



Air Conditioning & Heating

AR COMMERCIAL

ELECTRIC AIR HANDLERS FOR A/C AND HEATING PUMP SPLIT SYSTEMS 7½- & 10-TON MODELS



Standard Features

- Upflow or horizontal (left side) installation positions in 7½- and 10-ton cooling-only or heat pump applications
- 10-ton model circuited for use with two 4- or 5-ton cooling-only or heat pump systems, or one 10-ton cooling-only or heat pump system
- All models convertible to 460-3-60 from 208/230-3-60
- Transformer and blower relay
- TXV control; 7½-ton unit has one (1) thermal expansion check valve; 10-ton unit has two (2) thermal expansion check valves
- Draw-thru centrifugal blower is belt-driven for quiet, efficient operation
- Copper tube/aluminum fin coils

Cabinet Features

- Heavy-gauge, reinforced, galvanized-steel cabinet
- Fully insulated with fiberglass blanket
- Horizontal and vertical condensate pans
- Built-in filter rack (2" filter included)
- Entry on top of panel for both low and high voltage
- Removable access panels make servicing of unit faster and easier

Accessories

- 15 -30 kW electric heat kits available as field-installed options



* Complete warranty details available from your local dealer or at www.goodmanmfg.com.



NOMENCLATURE

		A	R	090	A		
		1	2	3,4,5	6		
Brand					Engineering *		
A	Single-piece Air Handler				Major/ Minor Revisions		
					* Not used for inventory management		
Unit Application					Nominal Capacity Range		
R	Multi-Position PSC Motor				090 7½ tons		
					120 10 Tons		

SPECIFICATIONS

	AR090A	AR120A
COOLING/ HEATING CAPACITIES		
Cooling (BTU/h)	90,000	120,000
Heating (kW)	15, 20, 30	15, 20, 30
CFM	3,000	4,000
ELECTRICAL		
Unit volts	208/240/460	208/240/460
Hertz/ Phase	60/ 3	60/ 3
Voltage Range	187 - 253 / 414-506	187 - 253 / 414-506
FLA (Total)	5.2	6
Minimum Circuit Ampacity	6.5 / 3.3	7.5 / 3.8
BLOWER MOTOR TYPE		
Type	Belt Drive	Belt Drive
Horse Power	1½	2
Volts	208/230/460	208/230/460
Hertz/ Phase	60/ 3	60/ 3
FLA/ LRA	5.2/ 35	6.0/ 32
BLOWER & CONTROLS		
Wheel Dia. & Width (Qty.)	11 x 10 (2)	11 x 10 (2)
Pulley Pitch Dia.	5.9"	6.5"
Bore	1"	1"
Motor Pulley Pitch Dia.	1.9 to 2.9	2.8 to 3.8
Bore	⅝"	⅝"
Belt Length & Width	39 x ½	41 x ½
Nominal Airflow (Ft./Min.)	3,000	4,000
Transformer (60 VAC.)	Standard	Standard
Blower Relay	Standard	Standard
FILTER, COIL & REFRIGERANT		
Filter Size (Disposable) / Qty	16" x 20" x 2" / 4	16" x 20" x 2" / 2 20" x 20" x 2" / 2
Coil Area (sq. ft.)	9	10
FPI - Rows	14 - 4	14 - 4
Metering Device (Qty.)	Expansion Valve (1)	Expansion Valve (2)
Refrigerant	R-410A	R-410A
Liquid Connection (Qty.)	⅝"	⅝" (2) *
Suction Connection (Qty.)	1½"	1½" (2) *
Condensate Drain	¾ FPT	¾ FPT
SHIP WEIGHT (LBS)	405	430

* For two refrigerant lines

ELECTRIC HEATER KITS

AHKD MODEL	NOMINAL kW	ELECTRICAL DATA	STAGES	WEIGHT (LBS.)	MAX. OVERCURRENT PROTECTION
AHKD15-3	15	208-230/3/60	1	56	60
AHKD15-4	15	460/3/60	1	55	30
AHKD20-3	20	208-230/3/60	2	59	70
AHKD20-4	20	460/3/60	2	57	35
AHKD30-3	30	208-230/3/60	2	60	100
AHKD30-4	30	460/3/60	2	58	50

NOTES:

- AR Series Air handlers do not have factory-installed electric heat. Purchased as an accessory, these are the **ONLY** heater kits that can be used with the AR Series.
- The electrical characteristics of the air handler, electric heater kits, and building power supply must be compatible.

TEMPERATURE RISE (°F)

MODEL	HEAT KIT kW	CFM	SUPPLY VOLTAGE		
			208	240	480
AR090A	15	2,800	14	19	19
		2,900	14	18	18
		3,000	13	18	18
		3,100	13	17	17
		3,200	12	17	17
	20	2,800	19	25	25
		2,900	18	24	24
		3,000	18	24	24
		3,100	17	23	23
		3,200	17	22	22
	30	2,800	28	38	38
		2,900	27	37	37
		3,000	27	35	35
		3,100	26	34	34
		3,200	25	33	33

MODEL	HEAT KIT kW	CFM	SUPPLY VOLTAGE		
			208	240	480
AR120A	15	3,800	10	14	14
		3,900	10	14	14
		4,000	10	13	13
		4,100	10	13	13
		4,200	9	13	13
		4,200	9	13	13
	20	3,800	14	19	19
		3,900	14	18	18
		4,000	13	18	18
		4,100	13	17	17
		4,200	13	17	17
	30	3,800	21	28	28
		3,900	20	27	27
		4,000	20	27	27
		4,100	19	26	26
4,200		19	25	25	

* Tables above are calculated with both stages of electric heat engaged (2-stage heat systems). Divide the temperature rise from the table by 2 for 1st stage operation for systems using staged electric heat.

A090A AIR DELIVERY*

STATIC PRESSURE	MOTOR SHEAVE TURNS OPEN			
	1	2	3	4
0.1"	4,264	3,930	3,633	3,273
0.2"	3,996	3,705	3,235	2,998
0.3"	3,731	3,379	3,002	2,517
0.4"	3,445	3,066	2,613	
0.5"	3,113	2,662		

* With dry coil and 2" air filter

AR120A DELIVERY*

STATIC PRESSURE	MOTOR SHEAVE TURNS OPEN					
	0	1	2	3	4	5
0.1"	5,193	5,037	4,790	4,529	4,097	4,097
0.2"	5,012	4,873	4,603	4,315	3,842	3,842
0.3"	4,852	4,675	4,393	4,091	3,589	3,589
0.4"	4,687	4,484	4,172	3,853	3,295	3,073
0.5"	4,501	4,268	3,939	3,561	2,922	2,610
0.6"	4,293	4,041	3,673	3,223	2,642	
0.7"	4,073	3,782	3,347	2,892		
0.8"	3,807	3,485	2,962			
0.9"	3,540	3,117				

* With dry coil and 2" air filter

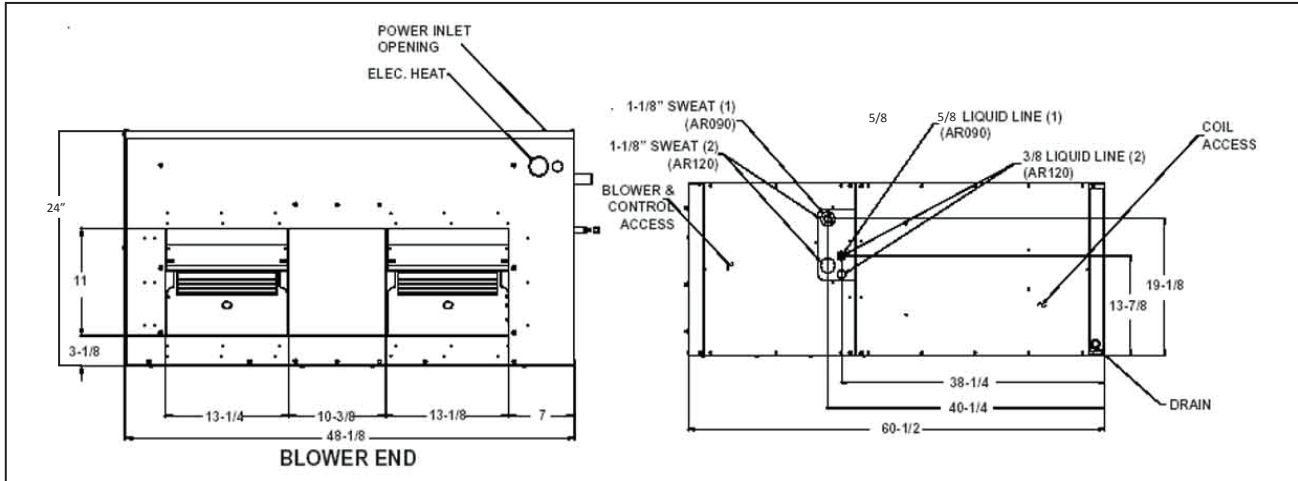
NOTE:

Any adjustment made to the blower should not cause the motor to draw more than the motors rated RLA. Applications that exceed the above could require a larger motor.

FILTERS

MODEL	FILTER SIZE
AR090A	16" x 20" x 2"
AR120A	16" x 20" x 2" 20" x 20" x 2"

DIMENSIONS

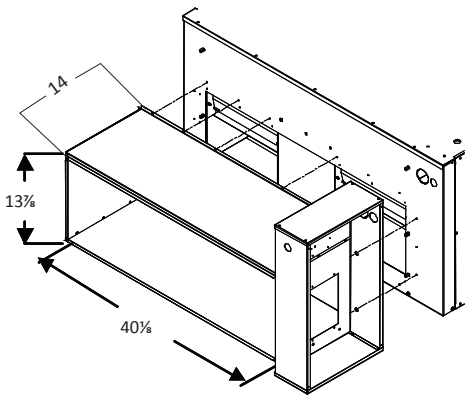


Note: AR090A (1) 5/8" Liquid Line AR120A (2) 3/8" Liquid Line

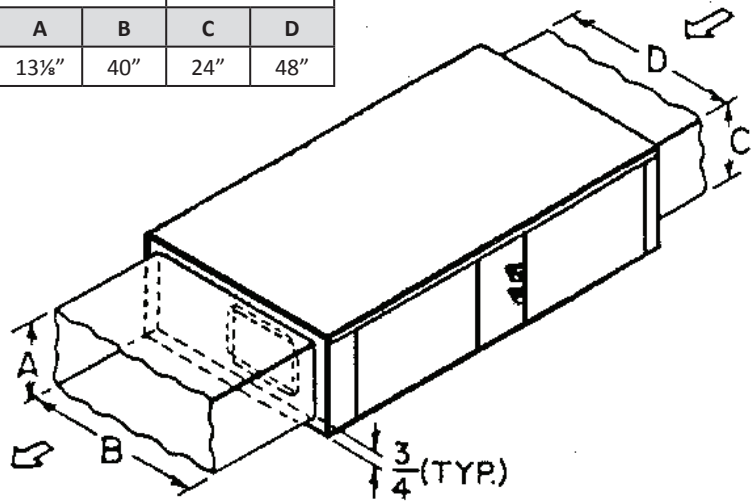
DUCT CONNECTION SIZING WITHOUT ELECTRIC HEATERS

MINIMUM SUPPLY AND RETURN DUCT DIMENSIONS

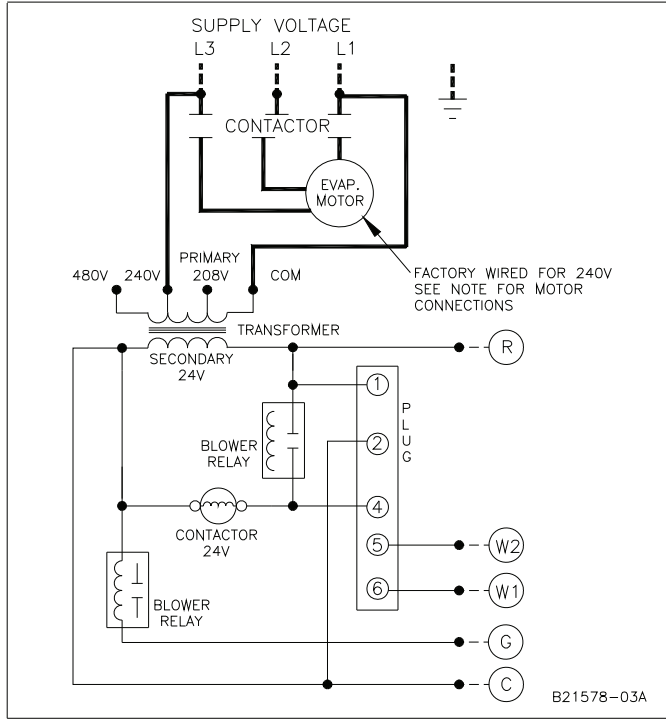
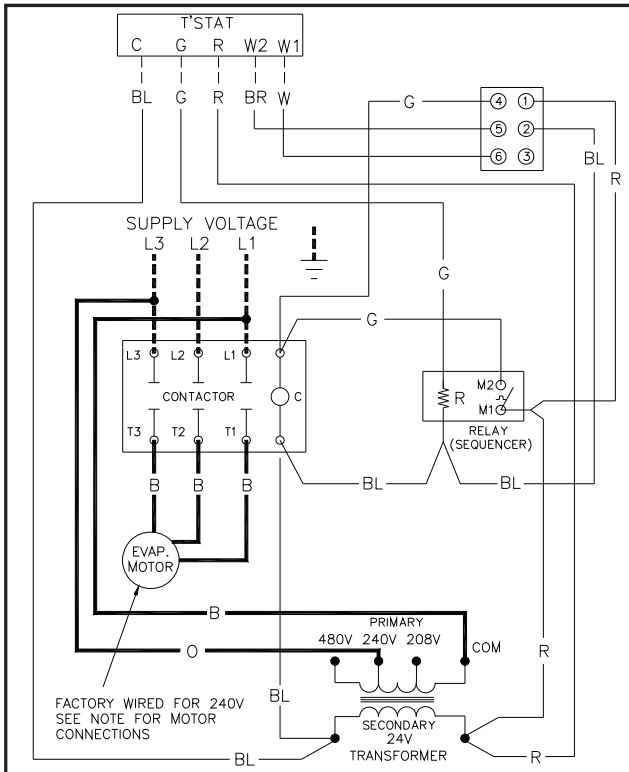
DIMENSIONAL DATA FOR ELECTRIC HEATER KITS
<ul style="list-style-type: none"> 15, 20, & 30 kW Heater Kits Supply opening is 13 7/8" x 40 1/2"



SUPPLY DUCT		RETURN DUCT	
A	B	C	D
13 7/8"	40"	24"	48"



WIRING DIAGRAM



NOTES

- 1) ALL REPLACEMENT WIRES MUST BE SAME GAUGE AND TYPE.
- 2) TO CHANGE VOLTAGE FROM 240V TO 208V, MOVE WIRE FROM 240V TAP TO 208V TAP AT TRANSFORMER PRIMARY.
- 3) TO CONVERT VOLTAGE FROM 240V TO 480V:
 - a) MOVE WIRE FROM 240V TAP TO 208V TAP AT TRANSFORMER PRIMARY.
 - b) IDENTIFY MODEL (i.e. AR090 OR AR120) AND REWIRE MOTOR FROM LOW VOLTAGE (240V) TO HIGH VOLTAGE (480V) ACCORDING TO INSTRUCTION BELOW.

COLOR CODE

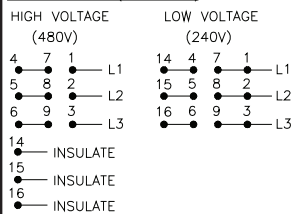
- B — BLACK
- BL — BLUE
- BR — BROWN
- G — GREEN
- O — ORANGE
- R — RED
- W — WHITE

WIRING CODE

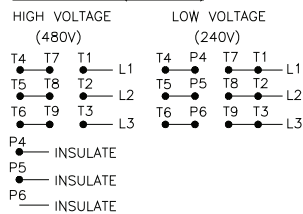
- FACTORY WIRING
 - HIGH VOLTAGE ———
 - LOW VOLTAGE ———
- FIELD WIRING
 - HIGH VOLTAGE - - - - -
 - LOW VOLTAGE - - - - -

A.O. SMITH MOTORS

AR120 MOTOR (B3240006)



AR090 MOTOR (B3240002)



Wiring is subject to change. Always refer to the wiring diagram or the unit for the most up-to-date wiring.

WARNING	High Voltage: Disconnect all power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury, or death.	
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