnder reduce the level of dust in the air, create a healthier working climate and reduce the amount of cleaning required.

## BEST CLIMATE IN THE WORLD



This warranty is extended only to the original purchaser from Zehnder.

**IMPORTANT: Approved submittal documentation, specific to each project, supersedes the general guidelines contained within this document.**

**zehnder**

The Zehnder brand offers excellent indoor climate solutions within the sectors of decorative radiators, clean air solutions, comfortable indoor ventilation and heating and cooling ceiling systems.

