

VVAH TRENCH HEATING AND COOLING UNITS

MDL: PROFESSIONAL GRADE HVAC SOLUTIONS



INVESTING IN QUALITY, RELIABILITY & PERFORMANCE



Management Service



ISO 9001 QUALITY

WORLD LEADING DESIGN AND TECHNOLOGY

Equipped with the latest air-conditioning test rooms and manufacturing technology, we produce over 50,000 fan coil units each year, all conforming to the highest international standards of quality and safety.

Every product is manufactured to meet the stringent requirements of the internationally recognized ISO 9001 standard for quality assurance in design, development and production.

ETL SAFETY STANDARDS

THE HIGHEST STANDARDS OF MANUFACTURING

In order to guarantee the very highest standards and performance, we manage every stage in the manufacturing of our products. Throughout the production process we maintain strict control, starting with our extensive resources in research and development through to the design and manufacturing of almost every individual component, from molded plastics to unit and controller assembly.

All products conform to UL standard for Safety for Heating and Cooling Equipment UL1995 4th Edition, October 14, 2011.

All products conform to CSA standard for Safety for Heating and Cooling Equipment CSA C22.2 No.236-11, 4th Edition, October 14 2011.

WEEE MARK

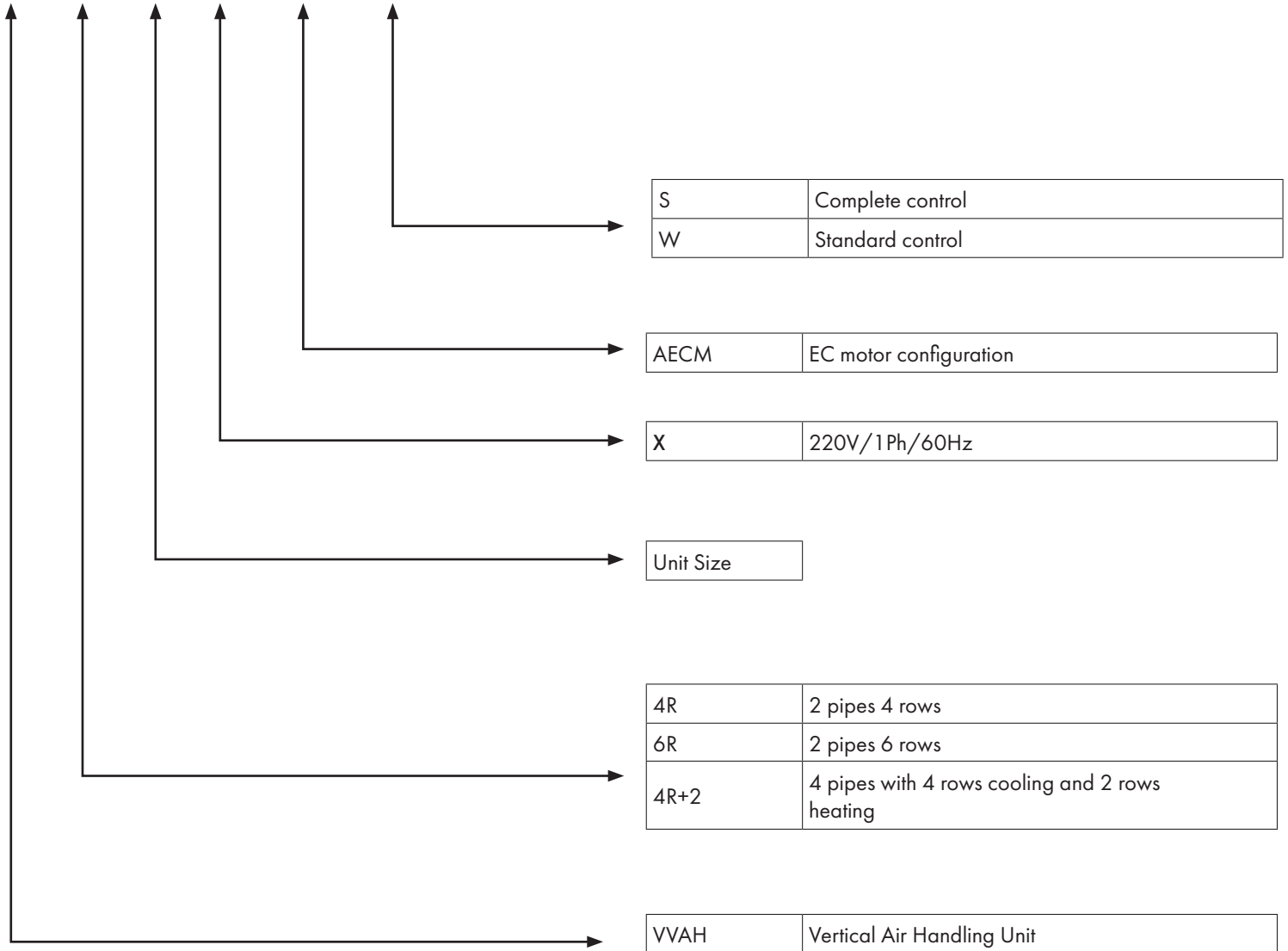
THE HIGHEST STANDARDS OF MANUFACTURING

Our highly trained staff and strict quality control methods enable us to produce products with an exceptional reputation for reliability and efficiency, maintained over many years. As well as full CE certification and ISO 9001, several products ranges have UL / ETL safety approval in the USA and Canada, Eurovent performance and sound certification as well as ROHS compliance for Europe, giving you the confidence of knowing our company is the right choice when selecting fan coil units.

All products conform to the "WEEE" directive to guarantee correct standards of environmental solutions.

MODEL CODE NOMENCLATURE

VVAH-4R/600/X/AECM -VW5



TECHNICAL DATA

GENERAL DESCRIPTION

The VVAH unit is an ideal air handling terminal unit for suspended ceiling installation and suitable for ducted air distribution. It is constructed of panels sandwiched together to achieve low noise levels during operation. VVAH air handling units are shipped completely assembled and motor wiring is introduced in the control box to reduce on-site installation time and manpower. Every unit is thoroughly inspected and tested to prevent potential problems during startup. The unit contains side panels that provide easy access to fans, motors and filters.

FRAMEWORK

A frameless structure is used. With integrated folding steel panels, which are tested to ensure that there is no air leakage.

CASING

The casing is double-skinned and consists of two panels with internal insulation. Each panel is 1" thick. The inner and outer panels are made of plain galvanized steel and pre-coated galvanized steel. The insulation consists of a high-pressure PU foam sandwiched between the inner and outer panels.

FILTER

The filter is washable, double-layer acrylic nylon with aluminum frame. G4 (Merv 8) or F8 (Merv 14) filter is optional.

COOLING COIL

The cooling coil is standard Cu/Al 3/8" OD. The manifolds are made of steel with threaded connections. The cooling coil is provided with manual Air-Vent valve. The aluminum fins are pre-coated for protection by hydrophilic blue fin process. Coils are tested at 500 PSI and recommended operating at no more than 300 PSI.

DRAIN PAN

The drain pan is made of single-wall painted steel with 3/16" insulation on outer wall. The drain pan extends the full length and width of the coil, is sloped for positive drainage and includes 3/4" male pipe threaded galvanized drain connector.

FAN SECTION

Fans are constructed of housing, impeller, mounting feet, and DC motor. The housing is made of hot-dip galvanized steel. The side panel includes inlet cones whose inlet conditions are designed for optimum aerodynamics. The wheel is made of hot-dip galvanized steel. The forward curved blades feature an advanced aerodynamic design for maximum efficiency and minimum noise level. The impeller is fixed on the center plate and on the end ring with riveting compression. The impeller is designed for maximum strength and can withstand continuous operation with maximum power. All impellers and motors are fully balanced according to ANSI/AMCA-204 standard. The mounting feet are made of galvanized steel. VVAH fans are equipped with YZWWSL external rotor BLDC motor. The motor consists of motor body and BLDC driver, controlled by 0~10 V DC or Modbus RS485. This new designed motor significantly reduces motor torque fluctuation, vibration and noise resulting in high efficiency, reliability and long-life operation.

STANDARD CONTROL

A 0-10 V DC motor modulating signal is received from the thermostat which is powered by R and C or by indoor room terminals VSP and GND. If the input signal is greater than 2 V DC, the unit is turned on. If the control signal is lower than 1.5 V DC, the unit is off. Motor speed depends on input signal. Motor RPM can be set from 300-1500. The unit is equipped with a 40 V AC 240-24 / 12 V AC transformer as standard which supplies power input to thermostat and other devices.

GENERAL SPECIFICATIONS

2-pipe systems

VVAH - 2 PIPE, 4 ROW VERTICAL MINI AHU

VVAH - 4 ROW - [SIZE]				200	300	400	600	800	
UNIT CONFIGURATION	CONFIGURATION			2 pipes					
	NUMBER OF FAN BLOWERS			1		2			
	POWER SUPPLY (V/PH/HZ)			220/1/60					
	CONTROL TYPE			~W: Standard Control					
PERFORMANCE DATA	AIR	AIR FLOW	H	CFM	1321	1869	2417	3739	4835
			M		1123	1589	2055	3178	4110
			L		793	1122	1450	2243	2901
		EXTERNAL STATIC PRESSURE	H	in. wg	0.5				
			M		0.5				
			L		0.5				
	COOLING	COOLING CAPACITY	H	BTU/h	53347	72849	95657	143556	182100
			M		47054	64410	84217	126925	160322
			L		35929	49362	64616	97272	123008
		SENSIBLE COOLING CAPACITY	H	BTU/h	35453	48956	63881	96176	122522
			M		31013	42802	55571	84086	106585
			L		23336	32437	42196	63723	80931
	HEATING	HEATING CAPACITY	H	BTU/h	82931	113248	148703	223165	283083
			M		73148	100128	130919	197310	249228
			L		55853	76736	100449	151214	191222
		MAX. EH CAPACITY		kW	4.5	6	7.5	9	9
	SOUND	SOUND PRESSURE LEVEL (OUTLET)		dB(A)	67/62/58	66/67/63	74/69/65	75/70/66	77/72/67
		SOUND PRESSURE LEVEL (INLET + RADIATED)			70/65/61	75/70/66	77/72/68	78/73/69	80/75/70
		SOUND POWER LEVEL (OUTLET)			76/71/67	75/76/72	83/78/74	84/79/75	86/81/76
		SOUND POWER LEVEL (INLET + RADIATED)			79/74/70	84/79/75	86/81/77	87/82/78	89/84/79
ELECTRICAL	POWER		W	375	500	500	1000	1000	
	CURRENT		A	1.63	2.17	2.17	4.34	4.34	
HYDRAULIC	COOLING WATER FLOW RATE	H	GPM	10.5	14.4	18.9	28.4	36.0	
		M		9.3	12.7	16.6	25.1	31.7	
		L		7.1	9.8	12.8	19.2	24.3	
	COOLING PRESSURE DROP	H	Ft. wg.	6.1	3.9	7.1	15.9	12.5	
		M		4.9	3.2	5.6	12.7	9.9	
		L		3.0	2.0	3.5	7.9	6.2	
	HEATING WATER FLOW RATE		GPM	Same As "Cooling Water Flow Rate"					
	HEATING PRESSURE DROP	H	Ft. wg.	5.5	3.6	6.4	14.3	11.3	
		M		4.4	2.8	5.1	11.5	8.9	
L		2.7		1.8	3.1	7.1	5.6		
WATER CONTENT		GALLONS	1.6	2.0	2.4	2.8	3.3		
CONSTRUCTION AND PACKING DATA	WATER CONNECTIONS OUT	IN	INCH	NPT 1 1/4					
		OUT							
	CONDENSATE DRAINAGE CONNECTION		INCH	1					
	DIMENSIONS	L	INCH	33 7/16	41 5/16	49 3/16	61	74	
W		26 3/8							
H		59 7/16							

COOLING MODE (2-PIPE)

- Return air temperature: 80°F DB/ 67°F WB.
- Inlet/ outlet water temperature: 45°F/55°F.

HEATING MODE (2-PIPE)

- Return air temperature: 70°F.
- Inlet water temperature: 140°F.
- Water flow same as cooling model.

(ALL DIMENSIONS ARE APPROXIMATE WITHIN 1/16 OF AN INCH OF THOSE INDICATED)

VVAH - 2 PIPE, 6 ROW VERTICAL MINI AHU

VVAH - 6 ROW - [SIZE]				200	300	400	600	800	
UNIT CONFIGURATION	CONFIGURATION			2 pipes					
	NUMBER OF FAN BLOWERS			1		2			
	POWER SUPPLY (V/PH/HZ)			220/1/60					
	CONTROL TYPE			~W: Standard Control					
PERFORMANCE DATA	AIR	AIR FLOW	H	CFM	1209	1789	2341	3577	4683
			M		1028	1520	1990	3041	3980
			L		726	1073	1405	2146	2810
		EXTERNAL STATIC PRESSURE	H	in. wg	0.5				
			M		0.5				
			L		0.5				
	COOLING	COOLING CAPACITY	H	BTU/h	54859	80713	107062	148860	198866
			M		48298	71490	94692	131850	175889
			L		37057	54639	72085	100771	133898
		SENSIBLE COOLING CAPACITY	H		35709	52622	69539	98948	131553
			M		31064	46057	60761	86604	114946
			L		23587	34840	45786	65512	86616
	HEATING	HEATING CAPACITY	H	BTU/h	85280	125472	166432	231410	309146
			M		75081	111134	147203	204966	273428
			L		57606	84938	112060	156653	208150
		MAX. EH CAPACITY			kW	4.5	6	7.5	9
	SOUND	SOUND PRESSURE LEVEL (OUTLET)		dB(A)	67/62/58	66/67/63	74/69/65	75/70/66	77/72/67
		SOUND PRESSURE LEVEL (INLET + RADIATED)			70/65/61	75/70/66	77/72/68	78/73/69	80/75/70
		SOUND POWER LEVEL (OUTLET)			76/71/67	75/76/72	83/78/74	84/79/75	86/81/76
		SOUND POWER LEVEL (INLET + RADIATED)			79/74/70	84/79/75	86/81/77	87/82/78	89/84/79
ELECTRICAL	POWER		W	375	500	500	1000	1000	
	CURRENT		A	1.63	2.17	2.17	4.34	4.34	
HYDRAULIC	COOLING WATER FLOW RATE	H	GPM	10.8	15.9	21.1	29.4	39.3	
		M		9.5	14.1	18.7	26.0	34.7	
		L		7.3	10.8	14.2	19.9	26.4	
	COOLING PRESSURE DROP	H	Ft. wg.	3.2	7.1	12.9	3.8	7.2	
		M		2.5	5.7	10.3	3.1	5.8	
		L		1.6	3.5	6.3	1.9	3.5	
	HEATING WATER FLOW RATE		GPM	Same As "Cooling Water Flow Rate"					
	HEATING PRESSURE DROP	H	Ft. wg.	2.9	6.4	11.6	3.4	6.5	
		M		2.3	5.1	9.3	2.7	5.2	
L		1.4		3.2	5.7	1.7	3.2		
WATER CONTENT		GALLONS	2.4	3.0	3.6	4.2	5.0		
CONSTRUCTION AND PACKING DATA	WATER CONNECTIONS OUT	IN	INCH	NPT 1 1/4					
		OUT							
	CONDENSATE DRAINAGE CONNECTION		INCH	1					
	DIMENSIONS	L	INCH	33 7/16	41 5/16	49 3/16	61	74	
		W		26 3/8					
H		59 7/16							

The manufacturer reserves the right to make changes to the design, colour and specification of the products shown. Illustrations may include optional accessories.

COOLING MODE (2-PIPE)

- Return air temperature: 80°F DB/ 67°F WB.
- Inlet/ outlet water temperature: 45°F/55°F.

HEATING MODE (2-PIPE)

- Return air temperature: 70°F.
- Inlet water temperature: 140°F.
- Water flow same as cooling model.

(ALL DIMENSIONS ARE APPROXIMATE WITHIN 1/16 OF AN INCH OF THOSE INDICATED)

4-pipe Systems

VVAH - 4 PIPE, 4+2 ROW VERTICAL MINI AHU

VVAH(4R+2)-[Size]-P-AECM				200	300	400	600	800		
UNIT CONFIGURATION	CONFIGURATION			4 pipes						
	NUMBER OF FAN BLOWERS			1		2				
	POWER SUPPLY (V/PH/HZ)			220/1/60						
	CONTROL TYPE			~W: Standard Control						
PERFORMANCE DATA	AIR	AIR FLOW	H	CFM	1209	1789	2341	3577	4683	
			M		1028	1520	1990	3041	3980	
			L		726	1073	1405	2146	2810	
		EXTERNAL STATIC PRESSURE	H	in. wg	0.5					
			M		0.5					
			L		0.5					
	COOLING	COOLING CAPACITY	H	BTU/h	50016	70212	93533	138359	178057	
			M		44034	62189	82726	122548	157484	
			L		33785	47530	62976	93662	119887	
		SENSIBLE COOLING CAPACITY	H	BTU/h	33145	47105	62398	92539	119678	
			M		28834	41228	54521	80995	104571	
			L		21894	31187	41084	61269	78798	
	HEATING	HEATING CAPACITY	H	BTU/h	71129	101418	131312	190464	246499	
			M		62441	89557	115719	168188	217228	
			L		47832	68353	87989	128367	165173	
	SOUND	SOUND PRESSURE LEVEL (OUTLET)			dB(A)	67/62/58	66/67/63	74/69/65	75/70/66	77/72/67
		SOUND PRESSURE LEVEL (INLET + RADIATED)				70/65/61	75/70/66	77/72/68	78/73/69	80/75/70
		SOUND POWER LEVEL (OUTLET)				76/71/67	75/76/72	83/78/74	84/79/75	86/81/76
		SOUND POWER LEVEL (INLET + RADIATED)				79/74/70	84/79/75	86/81/77	87/82/78	89/84/79
	ELECTRICAL	POWER			W	375	500	500	1000	1000
CURRENT			A	1.63	2.17	2.17	4.34	4.34		
HYDRAULIC	COOLING WATER FLOW RATE	H	GPM	9.9	13.9	18.5	27.3	35.2		
		M		8.7	12.3	16.3	24.2	31.1		
		L		6.7	9.4	12.4	18.5	23.7		
	COOLING PRESSURE DROP	H	Ft. wg.	5.4	3.7	6.8	14.9	12.0		
		M		4.3	3.0	5.4	12.0	9.6		
		L		2.7	1.8	3.3	7.4	5.9		
	HEATING WATER FLOW RATE	H	GPM	3.5	5.1	6.5	9.5	12.3		
		M		3.1	4.5	5.8	8.4	10.8		
		L		2.4	3.4	4.4	6.4	8.2		
	HEATING PRESSURE DROP	H	Ft. wg.	1.9	1.3	1.0	2.3	1.3		
M		1.5		1.0	0.8	1.8	1.0			
L		0.9		0.6	0.5	1.1	0.6			
COOLING WATER CONTENT			GALLONS	1.6	2.0	2.4	2.8	3.3		
HEATING WATER CONTENT				0.8	1.0	1.2	1.4	1.7		
CONSTRUCTION AND PACKING DATA	WATER CONNECTIONS OUT	IN	INCH	NPT 1 1/4						
		OUT								
	CONDENSATE DRAINAGE CONNECTION			INCH						
	DIMENSIONS	L	INCH	33 7/16	41 5/16	49 3/16	61	74		
W		26 3/8								
H		59 7/16								

COOLING MODE (4-PIPE)

- Return air temperature: 80°F DB/ 67°F WB.
- Inlet/ outlet water temperature: 45°F/55°F.

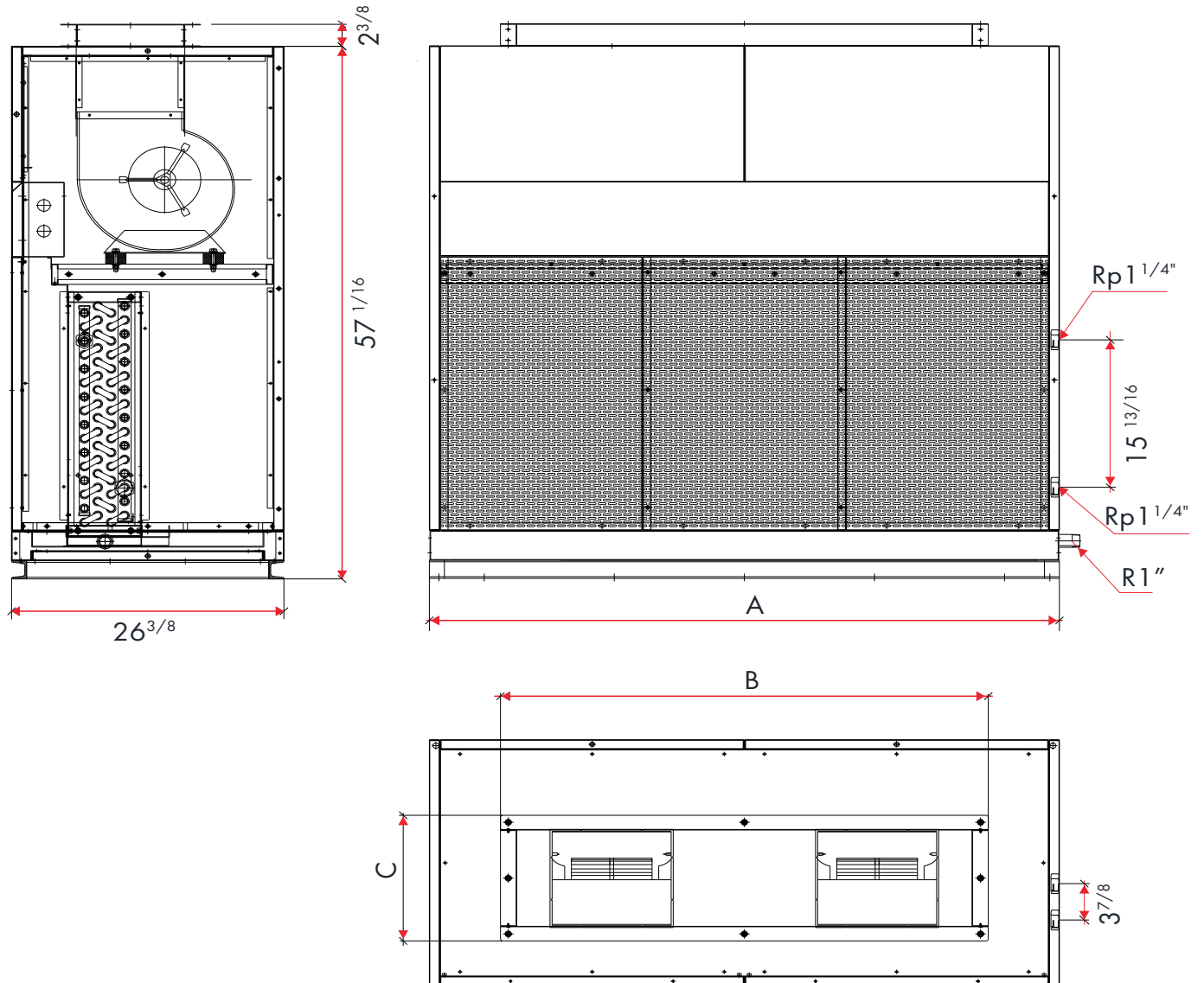
HEATING MODE (4-PIPE)

- Return air temperature: 70°F.
- Inlet water temperature: 180/140°F.
- Water flow same as cooling model.

(ALL DIMENSIONS ARE APPROXIMATE WITHIN 1/16 OF AN INCH OF THOSE INDICATED)

DIMENSION DRAWINGS

2-PIPE

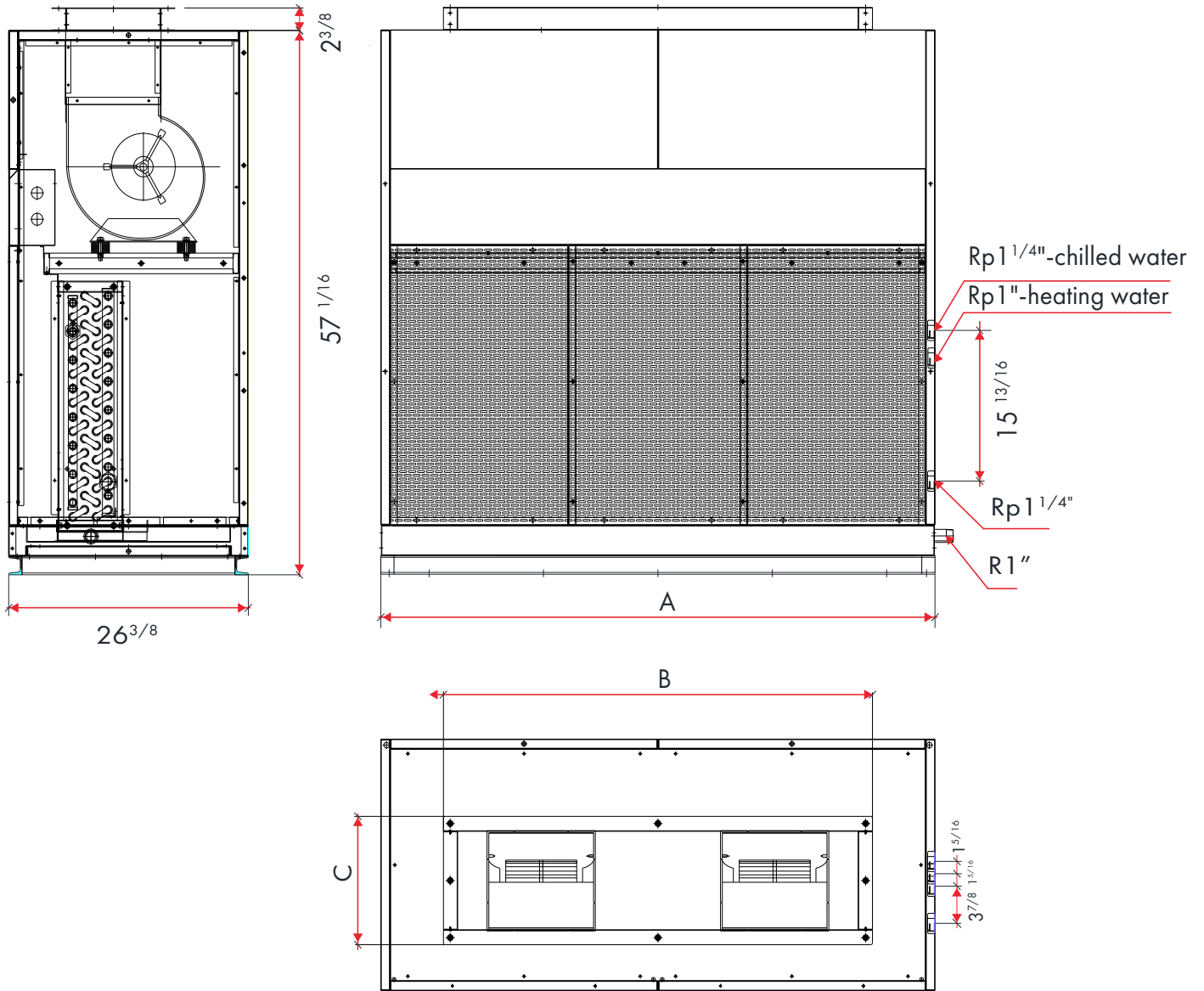


The manufacturer reserves the right to make changes to the design, colour and specification of the products shown. Illustrations may include optional accessories.

MODEL	A	B	C
200	$33\frac{7}{16}$	$21\frac{4}{16}$	$13\frac{7}{16}$
300	$41\frac{5}{16}$	$26\frac{12}{16}$	$13\frac{7}{16}$
400	$49\frac{3}{16}$	$30\frac{11}{16}$	$14\frac{10}{16}$
600	61	$47\frac{4}{16}$	$13\frac{7}{16}$
800	74	$53\frac{2}{16}$	$14\frac{10}{16}$

All dimensions are approximate within 1/16 of an inch of those indicated.

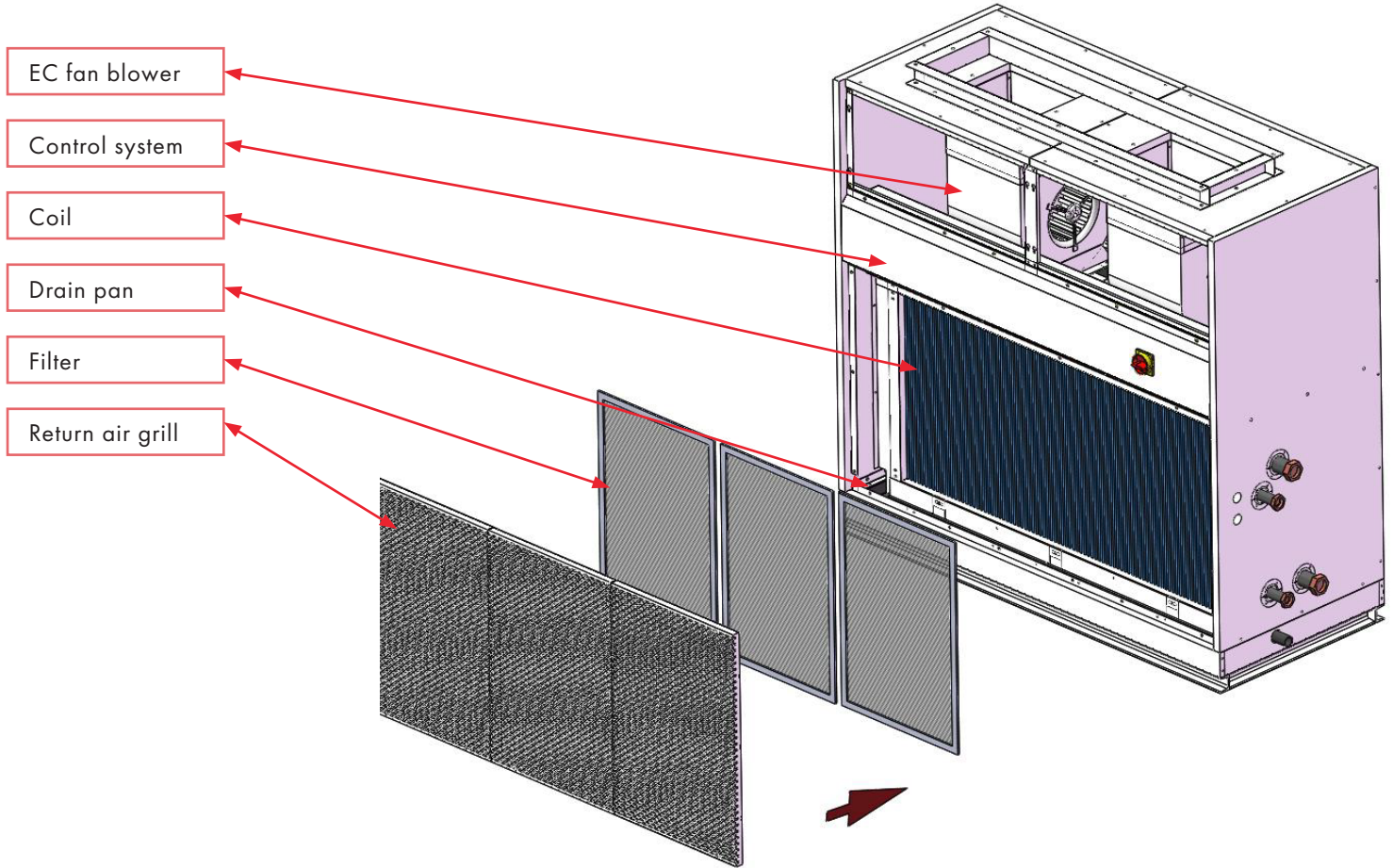
4-PIPE



MODEL	A	B	C
200	$33\frac{7}{16}$	$21\frac{4}{16}$	$13\frac{7}{16}$
300	$41\frac{5}{16}$	$26\frac{12}{16}$	$13\frac{7}{16}$
400	$49\frac{3}{16}$	$30\frac{11}{16}$	$14\frac{10}{16}$
600	61	$47\frac{4}{16}$	$13\frac{7}{16}$
800	74	$53\frac{2}{16}$	$14\frac{10}{16}$

All dimensions are approximate within 1/16 of an inch of those indicated.

EXPLODED DRAWING



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OPTIONAL ACCESSORIES

UNIT ACCESSORIES

- Electrical Heaters
 - The electric heater module is supplied for winter heating as an alternative to the auxiliary hot water coil. We offer a complete range of electric heater kits, which are easy to connect to the control box with a mounting fixture. The electric heater configuration is selectable by DIP switch on the internal control board.
- Valves & Actuator
 - 2-way or 3-way valve with motorized 24V on/off or modulating actuator integrated with SS hose and copper piping connection kits
- Stainless Steel Drain Pan

CONTROL ACCESSORIES

- Complete Control Board
 - Infra-Red Handset Controller & Wall Holder (*Currently not available in North America*)
 - With Global Control functionality for Main and Secondary unit groups.
- Unlimited Wired Wall Pad Controller
 - **Features:** 7 day ON/OFF timer program. Addressable Main and Secondary units allowing control of up to 32 Secondary units via a single Main Unit with set or check of each unit parameters individually. Error display with addressable error diagnostic (Main unit Wall Pad displays Secondary unit address and error type). One Touch Global Control (Global Control Main Unit Wall Pad controls all units in the group). Complete with Onboard Room Air Temperature Sensor.
- DIP Switch Configuration Service
 - Pre-set DIP switches for master/slave option, 2/4-pipe, Preheat temperature, Operation mode settings.
- ABS External LED Receiver (*Currently not available in North America*)
 - IR receiver in ABS housing with up to 70in length prewiring. LED lights show working mode or error code.
- Standard Control Board
 - Universal EC Thermostat
 - **Main functions:** 2-pipe, 4-pipe, 2-pipe+floor heating mode, floor heating, and cooling. AC/EC motor 3-speed control. Motorized valve control. 0-10 V DC Modulating valve. EC motor RPM control. Low temperature protection. Remote ON/OFF function. Power supply: 24 V AC or V DC. Working environment: 32-122, 5-95%RH (no condensate). Self-power consumption: <2W. Protection class: IP30.
- STCD Series Thermostats

VERANO[®]

BY MDL SOLUTIONS

COMPACT LOWER VOLTAGE FAN COILS AND HYDRONIC HEAT | MDLSOLN.COM

The data presented in this document is correct at time of publication. Illustrations may include optional accessories. Due to continuous research and development, and the desire to improve the quality of our products, MDL Solutions reserves the right to make changes regarding design and specifications without prior notice