Project:

Model: SHFCe —Vertical Stack Fan Coil

With Integrated ERV

Dev. B

Date:

Revision:

SIGMA Job #:

SUBMITTAL SET

Document: SIGMA-SHFCe-SUB-2505

Presented By:

SUMMARY PAGE

Standard Features

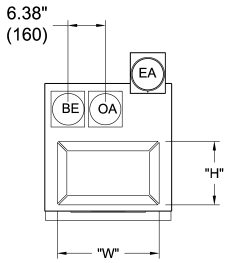
- ☐ Vertical Stack Fan Coil w/ Integrated ERV (SHFCe)
  - ☐ 120V/1Ph/60Hz
  - ☐ 208-240V/1Ph/60Hz
- ☐ Pipe System
  - ☐ 2-Pipe with Electric Heater
  - ☐ 2-Pipe without Electric Heater
  - ☐ 4-Pipe
  - ☐ 4-Pipe with 6-Way Valve
- ☐ Cabinet: 20 Gauge Galvanized Steel with 1/2" Sound Insulation
- ☐ Unit Mounted Disconnect Switch
- ☐ ECM Fan Motor with 3-speeds
- ☐ Dual ECM ERV Fans
- ☐ ERV Port Configurations as per schedule
- ☐ Polymer ERV Core:
  - ☐ Standard Efficiency Polymer ERV Core
  - ☐ Optional High Efficiency Polymer ERV Core
- ☐ Outdoor Air (OA) Motorized Damper, Spring Return
- ☐ "Whisper" Mode for Constant Low CFM Air Circulation
- ☐ Coil Pack as per schedule
- ☐ Hose Kits
- ☐ Isolation Ball Valves:
  - ☐ Sweat x NPSM
  - ☐ FNPT x FNPT
  - ☐ FNPT x FNPT w/ PT Ports

Optional Accessories

- ☐ Optional Auto-Flow Balancing Valves
- ☐ Optional 2-Way Motorized Zone Valves
- ☐ Optional 3-Way Motorized Zone Valves
- ☐ Optional 6-Way Motorized Zone Valves
- ☐ Pressure Independent Balancing Control Valves (PICV)
- ☐ Y-Strainer
- ☐ Return Air Panel
  - ☐ Optional Panel Mounted Front Discharge Supply Grille
- ☐ Thermostat with backlit LCD display, with 3-Speed Fan:
  - ☐ 7-Day Programmable, Auto Change-Over (ACO)
  - ☐ Wi-Fi Smart, Programmable, Auto Change-Over (ACO), ERV on/off
  - ☐ Non-Programmable, Auto Change-Over (ACO)
- ☐ ERV Bathroom Timer
- ☐ ERV Kill Switch
- ☐ Freeze Protection Sensor
- ☐ Flood Protection Package
- ☐ BTU Meter Installation
- ☐ Condensate Overflow Switch
- ☐ Filters
  - ☐ 1-inch MERV 8 Pleated Filters
  - ☐ Optional 2-inch MERV 13 Pleated Filters
- ☐ Type M, or Type L Supply and Return Risers as per schedule
- ☐ Type M, or Type L Condensate Risers as per schedule
- ☐ 1-in Supply and Return Riser Fiber Glass Insulation
- ☐ Optional 3/4-in Supply and Return Riser Closed Cell Insulation
- ☐ Optional 3/8-in Condensate Riser Closed Cell Insulation

UNIT AND RISER COUNT SUMMARY

SHFCe - CABINET DIMENSIONS



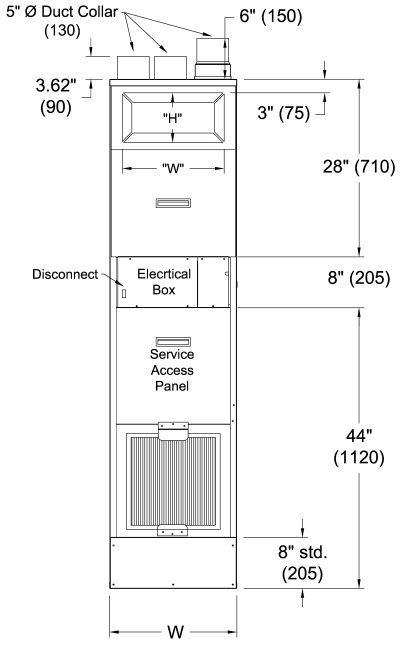
TOP VIEW

See ERV Fan Performance for ERV static pressure drop.

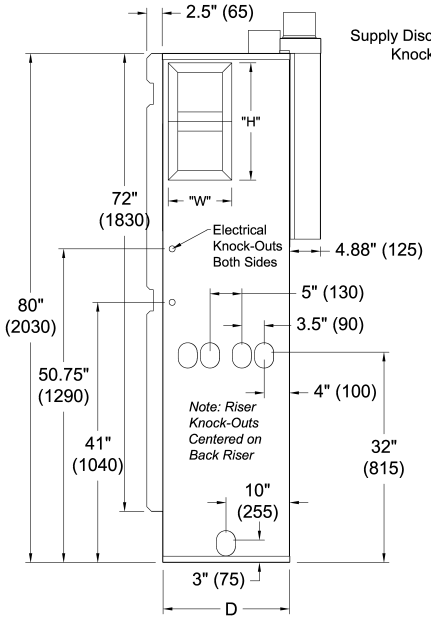
EA - Exhaust Air to Outside
BE - Bathroom Exhaust to ERV
OA - Outside Fresh Air to ERV

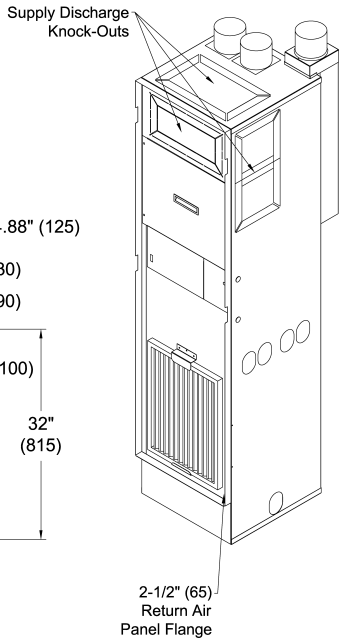
Recommended air velocity through supply grill between 300-500FPM

Exhaust Air (EA) Snorkel is shipped loose to be field mounted.



FRONT VIEW





RIGHT VIEW

SHFCe - CABINET DIMENSIONS & SUPPLY DISCHARGE OPENING SIZES

Model	Nominal CFM	Cabinet Dimensions (in)			Discharge Openings (in)		
		Width (W)	Depth (D)	Height (H)	Front (WxH)	Left/Right (WxH)*	Top (WxH)
SHFCe 03	350	20	20	80	17 x 7	10 x 8 (10 x 16)	10 x 16
SHFCe 04	450	20	20	80	17 x 7	10 x 8 (10 x 16)	10 x 16
SHFCe 06	600	20	20	80	17 x 7	10 x 8 (10 x 16)	10 x 16
SHFCe 08	800	20	22	80	17 x 7	10 x 8 (10 x 16)	12 x 16
SHFCe 10	1000	20	22	80	17 x 7	10 x 8 (10 x 16)	12 x 16
SHFCe 12	1200	20	22	80	17 x 7	10 x 8 (10 x 16)	12 x 16

Note:

*Discharge on right and left side can be opened up to large size as shown in table.

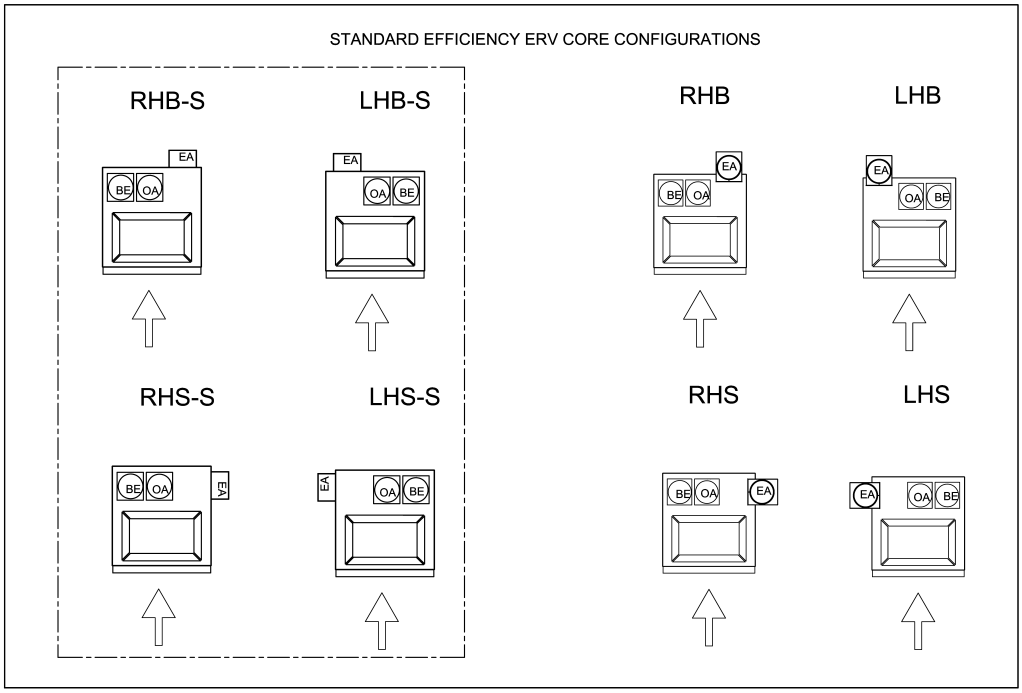
Discharge opening sizes shown (WxH) are customer configurable. Published sizes shown are maximum default factory sizes. Customer to verify discharge opening sizes match design requirements for proper airflow and confirm appropriate discharge openings at time of order.

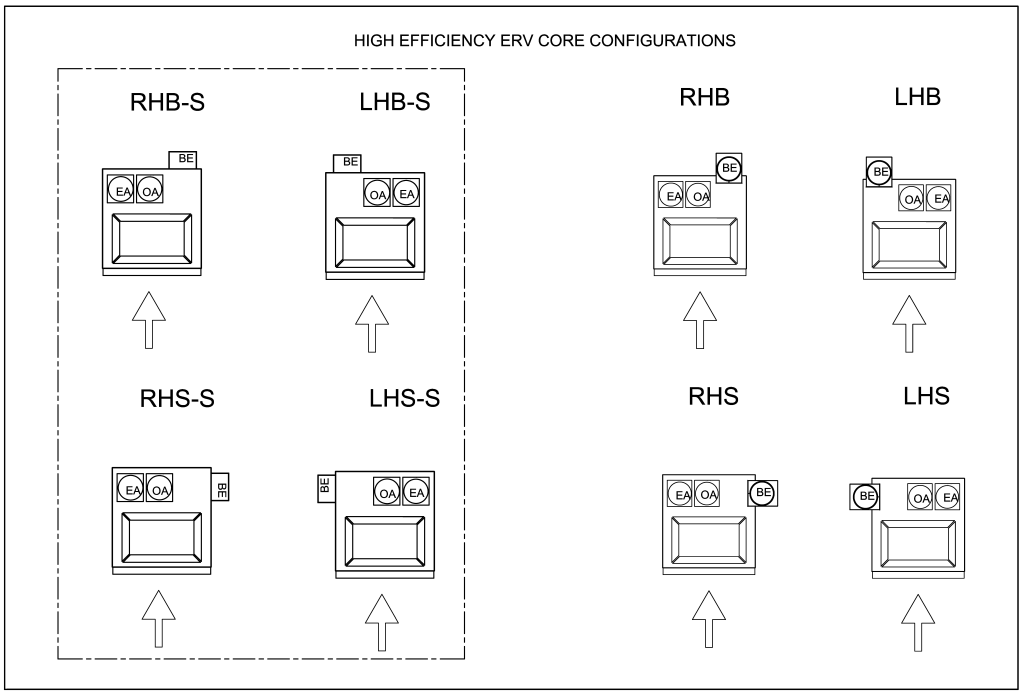
Unit base height of 8”(205mm) is standard. Taller heights are available in 1-inch (25mm) increments.

SHFCe - ERV CONFIGURATIONS (TOP VIEW)

Side Exhaust Air (EA) is connected to the side of the unit. No snorkel extension is provided to the top.

Top Snorkel Exhaust Air (EA) is connected at the top of the unit. Unit comes with shipped loose snorkel to be field installed.





Notes:

Available in 8 ERV Configurations.

Standard Top Snorkel & Optional Side Exhaust Air with no snorkel.

Risers are not available on same side as Exhaust Air (EA) snorkel.

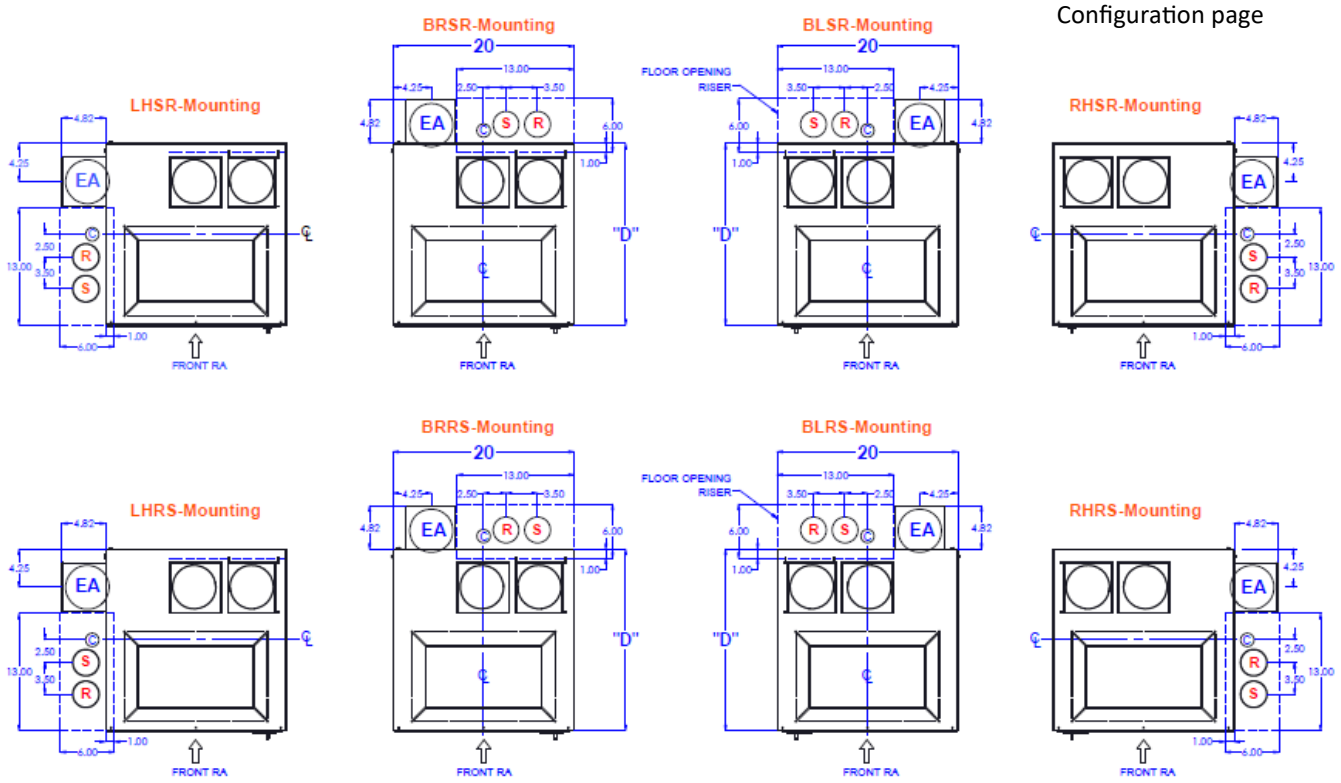
EA - Exhaust Air to Outside

BE - Bathroom Exhaust to ERV

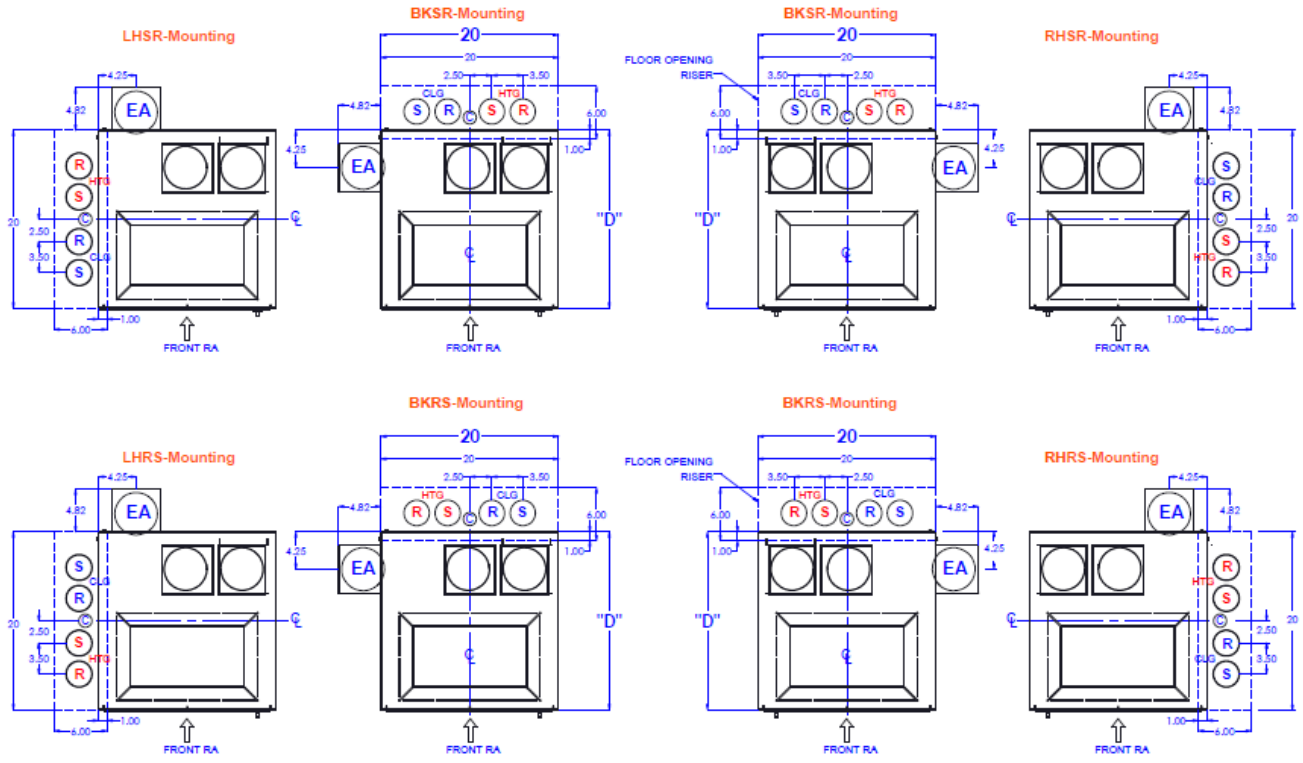
OA - Outside Air to ERV

SHFCe - RISER LAYOUT (2-PIPE)

Note: The EA options are not all shown, refer to ERV Configuration page



SHFCe- RISER LAYOUT (4-PIPE)



Note:

SHFCe - ELECTRICAL DATA (120V with ECM)

ELECTRICAL DATA - SHFCe03

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA	Max Fuse / Cct. Bkr. Amp
		HP	FLA					
SHFCe03	120V/1/60	1/4	1.9	1.1	0	3.0	3.8	15
SHFCe03	120V/1/60	1/4	1.9	1.1	0.5	7.2	9.0	15
SHFCe03	120V/1/60	1/4	1.9	1.1	1.0	11.3	14.2	15
SHFCe03	120V/1/60	1/4	1.9	1.1	1.5	15.5	19.4	20
SHFCe03	120V/1/60	1/4	1.9	1.1	2.0	19.7	24.6	25

ELECTRICAL DATA - SHFCe04

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA	Max Fuse / Cct. Bkr. Amp
		HP	FLA					
SHFCe04	120V/1/60	1/4	2.8	1.1	0	3.9	4.9	15
SHFCe04	120V/1/60	1/4	2.8	1.1	0.5	8.1	10.1	15
SHFCe04	120V/1/60	1/4	2.8	1.1	1.0	12.2	15.3	20
SHFCe04	120V/1/60	1/4	2.8	1.1	1.5	16.4	20.5	25
SHFCe04	120V/1/60	1/4	2.8	1.1	2.0	20.6	25.7	30

ELECTRICAL DATA - SHFCe06

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA	Max Fuse / Cct. Bkr. Amp
		HP	FLA					
SHFCe06	120V/1/60	1/4	3.3	1.1	0	4.4	5.5	15
SHFCe06	120V/1/60	1/4	3.3	1.1	0.5	8.6	10.7	15
SHFCe06	120V/1/60	1/4	3.3	1.1	1.0	12.7	15.9	20
SHFCe06	120V/1/60	1/4	3.3	1.1	1.5	16.9	21.1	25
SHFCe06	120V/1/60	1/4	3.3	1.1	2.0	21.1	26.3	30

ELECTRICAL DATA - SHFCe08

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA	Max Fuse / Cct. Bkr. Amp
		HP	FLA					
SHFCe08	120V/1/60	1/2	3.9	1.1	0	5.0	6.3	15
SHFCe08	120V/1/60	1/2	3.9	1.1	0.5	9.2	11.5	15
SHFCe08	120V/1/60	1/2	3.9	1.1	1.0	13.3	16.7	20
SHFCe08	120V/1/60	1/2	3.9	1.1	1.5	17.5	21.9	25
SHFCe08	120V/1/60	1/2	3.9	1.1	2.0	21.7	27.1	30

ELECTRICAL DATA - SHFCe10

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA	Max Fuse / Cct. Bkr. Amp
		HP	FLA					
SHFCe10	120V/1/60	1/2	4.7	1.1	0	5.8	7.3	15
SHFCe10	120V/1/60	1/2	4.7	1.1	0.5	10.0	12.5	15
SHFCe10	120V/1/60	1/2	4.7	1.1	1.0	14.1	17.7	20
SHFCe10	120V/1/60	1/2	4.7	1.1	1.5	18.3	22.9	25
SHFCe10	120V/1/60	1/2	4.7	1.1	2.0	22.5	28.1	30

ELECTRICAL DATA - SHFCe12

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA	Max Fuse / Cct. Bkr. Amp
		HP	FLA					
SHFCe12	120V/1/60	1/2	5.2	1.1	0	6.3	7.9	15
SHFCe12	120V/1/60	1/2	5.2	1.1	0.5	10.5	13.1	15
SHFCe12	120V/1/60	1/2	5.2	1.1	1.0	14.6	18.3	20
SHFCe12	120V/1/60	1/2	5.2	1.1	1.5	18.8	23.5	25
SHFCe12	120V/1/60	1/2	5.2	1.1	2.0	23.0	28.7	30

SHFCe - ELECTRICAL DATA (208-240V with ECM)

ELECTRICAL DATA - SHFCe03

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA (208V)	MCA (240V)	Max Fuse / Cct. Bkr. Amp (208V)	Max Fuse / Cct. Bkr. Amp (240V)
		HP	FLA							
SHFCe03	208-230/1/60	1/4	1.3	0.7	0	2.0	2.4	2.4	15	15
SHFCe03	208-230/1/60	1/4	1.3	0.7	0.5	4.0	4.7	5.0	15	15
SHFCe03	208-230/1/60	1/4	1.3	0.7	1.0	6.1	7.0	7.6	15	15
SHFCe03	208-230/1/60	1/4	1.3	0.7	1.5	8.2	9.2	10.3	15	15
SHFCe03	208-230/1/60	1/4	1.3	0.7	2.0	10.3	11.5	12.9	15	15
SHFCe03	208-230/1/60	1/4	1.3	0.7	2.5	12.4	13.7	15.5	15	20
SHFCe03	208-230/1/60	1/4	1.3	0.7	3.0	14.5	16.0	18.1	20	20

ELECTRICAL DATA - SHFCe04

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA (208V)	MCA (240V)	Max Fuse / Cct. Bkr. Amp (208V)	Max Fuse / Cct. Bkr. Amp (240V)
		HP	FLA							
SHFCe04	208-230/1/60	1/4	1.8	0.7	0	2.5	3.1	3.1	15	15
SHFCe04	208-230/1/60	1/4	1.8	0.7	0.5	4.5	5.3	5.7	15	15
SHFCe04	208-230/1/60	1/4	1.8	0.7	1.0	6.6	7.6	8.3	15	15
SHFCe04	208-230/1/60	1/4	1.8	0.7	1.5	8.7	9.8	10.9	15	15
SHFCe04	208-230/1/60	1/4	1.8	0.7	2.0	10.8	12.1	13.5	15	15
SHFCe04	208-230/1/60	1/4	1.8	0.7	2.5	12.9	14.3	16.1	15	20
SHFCe04	208-230/1/60	1/4	1.8	0.7	3.0	15.0	16.6	18.7	20	20
SHFCe04	208-230/1/60	1/4	1.8	0.7	4.0	19.1	21.7	23.9	25	25

ELECTRICAL DATA - SHFCe06

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA (208V)	MCA (240V)	Max Fuse / Cct. Bkr. Amp (208V)	Max Fuse / Cct. Bkr. Amp (240V)
		HP	FLA							
SHFCe06	208-230/1/60	1/4	2.2	0.7	0	2.9	3.6	3.6	15	15
SHFCe06	208-230/1/60	1/4	2.2	0.7	0.5	4.9	5.8	6.2	15	15
SHFCe06	208-230/1/60	1/4	2.2	0.7	1.0	7.0	8.1	8.8	15	15
SHFCe06	208-230/1/60	1/4	2.2	0.7	1.5	9.1	10.3	11.4	15	15
SHFCe06	208-230/1/60	1/4	2.2	0.7	2.0	11.2	12.6	14.0	15	15
SHFCe06	208-230/1/60	1/4	2.2	0.7	2.5	13.3	14.8	16.6	15	20
SHFCe06	208-230/1/60	1/4	2.2	0.7	3.0	15.4	17.1	19.2	20	20
SHFCe06	208-230/1/60	1/4	2.2	0.7	4.0	19.5	22.2	24.4	25	25

ELECTRICAL DATA - SHFCe08

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA (208V)	MCA (240V)	Max Fuse / Cct. Bkr. Amp (208V)	Max Fuse / Cct. Bkr. Amp (240V)
		HP	FLA							
SHFCe08	208-230/1/60	1/2	2.4	0.7	0	3.1	3.8	3.8	15	15
SHFCe08	208-230/1/60	1/2	2.4	0.7	0.5	5.1	6.1	6.4	15	15
SHFCe08	208-230/1/60	1/2	2.4	0.7	1.0	7.2	8.3	9.0	15	15
SHFCe08	208-230/1/60	1/2	2.4	0.7	1.5	9.3	10.6	11.6	15	15
SHFCe08	208-230/1/60	1/2	2.4	0.7	2.0	11.4	12.8	14.2	15	15
SHFCe08	208-230/1/60	1/2	2.4	0.7	2.5	13.5	15.1	16.8	20	20
SHFCe08	208-230/1/60	1/2	2.4	0.7	3.0	15.6	17.4	19.4	20	20
SHFCe08	208-230/1/60	1/2	2.4	0.7	4.0	19.7	22.4	24.6	25	25

Data shown is for 240V/1/60Hz unless otherwise indicated

SHFCe - ELECTRICAL DATA (208-240V with ECM)

ELECTRICAL DATA - SHFCe10

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA (208V)	MCA (240V)	Max Fuse / Cct. Bkr. Amp (208V)	Max Fuse / Cct. Bkr. Amp (240V)
		HP	FLA							
SHFCe10	208-230/1/60	1/2	2.9	0.7	0	3.6	4.4	4.4	15	15
SHFCe10	208-230/1/60	1/2	2.9	0.7	0.5	5.6	6.7	7.0	15	15
SHFCe10	208-230/1/60	1/2	2.9	0.7	1.0	7.7	9.0	9.6	15	15
SHFCe10	208-230/1/60	1/2	2.9	0.7	1.5	9.8	11.2	12.3	15	15
SHFCe10	208-230/1/60	1/2	2.9	0.7	2.0	11.9	13.5	14.9	15	15
SHFCe10	208-230/1/60	1/2	2.9	0.7	2.5	14.0	15.7	17.5	20	20
SHFCe10	208-230/1/60	1/2	2.9	0.7	3.0	16.1	18.0	20.1	20	25
SHFCe10	208-230/1/60	1/2	2.9	0.7	4.0	20.2	23.1	25.3	25	30

ELECTRICAL DATA - SHFCe12

MODEL	SUPPLY VOLTAGE	Fan Motor		ERV FLA	Elec. Heater kW	Total Unit FLA	MCA (208V)	MCA (240V)	Max Fuse / Cct. Bkr. Amp (208V)	Max Fuse / Cct. Bkr. Amp (240V)
		HP	FLA							
SHFCe12	208-230/1/60	1/2	3.2	0.7	0	3.9	4.8	4.8	15	15
SHFCe12	208-230/1/60	1/2	3.2	0.7	0.5	5.9	7.1	7.4	15	15
SHFCe12	208-230/1/60	1/2	3.2	0.7	1.0	8.0	9.3	10.0	15	15
SHFCe12	208-230/1/60	1/2	3.2	0.7	1.5	10.1	11.6	12.6	15	15
SHFCe12	208-230/1/60	1/2	3.2	0.7	2.0	12.2	13.8	15.2	15	20
SHFCe12	208-230/1/60	1/2	3.2	0.7	2.5	14.3	16.1	17.8	20	20
SHFCe12	208-230/1/60	1/2	3.2	0.7	3.0	16.4	18.4	20.4	20	25
SHFCe12	208-230/1/60	1/2	3.2	0.7	4.0	20.5	23.4	25.6	25	30

Data shown is for 240V/1/60Hz unless otherwise indicated

SHFCe - ECM FAN DATA

Unit Size	EC Motor Speed	Rated SCFM	External Static Pressure (in w.g.)											
			0	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6
			SCFM	SCFM	SCFM	SCFM	SCFM	SCFM	SCFM	SCFM	SCFM	SCFM	SCFM	SCFM
03	WHISPER* MODE	N/A	145	125	110	90	80	65	55	50	45	40	35	30
	LOW		245	230	220	210	200	190	180	170	160	150	140	130
	MED		350	335	325	315	305	295	285	275	265	255	245	235
	HIGH		-	365	355	350	340	330	320	310	305	295	285	275
04	WHISPER* MODE	N/A	175	155	140	120	100	85	75	65	55	50	45	40
	LOW	425	325	310	305	295	290	280	270	260	250	240	230	220
	MED		460	445	440	430	425	415	405	395	385	375	365	355
	HIGH		-	495	485	470	465	455	445	435	430	420	410	400
06	WHISPER* MODE	N/A	250	210	190	170	150	120	100	80	70	60	55	45
	LOW	600	505	475	460	445	430	420	405	390	375	355	340	325
	MED		640	610	595	580	565	555	540	525	510	490	475	460
	HIGH		-	675	670	655	650	640	620	610	595	580	565	550
08	WHISPER* MODE	N/A	320	260	220	190	165	140	120	95	85	75	65	50
	LOW	800	745	705	685	665	645	615	585	565	535	515	490	465
	MED		880	840	820	800	780	750	720	700	670	650	625	600
	HIGH		-	915	905	895	880	860	820	805	795	780	770	760
10	WHISPER* MODE	N/A	345	285	245	215	190	165	145	120	110	100	90	75
	LOW	1000	905	865	835	815	795	775	755	725	705	685	665	645
	MED		1080	1040	1010	990	970	950	930	900	880	860	840	820
	HIGH		-	1145	1135	1110	1090	1070	1060	1040	1020	990	980	960
12	WHISPER* MODE	N/A	355	295	255	225	200	175	155	130	120	110	100	85
	LOW	1200	1055	1010	995	975	955	935	920	905	880	865	845	825
	MED		1230	1185	1170	1150	1130	1110	1095	1080	1055	1040	1020	1000
	HIGH		-	1275	1260	1240	1225	1205	1190	1175	1160	1140	1120	1100

Note: All airflow ratings are taken at lowest voltage rating of dual rating (ie. 208 volt).
Airflow ratings include resistance of dry coil, Return Air panel and clean MERV10 air filters.
*Whisper mode is default Fan On / Cooling and Heating Off mode for air circulation.

SHFCe - ERV FAN DATA

% PWM Signal / Power	Potentiometer Dial Setting	ESP (External Static) inwg									
		0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.40	0.50	0.60
25% Speed @ 6 Watts	10 O'clock	57	42	31	22	-	-	-	-	-	-
37% Speed @ 13 Watts	11 O'clock	80	59	38	27	19	-	-	-	-	-
45% Speed @ 18 Watts	12 O'clock	95	71	52	40	32	-	-	-	-	-
57% Speed @ 30 Watts	1 O'clock	110	90	78	64	53	46	40	35	30	-
69% Speed @ 43 Watts	2 O'clock	131	122	115	105	95	86	75	65	57	49
82% Speed @ 61 Watts	3 O'clock	147	144	140	135	130	125	118	109	98	85
95% Speed @ 82 Watts	4 O'clock	164	160	153	150	148	145	142	136	129	121

Notes:
- All airflow ratings (CFM) are taken at lowest voltage rating of dual rating (ie. 208 volt).
- ERV external static setting is based on exhaust duct run.
- ESP capability shown per fan.
- Recommended ERV fan speeds are field set to match duct static. Default factory settings may not match site conditions and requirements.
- Watts includes both ERV fans.

SHFCe - SOUND DATA

Sigma Fan Coil Unit Sound Power Test Data

Unit Size	Motor Speed	Sound Rating (dBA), LA	Sound Power Levels (Db) Octave Band Center Frequency (Hz)						
			125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
03	Whisper	36	47	40	33	24	17	16	19
	Low	48	57	53	46	36	28	25	21
	Medium	51	58	56	48	39	30	28	22
	High	52	60	57	50	41	32	29	23
04	Whisper	36	47	40	33	24	17	16	19
	Low	51	58	56	48	39	30	28	22
	Medium	52	60	57	50	41	32	29	23
	High	54	61	59	51	43	33	31	24
06	Whisper	36	47	40	34	25	19	17	19
	Low	47	55	51	45	37	32	33	28
	Medium	50	57	54	47	40	35	36	31
	High	51	58	55	48	41	36	37	33
08	Whisper	44	53	47	39	32	32	30	23
	Low	50	57	54	47	40	35	36	31
	Medium	51	58	55	48	41	36	37	33
	High	55	63	59	49	45	44	44	38
10	Whisper	44	53	47	39	32	32	30	23
	Low	51	58	55	48	41	36	37	33
	Medium	55	63	59	49	45	44	44	38
	High	60	69	64	53	48	49	50	45
12	Whisper	44	53	47	39	32	32	30	23
	Low	58	67	62	51	47	47	47	42
	Medium	60	69	64	53	48	49	50	45
	High	61	70	65	54	49	50	51	46

Notes:
Above sound data may vary with actual site conditions. Sound Power: Sigma test room/2023 config.
Units fully furred in with 1/2-inch drywall and 2x4 wood frame construction.
Closet insulation: 3-1/2" Rockwool batt insulation inside stud space.
Configuration: Top Ducted and Front Supply Discharge. Return Air Panel - Acoustic Style, no baffle.
Sound measurements taken from a distance of 1.5m away.

SHFCe - HIGH EFFICIENCY ERV PERFORMANCE TABLE

Set Name	OA (DB)	OA (WB)	CFM	RA (DB)	RA (WB)	CFM	Sensible Efficiency (SRE)	Latent Efficiency	Total Efficiency
Summer Design	86	72	30	72	61	30	82.9	80.4	81.3
Winter Design	15	11	30	70	58	30	89.3	80.9	86.2
Summer Design	86	72	45	72	61	45	78.2	75.1	76.3
Winter Design	15	11	45	70	58	45	85.1	74.6	81.3
Summer Design	86	72	60	72	61	60	74.3	70.8	72.1
Winter Design	15	11	60	70	58	60	81.5	69.6	77.2
Summer Design	86	72	100	72	61	100	66.3	62.3	63.8
Winter Design	15	11	100	70	58	100	73.8	59.6	68.7

Notes:

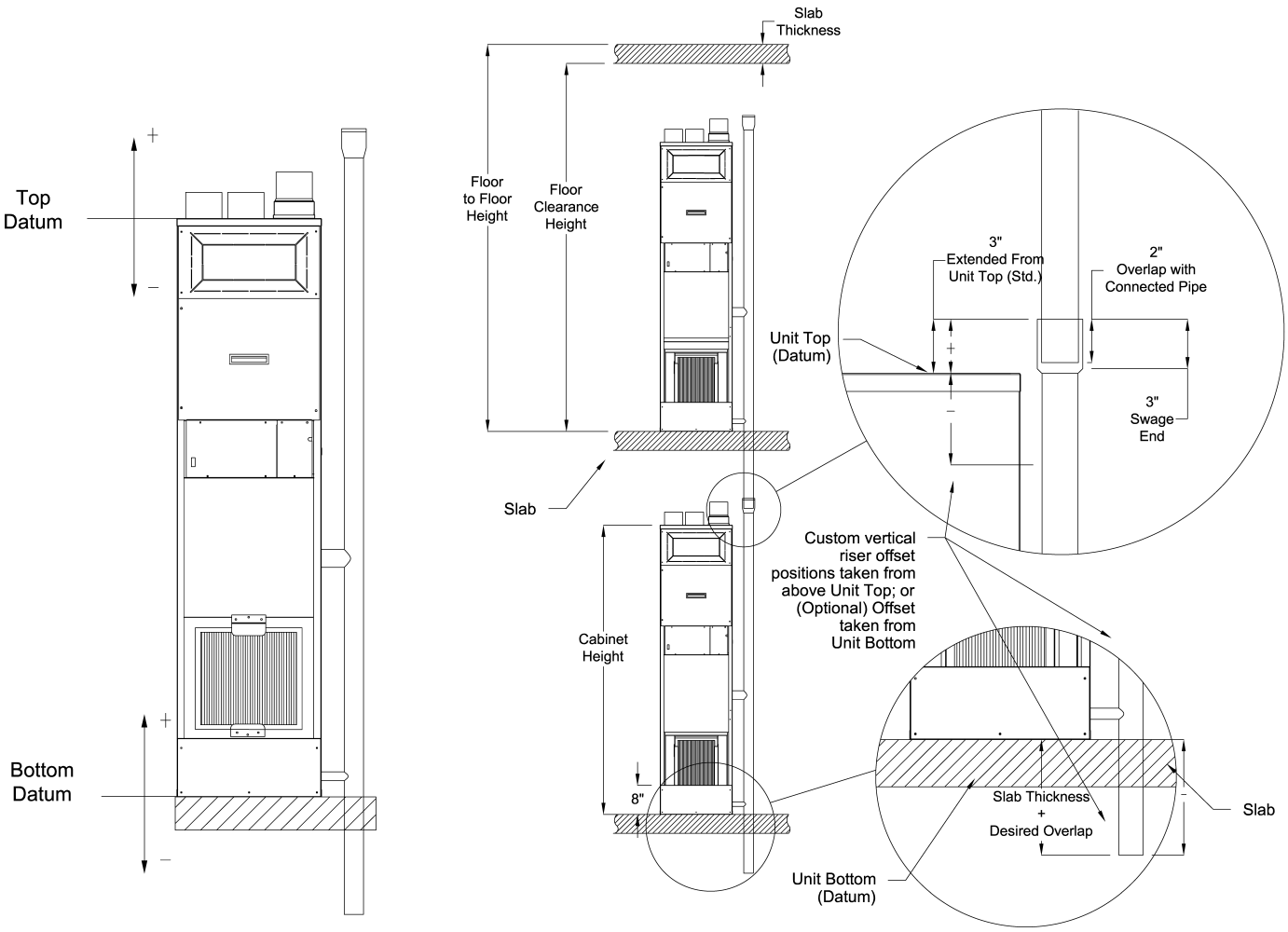
High Efficiency ERV Core - Counter Flow

CAN/CSA-C439 Certification

Modulating Outdoor Air Damper

Defrost Control

SHFCe - RISER INSTALL DETAIL

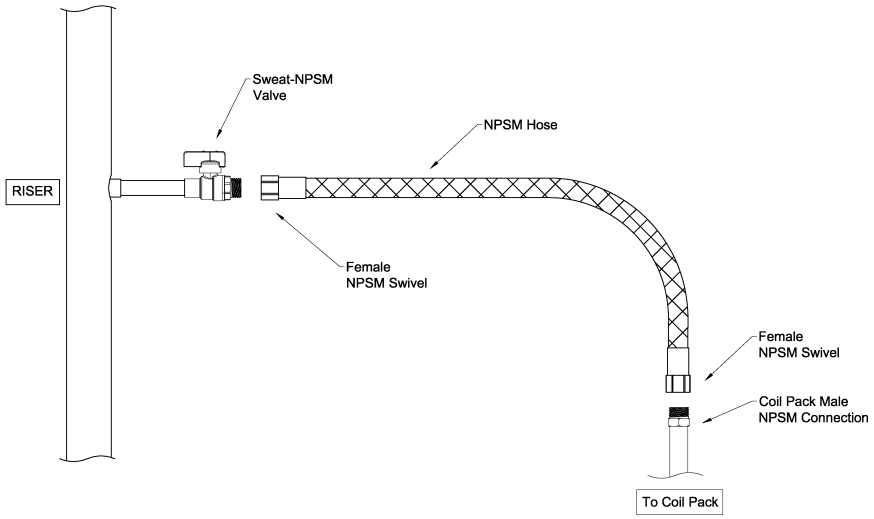


Notes:

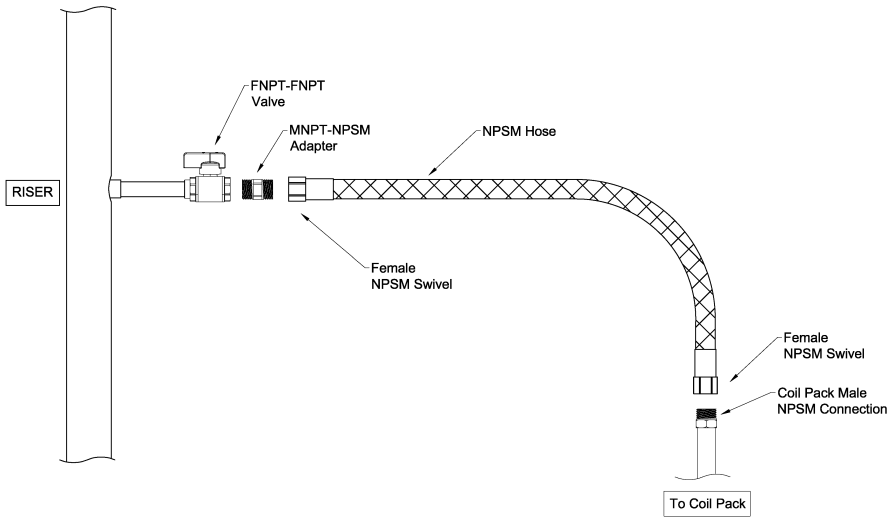
- Risers are sized using a “Top” and “Base” Datum reference. A specified Top Datum Offset indicates where top of riser will be located relative to top of cabinet. A Base Datum indicates where bottom of riser will be located relative to floor.
- Upon request Sigma will provide 3-inch (75mm) deep swage on risers .
- Risers should insert 2-inches (50mm) into the 3-inch (75mm) deep swage connection.
- Riser Length = Floor Clearance Height + Slab Thickness + 2-inch overlap (Rounded up to 120” or 144”).
- Sigma supplies two standard riser lengths, 120” (10’) and 144” (12’).
- Supply extension tailpieces or transition riser pieces for joining dissimilar piping sizes are field supplied.
- Risers available in Type L and Type M copper.
- Condensate riser are available with optional 3/8-inch (10mm) thick closed cell insulation to prevent condensation.
- Supply and Return risers are available with 1/2-inch (13mm), or optional 3/4-inch (19mm) closed cell insulation, and 1-inch (25.4mm) fiber glass insulation.

SHFCe - RISER INSTALL DETAIL

STANDARD VALVE - SWEAT CONNECTED NPSM



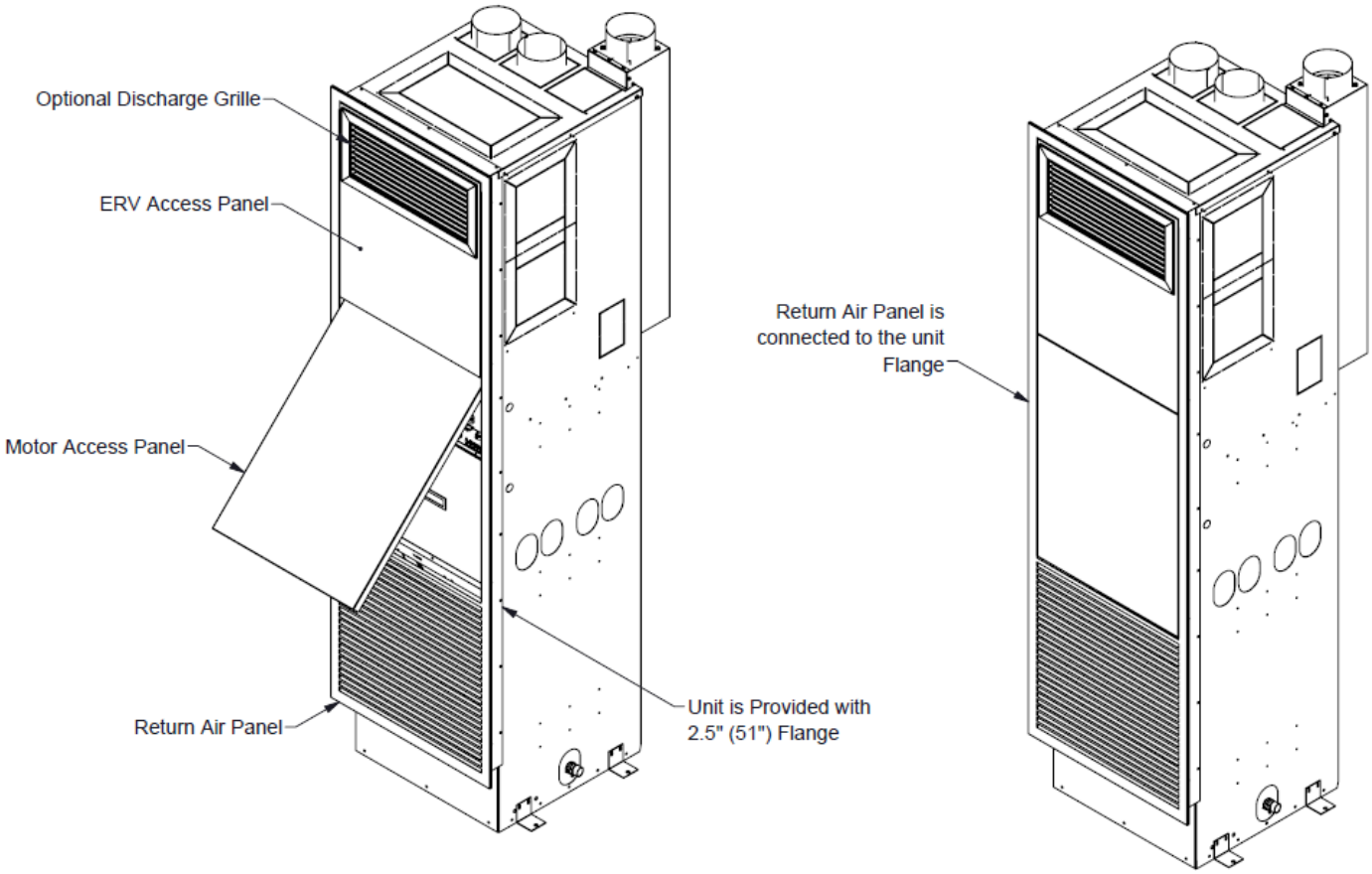
OPTIONAL FPT VALVE - FPT to FPT



Isolation Valve Notes:

- Standard NPSM sweat connected isolation valves are for Factory or Field Supplied Copper Risers.
- Optional Female NPT valves are for Field Supplied Steel Risers only. Includes MNPT-MNPSM hose adaptors with hose kit.
- Optional Female NPT valves with PT ports are available.

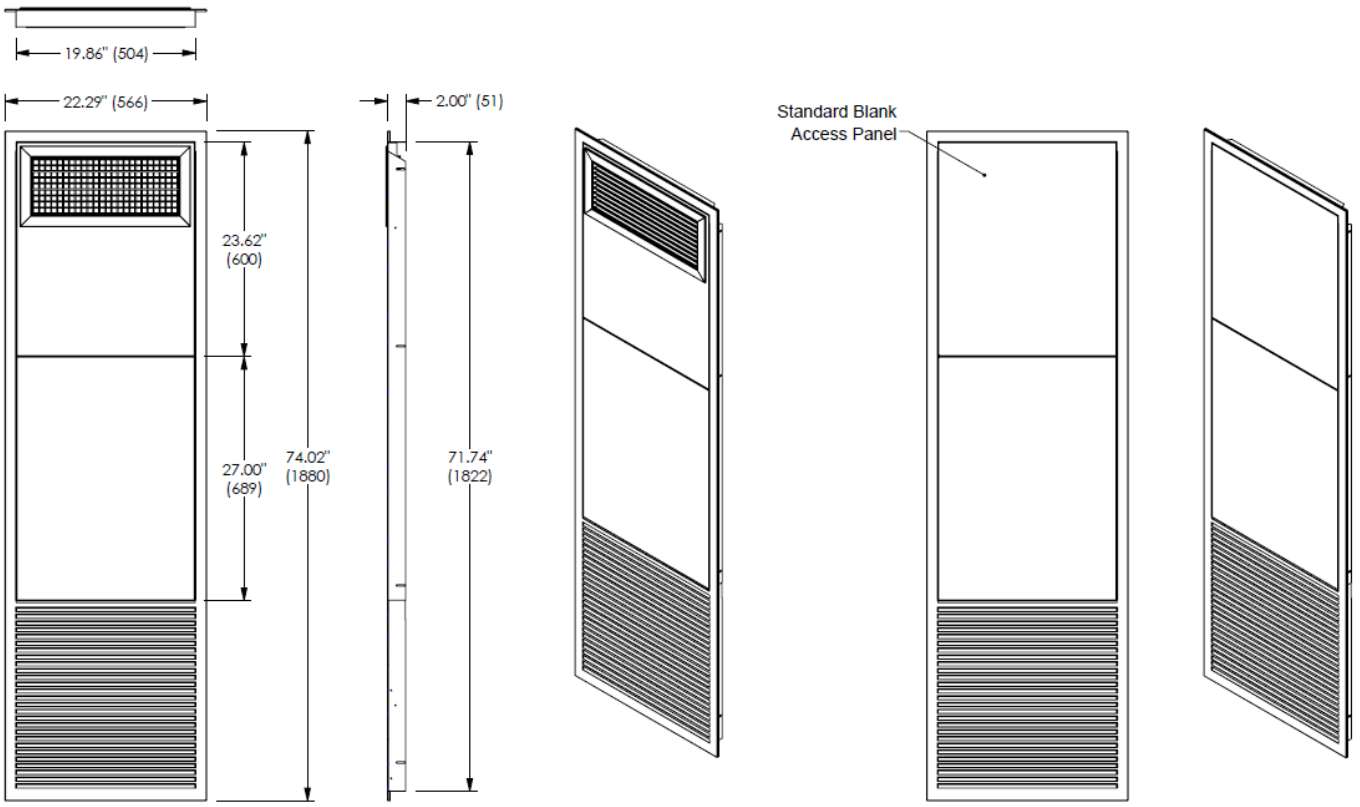
SHFCe - RETURN AIR PANEL



Notes:

Return Air Panel with optional Supply Discharge Grille shown.
Unit ERV configuration Right Hand Back shown (RHB).
Supply Discharge Grille may not be to scale.
Unit shown with optional anchoring flange.

SHFCe - RETURN AIR PANEL DETAILS



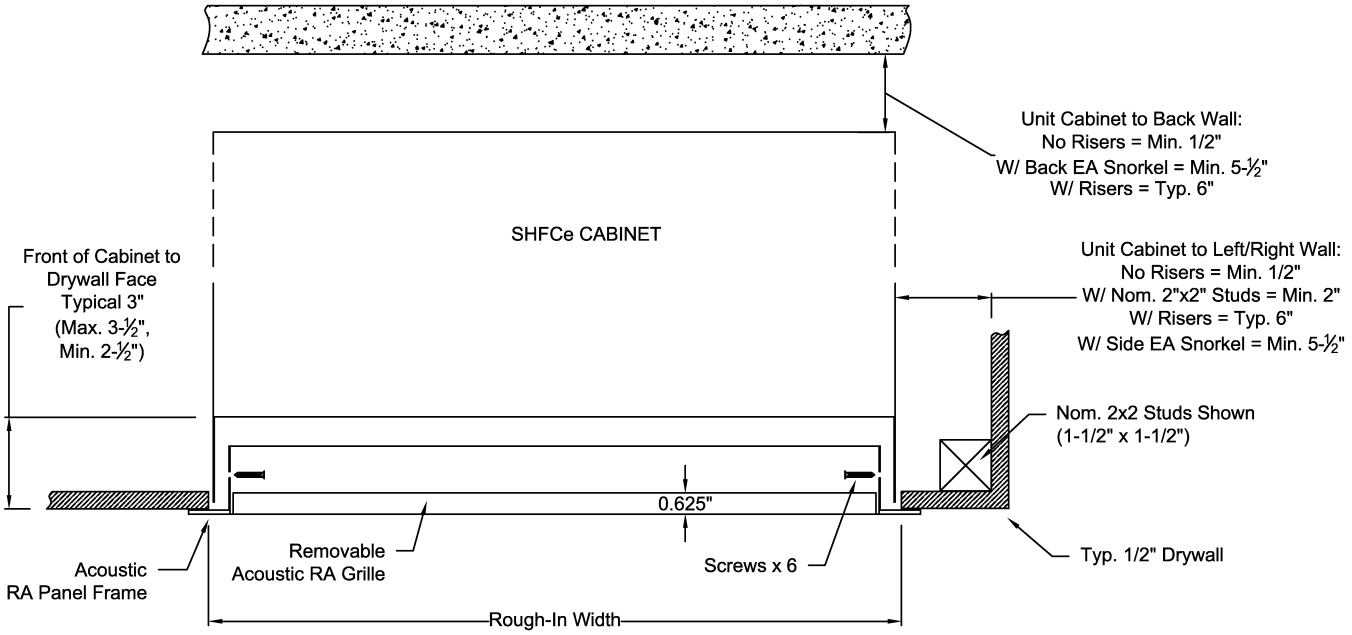
Return Air Panel Selections:

- ☐ Return Air Panel with Blank Access Panel
- ☐ Return Air Panel with Supply Discharge Grille Double Deflection (DD)
- ☐ Return Air Panel with Supply Discharge Grille Double Deflection with Opposed Blade Damper (DDOBD)

Notes:

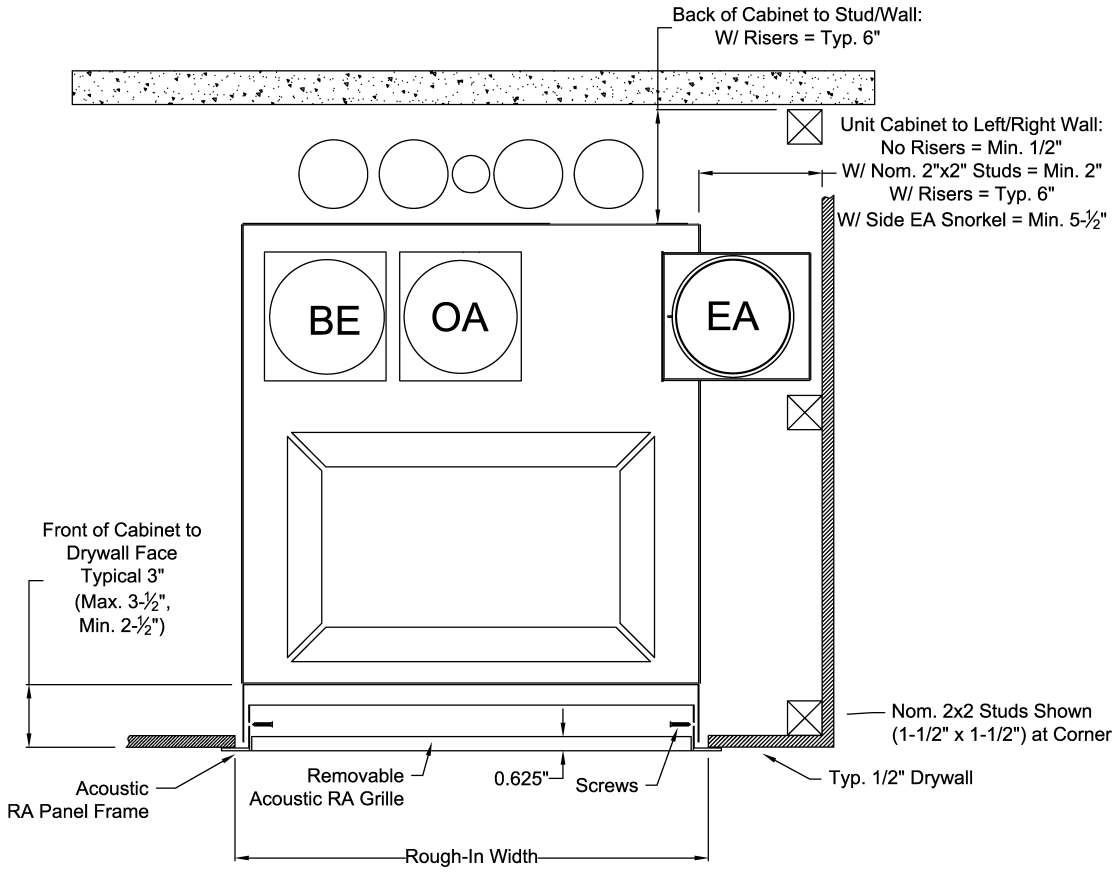
Return Air Panel is made in two sections for servicing.
Return Air Panel is fastened to unit flange.
Panel supplied in standard powder coat 'appliance white' finish.
Supply discharge grilles are optional. Blank opening is provided by default.
Supply Discharge grille may not be to scale.

SHFCe - RETURN AIR PANEL FURRING DETAILS (TYPICAL PLAN VIEW)



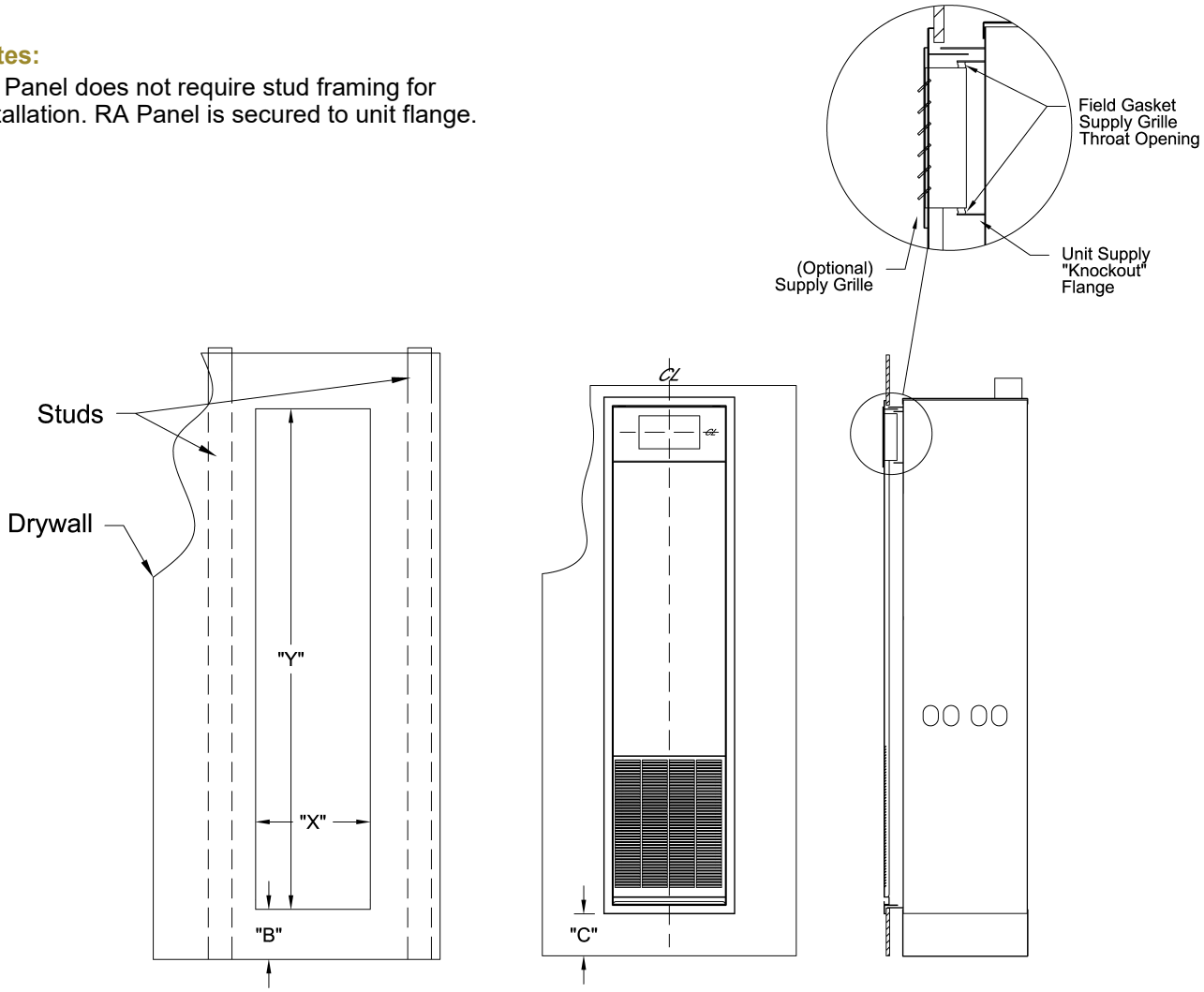
Notes:

1) Return air panel should be centered in front of the unit return air opening.
2) Return Air Panel is attached to unit flange - no drywall framing is required.
3) Standard Efficiency ERV ports shown.



SHFCe - RETURN AIR PANEL ROUGH IN DETAILS

Notes:
RA Panel does not require stud framing for installation. RA Panel is secured to unit flange.



Drywall & Stud Detail

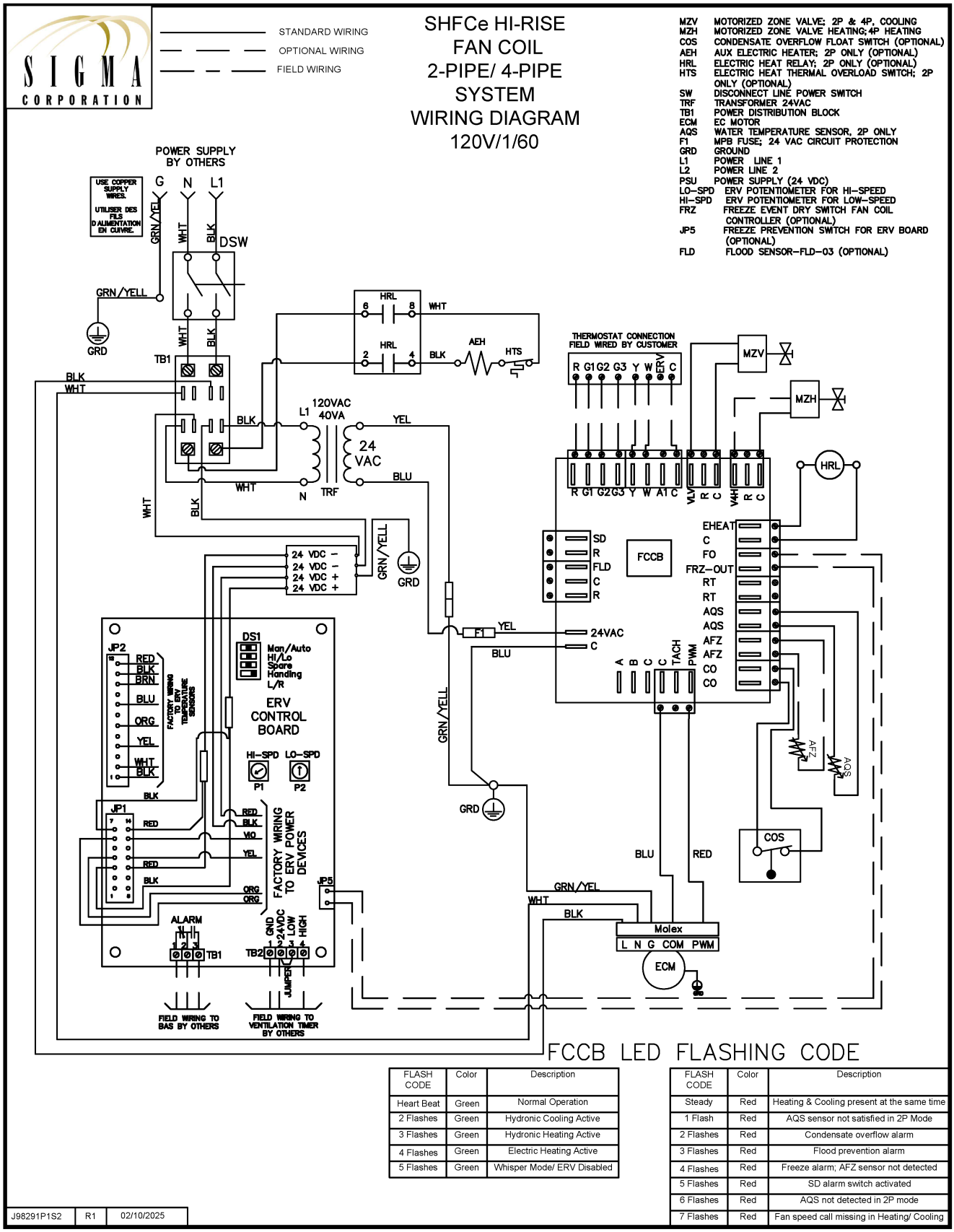
Front Panel View

Side Cutaway View

Return Air Panel Rough-In Dimensions

Model	Cabinet Size	Cabinet Dimensions (in)		Rough-In (in)			
		W	D	"X"	"Y"	"B"	"C"
SHFCe 03	Y	20	20	20 1/4	72 1/4	7 3/4	6 1/2
SHFCe 04							
SHFCe 06							
SHFCe 08	Z	20	22	20 1/4	72 1/4	7 3/4	6 1/2
SHFCe 10							
SHFCe 12							

SHFCe - ELECTRICAL SCHEMATIC (2-PIPE or 4-PIPE)



FCCB LED FLASHING CODE

FLASH CODE	Color	Description
Heart Beat	Green	Normal Operation
2 Flashes	Green	Hydronic Cooling Active
3 Flashes	Green	Hydronic Heating Active
4 Flashes	Green	Electric Heating Active
5 Flashes	Green	Whisper Mode/ ERV Disabled

FLASH CODE	Color	Description
Steady	Red	Heating & Cooling present at the same time
1 Flash	Red	AQS sensor not satisfied in 2P Mode
2 Flashes	Red	Condensate overflow alarm
3 Flashes	Red	Flood prevention alarm
4 Flashes	Red	Freeze alarm; AFZ sensor not detected
5 Flashes	Red	SD alarm switch activated
6 Flashes	Red	AQS not detected in 2P mode
7 Flashes	Red	Fan speed call missing in Heating/ Cooling

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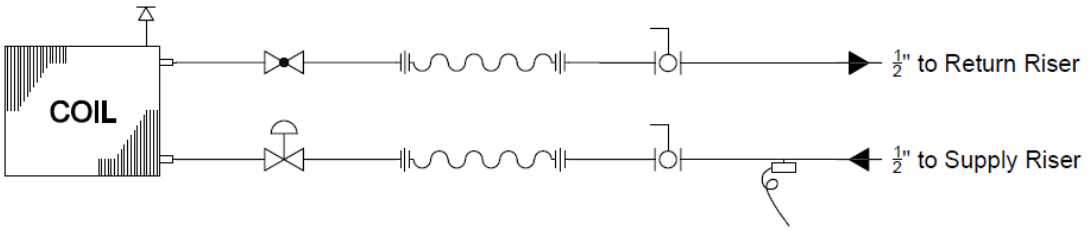
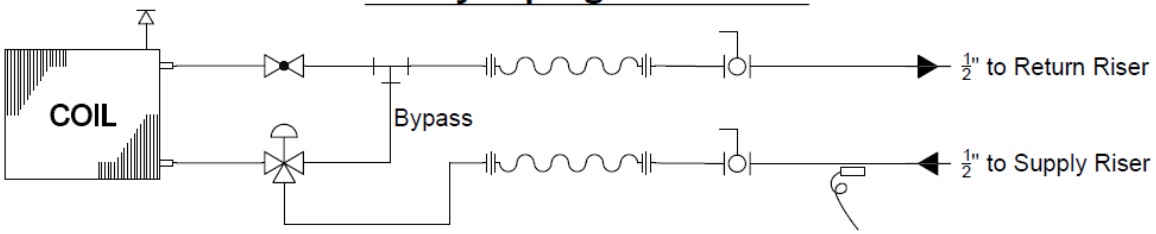
SHFCe - PIPING DIAGRAM—2 Way and 3 Way

2 Way Piping Schematic



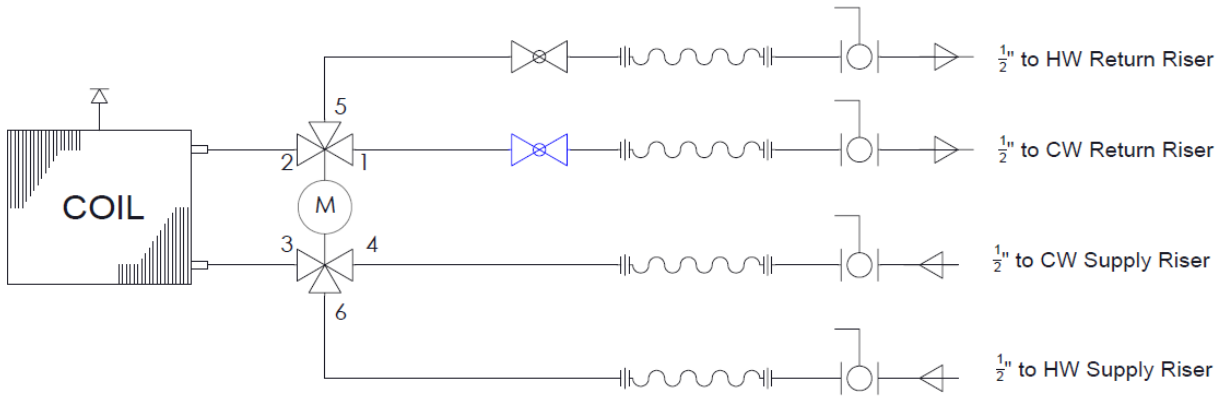
3 Way Piping Schematic



- Air Vent
- Auto Balancing Valve
- Flexible Hose
- Shut Off Ball Valve
- 2 Way Control Valve (NC to Coil, Failed safe close to coil)
- 3 Way Control Valve (NC to Coil, Failed safe close to coil)
- Pipe Sensor for 2 Pipe System

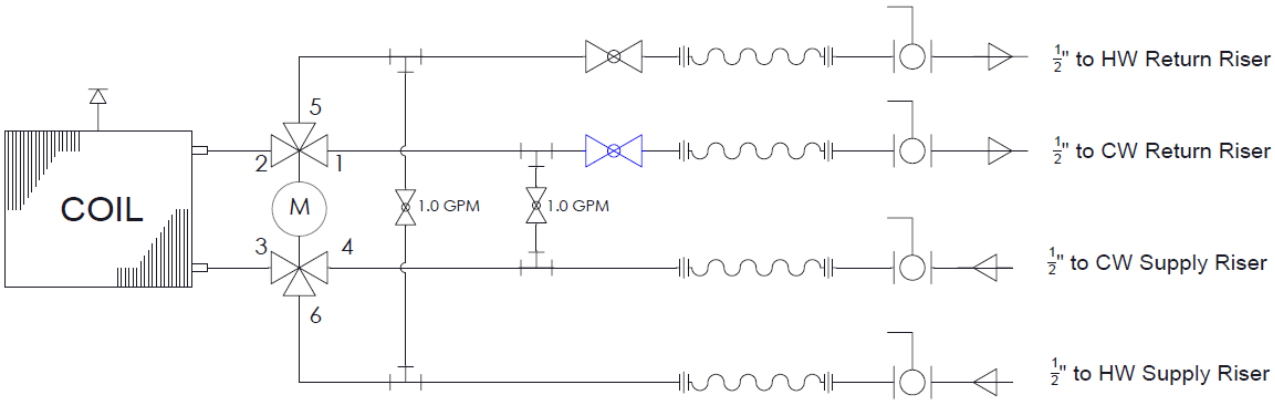
SHFCe - PIPING DIAGRAM— 6 Way

4 Pipe - 6 Way Valve Piping Schematic



- Air Vent
- Auto Balancing Valve
- Check Valve
- Flexible Hose
- Shut Off Ball Valve
- 6 Way Control Valve (NC, Non-Fail Safe, 50 psi coil presure relief, 200 psi close-off pressure) - Belimo B315 Control Sequence #1 for heating, #2 for cooling
- Y Strainer

4 Pipe - 6 Way Valve Piping Schematic with Bypass Line, for Top and Bottom riser stuck



- Air Vent
- Auto Balancing Valve
- Check Valve
- Flexible Hose
- Shut Off Ball Valve
- 6 Way Control Valve (NC, Non-Fail Safe, 50 psi coil presure relief, 200 psi close-off pressure) - Belimo B315 Control Sequence #1 for heating, #2 for cooling
- Y Strainer

SHFCe - CONTROLS

Discrete Speed Control EC Motors (ECM)

Fan motors are programmed with 3 pre-programmed speeds for Low, Medium, High and optional 'Whisper'. With optional 'Whisper' mode when there is a no request for cooling or heating, unit will operate in 'Whisper Mode' for constant low fan speed air circulation.

Thermostat

It is recommended to use a fan coil compatible, 3-speed thermostat to control heating and cooling operation to maximizing staging. Single fan speed thermostats will need to be wired to the desired fan speed on unit terminal strip.

Whisper Mode

With optional Whisper Mode unit fan will operate at ultra low fan speed for fresh air circulation.

SEQUENCE OF OPERATION

Call for Heating and Cooling

When a call for cooling is made, the optional motorized auto shut-off control valve will open. The contactor will then be energized so long as none of the following fault conditions are present:

- Condensate Over Flow Alarm (Optional)

When call for cooling request is terminated, the optional motorized auto shut-off control valve will be de-energized (close) and fan operation will end.

ERV Control Board

The ERV control board is powered by a 24VDC switching power supply mounted in the electrical box.

Units features six temperature sensors:

OA – Outside Air

MA – Mixed Air (Mix of Outside Air and Discharge Air)

SA – Supply Air

DA – Discharge Air

BA – Bathroom Exhaust Air (Before Core)

EA – Exhaust Air (After Core)

ERV Timer Switch (24VDC)

The optional ERV bathroom timer switch consists of a push button and timer option (10, 20,30 & 60min).

When the timer switch puts the unit on high speed mode for the set time and the high speed LED (LD2) lights up.

After the timer cycle is expired the unit ERV fans return to low speed (normal) mode and the low speed LED (LD4) lights up on the control board. Low speed mode is default on initial power-up.

Airflow Balancing—EA Fan Speed Adjustment

The exhaust air fans are field calibrated on site during start-up and commissioning for both high speed mode (P1) and low speed mode (P2).

On the ERV board low (**LO-SPD**) and high speed (**HI-SPD**) potentiometers are field adjusted to meet design CFM requirements based on site conditions.

See following page for recommended factory settings as a starting point for setting ERV fan speeds.

OA Fan Speed Adjustment

During normal operation the OA fan speed is automatically set by the controller's potentiometer settings.

Defrost Mode

If the unit senses incoming OA temperature below 14°F (-10°C) the unit will enter defrost mode. During defrost mode the unit operates in 40-minute cycles modulating between fresh air and recycled air.

During fresh air cycles, the ERV controller will maintain the supply air temperature above 50°F by controlling OA damper.

Supply Air Control

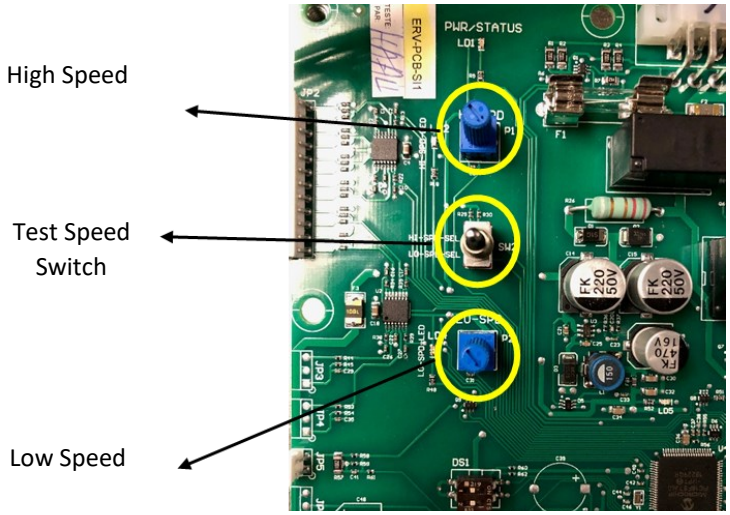
When the supply air (SA) temperature drops below 50°F (10°C) the ERV controller will activate the OA damper to maintain SA temperatures above this threshold to avoid the dumping of cold air.

This mode is disabled during the recycled air defrost mode.

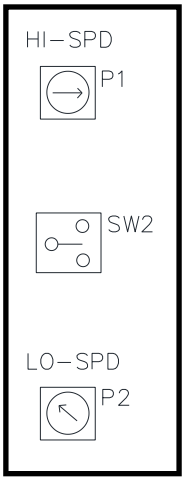
ERV FAN SETTINGS

The ERV fans are factory set to default position. A field air balance is recommended to determine required fan speeds - Low and High. The potentiometers located on the ERV board controls the Low and High fan speeds. These speeds are controlled using a PWM signal from 0% to 95% Torque. The range of the potentiometer is 8 o'clock to 4 o'clock.

SHFCe - CONTROLS - SETTING ERV FAN SPEEDS



Rotate clockwise to increase fan speed, rotate counterclock-wise to reduce fan speed.



1) Check that SW1 ON/OFF Switch is set to ON.
2) Set Hi-Speed to 3 o'clock position (80% Torque)
3) Set Lo-Speed to 12 o'clock position (45% Torque).
4) Site to verify toggle switch SW2 is in the middle position.

Site conditions may require different setpoints based on duct static and bath-room CFM fan requirements.

SHFCe - MECHANICAL SPECIFICATION

1 GENERAL

Vertical stacked fan coil units shall be Sigma SHFCe Series with integrated ERV. Units shall provide scheduled capacities at the ampacity and voltage shown on the drawings. Specified airflow shall be at the scheduled external static pressure and shall include the effects of a wet coil and clean filter.

Each unit shall be factory tested. Each unit shall have factory affixed label showing ETL logo. Cabinets shall be factory wired and pre-piped when applicable.

2 CABINET

2.1 The vertical stacked fan coil units shall be Sigma with an integrated ERV. Units shall provide scheduled capacities at the ampacity and voltage specified.

2.2 The cabinet shall be 20-gauge galvanized steel. Cabinet shall have internal surfaces insulated with 1/2 inch thick, 3.5 lbs. high-density, mold resistant, thermal and acoustic insulation. Insulation shall meet NFPA 90, UL-181, and ASTM-C1071 standards and insulation shall have a flame spread of less than 25, and a smoke developed classification of less than 50 per ASTM E-84 and UL 723.

2.3 Physical dimensions of each unit shall be accommodated within furring / ceiling-slab spaces provided as shown on the architectural drawings

2.4 A removable inner service panel allowing service access to the fan, valves and coil pack compartment shall be provided with each unit.

2.5 A removable inner ERV service panel allowing front service access to the ERV, ERV fans and filters shall be provided with each unit.

2.6 The drain pan shall be stainless steel. The drain pan outlet shall be readily accessible for cleaning with a 7/8 inch OD (22mm) copper drain connection. Unit shall be provided with a flexible p-trap condensate hose for connection to the condensate riser.

2.7 (Factory) (Field) supplied supply and return risers shall be (Type L) (Type M) copper, with (factory) (field) mounted shut-off ball valves on each supply and return riser. Valves shall be brass and rated for 300 psig (2060kPa). A (Type M) condensate riser shall be (factory) (field) supplied and field installed. Risers sizes shall be installed according to building plans.

2.8 Risers shall have optional factory provided 3-inch (75mm) deep swage. Reducers and caps shall be field provided and field installed. Anchors, and compensators shall be field supplied and field installed.

2.9 Unit cabinet shall come with supply discharge opening “knockouts”. All cabinet discharge openings shall include 1-1/2 inch drywall flange around the full opening perimeter. Supply discharge “knockouts” are cut and field selected.

2.10 Supply ducts shall not be rigidly attached to the cabinet and shall be acoustically isolated from cabinet using flexible connections. Contractor shall install flex connection on all discharge openings. There shall be no rigid connection to supply-air discharge grilles or supply ducts.

2.11 Each unit shall have a sectionalized removable Return Air panel. The panels shall be easily removable without tools. The lower panel section shall have access to the filter, blower assembly, and service disconnect. The upper panel shall provide access to the ERV section, including a removable ERV core, fans and sensors.

2.12 **(Optional)** Perimeter Return Air Panel shall be provided. Return air panel is sectionalized into 3 sections and all panels removable without tools.

2.13 **(Optional)** Front supply discharge grille shall be provided that integrates with ERV Return Air Panel. Supply discharge grille shall be provided as double deflection or with optional opposed blade dampers.

2.14 Each ERV shall be factory configured for the handing specified on the room schedule. Each ERV shall be factory installed in the Vertical Stack cabinet and factory wired. ERV’s that ship loose and/or are not configured, installed, and wired at factory and/or require field installation are not accepted. ERV power supply shall be factory wired to main unit disconnect. Single source power is required for entire fan coil and ERV. Units requiring separate external power feed for ERV module are not accepted.

2.15 ERV casing shall be constructed with 22GA galvanized steel. The ERV cabinet shall be fully insulated. Cabinet is furnished with 5-in (125mm) diameter ERV duct connections. Field Outdoor Air, Bathroom Exhaust and Exhaust Air duct diameters shall be 5-in (125mm) in diameter. ERV shall be integral to the cabinet and is factory installed in the fan cabinet section.

2.16 Energy recovery core material shall be Polymeric membrane with sensible and latent recovery. ERV core shall have no odor crossover (AHRI 1060 certified for <0.5% crossover), mold and bacteria resistant (certified to ISO 846) , and water washable. Cellulose (paper), plastic cores shall not be accepted.

2.17 Each of the two air streams shall have independent MERV 6 washable filter media. Each filter shall have a face area of no less than 80 square inches.

2.18 ERV shall be fitted with a modulating outside air damper controlled by an electronic actuator that will modulate outside air (OA) as required to maintain fresh air introduction and shut-off if required by the freeze protection sequence.

2.19 (**Optional)** Unit shall be provided with a High Efficiency ERV Core. ERV Core shall provided minimum 80% sensible effectiveness at 50CFM in heating mode.

2.20 (**Optional)** Provide each unit with 2-inch thick MERV 13 pleated filters.

3 FAN & BLOWER

3.1 Each unit shall include a factory mounted forward curved, double inlet double width centrifugal direct drive fan and motor assembly with internal overload protection. The blower fan assembly shall be positioned horizontally from a sheet metal blower deck.

3.2 Units shall be supplied with an ECM fan motor as standard. Fan motors speeds shall be field selectable by wiring thermostat to required fan speed terminals.

3.3 ERV unit shall be fitted with two ERV fans. Fan motor speed shall be fully controllable via internal signal.

3.4 ERV unit shall provide heat exchange when bathroom exhaust is activated at all times. ERVs that have bathroom air bypass

SHFCe - MECHANICAL SPECIFICATION CONT'D

ERV heat exchanger are not accepted.

4 COIL PACK

4.1. Provide high temperature and pressure rated water hoses for connection of the risers to the coil pack. The hoses supplied shall be constructed with an inner core of rubber, a stainless-steel metal braid, and rubber outer covering. Fittings shall be brass construction. Hoses shall carry a working pressure rating of 600 psig.

4.2. The coil pack shall be mounted inside the fan cabinet. Air side coils shall have copper tubes mechanically bonded to aluminum fins. Coil shall be sized to meet scheduled performance for cooling and heating. Provide 1" T/A filter on coil face.

4.3 The coil pack shall have factory installed 2-way control valves, as specified on the mechanical drawings.

4.4 (**Optional**) The coil pack shall employ an optional 3-way motorized auto shut-off valve to shut off water to the unit. Valve shall be factory installed as part of the coil pack assembly.

4.5 (**Optional**) The coil pack shall employ an optional 6-way motorized auto shut-off valve to shut off water to the unit. Valve shall divert cooling or heating water to the single coil pack. Coil pack shall be factory installed as part of the coil pack assembly.

4.6 (**Optional**) The coil pack shall employ an optional pressure independent control valve (PICV) to shut off water to the unit and balance water flow.

4.7 (**Optional**) The coil pack shall employ optional autoflow balancing valve factory installed in the coil pack to maintain specified unit water flow rate over 2-80 psig differential water pressure. Auto flow balancing valve shall be field serviceable.

4.8 **(Optional)** The coil pack shall come with optional y-strainer with #20 mesh screen to filter any debris and shall be field serviceable.

5 CONTROLS

5.1 Each unit shall be factory wired with all necessary controls. Each unit shall come standard with a fan motor contactor, 24-volt control power transformer, terminal block for low voltage field wiring connection, and terminal block for main power electrical connection, (optional) unit mounted service disconnect switch.

5.2 (**Optional**) Condensate Overflow Switch shall be installed in the drain pan and wired to the electrical box compartment.

5.3 Thermostats shall be 24VAC, field wired to the unit terminal strip. Thermostats shall be (non-programmable) (programmable). Thermostats shall be suitable for fan coil operation and have 3 fan speed control capability with Auto Change-Over and LCD backlit display.

5.4 Fan operation shall have an ultra low fan speed "whisper mode" for air circulation when there is no call for heating or cooling to circulate Outdoor Fresh Air.

6 ERV CONTROLS

6.1 ERV shall be integrated into the Vertical Stack cabinet and configured, fully wired at factory. Units that require field installation, field configuration and / or field wiring of ERV are not accepted.

6.2 The built-in ERV control algorithm shall operate to thermodynamically equalize outside air (OA) and exhaust air (EA) flow, which may vary considerably depending on stack effect. ERV shall be controlled with an on-board microprocessor controller. ERV shall measure 6 temperature sensors: Outside Air (OA), Mixed Air (MA), Supply Air (SA), Discharge Air (DA), Bathroom Exhaust Air (BA), and Exhaust Air (EA).

6.3 **Air Flow:** ERV shall contain two potentiometer speed settings, one for each high and low speed modes. Fan speeds are field configurable to meet design ERV CFM conditions in Low and High ERV fan speed requests.

6.4 **Defrost Mode:** ERV unit shall contain a Normally Closed, spring return outdoor damper for tempering outside air. Manual outside air dampers are not accepted. ERV unit shall enter defrost mode once OA temperatures are below 14°F (-10°C), to maintain supply air (SA) temperature above 50°F (10°C).

6.5 **Supply Air Temperature:** Recirculation damper shall temper outside air (OA) to maintain a minimum supply air (SA) temperature of 50°F (10°C) to avoid dumping of cold air into the conditioned space.

6.6 **Whisper Mode** shall provide constant air circulation to distribute the Outdoor Fresh Air throughout the occupied space.

6.7 ERV shall provide bathroom exhaust requirements without the need for additional field installed bathroom exhaust fan and wiring. Units that require bathroom fan to be field installed are not accepted.

6.8 ERV shall operate continuously even when unit heating and cooling demand is not required. Units that do not have continuous ERV fan on capability shall not be accepted.

7 TESTING & WARRANTY

7.1 Each unit shall be factory tested using a multi-step controlled testing equipment to prevent operator error during factory testing.

7.2 Warranty shall be for parts, 1 year not to exceed 18 months from date of shipment.

8 EXECUTION

8.1 Units shall be installed neat and level.

8.2 Flush the system per manufacturer instructions before connecting fan coil. Contractor shall join supply and return riser flexible hoses together, at the top/bottom on every riser and at the farthest point from the pump for flushing purposes. Contractor shall not flush or clean riser system through the unit coil pack.

8.3 Installing contractor shall install risers and install riser transition piece connections where riser sizes change.

8.4 The hoses shall be installed in the field by the contractor to the riser isolation valves. The flare fittings on the hoses shall be connected according to industry standard (Finger tighten then tighten with wrench while always using back-up wrench).

8.5 Flush the system per manufacturer instructions before connecting coil pack. The riser system shall be flushed, cleaned and commissioned before connecting fan coil units to the riser system.

8.6 Contractor shall make all necessary provisions to bring in ducts for "outside air", "bathroom exhaust", and "bathroom air to outside" and field connect each duct to unit mounted take-offs.

8.7 Contractor shall provide flexible duct connections on all single piece units.