

# VHAH HORIZONTAL MINI AHU

MDL: PROFESSIONAL GRADE HVAC SOLUTIONS





Management Service



# INVESTING IN QUALITY, RELIABILITY & PERFORMANCE

## 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

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

S	Complete Control
W	Standard Control
AECM	EC motor configuration
X	220V/1Ph/60Hz
Unit Size	
4R	2 pipes 4 rows
6R	2 pipes 6 rows
4+2R	4 pipes with 4 rows cooling and 2 rows heating
VHAH	Horizontal Air Handling Unit

The manufacturer reserves the right to make changes to the design, colour and specifications of the product shown. All images are for illustrative purposes only and some features such as grilles are optional accessories and not considered as standard equipment

# TECHNICAL DATA

## GENERAL DESCRIPTION

The VHAH 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. VHAH air handling units are shipped completely assembled and motor wiring is preinstalled in the control box to reduce on-site installation time and manpower. Every unit is thoroughly inspected and tested to ensure reliability during startup. The unit contains side panels that provide easy access to fans, motors and filters.

### FRAMEWORK

A frameless structure is used. The panel is an integrated folding steel structure and 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 equipped with manual Air-Vent valve. The aluminum fins are pre-coated for protection by hydrophilic blue fin process. Coils are tested at 435 PSI and recommended operating at no more than 232 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 and 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. VHAH 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 longevity.

### 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 A 240~24/12 V AC transformer as standard which supplies power input to thermostat and other devices.

## 2-PIPE SYSTEMS

### VHAH- 4 ROW, 2 PIPE HORIZONTAL MINI AHU

VHAH - 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			~T: Standard Control					
PERFORMANCE DATA	AIR	AIR FLOW	H	CFM	1339	1882	2429	3764	4858	
			M		1138	1600	2065	3199	4130	
			L		803	1129	1458	2258	2915	
		EXTERNAL STATIC PRESSURE	H	IN. WG	0.5					
			M		0.5					
			L		0.5					
	COOLING	COOLING CAPACITY	H	BTU/Hr	54088	73377	95657	144596	182100	
			M		47794	64937	84962	127964	161741	
			L		36357	49362	64616	97272	123008	
		SENSIBLE COOLING CAPACITY	H		35966	49326	63881	95903	122522	
			M		31558	43195	56096	84858	107592	
			L		23625	32437	42196	63723	80931	
	HEATING	HEATING CAPACITY	H	BTU/Hr	84082	114068	148703	224780	283083	
			M		74299	100948	132078	198926	251434	
			L		56519	76736	100449	151214	191222	
		MAX. EH CAPACITY			4.5	6	7.5	9	9	
	SOUND	SOUND PRESSURE LEVEL	H	dB(A)	70	75	77	78	80	
		SOUND POWER LEVEL	M		79	84	86	87	89	
	ELECTRICAL	POWER			W	412	650	765	1300	1530
		CURRENT			A	1.63	2.17	2.17	4.34	4.34
	HYDRAULIC	COOLING WATER FLOW RATE	H	GPM	10.7	14.5	18.9	28.6	36	
			M		9.44	12.8	16.8	25.3	31.9	
			L		7.18	9.75	12.8	19.2	24.3	
		COOLING PRESSURE DROP	H	FT/HEAD	6.3	4.0	7.2	16.4	12.8	
			M		5.1	3.3	5.9	13.3	10.4	
			L		3.2	2.1	3.7	8.4	6.5	
		HEATING WATER FLOW RATE			GPM	Same As "Cooling Water Flow Rate"				
		HEATING PRESSURE DROP	H	FT. WG.	5.7	3.6	6.4	14.8	11.5	
			M		4.6	3.0	5.3	12	9.4	
			L		2.9	1.9	3.3	7.5	5.9	
		WATER CONTENT			GALLONS	1.6	2.0	2.4	2.8	3.3
CONSTRUCTION AND PACKING DATA	WATER CONNECTIONS		IN OUT	INCH	NPT 1 1/4					
	CONDENSATE DRAINAGE CONNECTION			INCH	1					
	DIMENSIONS	L	INCH	50 3/8	58 1/4	66 1/8	74	85 13/16		
		W		40 9/16						
		H		25 3/16						

#### COOLING CONDITIONS

- Air temperature: 80°F DB /67°F WB.
- Water inlet/outlet: 45/55°F.

#### HEATING CONDITIONS

- Air temperature: 70°F.
- Water inlet temperature: 140°F.

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

## VHAH - 6 ROW, 2 PIPE HORIZONTAL MINI AHU

VHAH - 6R - [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			~T: 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/Hr	54859	80713	107061	148861	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/Hr	85280	125472	166432	231410	309146
			M		75081	111134	147203	204966	273428
			L		57606	84938	112060	156653	208150
		MAX. EH CAPACITY			4.5	6	7.5	9	9
	SOUND	SOUND PRESSURE LEVEL	H	dB(A)	70	75	77	78	80
		SOUND POWER LEVEL	M		79	84	86	87	89
	ELECTRICAL	POWER		W	412	650	765	1300	1530
		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		9.54	14.1	18.7	26	34.7
			L		7.32	10.8	14.2	19.9	26.4
		COOLING PRESSURE DROP	H	FT.WG	3.2	7.2	13.2	3.9	7.3
			M		2.6	5.8	10.7	3.1	6.0
			L		1.7	3.7	6.7	2.0	3.7
		HEATING WATER FLOW RATE		GPM	Same As "Cooling Water Flow Rate"				
		HEATING PRESSURE DROP	H	FT. WG.	5.7	3.6	6.4	14.8	11.5
M			4.6		3.0	5.3	12	9.4	
L			2.9		1.9	3.3	7.5	5.9	
WATER CONTENT		GALLONS	1.6	2.0	2.4	2.8	3.3		
CONSTRUCTION AND PACKING DATA	WATER CONNECTIONS	IN	INCH	NPT 1 1/4					
		OUT							
	CONDENSATE DRAINAGE CONNECTION		INCH	1					
	DIMENSIONS	L	INCH	50 3/8	58 1/4	66 1/8	74	85 13/16	
		W		40 9/16					
H		25 3/16							

### COOLING CONDITIONS

- Air temperature: 80°F DB /67°F WB.
- Water inlet/outlet: 45/55°F.

### HEATING CONDITIONS

- Air temperature: 70°F.
- Water inlet 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

## VHAH - 4+2 ROW, 4 PIPE HORIZONTAL MINI AHU

VHAH - 4+2R - [SIZE]					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			~T: Standard Control					
PERFORMANCE DATA	AIR	AIR FLOW	H	CFM	1339	1882	2429	3764	4858	
			M		1138	1600	2065	3199	4130	
			L		803	1129	1458	2258	2915	
		EXTERNAL STATIC PRESSURE	H	IN. WG	0.5					
			M		0.5					
			L		0.5					
	COOLING	COOLING CAPACITY	H	BTU/Hr	54088	73377	95657	144596	182100	
			M		47794	64937	84962	127964	161741	
			L		36357	49362	64616	97272	123008	
		SENSIBLE COOLING CAPACITY	H		35966	49326	63881	95903	122522	
			M		31558	43195	56096	84858	107592	
			L		23625	32437	42196	63723	80931	
	HEATING	HEATING CAPACITY	H	BTU/Hr	76725	105471	134486	198076	252457	
			M		67742	93013	119172	174679	223710	
			L		51720	71167	90438	133653	169771	
	SOUND	SOUND PRESSURE LEVEL	H	dB(A)	70	75	77	78	80	
		SOUND POWER LEVEL	M		79	84	86	87	89	
	ELECTRICAL	POWER INPUT			W	412	650	765	1300	1530
		CURRENT			A	1.63	2.17	2.17	4.34	4.34
	HYDRAULIC	COOLING WATER FLOW RATE	H	GPM	10.7	14.5	18.9	28.6	36	
			M		9.44	12.8	16.8	25.3	31.9	
			L		7.18	9.75	12.8	19.2	24.3	
		COOLING PRESSURE DROP	H	FT. WG.	6.3	4.0	7.2	16.4	12.8	
			M		5.1	3.3	5.9	13.3	10.4	
			L		3.2	2.1	3.7	8.4	6.5	
		HEATING WATER FLOW RATE	H	GPM	3.82	5.25	6.7	9.87	12.6	
			M		3.37	4.63	5.94	8.7	11.1	
			L		2.58	3.55	4.51	6.66	8.46	
		HEATING PRESSURE DROP	H	FT. WG.	2.6	1.7	1.3	2.9	1.6	
			M		2.1	1.3	1.1	2.3	1.3	
			L		1.3	0.9	0.7	1.5	0.8	
		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		COOLING WATER CONNECTIONS	IN	INCH	NPT 1 1/4					
			OUT							
		HEATING WATER CONNECTIONS	IN		NPT 1					
			OUT							
		CONDENSATE DRAINAGE CONNECTION			INCH	1				
		DIMENSIONS	L	INCH	50 3/8	58 1/4	66 1/8	74	85 13/16	
			W		40 9/16					
H	25 3/16									

### COOLING CONDITIONS

- Air temperature: 80°F DB /67°F WB.
- Water inlet/outlet: 45/55°F.

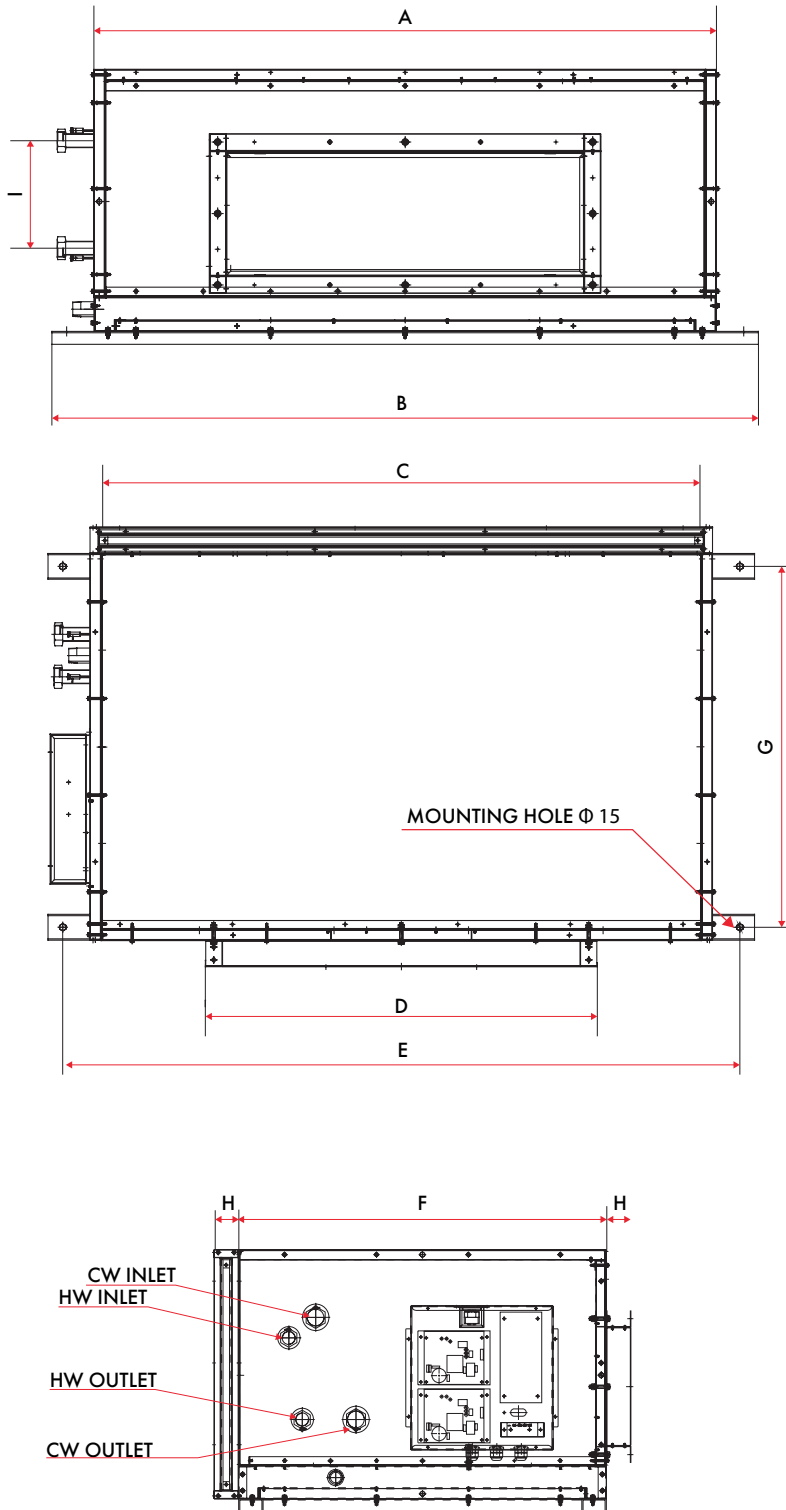
### HEATING CONDITIONS

- Air temperature: 70°F.
- Water Inlet/Outlet Temperature: 180/140°F.

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

# DIMENSIONAL DRAWINGS

## VHAH 4 PIPE

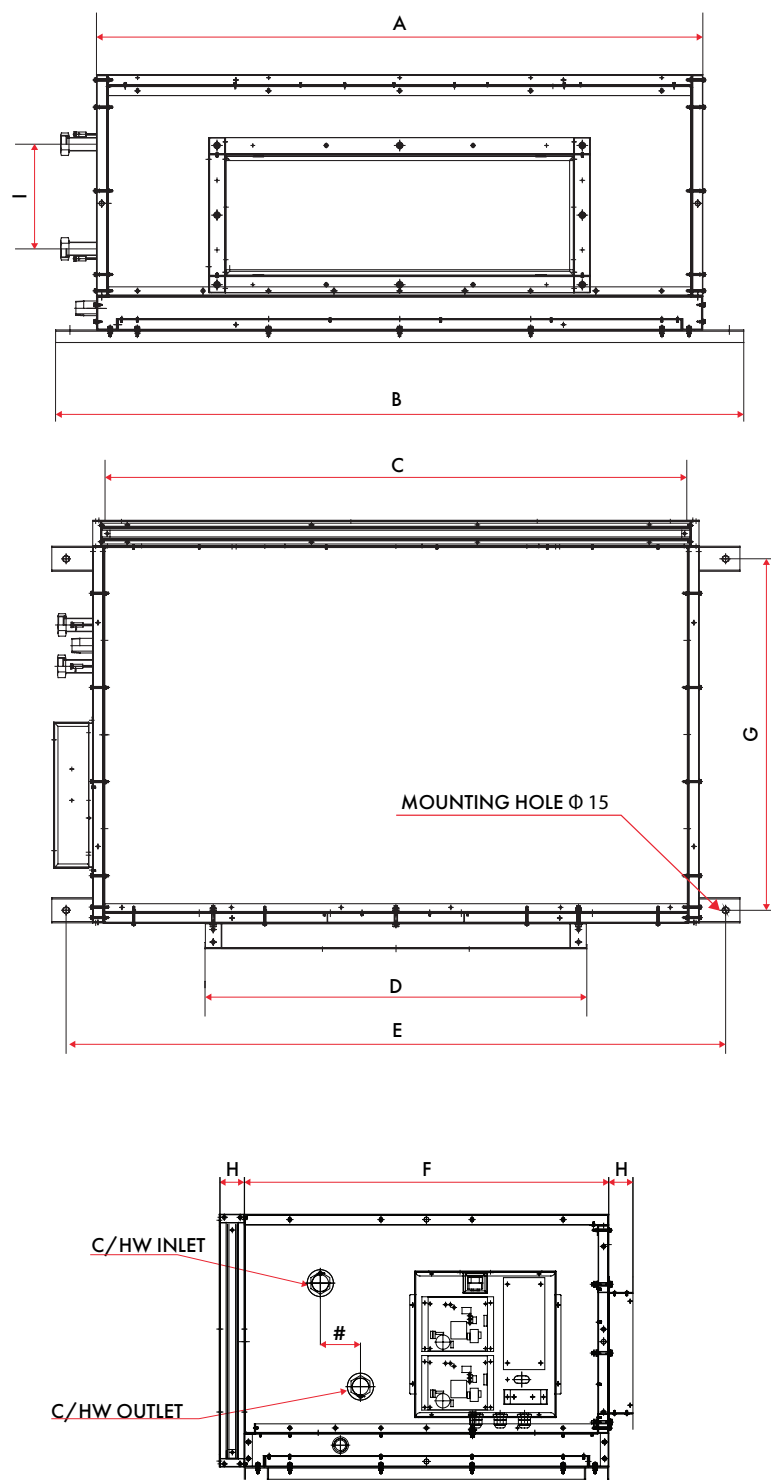


MODEL	A	B	C	D	E	F	G	H	I
200	42 1/2	18 1/2	50 3/8	40 3/16	10 1/16	23 5/8	26 3/4	47 5/8	13 1/4
300	50 3/8	22 3/16	58 1/4	48 1/16	11 13/16	27 9/16	30 11/16	55 1/2	13 7/16
400	58 1/4	27 11/16	66 1/8	55 7/8	13 3/4	33 7/16	36 5/8	63 3/8	14 5/8
600	66 1/8	36 1/8	74	63 3/4	15 3/4	49 3/16	52 3/8	71 1/4	13 7/16
800	77 15/16	36 1/8	85 13/16	75 9/16	18 7/8	53 15/16	57 1/16	83 1/16	14 5/8

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



VHAH 2 PIPE



MODEL	A	B	C	D	E	F	G	H	I
200	42 1/2	18 1/2	50 3/8	40 3/16	10 1/16	23 5/8	26 3/4	47 5/8	13 1/4
300	50 3/8	22 3/16	58 1/4	48 1/16	11 13/16	27 9/16	30 11/16	55 1/2	13 7/16
400	58 1/4	27 11/16	66 1/8	55 7/8	13 3/4	33 7/16	36 5/8	63 3/8	14 5/8
600	66 1/8	36 1/8	74	63 3/4	15 3/4	49 3/16	52 3/8	71 1/4	13 7/16
800	77 15/16	36 1/8	85 13/16	75 9/16	18 7/8	53 15/16	57 1/16	83 1/16	14 5/8

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

# 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 heaters 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.
- ABS External LED Receiver
  - IR receiver in ABS housing with up to 70in length prewiring. LED lights show working mode or error code.
- Unlimited Wired Wall Pad Controller (*Currently not available in North America*)
  - **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.
- 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<sup>®</sup>

BY MDL SOLUTIONS

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

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