

- Eight Sizes - 1-20, 1-40, 1-50, 1-65, 2-80, 2-120, 3-180, 3-260
- Horizontal Configuration with Full Curb Cap Base
- Horizontal or Vertical (down) Discharge
- Indoor/Outdoor Installation
- 100% Outside Air with Constant Volume
- 100% Outside Air with Variable Volume
- Combination Outside Makeup Air/Inside Air Heating with Constant Air Volume
- Combination Outside Makeup Air/Inside Air Heating with Potentiometer for Automatic Building Pressurization
- Electronically Controlled Discharge Air Temperature
- Remote Console for Controls
- ETL Listed to ANSI Standards
 - ANSI Z83.18 Direct Gas-Fired Industrial Air Heaters
 - ANSI Z83.4 Direct Gas-Fired Makeup Air Heaters

NOTE: Due to ongoing product development, all specifications in this catalog are subject to change without notice.

REZNOR**RDF****INDOOR/OUTDOOR DIRECT-FIRED GAS HEATING/MAKEUP AIR SYSTEM
FOR COMMERCIAL & INDUSTRIAL APPLICATIONS**

U.S. Pat. No. D294, 291; 4, 573, 912; 4, 674, 475

WARNING: GAS-FIRED APPLIANCES ARE NOT DESIGNED FOR USE IN HAZARDOUS ATMOSPHERES CONTAINING FLAMMABLE VAPORS OR COMBUSTIBLE DUST, OR ATMOSPHERES CONTAINING CHLORINATED OR HALOGENATED HYDROCARBONS. INSTALLATIONS IN PUBLIC GARAGES OR AIRPLANE HANGARS ARE PERMITTED WHEN IN ACCORDANCE WITH ANSI Z223.1 AND NFPA 54 CODES.

NOTE: RDF Models are not approved for residential use U.S. Pat. No. D294,291 4,573,912 4,674,475

DESCRIPTION

The Reznor Model RDF Series single-blower, direct, gas-fired units are certified by ETL to ANSI Standard Z83.18 and Z83.4. The units are designed for indoor or outdoor installation with cabinets of insulated, double-wall galvalume steel construction. Configuration is horizontal with either standard horizontal discharge or optional vertical discharge. The system is factory assembled and mounted on a curb cap for single unit field installation. The RDF Series has a heating range of 20 - 3,000 MBH and an air handling capability range of 1,000 - 28,000 CFM.

The blower section includes a single blower that is statically and dynamically balanced for vibration free operation. Depending on the model size and CFM requirements, the blower is either Class I or Class II. A selection of motor horsepower and drive packages is available to match application requirements. Motor and drive packages include an IEC style contactor or starter, adjustable motor base, adjustable sheaves, and drive belts.

The direct-fired burner is cast iron with drilled ports and stainless steel mixing plates for high efficiency combustion, designed to meet ANSI emission requirements. The pilot and flame monitoring device is an electronic (hot surface) ignition system and flame supervision with 100% lockout. Burner firing rate is modulated by a temperature selector and sensor to maintain the desired discharge air temperature.

The gas train includes main and pilot gas shutoff valves, a manual shutoff leak-test valve, a pilot regulator, a pilot solenoid valve, and either dual solenoid valves or fluid power valves, depending on the application requirements that determine gas train selection. Gas trains meet ANSI Standards, and options are available to meet FM and /or IRI requirements.

Standard controls include a remote control/monitoring console, high and low airflow proving switches, automatic and manual high temperature limit controls, an adjustable outside air temperature sensor for burner cutoff, burner and blower service switches, and a remote temperature selector with discharge sensor. A disconnect switch, a diagnostic light panel, a space override thermostat, a potentiometer, or a pressure sensing damper control device are all available as options or components of the air control option selected. Systems installed outdoors MUST include either an outside air hood or a Model REC evaporative cooling module.

STANDARD FEATURES

- ETL certified to ANSI Z83.18 and Z83.4
- 100% makeup air.
- 20 - 3,000 MBH Heating range.
- 1,000 - 28,000 CFM range.
- Double-wall, insulated industrial grade construction.
- Horizontal configuration with horizontal discharge.
- Dynamically balanced centrifugal blower.
- NEMA standard motor, IEC contactor (1/2 - 3 HP) or starter (5 - 30 HP).
- Adjustable belt drive.
- Electronic modulated cast-iron burner with stainless steel mixing plates.
- Electronic modulating gas control (25:1 turndown ratio)
- Hot surface intermittent ignition system with prepurge time delay. (U.S. Patent No. 5,556,272)
- 24-volt Transformer (fused secondary).
- Adjustable outside air temperature sensor (economizer).
- Safety limit controls including high and low air flow proving switches, automatic and manual high temperature limits, flame supervisor with 100% lockout.
- Gas train with dual main solenoid valves, main and pilot manual shutoff valves, manual shutoff leak-test valve, pilot regulator, and pilot solenoid valve (see page 28).
- Burner and blower service switches.
- Remote control console (see page 56).

OPTIONAL FEATURES - Factory Installed

- Propane gas
- Manifold arrangements to meet FM and IRI requirements (see page 28-29).
- Motor and drive options to meet CFM requirements.
- Discharge air temperature gas control systems with and without space override (see page 27).
- 230/1, 208/3, 230/3, 460/3, 575/3 voltage alternates.
- Combination makeup air-return air with constant or variable air volume supply controlled either by a manually set potentiometer or automatically by a remote building pressure sensor (see page 26).
- 2-position discharge damper.
- Vertical (down) discharge with or without 2-position discharge damper.
- 115-volt convenience outlet.
- Built-in lighted indicator panel.
- Firestat(s) - discharge and/or return, 200°F.
- Freezestat (automatic reset) with time delay relay.
- Interlocking and/or control relays.
- High and/or low gas pressure switches.

OPTIONAL FEATURES - Field Installed

- Disconnect switch (see page 56).
- Screened outside air hood with moisture-eliminating louvers with or without filter section and 1" or 2" permanent filters (screened air hood or attached evaporative cooling module is required on outdoor installations to retain certification) (see page 59).
- Indoor filter sections with 1" or 2" permanent filters (see page 59).
- Roof curb - 16" high (see page 57).
- Add-on evaporative cooling module is available (see Evaporative Cooling Catalog).



**INDOOR/OUTDOOR DIRECT-FIRED GAS HEATING/MAKEUP AIR SYSTEM
FOR COMMERCIAL & INDUSTRIAL APPLICATIONS**

TECHNICAL DATA

Model Number	1-20	1-40	1-50	1-65	2-80	2-120	3-180	3-260
Maximum Capacity (MBH)	400	600	750	750	1500	1500	2500	3000
CFM Range	1000/3000	2000/4500	3000/6000	4000/6500	6000/12000	9000/16000	11000/20000	16000/28000
Maximum Temperature Rise (°F)	120	120	120	120	120	120	120	120
Supply Voltage	115/1	115/1	115/1	230/1	208/3	208/3	208/3	208/3
Control Amps (110V)	6.0	6.0	6.0	3.0	3.4	3.4	3.4	3.4
Gas Connection (inches)	1	1	1	1	1 or 1-1/4	1 or 1-1/4	1, 1-1/4, or 2	1, 1-1/4, or 2
Net Weight (lb.)	915	925	935	950	1455	1505	2410	2480

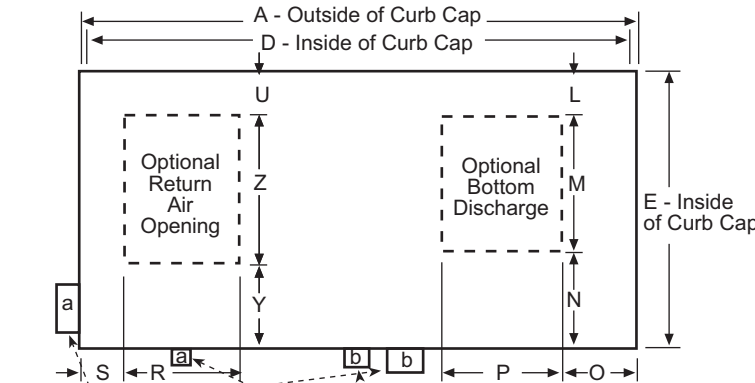
DIMENSIONS

Sizes	A	B	C	D	E	F	G	H	J	K	L*	M
1-20, 1-40, 1-50, 1-65	88 3/8	37 1/8	44 1/4	85 1/4	45 1/2	7 5/8	22	5 3/8	18 7/8	12 7/8	8 1/4	22
2-80, 2-120	88 3/8	48 3/4	68 1/4	85 1/4	69 1/2	16 1/8	27 1/4	6 5/8	27 1/4	14 7/8	16 3/4	27 1/2
3-180, 3-260	136 1/8	61 3/4	82 1/2	132 5/8	83	14 1/4	37	4	37	20 3/4	14 3/4	37

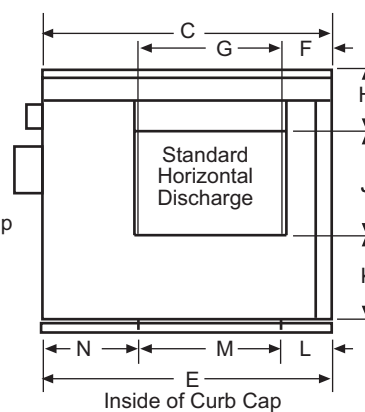
*Measurements for locating bottom air openings are from the edge of the inside of the curb cap.

Sizes	N*	O*	P	R	S*	T	U	V	W	X	Y*	Z
1-20, 1-40, 1-50, 1-65	15 1/4	12 5/8	19 1/8	17	2 3/8	10	8 1/4	31 1/8	3	33 5/8	15 1/8	22 1/8
2-80, 2-120	25 1/4	9 5/8	27 1/2	22	6 1/2	10	9 1/2	55 1/4	3	45 1/2	18 1/8	41 7/8
3-180, 3-260	31 3/8	9 1/4	37	30 1/4	11 5/8	12 1/2	12	67 1/8	3	54 5/8	14	57 1/8

TOP VIEW OF CURB CAP (NOT ROOF CURB)



FRONT VIEW

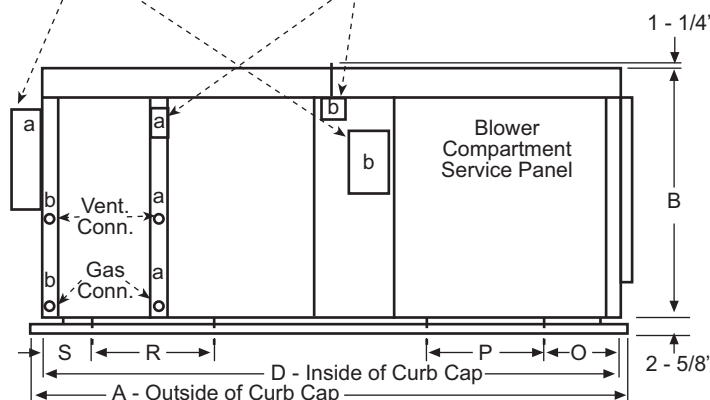


Location Key

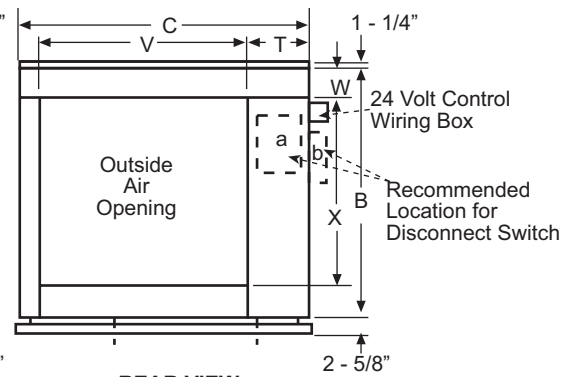
a = Sizes 1-20, 1-40, 1-50, 1-65
b = Sizes 2-80, 2-120, 3-180, 3-260

Recommended Location for Disconnect Switch

24 Volt Control Wiring Box



SIDE VIEW



REAR VIEW

MINIMUM CLEARANCES

Top	3"
Control Side	Width of Unit
Non-Control Side	3"
Bottom	To Combustible
	To Non-Combustible

Selection of Makeup Air Equipment

- Determine makeup air CFM based on
 - Total exhaust CFM - either from rating plates of exhaust equipment or measured
 - Infiltration CFM = (Building volume in square feet x the desired air rate change) / 60
 - Type (negative or positive) of building or "spot" pressure desired
 - For negative pressure** - add the exhaust CFM and the infiltration CFM and multiply by <1 (usually .9)
 - For positive pressure** - add the exhaust CFM and the infiltration CFM and multiply by >1 (usually 1.1)
- Determine makeup air BTUH based on
 - $H = Q \times K \times \Delta T$
 - H = Heat **output** of the makeup air equipment
 - Q = Required makeup air CFM (as determined in Step 1)
 - K = Constant of 1.085
 - ΔT = Discharge air temperature minus outdoor design temperature (also identified as the temperature rise)
 - To determine BTUH input, divide H by .92.
- Calculate the Total Adjusted Pressure Drop. With the CFM and pressure drop, determine the HP from the chart on page 25.
- With this information, determine which size of system will most efficiently provide the required CFM and BTUH. Select the options that meet the specification requirements.

Model	Range	BTUH Range (MBH)	¹ Fan Dia. (in)	Min/Max HP	RPM Range
RDF-1-20	1000/3000	20-400	10 x 10	0.5 / 2.0	730/1600
RDF-1-40	2000/4500	30-600	12 x 12	0.75 / 5.0	630/1500
RDF1-50	3000/6000	38-750	15 x 15	1.0 / 5.0	570/1200
RDF-1-65	4000/6500	38-750	18 x 18	1.5 / 5.0	425/900
RDF-2-80	6000/12000	75-1500	18 x 18	2.0 / 15.0	500/1140
RDF-2-120	9000/16000	75-1500	20 x 20	2.0 / 5.0	480/1000
RDF-3-180	11000/20000	100-2500	22 x 22	5.0 / 30.0	470/1000
RDF-3-260	16000/28000	150-3000	30 x 22	7.5 / 30.0	300/660

6"	12"	18"	24"	30"	36"	42"	48"	54"	60"	66"	72"
800	1000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
800	1000	1250	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
800	1000	1250	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1000	1000	1250	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1500	1500	1500	1500	1750	2000	N/A	N/A	N/A	N/A	N/A	N/A
2250	2250	2250	2250	2250	2250	N/A	N/A	N/A	N/A	N/A	N/A
2750	2750	2750	2750	2750	2750	2750	2750	2750	3000	3250	3500
4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000

¹ Check the shaded areas in RPM/BHP chart, page 25, for Class I or Class II blowers. Class II blowers are standard on Model RDF-2-80.

² Minimum CFM over the burner increases with increases in CFM. Minimum CFM over the burner must be the amount listed on the chart or 25% of actual supply CFM, whichever is greater.

Air Pressure Drop

Model	CFM	² 1" Filter Pressure Drop	² 2" Filter Pressure Drop	O/A Inlet Hood Pressure Drop	³ Discharge Damper Pressure Drop	⁴ External Static Pressure	¹ Total Adjusted Pressure Drop
RDF-1	1,000	0.05	0.10	0.15	0.04		
	2,500	0.10	0.20	0.22	0.06		
	4,000	0.15	0.30	0.29	0.10		
	5,500	0.20	0.40	0.37	0.16		
	6,500	0.25	0.50	0.45	0.22		
	6,000	0.05	0.10	0.15	0.04		
RDF-2	8,000	0.09	0.18	0.21	0.07		
	10,000	0.13	0.26	0.27	0.10		
	12,000	0.17	0.34	0.33	0.13		
	14,000	0.21	0.42	0.40	0.18		
	16,000	0.25	0.50	0.47	0.24		
	10,000	0.05	0.10	0.14	0.04		
RDF-3	13,000	0.08	0.16	0.18	0.06		
	16,000	0.11	0.22	0.22	0.09		
	19,000	0.14	0.28	0.27	0.12		
	22,000	0.17	0.34	0.33	0.15		
	25,000	0.20	0.40	0.39	0.18		
	28,000	0.23	0.46	0.46	0.22		

¹ To enter the RPM/BHP chart, page 25, the "Total Adjusted Pressure Drop" must be determined. The "Total Adjusted Pressure Drop" is determined by adding the external pressure from ducts, registers, grilles and diffusers, to the pressure drop for selected options.

² There will be different pressure drops for filters other than 1" or 2" permanent filters provided.

³ When a discharge damper or variable air volume unit is required, add in this pressure drop.

⁴ The External Pressure Drop should include all duct work, registers, grilles, and diffusers at required CFM.

Blower Notes: Models RDF 1-20, 1-40, 1-50, 1-65, 2-120 have a Class I blower. Model RDF 2-80 has a Class II blower. Depending on the CFM/Static/RPM/HP requirements (see Chart on page 25), Models RDF 3-180 and 3-260 have either a Class I blower or a Class II blower. A Class II blower is an available option on Models RDF 3-180 and 3-260 equipped with a standard Class I blower.

A Class I blower is a standard blower with permanently lubricated cartridge ball bearings. A Class II blower is a heavy duty blower with pillow block bearings. The pillow block bearings have a grease fitting and should be lubricated twice a year with a high temperature, moisture-resistant grease.

Units with a 7-1/2 or 1 HP motor have a heavy duty triangular bearing support; units with a 15 to 30 HP motor have a heavy duty angle iron bearing support.

Motor Amps: See pages 61-62.



RDF
RPM/BHP CHARTS

R
D
F

Model	CFM	Total Adjusted Pressure Drop (" w.c.)												
		0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4
RDF-1-20	1000	735/0.16	840/0.23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1500	745/0.29	850/0.36	950/0.45	1050/0.54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2000	850/0.49	945/0.61	1050/0.72	1125/0.83	1205/0.95	1285/1.08	1365/1.21	N/A	N/A	N/A	N/A	N/A	N/A
	2500	945/0.83	1015/0.94	1100/1.05	1180/1.17	1250/1.30	1325/1.43	1400/1.57	1460/1.73	1520/1.88	1580/2.04	1635/2.18	N/A	N/A
	3000	1080/1.38	1155/1.49	1225/1.59	1300/1.75	1375/1.90	1445/2.06	1510/2.22	N/A	N/A	N/A	N/A	N/A	N/A
RDF-1-40	2000	630/0.39	730/0.49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2500	665/0.55	740/0.68	825/0.81	895/0.94	965/1.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3000	735/0.83	820/1.00	890/1.19	955/1.36	1025/1.54	1100/1.72	1155/1.89	N/A	N/A	N/A	N/A	N/A	N/A
	3500	790/1.18	855/1.34	925/1.52	990/1.71	1055/1.90	1115/2.10	1175/2.30	1225/2.49	1280/2.66	1330/2.75	N/A	N/A	N/A
	4000	845/1.63	910/1.78	960/1.94	1030/2.10	1095/2.33	1150/2.57	1200/2.82	1250/3.06	1330/3.30	1345/3.52	1385/3.74	1430/3.96	1480/4.18
RDF-1-50	3000	570/0.66	660/0.82	735/0.99	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3500	595/0.82	665/0.99	740/1.21	805/1.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4000	615/1.04	685/1.26	745/1.48	810/1.71	875/1.93	930/2.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4500	640/1.43	705/1.61	770/1.80	825/2.02	880/2.26	935/2.50	985/2.74	1035/3.00	N/A	N/A	N/A	N/A	N/A
	5000	710/1.91	760/2.09	815/2.30	870/2.54	920/2.78	965/3.04	1015/3.30	1065/3.60	1110/3.90	1155/4.21	N/A	N/A	N/A
	5500	745/2.32	790/2.56	840/2.81	885/2.94	935/3.28	985/3.59	1030/3.89	1075/4.21	1120/4.52	1165/4.81	N/A	N/A	N/A
	6000	785/2.86	825/3.08	870/3.30	915/3.61	965/3.93	1010/4.26	1055/4.56	1100/4.84	N/A	N/A	N/A	N/A	N/A
RDF-1-65	4000	425/0.69	505/0.96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4500	440/0.94	520/1.15	585/1.37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5000	450/1.10	530/1.41	595/1.70	650/1.99	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5500	500/1.51	565/1.56	625/2.07	675/2.36	725/2.69	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	6000	510/1.78	570/2.06	630/2.36	680/2.69	730/3.04	775/3.39	820/3.74	N/A	N/A	N/A	N/A	N/A	N/A
6500	525/2.04	580/2.36	635/2.69	685/3.02	735/3.39	780/3.78	830/4.18	860/4.58	N/A	N/A	N/A	N/A	N/A	

Model	CFM	Total Adjusted Pressure Drop (" w.c.)												
		0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4
RDF-2-80	6000	510/1.62	570/1.87	630/2.15	680/2.45	730/2.76	775/3.08	820/3.40	N/A	N/A	N/A	N/A	N/A	N/A
	7000	545/2.20	585/2.50	640/2.80	690/3.10	740/3.46	785/3.82	835/4.18	865/4.54	900/4.91	N/A	N/A	N/A	N/A
	8000	565/2.87	610/3.25	650/3.65	700/4.05	750/4.45	795/4.85	845/5.24	875/5.62	910/6.00	945/6.38	980/6.76	1020/7.14	1055/7.50
	9000	605/3.99	640/4.31	675/4.63	715/4.95	760/5.37	805/5.79	855/6.21	885/6.63	920/7.06	955/7.50	990/8.00	1030/8.50	1065/9.00
	10000	N/A	N/A	705/5.82	745/6.24	780/6.66	815/7.08	865/7.50	895/8.00	930/8.50	965/9.00	1000/9.50	1040/10.00	1075/10.64
	11000	N/A	N/A	N/A	770/7.38	805/7.88	845/8.43	880/8.97	910/9.51	945/10.05	975/10.67	1010/11.29	1050/11.91	1085/12.53
	12000	N/A	N/A	N/A	N/A	N/A	875/10.43	905/10.97	935/11.50	970/12.00	1000/12.59	1030/13.13	1060/13.67	1095/14.22
RDF-2-120	9000	520/2.71	560/2.95	600/3.41	640/3.85	680/4.29	720/4.73	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10000	545/3.56	580/3.92	615/4.28	655/4.64	695/5.00	735/5.50	775/6.00	810/6.50	N/A	N/A	N/A	N/A	N/A
	11000	575/4.18	605/4.64	635/5.14	670/5.68	710/6.20	750/6.72	785/7.24	820/7.71	855/8.13	885/8.55	915/8.97	N/A	N/A
	12000	615/5.75	635/6.13	660/6.51	695/6.89	735/7.27	770/7.74	800/8.30	835/8.86	865/9.42	895/10.00	925/10.64	950/11.28	980/11.92
	13000	640/6.49	660/6.97	695/7.45	725/7.97	760/8.49	790/9.01	820/9.53	850/10.05	880/10.71	910/11.37	935/12.03	965/12.69	990/13.35
	14000	680/6.49	705/8.85	735/9.25	760/9.65	785/10.05	815/10.65	840/11.25	870/11.85	900/12.45	925/13.05	955/13.65	980/14.25	N/A
	15000	N/A	740/10.94	760/11.36	785/11.88	810/12.40	840/12.92	865/13.44	895/13.96	920/14.48	945/15.00	N/A	N/A	N/A
16000	N/A	N/A	790/13.03	815/13.49	840/13.95	865/14.41	890/14.87	920/15.47	N/A	N/A	N/A	N/A	N/A	

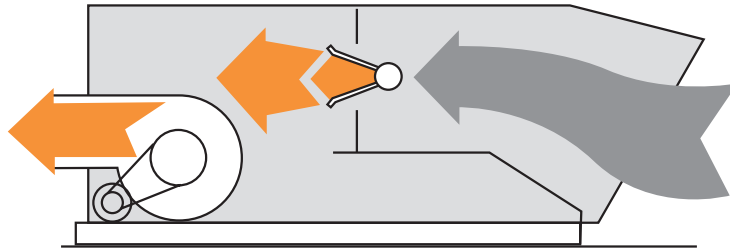
NOTE: Model RDF-2-80 has Class II type blowers as standard.

Model	CFM	Total Adjusted Pressure Drop (" w.c.)												
		0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4
RDF-3-180	11000	490/3.90	530/4.30	565/4.70	605/5.10	640/5.74	680/6.38	715/7.02	N/A	N/A	N/A	N/A	N/A	N/A
	12000	505/4.50	545/5.00	580/5.56	615/6.14	650/6.72	690/7.30	725/7.81	755/8.25	N/A	N/A	N/A	N/A	N/A
	13000	530/5.44	565/5.98	595/6.52	630/7.60	665/7.60	700/8.22	735/8.84	765/9.47	795/10.11	825/10.75	N/A	N/A	N/A
	14000	550/6.23	585/6.86	615/7.50	645/8.16	680/8.82	710/9.48	745/10.14	775/10.84	805/11.54	835/12.26	860/12.98	890/13.70	N/A
	15000	580/7.81	610/8.43	640/9.05	670/9.68	700/10.33	730/10.99	760/11.65	790/12.31	815/12.97	845/13.64	870/14.32	900/15.00	925/15.67
	16000	600/9.06	630/9.72	660/10.40	690/11.10	715/11.80	745/12.50	780/13.20	810/13.92	835/14.64	860/15.41	890/16.23	915/17.06	940/17.90
	17000	N/A	655/11.44	685/12.10	710/12.76	740/13.42	765/14.10	790/14.78	820/15.53	845/16.35	870/17.17	900/17.99	925/18.81	950/19.63
	18000	N/A	N/A	705/13.98	735/14.66	760/15.40	780/16.20	805/17.00	830/17.80	855/18.60	880/19.40	910/20.20	935/21.00	960/21.80
	19000	N/A	N/A	730/16.14	755/16.90	780/17.66	800/18.44	825/19.22	850/20.00	875/20.80	900/21.60	920/22.40	945/23.20	970/24.00
	20000	N/A	N/A	N/A	775/19.20	800/20.00	820/20.74	845/21.48	865/22.22	890/22.96	910/23.70	935/23.60	955/25.19	980/25.99
	21000	320/4.38	350/5.00	380/5.64	410/6.28	435/6.93	460/7.58	490/8.25	N/A	N/A	N/A	N/A	N/A	N/A
RDF-3-260	17000	325/4.89	355/5.58	385/6.30	415/7.02	440/7.75	465/8.49	493/9.24	505/10.00	N/A	N/A	N/A	N/A	N/A
	18000	330/5.60	360/6.36	390/7.12	420/7.91	445/8.74	470/9.58	496/10.38	510/11.14	540/11.90	N/A	N/A	N/A	N/A
	19000	335/6.20	365/7.00	395/7.81	423/8.63	448/9.45	472/10.28	498/11.22	515/12.16	542/13.10	560/14.14	580/15.00	N/A	N/A
	20000	345/6.96	375/7.78	405/8.60	425/9.44	450/10.28	475/11.24	500/12.22	520/13.20	545/14.18	565/15.16	585/16.14	605/17.12	N/A
	21000	355/7.80	385/8.60	410/9.40	430/10.20	455/11.16	480/12.12	503/13.08	525/14.04	547/15.00	567/15.95	587/16.85	610/17.69	625/18.62
	22000	N/A	395/9.59	415/10.50	440/11.50	460/12.50	485/13.50	505/14.50	530/15.45	550/16.35	570/17.25	590/18.16	615/19.08	630/20.00
	23000	N/A	400/10.50	420/11.50	445/12.50	465/13.50	490/14.50	510/15.50	535/16.50	555/17.50	575/18.50	595/19.50	617/20.50	635/21.50
	24000	N/A	405/11.75	430/12.75	450/13.75	475/14.75	495/15.75	515/16.75	540/17.75	560/18.75	580/19.75	600/20.80	620/21.90	640/23.02
	25000	N/A	N/A	440/14.00	460/15.00	480/16.00	500/17.00	520/18.00	545/19.00	562/20.00	582/21.10	602/22.20	622/23.32	642/24.44
	26000	N/A	N/A	450/15.00	470/16.16	490/17.34	510/18.52	530/19.70	550/20.81	565/21.85	585/22.89	605/23.94	625/25.00	645/26.08
	27000	N/A	N/A	N/A	475/17.50	495/18.50	515/19.50	535/20.62	555/21.86	570/23.11	590/24.37	610/25.54	630/26.62	647/27.70
28000	N/A	N/A	N/A	N/A	505/20.20	525/21.40	540/22.60	560/23.80	580/25.00	595/26.10	615/27.20	635/28.32	650/29.44	

NOTE: Shaded areas require Class II type blowers.

100% Makeup Air with Constant Air Volume

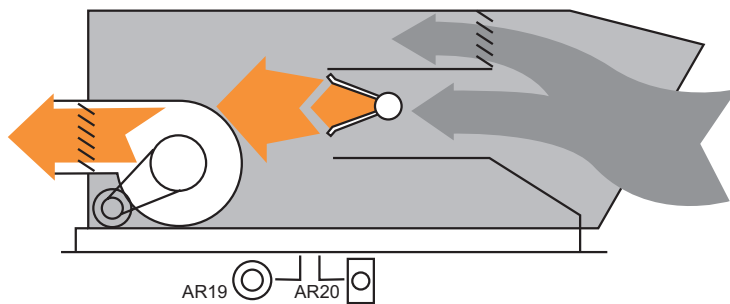
The most common method of makeup air, this arrangement provides a constant volume of outside air to match a constant amount of exhaust. It is most commonly used to match a specific process such as a kitchen range hood or an industrial process which might be used on an intermittent basis.



STD: The standard air control arrangement is for 100% makeup outside air across the burner. Profile plates will be factory-set to provide constant air velocity across the burner at the required air volume (CFM).

100% Makeup Air with Variable Air Volume

This arrangement is used to supply general makeup air to a space which has varying amounts of exhaust. A building pressure sensor controls the amount of makeup air supplied, to slightly pressurize the building even though exhaust systems may operate intermittently. The elimination of the need to heat excess amounts of makeup air and the reduction in blower motor power consumption make this system the most efficient system available.

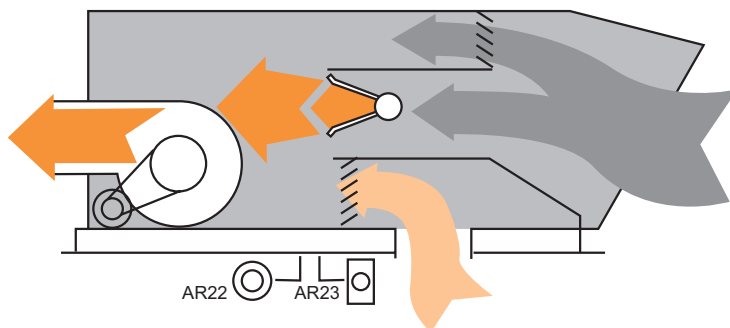


OPTION AR19: 100% outside makeup air with variable supply air volume (CFM). This system allows the occupant to manually vary the volume of supply air from a remote potentiometer. All of the air supplied to the space is outside air and can be varied from 100% to 25% of rated air flow (CFM). The supply air is varied by adjusting the position of a discharge damper at the outlet of the supply fan. The unit is arranged so that a fixed amount (25%) of the rated air volume (CFM) flows over the burner at a constant velocity. The remainder (75%) of the rated air volume flows through a balancing bypass damper. As the supply air volume is varied by the discharge damper, the balancing damper is adjusted to maintain the required air velocity over the burner.

OPTION AR20: This system is similar to Option AR19, except that control of the discharge air damper is automatic from a remote building pressure sensor.

Combination Outside/Inside Makeup Air Heating with Constant Air Volume

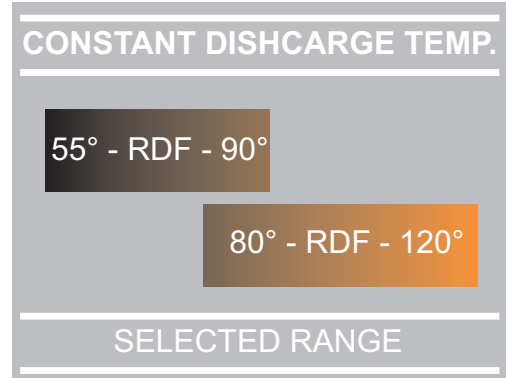
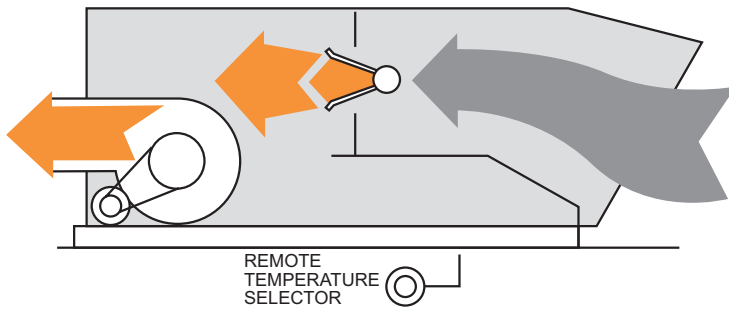
This system fulfills a combination of requirements by matching the required makeup air while supplying supplemental heating for worker comfort. The ability of this design to provide varying amounts of makeup air, while using return air for supplemental heating, allows the elimination of inefficient supplemental space heating equipment.



OPTION AR22: Combination outside makeup air and recirculation space heating system. This system supplies constant air volume and incorporates interacting return air and outside air dampers, which, between them, handle 75% of the rated air flow. Both dampers are in bypass positions so that the remaining 25% of rated air volume (CFM) flows over the burner to maintain constant burner velocity. A manual remote potentiometer positions the return air damper to maintain the required building pressure. The outside air damper operates as a balancing damper to reduce outside air as the return air is increased. It is operated from a velocity pressure sensor built into the unit and is independent of the return air damper.

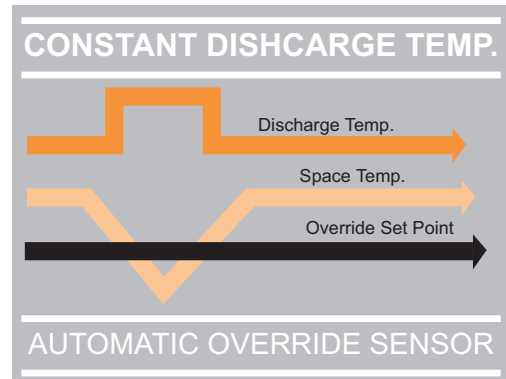
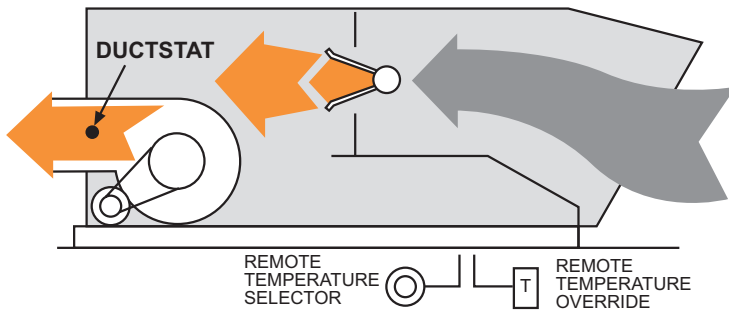
OPTION AR23: This system is similar to option AR22, except that control of the return air damper is automatic from a remote building pressure sensor.

REZNOR

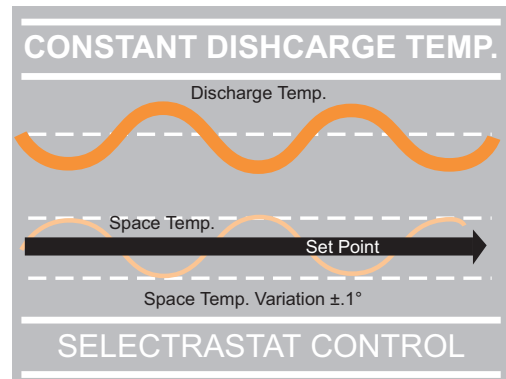
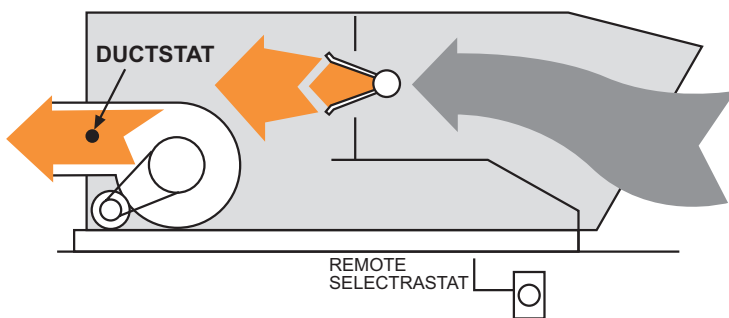


STD: The basic control system utilizes a Maxitrol Series 14 amplifier, discharge air temperature sensor, and modulating gas valve. The system can be set to maintain a constant discharge air temperature in the range of 55°-90° F or 80°-120°F (**Option AG32**). Adjustment of this temperature is made at the remote temperature selector mounted on the remote console.

**R
D
F**



AG31: This option provides a remote override space sensor. Discharge air temperature is temporarily reset upwards if space temperature falls below the setpoint. Only available with standard system (55°-90°F).



AG33: This optional system utilizes a Maxitrol Series 44 amplifier, discharge air temperature sensor, and remote selectrastat. The high and low limits (20°-60°F and 60°-120°F) for control of discharge air temperature are set at the amplifier in the electrical control compartment of the unit. The space temperature to be maintained (55°-90°F), is set at the remote selectrastat within the space. When temperatures are above or below the space temperature setpoint, the discharge air temperature setpoint is adjusted automatically within the maximum (60°-120°F) and minimum (20°-60°F) limits set on the amplifier.

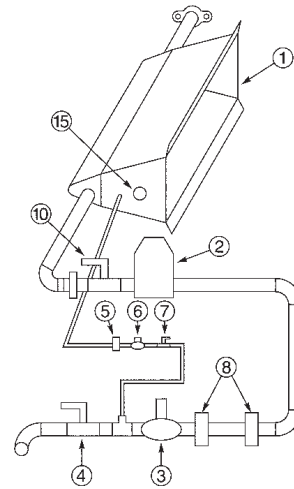
AG37: Maxitrol A200 Signal Conditioner (used with customer supplied 4-20MA or 0-10V input signal) and special electronic modulating gas regulator. Conditioner and regulator are factory-installed; computerized control system is field-supplied.

KEY:

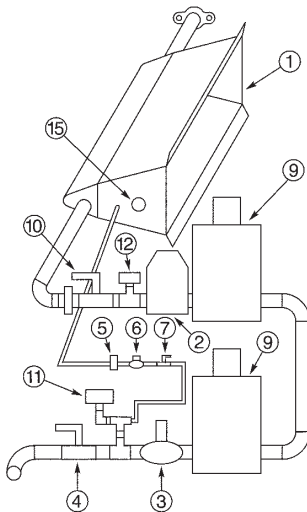
1. Burner
2. Modulating Gas Control Valve
3. Pressure Regulator
4. Main Gas Manual Shut-Off
5. Pilot Solenoid Valve
6. Pilot Regulator
7. Pilot Manual Shut-Off
8. Main Gas Solenoid Valves
9. Main Gas Motorized Fluid Power Valve
10. Manual Shut-Off Leak-Test Valve
11. Low Gas Pressure Safety Switch
12. High Gas Pressure Safety Switch
13. Vent Solenoid Valve
14. Combination Pressure Regulator, Modulating Valve
15. Hot Surface Ignitor

Manifolds Up to 750 MBH (STD, BM5, BM7)

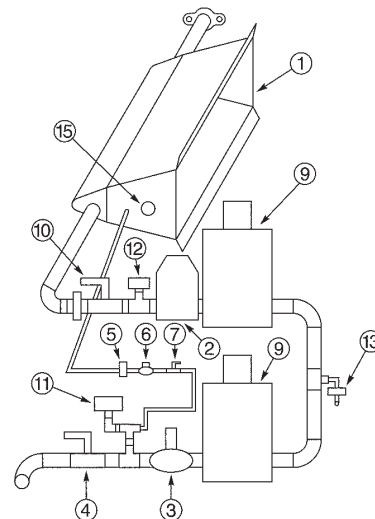
All manifold arrangements include main gas and pilot gas shut-off cocks, manual shut-off leak-test valve, pilot regulator, pilot solenoid valve, and a main gas pressure regulator. Each manifold arrangement is available for inlet gas pressures of 6" w.c. to 5 psi gas inlet pressure.



STD: Standard manifold arrangement to meet ANSI requirements up to 750 MBH. Includes two (2) solenoid main gas valves (6" w.c. to 5 psi gas inlet pressure).



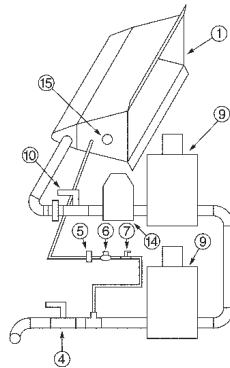
BM5: Optional manifold arrangement to meet FM requirements on outdoor units without filters and IRI requirements on all units. For inputs less than or equal to 750 MBH. Includes two (2) fluid power valves in lieu of solenoid valves, high and low gas pressure switches and a manual shut-off leak test valve (6" w.c. to 5 psi gas inlet pressure).



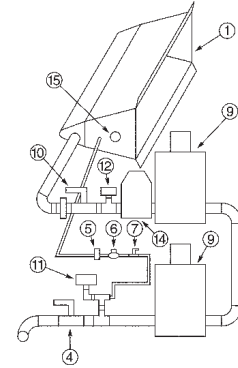
BM7: Optional manifold arrangement to meet FM requirements on outdoor units with filters and all indoor units. For inputs less than or equal to 750 MBH. Includes two (2) fluid power valves in lieu of solenoid valves, high and low gas pressure switches, vent valve, and a manual shut-off leak test valve. (6" w.c. to 5 psi gas inlet pressure).

MANIFOLD ARRANGEMENTS (cont'd)

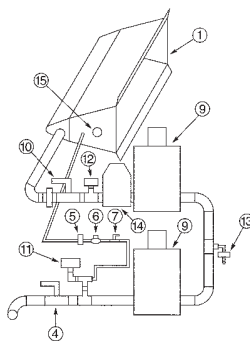
Manifolds for Greater than 750 MBH (BM9, BM10, BM11) - These manifold arrangements include main gas and pilot gas shut-off cocks, manual shut-off leak-test valve, pilot regulator, and pilot solenoid valve. Each manifold is available for inlet gas pressures from 6" w.c. to 5 psi. and utilize 1-1/4" or 2" manifold piping. For gas pressure greater than 5 psi., a pressure regulator must be installed upstream of the unit.



BM9: Optional manifold arrangement to meet ANSI requirements greater than 750 MBH. The pressure regulator and modulating valve are replaced with a combination pressure regulating/modulating valve. The two (2) solenoids are replaced by two (2) fluid power valves, and a manual shut-off, leak test valve is added.



BM10: Optional manifold to meet IRI requirements on units with inputs greater than 750 MBH but less than 1,000 MBH and FM requirements on outdoor units without filters with inputs greater than 750 MBH. The standard pressure regulator and modulating valve are replaced by a combination pressure regulating/modulating valve. The two (2) standard solenoid valves are replaced by two (2) fluid power valves. A manual shut-off, leak test valve and two (2) gas pressure switches are added.



BM11: Optional manifold to meet IRI requirements for units with inputs greater than or equal to 1,000 MBH and FM requirements on all indoor units and outdoor units with filters with inputs greater than 750 MBH. The standard pressure regulator and modulating valve are replaced by a combination pressure regulating/modulating valve. The two (2) standard solenoids are replaced by two (2) fluid power valves and a normally open vent solenoid valve. A manual shut-off, leak test valve and two (2) gas pressure switches are added.

Manifold Pressure Drops — The design inlet gas pressure on RDF products must recognize the pressure drops through the gas train. For maximum capacity, 5.0" w.c. natural gas pressure is required at the burner and 1.3" w.c. propane gas pressure. Use the following chart to determine the pressure drop through the gas train for your installation. Add the required pressure of 5.0" w.c. for natural gas or 1.3" w.c. for propane gas and the manifold pressure drop from the chart to calculate the **required minimum inlet pressure** for your installation.

Burner	Std	BL2	BL3	BL4	BL5	BL6	BL7	BL8	BL9	BL10	BL11	BL13
Max MBH	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
Manifold Std	0.9	2.3	6.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BM5/BN7	0.7	1.9	3.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BM9/BM10/BM11	N/A	N/A	N/A	3.0	4.0	5.1	6.6	8.0	2.5	2.9	3.3	3.8

SAMPLE SPECIFICATIONS - ETL LISTED TO ANSI STANDARDS**GENERAL**

Provide a direct fired makeup air/heating unit as manufactured as a Reznor brand by Thomas & Betts Corporation. The unit shall be designed to meet the standards for direct-fired gas heating equipment as developed by the American National Standards Institute (ANSI Z83.4). Units are ETL listed to ANSI standards.

The unit shall be shipped in one (1) piece from the factory completely wired and piped, with the exception of remote control devices, O/A weatherhoods, filter cabinets and roof curbs. Lifting lugs are to be provided from the factory for rigging the unit.

CABINET

The cabinet shall be of double-wall construction with 1 inch, 1½ lb. density insulation. The construction material used shall be galvalume steel for high corrosion resistance. The unit shall be fully weatherized for outdoor or indoor mounting. All gas and electrical controls shall be mounted in fully weatherized control compartments with easy removable doors. All access panels and doors shall have pocket handles for ease of handling.

The model RDF-(-) by Reznor shall provide () CFM at () in external static pressure. The unit shall provide () BTUH with a temperature rise of () °F and a final air temperature of () °F.

FEATURES

The unit shall be provided with the following features:

A 115 volt and a 24 volt transformer shall be provided for gas, safety and electrical controls. All remote wiring and controls shall be 24 volt. A motor with adjustable drive shall be included. Motors ½ through 3 hp shall be provided with internal overloads and a motor (contactor), (starter with 3 leg protection). All motors 5 hp and larger shall be provided with a motor starter with 3 leg protection.

Burner shall be cast iron with stainless steel mixing plates.

CONTROLS

Gas safety controls shall be provided to meet (ANSI), (IRI), (FM) requirements and will include a flame safeguard relay with flame sensing. Automatic and manual high temperature limits are to be provided at the discharge of the unit and a high temperature safety located at the burner. (Provide firestats at the supply (and return air). (Provide a Freezestat at the discharge of the unit.) An adjustable outside air cut-off shall be provided to shut-off gas when outside air temperatures exceed () °F. Ignition shall be by an electronically controlled hot surface intermittent ignition system with a ceramic ignitor.

The unit shall be provided with (100% outside air, constant volume), (100% outside air, variable volume), (outside and recirculation air, constant volume). The velocity of air over the burner must always remain constant and at no time shall recirculated air pass over the burner. High and low air velocity safety pressure switches shall be provided to protect against low or high air flow over the burner.

The gas temperature controls shall be electronic with accuracy to ± 0.2°F. The nominal turndown ratio shall be 25:1 with total control between high and low fire. The unit shall be provided with prepurge time delay and arranged for positive low-fire start-up. The temperature controls shall be (discharge air control from 55°F- 90°F with an adjustable space override), (adjustable discharge air reset from space temperature). The system shall be resettable from a remote temperature selector mounted on the remote control console. An adjustable outside air controller shall be provided to sense the outdoor air temperature and shut-off the burner if the outdoor temperature exceeds the setpoint on the control.

The unit shall include burner, blower (and damper) service switches (diagnostic analyzer board) in the electrical compartment. A remote operating console shall be provided with a system switch, burner and blower lights, a safety lockout light and a remote temperature selector.

Provide the following accessories:

- (a) Outside air weatherhood (with moisture eliminators).
- (b) Filter cabinet for indoor units.
- (c) Roof curb.
- (d) Weatherized fused disconnect switch.

If specification includes evaporative cooling, add a Reznor Model REC to the RDF Direct-Fired Packaged Makeup Air System. (See Evaporative Cooling Catalog).