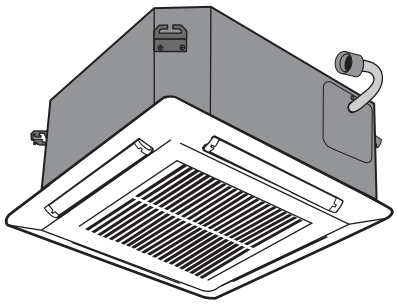
Product Data

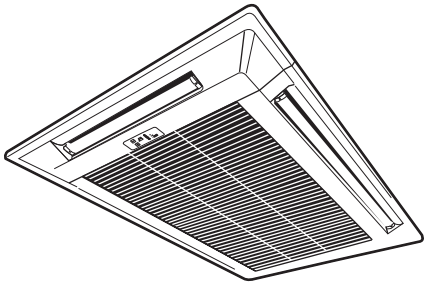
Airstream™ Hydronic Ceiling Cassettes

3/4 to 3 Nominal Tons

AIRSTREAM™



Unit Sizes 08-12



Unit Sizes 18-36

42WKN08-36
Hydronic Ceiling Cassettes

Features/Benefits

Ceiling cassette units make each served area an independent controlled temperature zone to suit diverse requirements.

Hydronic ceiling cassette units offer:

- 4 chilled water cooling models to properly match job
- optional electric heat or hot water coil
- wall-mounted thermostat
- installation cost savings through use of existing piping and/or wiring
- low noise level construction
- optional microprocessor based controller with infrared transmitter

Construction

Cases are constructed of lightweight galvanized sheet steel with integral fan mounting rails for added strength. Fire resistant foam insulation (rated to UL94 VO) is fitted internally to provide both thermal and acoustic insulation.

The light-gray fascia is constructed of high-impact polystyrene.

Chilled water coil

Units use large surface area coils positioned to optimize heat transfer and airflow. Each coil is manufactured from copper tubes with mechanically bonded aluminum fins and is circuited from headers to ensure low water pressure drops.

Fan

The backward-curved, centrifugal fans are statically and dynamically balanced for quiet operation. Fan impellers are made from either aluminum or fire-retardant plastic (UL94 VO) for lightweight and corrosion-resistant operation. Enclosed multi-speed external rotor fan motor allows good heat dissipation and increased motor efficiency. Fans come complete with thermal overload protection and sealed-for-life lubricated bearings.

Filtration

Reusable wire framed filters are fitted and may be vacuum cleaned.

Condensate pump

A condensate pump is fitted to carry water out of the unit. The pump is fixed to a mounting bracket which can be withdrawn from the side of the chassis and incorporates an inspection hole to allow a visual check of the pump during operation.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 manufactured from aluminum and covered with nylon flock to prevent condensation from forming. Vanes are manually adjustable on all unit sizes. Polystyrene blanking pieces are supplied with cassette packing so that up to two fascia discharge slots can be blanked off.

Alarm interlock relay

Alarm interlock relay includes a relay for unit failure notification. Normally open/normally closed contacts are available for field connection.

Table of contents

Model number nomenclature

42 Series Hydronic Ceiling Cassettes

42WKN 18 A C E N A N N N

Digits 1 - 5
42WKN – Hydronic Cooling Ceiling Cassette

Digits 6 - 7
Unit Size and Nominal Capacity
08 – 8 MBH
12 – 12 MBH
18 – 18 MBH
36 – 36 MBH

Supply Voltage (v-ph-hz) (Digit 8)
A – 115-1-60
B – 208-1-60
C – 230-1-60
H – 277-1-60
J – 110-1-50
K – 220-1-50

Design Revision (Digit 9)
C – Current Design

Control (Digit 10)
E – Electro-Mechanical Controls
M – Microprocessor Controls

Heating Option (Digit 11)
N – None
A – Electric Heat
B – Hot Water Heating Coil (4-pipe system)
C – Hot Water Heating (2-pipe changeover)

Filtration (Digit 12)
A – Cleanable Filter
B – MERV 10 Filter
C – MERV 13 Filter

Freeze Protection (Digit 13)
N – None
F – Hot Water Coil Freeze Protection

Power Option (Digit 14)
N – None
D – Power Disconnect Switch

Control Option (Digit 15)
N – None

Physical data

42WKN Physical Data — English

42WKN UNIT SIZE		08	12	18	36
COOLING CAPACITY					
At Normal High Speed Airflow[a]	**BTU/hr**	7,800	11,200	18,600	34,300
CONSTRUCTION					
Material: Fascia		High Impact Polystyrene (Light Grey color), UL 94 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 - H/M/L[b]	**cfm**	330 / 300 / 260	360 / 330 / 300	620 / 540 / 460	1080 / 940 / 740
Discharge		4-Way			
Unit Water Volume	**gal**	0.29		0.45	0.79
Maximum Inlet Water Pressure	**psi**	125			
FAN					
Type		Backward Curved with EC Motor			
Quantity		1			2
Diameter	**in.**	11		14	
Horsepower (per fan)	**hp**	1/10		1/5	
WEIGHTS					
Weight - Chassis with Fascia	**lb**	57	60	93	119
CONNECTIONS					
Chilled Water Inlet (OD)	**in.**	0.625		0.875	
Chilled Water Outlet (OD)	**in.**	0.625		0.875	
Condensate (ID)	**in.**	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 or MERV 13			
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			
Nominal Flow-Rate	**gpm**	0.1			
OPTIONS					
Electric Heating Capacity	**kW**	N/A		N/A	N/A
HW Heating Capacity [c]	**BTU/hr**	17,100	N/A	28,000	45,200
HW Coil Connection (OD)	**in.**	0.625	N/A	0.625	0.750
Max Supply Air Branch Duct	**qty**	2			
Supply Air Branch Duct Diameter	**in.**	5			6
Ducted Supply Air Volume [d]	**cfm**	80		125	220
Fresh Air Connections	**qty**	2		6	
Fresh Air Duct Diameter	**in.**	3			
Fresh Air Volume [e]	**cfm**	40		65	95

NOTE(S):

a. Nominal cooling capacity based on 80/67°F (26.7/19.4°C) DB/WB, water temperature of 45ºF (7.2°C) inlet / 55ºF (12.8°C) outlet, 208v/1Ph/60Hz supply voltage, and Standard filters.
b. Nominal airflow based on 208v/1Ph/60Hz supply voltage.
c. Nominal heating capacity based on 70/60°F (21.1/15.6°C) DB/WB, water temperature of 180ºF (82.2°C) inlet / 160ºF (71.1°C) outlet, 208v/1Ph/60Hz supply voltage, and Standard filters.
d. Maximum air volume available through one branch duct 6 ft (1.8 m) long, with Cassette fan(s) at high speed and corresponding fascia aperture closed.
e. Maximum fresh air through all knockouts connected to one 10 ft (3.1 m) long duct with fan at high speed. Fresh air volume will depend on duct configuration, fan speed, and filter type.

LEGEND

DB/WB— Dry Bulb / Wet Bulb
ID — Inside Diameter
OD — Outside Diameter

Physical data (cont)

42WKN Physical Data — SI

42WKN UNIT SIZE		08	12	18	36
COOLING CAPACITY					
At Normal High Speed Airflow[a]	**kW**	2.3	3.3	5.5	10.1
CONSTRUCTION					
Material: Fascia		High Impact Polystyrene (Light Grey color), UL 94 VO Fire Rating			
Material: Chassis		Galvanized Steel			
CHILLED WATER COIL					
Type		Finned Tube			
Quantity		1			
Face Area	**m²**	0.17		0.26	0.48
Nominal Airflow - H/M/L [b]	**m³/min**	9.3 / 8.5 / 7.4	10.2 / 9.3 / 8.5	17.6 / 15.3 / 13.0	30.6 / 26.6 / 21.0
Discharge		4-Way			
Unit Water Volume	**L**	1.1		1.7	3.0
Maximum Inlet Water Pressure	**Pa**	861,845			
FAN					
Type		Backward Curved with EC Motor			
Quantity		1		2	
Diameter	**cm**	28.0		35.5	
Horsepower (per fan)	**W**	74.6		149.1	
WEIGHTS					
Weight - Chassis with Fascia	**kg**	25.9	27.2	42.2	54.0
CONNECTIONS					
Chilled Water Inlet (OD)	**cm**	1.6		2.2	
Chilled Water Outlet (OD)	**cm**	1.6		2.2	
Condensate (ID)	**cm**	0.95			
FILTRATION					
Type		Washable Polyester Foam (Standard)			
Size	**cm**	36.8 x 34.2 x 0.5		29.5 x 58.9 x 0.5	
Type		MERV 10 or MERV 13			
Size	**cm**	33.0 x 33.0 x 2.5		30.5 x 63.5 x 2.5	
Quantity		1		2	3
CONDENSATE PUMP					
Maximum Head	**cm**	76.2			
Nominal Flow-Rate	**l/m**	0.38			
OPTIONS					
Electric Heating Capacity	**kW**	N/A		N/A	N/A
HW Heating Capacity[c]	**kW**	5.0	N/A	8.2	13.2
HW Coil Connection (OD)	**cm**	1.6	N/A	1.6	1.9
Max Supply Air Branch Duct	**qty**	2			
Supply Air Branch Duct Diameter	**cm**	12.7			15.2
Ducted Supply Air Volume[d]	**m³/min**	2.3		3.5	6.2
Fresh Air Connections	**qty**	2		3	
Fresh Air Duct Diameter	**cm**	7.6			
Fresh Air Volume [e]	**m³/min**	1.1		1.8	2.7

NOTE(S):

a. Nominal cooling capacity based on 80/67°F (26.7/19.4°C) DB/WB, water temperature of 45ºF (7.2°C) inlet / 55ºF (12.8°C) outlet, 208v/1Ph/60Hz supply voltage, and Standard filters.
b. Nominal airflow based on 208v/1Ph/60Hz supply voltage.
c. Nominal heating capacity based on 70/60°F (21.1/15.6°C) DB/WB, water temperature of 180ºF (82.2°C) inlet / 160ºF (71.1°C) outlet, 208v/1Ph/60Hz supply voltage, and Standard filters.
d. Maximum air volume available through one branch duct 6 ft (1.8 m) long, with Cassette fan(s) at high speed and corresponding fascia aperture closed.
e. Maximum fresh air through all knockouts connected to one 10 ft (3.1 m) long duct with fan at high speed. Fresh air volume will depend on duct configuration, fan speed, and filter type.

LEGEND

DB/WB — Dry Bulb / Wet Bulb
ID — Inside Diameter
OD — Outside Diameter

Options and accessories

ITEM	FACTORY-INSTALLED OPTIONS	FIELD-INSTALLED ACCESSORIES
Electro-Mechanical Controls	X	—
Microprocessor Controls	X	—
Electric Heat	X	—
Hot Water Coil	X	—
Hot Water Coil Freeze Protection Sensor	X	—
Disconnect Switch	X	—
Chilled Water/Hot Water Control Valve	—	X
Fresh Air Intake Duct Collar	—	X
Branch Duct Collars	—	X
Spare Filters	—	X
Thermostats	—	X
Aquastat	—	X

Factory-installed options

Electro-mechanical controls

Electro-mechanical controls include an electro-mechanical controller with a 24-v transformer. The controller requires a 24-v thermostat which can be supplied loose for onsite wall mounting. Thermostat options include cooling only or cooling and one stage auxiliary heat.

Units are equipped with a potentiometer to provide adjustable fan speed control for single fan speed thermostats. The fan can also be controlled via an external 3-10 vdc signal by others by making simple wiring changes.

Microprocessor controls

Microprocessor controls include a custom designed microprocessor fitted to the cassette to enable room conditions to be maintained at a user-defined set point. Communication to the controller is by a handheld infrared transmitter or a wall-mounted thermostat.

The microprocessor allows five operating modes: fan only, dry cooling, cooling only, heating only, and heating/cooling with auto changeover for maximum versatility. A temperature set point between 58°F and 90°F can also be selected.

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 microprocessor is controlled with either an infrared transmitter or wall-mounted thermostat, depending on the transmitter type selected at the time of order.

The infrared transmitter or wall-mounted thermostat 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 an built-in clock which can be activated to enable the unit to be programmed with up to two separate operating periods for the days of the week (Mon-Fri). The clock provides ON/OFF unit operation and is not a night set back or occupied/unoccupied control function. Mon-Fri will operate as a 'block' of days and cannot be programmed independently of one another.

Saturdays and Sundays can each be programmed with up to two separate operating periods and are programmed independently of the weekdays and each other.

A fascia-mounted receiver displays on/off, cool or heat, and timer/alarm status.

Microprocessor Remote

Electric heat (single stage)

Single stage electric heat includes fitted heating elements manufactured for maximum surface area and lower working temperature for improved reliability. Thermal cutout protection switches are fitted to the electric heat circuit to protect against overheating. The optional electric heating elements are available with the 208/220/230-v model units only.

Hot water heat

Hot water heat includes hot water heating coil factory fitted to the standard chilled water coil to provide heating. The coil is manufactured from copper tubes with mechanically bonded aluminum fins. The hot water heat option is not available on unit size 12.

Hot water coil freeze protection sensor

The sensor is mounted to prevent freezing of the hot water coil assembly. When the sensor detects a freeze up condition, it will force the flow control valve open and prevent the unit fan(s) from running.

Disconnect switch (non-fused)

The non-fused disconnect switch is factory installed on the control panel exterior and sized for the full load amperage of the unit to enable the unit to be disconnected from the power supply prior to any maintenance.

Options and accessories (cont)

Field-installed accessories

Chilled water/hot water control valve

The chilled water/hot water control valve includes a three-way, three-port diverting type valve or a two-way, two-port control valve for control of chilled water or hot water flow. Valve is supplied loose. Actuation is via a 24-v signal from the unit's electrical panel.

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 can also be supplied to monitor water supply temperature and allow action of the valve.

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 in. flexible duct.

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 3 knockouts positioned on three of the unit sides (one per side). For all other model sizes, a total of 4 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 in. or 6 in. (depending on the unit size) flexible duct to the cassette.

NOTE: On the 08 and 12 size units, it is recommended that only one of the three branch duct knockouts is utilized, due to the small capacity of the unit.

Spare filters

These accessories include either a cleanable wire mesh filter with a throwaway MERV 10 or MERV 13 filter.

Thermostats

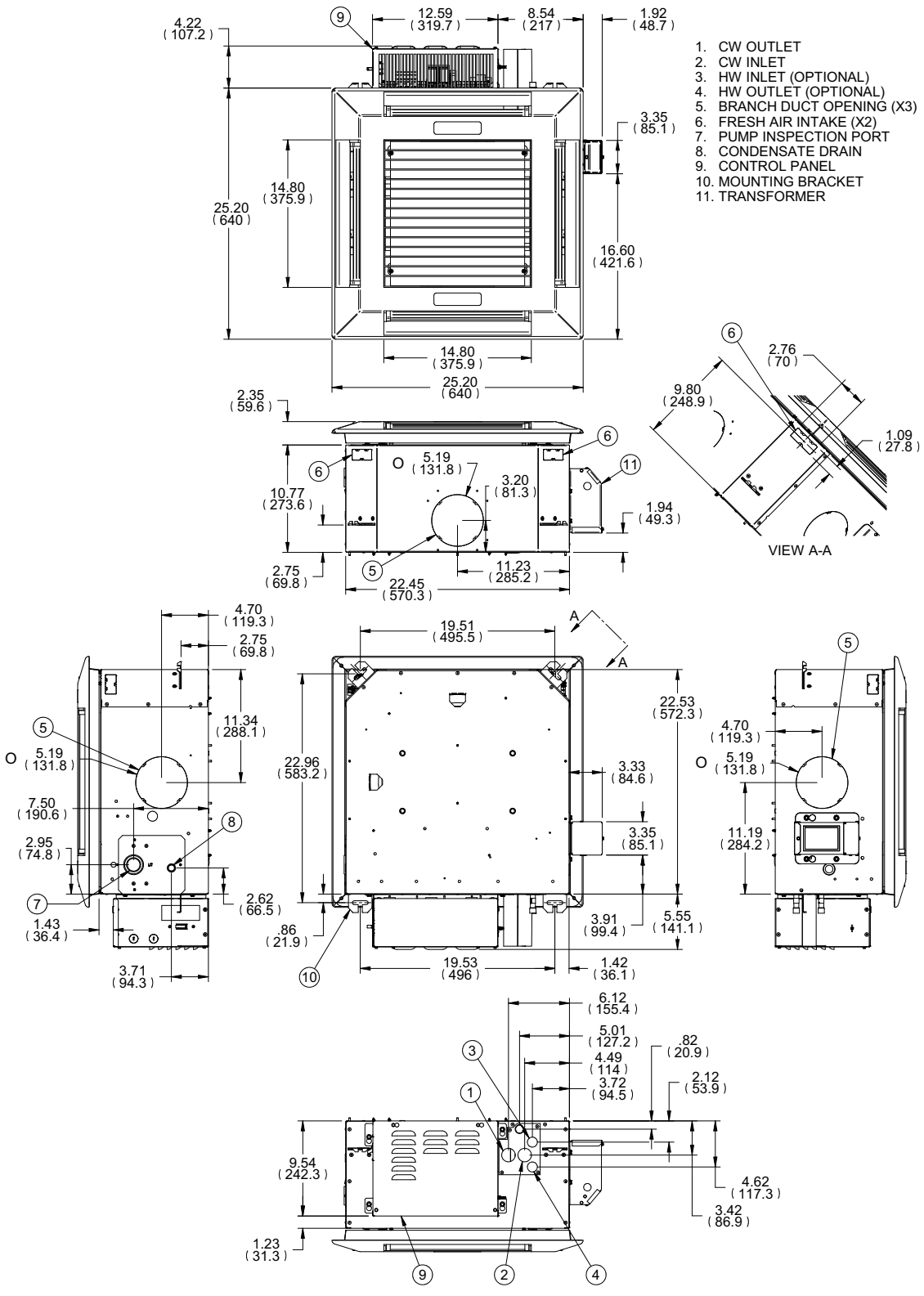
Thermostats are available for use with both the electromechanical controller and microprocessor options. These thermostats operate with 24-v power and are for wall mounting. Several options are available depending upon system type.

Aquastat

An aquastat is available for use with a 2-pipe heating/cooling changeover system.

Dimensions

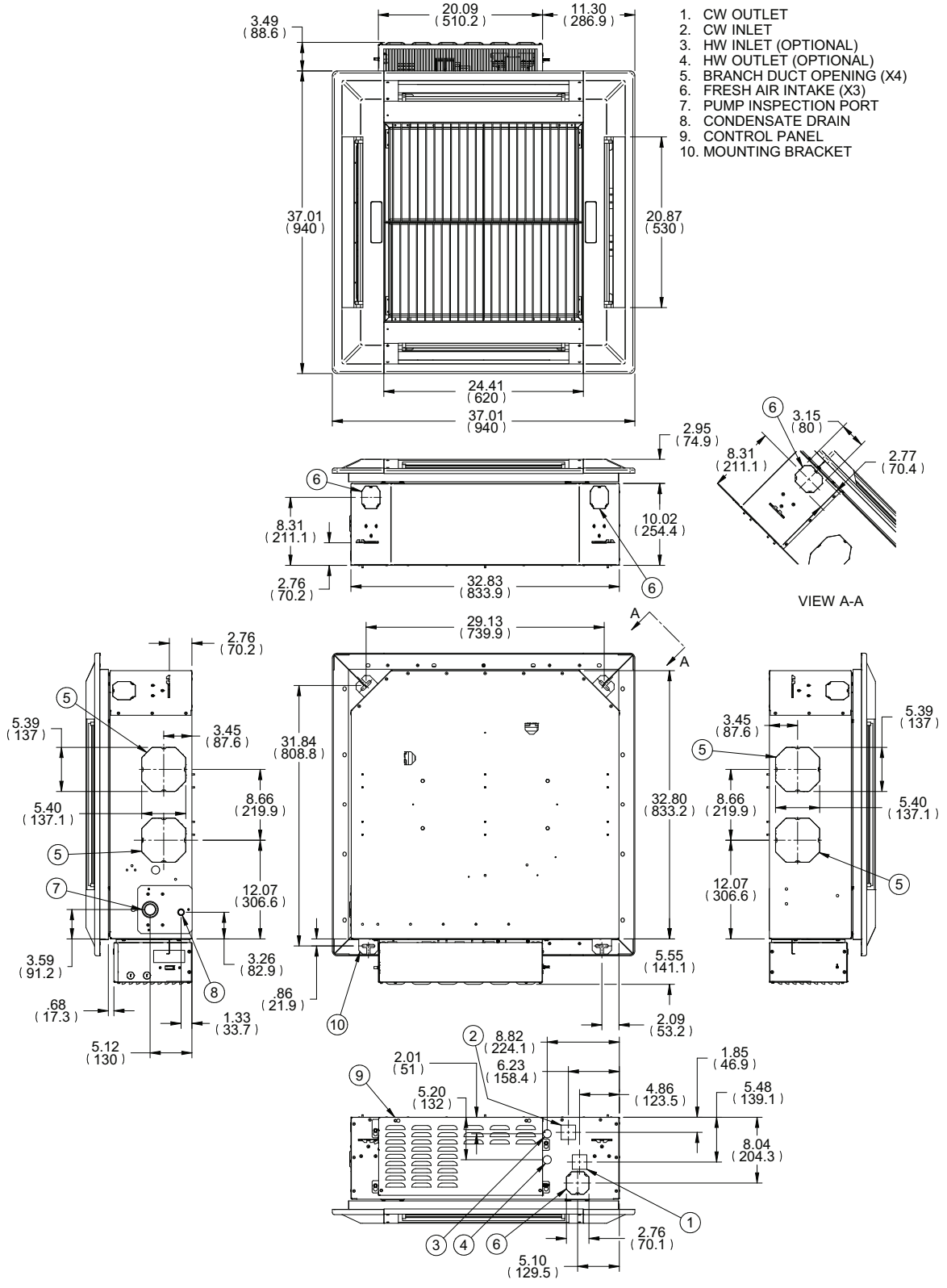
42WKN08 and 42WKN12 Unit



NOTE: Dimensions shown are inches (mm)

Dimensions (cont)

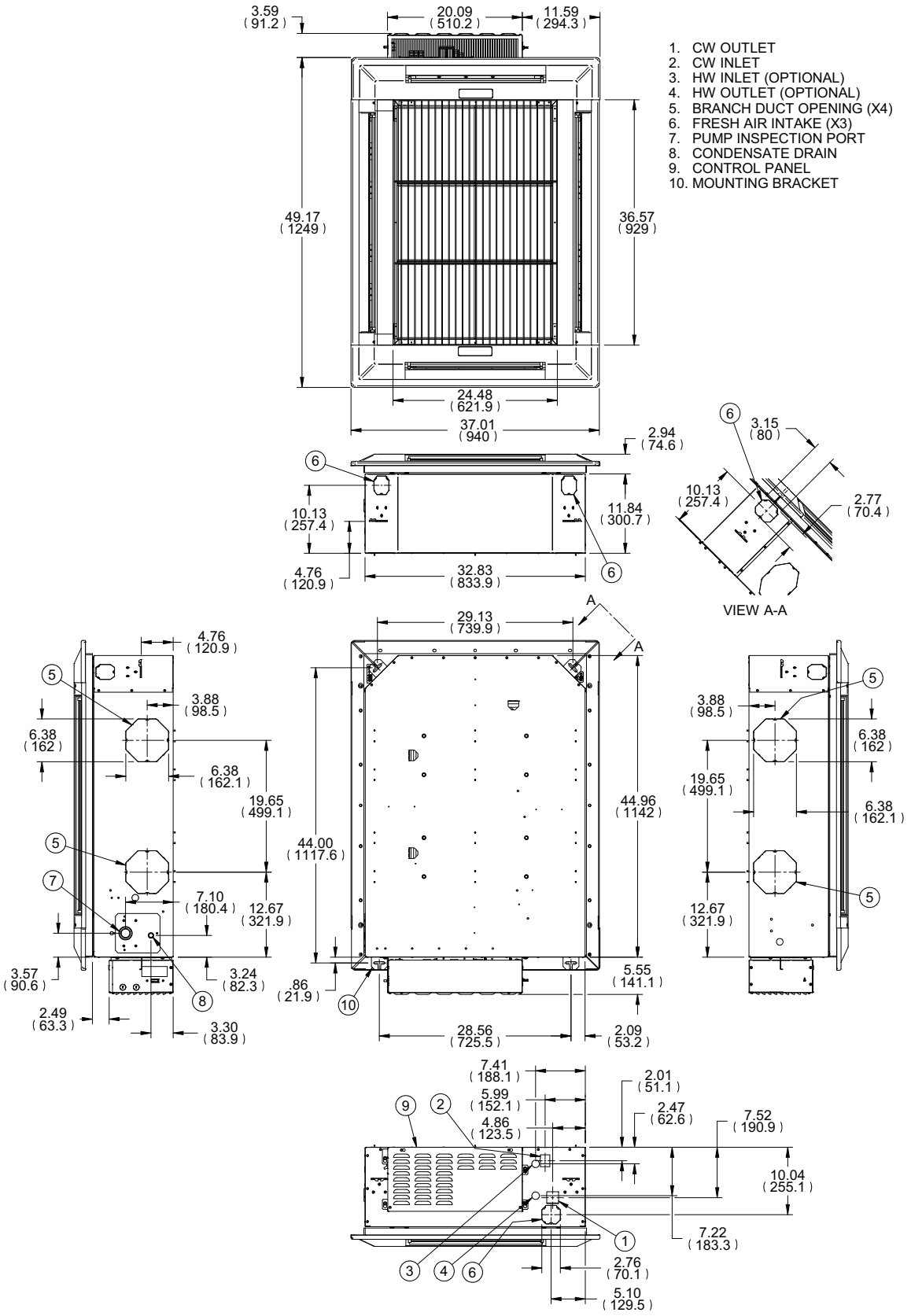
42WKN18 Unit Dimensions (Medium Chassis)



NOTE: Dimensions show are inches (mm).

Dimensions (cont)

42WKN36 Unit Dimensions (Large Chassis)



NOTE: Dimensions show are inches (mm).

Selection procedure (42WKN unit example)

I Determine job requirements.

Given:

Room Sensible Cooling Load . . . . . 8,200 Btuh
Room Total Cooling Load . . . . . 11,000 Btuh
Entering-Air Temperature . . . . . 80°F at 50% RH
Entering Water Temperature . . . . . 45°F
Temperature Rise . . . . . 10°F
Nominal Air Delivery . . . . . 350 cfm

II Determine unit size and nominal cfm.

For an initial selection, choose a unit size that will provide the required airflow (cfm). Refer to the Physical Data table on page 4. At high speed, a 42WKN12 unit will provide 360 cfm.

III Determine total cooling capacity.

Refer to the cooling capacity table for 42WKN12 on page 12. Locate required entering dry bulb (edb) and relative humidity (RH) conditions. Locate the entering water temperature required. Under Total Cooling (TC) column, a 42WKN12 unit at an entering-air temperature of 80°F dry bulb at 50% RH, an entering water temperature of 45°F, and a water temperature rise of 10°F, will provide 11,200 Btuh.

IV Determine sensible cooling capacity.

In cooling capacity table for 42WKN12, locate the sensible cooling (SC) column and find that the 42WKN12 at the required conditions will provide 8,000 Btuh of sensible cooling at a water temperature rise of 10°F. The 42WKN12 will satisfy the job requirements.

If additional SC were required, a larger unit or a lower entering water temperature would be needed.

Performance data

Chilled Water Unit Cooling Capacities[a,b,c,d]

42WKN UNIT SIZE	FILTER	ENTERING DB AIR TEMPERATURE (°F) at 50% RH	CHILLED WATER ENTERING/LEAVING TEMPERATURE							
			40/50°F				45/55°F			
			TC (Btuh)	SC (Btuh)	Flow (gpm)	Pressure Drop (psi)	TC (Btuh)	SC (Btuh)	Flow (gpm)	Pressure Drop (psi)
08	STD MERV 10 MERV 13	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
12	STD MERV 10 MERV 13	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
18	STD MERV 10 MERV 13	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
36	STD MERV 10 MERV 13	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

NOTE(S):

a. All duties based on 208V-1Ph-60Hz supply voltage and high fan speed except where stated otherwise.
b. Cooling capacities are gross. Do not include fan motor gains.
c. Pressure drops are coil only (excludes valves).
d. Hot water duties on chilled water units fitted with additional, optional hot water coil. See data on next page.

LEGEND

DB — Dry Bulb
RH — Relative Humidity
SC — Sensible Cooling Capacity
TC — Total Cooling Capacity

Performance data (cont)

Heating Performance — Chilled Water Units with Optional Heating Coil[a,b,c,d]

42WKN UNIT SIZE	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)
08	STD MERV 10 MERV 13	17,100	2.8	1.7	18,900	3.3	1.9	20,600	3.8	2.0
18	STD MERV 10 MERV 13	27,900	1.1	2.8	30,700	1.4	3.1	33,500	1.6	3.3
36	STD MERV 10 MERV 13	45,200	1.7	4.5	49,800	2.0	5.0	54,300	2.3	5.4

NOTE(S):

a. All duties based on 208V-1Ph-60Hz supply voltage and high fan speed except where stated otherwise.
b. Pressure drops are coil only, excluding valves.
c. Hot water duties based on units fitted with additional, optional hot water coil.
d. Hot water coil not available on size 42WKN12.

Heating Performance — Chilled Water Units with 2-pipe Changeover[a,b]

42WKN UNIT SIZE	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)
08	STD MERV 10 MERV 13	21,000	6.3	2.1	23,100	7.5	2.3	25,100	8.8	2.5
12	STD MERV 10 MERV 13	29,000	3.1	2.9	31,900	3.7	3.2	34,800	4.4	3.5
18	STD MERV 10 MERV 13	55,100	3.6	5.5	60,400	4.2	6.0	65,600	4.9	6.5
36	STD MERV 10 MERV 13	89,300	6.6	8.9	97,900	7.8	9.7	106,400	9.1	10.6

NOTE(S):

a. All duties based on 208V-1Ph-60Hz supply voltage and high fan speed except where stated otherwise.
b. Pressure drops are coil only, excluding valves.

LEGEND

DB — Dry Bulb
PD — Pi Delta

Performance data (cont)

Standard Filter — Sound Pressure Data[a,b,c,d]

MODEL	FAN SPEED	NOMINAL AIRFLOW (CFM)	SOUND PRESSURE FREQUENCY SPECTRUM, dB							SPL	
			125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA	NC
42WKN08	High	330	27.4	37.4	40.2	37.4	30.3	24.5	14.4	43.0	36.0
	Medium	300	28.3	35.9	38.8	35.2	27.7	21.9	13.6	41.8	34.0
	Low	260	29.7	30.2	35.0	31.4	22.1	17.0	12.7	38.0	30.0
42WKN12	High	360	29.8	38.5	41.5	40.4	34.8	28.0	16.5	45.0	39.0
	Medium	330	25.4	34.4	39.2	38.1	31.2	23.6	12.7	42.0	37.0
	Low	300	23.9	31.5	37.3	35.6	28.1	20.2	10.5	40.0	35.0
42WKN18	High	620	37.8	43.5	47.7	44.7	36.6	24.9	16.4	50.3	44.0
	Medium	540	33.8	41.9	46.1	41.4	32.3	21.4	13.2	48.0	41.0
	Low	460	29.7	38.6	39.9	33.3	22.7	13.4	9.3	42.8	35.0
42WKN36	High	1080	43.3	41.6	44.4	41.8	45.1	27.8	19.4	50.0	46.0
	Medium	940	39.4	39.3	42.6	42.8	43.2	24.8	16.4	48.0	44.0
	Low	740	29.0	32.3	34.8	38.2	25.9	14.3	10.0	40.0	37.0

NOTE(S):

a. Sound pressure data was recorded with a microphone located 5ft directly underneath the unit's fascia.
b. These operation values were obtained in an anechoic sound chamber that uses ISO standard 3745:2012"Acoustics – Determination of Sound Power Levels and Sound Energy Levels of Noise Sources using Sound Pressure – Precision Methods for Anechoic Rooms and Hemi-Anechoic Rooms" for guidance in standardized testing.
c. Sound pressure level will vary depending on a range of factors such as the construction of the particular room where the equipment is installed.
d. Operation sound level may differ depending on operation and ambient conditions.

MERV 10 Filter — Sound Pressure Data[a,b,c,d]

MODEL	FAN SPEED	NOMINAL AIRFLOW (CFM)	SOUND PRESSURE FREQUENCY SPECTRUM, dB							SPL	
			125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA	NC
42WKN08	High	330	38.0	44.5	48.8	43.7	39.0	33.0	21.8	51.5	45.0
	Medium	300	38.1	43.7	47.6	42.2	37.2	31.0	20.7	50.5	43.0
	Low	260	28.9	40.5	43.3	37.9	32.4	26.2	17.2	46.0	38.0
42WKN12	High	360	45.2	44.3	50.6	47.3	43.0	37.6	27.0	54.0	47.0
	Medium	330	36.8	41.6	48.6	44.9	40.2	34.4	23.3	51.5	44.0
	Low	300	37.7	40.5	46.8	42.8	37.6	31.4	20.2	49.5	42.0
42WKN18	High	620	40.5	51.9	52.3	48.6	41.5	30.2	21.9	56.5	48.0
	Medium	540	43.7	47.8	48.4	44.4	37.5	26.0	17.2	52.5	44.0
	Low	460	34.4	43.2	42.3	37.9	29.9	18.9	12.4	47.0	37.0
42WKN36	High	1080	43.5	51.0	50.3	45.3	45.2	31.4	24.3	55.0	46.0
	Medium	940	45.7	44.3	47.4	42.7	42.7	27.3	20.2	54.5	44.0
	Low	740	34.7	37.4	40.8	39.1	32.2	17.8	12.8	45.0	38.0

NOTE(S):

a. Sound pressure data was recorded with a microphone located 5ft directly underneath the unit's fascia.
b. These operation values were obtained in an anechoic sound chamber that uses ISO standard 3745:2012"Acoustics – Determination of Sound Power Levels and Sound Energy Levels of Noise Sources using Sound Pressure – Precision Methods for Anechoic Rooms and Hemi-Anechoic Rooms" for guidance in standardized testing.
c. Sound pressure level will vary depending on a range of factors such as the construction of the particular room where the equipment is installed.
d. Operation sound level may differ depending on operation and ambient conditions.

Performance data (cont)

MERV 13 Filter — Sound Pressure Data[a,b,c,d]

MODEL	FAN SPEED	NOMINAL AIRFLOW (CFM)	SOUND PRESSURE FREQUENCY SPECTRUM, dB							SPL	
			125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA	NC
42WKN08	High	330	41.5	45.0	51.3	46.6	42.9	37.4	26.0	53.0	47.0
	Medium	300	36.6	43.7	49.8	45.1	41.4	35.7	24.0	52.0	46.0
	Low	260	37.1	41.0	46.1	41.2	36.9	29.8	17.9	48.5	41.0
42WKN12	High	360	49.1	47.7	52.2	48.6	45.4	40.2	30.2	56.0	48.0
	Medium	330	44.7	44.2	50.0	46.6	42.9	37.4	26.8	53.0	46.0
	Low	300	39.3	42.4	48.4	44.7	41.1	35.4	24.3	51.0	44.0
42WKN18	High	620	42.4	52.7	53.6	50.2	43.5	33.1	24.6	57.0	50.0
	Medium	540	40.8	50.0	50.0	46.4	39.8	29.0	20.1	54.0	46.0
	Low	460	39.9	45.0	44.5	40.8	33.8	22.8	13.7	49.0	40.0
42WKN36	High	1080	43.2	52.0	50.8	46.8	45.0	32.6	24.5	55.0	47.0
	Medium	940	45.6	49.3	48.8	44.8	43.1	29.9	21.9	53.8	45.0
	Low	740	39.9	40.1	42.8	41.0	36.7	21.2	14.4	47.0	40.0

NOTE(S):

a. Sound pressure data was recorded with a microphone located 5ft directly underneath the unit's fascia.
b. These operation values were obtained in an anechoic sound chamber that uses ISO standard 3745:2012"Acoustics – Determination of Sound Power Levels and Sound Energy Levels of Noise Sources using Sound Pressure – Precision Methods for Anechoic Rooms and Hemi-Anechoic Rooms" for guidance in standardized testing.
c. Sound pressure level will vary depending on a range of factors such as the construction of the particular room where the equipment is installed.
d. Operation sound level may differ depending on operation and ambient conditions.

Electrical data

Ceiling Cassettes Data

42WKN NOMINAL CAPACITY (DIGIT 6, 7)	SUPPLY VOLTAGE (DIGIT 8)	PERFORMANCE (WITH ELECTRIC HEAT)			PERFORMANCE (NO ELECTRIC HEAT)		
		FLA	MCA	Recommended Fuse Size	FLA	MCA	Recommended Fuse Size
08 and 12 Small Chassis	A: 115/60/1	—	—	—	1.4	1.8	15
	J: 110/50/1						
	B: 208/60/1	N/A	N/A	N/A	0.7	0.9	15
	C: 230/60/1						
	K:220/50/1						
	H: 277/60/1	—	—	—	0.6	0.7	15
18 Medium Chassis	A: 115/60/1	—	—	—	2.8	3.5	15
	J: 110/50/1						
	B: 208/60/1	—	—	—	1.4	1.8	15
	C: 230/60/1						
	K: 220/50/1						
	H: 277/60/1	—	—	—	1.2	1.5	15
36 Large Chassis	A: 115/60/1	—	—	—	5.6	7.0	15
	J: 110/50/1						
	B: 208/60/1	—	—	—	2.8	3.5	15
	C: 230/60/1						
	K: 220/50/1						
	H: 277/60/1	—	—	—	2.3	2.9	15

LEGEND

FLA — Full Load Amps
MCA — Minimum Circuit Amps

Typical wiring schematic

NOTE: Refer to Installation and Operation manual for wiring schematic.

Electro-mechanical controls

A 24-v signal from the thermostat to terminal G supplies power to the blower motor(s) and condensate pump. The condensate pump will run continuously during cooling operation, as long as there is a call for cooling. A call for heating, at terminal W, or cooling, at terminal Y, will energize the water valve actuator and allow water to flow through the cassette coil. When the call for heating or cooling is satisfied the valve will close.

If the temperature drops below the set point of the coil freezestat, the water valve will automatically open to circulate water through the coil.

If the condensate float switch detects a high level of water in the condensate tray, the switch will open, activate the condensate pump and disable the heating/cooling signal until the water level drops down to normal.

Microprocessor controls

The PCB (printed circuit board) microprocessor control board relays control the operation of the indoor-fan motor and electric heater (if fitted) to maintain room conditions at a user-defined set point.

Temperature settings, fan speeds, and other control functions can be changed by the infrared transmitter or wall-mounted thermostat. The controller PCB provides the following input/output facilities:

Inputs

T1 Return Air Temperature Sensor: 50k at 77°F.

T2 Changeover Temperature Sensor: 50k at 77°F.

Outputs

Indoor fan motor: The controller will change the 3-10 VDC control signal to deliver the selected indoor fan speed.

Condensate pump

Activated when unit is in cooling mode.

Indoor fan operation

The indoor fan will run continuously at the most recently set speed or will alter the speed according to the room temperature conditions when set to Auto. The indoor fan will continue to run until the unit is turned off by the user or by a preset time setting. When the unit is turned off during heating, the indoor fan will continue to run for approximately 2 minutes, this helps to dissipate residual heat from the electric heaters.

Boost heat

The electric heat relay can be used to initiate either low watt density electric heating (optional) or low pressure hot water heating (optional). The boost heat will be activated when the room temperature falls to more than 8°F below set point. Hysteresis of 2°F will be applied to prevent "hunting." The boost heat facility is automatically enabled or disabled by selecting non heat pump (Jumper 2 open).

Temperature control

The controller will switch heating or cooling loads in order to maintain the temperature set point. The deadband is programmed to 4°F. Under normal operation, cooling or heating will be activated at the limits of the deadband and will continue to operate until set point is achieved.

The temperature set point can be adjusted between 58°F and 90°F in 2°F increments.

Power failure

The controller will auto restart in its previous mode of operation after a power failure. When power is restored, the controller will revert to its last operating mode, e.g., if the controller was turned on before power fail, after power is restored the controller will automatically turn on. Alternatively, if the controller was turned off before power fail, the controller will remain off after power is restored.

Electric heat

A 30 amp, 230 vac resistive rated relay switches the electric heater on when required.

Electric heater overheat protection

In the event of an auto reset overheat cutout, the electric heater will be switched off until the temperature drops sufficiently for the auto cutout to reset itself.

Guide specifications

Commercial Hydronic Cassette Fan Coil

HVAC Guide Specifications

Size Range: **3/4 to 3 Tons**

Nominal Cooling: **7,800 to 34,300 Btuh**

Nominal Heating: **17,100 to 45,200 Btuh**

Carrier Model Number:

42WKN

Part 1 — General

1.01 SYSTEM DESCRIPTION

Indoor, in-the-ceiling mounted, chilled or hot water coil, to be matched with a commercial chiller, water source heat pumps, or hot water boiler (180°F maximum).

1.02 QUALITY ASSURANCE

Base unit shall be ETL certified to UL standards. Each coil shall be factory tested for leakage at 325 psig air pressure with coil submerged in water. Insulation and adhesive shall meet NFPA-90A (National Fire Protection Association) requirements for flame spread and smoke generation. Insulation shall be rated to UL94 VO. All equipment wiring shall comply with NEC (National Electrical Code) requirements.

1.03 DELIVERY, STORAGE, AND HANDLING

Unit shall be stored and handled per manufacturer's instructions.

1.04 WARRANTY (One year on parts).

Part 2 — Products

2.01 EQUIPMENT

A. General:

Indoor, downward discharge 2 or 4-pipe low-profile in-ceiling fan coil. Units shall come complete with cooling coil or hot water coil (4-pipe systems only), fan, fan motor, piping connectors, electrical controls, condensate pump, and hanging brackets.

B. Unit Cabinet:

1. Cabinet shall be constructed of galvanized sheet steel. Cabinet shall have filter tracks and cleanable filters which shall be accessible from below. Adjacent room cooling to be provided by a simple knockout in the cabinet side panel, and cabinet shall have provisions to accommodate a limited amount of ductwork, if desired.
2. Fan shall be a centrifugal, direct-drive blower type with air intake in center of the unit and discharge on the perimeter. Air louvers shall be adjustable for 2, 3, or 4-way discharge. Air outlet vanes shall be fully insulated aluminum to prevent condensation from forming. Vanes shall be manually adjustable on all unit sizes.
3. Fascia shall be constructed of high impact polystyrene.

C. Coil:

1. Standard base unit shall be equipped with a cooling coil for installation in a 2-pipe system. Additional coil depth and circuiting shall be provided for installation in a 4-pipe system.
2. Heating coils are single row, independently circuited coils specifically designed for hot water application. Heating coil is in the reheat position for unit sizes 08 and 36. Heating coil is in the preheat position for unit size 18. Hot water heating is not available on size 12.
3. Coils shall have 3/8 in. OD copper tubes, aluminum fins bonded to the tubes by mechanical expansion, and a working pressure of 125 psig.
4. Each coil shall have a manual air vent on upper connection, a drain port on the lower connection.

D. Motors:

Motor shall be enclosed and with thermal overload protection, sealed for life lubricated bearings, and external rotor allowing good heat dissipation. Fan motor shall be ECM.

E. Controls:

Controls shall be 24-v, and shall be easily operated by the user from a wall-mounted thermostat. A normally closed float control shall be in the condensate sump to shut unit down in case of pump malfunction.

F. Alarm Interlock Relay:

Alarm interlock relay shall include a relay for unit failure notification. Normally open/normally closed contacts are available for field connection.

G. Filters:

Unit shall have a filter track with factory-supplied cleanable filters, MERV 10 disposable filters.

H. Electrical Requirements:

Unit shall operate on a 115-v, 208-v, 230-v or 277-v 60 Hz power supply or on 110-v or 220-v 50 Hz power supply as specified on the equipment schedule.

I. Operating Characteristics:

A one-coil unit installed in a 2-pipe system shall be capable of providing cooling as specified by the operating mode of the central water supply system. A double-circuit coil unit installed in a 4-pipe system shall be capable of providing sequenced heating and cooling.

J. Special Features:

1. Fresh Air Intake Kit:

The fresh air intake kit shall include duct collars for connection to the unit.

2. Duct Collars:

Duct collars shall be available to allow connection of a 5 in. or 6 in. (depending on unit size) flexible duct to the cassette.

3. Thermostat:

   The thermostat shall be commercial grade to control unit operation and shall provide single speed fan capability. Automatic changeover from cooling or heating shall be provided (4-pipe systems only).

4. Motorized Valve Accessory:

   The motorized valve shall be a two-position, spring return two or three-way valve.

5. Microprocessor Control:

   a. The microprocessor control shall include a custom designed microprocessor fitted to the cassette to enable room conditions to be maintained at a user defined set point.

   b. Microprocessor controller shall allow automatic control of fan speed based on demand in space. The controller, either an infrared transmitter or wall-mounted thermostat, also allows programming of a weekly operating schedule.

6. Electric Heat:

   Single-stage electric heat shall include fitted heating elements manufactured for maximum surface area and lower working temperature for improved reliability. Thermal cutout protection switches are fitted to the electric heat circuit to protect against overheating. The optional electric heating elements are available with the 208/220/230-v model units only.

7. Hot Water Coil Freeze Protection Sensor:

   The freeze protection sensor shall be available for mounting to prevent freezing of the hot water coil assembly. When the sensor detects a freeze up condition, it will force the flow control valve open and prevent the unit fan(s) from running.

8. Disconnect Switch:

   The non-fused disconnect switch shall be factory mounted on the exterior of the control panel and sized for the full load amperage of the unit to enable the unit to be disconnected from the power supply prior to any maintenance.

9. Aquastat:

   An aquastat shall be available for use with a 2-pipe heating/cooling changeover system.

Pg 20 Catalog No. 04-52420039-01 Printed in U.S.A. Form 42WKN-12PD
Replaces: 42WKN-11PD