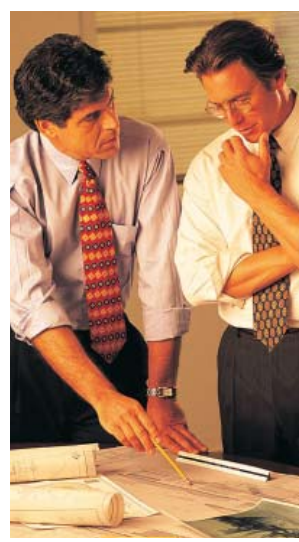


# Vertical Stack Fan Coils 300 - 1,200 CFM





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## **ARI Certified**

Williams Vertical Stack fan coils are labeled and approved by the Air Conditioning and Refrigeration Institute (ARI). This designation signifies that Williams Vertical Stack fan coil units have been examined by ARI and comply with the organization's applicable standards.



## **UL Listing**

Williams Vertical Stack fan coils are listed by Underwriters Laboratories, Inc. (UL). The UL listing ensures that Williams Vertical Stack fan coil units have been examined by UL and comply with the organization's applicable standards. UL's re-examination service includes periodic visits by UL inspectors to Williams' factory to ensure continued compliance for all listed products.



## **C-UL US Listing**

Williams Vertical Stack fan coils are listed by Underwriters Laboratories of Canada (ULC). The C-UL US listing ensures that Williams Vertical Stack fan coil units have been examined by UL and are in compliance with both the U.S. and Canadian organizations' applicable standards.

Materials and equipment acceptance for use by the New York Department of Buildings:

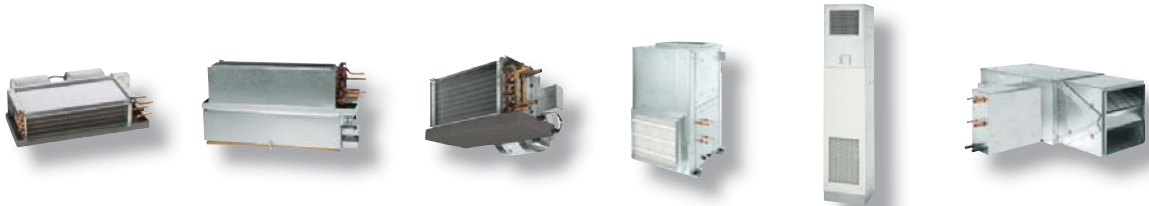
ER/DR003-012

MEA 413-05-E



## Williams Applied Products

*...more than just fan coils.*



For 90 years, Williams has been a market leader in providing high quality HVAC products for residential and commercial buildings. Today, the Williams Applied



Products Group continues the proud tradition by offer-

ing to the commercial/industrial market more configurations and size options of quality fan coils and blower coils/air handlers than any other HVAC company in North America.

The Williams Applied Products Group, based in Oklahoma City, Oklahoma, serves all US and overseas markets with complete application engineering, sales, marketing and administrative services.

Served by company factories in Colton, California and Phoenix, Arizona, the Applied Products Group uses the resources of nearly 600,000 square feet of manufacturing and warehouse facilities to provide high quality products to some of the most discriminating customers in the world.

The Williams Applied Products Group pledge is to provide complete, high quality and timely support for the success-



ful completion of your construction projects involving engineered products offered by Williams. We believe in a partnering attitude that creates superior projects and high levels of satisfaction.



**300 - 1200 CFM**



### **Easy Riser Basic**

For concealed application virtually anywhere in the room, the Easy Riser Basic Vertical Stack (ER-B) comes standard in a heavy-gauge 88" galvanized steel cabinet, insulated with 1/2" thick, neoprene-coated fiberglass. This standard unit features a 1/2" OD copper tube coil, slide-out blower assembly with quick-disconnect plug, insulated drain pan and filter. Risers are ordered separately due to size changes throughout the building.

### **Easy Riser Deluxe**

For exposed applications along walls and in corners, the Easy Riser Deluxe Vertical Stack (ER-D) is the model of choice. In addition to the same internal features as the ER-B, the Easy Riser Deluxe comes with a epoxy, powder-coat exterior and is subjected to a 1,500-hour salt spray test in accordance with ASTM B117. When greater architectural appeal is desired, the ER-B with cabinet enclosure is the preferred choice.

### **Designer Riser Basic**

The Designer Riser Basic Vertical Stack (DR-B) is for concealed applications along walls and in corners. This model comes standard in an extended 97" galvanized steel cabinet, insulated with 1/2" thick neoprene-coated fiberglass. Like the ER-B, this unit features a 1/2" OD copper tube coil, slide-out blower assembly with quick-disconnect plug, insulated drain pan and filter.

### **Designer Riser Deluxe**

The Designer Riser Deluxe Vertical Stack (DR-D) is for exposed applications also along walls and in corners. In addition to the same internal features as the DR-B, the Designer Riser Deluxe's 97" cabinet includes a epoxy, powder-coat exterior and is subjected to a 1,500-hour salt spray test in accordance with ASTM B117. When greater architectural appeal is desired, the DR-B with cabinet enclosure is the preferred choice.



### 300 - 1200 CFM



#### Easy Riser / Master Slave

The Easy Riser Master/Slave Vertical Stack units (ER-M and ER-S) have the same internal components as our Basic model, yet are designed to share a common riser set. The Master/Slave combination features two separate units piped to a common set of risers, each with individual valves and controls. These units come in an 88" galvanized steel cabinet.



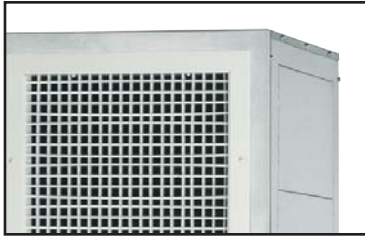
#### Designer Riser / Master Slave

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#### Twinpack

The TwinPack is a master/slave combination that is pre-piped and housed in a common cabinet assembly at the factory. TwinPack Vertical Stack units include a UL 1-Hour Through Penetration Firestop W-L-7089 system. Local codes may dictate exact amount and placement of drywall. Each unit has its own set of valves and controls.



### Standard Features

- Heavy-gauge galvanized steel cabinet with neoprene-coated 1/2" thick fiberglass insulation with 3.35 PCF density.
- Coils are made of 1/2" OD copper tube with aluminum fins (12 FPI) equipped with manual-air vent. DX and steam coils do not include manual-air vent. Coils are 100% underwater pressure tested at 350 PSI with a 300 PSI working pressure.
- Galvanized drain pan is powder-coated epoxy with a 1/8" thick closed-cell insulation and has primary and secondary drain connections.
- Three-speed, 115/1/60 PSC motor with quick-connect plug.
- Controls and motors are factory-wired and terminated in a junction box for single-point power supply.
- 1/2" reinforced duct collar on return-air opening.
- Deluxe unit has single-deflection supply-air grille.
- One-inch fiberglass, throwaway filter.
- Protective cardboard covers grille openings during shipment and construction.
- Individually tagged, crated and shipped as scheduled for installation.
- UL and C-UL approved, ARI certified and 100% factory tested.



### Options

- Soft-white, powder-coated epoxy cabinet that's subjected to a 1,500-hour salt spray test in accordance with ASTM B117.
- Drain Pans - stainless steel and double-wall.
- Insulation - fiberglass, foil-face, elastomeric and double-wall (solid or perforated) in 1/2" and 1" thicknesses.
- Coils - copper fins/tubes, stainless steel fins/tubes, phenolic coated, stainless steel end plates. All options are available on one- to six-rows.
- Three-speed, 208-230/1/50-60 or 277/1/60 PSC motor with quick-connect plug.
- Systems - two- or four-pipe, hydronic cooling/heating, steam, direct-expansion (DX) and/or electric heat.
- Cabinet - Enclosures; Deluxe and Concealed.
- Controls - wide selection of factory-mounted valves and controls.
- Filters - two-inch thick throwaway washable and metallic.
- Flow-control circulator for water heating applications.
- Grilles -supply and return, single- and double-deflection, additional openings and custom colors.
- Thermostat with quick-connect plug.
- Outside Air Openings - motorized and manual outside-air dampers.
- Electric Resistance Heat from 1.0 to 7.5 kW.
- Pedestal bases.
- Risers and extensions available in Type M, L and K copper with fiberglass, elastomeric and closed-cell insulation.
- Risers on Master fan coils have a 3" long and 5/8" swaged solder joint to connect to the Slave unit.
- Riser Termination Valve Package.



# ARI Cooling Capacity



## ARI Certified Cooling Capacity

Williams ER & DR Series vertical stack fan coils have been rated in accordance with ARI Standard 440-2005 for room fan-coils air-conditioners and are certified by the Air-Conditioning and Refrigeration Institute to meet the following product performance ratings:

ARI APPROVED STANDARD RATINGS						COOLING CAPACITY	
SIZE	MODEL / MOTOR TYPE	STYLE	RATED CFM	GPM	WPD (FT./H <sub>2</sub> O)	TOTAL COOLING (BTUH)	SENSIBLE COOLING (BTUH)
003	ER Series (Standard)	B, D, S, M	340	2.3	3.7	11,440	8,540
	DR Series (Standard)	B, D, S, M	340	1.7	2.3	8,310	7,090
004	ER Series (Standard)	B, D, S, M	450	2.9	5.1	14,440	10,940
	DR Series (Standard)	B, D, S, M	420	1.9	2.9	9,680	8,400
005	DR Series (Standard)	B, D, S, M	525	3	3.9	15,220	11,180
006	ER Series (Standard)	B, D, S, M	680	4	2.1	20,070	16,060
	DR Series (Standard)	B, D, S, M	630	3.2	4.6	16,140	13,720
008	ER Series (Standard)	B, D, S, M	850	4.9	5.1	24,330	19,330
	DR Series (Standard)	B, D, S, M	760	4.7	7.8	23,420	18,140
010	ER Series (Standard)	B, D, S, M	1040	5.7	6.6	28,370	22,900
	DR Series (Standard)	B, D, S, M	1040	5.7	6.6	28,370	22,900
012	ER Series (Standard)	B, D, S, M	1140	7.7	6.2	38,660	28,870
	DR Series (Standard)	B, D, S, M	1140	7.7	6.2	38,660	28,870

- Notes: 1) Based on 80°F DB and 67°F WB EAT, 45°F EWT, 10°F temperature rise, high fan speed. Motor voltage 115/1/60 power source. Air flow under dry coil conditions. Water pressure drops shown in feet of water. All units are listed under UL Category Control No. LZFE.  
 2) Ratings are based on actual CFM. Standard coils for 002-004 is 3 rows and 006-012 is 4 rows.



## Heating Performance

Heating Performance						
SIZE	SERIES / MOTOR TYPE	COIL ROWS/ (FPI)	RATED CFM	MBH	GPM	WPD (FT./H <sub>2</sub> O)
003	ER Series (Standard)	1 Row (12)	350	23.3	2.3	2.9
		2 Rows (12)	350	33.1	3.3	2.1
	DR Series (Standard)	1 Row (12)	340	22.9	2.3	2.9
		2 Rows (12)	340	32.3	3.2	2.1
004	ER Series (Standard)	1 Row (12)	450	31.3	3.1	5.0
		2 Rows (12)	450	43.9	4.4	3.6
	DR Series (Standard)	1 Row (12)	425	30.0	3.0	4.8
		2 Rows (12)	425	41.8	4.2	3.4
005	DR Series (Standard)	1 Row (12)	495	33.2	3.3	5.7
		2 Rows (12)	495	47.2	4.7	4.1
006	ER Series (Standard)	1 Row (12)	665	41.1	4.1	2.0
		2 Rows (12)	665	59.6	5.9	1.5
	DR Series (Standard)	1 Row (12)	630	43.3	4.3	8.3
		2 Rows (12)	630	61.2	6.1	6.0
008	ER Series (Standard)	1 Row (12)	860	50.4	5.0	2.8
		2 Rows (12)	860	74.1	7.4	2.2
	DR Series (Standard)	1 Row (12)	755	46.7	4.6	2.6
		2 Rows (12)	755	73.5	7.3	9.0
010	ER Series (Standard)	1 Row (12)	1,055	63.0	6.3	3.9
		2 Rows (12)	1,055	92.6	9.2	3.1
	DR Series (Standard)	1 Row (12)	1,055	69.2	6.9	17.5
		2 Rows (12)	1,055	99.8	10.0	13.5
012	ER Series (Standard)	1 Row (12)	1,210	74.4	7.4	5.2
		2 Rows (12)	1,210	108.7	10.8	4.0
	DR Series (Standard)	1 Row (12)	1,210	80.7	8.0	22.8
		2 Rows (12)	1,210	115.8	11.6	17.5

Notes: Based on 70°F DB EAT, 180°F EWT, Delta T = 20, high fan speed. Motor voltage 115/1/60 power source. Air flow under dry coil conditions. Water pressure drops shown in feet of water.

## Coil Data

Coils are made from 1/2" O.D. copper tubing with .017" wall thickness, and tubes are staggered for maximum heat transfer. A manual air vent is standard on all hydronic coils. DX and steam coils do not include manual-air vent. All coils are 100% underwater pressure tested to 350 PSIG with a 300 PSIG working pressure. Steam coils are rated for up to 15 PSIG or 250°F.

Coils are available in two- or four-pipe, and from one- to six-row configurations for ER & DR Series units with any combination of chilled or hot water, steam or direct expansion. Custom circuiting is available.

Coil Rows	003	004	(005)	006	008	010	012
Single-Row Coil	S T A N D A R D						
Two-Row Coil							
Three-Row Coil							
Four-Row Coil	O P T I O N A L						
*Five-Row Coil							
Six-Row Coil							

\* Five-row coil maximum when selecting a DX coil with a hot water coil.

\* Five-row available as DR only.



## Coil Data (cont.)

### Coil Options:

- DX – Includes distributor and nozzle, TXV must be field furnished and installed
- Steam – 1-15 PSIG
- Wild Coil - Includes coil baffle and coil separator - requires outside air opening.
- Opposite End Connection (E). Place the “E” - pipe-hand connection in the eleventh digit of the model number - when ordering
- Preheat Coil Position (PREHEAT) – Standard coil is reheat position
- Phenolic Anti-Corrosion Coating (PAC)      • Stainless Steel Tubes/Fins/End Plates
- Copper Fins/Tubes/End Plates                      • 6-16 Fins Per Inch (Standard is 12 FPI)

Coil connections on the chilled water side is 1/2” on the 003-012.. The hot water connection is also 1/2” on the 003-012.

## Electric Heat

Electric heat may be furnished with either hydronic, direct expansion or steam coils and is factory-mounted, wired, and tested. Option-equipped with low-watt density (for long life) nichrome wire elements. The heater has a built-in, high limit, and fusible link to provide maximum safety.

Model / Size	kW	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
	Voltage	AMPS															
003	115	8.7	13.0	17.4	21.7	26.1											
	208	4.8	7.2	9.6	12.0	14.4	16.8	19.2									
	230	4.4	6.5	8.7	10.9	13.0	15.2	17.4									
	277	3.6	5.4	7.2	9.0	10.8	12.6	14.4									
004	115	8.7	13.0	17.4	21.7	26.1											
	208	4.8	7.2	9.6	12.0	14.4	16.8	19.2									
	230	4.4	6.5	8.7	10.9	13.0	15.2	17.4									
	277	3.6	5.4	7.2	9.0	10.8	12.6	14.4									
005*	115	8.7	13.0	17.4	21.7	26.1											
	208	4.8	7.2	9.6	12.0	14.4	16.8	19.2									
	230	4.4	6.5	8.7	10.9	13.0	15.2	17.4									
	277	3.6	5.4	7.2	9.0	10.8	12.6	14.4									
006	115	8.7	13.0	17.4	21.7	26.1											
	208	4.8	7.2	9.6	12.0	14.4	16.8	19.2									
	230	4.4	6.5	8.7	10.9	13.0	15.2	17.4									
	277	3.6	5.4	7.2	9.0	10.8	12.6	14.4									
008	115	8.7	13.0	17.4	21.7	26.1											
	208	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0							
	230	4.4	6.5	8.7	10.9	13.0	15.2	17.4	19.6	21.7	23.9	26.1	28.3	30.4	32.6		
	277	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.3	18.1							
010	115	8.7	13.0	17.4	21.7	26.1											
	208	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0	26.4	28.9	31.3	33.7	36.1		
	230	4.4	6.5	8.7	10.9	13.0	15.2	17.4	19.6	21.7	23.9	26.1	28.3	30.4	32.6		
	277	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.3	18.1	19.9	21.7	23.5	25.3	27.1		
012	115	8.7	13.0	17.4	21.7	26.1											
	208	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0	26.4	28.9	31.3	33.7	36.1		
	230	4.4	6.5	8.7	10.9	13.0	15.2	17.4	19.6	21.7	23.9	26.1	28.3	30.4	32.6		
	277	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.3	18.1	19.9	21.7	23.5	25.3	27.1		

\* 005 available as DR only.



## Air Flow Data

Air flow shown below is under dry coil conditions.

AIR FLOW DATA			EXTERNAL STATIC PRESSURE																	
SIZE	MODEL / STYLE	COIL ROWS	0.00			0.05			0.10			0.15			0.20			0.25		
			HI	MED	LOW	HI	MED	LOW	HI	MED	LOW	HI	MED	LOW	HI	MED	LOW	HI	MED	LOW
003	ER Series (Standard)	3 ROW	350	270	200	310	235	170	265	205	145	225	170	115	NA	NA	NA	NA	NA	NA
		4 ROW	346	267	197	306	232	168	261	202	142	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DR Series (Standard)	3 ROW	340	285	245	305	260	210	275	230	180	245	200	145	NA	NA	NA	NA	NA	NA
		4 ROW	337	283	242	302	257	207	272	227	177	NA	NA	NA	NA	NA	NA	NA	NA	NA
004	ER Series (Standard)	3 ROW	450	350	255	410	315	230	370	285	210	330	255	185	290	225	160	NA	NA	NA
		4 ROW	446	347	253	406	312	228	366	282	208	326	252	183	290	225	160	NA	NA	NA
	DR Series (Standard)	3 ROW	425	345	290	395	310	260	360	280	235	330	245	205	300	210	175	NA	NA	NA
		4 ROW	422	342	287	392	307	258	357	277	232	327	242	202	300	210	175	NA	NA	NA
005	DR Series (Standard)	4 ROW	491	411	385	470	390	360	445	366	335	420	346	310	400	330	290	NA	NA	NA
		5 ROW	493	413	388	473	393	363	448	368	338	423	348	313	400	330	290	NA	NA	NA
006	ER Series (Standard)	4 ROW	665	490	380	620	459	353	566	424	323	511	389	293	460	349	263	NA	NA	NA
		5 ROW	660	487	377	610	452	347	555	417	317	500	381	287	455	345	260	NA	NA	NA
	DR Series (Standard)	4 ROW	630	550	465	610	530	445	590	515	430	570	495	415	550	475	400	NA	NA	NA
		5 ROW	628	548	463	610	529	444	588	513	429	568	493	414	550	475	400	NA	NA	NA
008	ER Series (Standard)	4 ROW	860	665	525	805	625	490	755	580	460	700	540	425	650	495	390	600	455	360
		5 ROW	855	661	522	800	621	487	750	576	457	695	536	422	645	491	387	600	455	360
	DR Series (Standard)	4 ROW	755	630	550	730	610	530	705	590	515	680	570	495	655	550	475	630	530	455
		5 ROW	753	628	548	728	608	529	703	588	513	678	568	493	653	548	473	630	530	455
010	ER Series (Standard)	4 ROW	1055	810	655	995	765	620	940	725	590	880	685	555	820	640	520	760	600	480
		5 ROW	1049	806	652	990	761	617	934	721	587	874	681	552	814	636	516	760	600	480
	DR Series (Standard)	4 ROW	1055	810	655	995	765	620	940	725	590	880	685	555	820	640	520	760	600	480
		5 ROW	1049	806	652	990	761	617	934	721	587	874	681	552	814	636	516	760	600	480
012	ER Series (Standard)	4 ROW	1055	810	655	995	765	620	940	725	590	880	685	555	820	640	520	760	600	480
		5 ROW	1049	806	652	990	761	617	934	721	587	874	681	552	814	636	516	760	600	480
	DR Series (Standard)	4 ROW	1055	810	655	995	765	620	940	725	590	880	685	555	820	640	520	760	600	480
		5 ROW	1049	806	652	990	761	617	934	721	587	874	681	552	814	636	516	760	NA	480

Notes: Ratings and capacity tables based on nominal CFM.



## Motor Data

Motors are wired to a junction box ready for single-point field connection.

Outstanding motor features:

- Quick-Connect Plug
- Permanent Split Capacitor
- Thermal overload protection
- 1050 RPM for lower operating costs
- Oversized bearings and permanently lubricated and sealed
- 122°F maximum operating temperature
- Custom motor mounts designed to reduce noise and eliminate vibration
- Stators are epoxy-dipped for more efficient motor cooling

Optional motors:

- 208V-1Ø-60 motors
- 277V-1Ø-60 motors
- 230/220V-1Ø-60 motors
- 50-Hz motors in specified voltages

60 Hertz Single-Phase Motors (1100 RPM)				Voltage/Watts							
				115V		208V		230V		277V	
Size	Model / Motor Type	HP (Qty)	Blowers	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
003	ER Series (Standard)	1/15	1	0.9	105	0.55	105	0.5	105	0.4	134
	DR Series (Standard)	1/15	1	0.9	108	0.55	108	0.5	108	0.4	108
004	ER Series (Standard)	1/15	1	1.0	143	0.66	143	0.6	143	0.6	143
	DR Series (Standard)	1/15	1	1.0	138	0.66	138	0.6	138	0.6	138
005*	DR Series (Standard)	1/12	1	1.2	205	0.77	205	0.7	205	0.7	205
006	ER Series (Standard)	1/6	1	1.5	188	0.66	188	0.6	188	0.6	188
	DR Series (Standard)	1/6	1	1.5	224	0.88	224	0.8	224	0.6	224
008	ER Series (Standard)	1/6	1	2.2	293	1.10	293	1.0	293	0.8	293
	DR Series (Standard)	1/6	1	2.2	284	1.10	282	1.0	282	0.8	282
010	ER Series (Standard)	1/4	1	2.5	298	1.10	298	1.0	298	0.8	298
	DR Series (Standard)	1/4	1	2.6	303	1.30	303	1.2	303	0.9	303
012	ER Series (Standard)	1/4	1	3.2	383	1.65	383	1.5	383	1.2	383
	DR Series (Standard)	1/4	1	3.2	390	1.65	390	1.5	390	1.2	390

Notes: Motor full load amps listed refer to NEC amps. Actual motor nameplate amps may vary.



## Sound Data

Size	Model	Fan Speed	OCTAVE BAND							
			2	3	4	5	6	7	8	
			CENTER FREQUENCY (CPS)							
			125	250	500	1000	2000	4000	8000	
003	ER Series	High	55.4	47.6	47.3	38.7	21.3	29.8	31.8	
		Medium	50.6	43.7	41.3	33.6	27.7	27.3	29.7	
		Low	46.5	38.8	36.5	28.7	22.4	21.8	24.6	
		*Low-Special	40.9	34.9	32.7	23.6	19.9	19.8	22.4	
003	DR Series	High	55.0	47.0	46.5	40.5	31.0	24.0	27.5	
		Medium	50.5	44.5	43.5	37.0	25.5	20.5	27.5	
		Low	46.5	39.0	37.0	30.0	19.5	20.0	27.5	
004	ER Series	High	58.5	52.3	51.0	43.6	38.6	34.7	31.7	
		Medium	55.6	43.1	40.0	34.5	28.8	26.6	28.7	
		Low	51.4	40.0	38.8	31.6	25.4	23.8	27.5	
		*Low-Special	44.5	37.9	34.9	25.5	23.1	21.7	25.4	
004	DR Series	High	57.5	54.5	53.0	48.0	41.5	33.5	29.0	
		Medium	55.0	47.0	46.5	40.5	31.0	24.0	27.5	
		Low	50.5	44.5	43.5	37.0	25.5	20.5	27.5	
006	ER Series	High	60.9	51.7	50.7	44.6	38.7	34.0	35.6	
		Medium	57.6	48.6	47.5	40.3	33.5	32.1	35.0	
		Low	52.6	46.0	43.0	35.7	32.2	28.1	27.9	
		*Low-Special	47.1	44.7	42.7	37.1	31.4	27.0	26.8	
006	DR Series	High	58.5	55.0	56.5	50.5	42.0	36.5	30.0	
		Medium	53.0	51.5	53.0	45.0	40.0	37.0	30.0	
		Low	51.0	47.5	48.5	40.5	31.0	24.0	27.0	
008	ER Series	High	64.3	58.4	56.1	50.1	46.3	42.1	38.7	
		Medium	58.4	49.8	46.3	42.3	38.8	32.2	31.0	
		Low	51.4	46.2	40.5	36.7	33.2	28.5	25.2	
		*Low-Special	46.3	43.9	39.2	35.2	29.5	28.1	24.8	
008	DR Series	High	61.5	59.5	60.5	56.0	48.0	42.5	36.0	
		Medium	57.5	56.0	56.0	51.5	46.5	41.0	34.0	
		Low	52.6	51.0	52.0	45.0	36.0	30.5	27.0	
010	ER Series	High	65.8	59.9	58.8	55.7	49.8	44.6	41.7	
		Medium	60.3	54.1	54.7	51.5	44.6	41.7	33.8	
		Low	57.0	49.8	46.5	44.3	37.6	35.5	31.7	
		*Low-Special	56.0	48.2	43.2	36.7	30.3	29.3	30.1	
012	ER Series	High	69.1	65.3	62.3	58.5	52.8	47.3	45.8	
		Medium	63.3	58.9	57.9	54.1	47.3	44.2	37.2	
		Low	59.9	54.3	49.3	46.5	39.9	37.6	34.8	
		*Low-Special	58.8	52.5	45.8	38.5	32.1	31.1	33.1	

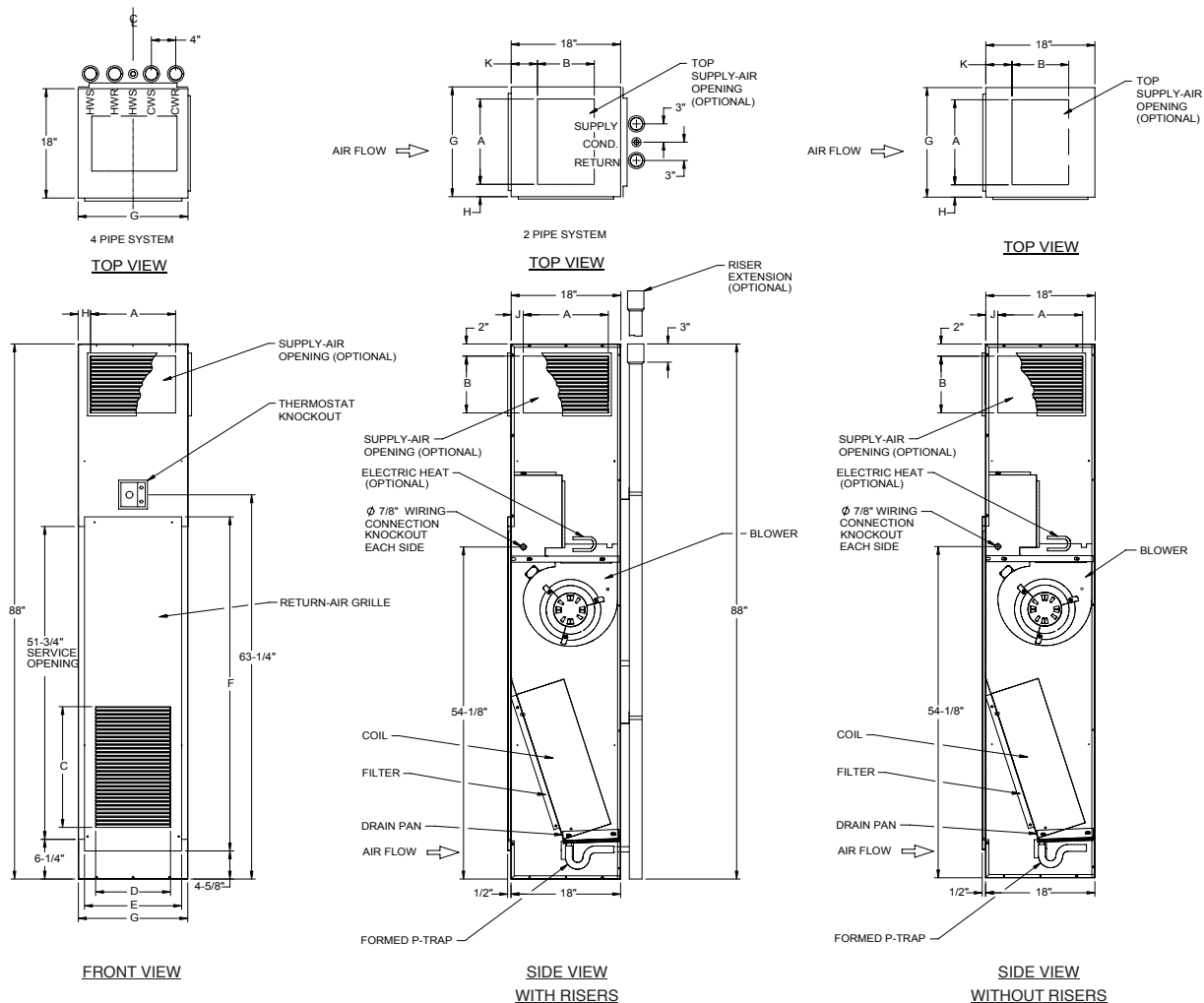
- Notes:
- 1) Power levels are in dB RE 10-12 watts.
  - 2) Sound data tested in accordance with ASHRAE Standard 68 and ARI Standard 260 and 350.
  - 3) Ratings are based on actual CFM. Standard coils for 003-004 is 3 rows and 006-012 is 4 rows.
  - 4) Air Flow under dry coil conditions.



# Certified Dimensional Drawings - ER Series

## VERTICAL STACK HIGH RISE - ER BASIC/DELUXE

300 - 1200 CFM

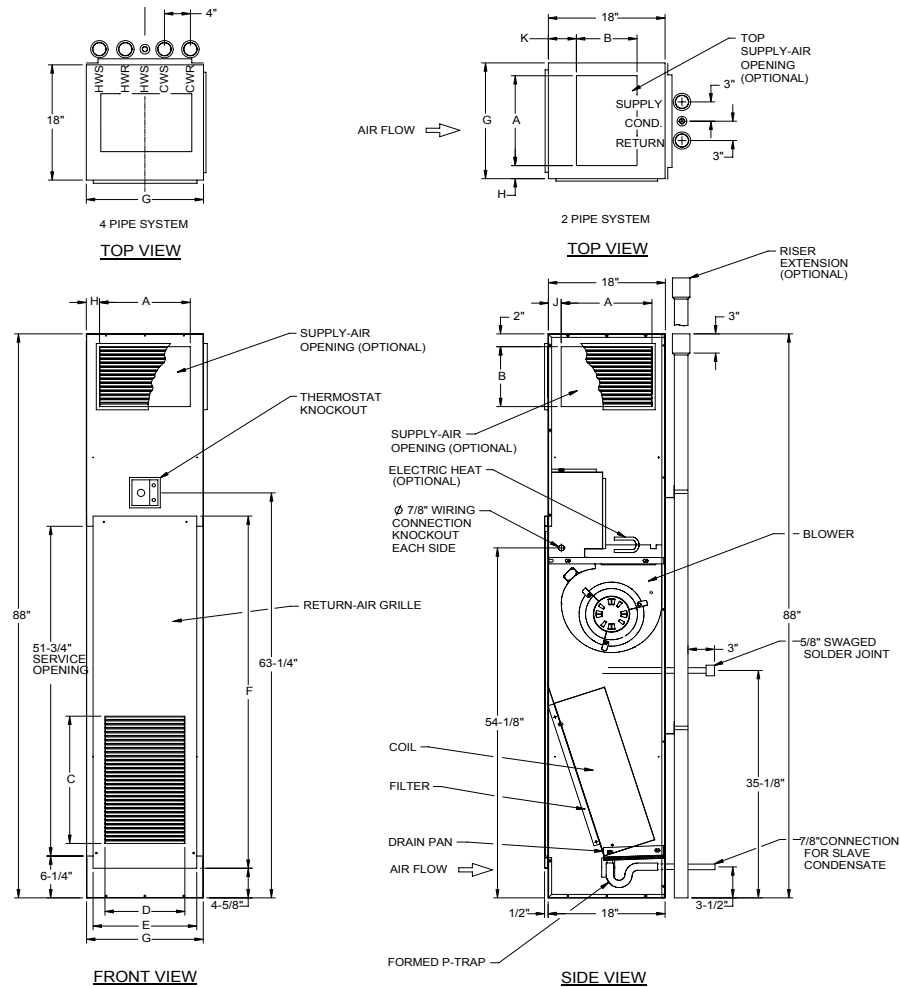


MODEL	Discharge Opening		Return-Air Grille		Access Panel		G	H	J	K	FILTER SIZE
	A	B	C	D	E	F					
300	14	12	19-1/2	13	17	55	18	2	2	2	14X25X1
400	14	12	19-1/2	13	17	55	18	2	2	2	14X25X1
600	14	12	19-1/2	13	17	55	18	2	2	2	14X25X1
800	16	14	20-1/2	15	23	55	24	4	1	4	20X25X1
1000	16	14	20-1/2	15	23	55	24	4	1	4	20X25X1
1200	16	14	20-1/2	15	23	55	24	4	1	4	20X25X1

- Coil connections may be right, left or rear.
- Coil connections determined by facing the return-air grille.
- Electrical junction box is located above the blower and motor assembly.
- Unit must be installed level and condensate drain lines should be trapped.
- Removable drain pan is powder-coated epoxy with a 1/8" thick closed-cell insulation and has 3/4" NPT primary and secondary drain connections.
- Entire cabinet, scroll and blower wheel are heavy-gauge, galvanized steel.
- Coil Connections: 1/2" CW on ER003-012 and 1/2" HW on ER003-012.



## VERTICAL STACK HIGH RISE - ER MASTER 300 - 1200 CFM

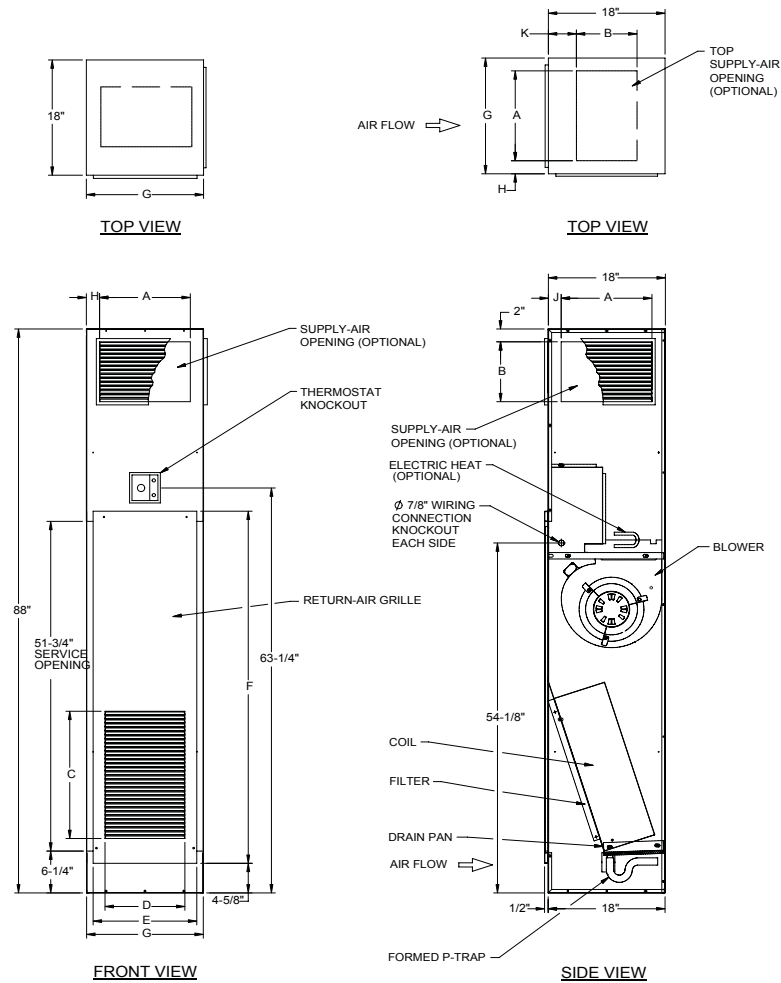


MODEL ER-M	Discharge Opening		Return-Air Louvers		Return-Air Grille		G	H	J	K	FILTER SIZE
	A	B	C	D	E	F					
300	14	12	19-1/2	13	17	55	18	2	2	2	14X25X1
400	14	12	19-1/2	13	17	55	18	2	2	2	14X25X1
600	14	12	19-1/2	13	17	55	18	2	2	2	14X25X1
800	16	14	20-1/2	15	23	55	24	4	1	4	20X25X1
1000	16	14	20-1/2	15	23	55	24	4	1	4	20X25X1
1200	16	14	20-1/2	15	23	55	24	4	1	4	20X25X1

- Coil connections may be right, left or rear.
- Coil connections determined by facing the return-air grille.
- Electrical junction box is located above the blower and motor assembly.
- Unit must be installed level and condensate drain lines should be trapped.
- Removable drain pan is powder-coated epoxy with a 1/8" thick closed-cell insulation and has 3/4" NPT primary and secondary drain connections.
- Entire cabinet, scroll and blower wheel are heavy-gauge, galvanized steel.
- Coil Connections: 1/2" CW on ER003-012 and 1/2" HW on ER003-012.



VERTICAL STACK HIGH RISE - ER SLAVE  
300 - 1200 CFM



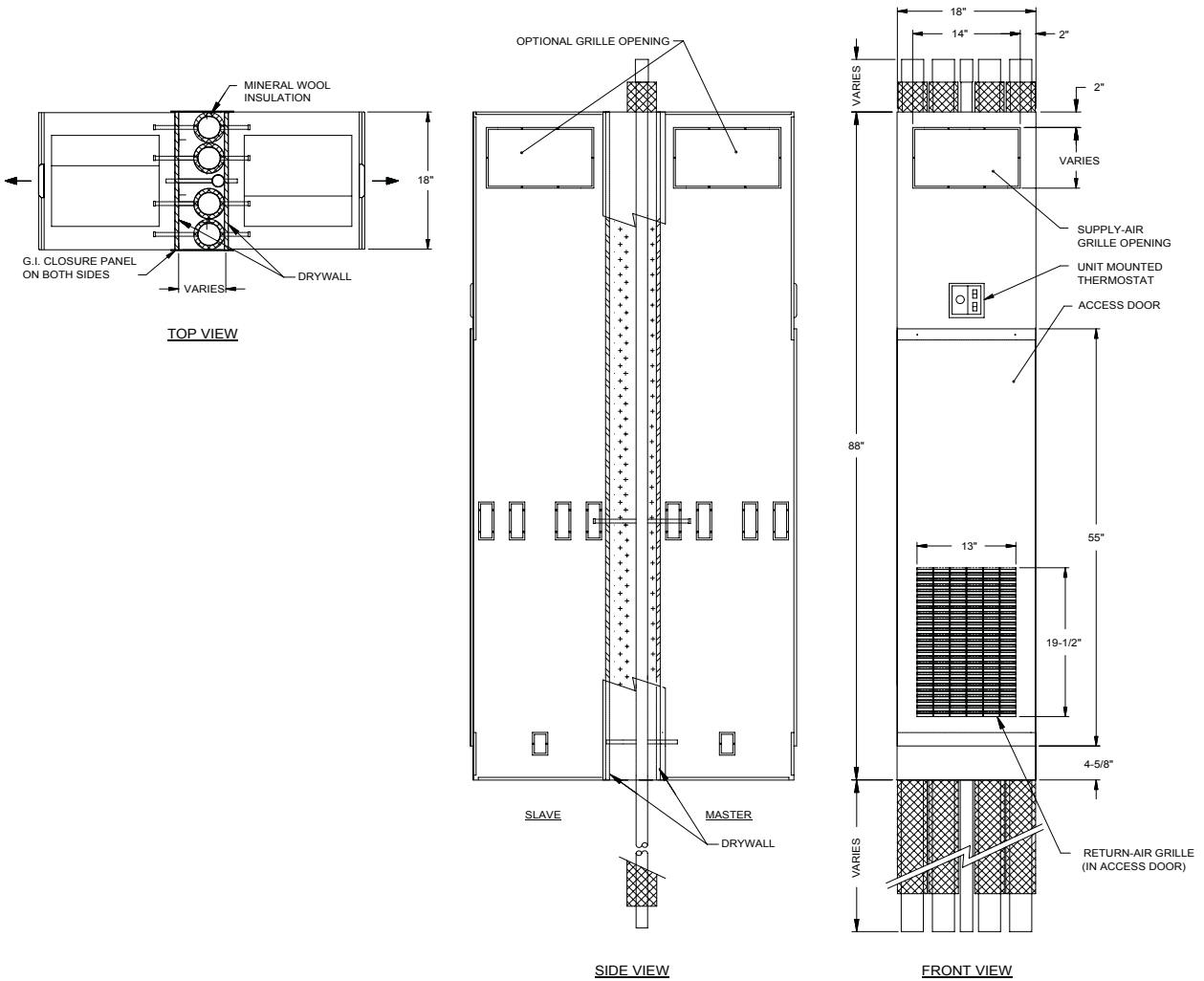
MODEL	Discharge Grille		Return-Air Opening		Return-Air Grille		G	H	J	K	FILTER SIZE
	A	B	C	D	E	F					
300	14	12	19-1/2	13	17	55	18	2	2	2	14X25X1
400	14	12	19-1/2	13	17	55	18	2	2	2	14X25X1
600	14	12	19-1/2	13	17	55	18	2	2	2	14X25X1
800	16	14	20-1/2	15	23	55	24	4	1	4	20X25X1
1000	16	14	20-1/2	15	23	55	24	4	1	4	20X25X1
1200	16	14	20-1/2	15	23	55	24	4	1	4	20X25X1

- Coil connections may be right, left or rear.
- Coil connections determined by facing the return-air grille.
- Electrical junction box is located above the blower and motor assembly.
- Unit must be installed level and condensate drain lines should be trapped.
- Removable drain pan is powder-coated epoxy with a 1/8" thick closed-cell insulation and has 3/4" NPT primary and secondary drain connections.
- Entire cabinet, scroll and blower wheel are heavy-gauge, galvanized steel.
- Coil Connections: 1/2" CW on ER003-012 and 1/2" HW on ER003-012.



## VERTICAL STACK HIGH RISE - ER TWINPACK

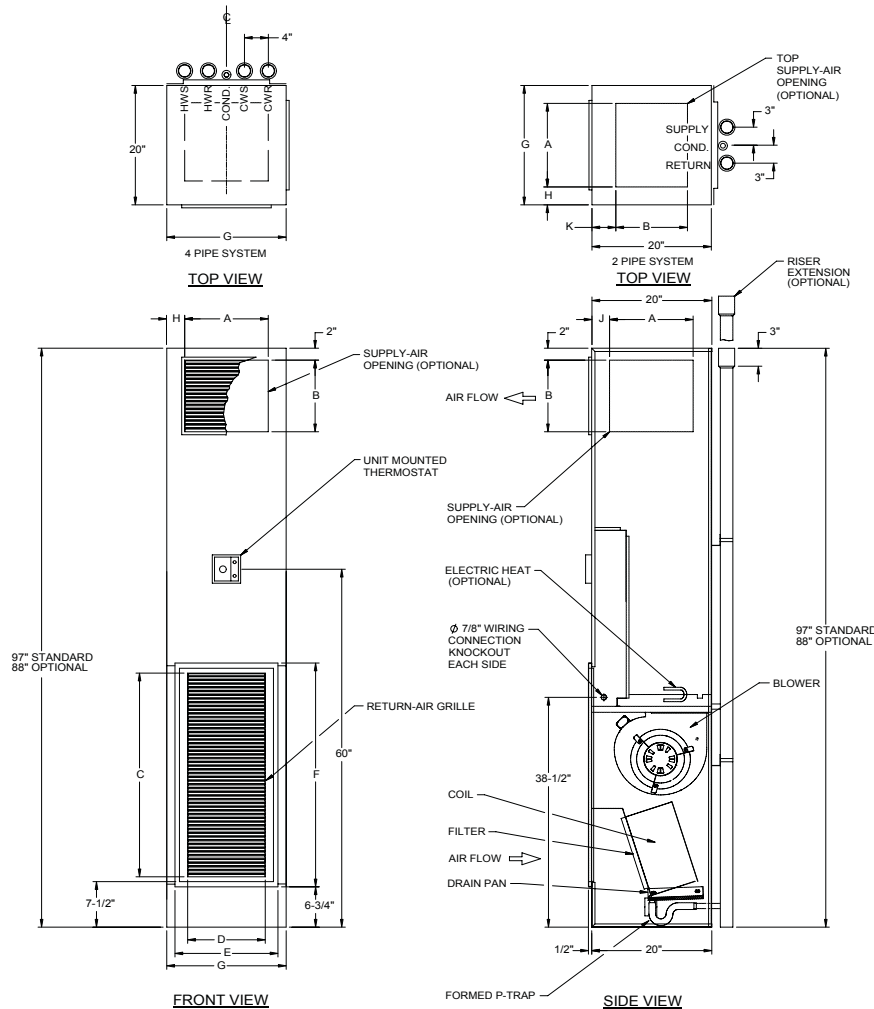
300 - 600 CFM



- TwinPacks include a One-Hour UL Through Penetration Firestop W-L-7089 System. Local codes may dictate exact amount and placement of drywall.
- Galvanized steel support brackets are added to the top and bottom of each TwinPack for protection during shipping and handling.
- Field-furnish and install approved firestop material after the units are installed at points where piping penetrates the ceiling and floor.
- Each unit operates independently with it's own valves and controls.
- The TwinPack unit is suitable for zero-inch clearance to combustibile materials.



VERTICAL STACK HIGH RISE - DR BASIC/DELUXE  
300 - 1200 CFM

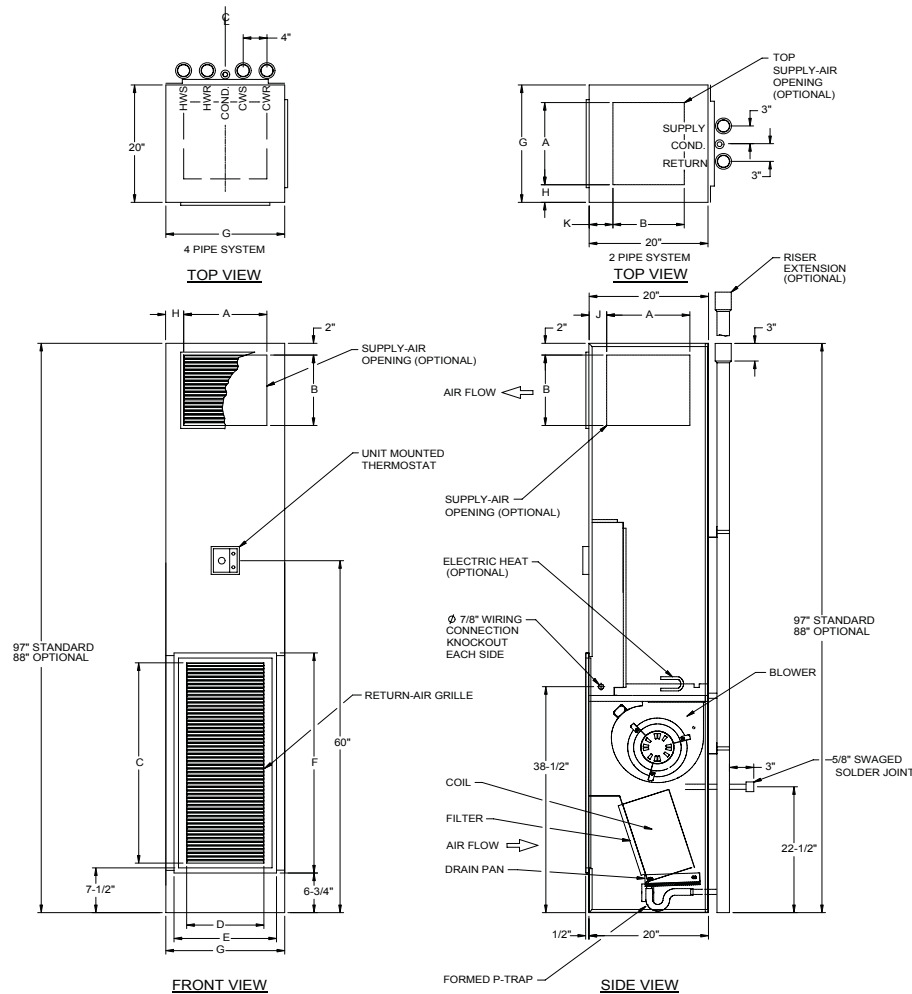


MODEL	Discharge Opening		Return-Air Grille		Access Panel		G	H	J	K	FILTER SIZE
	A	B	C	D	E	F					
300	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
400	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
500	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
600	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
800	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
1000	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1
1200	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1

- Coil connections may be right, left or rear.
- Coil connections determined by facing the return-air grille.
- Electrical junction box is located above the blower and motor assembly.
- Unit must be installed level and condensate drain lines should be trapped.
- Removable drain pan is powder-coated epoxy with a 1/8" thick closed-cell insulation and has 3/4" NPT primary and secondary drain connections.
- Entire cabinet, scroll and blower wheel are heavy-gauge, galvanized steel.
- Coil Connections: 1/2" CW on ER003-012 and 1/2" HW on ER003-012.



VERTICAL STACK HIGH RISE - DR MASTER  
300 - 1200 CFM

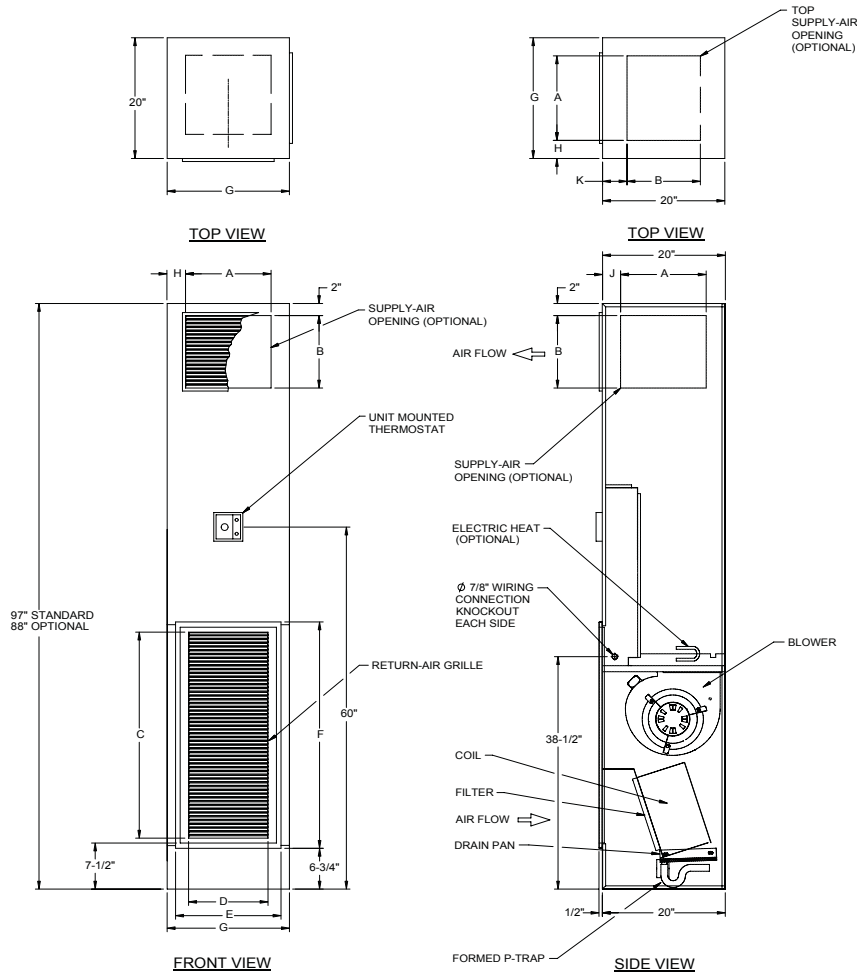


MODEL DR-M	Discharge Opening		Return-Air Grille		Access Panel		G	H	J	K	FILTER SIZE
	A	B	C	D	E	F					
300	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
400	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
500	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
600	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
800	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
1000	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1
1200	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1

- Coil connections may be right, left or rear.
- Coil connections determined by facing the return-air grille.
- Electrical junction box is located above the blower and motor assembly.
- Unit must be installed level and condensate drain lines should be trapped.
- Removable drain pan is powder-coated epoxy with a 1/8" thick closed-cell insulation and has 3/4" NPT primary and secondary drain connections.
- Entire cabinet, scroll and blower wheel are heavy-gauge, galvanized steel.
- Coil Connections: 1/2" CW on ER003-012 and 1/2" HW on ER003-012.



VERTICAL STACK HIGH RISE - DR SLAVE  
300 - 1200 CFM

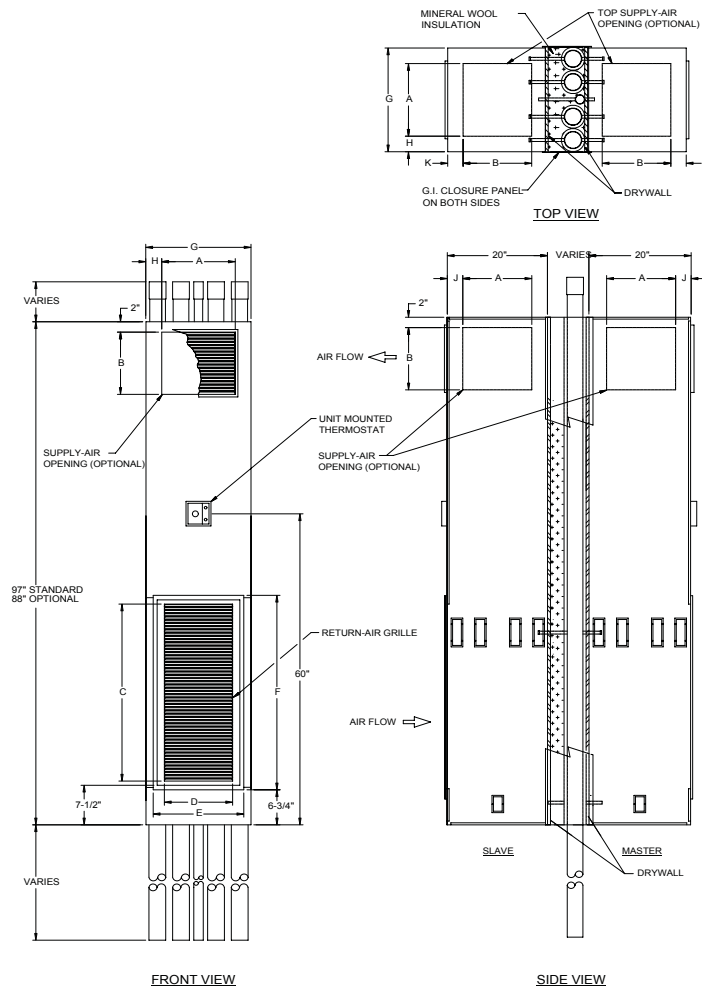


MODEL DR-S	Discharge Opening		Return-Air Grille		Access Panel		G	H	J	K	FILTER SIZE
	A	B	C	D	E	F					
300	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
400	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
500	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
600	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
800	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
1000	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1
1200	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1

- Coil connections may be right, left or rear.
- Coil connections determined by facing the return-air grille.
- Electrical junction box is located above the blower and motor assembly.
- Unit must be installed level and condensate drain lines should be trapped.
- Removable drain pan is powder-coated epoxy with a 1/8" thick closed-cell insulation and has 3/4" NPT primary and secondary drain connections.
- Entire cabinet, scroll and blower wheel are heavy-gauge, galvanized steel.
- Coil Connections: 1/2" CW on ER003-012 and 1/2" HW on ER003-012.



## DR TWINPACK - VERTICAL STACK WITH RISERS BETWEEN UNITS 300 - 1200 CFM

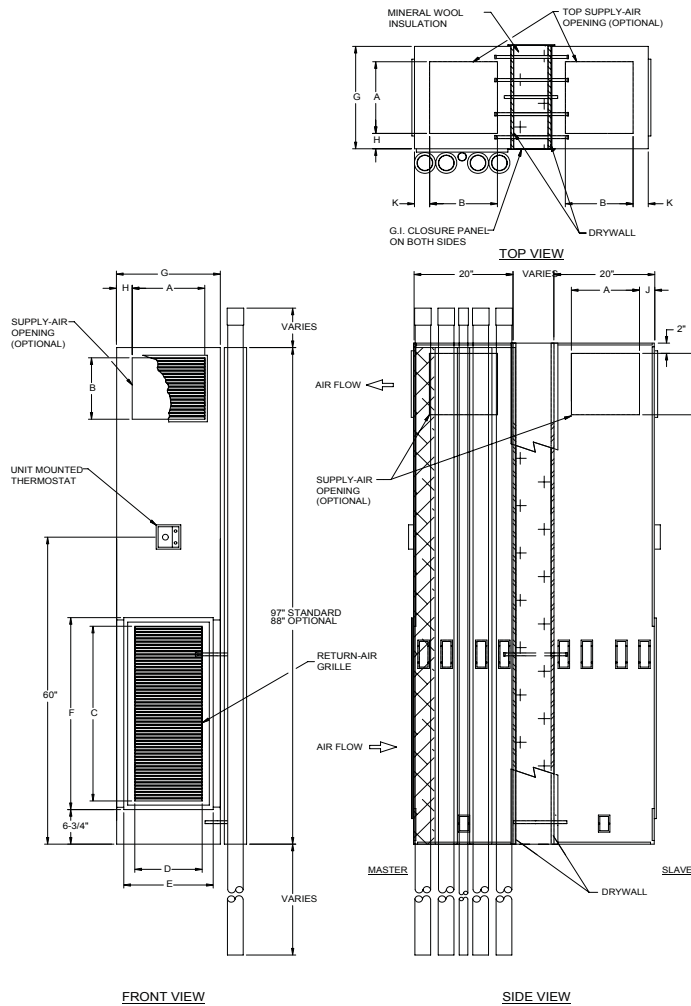


MODEL	Discharge Opening		Return-Air Grille		Access Panel		G	H	J	K	FILTER SIZE
	A	B	C	D	E	F					
300	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
400	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
500	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
600	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
800	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
1000	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1
1200	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1

- TwinPacks include a One-Hour UL Through Penetration Firestop W-L-7089 System. Local codes may dictate exact amount and placement of drywall.
- Galvanized steel support brackets are added to the top and bottom of each TwinPack for protection during shipping and handling.
- Field-furnish and install approved firestop material after the units are installed at points where piping penetrates the ceiling and floor.
- Each unit operates independently with it's own valves and controls.
- The TwinPack unit is suitable for zero-inch clearance to combustible materials.



## DR TWINPACK - VERTICAL STACK WITH RIGHT SIDE RISERS 300 - 1200 CFM

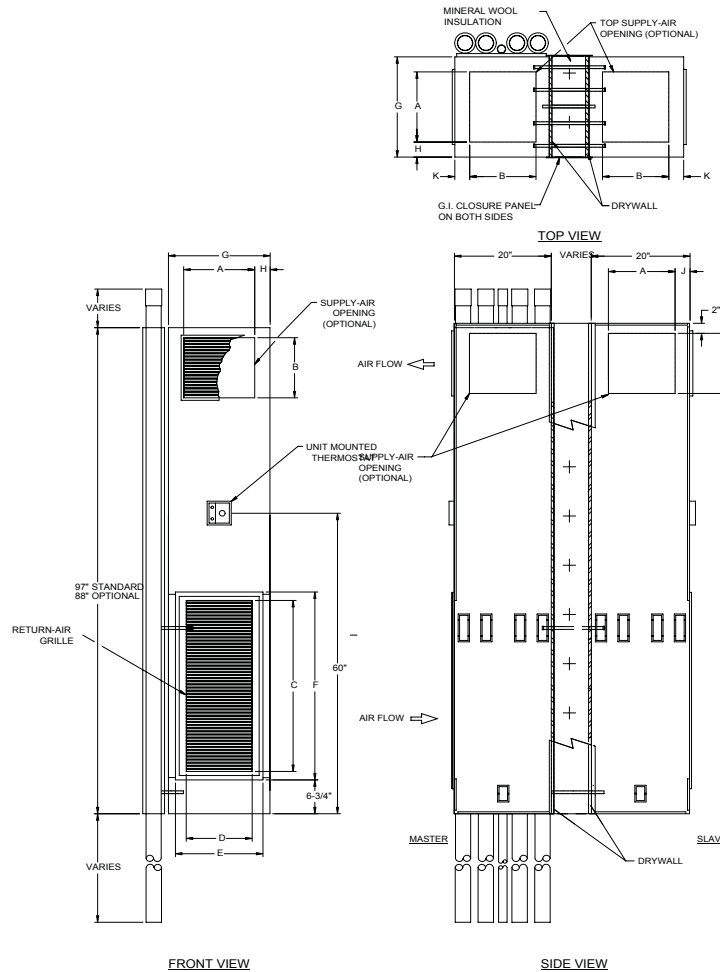


MODEL	Discharge Opening		Return-Air Grille		Access Panel		G	H	J	K	FILTER SIZE
	A	B	C	D	E	F					
300	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
400	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
500	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
600	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
800	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
1000	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1
1200	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1

- TwinPacks include a One-Hour UL Through Penetration Firestop W-L-7089 System. Local codes may dictate exact amount and placement of drywall.
- Galvanized steel support brackets are added to the top and bottom of each TwinPack for protection during shipping and handling.
- Field-furnish and install approved firestop material after the units are installed at points where piping penetrates the ceiling and floor.
- Each unit operates independently with it's own valves and controls.
- The TwinPack unit is suitable for zero-inch clearance to combustible materials.



## DR TWINPACK - VERTICAL STACK WITH LEFT SIDE RISERS 300 - 1200 CFM



MODEL	Discharge Opening		Return-Air Grille		Access Panel		G	H	J	K	FILTER SIZE
	A	B	C	D	E	F					
300	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
400	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
500	14	12	34	13	17-1/2	37-1/2	20	3	3	4	12X15-1/2X1
600	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
800	16	14	34	17	20-1/2	37-1/2	24	4	2	3	12X19-1/2X1
1000	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1
1200	16	14	40	17	20-1/2	43-1/2	24	4	2	3	18X19-1/2X1

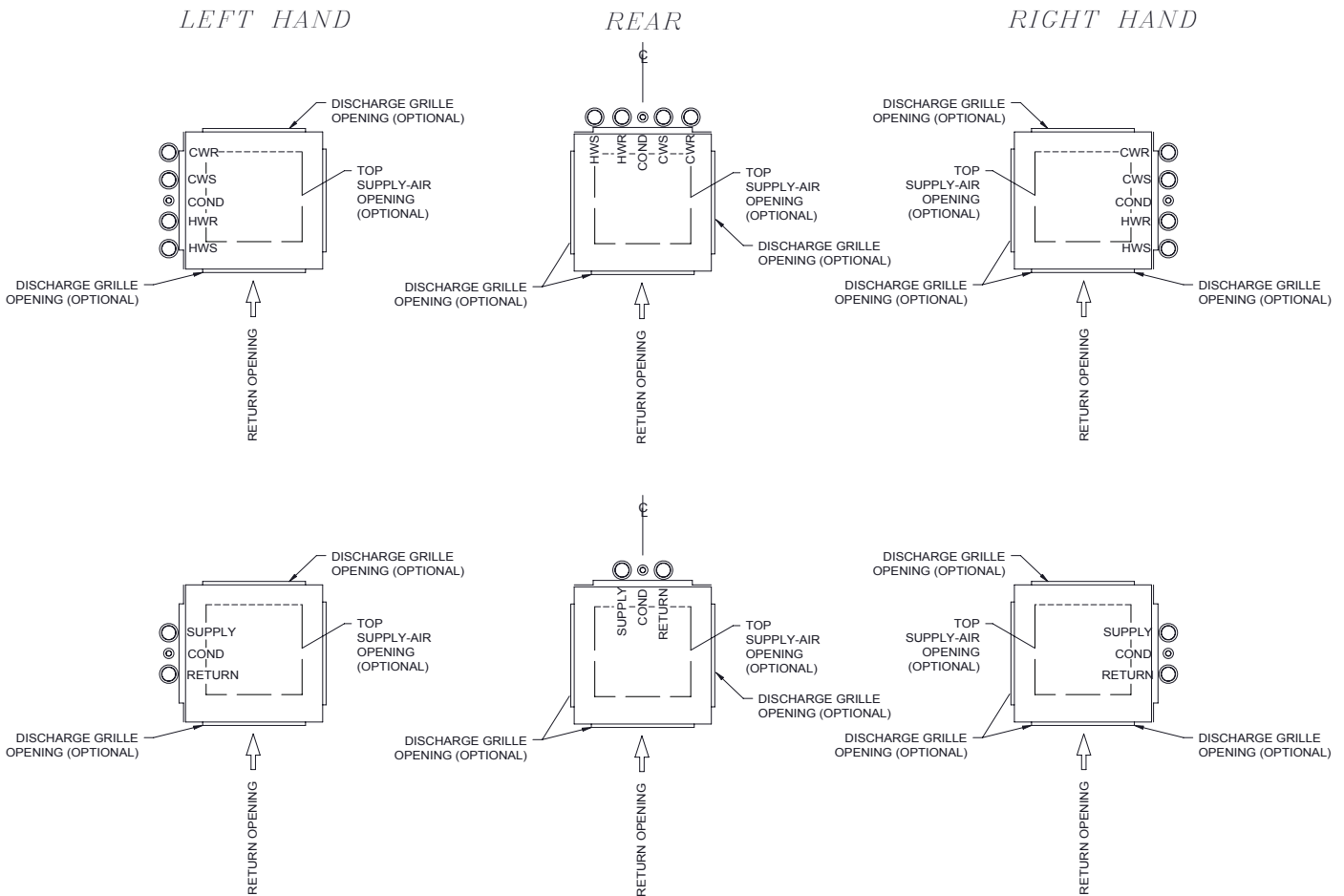
- TwinPacks include a One-Hour UL Through Penetration Firestop W-L-7089 System. Local codes may dictate exact amount and placement of drywall.
- Galvanized steel support brackets are added to the top and bottom of each TwinPack for protection during shipping and handling.
- Field-furnish and install approved firestop material after the units are installed at points where piping penetrates the ceiling and floor.
- Each unit operates independently with it's own valves and controls.
- The TwinPack unit is suitable for zero-inch clearance to combustible materials.



## Riser Cabinet Configurations

The drawings below illustrate the variety of unit handing and supply air option combinations that are available with ER & DR Series Vertical Stack fan coils.

### CABINET CONFIGURATIONS





## Weights and Measures

The following ER & DR Series weights and measures are based on fan coil units only. Add approximately 20% for packaging and crating.

Unit	Model	Dimensions / Inches			Weight/lbs.	Dimensions / Millimeters			Weight/kg.
		Height	Width	Depth	Dry	Height	Width	Depth	Dry
ER Series Basic / Deluxe Master / Slave	003	88	18	18	225	2,235	457	457	102
	004	88	18	18	225	2,235	457	457	102
	006	88	18	18	225	2,235	457	457	102
	008	88	24	18	250	2,235	610	457	114
	010	88	24	18	250	2,235	610	457	114
	012	88	24	18	250	2,235	610	457	114
ER Series TwinPack	003	88	18	42	450	2,235	457	1067	205
	004	88	18	42	450	2,235	457	1067	205
	006	88	18	42	450	2,235	457	1067	205
	008	88	24	42	500	2,235	610	1067	227
	010	88	24	42	500	2,235	610	1067	227
	012	88	24	42	500	2,235	610	1067	227
DR Series Basic / Deluxe Master / Slave	003	97	20	20	240	2,464	508	508	109
	004	97	20	20	240	2,464	508	508	109
	005	97	20	20	240	2,464	508	508	109
	006	97	24	20	240	2,464	610	508	137
	008	97	24	20	300	2,464	610	508	137
	010	97	24	20	300	2,464	610	508	137
	012	97	24	20	300	2,464	610	508	137
DR Series TwinPack	003	97	20	46	480	2,464	508	1168	218
	004	97	20	46	480	2,464	508	1168	218
	005	97	20	46	480	2,464	508	1168	218
	006	97	24	46	480	2,464	610	1168	218
	008	97	24	46	600	2,464	610	1168	273
	010	97	24	46	600	2,464	610	1168	273
	012	97	24	46	600	2,464	610	1168	273

Notes: 1) Standard coils for 003-004 is 3 rows and 006-012 is 4 rows.  
2) Cabinet only. Does not include risers.



## General

Furnish and install Williams Model ER Vertical Stack, Direct Drive Fan Coil Units where indicated on the plans and in the specifications. Units shall be completely factory assembled, tested and shipped as one piece. All units shall be capable of meeting or exceeding the scheduled capacities for cooling, heating and air delivery. All unit dimensions for each model and size shall be considered maximums. Units shall be UL/cUL listed in compliance with UL/ANSI Standard 1995, and be certified as complying with the latest edition of ARI Standard 440.

## Construction

All unit chassis shall be fabricated of heavy gauge galvanized steel panels for structural stability and product durability. All exterior panels shall be insulated with 1/2" thick fiberglass insulation, rated for a maximum air velocity of 3600 f.p.m. Maximum thermal conductivity shall be .24 (BTU • in) / (hr • ft<sup>2</sup> • °F). Insulation must meet all requirements of ASTM C1071 (including C665), UL 181 for erosion, and carry a 25/50 rating for flame spread/smoke developed per ASTM E-84, UL 723 and NFPA 90A.

OPTION: For units with multiple supply air openings, include an insulated sheet metal baffle inside the discharge plenum to break the sight lines between the two discharge outlets and to attenuate room noise that could be transmitted through the openings.

All unit panels shall have knockouts for supply air openings to facilitate the field conversion of supply air grille location.

OPTION: Supply air opening knockouts shall be factory sealed and left in place during shipping and staging at the job site.

All units shall have a front return air panel fabricated heavy gauge galvanized steel. The front panel shall include a stamped louver grille and be attached to the unit with quarter turn quick fasteners to allow for easy removal and for field service.

All exposed units shall have exterior panels fabricated of heavy gauge galvanized steel. The front panel shall include a stamped louver grille and be attached to the unit with quarter turn quick fasteners to allow for easy removal and for field service.

OPTION: Provide an architectural grade double deflection aluminum discharge grille.

OPTION: Provide foil faced insulation in lieu of standard. Foil insulation shall meet or exceed the requirements stated above, and in addition meet ASTM Standards C-665 and C-1136 for biological growth in insulation. Insulation shall be lined with aluminum foil, fiberglass scrim reinforcement, and 30 pound kraft paper laminated together with a flame resistant adhesive. All exposed edges shall be sealed to prevent any fibers from reaching the air stream.

OPTION: Provide Elastomeric Closed Cell Foam Insulation in lieu of standard. Insulation shall conform to UL 181 for erosion and NFPA 90A for fire, smoke and melting, and comply with a 25/50 Flame Spread and Smoke Developed Index per ASTM E-84 or UL 723, fungi resistance per ASTM Q21, bacteria resistance per ASTM G22 and mold growth per UL 181. Polyethylene insulation is not acceptable.

OPTION: Twinpack units--master and slave units shall be supplied joined together by a wall that contains the supply, return and condensate risers. The cabinets of both units in the pair will be the same height and width regardless of capacity and will be the standard dimension of the unit with the greater capacity.



The slave unit will have a 5/8" layer of type-X gypsum board mechanically fastened to the unit wall adjacent to the risers. Where a one hour rating of the partition between the units is required, a second layer of type-X gypsum board shall be mechanically fastened to the master unit wall adjacent to the risers. Piping penetrations in the partition walls shall be provided with fire blocking material. The unit shall be UL/cUL listed in compliance with ANSI/UL-1479 Standard Test Method for Fire Tests of Through Penetration Fire Stops. A copy of the Authorization to Mark certifying compliance by a nationally recognized testing laboratory shall be provided with the unit submittal.

## Painted Finish

All painted cabinet exterior panels shall be finished with a powder-coated paint of the standard factory color and subjected to a 1,500-hour salt spray test in accordance with ASTM B117.

## Sound

Units shall have available published sound power level data tested in accordance with ARI Standard 350 and ASHRAE Standard 68.

## Fan Assembly

Unit fan shall be dynamically balanced, forward curved, DWDI centrifugal type constructed of gauge galvanized steel for corrosion resistance. Motors shall be high efficiency, permanently lubricated sleeve bearing, permanent split-capacitor type with UL and CSA listed automatic reset thermal overload protection and three separate horsepower taps. Single speed motors are not acceptable.

OPTION: Provide a sound shield to cover the entire fan assembly. The sound shield shall be tight fitting to prevent air bypass and prohibit accidental

contact with the fan assembly. Units that allow accidental contact with the fan assembly with the decorator front panel removed are not acceptable.

The fan assembly shall be removed and serviced through the front and safety panels. The entire assembly shall be able to come out of the unit easily by removing one screw and unplugging the motor.

OPTION: Devices used to energize and de-energize (switch) fan speeds must be totally silent. Magnetic, mercury, and/or quiet relays and/or contactors are not acceptable.

## Coils

All cooling and heating coils shall optimize rows and fins per inch to meet the specified capacity. Coils shall have seamless copper tubes and shall be mechanically expanded to provide an efficient, permanent bond between the tube and fin. Fins shall have high efficiency aluminum surface optimized for heat transfer, air pressure drop and carryover.

All coils shall be 100% underwater pressure-tested at 350 PSIG, and rated for a maximum 300 PSIG working pressure.

Heating coils shall be furnished in the reheat position as standard.

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

OPTION: Provide automatic air vents in lieu of manual air vents.

OPTION: Coil casing shall be fabricated from stainless steel.



## Filters

All units shall be furnished with a minimum 1” nominal glass fiber throwaway filter. Filters shall be tight fitting to prevent air bypass. Filters shall be easily removable from the return air opening with the front panel removed, without the need for tools.

OPTIONS: Provide unit with 1” pleated, cleanable metallic or washable filters.

## Electrical

Units shall be furnished with single point power connection. Provide an electrical junction box with terminal strip for motor and other electrical terminations. The factory mounted terminal wiring strip consists of a multiple position screw terminal block to facilitate wiring terminations for the electric control valves and thermostats.

## Electric Heat

When required, the manufacturer should furnish an electric resistance heating assembly as an integral part of the fan coil unit, with the heating capacity, voltage and kilowatts scheduled. The heater assembly shall be rated for installation on the fan coil unit and be located so as not to expose the fan assembly to excessive leaving air temperatures that could affect motor performance.

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

All heating elements shall be open coil type Ni-Chrome wire mounted in ceramic insulators and located in an insulated heavy gauge galvanized steel housing. All elements shall terminate in a machine staked stainless steel terminal secured with stainless steel hardware for corrosion resistance. All internal wiring shall be rated for 105°C minimum.

All electric heaters shall include temperature protection consisting of a built-in high limit and fusible link to provide maximum protection. All electric heaters shall be single stage.

All units with electric heat shall be provided with an incoming line power designated to accept single point power wiring capable of carrying the calculated load current.

OPTION: Devices used to energize and de-energize (switch) electric heat must be silent. Magnetic, mercury, and/or quiet relays and/or contactors are not acceptable.

## Piping Packages

Provide a standard factory assembled valve piping package to consist of a 2 or 3-way, on/off, motorized electric control valve and two ball isolation valves. Control valves shall be piped normally closed to the coil. Maximum entering water temperature on the control valve shall be 200°F, and maximum close-off pressure 30 PSIG. Maximum operating pressure shall be 300 PSIG.

OPTION: Piping packages including stainless steel braided hoses to allow for thermal expansion within the unit cabinet. The hose shall be EPDM inner lined and Kevlar® reinforced, with stainless steel FNPT swivels and/or fittings. The hoses shall be rated for a maximum 450 PSIG working pressure at 250°F, and shall conform to NFPA 90A and carry a 25/50 Flame Spread and Smoke Developed Rating, per ASTM E-84 and UL 723.

OPTION: Provide 3-wire floating point modulating control valve in lieu of standard 2-position control valve with factory assembled valve piping package.

OPTION: Provide high pressure close-off actuators for 2-way on/off control valves. Maximum close-off pressure is 50 PSIG (1/2”).



OPTION: Provide either a fixed or adjustable flow control device for each piping package.

OPTION: Provide pressure-temperature ports for each piping package.

Piping packages shall be completely factory assembled, including interconnecting pipe, and mounted inside the unit in a serviceable location over the coil and primary drain pan.

### Risers

Furnish chilled and hot water supply and return risers mounted to the unit. Risers shall be Type-M seamless copper tube and include swaged connections at the top for connection to the unit above. Slip couplings are not acceptable.

OPTION: Provide Type-L copper risers that meet or exceed the requirements stated above.

Risers shall be insulated with 1/2" closed cell foam insulation covering the entire riser. Insulation shall conform to NFPA 90A and carry a 25/50 Flame Spread and Smoke Developed Rating, per ASTM E-84 and UL 723.

OPTION: Provide 3/4" or 1" closed cell foam insulation that meets or exceeds the requirements stated above.

Condensate drain risers shall be Type-M seamless copper tube and meet the requirements stated above.

OPTION: Risers shall be factory fabricated, bundled, and tagged separate from the fan coil units, allowing for shipment and installation of risers prior to the fan coil units. The riser tag must show the corresponding FCU tag, floor number, room number, riser number, CW, HW, and condensate pipe diameters.

### Outside Air Dampers

OPTION: Provide a manual outside air damper with locking mechanism integral to the unit.

OPTION: Provide a motorized outside air damper integral to the unit and interlocked with the fan motor. The damper actuator shall be spring return closed.



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