

Quiet, efficient, high rise comfort

Temspec Leaf . . . the highest efficiency V-stack fan coil available

"PUTTING GREEN INTO HIGH RISE BUILDINGS"

Vertical Stacked Fancoils

1 through 3 Ton Capacity

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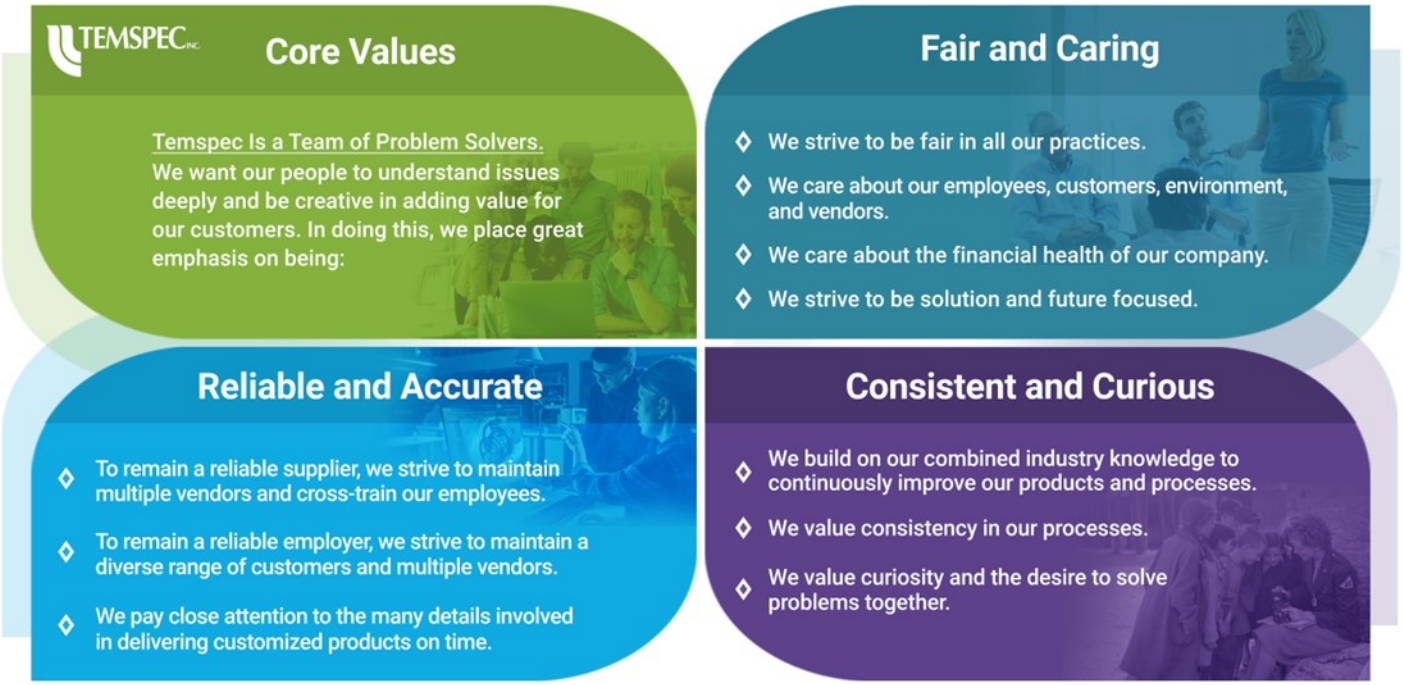
Need a special design for your project?

Temspec understands that retrofit projects often come with a unique set of challenges and *our applications support team takes great pride in working with consultants to design custom solutions*

Please contact Temspec's application support team to learn more about our custom designs

Our Purpose: *make comfortable living environments, sustainably*

"Energy efficiency is the first renewable/green energy"



Our Niche: *We build great relationships manufacturing customized reliable, efficient HVAC solutions*

Temspec Leaf Fan Coil Units

In a time when environmentally responsibility has been never been greater, it is our duty as an HVAC equipment manufacturer to design equipment with the lowest environmental impact. At Temspec, we design equipment with the lowest embodied and operational carbon we can. The result is, the Temspec Leaf unit offers the highest efficiency of any vertical stacked fan coil on todays market.

Our design criteria was quite simple:

1/ smallest footprint
2/ highest fan efficiency
3/ quietest operation
4/ no cost premium

The Leaf unit was designed for customers looking to raise the bar on efficiency, reliability, longevity, and quiet operation.

Features:

- *2-pipe changeover or 4-pipe*
- *120V, 208V, 240V and 277V single phase*
- *3 cabinet sizes cover an airflow range of 300 to 1200 CFM*
- *2-way, 3-way, or 6-way control valve*
- *2 position or modulating control*
- *variable speed ECM fan*

Cabinet Configurations:

- *Consealed cabinet*
- *Finished cabinet*
- *Compact ducted unit*
- *Integrated E/HRV unit*

Typical Applications:

- *hotels*
- *condominiums*
- *assisted living*
- *student domatories*
- *armed forces barracks*

Contact the Temspec applications support for your special retrofit needs. We pride ourselves on helping customers solve unique retrofit challenges

Leaf Model Number

Digits 1,2 - Finished
Must always be 'TL'

Digit 3 - Spacer

Digit 4 - Cabinet
G - Concealed Cabinet

Digit 5 - Outside Air
F - None

Digit 6,7 - Cabinet Footprint
04 - 15.75"W x 15.75"D
08 - 20"W x 18"D
12 - 24"W x 18"D

Digit 8- Spacer

Digit 9,10 - Cabinet Height = 86"

Digit 11 - M

Digit 12 - K

Digit 13 - Y

Digit 14 - Spacer

Digit 15 - Primary Cooling
C - Chilled Water (Single Purpose Coil)
W - Chilled Water (2-pipe Changeover)
Y - No Cooling Coil

Digit 16 - Primary Heating
H - Hot Water (Single Purpose Coil)
W - Hot Water (2-pipe Changeover)
E - Electric Resistance
Y - No Heating Coil

Digit 17- Auxillary Heat
E - Electric Resistance
Y - None

Digit 18- Spacer

Digit 19- Nomical Airflow (CFM / LS)
E - 300 / 142
G - 400 / 188
H - 575 / 271 (free discharge, 250mm fan in 08 cabinet)
K - 600 / 283
M - 800 / 378
P - 1000 / 472
R - 1200 / 566

Digit 20 - Unit Connected Voltage
1 - 120/1/60 Unfused Disconnect
2 - 208/1/60 Unfused Disconnect
3 - 240/1/60 Unfused D(isconnect
4 - 277/1/60 Unfused Disconnect
5 - 120/1/60 Fused Disconnect
6 - 208/1/60 Fused Disconnect
7 - 240/1/60 Fused Disconnect
8 - 277/1/60 Fused Disconnect

Digit 21 - Motor Type
V - ECM Variable Speed

Digit 22 - Water Coils
Note: X/Y format where X = number of cooling rows and 'Y' = number Y of heating rows. All coils have aluminum fins, copper tubes, and galvanized casing
Y - No water coil (electric heat only)

3 Row Coils
K - 3/0 (2-pipe), 12FPI
L - 3/1 (4-pipe), 12FPI
M - 3/2 (4-pipe), 12FPI
N - 3/0 (2-pipe), 14FPI
P - 3/1 (4-pipe), 14FPI
Q - 4/1 (4-pipe), 14FPI

4 Row Coils
U - 4/0 (2-pipe), 12FPI
V - 4/1 (4-pipe), 12FPI
V - 4/0 (2-pipe), 14FPI
V - 4/1 (4-pipe), 14FPI

Digit 23 - Chilled Water Piping Packages
Note: Manual air vent, flexible braided hoses and shutoff valves are standard on all exceptions except 'Y'. Control valves are mounted on coil return
Y - no piping package (hose adaptors are included for pressure testing at the factory
A - 2-way control valve, shutoff vavles on supply and return
B - 3-way control valve, shutoff valves on supply and return
C - 2-way control valve, shutoff valve on supply, manual balancing valve with shutoff on return
D - 3-way control valve , shutoff on supply, manual balancing valve with shutoff on return
E - 2-way control valve , combo strainer/shuttoff on supply, manual balancing valve with shutoff on return
F - 3-way control valve , combo strainer/shuttoff on supply, manual balancing valve with shutoff on return
G - 2-way control valve , combo strainer/shuttoff on supply, auto balancing valve with shutoff on return
H - 3-way control valve , combo strainer/shuttoff on supply, auto balancing valve with shutoff on return

Digit 24 - Hot Water Piping Packages
Note: Manual air vent, flexible braided hoses and shutoff valves are standard on all exceptions except 'Y'. Control valves are mounted on coil return
Y - no piping package (hose adaptors are included for pressure testing at the factory
A - 2-way control valve, shut-off valves on supply and return
B - 3-way control valve, shut-off valves on supply and return
C - 2-way control valve, shut-off valve on supply, manual balancing valve with shutoff on return
D - 3-way control valve, shut-off on supply, manual balancing valve with shutoff on return
E - 2-way control valve, combo strainer/shut-off on supply, manual balancing valve with shutoff on return
F - 3-way control valve, combo strainer/shut-off on supply, manual balancing valve with shut-off on return
G - 2-way control valve, combo strainer/shut-off on supply, auto balancing valve with shut-off on return
H - 3-way control valve, combo strainer/shut-off on supply, auto balancing valve with shut-off on return

Digit 25 - Electric Heat

Note: must operate at supply voltage, subject to cabinet size and air flow. SSR for modulating control available - contact factory for pricing and lead time

Y - No electric heat
A - 0.75 kW (available in 120V only
B - 1.0 kW
C - 1.5 kW
D - 2.0 kW (maximum size 120V)
E - 2.5 kW
F - 3.0 kW
G - 3.5 kW
H - 4.0 kW
J - 4.5 kW
K - 5.0 kW
L - 6.0 kW
M - 7.0 kW
G - 8.0 kW

Digit 26 - Control Interface

Note: supplied and pre-wired at factory unless otherwise noted. Our fan requires a 0-10VDC signal. Our standard thermostat is "J" which *is the least expensive, offers the greatest energy savings and quietest operation*

O - 0-10VDC Fan speed control, thermostat or controller by others
K - 3 SPD Fan control, thermostat or controller by others
C - Johnson Controls FCP-PA-701 - 3 spd fan control, manual changeover, programmable, NC 2 position valve control
E - Johnson Controls FCP-NA-701 - 3 spd fan control, manual changeover, non -programmable, NC 2-position valve control
J - Spartan TE226 - 4-pipe or 2-pipe w/electric heat, 0-10VDC fan control, programmable, auto changeover, energy savings input, NO or NC 2-postition control valves
Q - Spartan TE246 - 2-pipe w/out electric heat, 0-10VDC fan control, programmable auto changeover, energy savings input, NO or NC 2 position valve control
H - KMC MIT-FA-005 - 0-10VDC fan control, on/auto fan control, programmable auto changeover, NO or NC modulating or 2-position valve control, BACnet
M - KMC MIT-FA-005 - 0-10VDC fan control, on/auto fan control, programmable manual changeover, NO or NC modulating or 2 position valve control, BACnet
R - MBTek Apollo - 0-10VDC fan control, on/auto fan control, manual changeover, NC 2 position valve control, WiFi control with user app
Z - Special - select for an option not listed. Digit 30 must also be 'S' Consult with Temspec for any special options before placing an order

Digit 27 - Cooling & Heating Valve Control

Y - None - controls installed by others
C - 2-pipe, contractor supplied, factory installed
L - 4-pipe, contractor supplied, factory installed
A - 2-pipe, 2 position NO SR
B - 2-pipe, 2 position NC SR
D - 2-pipe, 3-wire floating, FL (fail last)
E - 2-pipe, 0-10VDC NO SR
F - 2-pipe, 0-10VDC NC SR
G - 4-pipe, 2-position CW NO, HW NC, SR
H - 4-pipe, 2-position CW NC, HW NO, SR
J - 4-pipe, 0-10VDC CW NO, HW NC, SR
K - 4-pipe, 0-10VDC CW NC, HW NO, SR
P - 4-pipe, 2-position NO, SR
Q - 4-pipe, 2-position NC, SR
R - 4-pipe, 3-wire floating, FL (fail last)
S - 4-pipe, 0-10VDC, NO SR
S - 4-pipe, 0-10VDC, NC SR
S - Special - select for an option not listed. Digit 30 must also Consult with Temspec for any special options before placing an order

Digit 28 - Thermostat/Controller Mounting & Insulation

A - Remote mounted thermostat, 1" fiberglass insulation
B - Unit mounted thermostat provided by factory, 1" insulation
C - Remote mounted thermostat, 1/2" closed cell insulation
D - Unit mounted thermostat, 1/2" closed cell insulation
E - Unit mounted thermostat/controller provided by others, 1" fiberglass insulation
F - Unit mounted thermostat/controller provided by others, 1/2" closed cell insulation

Digit 29 - Condensate Drain Pan

Y - None (heating only unit)
1 - Acrylic coated galvanized, (size 06-12)
2 - Acrylic coated galvanized w/condensate switch, (size 06-12)
3 - 304 SS, (size 03-12)
4 - 304 SS, w/condensate switch (size 03-12)
5 - Polymer (size 03-04) Offers best corrosion protection
6 - Polymer, w/condensate switch, (size 03-04), offers best corrosion protection

Digit 30 - Design Sequence

A - Current design
S - Special

Digit 31 - Spacer

Digit 32 - Top Supply Air Opening

Y - None
V - Top duct connection

Digit 33 - SA Grille/Register Opening(s)

Note: line of sight and sound baffle provided with front and back or 2 side grilles selected

Y - None
A - Single front
B - Single back
C - Single left
D - Single right
E - Front and left
F - Front and right
G - Front, left, and right
H - Front and back
K - Back and left
L - Back and right

Digit 34 - Filters 1" MERV 10

1 - 1 set
2 - 2 sets

Digit 35 - Riser Location

3 - Left
4 - Right
5 - Back
6 - Reverse left
7 - Reverse right
8 - Reverse back

Digit 36 - Riser Shipping Method

Note: see separate riser code string if supplied by Temspec. Stub-out height is 36".

Y - No risers
1 - Attached to unit
2 - Shipped loose

Digit 37 - Raised Base

Y - None - controls installed by others
A - 4" raised base
B - 8" raised base
C - 8" raised base with access door
D - 8" raised base with access door and 120-240v condensate pump
E - 8" raised base with access door and 277v condensate pump
F - 12" raised base
G - 12" raised base with access door
H - 12" raised base with access door and 120-240v condensate pump
J - 12" raised base with access door and 277v condensate pump

Note: If condensate pump is required, raised base with condensate pump must be factory installed

Digit 38 - External Static Pressure (in wc)

F - Direct supply
J - 0.2*
K - 0.4**

*Note: * 0.2 is max ESP for 400 CFM unit*
*** Contact factory for nominal airflow (CFM)*

Digit 39 - Spacer

Digit 40, 41 - Riser Number

YY - No riser number
Example:
Riser 9 = 09

Digit 42, 43 - Floor Number

YY - No floor number
Example:
6th Floor = 06
35th Floor = 35

Digit 44,45,46,47 - Room Number

YYYY - No room number
Example:
Suite 10 = 0010
Suite 945 = 0945
Suite 1030 = 1030

Digit 48 - Special

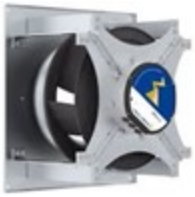
Y- None

What makes us different?

Backward Inclined Impeller Fans with Variable Speed ECM

250mm Fan 400 CFM

280mm Fan 800 CFM



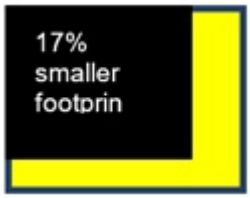
310mm Fan 1200 CFM

Electronically commutated motors, ECM, with a backward inclined impeller fan are 25% more efficient than a PSC motor and forward curved fan at full load and 70% more efficient at part load.

In a typical 250 suite hotel or condominium, this represents energy savings of more than 100,000 kWh annually and significant maintenance cost reduction.

The 0-10VDC variable speed fan operates at the lowest speed possible to maintain the space temperature providing quiet and extremely efficient operation

Smallest Footprint

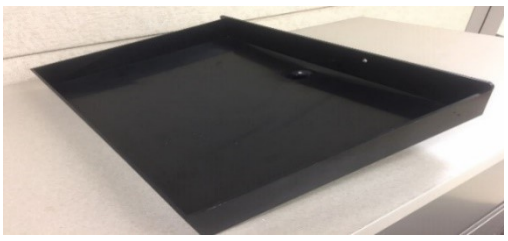


Our 300-400 CFM unit footprint is 17% smaller than our competitors which means more leasable space

Exceptionally Quiet

Our cabinet size and shape, fan design and location, and cabinet acoustic treatment of 1" insulation, all play a role in achieving your desired space NC level

100% Corrosion Free Condensate Drain Pan



Our polymer drain pans offer corrosion protection for the life of the fan coil. SS or any matalic material is subject to carbon staining and galvanic corrosion

Hinged Filter Access

No tools are required to access/change the MERV 10 filter

Thermostat Options

Temspec highly recommends using a thermostat with variable speed fan control, (0-10VDC) to fully leverage:

- *energy savings*
- *quiet operation*
- *lowest cost control option*
- *unit longevity*
- *reduced maintenance*

We offer many thermostat options including WiFi with user app, programmable, BACnet enabled, auto and manual changeover

Whether new construction or a retrofit project, the Temspec Leaf fan coil offers significant energy savings over the life of the system.

Contact the applications team for complimentary energy analysis comparing a Temspec Leaf fan coil unit to any other fan coil product.

Is your project noise sensitive? Contact our applications support team to learn about our complimentary sound analysis and lay your concerns to rest

Cooling Capacities

45F Entering Water Temperature & 10F Delta T

Model	Coil	Airflow (CFM)	Total Capacity (MBH)	Sensible Capacity (MBH)	Water Flow (GPM)	WPD (Ft H20)	Power Input (w)
03	3-Row cooling, 14 FPI	300	9.1	6.5	2.1	4.5	29
	4-Row cooling, 14 FPI	300	10.0	6.8	2.3	3.7	31
	3-Row cooling, 12 FPI	300	8.5	6.2	1.9	3.7	28
	4-Row cooling, 12 FPI	300	9.2	6.7	2.1	3.4	30
04	3-Row cooling, 14 FPI	400	11.2	8.2	2.6	6.6	58
	4-Row cooling, 14 FPI	400	12.3	8.7	2.8	5.6	59
	3-Row cooling, 12 FPI	400	10.3	7.9	2.4	5.1	56
	4-Row cooling, 12 FPI	400	11.4	8.5	2.6	4.9	57
06	3-Row cooling, 14 FPI	600	19.3	13.5	4.5	12.9	57
	4-Row cooling, 14 FPI	600	21.9	14.6	5.1	15.4	64
	3-Row cooling, 12 FPI	600	18.1	12.7	4.2	11.7	66
	4-Row cooling, 12 FPI	600	20.6	13.9	4.8	19.1	62
08	3-Row cooling, 14 FPI	800	23.9	17.5	5.6	19.7	139
	4-Row cooling, 14 FPI	800	27.1	19.2	6.4	22.9	142
	3-Row cooling, 12 FPI	800	21.9	16.5	5.1	16.4	138
	4-Row cooling, 12 FPI	800	25.4	18.3	5.9	17.9	140
10	3-Row cooling, 14 FPI	1000	31.6	22.5	7.4	18.9	174
	4-Row cooling, 14 FPI	1000	36.2	24.7	8.5	16.5	177
	3-Row cooling, 12 FPI	1000	29.3	21.4	6.8	15.2	173
	4-Row cooling, 12 FPI	1000	33.8	23.7	7.9	16.5	175
12	3-Row cooling, 14 FPI	1200	35.4	25.8	8.3	20.4	277
	4-Row cooling, 14 FPI	1200	40.9	28.6	9.6	18.9	282
	3-Row cooling, 12 FPI	1200	32.6	24.4	7.6	18.8	278
	4-Row cooling, 12 FPI	1200	38.6	27.6	9.0	19.9	280

Notes:

1/ Flow rates can be adjusted in 0.5 GPM increments (auto balancing valve)

2/ Temspec recommends 2-position control when flow rates are less than 4.0 GPM

3/ A modulating control valve with auto flow balancing valve is less costly than a PIC valve

4/ PIC (pressure independant control), valves should be considered on large central plant chilled water systems to avoid overflowing buildings close to the plant starving distant buildings

5/ 3-way valves should be considered on units at the end of the risers

AHR- Certified cooling performance is based on ANSI/AHRI Standard 440-2019: Performance Rating of Room Fan Coils: 80/67F entering air temperature, 45F entering water temperature with 10F delta T. All performance is measured using 120V AC motor, 0.05 inches wc ESP static pressure without filters or grilles

Heating Capacities
Size 03 - 04, 2-Pipe Coil (4-pipe system with 6-way valve)

105°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.0 GPM			2.0 GPM			3.0 GPM		
03 - 04	3-Row heating	300	0.4	90	7.3	1.3	96	8.7	2.6	99	9.1
	4-Row heating	300	0.2	89	7.6	0.6	95	9.2	1.1	98	9.7
	3-Row heating	400	0.4	87	8.3	1.3	94	10.5	2.7	97	11.3
	4-Row heating	400	0.2	87	8.7	0.6	93	11.2	1.1	96	12.1

110°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.0 GPM			2.0 GPM			3.0 GPM		
03 - 04	3-Row heating	300	0.4	92	8.3	1.3	99	9.9	2.6	103	10.4
	4-Row heating	300	0.2	91	8.7	0.6	98	10.5	1.1	102	11.1
	3-Row heating	400	0.4	90	9.6	1.3	97	12.0	2.7	101	12.9
	4-Row heating	400	0.2	89	10.0	0.6	96	12.8	1.1	100	13.9

120°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.0 GPM			2.0 GPM			3.0 GPM		
03 - 04	3-Row heating	300	0.4	98	10.5	1.3	107	12.5	2.6	111	13.1
	4-Row heating	300	0.2	97	11.0	0.5	106	13.2	1.1	110	13.9
	3-Row heating	400	0.4	94	12.1	1.3	104	15.1	2.6	109	16.2
	4-Row heating	400	0.2	93	12.6	0.5	103	16.1	1.1	108	17.4

130°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.0 GPM			2.0 GPM			3.0 GPM		
03 - 04	3-Row heating	300	0.4	99	12.7	1.2	114	15.0	2.5	119	15.7
	3-Row heating	300	0.2	103	13.3	0.5	113	15.9	1.1	118	16.7
	4-Row heating	400	0.4	102	14.6	1.2	111	18.2	2.5	116	19.5
	4-Row heating	400	0.2	97	15.3	0.5	109	19.4	1.1	115	20.9

Size 06 - 08, 2-Pipe Coil (4-pipe system w/ 6-way Valve)

105°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.5 GPM			2.5 GPM			3.5 GPM		
06 - 08	3-Row heating	600	0.4	86	13.4	1.0	91	16.0	1.8	95	17.2
	4-Row heating	600	0.5	85	14.2	0.6	90	17.2	1.1	94	18.5
	3-Row heating	800	0.4	84	15.1	1.0	89	18.9	1.8	92	20.8
	4-Row heating	800	0.5	83	15.9	0.6	88	20.3	1.1	91	22.5

110°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.5 GPM			2.5 GPM			3.5 GPM		
06 - 08	3-Row heating	600	0.4	88	15.4	1.0	94	18.4	1.8	98	19.7
	4-Row heating	600	0.3	87	16.3	0.6	93	19.7	1.1	97	21.1
	3-Row heating	800	0.4	86	17.3	1.0	92	21.7	1.8	96	23.9
	4-Row heating	800	0.3	84	18.3	0.6	90	23.3	1.1	94	25.8

120°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.5 GPM			2.5 GPM			3.5 GPM		
06 - 08	3-Row heating	600	0.4	92	19.4	1.0	94	23.1	1.8	105	24.7
	4-Row heating	600	0.2	91	20.6	0.6	93	24.7	1.1	104	26.5
	3-Row heating	800	0.4	89	21.8	1.0	92	27.3	1.8	102	29.9
	4-Row heating	800	0.2	87	23.0	0.6	90	29.3	1.1	100	32.4

130°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.5 GPM			2.5 GPM			3.5 GPM		
06 - 08	3-Row heating	600	0.4	97	23.5	1.0	97	27.9	1.7	112	29.8
	4-Row heating	600	0.2	95	24.9	0.6	95	29.9	1.0	111	32.0
	3-Row heating	800	0.4	92	26.4	1.0	92	33.0	1.7	108	36.0
	4-Row heating	800	0.2	90	27.9	0.6	90	35.5	1.0	106	29.1

Size 10 - 12, 4-Pipe Coil (4-pipe system with 6-way valve)

105°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			2.5 GPM			3.5 GPM			4.5 GPM		
10 - 12	3-Row heating	1000	1.2	87	23.4	2.2	90	23.4	3.3	93	24.7
	4-Row heating	1000	0.7	85	25.5	1.3	89	25.5	2.0	92	27.1
	3-Row heating	1200	1.2	85	25.8	2.2	89	25.8	3.3	92	27.6
	4-Row heating	1200	0.7	84	28.1	1.3	87	28.1	2.0	90	30.4

110°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			2.5 GPM			3.5 GPM			4.5 GPM		
10 - 12	3-Row heating	1000	1.2	89	24.0	2.1	93	26.8	3.3	96	28.3
	4-Row heating	1000	0.7	87	25.9	1.3	92	29.2	2.0	95	31.1
	3-Row heating	1200	1.2	87	26.0	2.1	91	29.5	3.3	95	31.6
	4-Row heating	1200	0.7	85	28.0	1.3	90	32.3	2.0	93	34.8

120°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			2.5 GPM			3.5 GPM			4.5 GPM		
10 - 12	3-Row heating	1000	1.2	93	30.2	2.1	99	33.6	3.2	103	35.5
	4-Row heating	1000	0.7	91	32.6	1.3	97	36.7	2.0	101	36.7
	3-Row heating	1200	1.2	91	32.7 `	2.1	97	37.1	3.2	101	39.6
	4-Row heating	1200	0.7	89	35.3	1.3	95	40.6	2.0	99	43.7

130°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			2.5 GPM			3.5 GPM			4.5 GPM		
10 - 12	3-Row heating	1000	1.2	98	36.4	2.1	105	40.4	3.2	109	42.7
	4-Row heating	1000	0.7	95	39.4	1.2	102	44.2	1.9	107	46.8
	3-Row heating	1200	1.2	95	39.5 `	2.1	102	44.6	3.2	107	47.6
	4-Row heating	1200	0.7	92	42.6	1.2	99	49.0	1.9	104	52.5

Size 03 - 04, 4-Pipe Conventional

140°F Entering Water Temperature

	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Capacity Total (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
Model			1.0 GPM			2.0 GPM			3.0 GPM		
03 - 04	1-Row heating	300	0.8	119	9.4	2.6	128	10.7	5.4	132	11.2
	2-Row heating	300	0.2	113	12.5	0.8	124	14.9	1.6	129	15.7
	1-Row heating	400	0.8	117	10.7	2.6	127	12.5	5.4	131	13.3
	2-Row heating	400	0.2	110	14.2	0.8	121	17.7	1.6	126	19.0

160°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.0 GPM			2.0 GPM			3.0 GPM		
03 - 04	1-Row heating	300	0.8	133	12.2	2.5	145	13.9	5.1	149	14.5
	2-Row heating	300	0.2	125	16.3	0.8	139	19.2	1.5	145	20.3
	1-Row heating	400	0.8	130	13.9	2.5	143	16.2	5.1	148	17.1
	2-Row heating	400	0.2	120	18.5	0.8	135	22.9	1.5	142	24.6

180°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.0 GPM			2.0 GPM			3.0 GPM		
03 - 04	1-Row heating	300	0.7	147	15.0	2.4	161	17.0	4.8	166	17.6
	2-Row heating	300	0.2	136	20.2	0.7	154	23.7	1.5	162	25.0
	1-Row heating	400	0.7	143	17.1	2.4	158	19.9	4.9	165	21.1
	2-Row heating	400	0.2	130	23.0	0.7	149	28.8	1.5	158	30.3

Size 06 - 08, 4-Pipe Conventional System

140°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.5 GPM			2.5 GPM			3.5 GPM		
06 - 08	1-Row heating	600	0.4	116	17.0	1.0	123	19.5	1.7	112	20.8
	2-Row heating	600	0.8	105	24.7	0.6	116	28.5	1.0	111	30.3
	1-Row heating	800	0.4	113	19.1	1.0	121	22.4	1.7	108	24.1
	2-Row heating	800	0.8	100	27.9	0.6	111	33.5	1.0	106	36.2

160°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.5 GPM			2.5 GPM			3.5 GPM		
06 - 08	1-Row heating	600	0.4	128	22.2	1.0	138	25.2	1.6	143	26.7
	2-Row heating	800	0.8	114	32.1	0.6	130	36.9	3.3	136	39.2
	1-Row heating	600	0.4	124	25.0	1.0	135	39.1	1.6	141	31.3
	2-Row heating	800	0.8	108	36.3	0.6	123	43.3	3.3	131	46.8

180°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			1.5 GPM			2.5 GPM			3.5 GPM		
06 - 08	1-Row heating	600	0.3	141	27.3	0.8	153	30.9	1.5	159	33.0
	2-Row heating	600	0.7	123	39.4	1.7	141	45.3	3.1	150	48.1
	1-Row heating	800	0.4	136	30.8	0.8	149	35.8	1.5	156	38.5
	2-Row heating	800	0.7	116	44.7	1.8	134	53.2	3.1	144	57.5

Size 10 - 12, 4-Pipe Conventional

140°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			2.5 GPM			3.5 GPM			4.5 GPM		
10 - 12	1-Row heating	1000	1.1	119	24.4	2.0	124	26.4	3.2	109	42.7
	2-Row heating	1000	2.3	108	36.8	4.0	115	40.2	1.9	107	46.8
	1-Row heating	1200	1.1	117	26.5	2.0	122	28.9	3.2	107	47.6
	2-Row heating	1200	2.3	105	39.9	4.0	112	44.2	1.9	104	52.5

160°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			2.5 GPM			3.5 GPM			4.5 GPM		
10 - 12	1-Row heating	1000	1.0	133	31.9	1.9	139	34.1	2.9	143	35.5
	2-Row heating	1000	2.2	118	47.5	3.9	127	51.9	6.0	133	54.5
	1-Row heating	1200	1.0	129	34.4	1.9	136	37.4	2.9	141	39.3
	2-Row heating	1200	2.2	114	51.6	3.9	124	57.1	6.0	130	60.5

180°F Entering Water Temperature

Model	Coil	Airflow (CFM)	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)	WPD (ft H20)	LWT (°F)	Total Capacity	WPD (ft H20)	LWT (°F)	Total Capacity (MBH)
			2.5 GPM			3.5 GPM			4.5 GPM		
10 - 12	1-Row heating	1000	1.0	147	39.1	1.8	154	42.2	2.8	157	157
	2-Row heating	1000	2.1	128	58.3	3.7	139	63.7	5.7	145	145
	1-Row heating	1200	1.0	142	42.4	1.8	151	46.0	2.8	156	156
	2-Row heating	1200	2.1	123	63.4	3.7	135	70.1	5.7	143	143

Electric Heat

Model	KW / Volts/ph/Hz	0.75	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0
		Heater Amps												
03-04	120/1/60	6.3	8.3	12.5	16.7	–	–	–	–	–	–	–	–	–
	208/1/60	–	4.8	7.2	9.6	12.0	14.4	16.8	–	–	–	–	–	–
	240/1/60	–	4.2	6.3	8.3	10.4	12.5	14.6	–	–	–	–	–	–
	277/1/60	–	3.6	5.4	7.2	9.0	10.8	12.6	–	–	–	–	–	–
06-08	120/1/60	6.3	8.3	12.5	16.7	–	–	–	–	–	–	–	–	–
	208/1/60	–	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0	28.8	–	–
	240/1/60	–	4.2	6.3	8.3	10.4	12.5	14.6	16.7	18.8	20.8	25.0	–	–
	277/1/60	–	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.1	21.7	–	–
10-12	120/1/60	6.3	8.3	12.5	16.7	–	–	–	–	–	–	–	–	–
	208/1/60	–	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0	28.8	33.7	38.5
	240/1/60	–	4.2	6.3	8.3	10.4	12.5	14.6	16.7	18.8	20.8	25.0	29.2	33.3
	277/1/60	–	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.1	21.7	25.3	28.9

Note: Electric heat is available on 2-pipe systems only as primary or auxillary

- Heaters are wired for single stage operation. 2-stage or SCR control available
- Auto reset high limit is standard
- Single point power connection
- Heater is located in the reheat position reltive to the cooling coil

$$\text{Amps} = \frac{\text{Watts}}{\text{Volts}}$$

$$\text{Air temp rise (delta t)} = \frac{\text{kW x 3160}}{\text{CFM}} = \frac{\text{MBH x 925}}{\text{CFM}}$$

SA = Supply Air
FLA = Full Load Amps
= SA fan motor amps + electric heater amps
MCA = Minimum Circuit Ampacitiy
= FLA x 1.25
MOP = Rating of Maximum Overcurrent Protection Device
MOP = (2.25 x SA Fan Motor Amps) + Electric Heater Amps

Requirements of Standards: UL 1995 and SCA C22.2 No. 226

If the value of the calculated rating does not equal the standard current rating of overcurrrent protective device, the marked maximum rating shall be the next lower standard rating

Exception No. 1: The marked maximum rating of the overcurrrent protective device shall be the standard next higher rating supply than the computed value of the next lower standard rating less 125% of the current rating of an electric heater load when the unit includes an electric heater

Exception No. 2: If the computed value of the overcurrrent protective device is less than the minimum ampacity of the supply circuit, the marked rating of the device shall be increased to the largest standard overcurrent protective device rating

Exception No. 3: If the marked maximum circuit ampacity does not correspond to a standard protective device rating, the next higher standard rating of the protective device may be marked

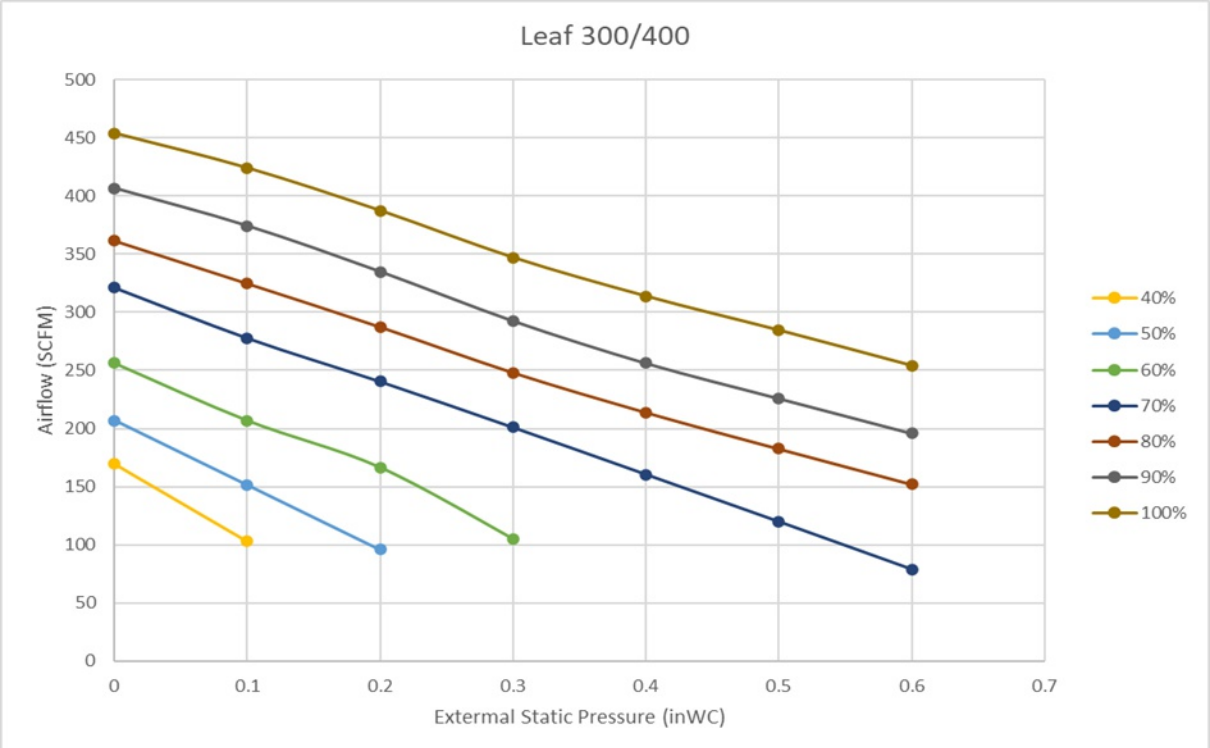
Motor Data (ECM 0-10VDC Control Signal)

Model (size)	Connection Voltage Volts/ph/Hz	ECM Nameplate Data Watts	Amps	FLA (Amps)	MOP (Amps)	Airflow (CFM)	Direct Supply (Watts)
03	120/1/60	85	1.3	1.63	15	220	14
	208-240/1/60	80	0.7	0.88	15	272	21
	277/1/60	80	0.7	0.88	15	*300	29
04	120/1/60	85	1.3	1.63	15	328	32
	208-240/1/60	80	0.7	0.88	15	370	44
	277/1/60	80	0.7	0.88	15	*400	59
06	120/1/60	165	2.3	2.88	15	426	29
	208-240/1/60	168	1.4	1.75	15	563	50
	277/1/60	168	1.4	1.75	15	*600	66
08	120/1/60	165	2.3	2.88	15	571	50
	208-240/1/60	168	1.4	1.75	15	658	74
	277/1/60	168	1.4	1.75	15	*800	142
10	120/1/60	345	3.0	2.88	15	667	67
	200-277/1/60	500	2.2	1.75	15	776	88
						*1000	177
12	120/1/60	345	3.0	2.88	15	768	97
	200-277/1/60	500	2.2	1.75	15	1081	196
						*1200	282

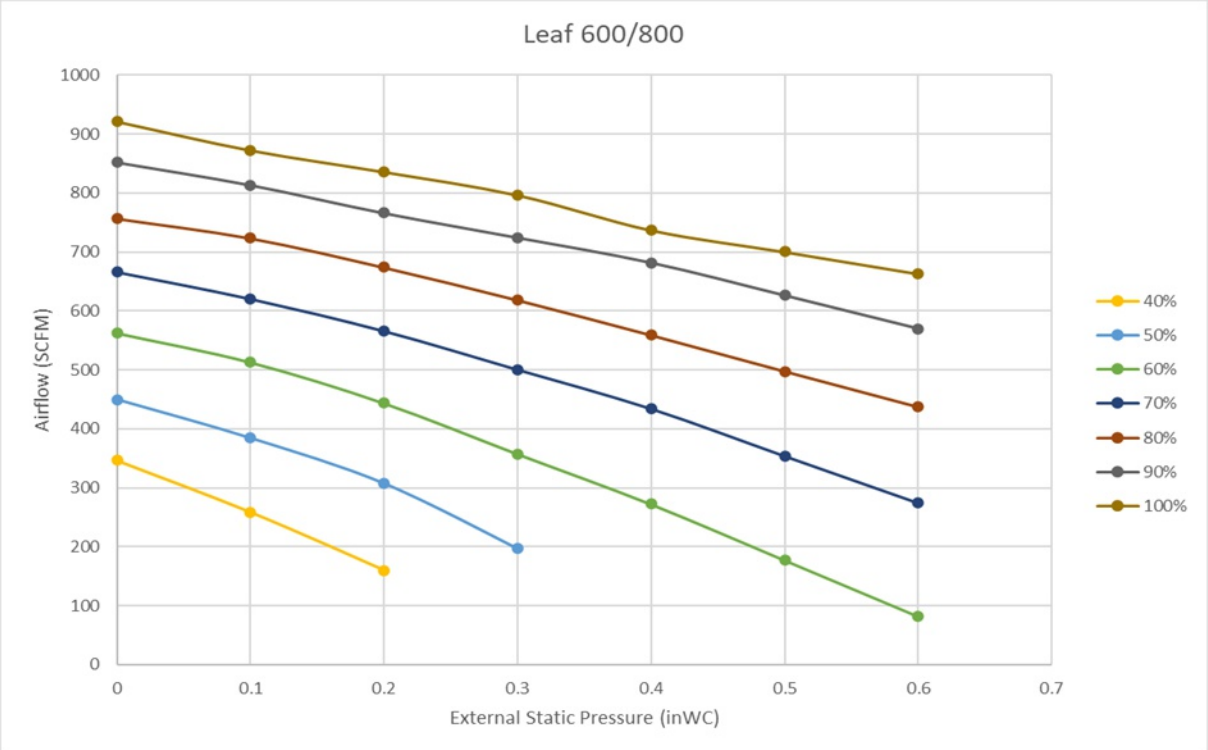
*AHRI certifed operating points. Other airflow readings recorded during factory performance testing
Contact factory for fan wattage at different duty points (airflow & external static pressure)

AHRI-440 Rated Fan Curves

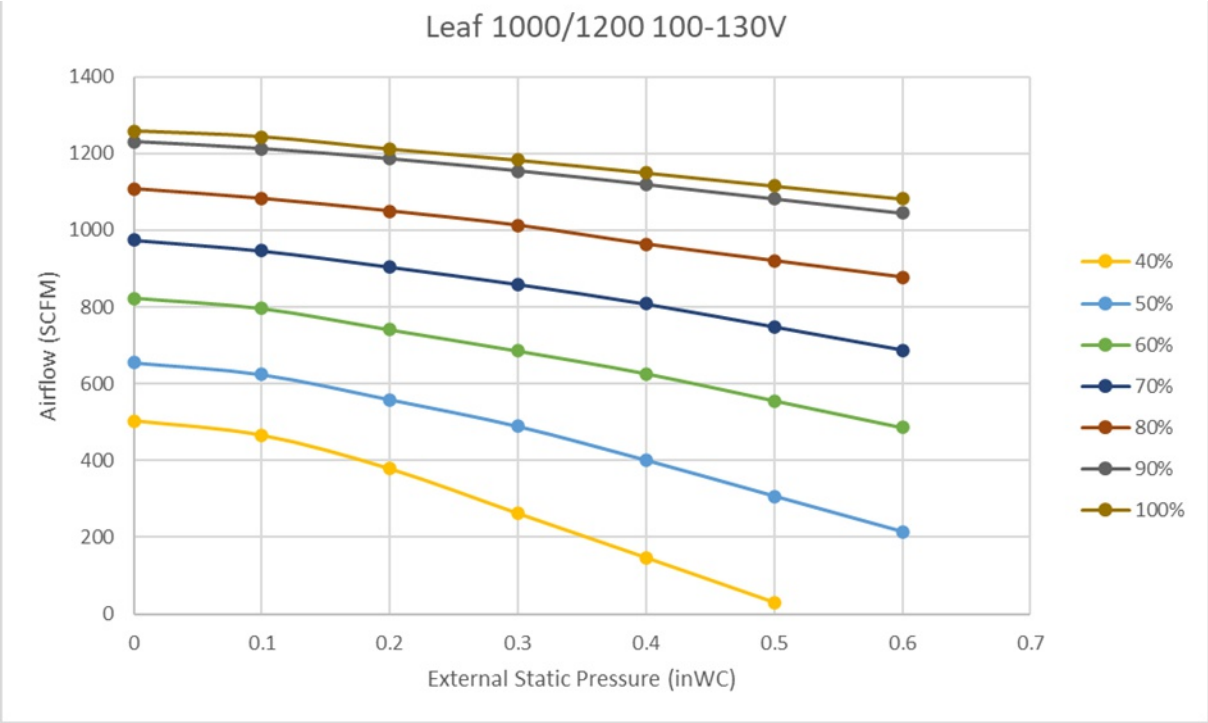
Size 03-04



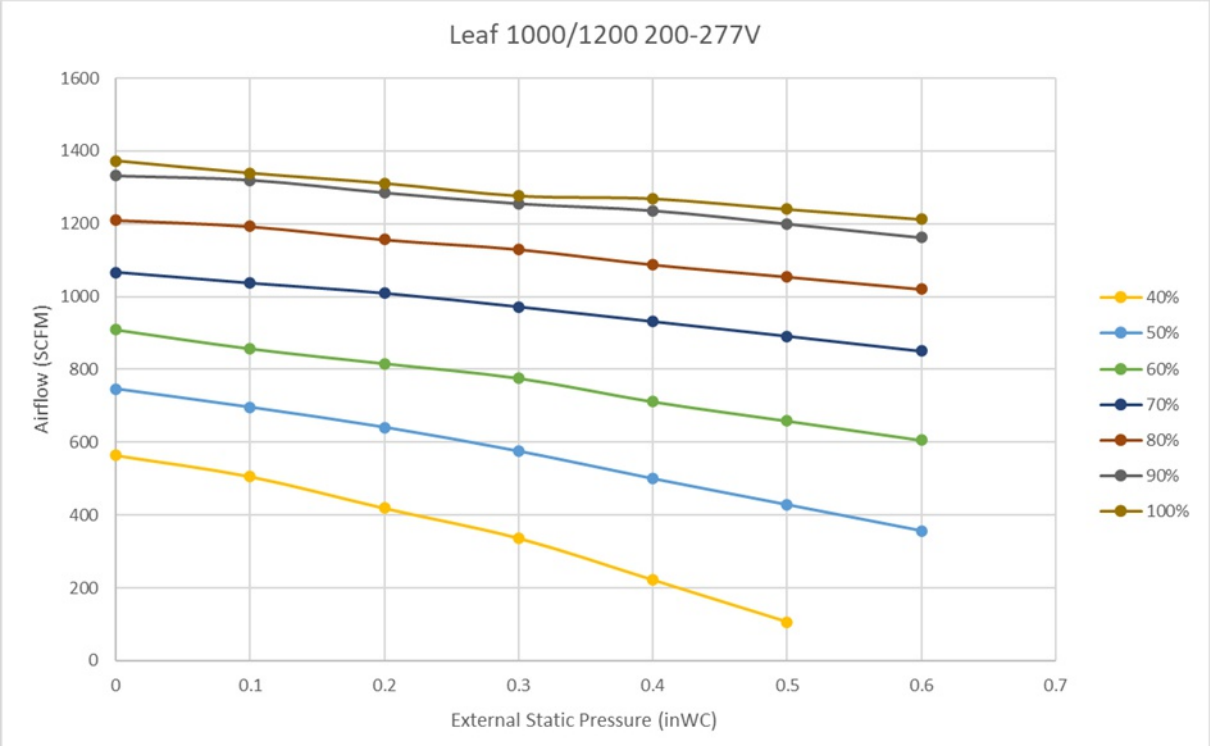
Size 06- 08



Size 10 - 12, (100 - 130 VAC)



Size 10 - 12, (200 - 277 VAC)



Sound Data

Casing Radiated Sound Power (Free Discharge)										
1/3 Octave Band Fequencies (Hz)										
Model	Airflow (CFM)	63	125	250	500	1000	2000	4000	8000	A-wt (dBA)
		Sound Power, dB								
03-04	175	60	52	42	38	32	26	26	32	42
	225	60	57	44	39	34	28	26	32	45
	300	59	61	49	43	38	33	27	32	48
	350	59	62	54	46	39	34	28	32	50
	400	60	60	61	49	42	37	31	32	54
06-08	400	58	61	42	42	39	35	29	31	48
	500	59	62	46	44	40	33	28	31	51
	600	64	65	53	48	44	36	28	32	54
	700	63	66	55	51	46	40	30	32	57
	800	65	67	58	54	48	43	33	32	59
10-12	600	63	68	53	48	44	36	28	32	54
	700	63	72	55	51	46	40	30	32	57
	800	65	73	58	54	48	43	33	32	59
	900	67	73	61	56	51	46	36	32	60
	1000	68	73	64	58	53	49	39	33	62
	1100	70	75	67	61	55	51	42	34	64
	1200	71	75	70	64	57	53	45	36	66

Notes & Design Tips:

1. Consult factory for sound power values not listed
2. Temspec fan coil units are designed to acheive space sound level of NC35 at design airflow and NC30 at at normal airlfows. All our fan coils use a variable speed backward inclined impeller fan with a variable speed ECM. The fan operates at the lowest RPM to maintain the room setpoint. This control algorithm saves energy, reduces noise, and reduces maintenance costs.
3. A ducted discharge should be considered on units over 600 CFM
4. The dominate noise path on a fan coil is the return air. Position the unit in the least noise senstive area of the suite and duct the unit to the noise sensitive areas like the bedrooms
5. Right size the fan coil for the space. Over-sizing leads to poor humidity control, higher first and operating costs, and noise issues

Ducted Discharge Sound Power

1/3 Octave Band Fequencies (Hz)

Model	Airflow (CFM)	ESP (in. wc)	63	125	250	500	1000	2000	4000	8000	A-wt (DBA)
			Sound Power, dB								
03-04	175	0.0	65	52	37	37	34	28	26	32	43
	225	0.0	66	54	39	39	34	29	26	32	45
	300	0.0	67	57	42	42	35	30	27	32	47
	350	0.0	67	60	45	45	35	30	27	32	49
	400	0.0	65	57	48	48	37	31	28	32	53
	175	0.2	67	58	42	42	34	28	27	32	47
	225	0.2	65	55	46	43	36	32	29	32	46
	300	0.2	67	59	49	46	36	29	27	32	50
	350	0.2	65	56	52	49	37	31	28	32	54
	400	0.2	66	59	66	52	38	31	29	33	58
06-08	350	0.0	74	53	43	38	32	28	28	32	49
	400	0.0	67	60	49	42	34	30	28	32	48
	450	0.0	66	61	50	42	33	28	27	32	48
	500	0.0	65	62	52	44	35	29	28	32	50
	600	0.0	68	65	57	48	38	32	29	32	53
	700	0.0	71	69	61	52	41	37	34	33	57
	800	0.0	70	68	64	55	43	37	34	33	59
	350	0.2	61	57	49	43	38	33	27	32	47
	400	0.2	64	59	52	44	34	29	28	32	48
	450	0.2	68	61	54	45	36	32	29	32	50
	500	0.2	67	64	56	47	38	33	30	32	52
	600	0.2	68	67	60	50	41	36	32	33	56
	700	0.2	68	67	63	53	43	38	34	34	58
	800	0.2	72	68	68	58	45	40	37	35	62
10-12	600	0.0	69	62	52	45	39	31	28	32	51
	700	0.0	70	65	53	46	38	32	28	32	52
	800	0.0	69	65	57	50	41	34	30	32	54
	900	0.0	72	66	60	53	44	36	33	32	56
	1000	0.0	72	68	63	55	47	39	36	33	58
	1100	0.0	74	70	66	58	50	42	39	35	61
	1200	0.0	75	70	68	61	52	45	52	37	63
	600	0.2	67	63	52	45	37	31	29	32	50
	700	0.2	69	65	56	49	40	33	30	32	53
	800	0.2	71	65	59	51	43	35	33	33	55
	900	0.2	74	67	62	54	46	38	35	33	58
	1000	0.2	73	70	65	57	48	40	37	34	60
	1100	0.2	79	69	67	61	50	43	40	36	63
	1200	0.2	77	70	71	62	53	46	43	38	65

See notes & design tips on page 18

Consult factory for sound power levels not listed

Control Options

Standard Thermostats (24Vac)

Manufacturer	Model	Heat/Cool Changeover	Description	Fan Speed	Application
Spartan 	TE226	Auto/ Manual	Programmable, 2-position valve control, 0-10VDC variable speed fan control **BEST VALUE**	Auto/On	Residential
MBTek 	Apollo	Auto/ Manual	Programmable, 2-position or analog, 0-10VDC valve control, variable speed, 0-10VDC, fan control, WiFi, (phone app) 3.5" TFT color touch screen	Auto/On	Residential
Viconics 	VT8300	Auto/ Manual	Programmable, 2-position valve control, variable speed, 0-10VDC, IoT gateway, PIR motion sensor	Auto/On	Residential or Hospitality
INNCOM 	E7	Auto	Programmable, 2-position or analog, 0-10VDC valve control, variable speed, 0-10VDC, fan control	Auto/On	Hospitality
Energex 	Dream	Auto	Programmable, 2-position valve control, variable speed, 0-10VDC, fan control, WiFi Building Management App, wireless PIR motion sensor	Auto/On	Hospitality
Evolution 	EVO-4spd	n/a	Converts conventional 3 speed fan signal thermsotat to 0-10VDC - allows maximum RPM to be selected for each speed		

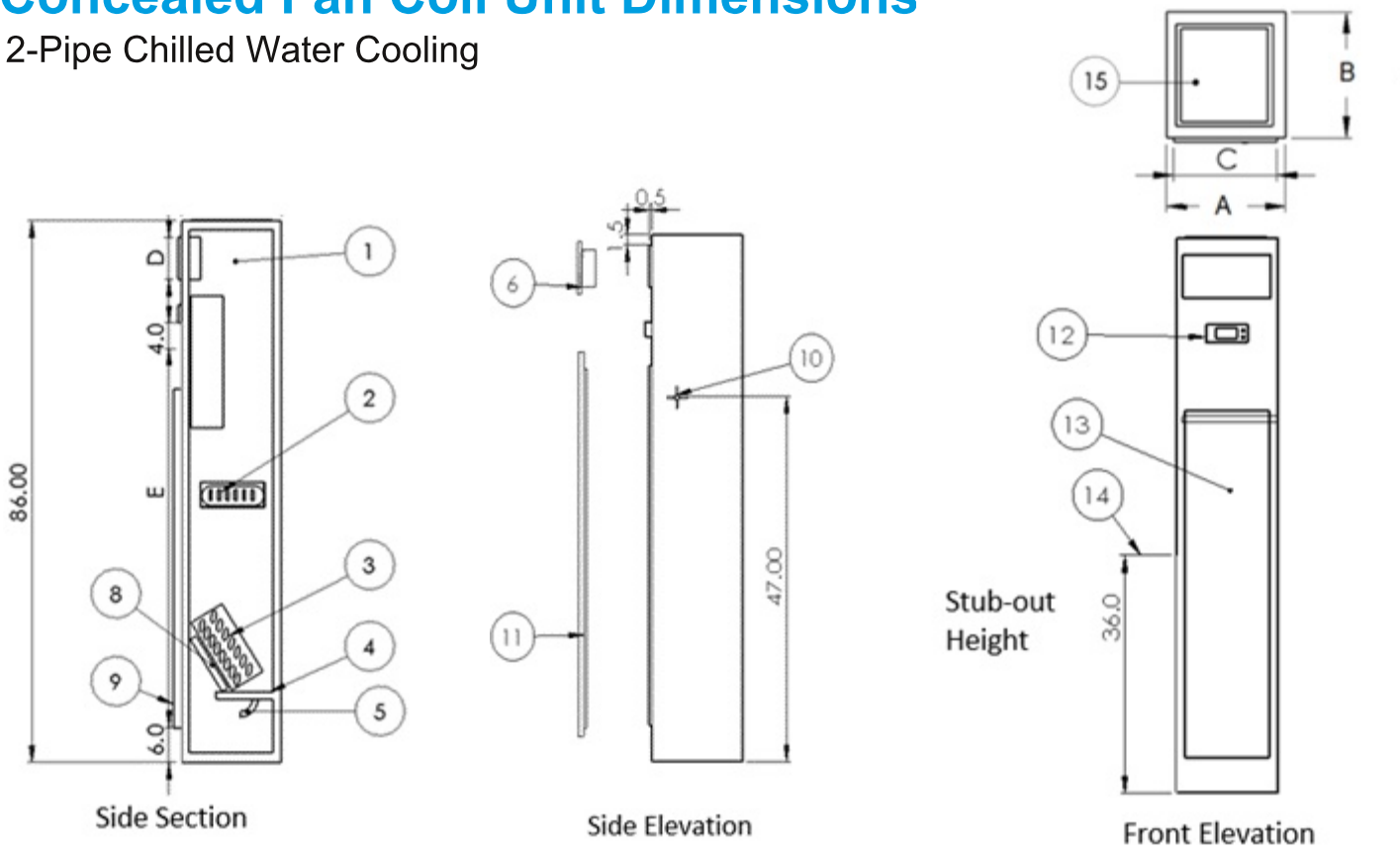
Note: The EVO board is required with any thermostat that does not have a 0-10VDC fan control signal output. It is highly recommended that a thermostat with a variable speed fan signal be used to reduce energy consumption, reduce noise, and maintain a lower relative humidity in cooling operation.

Sequence Of Operation: Spartan TE226, on/off heating/cooling control, programmable, 0-10VDC fan control
The thermostat measures the room temperature via integral sensor or optional 10K ohm remote sensor. The P+I algorithym will signal the heating or cooling to valve open and modulate the fan speed to maintain the space temperature setpoint. The fan speed will slow as the setpoint is approached until it reaches 20% of maximum airflow and then close the valve and signal the fan to stop. In continuous fan mode, the fan will remain operating at minimum speed programmed by the owner/contractor

The thermostat has optional digital inputs such as occupancy to enhance energy savings. It is equipped with a large display showing room temperature, room setpoint, and operating mode. Minimum and maximum airflows can be set as well as hi/low temperature setpoint limits

Concealed Fan Coil Unit Dimensions

2-Pipe Chilled Water Cooling

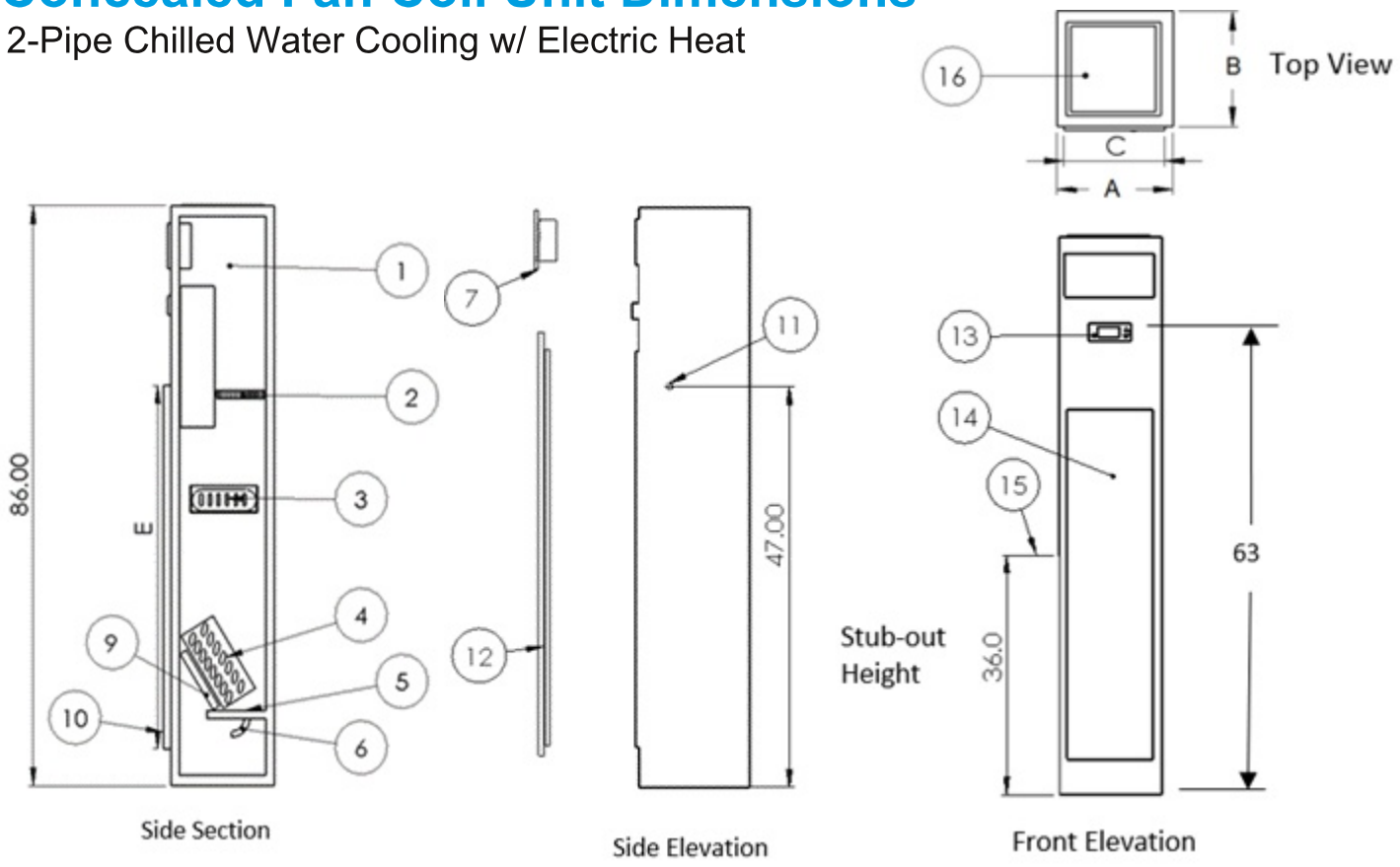


Model	A	B	C	D	E
03	16"	16"	12"	see note 6	52"
04	16"	16"	12"	see note 6	52"
06	20"	18"	14"	see note 6	52"
08	20"	18"	14"	see note 6	52"
10	24"	18"	16"	see note 6	54"
12	24"	18"	16"	see note 6	54"

1/ 20 ga steel cabinet lined with 1" fiberglass insulation coated on the air side, 1/2" closed cell insulation optional	9/ 1/2" flange on front of unit allows direct application application of drywall to unit
2/ Variable Speed EC motor, backward inclined fan (0-10VDC Fan Speed Control)	10/ 7/8" hole in each side of cabinet for power and control cable entry. See fan coil installation manual for details
3/ Chilled Water coil; Hot Water changeover optional	11/ Hinged return air grille/access panel
4/ Drain pan - acrylic coated galvanized, polymer, or 304 stainless steel. (all dual sloped to drain)	12/ Unit mounting location for thermostat
5/ Drain hose from drain pan to condensate riser non-kink flexible hose forms a running trap	13/ Motor cover panel, acoustically lined. Identification, electrical schematic, and safety/caution labels are affixed to this panel
6/ Double deflection steel supply air grille at front, left, back, or any combination when there are multiple openings. Dimension D varies with airflow volume: 5", 8" 10" 12" or 14"	14/ Vertical centerline of coil connection run outs. Connections are the back , left or right sides of the unit
8/ 1" (one inch) MERV 10 disposable filter, MERV 13 optional	15/ Top supply air opening, (knock out), for attachment of ductwork

Concealed Fan Coil Unit Dimensions

2-Pipe Chilled Water Cooling w/ Electric Heat

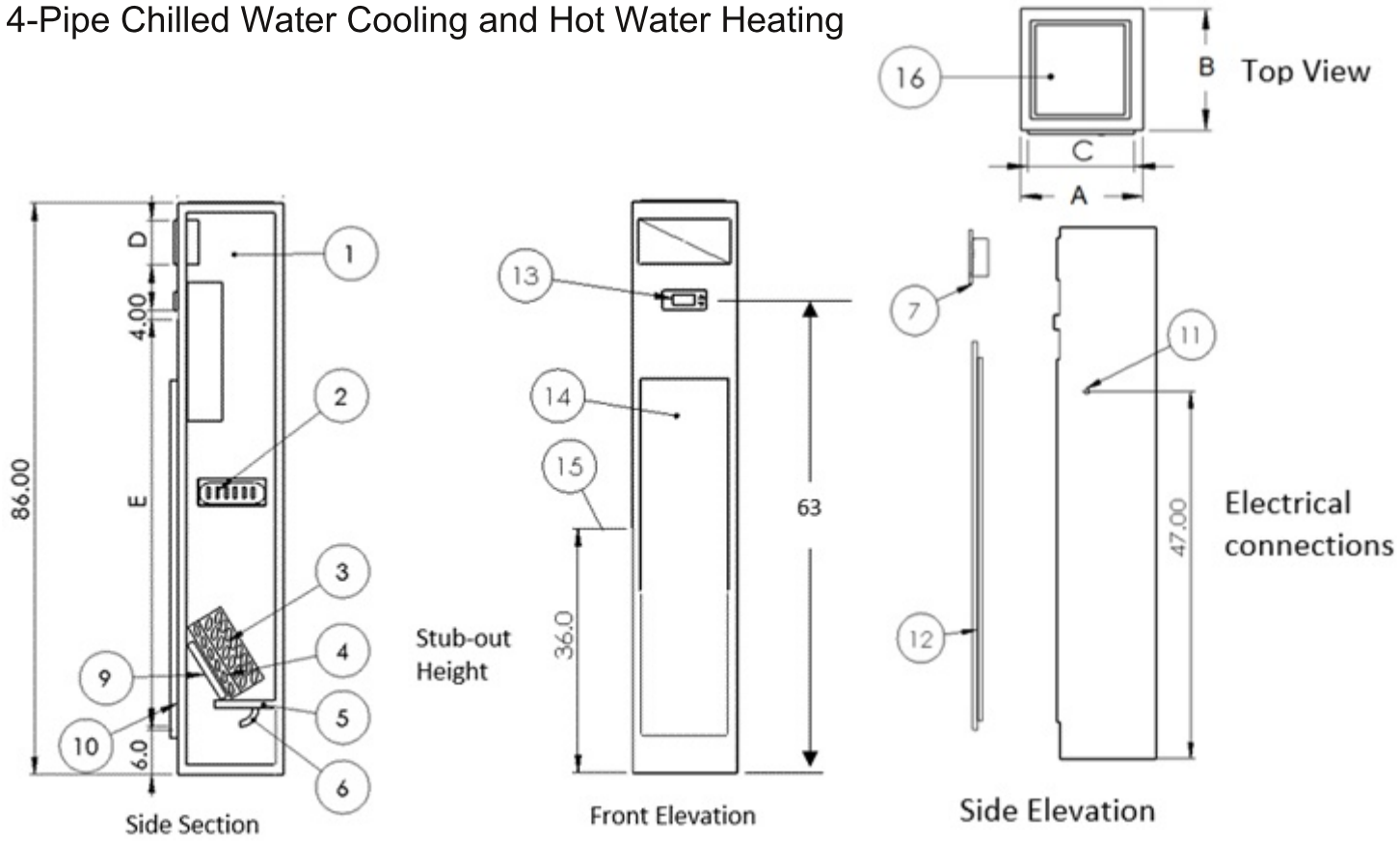


Model	A	B	C	D	E
03	16"	16"	12"	see note 7	52"
04	16"	16"	12"	see note 7	52"
06	20"	18"	14"	see note 7	52"
08	20"	18"	14"	see note 7	52"
10	24"	18"	16"	see note 7	54"
12	24"	18"	16"	see note 7	54"

1/ 20 ga steel cabinet lined with 1" fiberglass insulation coated on the air side, 1/2" closed cell insulation optional	9/ 1" (one inch) MERV 10 disposable filter, MERV 13 optional
2/ Electric Heater (Primary or Auxillary)	10/ 1/2" flange on front of unit allows direct application of drywall to unit
3/ Variable Speed EC motor, backward inclined fan (0-10VDC Fan Speed Control)	11/ 7/8" hole in each side of cabinet for power
4/ Chilled Water Coil: Hot Water Changeover Optional	12/ Hinged return air/access panel
5/ Drain pan - acrylic coated galvanized, polymer, or 304 stainless steel. (all dual sloped to drain)	13/ Unit mounting location for thermostat. ADA compliant thermostat must be remote mounted
6/ Drain hose from drain pan to condensate riser Non-kink flexible hose forms a running trap	14/ Motor cover panel, acoustically lined. Identification, electrical schematic, and safety/caution labels are affixed to this panel
7/ Double deflection steel supply air grille at front, left, back, or any combination when there are multiple openings. Dimension D varies with airflow volume: 5", 8" 10" 12" or 14"	15/ Vertical centerline of coil connection run outs. Connections are the back, left or right sides of the unit
	16/ Top supply air opening, (knock out), for attachment of ductwork

Concealed Fan Coil Unit Dimensions

4-Pipe Chilled Water Cooling and Hot Water Heating



Model	A	B	C	D	E
03	16"	16"	12"	see note 7	52"
04	16"	16"	12"	see note 7	52"
06	20"	18"	14"	see note 7	52"
08	20"	18"	14"	see note 7	52"
10	24"	18"	16"	see note 7	54"
12	24"	18"	16"	see note 7	54"

1/ 20 ga steel cabinet lined with 1" fiberglass insulation coated on the air side, 1/2" closed cell insulation optional	9/ 1" (one inch) MERV 10 disposable filter, MERV 13 optional
2/ Variable Speed EC motor, backward inclined fan (0-10VDC Fan Speed Control)	10/ 1/2" flange on front of unit allows direct application application of drywall to unit
3/ Chilled Water Coil	11/ 7/8" hole in each side of cabinet for power
4/ Hot Water Coil	12/ Hinged return air/access panel
5/ Drain pan - acrylic coated galvanized, polymer, or 304 stainless steel. (all dual sloped to drain)	13/ Unit mounting location for thermostat. ADA compliant thermostat must be remote mounted
6/ Drain hose from drain pan to condensate riser Non-kink flexible hose forms a running trap	14/ Motor cover panel, acoustically lined. Identification, electrical schematic, and safety/caution labels are affixed to this panel
7/ Double deflection steel supply air grille at front, left, back, or any combination when there are multiple openings. Dimension D varies with airflow volume: 5", 8" 10" 12" or 14"	15/ Vertical centerline of coil connection run outs. Connections are the back , left or right sides of the unit
	16/ Top supply air opening, (knock out), for attachment of ductwork

Finished Cabinet Fan Coil

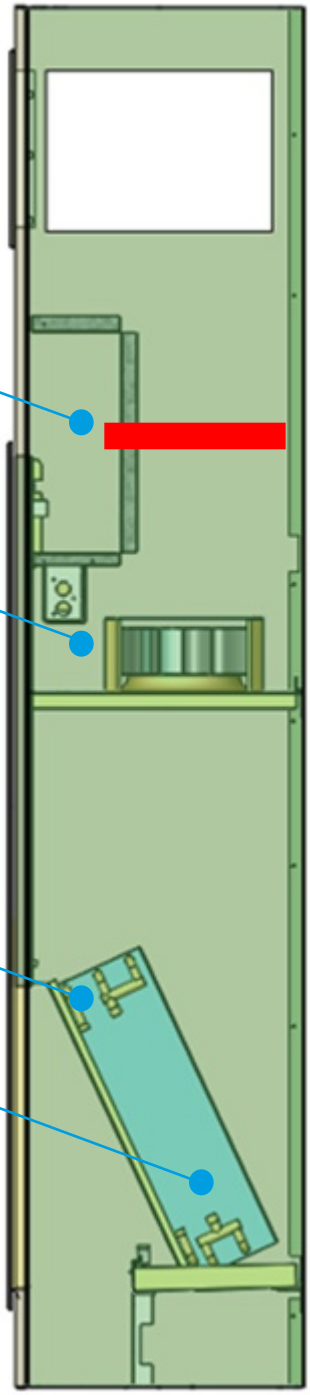
18 ga painted enamel steel cabinet
3 standard colors w/custom color option
1" acoustic insulation or 1/2" closed cell

Optional electric heater (primary auxillary heat)

Variable speed backward inclined impellar fan with ECM

Factory installed piping package, 2-way, 3-way, 6-way valve w/ 2-position or modulating control

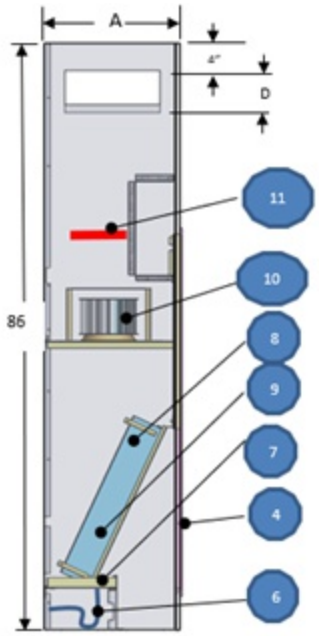
CH/HW coils, 2-pipe or 4-pipe



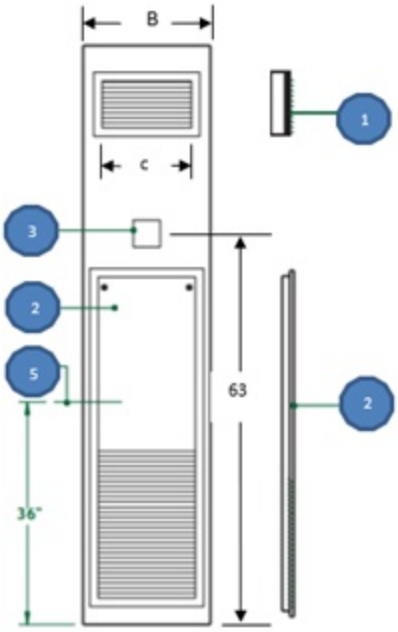
The finished cabiet fan coil is designed for dormatories, army barracks or other spaces where an exposed cabinet is desireable. The unit is constructed of robust 18 gauge steel with durable baked enamel finish. Optional pipe/riser covers and top extensions are availalbe available to provide a finished appearance with no exposed duct work or piping. The thermostat can be unit or remote mounted. Power and control cable entry is through the top of the unit

Finished Cabinet Fan Coil

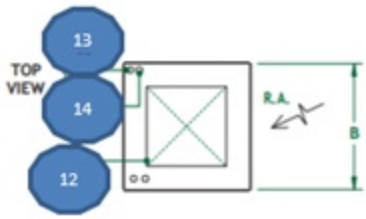
Dimensions



Side Section View



Front Elevation View

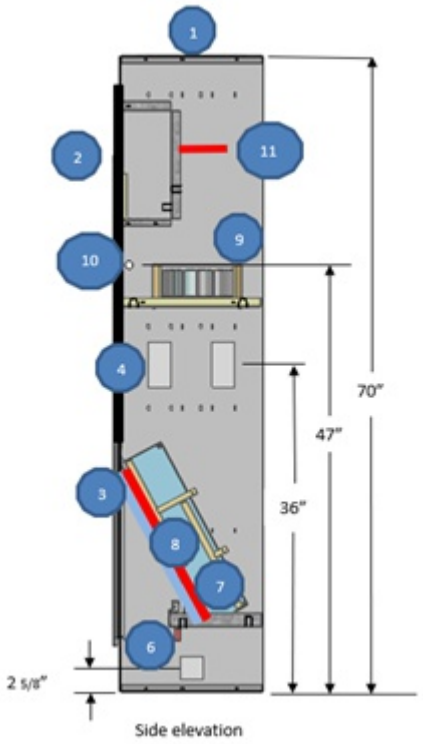


Model	A	B	C	D
03	18"	18"	14"	see note 1
04	18"	18"	14"	see note 1
06	20"	20"	16"	see note 1
08	20"	20"	16"	see note 1
10	20"	24"	18"	see note 1
12	20"	24"	18"	see note 1

1/ Double deflection supply air grilles at front, left, right back or any combination when their are multiple openings Dimension 'D' varies with airflow, 5", 8", 10", or 12"	8/ Chilled water coil (3 or 4 row)
2/ Removeable access panel incorporating return air	9/ Hot water coil (1 or 2 row) in 4-pipe units
3/ Thermostat location when unit mounted. Note: ADA compliant height thermostat must be remote mounted	10/ High efficiency backward inclined impellar fan with variable speed EC motor
4/ 1" MERV 10 disposable filter. MERV 13 optional (see page 31 for size)	11/ Electric heater (primary or auxillary)
5/ Vertical centerline of coil riser connection run outs. Connections can be back, left, or right	12/ Vertical centerline of coil connection run outs. Connections can be back, left, or right
6/ Hose from drain pan to riser. The reinforced non-kink rubber hose forms a running trap	13/ Control cable entry (for remote mounted thermostat) Note: ADA compliant thermostat must be remote mounted
7/ Double sloped drain insulated on under side	14/ Power cable entry point

Compact Unit (top ducted for mechanical closets)

Dimensions



Side elevation

Top Duct Connections Sizes	
Airflow (CFM)	L x W (inches)
300	10" x 10"
400	12" x 12"
600	14" x 14"
800	14" x 14"
1000	16" x 16"
1200	16" x 16"

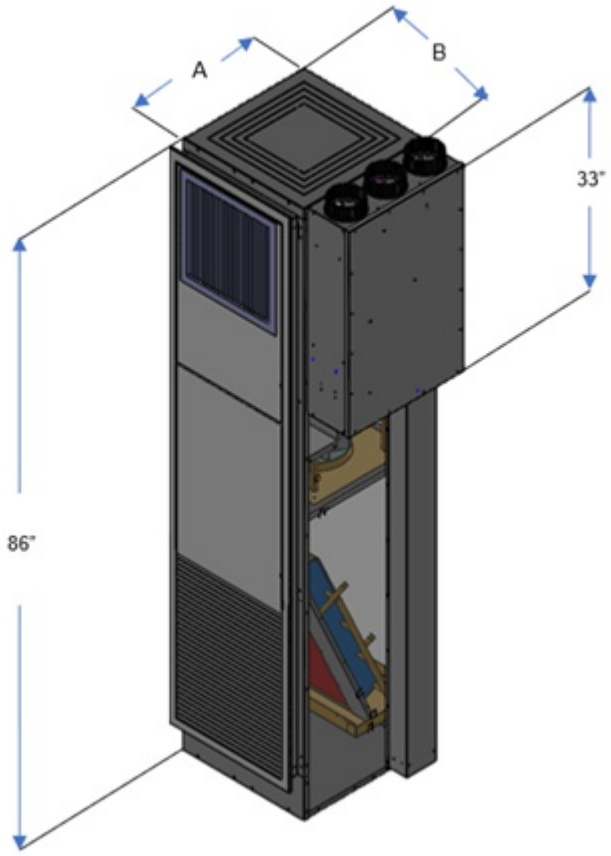
1/ Top supply air opening for attachment of ductwork	6/ Hose from drain pan to riser. The reinforced non-kink rubber hose forms a running trap
2/ Removeable motor/electrical enclosure access panel	7/ Chilled water coil (3 or 4 row)
3/ Thermostat location when unit mounted. Note: ADA	8/ Hot water coil (1 or 2 row) in 4-pipe units
4/ 1" MERV 10 disposable filter. (MERV 13 optional) (see page 31 for size)	9/ High efficiency backward inclined impellar fan with variable speed EC motor
5/ Vertical centerline of coil riser connection run outs. Connections can be back, left, or right	10/ Control and power cable entry, (for remote mounted thermostat) (qty 2 7/8" knockouts located on both sides
	11/ Electric heater (primary or auxillary)

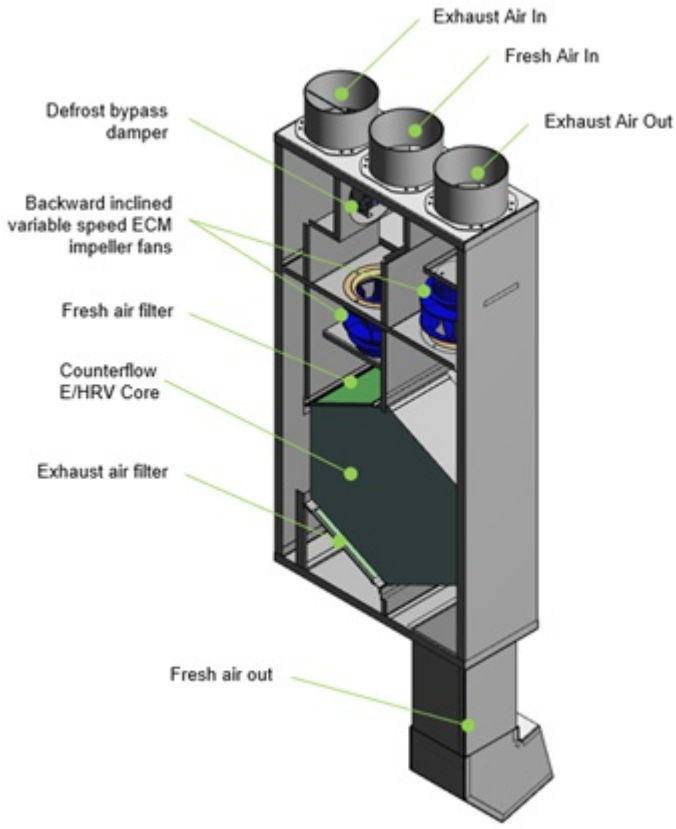
Energy Recovery Fan Coil (Integrated E/HRV)

Dimensions

Temspec continues to push the boundaries of our ultimate quest to achieve zero net energy in hi-rise buildings with our integrated counterflow core energy recovery vertical stacked fan coil unit. With a minimum sensible energy recovery effectiveness, (SRE), of 80% at 60CFM with our HRV, and 65% total energy recovery in our ERV, we lead the industry in both energy recovery modes.

But how much energy is spent recovering this energy? While other manufactures use PSC motors and forward curved fans, Temspec uses backward inclined fans with variable speed EC motors which reduce the energy consumption by 50%. This coupled with our backward inclined supply fan give us the lowest connected fan watts and highest energy recovery effectiveness on todays market.





Model	A	B	Weight (lbs)
03	20"	20"	195
04	20"	20"	205
06	20"	20"	215
08	20"	20"	225
10	20"	24"	255
12	20"	24"	265

System Design Notes:

1/ E/HRV can be mounted on either side or back and can be reversed so exhaust air in and out are reversed

2/ Risers cannot be located on the same face as the E/HRV

3/ Fan coil supply air openings cannot be located on the same side as the risers or E/HRV

4/ Riser stub-out height is 36"

5/ A single point power 7/8" knockout is located on both sides of the unit at 47" high

Note: the E/HRV is inset by 3.0" on size 10-12 cabinet whne mounted on the left or right side

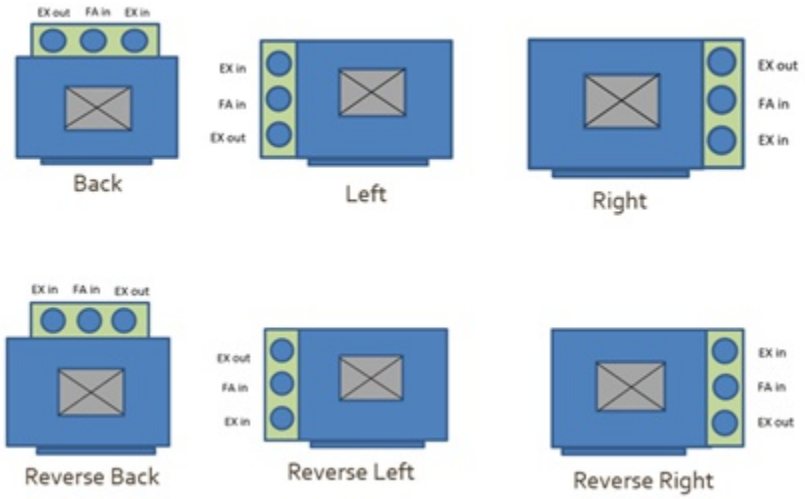
Fan Coil HRV Airflow vs Watts & Effectiveness

Supply Fan Airflow CFM (L/s)	Supply Fan ESP In w.c. (Pa)	Supply Fan Wattage	HRV Fan Airflow CFM (L/s)	HRV Fan ESP In w.c. (Pa)	HRV Fan Wattage	Sensible Effectiveness (SRE)	Total Unit Fan Wattage (HRV and Fan Coil)
Size 03							
300 (142)	0.00 (00)	20W	20 (9)	0.20 (50)	20W	90%	40W
300 (142)	0.20 (50)	35W	20 (9)	0.20 (50)	20W	90%	55W
300 (142)	0.40 (100)	50W	20 (9)	0.20 (50)	20W	90%	70W
Size 04							
400 (189)	0.00 (00)	35W	25 (12)	0.20 (50)	25W	88%	60W
400 (189)	0.20 (50)	60W	25 (12)	0.20 (50)	25W	88%	85W
400 (189)	0.40 (100)	80W	25 (12)	0.20 (50)	25W	88%	105W
Size 06							
600 (283)	0.00 (00)	60W	40 (19)	0.20 (50)	30W	84%	90W
600 (283)	0.20 (50)	90W	40 (19)	0.20 (50)	30W	84%	120W
600 (283)	0.40 (100)	125W	40 (19)	0.20 (50)	30W	84%	155W
Size 08							
800 (376)	0.00 (00)	120W	50 (24)	0.30 (75)	35W	82%	155W
800 (376)	0.20 (50)	155W	50 (24)	0.30 (75)	35W	82%	190W
800 (376)	0.40 (100)	170W	50 (24)	0.30 (75)	35W	82%	205W
Size 10							
1000 (472)	0.00 (00)	190W	60 (28)	0.40 (100)	45W	80%	135W
1000 (472)	0.20 (50)	240W	60 (28)	0.40 (100)	45W	80%	285W
1000 (472)	0.40 (100)	295W	60 (28)	0.40 (100)	45W	80%	340W
Size 12							
1200 (376)	0.00 (00)	325W	60 (28)	0.50 (125)	50W	80%	375W
1200 (376)	0.20 (50)	395W	60 (28)	0.50 (125)	50W	80%	445W
1200 (376)	0.40 (100)	450W	60 (28)	0.50 (125)	50W	80%	500W

Fan Coil ERV Airflow vs Watts & Effectiveness

Supply Fan Airflow CFM (L/s)	Supply Fan ESP In w.c. (Pa)	Supply Fan Wattage	ERV Fan Airflow CFM (L/s)	ERV Fan ESP In w.c. (Pa)	ERV Fan Wattage	Sensible Effectiveness (SRE)	Latent Effectiveness (LRE)	Total Effectiveness	Total Unit Wattage
Size 03									
300 (142)	0.00 (00)	20W	20 (9)	0.20 (50)	20W	85%	77%	80%	40W
300 (142)	0.20 (50)	35W	20 (9)	0.20 (50)	20W	85%	77%	80%	55W
300 (142)	0.40 (100)	50W	20 (9)	0.20 (50)	20W	85%	77%	80%	70W
Size 04									
400 (142)	0.00 (00)	35W	25 (12)	0.20 (50)	25W	82%	73%	76%	60W
400 (142)	0.20 (50)	60W	25 (12)	0.20 (50)	25W	82%	73%	76%	85W
400 (142)	0.40 (100)	80W	25 (12)	0.20 (50)	25W	82%	73%	76%	105W
Size 06									
600 (142)	0.00 (00)	60W	40 (19)	0.20 (50)	30W	76%	64%	69%	90W
600 (142)	0.20 (50)	90W	40 (19)	0.20 (50)	30W	76%	64%	69%	120W
600 (142)	0.40 (100)	125W	40 (19)	0.20 (50)	30W	76%	64%	69%	155W
Size 08									
800 (142)	0.00 (00)	120W	50 (24)	0.30 (75)	35W	73%	60%	65%	155W
800 (142)	0.20 (50)	155W	50 (24)	0.30 (75)	35W	73%	60%	65%	190W
800 (142)	0.40 (100)	170W	50 (24)	0.30 (75)	35W	73%	60%	65%	205W
Size 10									
1000 (142)	0.00 (00)	190W	60 (24)	0.40 (75)	45W	71%	56%	62%	135W
1000 (142)	0.20 (50)	240W	60 (24)	0.40 (75)	45W	71%	56%	62%	285W
1000 (142)	0.40 (100)	295W	60 (24)	0.40 (75)	45W	71%	56%	62%	340W
Size 12									
1200 (142)	0.00 (00)	325W	60 (24)	0.50 (75)	50W	71%	56%	62%	375W
1200 (142)	0.20 (50)	395W	60 (24)	0.50 (75)	50W	71%	56%	62%	445W
1200 (142)	0.40 (100)	450W	60 (24)	0.50 (75)	50W	71%	56%	62%	500W

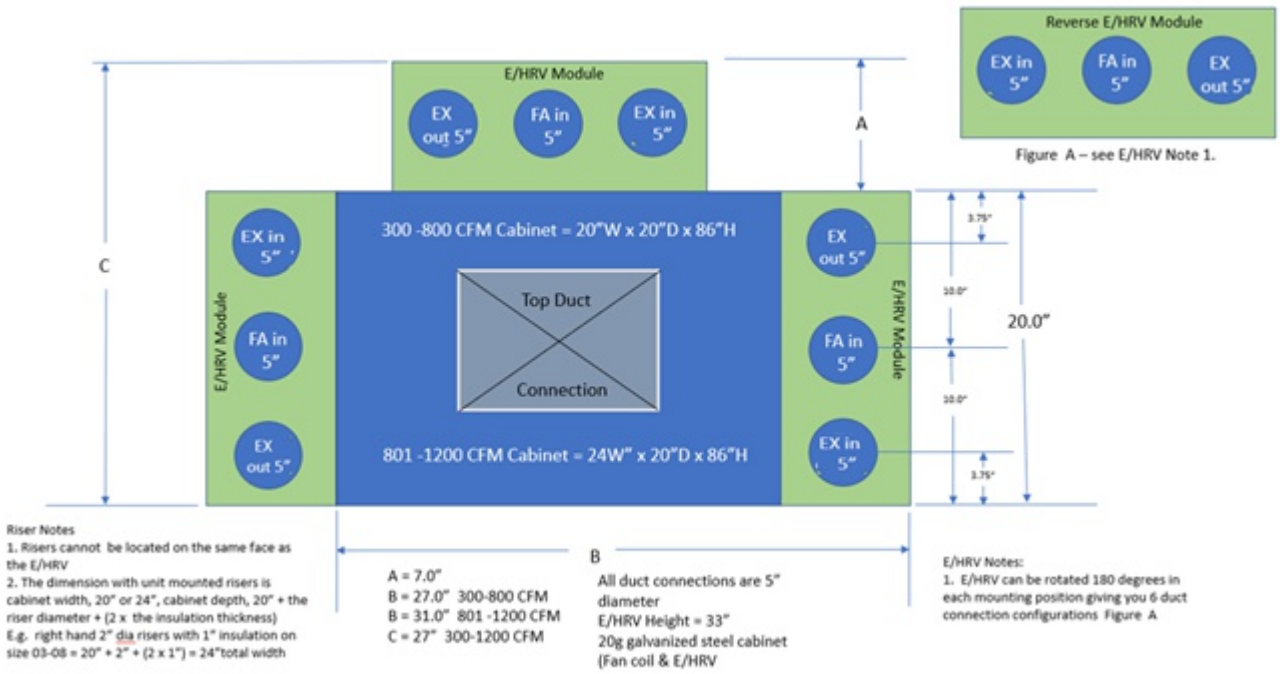
Six E/HRV Orientations for System Design Flexibility



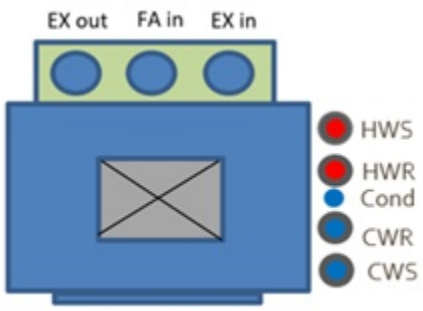
E/HRV may be located back, right or left side and reversed to give 6 possible orientations to facilitate duct connections

Risers may be located on whichever side is not occupied by the E/HRV

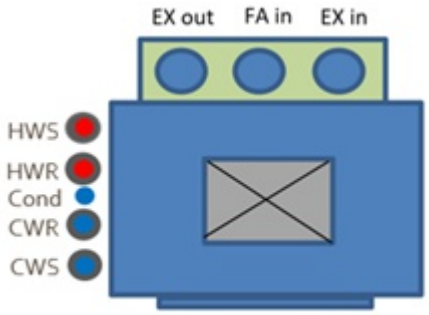
E/HRV Mounting Locations and Duct Connections



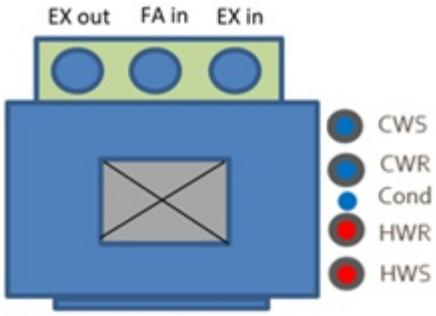
E/HRV & Riser Locations



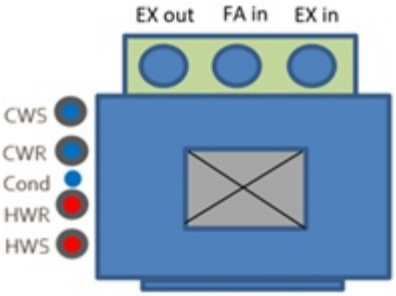
Back E/HRV, Right Riser



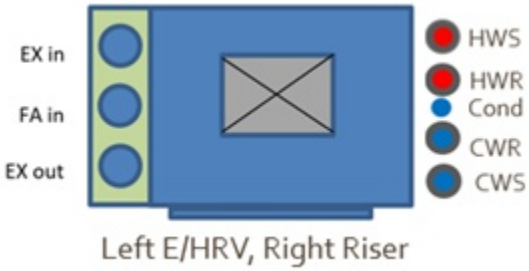
Back E/HRV, Left Riser



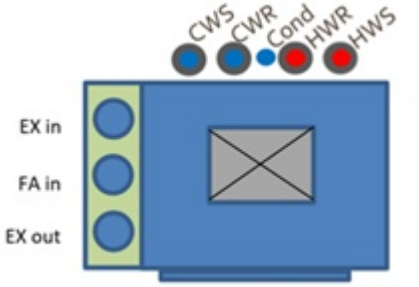
Back E/HRV, Reverse Right Riser



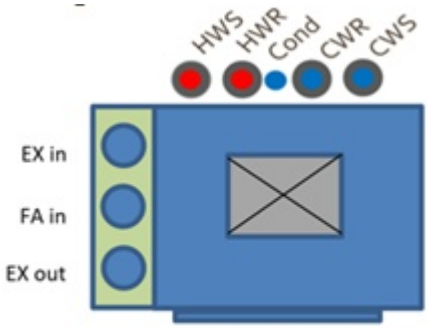
Back E/HRV, Reverse Left Riser



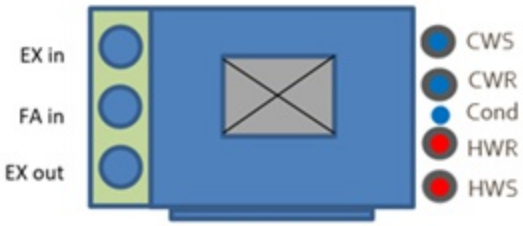
Left E/HRV, Right Riser



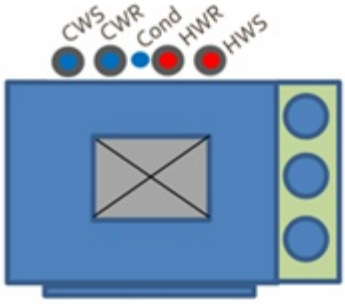
Left E/HRV, Back Riser



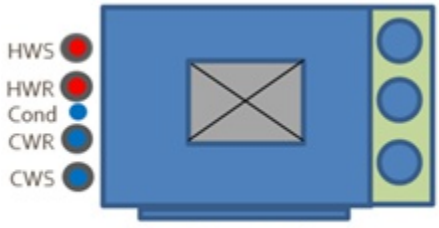
Left E/HRV, Reverse



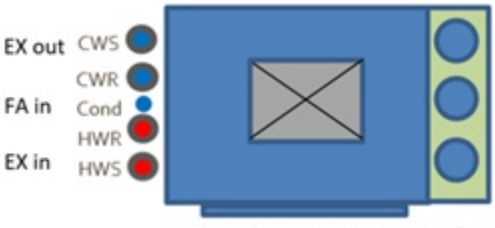
Left E/HRV, Reverse Right Riser



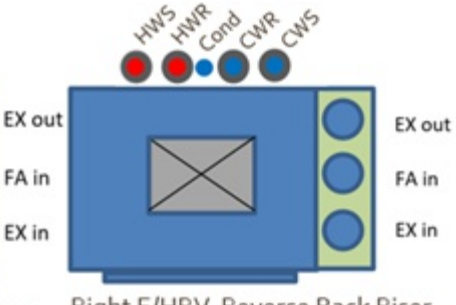
Right E/HRV, Back Riser



Right E/HRV, Left Riser

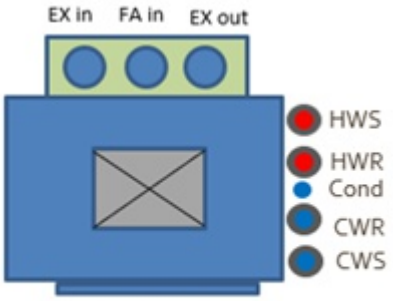


Right E/HRV, Reverse Left Riser

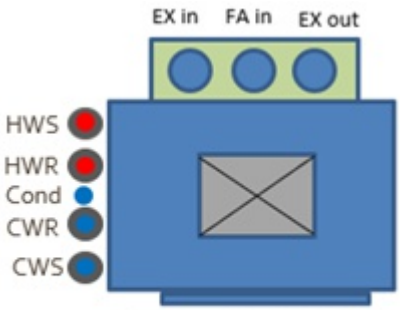


Right E/HRV, Reverse Back Riser

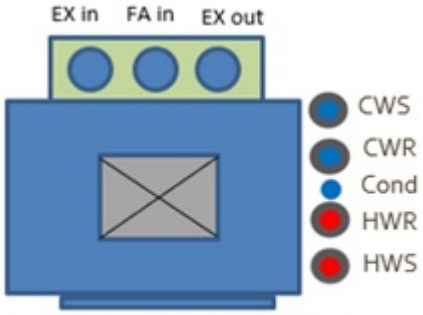
Reverse E/HRV & Riser Locations



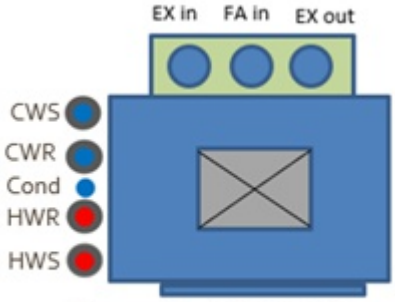
Reverse Back E/HRV, Right Riser



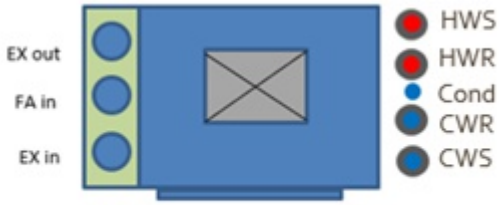
Reverse Back E/HRV, Left Riser



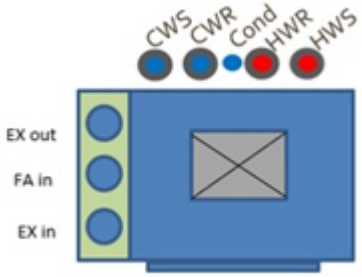
Reverse Back E/HRV, Reverse Right Riser



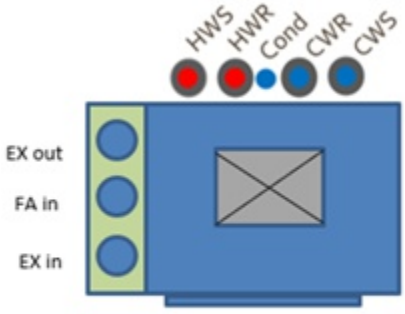
Reverse Back E/HRV, Reverse Left Riser



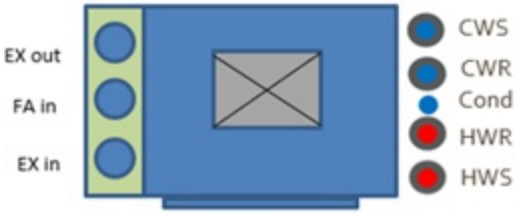
Reverse Left E/HRV, Right Riser



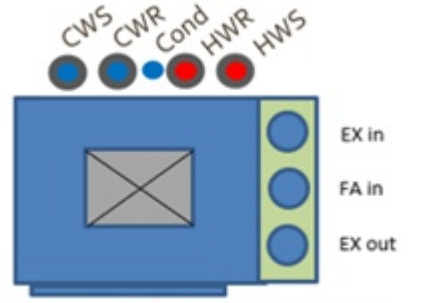
Reverse Left E/HRV, Back Riser



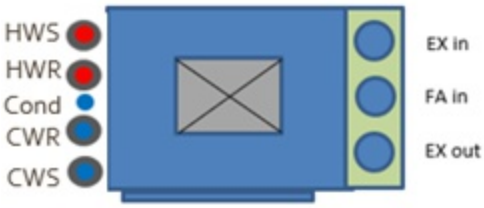
Reverse Left E/HRV, Reverse Back Riser



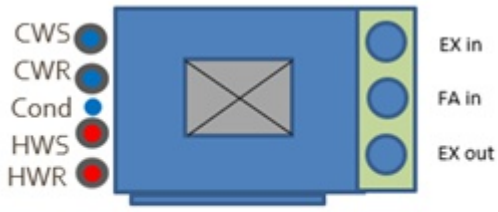
Reverse Left E/HRV, Reverse Right Riser



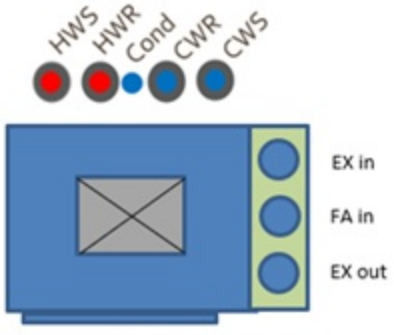
Reverse Right E/HRV, Back Riser



Reverse Right E/HRV, Left Riser



Reverse Right E/HRV, Reverse Left Riser



Reverse Right E/HRV, Reverse Back Riser

Fan Coil with E/HRV Electrical Data

Size	Voltage	FLA	MOP	MCA
03 - 04	120 -1- 60 208-240 - 1 - 60 277 - 1 - 60	2.3 1.7 1.7	15 15 15	2.9 2.1 2.1
06 - 08	120 -1- 60 208-240 - 1 - 60 277 - 1 - 60	3.3 2.4 2.4	15 15 15	4.1 3.0 3.0
10 - 12	120 -1- 60 200-277- 1 - 60	4.0 3.2	15 15	4.1 3.0

E/HRV Physical Data

Dimensions - inches (mm)	33"H x 20"W x 7"D (838mm x 508mm x 178mm)
Weight lbs (kG)	45 lbs (20kG)
Construction	20 gauge galvanized steel
Insulation	1/2" Closed Cell
Filters	MERV 8, Washable Electrostatic
Controls	Digital on board with defrost control, adjustable air flow rates
Sensors	20K OHM Thermisters
Energy Recovery Core	Counterflow washable polymer membrane
Duct Connections	5" Round
Maximum Airflow	125 CFM & 0.5" wc ESP
Exhaust & Fresh Air Fans	133mm Backward Inclined with Variable Speed ECM

HRV Performance (Sensible Recovery Effectiveness, SRE)

Airflow CFM (l/s)	Summer (Cooling)	Winter (Heating)
20 (9.5)	90%	90%
25 (12.0)	88%	88%
30 (14.0)	86%	86%
40 (19.0)	84%	84%
50 (23.5)	82%	82%
60 (28.5)	80%	80%
70 (33.0)	79%	79%
80 (38.0)	78%	78%
90 (42.5)	77%	77%
100 (47.0)	76%	76%

ERV Performance (Sensible & Latent Recovery Effectiveness)

Airflow CFM (l/s)	Summer Sensible (SRE)	Summer Latent (LRE)	Winter Sensible (SRE)	Winter Latent (LRE)	Total Effectiveness
20 (9.5)	85%	77%	85%	77%	80%
25 (12.0)	82%	73%	82%	73%	76%
30 (14.0)	80%	69%	80%	69%	73%
40 (19.0)	76%	64%	76%	64%	69%
50 (23.5)	73%	60%	73%	60%	66%
60 (28.5)	71%	56%	71%	56%	62%
70 (33.0)	69%	54%	69%	54%	59%
80 (38.0)	67%	51%	67%	51%	57%
90 (42.5)	65%	49%	65%	49%	55%
100 (47.0)	64%	47%	64%	47%	53%

Supply Air Opening Dimensions

Supply Air Openings (Non Ducted Units)

Unit Size/Type	Single (any one side)	Double (any two sides)	Triple (any three sides)
03 Concealed cabinet	12" x 12"	12" x 6"	12" x 6"
04 Concealed cabinet	12" x 12"	12" x 6"	12" x 6"
06 Concealed cabinet	14" x 12"	14" x 8"	14" x 5"
08 Concealed cabinet	14" x 14"	14" x 8"	14" x 8"
06 Finished cabinet	16" x 12" (front or back) 14" x 12" (left or right)	16" x 8" (front or back) 14" x 8" (left or right)	16" x 5" (front or back) 14" x 5" (left or right)
08 Finished cabinet	16" x 14" (front or back) 14" x 14" (left or right)	16" x 8" (front or back) 14" x 8" (left or right)	16" x 8" (front or back) 14" x 8" (left or right)
10 All cabinets	16" x 14" (front or back) 14" x 14" (left or right)	16" x 10" (front or back) 14" x 10" (left or right)	16" x 8" (front or back) 14" x 8" (left or right)
12 All cabinets	16" x 14" (front or back) 14" x 14" (left or right)	16" x 12" (front or back) 14" x 12" (left or right)	16" x 10" (front or back) 14" x 10" (left or right)
	One grille provided	One grille & one register provided	One grille & two registers provided

Note: E/HRV units can have only 2 openings in addition to the top

Supply Air Openings (Ducted Units)

Unit Size	100% Top Ducted	One on Unit & Top Duct		** Two on Unit & Top Duct		Three on Unit & Top Duct	
		Register	Duct Connection	Register	Duct Connection	Register	Duct Connection
03*	10" x 10"	12" x 6"	10" x 10"	12" x 6"	10" x 10"	12" x 6"	10" x 10"
04	12" x 10"	12" x 6"	10" x 10"	12" x 6"	12" x 10"	12" x 6"	10" x 10"
06	14" x 14"	16" x 8" (front/ back) 14" x 8" (left/right)	12" x 12"	16" x 5" (front/ back) 14" x 5" (left/right)	10" x 10"	16" x 5" (front/ back) 14" x 5" (left/right)	10" x 10"
08	14" x 14"	16" x 8" (front/ back) 14" x 8" (left/right)	12" x 12"	16" x 8" (front/ back) 14" x 8" (left/right)	12" x 12"	16" x 5" (front/ back) 14" x 5" (left/right)	10" x 10"
10	16" x 16"	16" x 8" (front/ back) 14" x 8" (left/right)	14" x 14"	16" x 8" (front/ back) 14" x 8" (left/right)	12" x 12"	16" x 8" (front/ back) 14" x 8" (left/right)	12" x 12"
12	16" x 16"	16" x 8" (front/ back) 14" x 8" (left/right)	14" x 14"	16" x 10" (front/ back) 14" x 10" (left/right)	12" x 12"	16" x 8" (front/ back) 14" x 8" (left/right)	12" x 12"

Notes: 1/ *E/HRV size 03 top supply air opening is 12" x 12"
2/ **Maximum two unit mounted supply air openings on E/HRV unit (risers and E/HRV occupy one side each)

Utilizing Low Temperature Heating Water from Air to Air Energy Recovery Heat Pumps with 6-way Valves

As we enter the new world of decarbonization and next generation A2L refrigerants (R32 and R464B), future proofing our mechanical systems can be a challenge.

A2L refrigerants, mildly flammable with a GWP of less than 750, are only a stepping stone to the next step which will be A3 or flammable refrigerants such as propane (R290)

Obviously we can't have flammable refrigerants inside buildings so it will reside outside the building and a refrigerant to water heat exchanger will make water the medium to transfer energy inside the building

The challenge with using air to air heat pumps in heating dominate climates is the heating water temperature can be as low as 105F in ambient temperatures of -13F (-25C)

2-pipe change-over systems are ideal for heating with low temperature water but a 4-pipe system is often needed to provide similtaneous heating and cooling.

One solution is use a 6-way control valve which has 2 ports connected to the heating supply and return, 2 ports connected to cooling supply and return, and 2 ports connected to the coil. Fig. 1, 2, and 3.

Since the coil is selected for cooling performance, the higher flow rate and greater heat transfer surface area delivers ample heat energy to supply your space at +90F supply air temperature to meet your heating load Fig. 3

An alternative to using a 6-way valve is to use four 2-way valves Fig. 4

Fig. 1 6-way control valve used in 4-pipe heating and cooling systems with 2-pipe coil

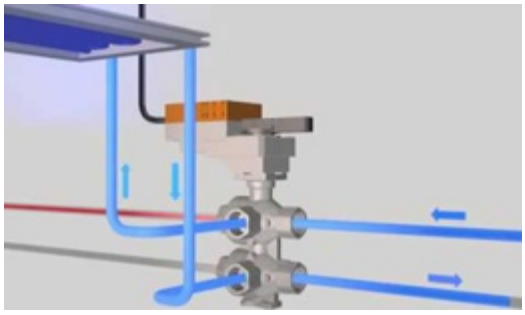


Fig. 2 6-way control valve in 4-pipe system with 2 pipe coil operating in cooling mode

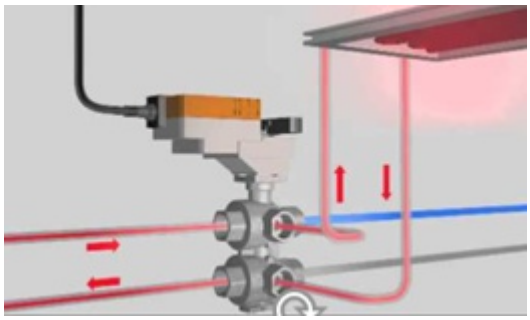


Fig. 3 6-way control valve in 4-pipe system with 2-pipe coil operating in heating mode

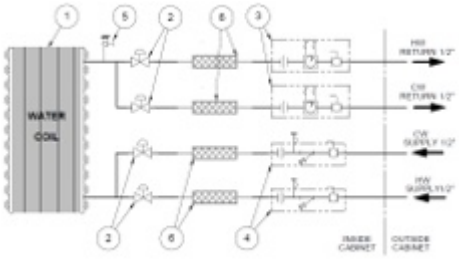


Fig. 4 Four 2-way control valves in 4-pipe system with 2-pipe coil

Riser Packages

Factory and Field Installed Risers

Insulated risers are available factory-installed on the units or can be shipped with or prior to the units for field installation. Isolation ball valves (sweat) are included with factory risers.

All copper risers can be cut to a maximum 120" length. Swaged connections for all supply and return risers are standard. All Insulation options meet or exceed flamability classification UL94. Insulation to cover swaged connections must be field supplied.

Riser Selection Notes

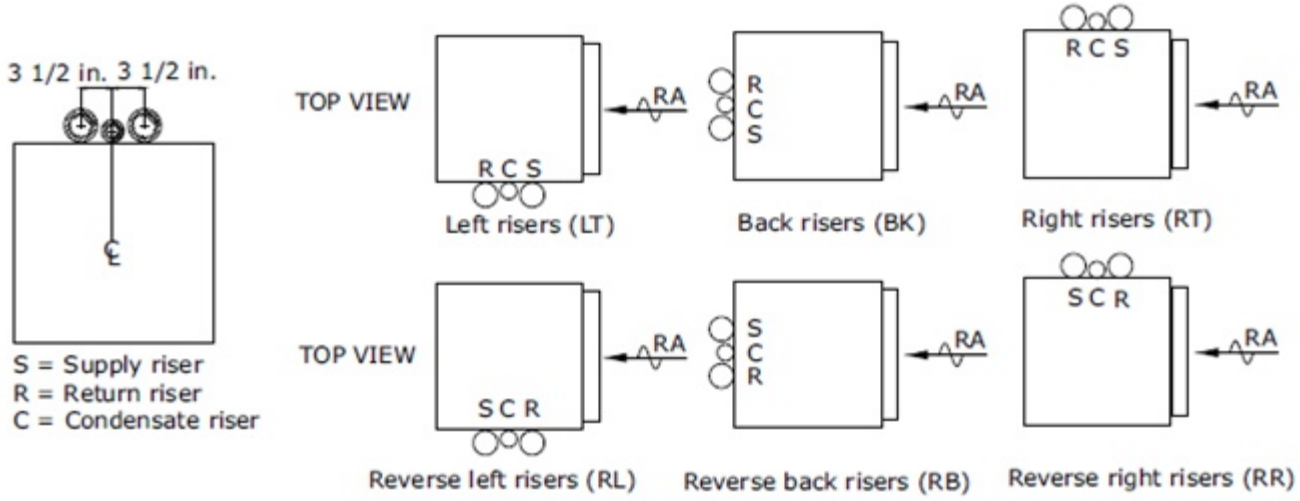
1/ Supply and return risers are type "L" copper in nominal 3/4", 1.0", 1.25", 1.5", 2.0", 2.5" and 3.0" diameters with 1/2" to 1.5" insulation factory installed flexible closed cell or glass fiber insulation.

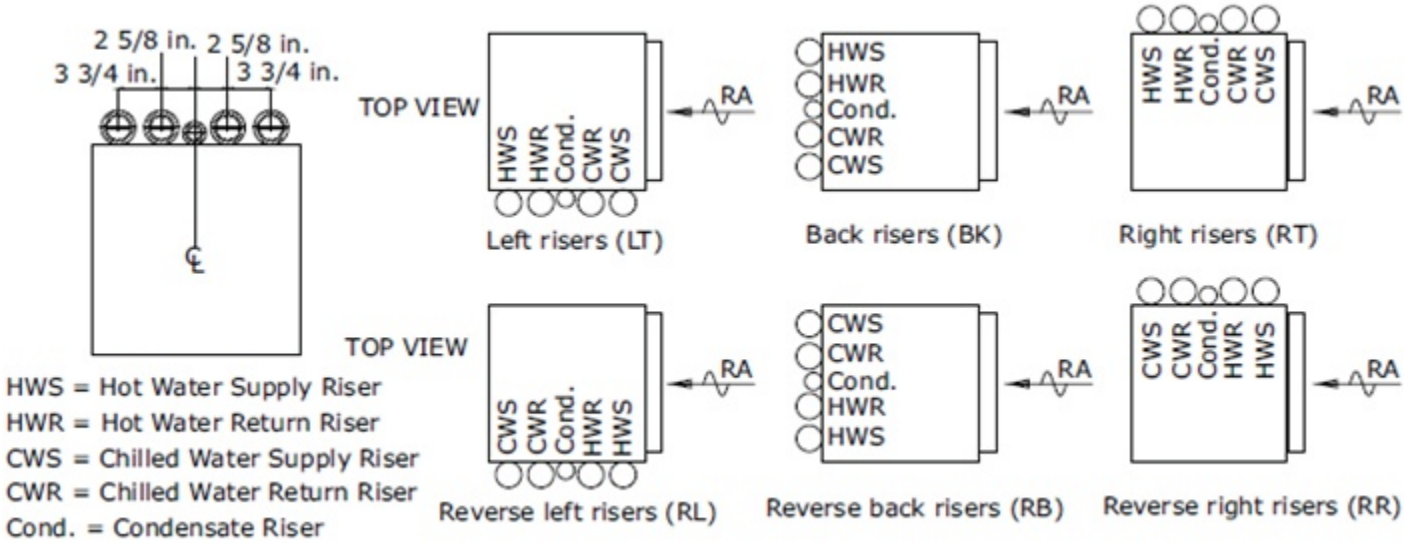
2/ Insulation within cabinet height is standard. Full riser length insulaiton is an option.

3/ Condensate drain risers are type "M" copper, in nominal 3/4", 1.0" or 1.25" diameter.

4/ Optional "L" or "K" type copper is available.

5/ Insulation thicknss is limited on larger diameter risers due to physical space limitations in riser spacing - consult factory on riser selections over 2" diameter.





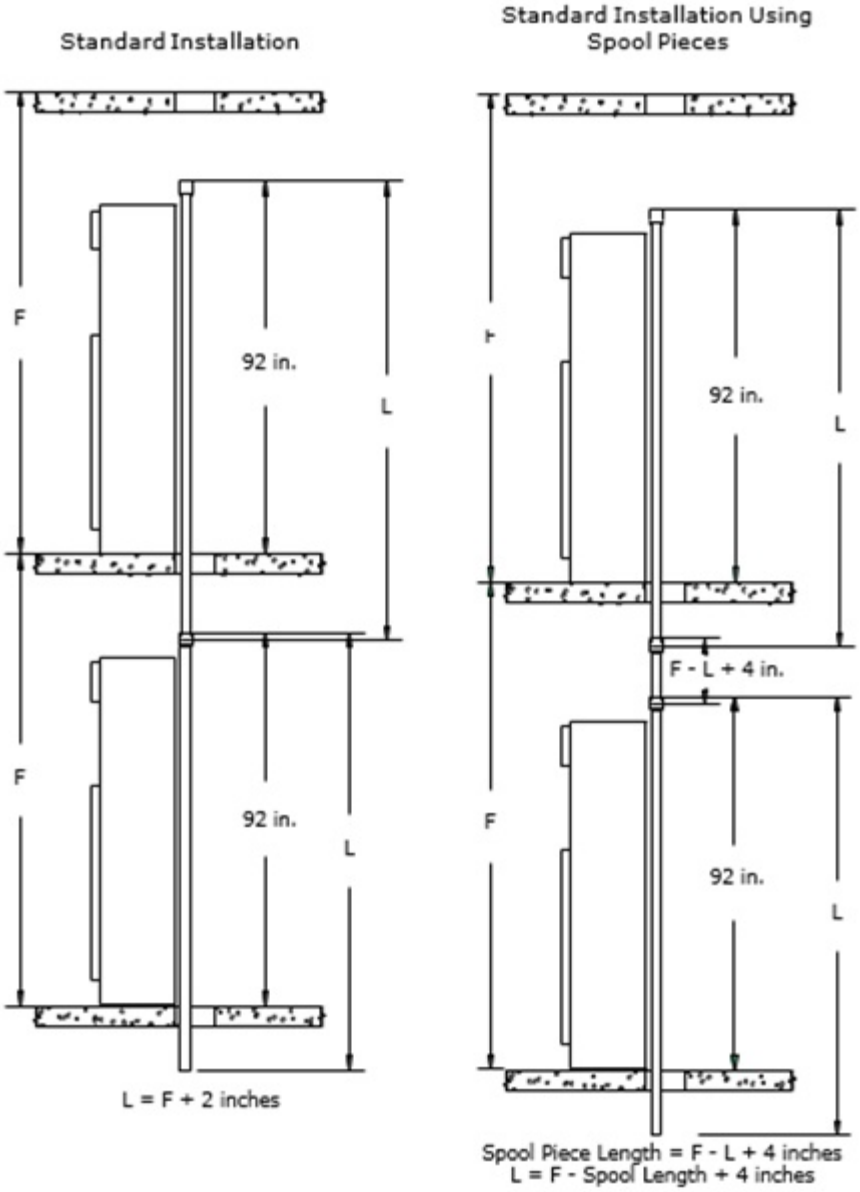
Riser Packages Con't

Reverse riser orientations are used to aid in eliminating cross-over piping when units on a riser stack change position from floor to floor or when two units are positioned back to back, primary/secondary.

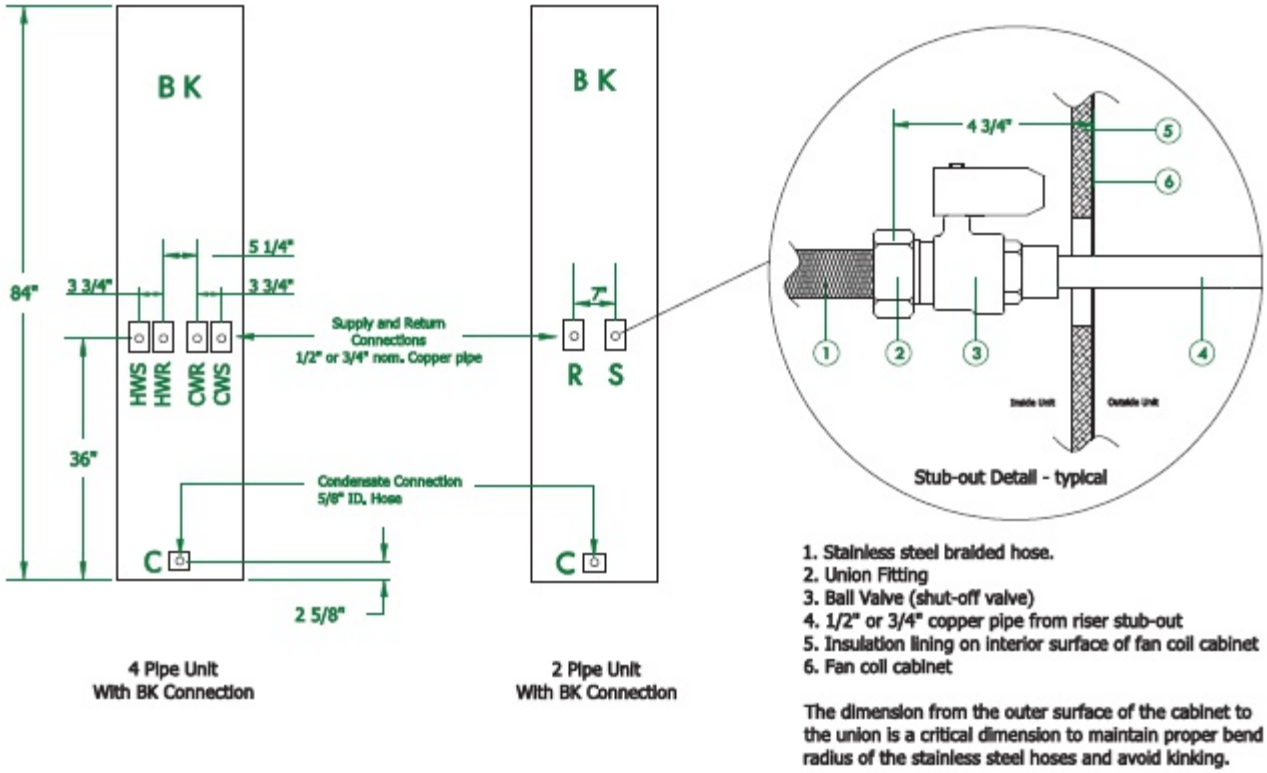
Risers lengths are always sized based floor-to-floor height, (top of slab to top of slab) to ensure the proper assembly. The top of the riser should always be be positioned at a distance of 92" from the floor, (6" above the unit). Then, using the equation L = F + 2" to allow for 2" of insertion into the swage connection at the top of the riser.

Using the 92" height for installation allows the riser to be installed correctly on all floors, even when access to stub-out heights is not practical

In cases where the floor-to-floor height is greater than the maximum riser length of 120", a spool piece can be added to make up the extra height needed.



Fan Coil Units Without Risers



Riser Thermal Expansion

Anchoring risers subject to therml expansion and contraction in hi-rise HVAC systems must be considered by the Design Engineer. Copper pipe expands or contracts at a rate of 1.2" (30.5mm) per 100ft (30.5m) per 100F (38C). Operating heating systems at lower temperatures, <140F, (60C), reduce both the expansion system volume and linear expansion requirements and reduces the thermal stress on all components. The thermal expansion of a riser system operating at 160 F in a 20 story building will be 2.4".

Fig. 5 illustrates a horizontal expansion loop while Fig. 6 illustrates an in-line system. Fig. 7.0 illustrates a full floating system which has popularity because there are no additional potentional failure components that could cause leaks introduced to the piping system.

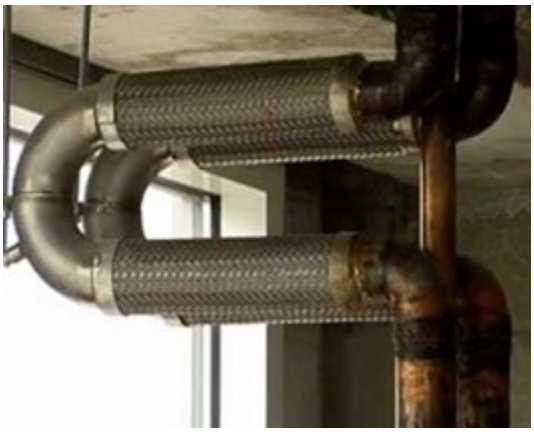


Fig. 5 Horizontal Expansion Loop

Fig. 6 In-line Rubber or Stainless Steel Thermal expansion compensators

Riser Thermal Expansion Con't

Fig. 7 Full Floating Riser using Spring Isolation

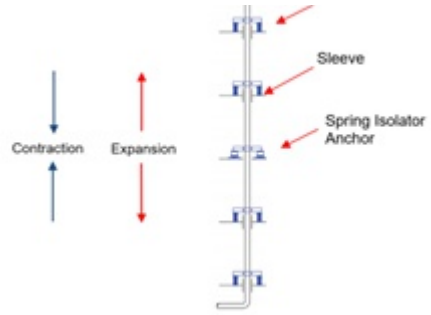
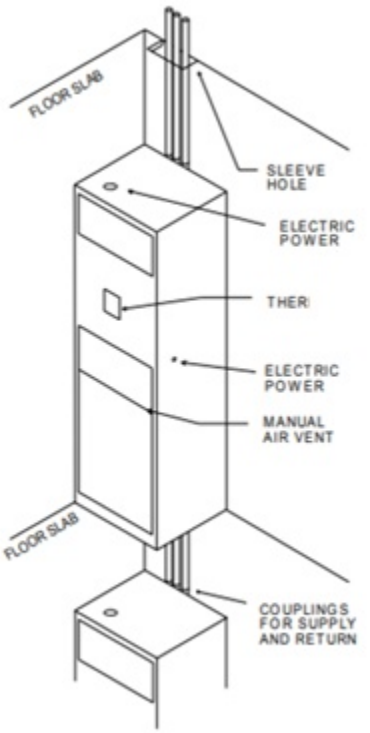
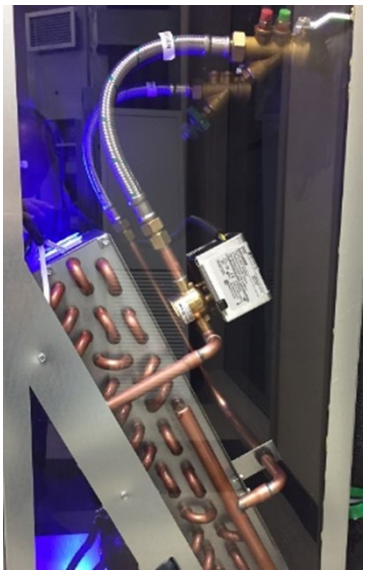


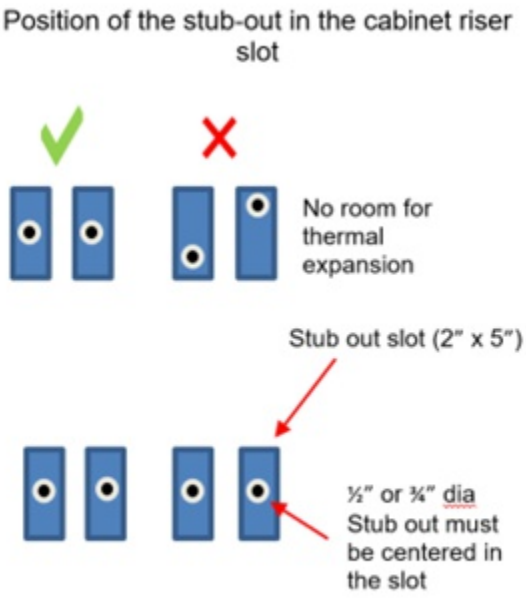
Fig. 8 The Spring Isolator Deflection is selected to meet the thermal expansion measurement at the anchor point

Thermal Expansion in V-Stack Fan Coil Units



Stainless steel braided hoses inside the cabinet allow thermal expansion of the riser system

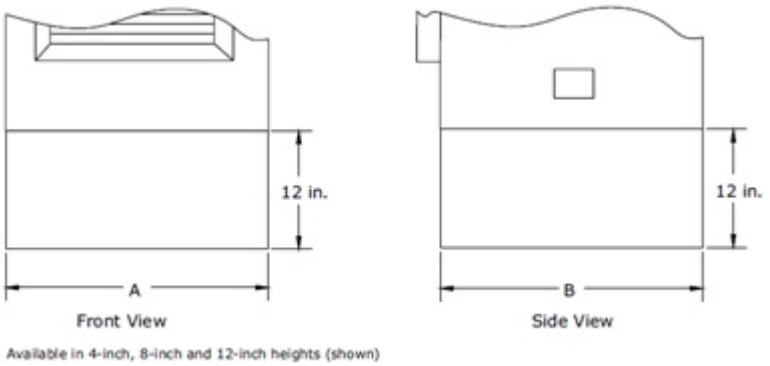




Notes:

Temspec Inc. does not design or take responsibility for riser supports, riser anchoring, linear thermal expansion compensators, system volume expansion, or fire stop between floors or adjacent spaces suites. Regardless of the thermal expansion device used in the riser piping, it is imperative that the riser stub-outs be centered in the cabinet stub-out slot at room temperature as shown. Failure to do so could lead to the stub-outs shearing off causing water damage

Raised Base Options



Available in 4-inch, 8-inch and 12-inch heights (shown)

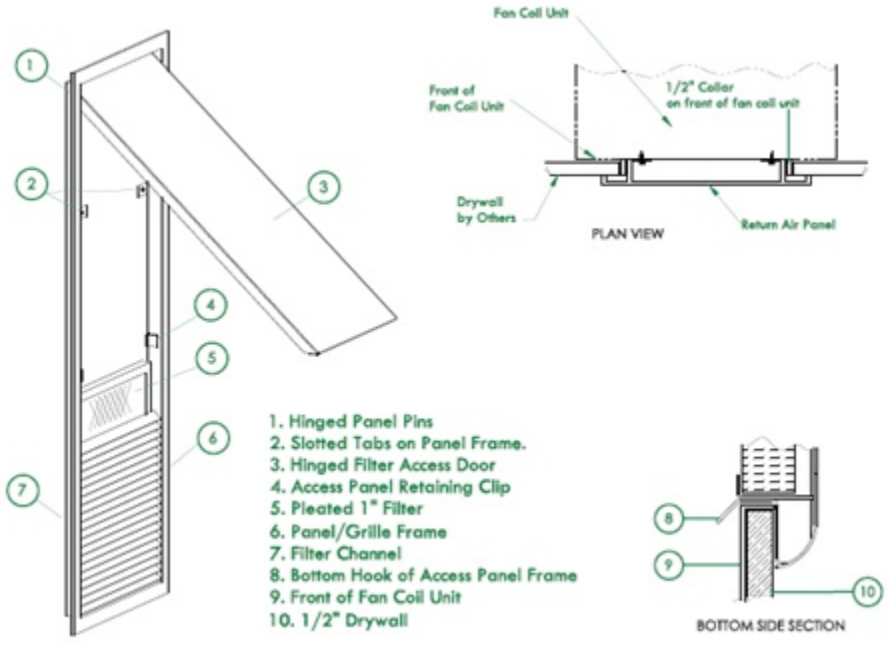
A raised base may be considered when:
1/ A high baseboard is specified by the architect
2/ A condensate pump is required (8" or 12" base needed)
3/ The building has a higher slab to slab height
4/ The existing riser stub-out height is greater than 36.0"

Raised Base Dimensions (inches)

Model (Unit Size)	A	B	C
03	16	16	4, 8 or 12
04	16	16	4, 8 or 12
06	20	18	4, 8 or 12
08	20	18	4, 8 or 12
10	24	18	4, 8 or 12
12	24	18	4, 8 or 12

Return Air Panels

Return Air Panel with Hinged Filter Access



Contact our applications group for return air panel options such as a perimeter panel or full face panel for retrofit applications

Fan Coil Weights

Model (Unit Size)	Concealed Cabinet	Finished Cabinet	E/HRV Cabinet
03	130lbs (59kg)	141lbs (64kg)	186lbs (84kg)
04	130lbs (59kg)	141lbs (64kg)	186lbs (84kg)
06	170lbs (77kg)	182lbs (84kg)	227lbs (103kg)
08	180lbs (82kg)	190lbs (86kg)	227lbs (103kg)
10	210lbs (95kg)	221lbs (100kg)	255lbs (116kg)
12	220lbs (100kg)	230lbs (104kg)	265lbs (120kg)

Note: Weights are approximate and do not includes risers and accessories

Fan Coil Filter Sizes

Model (Unit Size)	Concealed Cabinet	Finished Cabinet and E/HRV Unit	E/HRV Filters (fresh & exhaust air)
03-04	12" x 20" x 1"	14" x 20" x 1"	6.5" x 6.5"
06-08	14" x 25" x 1"	16" x 25" x 1"	6.5" x 6.5"
10-12	16" x 25" x 1"	16" x 25" x 1"	6.5" x 6.5"

Notes: 1/ Standard Fan Coil filter is MERV 10. MERV 13 available.
2/ E/HRV filter is a washable electrostatic (MERV 8 equivelant)

Humidity Control Without Reheat

One of the advantages of using a variable speed ECM fan is their ability to operate very efficiently at low speeds. The thermostat PI control algorithm slows the fan speed to 20%, (adjustable) as it approaches the temperature setpoint before closing the chilled water valve. The low airflow decreases the coil water temperature which in turn decreases the grains of moisture in the suppy air. The low air velocity of less than 50FPM does not create drafts so there is no discomfort to occupants and the lower SAT offers 71% more dehumidification than a standard fancoil with 3 speed ECM and forward curved fan.

Desciption	Temspec Leaf Fan Coil	Conventional Fan Coil
SAT (Supply Air Temperature)	55F	55F
RAT (Return Air Temperature)	75F	75F
RAH (Return Air Relative Humidity)	60%	60%
Grains of Moisture Removed	78 - 54 = 24	78 - 64 = 14

The Temspec Leaf Fan Coil offers 71% more dehumidification making it an ideal alternative where a conventional reheat strategy is used for humidity control

Retrofit Fan Coil Package

There is no good time to retrofit a hotel suite so minimizing the disruption to guest occupancy is a top concern. Temspec has developed a unique full face panel where the existing unit can be removed and a new high efficiency Leaf fan coil can be installed in a few hours with the new full face panel which covers the old drywall opening. This allows the installation to be completed the same day by avoiding the steps of installing new drywall and paint.

Contact the Temspec applications support team to design the right retrofit solution

Warranty

Replacement parts will be provided at no cost by Temspec in the event a component proved defective in material or workmanship for a period of eighteen, (18) months from date of shipment. Labour to replace the component is covered by the installing contractor. Temspec may request the failed component to be returned for analysis or examination. Any component found to fail due to improper maintenance or operation will not be covered under our warranty program.

Measures to Avoid Non Warranty Claims Are:

1/ Store the fan coil units in a conditioned space protected from dust and moisture while waiting for installation
2/ Keep the unit protected from dust and moisture after installation
3/ Do not operate the fan coil during construction - construction dust can be harmful to motors, filters, and electronic components
4/ Flush the chilled and hot water systems before opening the isolation valves to the units
5/ Operate the unit with treated water only - fresh water may damage piping components
6/ Do not use clorine or amonia-based cleaning products on the fan coils to avoid corrosion
7/ Thoroughly rinse the coil surface and drain pans after cleaning to avoid corrosion
8/ Do not exceed the design operating temperatures of the system
9/ Do not alter the fan coil OEM wiring. Doing so will void the warranty and the ETL listing.

A special note on our backward inclined fan with variable speed ECM warranty record. As of this publishing, Temspec had over 40,000 fans installed with a confirmed failure count of 14 units. This failure rate of 0.000425 % is unparallelled in our industry

Concealed Leaf Fan Coil Specifications

	Model TL-03, 04	Model TL-06, 08	Model TL-10, 12
Dimensions	86"H x 16"W x16"D 2133mmH x 406mmW 406mmD	86"H x 20"W x18"D 2133mmH x 510mmW 457mmD	86"H x 24"W x18"D 2133mmH x 610mmW 457mmD
Airflow	up to 400 CFM (189l/s)	up to 800 CFM (378l/s)	up to 1200 CFM (566l/s)
Max ESP @ Design Airflow	0.2"wc (50pa)	0.4"wc (100pa)	0.4"wc (100pa)
Weight	140lbs (64kg)	170lbs (77kg)	210lbs (95kg)
Cooling	Hydronic		
Heating	Hydronic, electric		
Construction	20 gauge galvanized sheet metal		
Insulation	1" glass fiber with acrylic coating or 1/2" closed cell		
Condensate Drain	Polymer or 304 Stainless Steel	Acrylic coated galvanized or 304 Stainless Steel	Acrylic coated galvanized or 304 Stainless Steel
Filter	12" x 20" x 1" MERV 10	14" x 25" x 1" MERV 10 optional MERV 13 available	16" x 25" x 1" MERV 10
Coils	0.0045" aluminum fins mechanically bonded to 1/2" diameter 0.015" copper tube. 18 gauge galvanized steel or optional stainless steel coil casing		
Voltage	100 - 130VAC, 200-240VAC, 277VAC	100 - 130VAC, 200-240VAC, 277VAC	100 - 130VAC, 200- 277VAC
Disconnect Switch	Included		
Piping Packages	shut-off valve, strainer, manual or autoflow balancing valve, modulating, 2-position, 6-way or pressure independant control valve, stainless steel braided hoses		
Control Valve	24VAC 2-way, 3-way, 6-way, 2-position, 0-10 modulating, floating point control		
Fresh Air Opening	Optional: 4"H x 6"W, manual or motorized 2-position damper (for freeze protection)		
Raised Bases	Optional: 4.0" high, 8.0" high, or 12.0" high		
Condensate Pump	Optional: 8.0" or 12.0" raised base required, 20ft lift, 120-240VAC		
Supply Fan & Motor	Backward inclined impeller fan with variable speed ECM		
Operating Temp	-25C to +60C, (-13F to +140F)		
Fan Speed Control Input	0-10VDC		
ECM Output	0-10VDC, 10ma		
Soft Start	Standard		
Motor Current Limit	Standard		
Power Limiter	Standard		
Thermal Overload Protection	Standard		
Under Voltage Protection	Standard		
Integrated PID Controller	Standard		
Riser Insulation	0.5" to 1.5" fiberglass, polyolefin, elastomeric K-flex, Armaflex (thickness restriction bases on riser diameter - contact factory)		

Finished Cabinet Leaf Fan Coil Specifications

	Model TF-03, 04	Model TF-06, 08	Model TF-10, 12
Dimensions	86"H x 18"W x18"D 2133mmH x 458mmW 460mmD	86"H x 20"W 20"D 2133mmH x 510mmW 510mmD	86"H x 24"W x20"D 2133mmH x 610mmW 510mmD
Airflow	up to 400CFM (189l/s)		
Max ESP @ Design Airflow	0.2"wc (50pa)	0.4"wc (100pa)	0.4"wc (100pa)
Weight	145lbs (61kg)	170lbs (73kg)	205lbs (88kg)
Cooling	Hydronic		
Heating	Hydronic, electric		
Construction	18 gauge sheet metal with baked enamel finish		
Insulation	1" glass fiber with acrylic coating or 1/2" closed cell		
Condensate Drain	Polymer or 304 Stainless Steel	Acrylic coated galvanized or 304 Stainless Steel	Acrylic coated galvanized or 304 Stainless Steel
Filter	12" x 20" x 1" MERV 10	14" x 25" x 1" MERV 10 optional MERV 13 available	16" x 25" x 1" MERV 10
Coils	0.0045" aluminum fins mechanically bonded to 1/2" diameter 0.016" copper tube. 18 gauge galvanized steel or optional stainless steel coil casing		
Voltage	100 - 130VAC, 200-240VAC, 277VAC	100 - 130VAC, 200-240VAC, 277VAC	100 - 130VAC, 200- 277VAC
Disconnect Switch	Included		
Piping Packages	shut-off valve, strainer, manual or autoflow balancing valve, modulating, 2-position, 6-way or pressure independant control valve, stainless steel braided hoses		
Control Valve	24VAC 2-way, 3-way, 6-way, 2-position, 0-10VDC modulating, floating point		
Fresh Air Opening	Optional: 4"H x 6"W, manual or motorized 2-position damper (for freeze protection)		
Raised Bases	Optional: 4.0" high, 8.0" high, or 12.0" high		
Condensate Pump	Optional: 8.0" or 12.0" raised base required, 20ft lift, 120-240VAC		
Supply Fan & Motor	Backward inclined impeller fan with variable speed ECM		
Operating Temp	-25C to +60C, (-13F to +140F)		
Fan Speed Control Input	0-10VDC		
ECM Output	10VDC, 10ma		
Soft Start	Standard		
Motor Current Limit	Standard		
Power Limiter	Standard		
Thermal Overload Protection	Standard		
Under Voltage Protection	Standard		
Integrated PID Controller	Standard		
Riser Insulation	1/2" to 1.5" fiberglass, polyolefin, elastomeric K-flex, Armaflex (thickness restriction bases on riser diameter - contact factory)		
Architectural Accessories	Contact the factory for architectural accessories like top extensions, pipe covers, side covers, raised bases etc		

Mechanical Closet Fan Coil Specifications

	Model TM-03, 04	Model TM-03, 08	Model TM-10, 12
Dimensions	70"H x 16"W x16"D 1788mmH x 406mmW 406mmD	70"H x 20"W x18"D 1788mmH x 510mmW 457mmD	70"H x 24"W x18"D 1788mmH x 610mmW 457mmD
Airflow	up to 400 CFM (189l/s)	up to 800 CFM (378l/s)	up to 1200 CFM (566l/s)
Max ESP @ Design Airflow	0.2"wc (50pa)	0.4"wc (100pa)	0,4"wc (100pa)
Weight	135lbs (61kg)	160lbs (74kg)	295lbs (88kg)
Cooling	Hydronic		
Heating	Hydronic, electric		
Construction	20 gauge galvanized sheet metal		
Insulation	1" glass fiber with acrylic coating or 1/2" closed cell		
Condensate Drain	Polymer or 304 Stainless Steel	Acrylic coated galvanized or 304 Stainless Steel	Acrylic coated galvanized or 304 Stainless Steel
Filter	12" x 20" x 1" MERV 10 optional MERV 13 available	14" x 25" x 1" MERV 10 optional MERV 13 available	16" x 25" x 1" MERV 10 optional MERV 13 available
Coils	0.0045" aluminum fins mechanically bonded to 1/2" diameter 0.016" copper tube. 18 gauge galvanized steel or optional stainless steel coil casing		
Voltage	100 - 130VAC, 200-240VAC, 277VAC	100 - 130VAC, 200-240VAC, 277VAC	100 - 130VAC, 200- 277VAC
Disconnect Switch	Included		
Piping Packages	shut-off valve, strainer, manual or autoflow balancing valve, modulating, 2-position, 6-way or pressure independant control valve, stainless steel braided hoses		
Control Valve	24VAC 2-way, 3-way, 6-way, 2-position, 0-10 modulating, floating point control		
Fresh Air Opening	Optional: 4"H x 6"W, manual or motorized 2-position damper (for freeze protection)		
Raised Bases	Optional: 4.0" high, 8.0" high, or 12.0" high		
Condensate Pump	Optional: 8.0" or 12.0" raised base required, 20ft lift, 120-240VAC		
Supply fan & motor	Backward inclined impeller fan with variable speed ECM		
Operating temp	-25C to +60C, (-13F to +140F)		
Fan Speed Control Input	0-10VDC		
ECM Output	10VDC, 10ma		
Soft Start	Standard		
Motor Current Limit	Standard		
Power Limiter	Standard		
Thermal Overload Protection	Standard		
Under Voltage Protection	Standard		
Integrated PID Controller	Standard		
Riser Insulation	1/2" to 1.5" fiberglass, polyolefin, elastomeric K-flex, Armaflex (thickness restriction bases on riser diameter - contact factory)		

Energy Recovery Leaf Fan Coil Specifications

	Model TR-03, 04	Model TR-06, 08	Model TR-10, 12
Dimensions	86"H x 20"W x20"D 2133mmH x 510mmW 510mmD	86"H x 20"W x20"D 2133mmH x 510mmW 510mmD	86"H x 24"W x20"D 2133mmH x 610mmW 510mmD
Airflow	up to 800 CFM (189l/s)	up to 800 CFM (189l/s)	up to 1200 CFM (566l/s)
Max ESP @ Design airflow	0.4"wc (100pa)	0.4"wc (100pa)	0.4"wc (100pa)
Weight	210lbs (95kg)	220lbs (100kg)	265lbs (120kg)
Cooling	Hydronic		
Heating	Hydronic, electric		
Construction	20 gauge galvanized sheet metal		
Insulation	1" glass fiber with acrylic coating or 1/2" closed cell		
Condensate Drain		Acrylic coated galvanized or 304 Stainless Steel	Acrylic coated galvanized or 304 Stainless Steel
Filter	14" x 25" x 1" MERV 10 optional MERV 13 available	14" x 25" x 1" MERV 10 optional MERV 13 available	16" x 25" x 1" MERV 10 optional MERV 13 available
Coils	0.0045" aluminum fins mechanically bonded to 1/2" diameter 0.015" copper tube. 18 gauge galvanized steel or optional stainless steel coil casing		
Voltage	100 - 130VAC, 200-240VAC, 277VAC	100 - 130VAC, 200-240VAC, 277VAC	100 - 130VAC, 200- 277VAC
Disconnect Switch	Included		
Piping Packages	shut-off valve, strainer, manual or autoflow balancing valve, modulating, 2-position, 6-way or		
Control Valve	24VAC 2-way, 3-way, 6-way, 2-position, 0-10 modulating, floating point control		
Fresh Air Opening	Optional: 4"H x 6"W, manual or motorized 2-position damper (for freeze protection)		
Raised Bases	Optional: 4.0" high, 8.0" high, or 12.0" high		
Condensate Pump	Optional: 8.0" or 12.0" raised base required, 20ft lift, 120-240VAC		
Supply Fan & Motor	Backward inclined impeller fan with variable speed ECM		
Operating Temp	-25C to +60C, (-13F to +140F)		
Fan Speed Control Input	0-10VDC		
ECM Output	0-10VDC, 10ma		
Soft Start	Standard		
Motor Current Limit	Standard		
Power Limiter	Standard		
Thermal Overload Protection	Standard		
Under Voltage Protection	Standard		
Integrated PID Controller	Standard		
Riser Insulation	1/2" to 1.5" fiberglass, polyolefin, elastomeric K-flex, Armaflex (thickness restriction bases on riser diameter - contact factory)		

Energy Recovery Leaf Fan Coil Specifications Cont'

HRV

Core	Counter flow
Standard Airflow **Boost Airflow**	15 CFM to 100 CFM @ 0.5"wc ESP (adjustable) 50 CFM to 125 CFM @ 0.5"wc ESP (adjustable)
Sensible Recovery Effectiveness (SRE)	81% at 60 CFM
Dimensions	33"H x 20"w x 7"D Note: add 7" to fancoil unit dimension where located - side or back, on the size the small cabinet and add 4" to the dimension where located on the large cabinet
Construction	20 gauge galvanized sheet metal
Insulation	1/2" closed cell
Filters	Electrostatic - washable
Controls	Integrated (digital on board) , optional push button timers
Voltage	Single point power supply (100-130VAC, 200-240 VAC, 277VAC)
Duct Connections	5" diameter (round)
Fans	133mm backward inclined impeller fan with variable speed ECM
Condensate drain pan	Galvanized

ERV

Core	Counter flow
Standard Airflow **Boost Airflow**	15 CFM to 100 CFM @ 0.5"wc ESP (adjustable) 50 CFM to 125 CFM @ 0.5"wc ESP (adjustable)
Sensible Recovery Effectiveness (SRE)	76% at 40 CFM
Latent Recovery Effectiveness (LRE)	64% at 60 CFM
Total Effectiveness	69% at 60 CFM
Dimensions	33"H x 20"w x 7"D Note: add 7" to fancoil unit dimension where located - side or back)
Construction	20 gauge galvanized sheet metal
Insulation	1/2" closed cell
Filters	electrostatic - washable
Controls	integrated (digital on board) , optional push button timers
Voltage	single point power supply to unit (100-130VAC, 200-240 VAC, 277VAC)
Duct Connections	5" diameter (round)
Fans	133mm backward inclined impeller fan with variable speed ECM
Condensate Drain Pan	Galvanized

Leaf Fan Coil Specifications (Guide Spec)

Certifications

Performance: Unit performacne is certified by AHRI in accordance with ANSI/AHRI 440-2019: Performance Rating of Room Fan Coils

Safety: All standard units are agency listed in the United States and Canada and comply with the current additions of UL 1995/C22.2 No. 236

Construction

The cabinets shall be fabricated from 20 gauge glavanized steel lined with 1" fiberglass insulation bonded with a thermosetting resin or grip nails and coated on the airstream side with an acrylic coating rated for 6000FPM velocity. Optional 1/2" closed cell insulation is available

The drain pan shall be 100% corrosion resistant polymer, galvanized acrylic coated steel, or 304 stainless steel, positively sloped in two directions towards the outlet. The stainless steel and acrylic coated galvanized drain pans shall be insulated on the underside with 1/2" closed cell insulation. The drain hose from the outlet to the condensate riser shall be non-kinking type and form a running trap. An optional float switch shall closed the chilled water control valve upon detection of high water level in the condensate drain pan.

Fan & Motor

The fan shall be a backward inclined impeller type with variable speed electronically commutated brushless motor, (ECM). Efficiency, (operating wattage) must not exceed the values listed in the fan coil schedule. Forward curved three-speed fans will not be accepted.

Disconnect

An unfused disconnect switch shall be included, mounted inside the unit behind the motor cover.

Coils

The coil shall have 0.0045" +/- 0.0005" aluminum fins mechancially bonded to 1/2" diameter copper tube with 0.015" tube wall thickness. The coil shall be factory pressure tested to no less than 300 psig. A manual air vent vent shall be incorpoated at the high point of the coil.

Piping Packages

The piping package shall include: ball type shut-off valves at the coil supply and return, (combined with automatic balancing valves or strainers when used), and a two-way, three-way, or six-way control valve with 24VAC 2-position, modulating 0-10VDC, 3 wire floating point, or pressure independent actuator. Chilled water valves are normally closed and heating water valves are normally open. Valves are installed on the coil return.

Electric Heat

Units with electric heat shall have single power connection and be wired for single-stage operation with an open wire nickel-chrome element. An auto reset high limit device shall be included. Electric heat can be the primary heating or an auxillary source.

Filters

A one inch MERV 10 disposable filter shall be shipped loose with the return air panel. The 1" MERV 10 filter shall be rated in accordance with ASHRAE Standard 52.2. The average dust spot efficiency shall be no less than 35-40%

Controls

The fan coil manufacturer shall provide a low voltage (24VAC) digital programmable thermostat for remote or unit mounting. The thermostat shall have optional remote sensing, and energy savings contacts. Thermostat shall have modulating 0-10VDC fan speed control and 2-position valve control. Thermostat options are BACnet, WiFi with Smart Phone app, and modulating valve control. Refer to schedule notes for appropriate model

Riser Package

Risers from 3/4" to 3.0" are available in both type "L" and "M" copper for supply, return and condensate. Riser insulation is available in 1/2" to 1.5" wall thickness for closed cell foam, (polyolefin), closed cell elastomeric, (similar to Armaflex, or fiberglass (wrapped with vapor barrier). Insulation thickness shall comply with ASHRAE Standard 90.1.

Riser diameter and insulation thickness are subject to physical limitations. Contact Temspec on 4-pipe risers larger than 2.0" diameter. The risers shall have a 3.0" swaged expansion at the top to allow a 3.0" incertion of the riser above with the use of a coupling.

The riser insulation shall have a flame spread of rating of <25 and a smoke rating of <50 in compliance with ASTM E 84. The insulation shall be continuous over the riser length within the height of the cabinet. Provision for insulation beyond the ends of the cabinet shall be the responsibilty of the installing contractor.

The specification relating to the riser anchoring, expansion, and fire fire stopping requirments are not detailed in this specification and not part of the Temspec fan coil scope of supply.

Return Air Access Panel

The return air access panel shall have a fixed blade return air grille in the lower portion with a hinged panel filter access on concealed units. The return air panel is installed flush on the drywall which has been applied directly to the front of the unit. The panel is of stamped steel construction and shall be finished in standard white baked enamel. The panel is secured to the unit by a hook at the bottom edge and sheet metal fasteners to the cabinet. The panel is shipped loose for installation after the unit is installed, drywall is applied, and the walls are painted.

There is an optional perimeter panel and a full face panel to cover the entire opening for retroft applications to avoid the steps of new installing new drywall and paint.

Supply Air Grilles and Registers

Unit mounted supply air grilles and registers shall be provided by the fan coil manufacturer. The grilles shall be steel, have double deflection airfoil blades and shall be finished in standard white baked enamel.

The grilles shall attach to the collar of the fan coil with spring clips. When a unit has more than one supply air opening, a balancing damper is included with the grille, (register) to balance the air flow. (screw holes are optional) Any remote mounted supply air grilles attached to duct shall be the responsibility of the installing contractor. Grilles are shipped loose for installation after the unit is installed, drywall applied, and walls are painted.

(Optional aluminum grilles are available as well custom colors for supply grilles and return air panels.

Supply grilles are factory mounted on finished fan coils.

Fresh Air Openings

Fresh air openings shall be 4" round or 6" x 4". Fresh air opening shall have a manual damper or 2-position if freeze protection is listed in the schedule notes.

Integrated ERV or HRV

ERV core shall be AHRI certified and provide minimum 70% sensible recovery effectiveness, (SRE) , and 60% latent recovery effectiveness, (LRE), at 60 CFM using a counterflow washable polymer membane core that bolcks VOC's, CO_2 and other gasses and contaminants.

HRV core shall be a counterflow type and AHRI certifed under standard 1060 and provide minimum 80% sensible recovery effectiveness, (SRE), using a polymer washable core.

Fresh air and space exhaust air shall be filtered using an electrostatic washable filter. The energy recovery module shall incorporate two fans with independent variable speed control for system balancing. Fans are to be backward inclined impeller type with variable ECM capable of supplying 120 CFM at 0.5" wc ESP. Forward curved fans and PS PSC motors will not be accepted.

ERV shall be equipped with frost protection and operate down to -4F (-20C). Core shall be tested to UL 723 verifying maximum flame spread index (FSI) of 25 and maximum smoke developed index (SDI) of 50

Raised Bases

Raised bases shall be 4.0", 8.0" or 12.0" in height. (refer to schedule notes). Provide access panel in the 8.0" and 12.0" bases when a condensate pump is supplied.

Air Conditioning Formulas

Air Side Equations

Q Sensible Btuh = 1.085 x CFM x deltaT(F)

Q Latent Btuh = 0.68 x CFM x delta grains(gr/lb)

Q Total Btuh = 4.5 x CFM x delta h (Btu/lb)

Humidification Equation

$$\text{Humidification lb/hr} = \frac{\text{CFM x delta Gr (gr/lb)}}{1555}$$

Fan Power Equation

$$\text{Fan BHP} = \frac{\text{SCFM x S.P (in wc)}}{\text{6356 x fan effic.}}$$

Water Side Equations

Q Btuh = 500 x USGPM x deltaT(F)

$$\text{Q Tons} = \frac{\text{USGPM x delta T}}{24}$$

Pump Power Equation

$$\text{Pump BHP} = \frac{\text{USGPM x Head (ft)}}{\text{23960 x pump effic}}$$

Conversions

1 Watt = 3.412 Btuh

1 ft (head) = 0.433 psi

1 cubic meter = 35.1 cubic ft

1 liter = 0.2642 gallons

Fuel Switching Operating Cost Comparisons Associated with Decarbonization

Decarbonization of HVAC equipment has many complexities especially in existing buildings. End of servicable life, regulatory compliance, first cost and operating cost, and environmental ethics all play a role. The equations listed will help us understand some of the operating costs and the thermal performance of switching from a fossil fuel heating systems to a heat pump.

Electricity Vs Natural Gas Cost (Canada $ - SI units)

Fuel Type	Cost	Energy	Energy Equivalent Kilowatts	Equivalent Energy Cost	Heat pump COP for Equivalent NG Operating Cost
Electricity	$0.17/kWH	3,412 BTUH	10.349 kWH	$1.76	2.84
Natural Gas (NG)	$0.62/ m3	35,310 BTUH	35,310 BTUH	$0.62	

Notes: 1/ The carbon cost increases by $0.15/ton every year to 2030 ($170/ton) This calculation is based on the 2030 carbon tax of $170/ton 2/ Check with your local utility for electrical cost. For example, "time of day" electrical cost will reduce your coperating cost and cost equivalent heat pump COP

Electricity Vs Natural Gas Cost (USA $ - Imperial units)

Fuel Type	Cost	Energy	Energy Equivalent Kilowatts	Equivalent Energy Cost	Heat pump COP for Equivalent NG Operating Cost
Electricity	$0.12/kWH	3,412 BTUH	301.7 kWH	$54.30	2.75
Natural Gas (NG)	$19.70/1000 cu.ft.	1,030 MBTUH	1,030 MBTUH	$19.70	

Notes: 1/ Check with your local utility for electrical and NG cost. For example, "time of day" electrical cost will reduce your operating cost and cost equivalent heat pump COP
2/ A typical heat pump COP is 2.5 to 4.0 so heating with a heat pump is cost comparable to heating with natural gas

Equivalent Heat Pump Heating Capacity to Natural Gas

Natural Gas Vs Heat Pump to Achieve 200,000 BTUH

Q = 500 x GPM X Delta T	Natural Gas Boiler	Air to Water Heat Pump
Heating Load (BTUH)	200,000	200,000
Delta T (F)	20	8
Flow Rate (GPM)	10	50

Notes:
1/ Attention to the discharge air temperature from the terminal heating unit must be considered. Temperatures below 92F, Our body surface temperature, can lead to comfort complaints if velocity is greater than 50FPM
2/ A six-way valve on a 2-pipe coil may be considered in a 4-pipe system to ensure ample flow and heat transfer is achieved to meet the heating load. See Fig 1 & 2

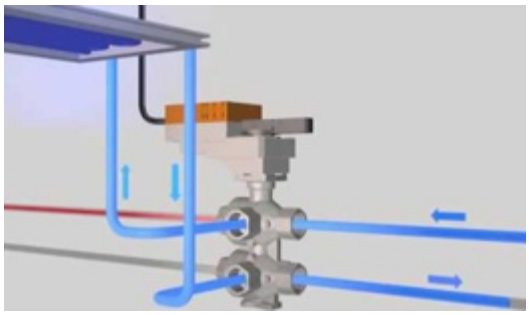


Fig. 1 6-way control valve in 4-pipe system with 2 pipe coil operating in cooling mode

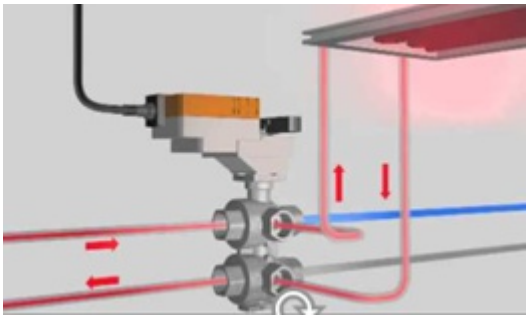


Fig. 2 6-way control valve in 4-pipe system with 2-pipe coil operating in heating mode

Designing with a low heating water temperature from a heat pump is easy in new construction but can become challanging in existing buildings where heat emitters and distribution piping were designed for 160-180F HWS. Flow rates and heat transfer surface areas must increase to achieve the same heating performance with 110 -120F HWS. Contact the Temspec Applications Team to assist with your new low heating water temperature system design