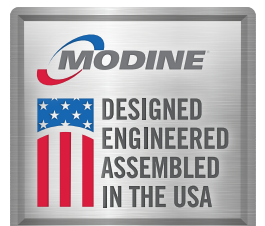




DUCTLESS CHILLED WATER CEILING CASSETTES



Overview

The ceiling mounted Cassette units effectively make each area served an independent controlled temperature zone. Through thermostatic control of operations, conditions can be varied to suit diverse requirements or activities. Optional fresh air intakes are available to provide outside air for ventilation into the space. Cassettes are available with chilled water cooling. Optional heating can be provided as electric heat or hot water, depending on the model. This versatility eliminates compromising architecture or design. Important cost savings are often realized during building modernizations, as existing piping and/or wiring can frequently be reused.

Design techniques are incorporated in every Airedale by Modine Cassette to reduce noise levels to a minimum. These techniques include low blower speeds, rigid panel and cabinet construction, and sound-absorbent cabinet insulation.

For individual comfort, Cassettes are available with electro-mechanical or micro-processor based controls. The micro-processor controller includes an infrared transmitter which enables room conditions to be maintained at a user defined setpoint.

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The Modine Breeze® AccuSpec is the fastest way to generate performance data based on actual job conditions. The Breeze® AccuSpec program is a web-based sizing and selection program. The program provides a series of step-by-step questions that allow for the easy configuration of Airedale by Modine products. After a model has been configured, the program can generate Submittal Schedules, Submittal Data (including performance and dimensional drawings), and Specifications.

MODEL IDENTIFICATION

Ceiling Cassette

Model Nomenclature

1	2,3	4,5	6	7	8	9	10	11	12	13
PT	UC	MBH	SV	G	C	HO	FL	FP	PO	CC

1 – Product Type (PT)

S – Ceiling Cassette

2,3 – Unit Configuration (UC)

CW – Chilled Water

4,5 – Nominal Capacity (MBH)

08 – 8,000 Btu/Hr

12 – 12,000 Btu/Hr

18 – 18,000 Btu/Hr

20 – 20,000 Btu/Hr

33 – 33,000 Btu/Hr

36 – 36,000 Btu/Hr

6 – Supply Voltage (SV)

A – 115V/60Hz/1ph

B – 208V/60Hz/1ph

C – 230V/60Hz/1ph

H – 277V/60Hz/1ph

J – 110V/50Hz/1ph

K – 220V/50Hz/1ph

7 – Generation (G)

A - First Gen - PSC Motor

B - Second Gen - Single Speed PSC Motor

8 – Control Code (C)

E – Electro-Mechanical Controls

M – Microprocessor Controls (Infrared Remote Control)

9 – Heating Option (HO)

N – None

A – Electric Heat

B – Hot Water Heating Coil – 4-pipe

C – Hot Water Heating – 2 Pipe (Uses CW Coil)

10 – Filters (FL)

A – 60-80% Arrestance (Standard)

B – MERV 10

11 – Heat Freeze Protection (FP)

N – None

F – Hot Water Coil Freeze Protection

12 – Power Option (PO)

N – None

D – Cassette Power Disconnect Switch

13 – Control Communication Option (CC)

N – None

STANDARD FEATURES

Ceiling Cassette

General Description – Ceiling Cassette Unit

Digit 2,3: Unit Configuration (UC)

CW = Chilled Water

All chilled water units utilize large surface area coils positioned to optimize heat transfer and airflow. Each coil is manufactured from refrigeration quality copper tubes with mechanically bonded aluminum fins and are circuited from headers to ensure low water pressure drops.

Digit 4,5: Nominal Capacity (MBH)

08 = 8,000 Btu/Hr
12 = 12,000 Btu/Hr
18 = 18,000 Btu/Hr
20 = 20,000 Btu/Hr
33 = 33,000 Btu/Hr
36 = 36,000 Btu/Hr

Digit 6: Supply Voltage (SV)

A = 115/60/1
B = 208/60/1
C = 230/60/1
H = 277/60/1
J = 110/50/1
K = 220/50/1

Digit 7: Generation (G)

A = First Generation - PSC Motor

Units utilize backward curved centrifugal fans, are statically and dynamically balanced for quiet operation. Fan impellers are made from either aluminum or fire retardant plastic for light weight and corrosion resistant operation. Fans are driven by an enclosed multi-speed external rotor motor allowing good heat dissipation and an increased motor efficiency. Fans come complete with thermal overload protection and sealed-for-life lubricated bearings.

B = Second Generation - Single Speed PSC Motor

Units utilize backward curved centrifugal fans, are statically and dynamically balanced for quiet operation. Fan impellers are made from fire retardant plastic for light weight and corrosion resistant operation. Fans are driven by an enclosed single speed external rotor motor. The unit has multi-speeds available through a factory installed auto-transformer. Fans come complete with thermal overload protection and sealed-for-life lubricated bearings.

Digit 8: Control Code (C)

E = Electro-Mechanical Controls

The unit shall be factory wired with an electro-mechanical control system that includes the necessary relays and safety switches for proper unit operation. A terminal strip is provided at the unit for the wiring of a 24V wall mounted thermostat required for unit operation.

The unit shall include terminals for remote start/stop of the unit. The unit is enabled when contact between the terminals is closed.

M = Microprocessor Controls

A custom designed microprocessor is fitted to the cassette to enable room conditions to be maintained at a user defined setpoint. Communication to the controller is by a hand held infrared transmitter.

The microprocessor monitors indoor coil temperature and return air temperature. The receiver contains a self diagnostic feature. When a low indoor coil temperature is detected the cooling action is stopped. If a sensor fails then an alarm is displayed on the fascia-mounted receiver.

The infrared transmitter is used to switch the unit ON/OFF, change temperature settings, fan speed, operating mode, and to toggle the motorized air sweep (where fitted). The microprocessor also has a built-in clock with a timer. The timer can be activated to provide ON/OFF unit operation. Note this is not a night set back or occupied/unoccupied control function.

Figure 4.1 - Microprocessor Remote



Digit 9: Heating Option (HO)

N = None

A = Electric Heat

Electric heating elements will be factory fitted to the unit. Elements are manufactured for maximum surface area and lower working temperature for improved reliability. Thermal cut out protection switches are fitted to the electric heat circuit to protect against overheating.

B = Hot Water Heating Coil - 4 Pipe

A hot water heating coil will be factory fitted (depending on unit size) in addition to the chilled water coil to provide heating. The coil is manufactured from refrigeration quality copper tubes with mechanically bonded aluminum fins.

C = Hot Water Heating - 2 Pipe (Uses CW Coil)

A common chilled water/hot water coil for 2 pipe systems will provide cooling or heating, depending on mode of operation. The coil is manufactured from refrigeration quality copper tubes with mechanically bonded aluminum fins.

Digit 10: Filtration (F)

A = 60-80% Arrestance (Standard)

Wire framed filters are fitted. These are reusable and may be vacuum cleaned.

B = MERV 10

MERV 10, 1" thick, radial pleated disposable cotton and synthetic blend filters. Minimum Efficiency Reporting Value of MERV 10 per ASHRAE standard 52.2.

Digit 11: Heat Freeze Protection (FP)

N = None

F = Hot Water Coil Freeze Protection

The unit shall be fitted with a freeze protection sensor to prevent freezing of the hot water coil assembly. When the sensor detects a conditions that can result in a freeze condition, it will open the flow control valve and prevent the unit fan(s) from running.

Digit 12: Power Option (PO)

N = None

D = Cassette Power Disconnect Switch

The unit shall be fitted with a power disconnect switch located on the control panel, sized for the full load amperage of the unit to enable the unit to be disconnected from the power supply prior to any maintenance.

Digit 13: Control Communication Option (CC)

N = None

Standard Features**Construction**

Cases are manufactured from lightweight galvanized sheet steel with integral fan mounting rails for added strength. Fire resistant foam insulation is fitted internally to provide both thermal and acoustic insulation.

Condensate Pump

A condensate pump and check valve are fitted to carry condensate water out of the unit and stop water from flowing back into the condensate tray. The pump is fixed to a mounting bracket which can be withdrawn from the side of the chassis and incorporates an inspection hole to allow a visual check of the pump during operation. A float switch is fitted to stop the cooling action should the pump become blocked or fail.

Air Vanes

Air outlet vanes are designed to prevent condensation from forming. Vanes are manually adjustable on model sizes 08 and 12. The vanes on all other model sizes are driven by an electric motor. Motorized air vanes can be set to auto sweep or can be stopped in a fixed position. Polystyrene blanking pieces are supplied with Cassette packing so that up to two fascia discharge slots can be blanked off.

Alarm Status Relay

The unit shall include a relay for unit failure notification. In addition, a normally open contact is available for field connection.

Field Installed Accessories**Fresh Air Duct Collars**

The Cassette chassis features two or three fresh air knockouts depending on model size. Any number can be removed to allow fresh air to enter the unit. A duct collar is available for fastening to the unit to allow connection of a 3" flexible duct. A replacement filter is included with fresh air duct collars to aid in balancing the amount of return air and fresh air delivered to the unit's coil.

Supply Air Duct Collars

A limited amount of conditioned air can be ducted from the unit by removing the branch duct knockouts (up to 2 per unit) and connecting flexible ducting. For model sizes 08 and 12, there are a total of three knockouts positioned on three of the unit sides (one per side). For all other model sizes, a total of four knockouts are available and are arranged in pairs along two of the unit sides (two per side). A duct collar is available to allow connection of a 5" or 6" (depending on units size) flexible duct to the Cassette.

On model sizes 08 and 12, it is recommended that only one of the three branch duct knockouts are utilized, due to the small capacity of the unit.

Control Valves

For control of chilled water or hot water flow, a three-way, three-port diverting type valve or a two-way, two-port control valve is supplied loose for on site installation. Actuation is via a 24V signal from the unit's electrical panel.

- Two Position Spring Return Control Valves with Two Shut-Off Valves (package)

On a four pipe system where two-way valves are specified, the chilled water valve will be a normally closed type. The hot water valve will be a normally open type. Where three-way valves are specified, the same type valve will be supplied for both coils and should be installed normally closed to the coil in the case of the chilled water coil and normally open to the coil in the case of the hot water coil.

On a two pipe changeover system where a two-way valve is specified, a normally open valve is supplied. Where a three-way valve is specified, this should be installed normally open to the coil. In both cases, a pipe mounted changeover thermostat is factory supplied and shipped loose for field installation. The changeover thermostat is used to monitor water supply temperature and allow action of the valve accordingly.

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Table 8.1 - Cooling Performance - Chilled Water Units

Model	Filter	Entering Air DB °F @ 50% RH	Chilled Water Inlet / Outlet, °F							
			40/50°F				45/55°F			
			TC	SC	FLOW	PR DROP	TC	SC	FLOW	PR DROP
			BTUH	BTUH	GPM	PSI	BTUH	BTUH	GPM	PSI
SCW 08	STD.	72	5,900	4,900	1.2	2.9	4,100	3,900	0.8	1.5
		75	7,300	5,500	1.5	4.3	5,100	4,500	1.0	2.2
		80	9,900	6,500	2.0	7.4	7,800	5,500	1.6	4.8
	MERV 10	72	4,000	3,300	0.8	1.6	2,800	2,600	0.6	0.8
		75	5,000	3,700	1.0	2.3	3,500	3,100	0.7	1.2
		80	6,800	4,400	1.3	3.8	5,400	3,700	1.1	2.5
SCW 12	STD.	72	8,800	7,100	1.7	1.7	6,100	5,700	1.2	0.9
		75	10,900	8,000	2.2	2.5	7,600	6,600	1.5	1.3
		80	14,600	9,400	2.9	4.2	11,200	8,000	2.2	2.6
	MERV 10	72	5,300	4,300	1.1	0.7	3,700	3,400	0.7	0.3
		75	6,600	4,800	1.3	1.1	4,600	3,900	0.9	0.5
		80	8,900	5,700	1.8	1.8	6,800	4,800	1.4	1.1
SCW 18	STD.	72	14,200	11,700	2.8	1.5	10,000	9,500	2.0	0.8
		75	17,700	13,200	3.5	2.2	12,500	10,800	2.5	1.2
		80	23,900	15,600	4.8	3.7	18,200	13,200	3.6	2.3
	MERV 10	72	12,900	10,500	2.6	1.3	9,000	8,500	1.8	0.7
		75	16,000	11,900	3.2	1.8	11,300	9,800	2.3	1.0
		80	21,600	14,000	4.3	3.1	16,500	11,900	3.3	1.9
SCW 20	STD.	72	14,500	12,000	2.9	1.6	10,200	9,700	2.0	0.8
		75	18,100	13,500	3.6	2.3	12,800	11,100	2.5	1.2
		80	24,500	15,900	4.9	3.9	18,600	13,500	3.7	2.4
	MERV 10	72	12,900	10,500	2.6	1.3	9,000	8,500	1.8	0.7
		75	16,000	11,900	3.2	1.8	11,300	9,800	2.3	1.0
		80	21,600	14,000	4.3	3.1	16,500	11,900	3.3	1.9
SCW 33	STD.	72	24,400	19,400	4.9	3.1	17,200	15,800	3.4	1.6
		75	30,000	21,800	6.0	4.4	21,400	18,000	4.3	2.4
		80	40,300	25,800	8.0	7.4	31,100	21,900	6.2	4.6
	MERV 10	72	23,300	18,500	4.6	2.8	16,400	15,100	3.3	1.5
		75	28,700	20,800	5.7	4.1	20,500	17,100	4.1	2.2
		80	38,400	24,600	7.7	6.8	29,700	20,800	5.9	4.2
SCW 36	STD.	72	26,800	21,500	5.3	3.6	18,900	17,500	3.8	1.9
		75	33,100	24,100	6.6	5.2	23,500	19,900	4.7	2.8
		80	44,600	28,600	8.9	8.8	34,300	24,200	6.9	5.5
	MERV 10	72	23,300	18,500	4.6	2.8	16,400	15,100	3.3	1.5
		75	28,700	20,800	5.7	4.1	20,500	17,100	4.1	2.2
		80	38,400	24,600	7.7	6.8	29,700	20,800	5.9	4.2

① Test conditions based on ANSI/AHRI Standard 440

② TC = Total Cooling Capacity

③ SC = Sensible Cooling Capacity

④ All duties based on 208V/1Ph/60Hz supply voltage and high fan speed except where stated otherwise

⑤ Pressure drops are coil only, excluding valves

PERFORMANCE DATA

Ceiling Cassette

Table 9.1 - Heating Performance - Chilled Water Units with Optional Heating Coil

Model	Filter	Hot Water 180°F Inlet / 160°F Outlet								
		70°F Entering Air DB			60°F Entering Air DB			50°F Entering Air DB		
		Capacity (btuh)	PD (psi)	Flow (gpm)	Capacity (btuh)	PD (psi)	Flow (gpm)	Capacity (btuh)	PD (psi)	Flow (gpm)
SCW 08	STD.	17,100	2.8	1.7	18,900	3.3	1.9	20,600	3.8	2.0
	MERV 10	13,400	1.8	1.3	14,700	2.1	1.5	16,100	2.5	1.6
SCW 12	N/A	N/A			N/A			N/A		
SCW 18	STD.	27,300	1.1	2.7	30,000	1.3	3.0	32,800	1.5	3.3
	MERV 10	24,800	0.9	2.5	27,300	1.1	2.7	29,800	1.3	3.0
SCW 20	STD.	27,900	1.1	2.8	30,700	1.4	3.1	33,500	1.6	3.3
	MERV 10	24,800	0.9	2.5	27,300	1.1	2.7	29,800	1.3	3.0
SCW 33	STD.	41,200	1.4	4.1	45,300	1.7	4.5	49,400	2.0	4.9
	MERV 10	42,300	1.5	4.2	45,900	1.7	4.6	49,300	2.0	4.9
SCW 36	STD.	45,200	1.7	4.5	49,800	2.0	5.0	54,300	2.3	5.4
	MERV 10	42,300	1.5	4.2	45,900	1.7	4.6	49,300	2.0	4.9

① All duties based on 208V/1Ph/60Hz supply voltage and high fan speed except where stated otherwise

② Pressure drops are coil only, excluding valves

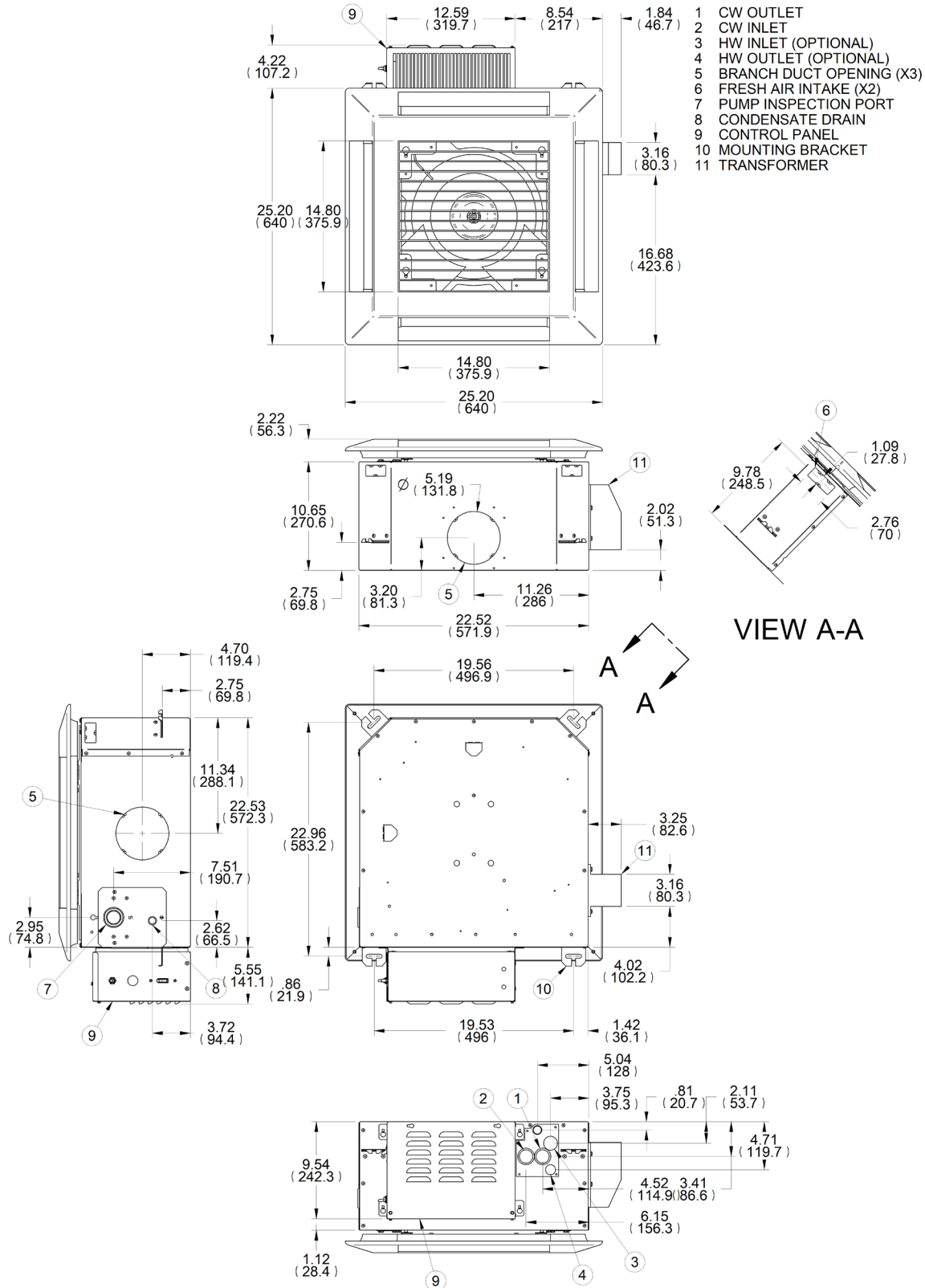
Table 9.2 - Heating Performance - Chilled Water Units with 2-Pipe Changeover

Model	Filter	Hot Water 180°F Inlet / 160°F Outlet								
		70°F Entering Air DB			60°F Entering Air DB			50°F Entering Air DB		
		Capacity (btuh)	PD (psi)	Flow (gpm)	Capacity (btuh)	PD (psi)	Flow (gpm)	Capacity (btuh)	PD (psi)	Flow (gpm)
SCW 08	STD.	21,000	6.3	2.1	23,100	7.5	2.3	25,100	8.8	2.5
	MERV 10	14,200	3.1	1.4	15,600	3.7	1.6	17,000	4.3	1.7
SCW 12	STD.	29,000	3.1	2.9	31,900	3.7	3.2	34,800	4.4	3.5
	MERV 10	17,400	1.2	1.7	19,100	1.5	1.9	20,800	1.7	2.1
SCW 18	STD.	55,100	3.6	5.5	60,400	4.2	6.0	65,600	4.9	6.5
	MERV 10	49,200	2.9	4.9	53,900	3.4	5.4	58,600	4.0	5.8
SCW 20	STD.	55,100	3.6	5.5	60,400	4.2	6.0	65,600	4.9	6.5
	MERV 10	49,200	2.9	4.9	53,900	3.4	5.4	58,600	4.0	5.8
SCW 33	STD.	80,500	5.5	8.0	88,200	6.4	8.8	95,900	7.5	9.5
	MERV 10	76,500	5.0	7.6	83,900	5.9	8.4	91,200	6.8	9.1
SCW 36	STD.	89,300	6.6	8.9	97,900	7.8	9.7	106,400	9.1	10.6
	MERV 10	76,500	5.0	7.6	83,900	5.9	8.4	91,200	6.8	9.1

① All duties based on 208V/1Ph/60Hz supply voltage and high fan speed except where stated otherwise

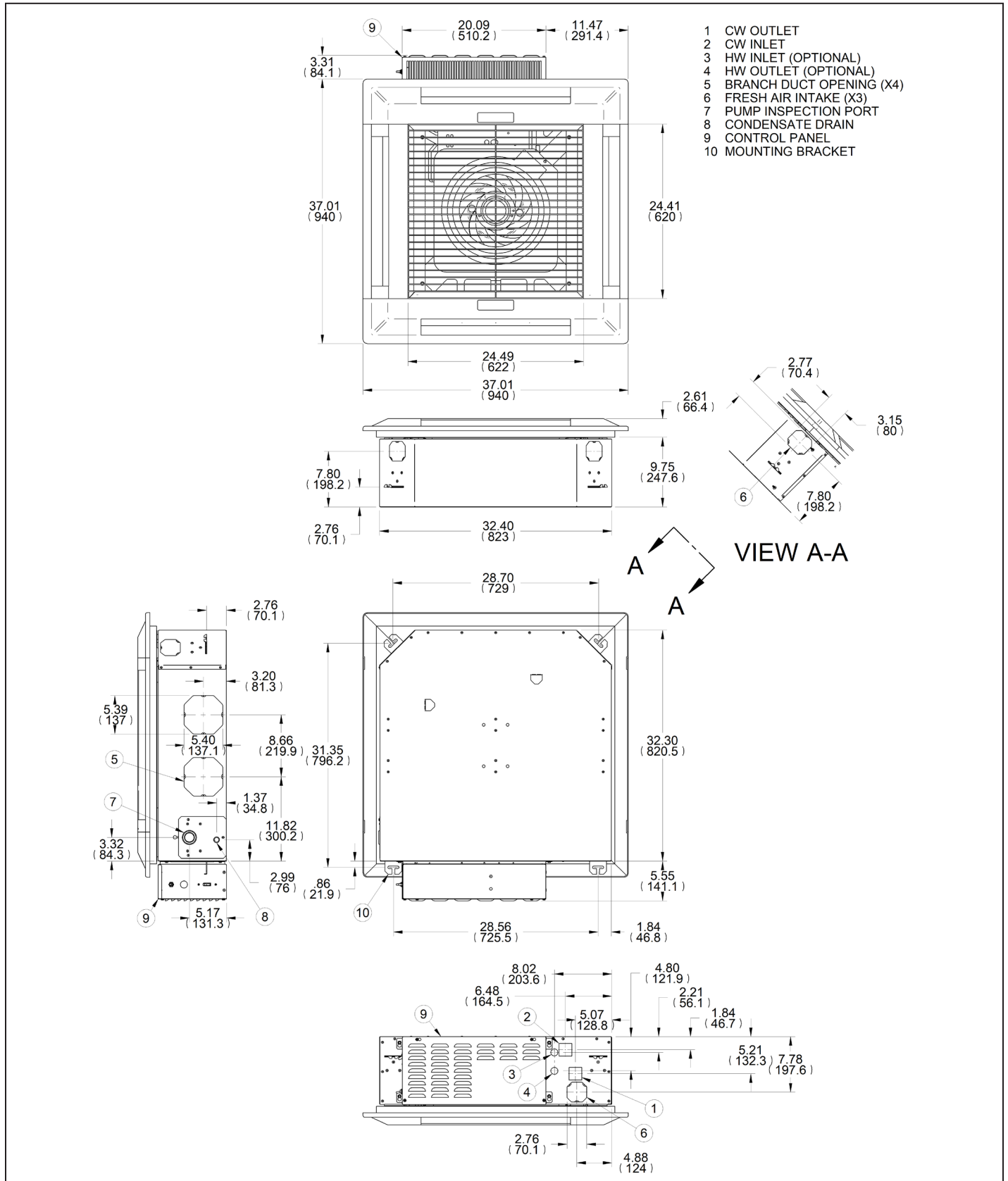
② Pressure drops are coil only, excluding valves

Figure 10.1 - Dimensions - Small Chassis: SCW08 and SCW12



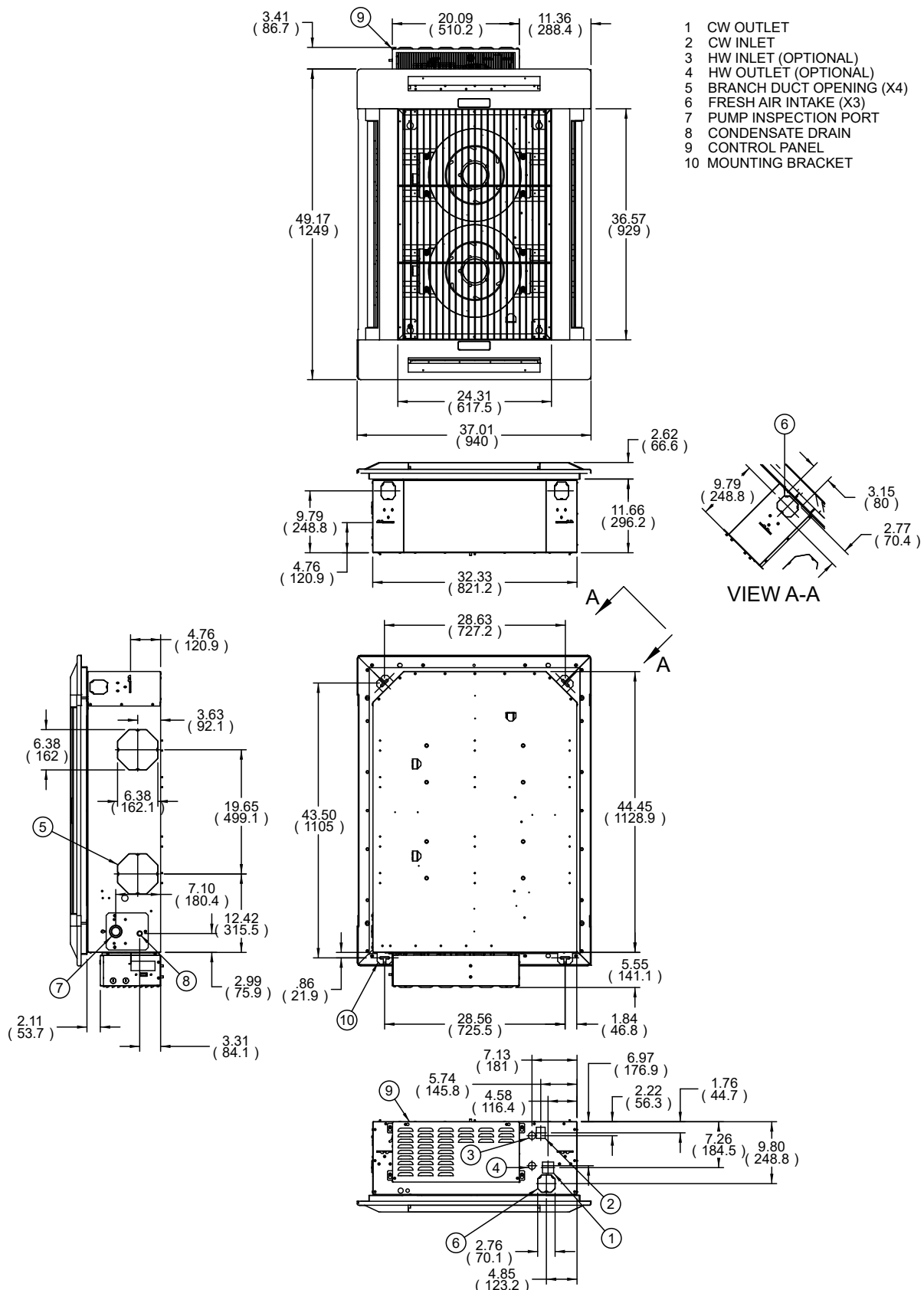
① Dimensions shown are inches (mm)

Figure 11.1 - Dimensions - Medium Chassis: SCW18 and SCW20



① Dimensions shown are inches (mm)

Figure 12.1 - Dimensions - Large Chassis: SCW33 and SCW36



① Dimensions shown are inches (mm)

Table 13.1 - Technical Data – Chilled Water Units

			Model Digit 2, 3 + Model Size						
DESCRIPTION		UNITS	CW08	CW12	CW18	CW20	CW33	CW36	
CONSTRUCTION	Material: Fascia		High Impact Polystyrene (Light Grey color), UL94 VO Fire Rating						
	Material: Chassis		Galvanized Steel						
CHILLED WATER COIL	Type		Finned Tube						
	Quantity		1						
	Face Area	ft²	1.8		2.8		5.2		
	Nominal Airflow - Standard - H/M/L (1)	CFM	330/300/260	360/330/300	600/540/460	620/600/540	940/850/740	1080/940/850	
	Nominal Airflow - MERV 10 - H/M/L (1)	CFM	200 / 170 / 160		520 / 490 / 450		880 / 760 / 690		
	Discharge		4-Way						
	Unit Water Volume	gal	0.29		0.45		0.79		
	Maximum Inlet Water Pressure	psi	125						
	FAN	Type		Centrifugal					
Quantity			1				2		
Diameter		in	12.0		15.0		14.0		
Horsepower (per fan)		HP	1/8		1/6				
WEIGHTS	Weight - Chassis	lbs	40		64		97		
	Weight - Fascia		5		18		21		
CONNECTIONS	Chilled Water Inlet (OD)	in	0.625		0.875				
	Chilled Water Outlet (OD)		0.625		0.875				
	HW Coil Connection (OD)		0.625	N/A	0.625		0.750		
	Condensate (ID)		0.375						
FILTRATION	Type		Washable Polyester Foam (Standard)						
	Size	in	14.5 x 13.5 x 0.2			11.6 x 23.2 x 0.2			
	Type		MERV 10						
	Size	in	13.0 x 13.0 x 1.0			12.0 x 25.0 x 1.0			
	Quantity		1		2		3		
CONDENSATE PUMP	Maximum Head	in	30.0						
	Nominal Flow rate	GPM	0.1						
OPTIONS	Electric Heating Capacity	kW	1.5		3.0		5.0		
	Max Supply Air Branch Duct Connections	qty	2						
	Supply Air Branch Duct Diameter	in	5.0				6.0		
	Ducted Supply Air Volume (2)	CFM	80	100	125	200	220		
	Fresh Air Connections	qty	2	3					
	Fresh Air Duct Diameter	in	3.0						
	Fresh Air Volume (3)	CFM	40	60	65	90	95		

① Nominal airflow based on 208V/1Ph/60Hz supply voltage.

② Maximum air volume available through one branch duct 6' long, with Cassette fan(s) at high speed and corresponding fascia aperture closed.

③ Maximum fresh air through all knockouts connected to one 10' long duct with fan at high speed. Fresh air volume will depend on duct configuration, fan speed, and filter type.

④ For electrical data, please refer to the submittal data in Breeze AccuSpec.

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Specific catalogs are available for each product. Catalogs 75-136 and 75-137 provide details on all Modine HVAC equipment.



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