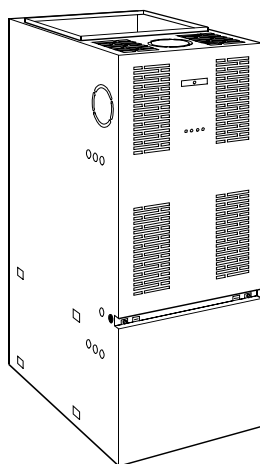


**CVMAAR
MULTIPOISE OIL FURNACE
INPUT RATES: 70,000 thru 154,000 BTUH
SERIES 110**

Product Data



A97247

THE LATEST IN OIL FURNACE TECHNOLOGY

The model CVMAAR combines variable-speed high efficiency and quiet operation with the latest oil heating technology. The CVMAAR is available in 2 sizes. Each size can be fired at 3 different rates by a simple nozzle change. Unit CVMAAR105 covers input ranges from 70,000 to 105,000 Btuh. Unit CVMAAR120 covers input ranges from 119,000 to 154,000 Btuh. The furnace design is a multipoise style for upflow, downflow, and horizontal applications.

The components of the CVMAAR are the finest in the industry. The unit uses a Riello oil burner with an electronic air damper.

The CVMAAR is a standard part of a quality-built home. This energy efficient furnace will provide years of quality service to home builders and homeowners alike.

As with our other furnaces, this model is designed to work as part of total home comfort system which includes elements for cooling, air cleaning, humidification, ventilation, and zoning.

This unit is not approved for use in mobile home installations.

CVMAAR FEATURES/BENEFITS

Riello Oil Burner

- High quality Riello oil burner allows safe and efficient combustion of oil.

Casing

- Made of 20 gauge powder painted steel for years of durability and attractiveness.
- Cabinet features a reversible door, ensuring ease of service access even in downflow applications.

Insulation and Soundproofing

- Unique silencer baffle along with insulated walls and rubber blower mounts efficiently captures most combustion noise and vibrations and makes this unit one of the quietest on the market.

Combustion Products Venting

- Top or side flue outlets.
- Unit may be vented using Type L vent material and a factory-built metal or masonry chimney.
- Unit may also be sidewall vented with an approved power venter.

Variable Speed Blower

- Variable speed blower for precise airflow selection of heating or cooling operation.

Electronic Fan Control

- Electronic fan control board provides reliable operation and easy connection of thermostat and accessory wiring.

Combustion Chamber/Heat Exchanger

- Composed mainly of stainless and aluminized steel, the unique combination combustion chamber/heat exchanger resists corrosion, overheating, and deterioration.
- Heat transfer properties make it energy efficient.
- All seams are tightly welded for leak-free operation.

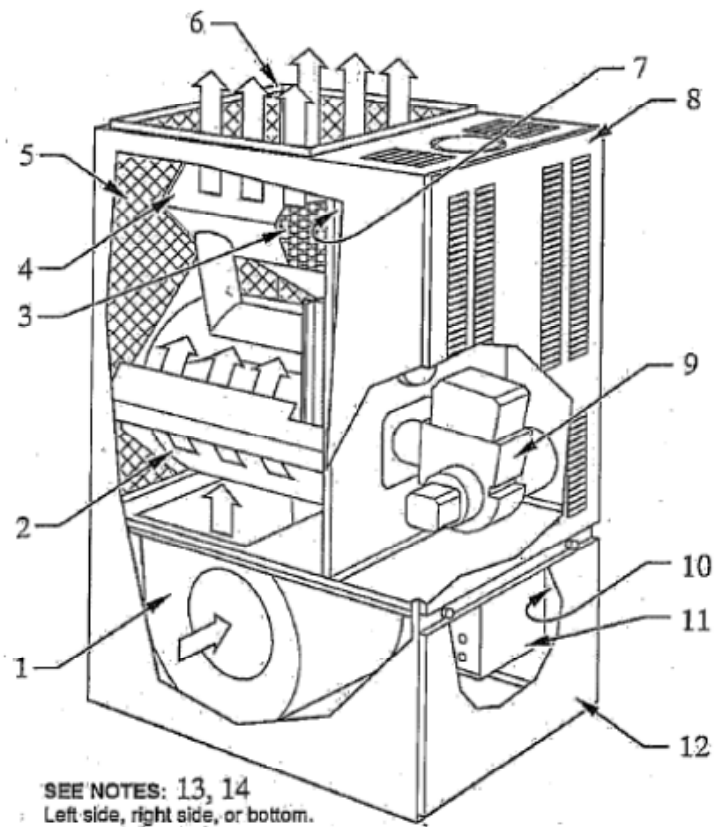
Certifications

- CVMAAR unit is CSA certified.
- The efficiency is AHRI efficiency rating certified.

	CVMAAR	036	105	AAB	F
Riello Burner Multi-poise Oil Furnace Variable Speed motor					
Cooling Size Airflow (Nominal 400 CFM per 12,000 BTUH Cooling) 036 – 1200 CFM 060 – 2000 CFM					
Input Capacity 105 – 70,000 BTUH with 0.40 gph nozzle 91,000 BTUH with 0.50 gph nozzle 105,000 BTUH with 0.65 gph nozzle 120 – 119,000 BTUH with 0.75 gph nozzle 140,000 BTUH with 0.85 gph nozzle 154,000 BTUH with 1.00 gph nozzle					
					Blower Motor E=1/3 HP – Direct Drive F=1/2 HP – Direct Drive G=3/4 HP (or larger) – Direct Drive
					Series



Always Ask For
**FACTORY
AUTHORIZED
PARTS**



A97244

1. Variable speed blower circulates air across the heat exchanger to transfer heat into the home
2. Stainless steel combustion chamber/primary heat exchanger
3. Unique silencer system reduces combustion noise
4. Heat exchanger designed and shaped to efficiently transfer heat from furnace into the home
5. Fully insulated internal walls to minimize heat loss
6. Supply-air plenum
7. High limit control to prevent overtemperature operation
8. Reversible access door provides easy access to burner and controls
9. High-performance oil burner
10. Return-air plenum
11. Adjustable electronic fan control (inside) has low voltage electrical terminal strip for easy connection of thermostat, cooling control, electronic air cleaner, and humidifier
12. Access door to blower
13. Air filter (field supplied)
14. Return-air plenum

CLEARANCE TO COMBUSTIBLES

UNIT APPLICATION		UPFLOW (IN.)	DOWNFLOW (IN.)	HORIZONTAL (IN.)
SIDES	Furnace	0	2	2
	Supply Plenum and Warm-Air Duct Within 6 Ft of Furnace	1	2	1
BACK	Furnace	0	1	0
TOP	Furnace Casing or Plenum	2	2	2
	Horizontal Warm-Air Duct Within 6 Ft of Furnace	2	2	3
BOTTOM	Furnace	0	0*	0*
FLUE PIPE	Horizontally or Below Pipe	4	4	4
	Vertically Above Pipe	9	9	9
FRONT		8	8	24

*For combustible floor, use approved accessory subbase

NOTE: Adequate service clearance should be provided over and above these dimensions as required.

PHYSICAL DATA

UNIT SIZE	CVMAAR105			CVMAAR120		
INPUT (BTUH)	70,000	91,000	105,000	119,000	140,000	154,000
HEATING CAPACITY*	56,000	72,000	85,000	100,000	117,000	127,000
NOZZLE	0.40 - 70A	0.50 - 70W	0.65 - 70W	0.75 - 70B	0.85 - 70W	1.00 - 70W
FIRING RATE (GPH)**	0.50	0.65	0.75	0.85	1.00	1.10
AFUE% UPFLOW	82.5	81.6	82.3	85.7	84.9	84.3
OIL PUMP STAGES/PRESSURE (PSIG)	1/160	1/170	1/135	1/130	1/140	1/125
HEATING TEMP RISE _F	55-85	55-85	55-85	55-85	55-85	55-85
SHIPPING WEIGHT (LB)	221	221	221	270	270	270
BURNER MODEL (3450 RPM)	RIELLO 40-F3	RIELLO 40-F3	RIELLO 40-F3	RIELLO 40-F5	RIELLO 40-F5	RIELLO 40-F5

* Capacity and AFUE in accordance with U.S. Government DOE test procedures

** For rating purposes only

Shaded cells are as Factory Shipped

PERFORMANCE DATA

UNIT SIZE	CVMAAR105	CVMAAR120
VARIABLE SPEED ECM MOTOR	1/2	1
BLOWER WHEEL DIAMETER X WIDTH (In.)	10 x 10	12 x 10
FILTER SIZE (In.) - (Disposable, Field Supplied)	16 x 24 or 25 x 1	18 x 30 or 20 x 30 x 1

ELECTRICAL DATA

UNIT SIZE	CVMAAR105	CVMAAR120
UNIT VOLTS-HERTZ - PHASE	115 - 60 - 1	115 - 60 - 1
OPERATING VOLTAGE RANGE (Min-Max)*	104 - 132	104 - 132
MAXIMUM UNIT AMPS	12.2	15.7
MINIMUM WIRE SIZE (AWG)	14	12
MAXIMUM WIRE LENGTH (Ft)**	26	26
MAXIMUM FUSE SIZE OR CKT BKR (Amps)***	15	20
TRANSFORMER (24v)	40va	40va
EXTERNAL CONTROL POWER AVAILABLE	Heating	40va
	Cooling	30va
AIR CONDITIONING RELAY	Standard	Standard

* Permissible limits of the voltage range at which the unit will operate satisfactorily

** Length is as measured one way along wire path between unit and service panel for maximum 2% voltage drop

*** Time-delay fuse type is recommended

CVMAAR105 AIRFLOW DATA (CFM)

OIL HEATING MODE 24 VAC INPUT (R) ON W ONLY				
SW1-HEAT DIP switch position	HEAT INPUT (USGPH)	CFM with SW3-ADJ DIP switch position A	CFM with SW3-ADJ DIP switch position B	CFM with SW3-ADJ DIP switch position C
A (1=OFF, 2=OFF)	0.75	1260	1385	1135
B (1=ON, 2=OFF)	0.65	1050	1155	945
C (1=OFF, 2=ON)	0.50	850	935	765
D (1=ON, 2=ON)	Same value as DIP switch position A			

CONTINUOUS FAN 24 VAC INPUT (R) ON G ONLY				
SW2-COOL DIP switch position	A/C SIZE (TON)	CFM with SW3-ADJ DIP switch position A	CFM with SW3-ADJ DIP switch position B	CFM with SW3-ADJ DIP switch position C
A (1=OFF, 2=OFF)	3.0	900	990	810
B (1=ON, 2=OFF)	2.5	750	830	675
C (1=OFF, 2=ON)	2.0	600	660	540
D (1=ON, 2=ON)	1.5	450	495	405

CVMAAR105 AIRFLOW DATA (CFM) (CONTINUED)

COOLING OR HEAT PUMP HEATING MODE HIGH SPEED 24 VAC INPUT (R) TO G, Y/Y2 AND O (FOR COOLING)				
SW2-COOL DIP switch position	A/C SIZE (TON)	CFM with SW3-ADJ DIP switch position A	CFM with SW3-ADJ DIP switch position B	CFM with SW3-ADJ DIP switch position C
A (1=OFF, 2=OFF)	3.0	1200	1320	1060
B (1=ON, 2=OFF)	2.5	1000	1100	900
C (1=OFF, 2=ON)	2.0	800	880	720
D (1=ON, 2=ON)	1.5	600	660	540

NOTE: In cooling - dehumidification mode, with no 24VAC to DH, the CFM is reduced by 15%

COOLING OR HEAT PUMP HEATING MODE LOW SPEED 24 VAC INPUT (R) TO G, Y1 AND O (FOR COOLING)				
SW2-COOL DIP switch position	A/C SIZE (TON)	CFM with SW3-ADJ DIP switch position A	CFM with SW3-ADJ DIP switch position B	CFM with SW3-ADJ DIP switch position C
A (1=OFF, 2=OFF)	3.0	960	1055	865
B (1=ON, 2=OFF)	2.5	800	880	720
C (1=OFF, 2=ON)	2.0	640	705	575
D (1=ON, 2=ON)	1.5	480	530	430

NOTE: In cooling - dehumidification mode, with no 24VAC to DH, the CFM is reduced by 15%.

DELAY PROFILE FOR OIL HEATING MODE				
SW4-DELAY DIP switch position	HEAT INPUT (USGPH)	Pre Run On-Delay CFM Level - Time	Short Run On-Delay CFM Level - Time	Off Delay CFM Level - Time
A (1=OFF, 2=OFF)	0.75	13% - 45 sec.	19% - 30 sec	38% - 3 min.
B (1=ON, 2=OFF)	0.65	13% - 45 sec.	19% - 60 sec	38% - 3 min.
C (1=OFF, 2=ON)	0.50	13% - 60 sec.	13% - 60 sec	38% - 3 min.
D (1=ON, 2=ON)	All	13% - 30 sec.	100% - 0 sec	100% - 2 min.

Pre Run and Short Run are the periods of time when the blower starts at very low CFM to minimize the distribution of cool air in the system and then runs up to normal speed.

Off Delay is the time required to cool down the heat exchanger with low CFMs, to minimize cool draft in the air distribution system.

DELAY PROFILE FOR COOLING OR HEAT PUMP HEATING MODE				
No adjustment required	A/C size	Pre Run On-Delay CFM Level - Time	Short Run On-Delay CFM Level - Time	Off-Delay CFM Level - Time
—	ALL	13% - 30 sec.	75% - 2.5 min.	50% - 3 min.

CVMAAR120 AIRFLOW DATA (CFM)

OIL HEATING MODE 24 VAC INPUT (R) ON W ONLY				
SW1-HEAT DIP switch position	HEAT INPUT (USGPH)	CFM with SW3-ADJ DIP switch position A	CFM with SW3-ADJ DIP switch position B	CFM with SW3-ADJ DIP switch position C
A (1=OFF, 2=OFF)	0.85	1450	1640	1235
B (1=ON, 2=OFF)	1.00	1700	1920	1445
C (1=OFF, 2=ON)	1.10	1850	2090	1575
D (1=ON, 2=ON)	Same value as DIP switch position A			

CVMAAR120 AIRFLOW DATA (CFM) (CONTINUED)

CONTINUOUS FAN 24 VAC INPUT (R) ON G ONLY				
SW2-COOL DIP switch position	A/C SIZE (TON)	CFM with SW3-ADJ DIP switch position A	CFM with SW3-ADJ DIP switch position B	CFM with SW3-ADJ DIP switch position C
A (1=OFF, 2=OFF)	5.0	1500	1725	1275
B (1=ON, 2=OFF)	4.0	1200	1380	1020
C (1=OFF, 2=ON)	3.5	1050	1205	890
D (1=ON, 2=ON)	3.0	900	1035	765

COOLING OR HEAT PUMP HEATING MODE HIGH SPEED 24 VAC INPUT (R) TO G, Y/Y2 AND O (FOR COOLING)				
SW2-COOL DIP switch position	A/C SIZE (TON)	CFM with SW3-ADJ DIP switch position A	CFM with SW3-ADJ DIP switch position B	CFM with SW3-ADJ DIP switch position C
A (1=OFF, 2=OFF)	5.0	2000	2200	1800
B (1=ON, 2=OFF)	4.0	1600	1760	1440
C (1=OFF, 2=ON)	3.5	1400	1540	1260
D (1=ON, 2=ON)	3.0	1200	1320	1080

NOTE: In cooling - dehumidification mode, with no 24VAC to DH, the CFM is reduced by 15%.

COOLING OR HEAT PUMP HEATING MODE LOW SPEED 24 VAC INPUT (R) TO G, Y1 AND O (FOR COOLING)				
SW2-COOL DIP switch position	A/C SIZE (TON)	CFM with SW3-ADJ DIP switch position A	CFM with SW3-ADJ DIP switch position B	CFM with SW3-ADJ DIP switch position C
A (1=OFF, 2=OFF)	5.0	1600	1760	1440
B (1=ON, 2=OFF)	4.0	1280	1400	1150
C (1=OFF, 2=ON)	3.5	1120	1235	1000
D (1=ON, 2=ON)	3.0	960	1055	865

NOTE: In cooling - dehumidification mode, with no 24VAC to DH, the CFM is reduced by 15%.

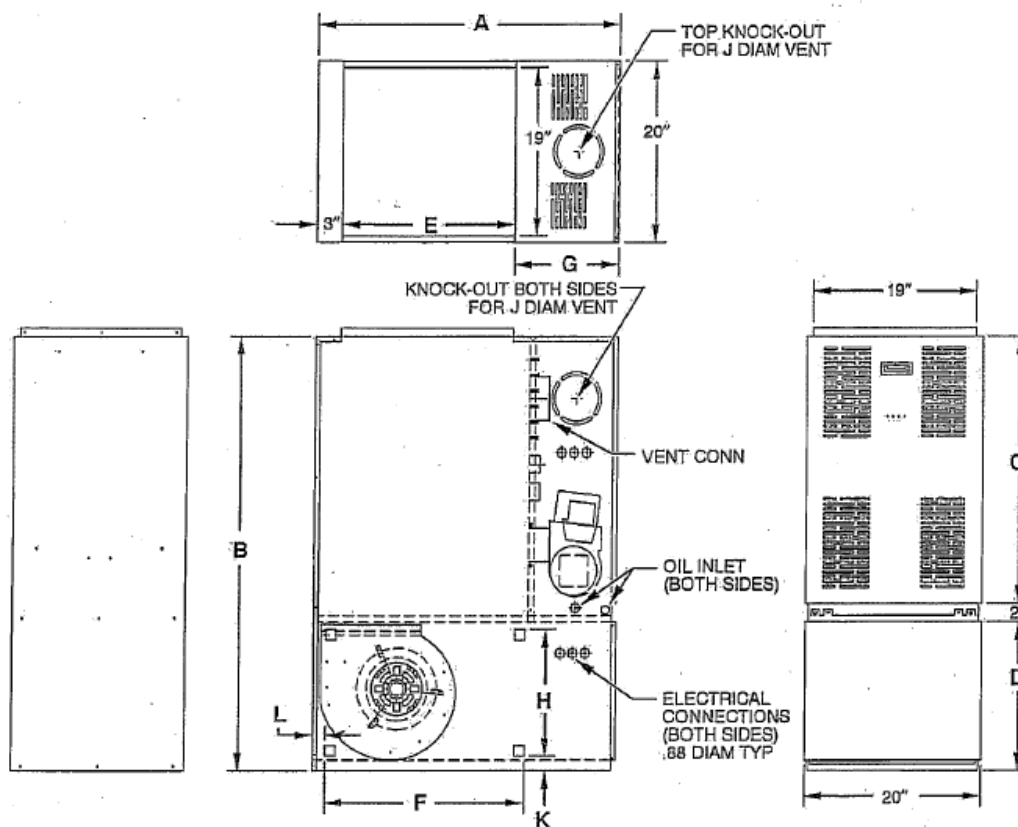
DELAY PROFILE FOR OIL HEATING MODE				
SW4-DELAY DIP switch position	HEAT INPUT (USGPH)	Pre Run On-Delay CFM Level - Time	Short Run On-Delay CFM Level - Time	Off Delay CFM Level - Time
A (1=OFF, 2=OFF)	0.85	13% - 45 sec.	19% - 30 sec	38% - 3 min.
B (1=ON, 2=OFF)	1.00	13% - 45 sec.	19% - 60 sec	38% - 3 min.
C (1=OFF, 2=ON)	1.10	13% - 60 sec.	13% - 60 sec	38% - 3 min.
D (1=ON, 2=ON)	All	13% - 30 sec.	100% - 0 sec	100% - 2 min.

Pre Run and Short Run are the periods of time when the blower starts at very low CFM to minimize the distribution of cool air in the system and then runs up to normal speed.

Off Delay is the time required to cool down the heat exchanger with low CFMs, to minimize cool draft in the air distribution system.

DELAY PROFILE FOR COOLING OR HEAT PUMP HEATING MODE				
No adjustment required	A/C size	Pre Run On-Delay CFM Level - Time	Short Run On-Delay CFM Level - Time	Off-Delay CFM Level - Time
—	ALL	13% - 30 sec.	75% - 2.5 min.	50% - 3 min.

DIMENSIONS



A98037

DIMENSIONS (IN.)

UNIT SIZE	A	B	C	D	E	F	G	H	J	K	L
CVMAAR105	35	48-3/4	31-1/4	16-5/8	20	22	12	14	5	1-1/2	1-3/4
CVMAAR120	39-1/2	53	33-1/4	18-3/4	24	28	12-19/32	16	6	1-5/8	1-1/2

ACCESSORIES

FURNACE ACCESSORIES	
KLASB0601DET	Downflow Subbase Kit - Required for combustible floors
KLASB0701DET	Horizontal Subbase Kit - Required for combustible floors
KLAV0101DET	Blocked Vent Shutoff Kit
KLADC0101DET	Downflow Conversion/Vent Guard - Required for downflow operation, Model CVMAAR105
KLADC0201DET	Downflow Conversion/Vent Guard - Required for downflow operation, Model CVMAAR120