REZNOR®

EVAPORATIVE COOLING

EVAPORATIVE COOLING MODULES

Form C-EC-0514 (Version C)

BACKGROUND

Reznor was founded in 1888 to manufacture the “Reznor” reflector heater, which used a luminous flame gas burner developed by George Reznor. This technological breakthrough was an immediate success and hastened the expansion of gas heating in residential and commercial applications. Technological development and innovation have been the hallmark of Reznor products through the years. The development of the forced air gas unit heater, the modular Thermocore® heat exchanger, and the high-efficiency, V3® Series Unit Heater with the Tcore2® single-burner and innovative heat exchanger system, have kept Reznor products at the forefront of technological advances in commercial and industrial gas heating. As a result of this pioneering role in the heating, makeup air, and ventilating equipment field, the products offered today are the most advanced in engineering design to satisfy a wide variety of applications.

FACILITIES

Reznor heaters were first manufactured and sold in Mercer, Pennsylvania (70 miles north of Pittsburgh) in 1888. Over the years, the company has grown and expanded. Today, with sales worldwide, Reznor products are being manufactured at facilities throughout North America and Europe.

PRODUCT SCOPE

Well-equipped engineering laboratories for both product development and testing can be found at many of the manufacturing sites. All domestic lab sites are agency approved.

Reznor Products include a complete line of heating, makeup air, air conditioning and ventilating systems, using gas, oil, hot water/steam, or electric heating or cooling sources. Reznor catalogs are designed to aid the engineer, architect or contractor in specifying the correct equipment for all standard and special applications. Complete data is presented on unit heaters, duct furnaces, infrared heaters, makeup air systems, pre-engineered custom-designed systems, packaged cooling equipment, energy recovery and evaporative cooling modules. Consult your local Reznor Sales Representative for further assistance in specifying Reznor Equipment for your specific application.

SERVICES

Product service requirements are handled through contractors and/or distributors, with backup from local representatives and factory-based service team. Replacement parts inventories for both warranty and non-warranty requirements are maintained at service centers throughout the country and at the manufacturing facilities.

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CATALOG OF REZNOR® EVAPORATIVE COOLING PRODUCTS

Table of Contents

IMPORTANT - MODEL REC MUST BE USED IN DRAW-THROUGH APPLICATION.

NOTE: When specifying a makeup air heating system with evaporative cooling, determine which ordering method best suits the installation.

Contents

IMPORTANT: Specifications are subject to change without notice. This guide is intended to provide specifications and technical information only.

This guide is not intended to be an instruction manual. When installing heating and ventilating equipment, you must check and conform to all local and national building codes. Improper installation of heating and ventilating equipment could be dangerous. Consult manufacturer's installation manual for instructions and important warnings.

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MODEL REC
EVAPORATIVE COOLING MODULE FOR MAKEUP AIR

DESCRIPTION

The Reznor Model REC evaporative cooling module is designed as a freestanding module with duct flanges for connection upstream from an air moving device. The Model REC cooling module may be connected to any Reznor indirect-fired makeup air system, a Reznor direct-fired makeup air system, a Reznor blower cabinet or to some other type of makeup air heating system or blower cabinet within the allowable CFM range. The evaporative cooling module provides excellent comfort cooling at low initial equipment and installation costs and low operating and maintenance costs.

This type of evaporative cooling works on the principles that water in direct contact with a moving airstream will eventually evaporate if the droplets have long enough exposure and that evaporation will lower the air temperature. To increase the droplet exposure to the moving airstream, wetted cellulose media is used to retain the water in order to allow time for evaporation. The Model REC evaporative cooler has standard 6" rigid cellulose media. Optional 12'' cellulose media; 6" or 12" rigid glass fiber media are available. The addition of an optional moisture elimination pad allows for use of the evaporative cooling module at higher air velocities.

The thermally protected water pump features a heavy duty, fan cooled motor with moistureproof windings along with a corrosion resistant one-piece motor shaft. The snapout base allows for simple access to the impeller for easy cleaning. The pump is wired to allow for manual or automatic thermostat switching to call for cooling.

Standard equipment includes an electrically activated, pump-protector, float switch to ensure that an adequate amount of water is in the reservoir prior to the pump being energized. An automatic float and constant bleed line maintains the proper reservoir level while allowing the appropriate bleed-off to prevent accumulation of scale deposits including calcium and magnesium salts. The optional Aqua Saver® water metering system is designed to decrease water usage by automatically regulating water flow by time and temperature and to decrease maintenance requirements by eliminating the pump and float switches.

STANDARD FEATURES

- Easily accessible, self-cleaning, high-efficiency evaporative media of 6" rigid cellulose media
- Thermally protected water pump
- Electrical motor-protection float switch with stainless steel arm
- Float valve and bleed line
- 115 volt supply voltage
- Terminal block wiring
- Overflow and drain connections in cabinet bottom (1/2'' pipe or standard hose thread)
- 300 Series Grade stainless steel water reservoir
- Weatherized cabinet with mesh intake screen
- Adjustable legs

OPTIONAL FEATURES

- Stainless steel cabinet
- 12" rigid cellulose media, 6" or 12" rigid glass fiber media
- Moisture elimination pad
- 208 or 230 volt power supply capability
- Automatic fill and drain kit
- Aqua Saver® water metering system
- Water Hammer Arrestor

TECHNICAL DATA

Size		40	50	60	70	80	90	180	360 [C]
Evaporative Efficiency [A]	with 6" media	68%	68%	68%	68%	68%	68%	68%	
	with 12" media	90%	90%	90%	90%	90%	90%	90%	
Maximum Cooling CFM		4,110	5,060	5,860	7,125	8,075	8,860	17,730	
Maximum Face Velocity [B], (Optional moisture) elimination pad required above 600 FPM)		950	950	950	950	950	950	950	
Pump Horsepower		1/70	1/70	1/70	1/70	1/70	1/70	1/50	
Amps @ 115V/1 phase		0.92	0.92	0.92	0.92	0.92	0.92	1.1	
Watts		.85	.85	.85	.85	.85	.85	.80	
Media Face size - Media pads are in sections	Dimensions	24" x 26"	24" x 32"	24" x 37"	24" x 45"	24" x 51"	24" x 56"	48" x 56"	
	Square Feet	4.33	5.33	6.17	7.50	8.50	9.33	18.67	

[A] The cooling efficiency was determined at the maximum allowable CFM without the moisture elimination pad with an inlet dry bulb temperature of 95°F and an inlet wet bulb temperature of 65°F. Evaporative cooling efficiency is a function of inlet temperature (wet and dry bulbs) and of face velocity through the pads. The stated cooling efficiency will rise with the decrease of velocity and the increase of inlet temperature.

[B] Velocity (FPM) = CFM ÷ Media face size (sq. ft.)

[C] REC-360 is shipped as two REC-180, one left hand, one right hand. One fill - drain kit may be used if fills and drains are manifolded. One freeze protection kit may be used for AquaSavers.

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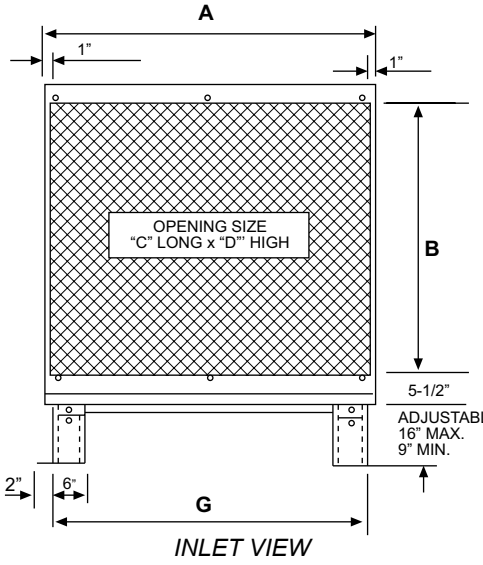
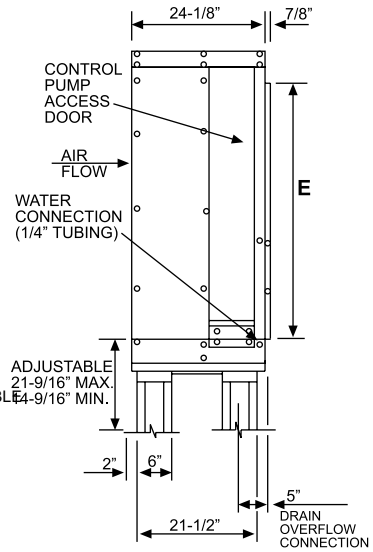
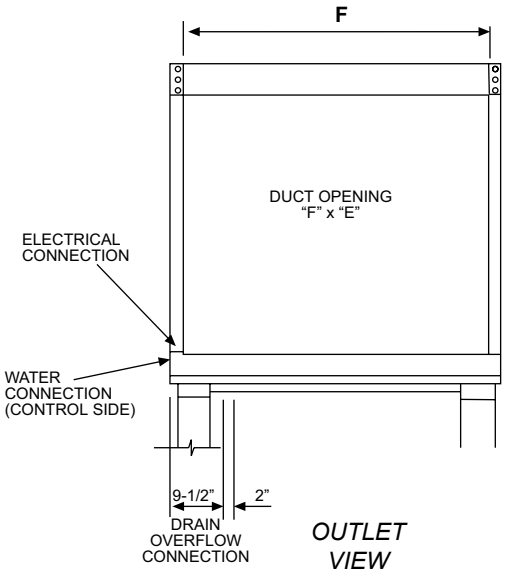
MODEL REC DIMENSIONAL DATA (+ or - 1/8")



INLET VIEW



SIDE VIEW



OUTLET VIEW

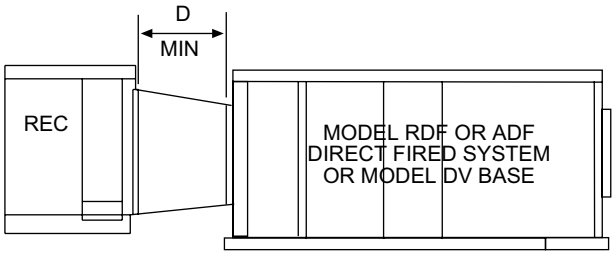
MODEL SIZE	A		B		INLET C		INLET D		DUCT OPENING E		DUCT OPENING F		G	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
40	28 1/2	(724)	23 3/4	(603)	26 1/2	(673)	24	(610)	21 1/4	(540)	23 3/4	(603)	26	(660)
50	34	(864)	23 3/4	(603)	32	(813)	24	(610)	21 1/4	(540)	29 1/4	(743)	31 1/2	(800)
60	39 1/2	(1,003)	23 3/4	(603)	37 1/2	(953)	24	(610)	21 1/4	(540)	34	(864)	37	(940)
70	47 3/4	(1,213)	23 3/4	(603)	45 3/4	(1,162)	24	(610)	21 1/4	(540)	34 3/4	(883)	45 1/4	(1,149)
80	53 1/4	(1,353)	23 3/4	(603)	51 1/4	(1,302)	24	(610)	21 1/4	(540)	48 1/2	(1,232)	50 3/4	(1,289)
90	58 3/4	(1,492)	23 3/4	(603)	56 3/4	(1,441)	24	(610)	21 1/4	(540)	54	(1,372)	56 1/4	(1,429)
180	58 3/4	(1,492)	47 3/4	(1,213)	56 3/4	(1,441)	48	(1,219)	45 1/4	(1,149)	54	(1,372)	56 1/4	(1,429)

Weight - Model REC Evaporative Cooling Module

Size		40		50		60		70		80		90		180		360	
		lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
Ship Weight	with 6" cellulose media	158	(72)	168	(76)	182	(83)	212	(96)	224	(102)	239	(108)	313	(142)	0	0
	with 12" cellulose media	163	(74)	174	(79)	189	(86)	221	(100)	234	(106)	249	(113)	335	(152)	0	0
	with 6" glass fiber media	162	(73)	173	(78)	188	(85)	220	(100)	232	(105)	248	(112)	332	(151)	0	0
	with 12" glass fiber media	172	(78)	185	(84)	202	(92)	237	(108)	252	(114)	269	(122)	374	(170)	0	0
Net Wt. with **wet** media and a Full Reservoir	with 6" cellulose media	173	(78)	197	(89)	218	(99)	249	(113)	271	(123)	292	(132)	379	(172)	0	0
	with 12" cellulose media	184	(83)	212	(96)	237	(108)	270	(122)	295	(134)	318	(144)	431	(196)	0	0
	with 6" glass fiber media	181	(82)	206	(93)	230	(104)	262	(119)	285	(129)	308	(140)	420	(191)	0	0
	with 12" glass fiber media	201	(91)	230	(104)	261	(118)	296	(134)	305	(138)	350	(159)	514	(233)	0	0

MODEL REC DIMENSIONAL DATA FOR FIELD SUPPLIED TRANSITION DUCT

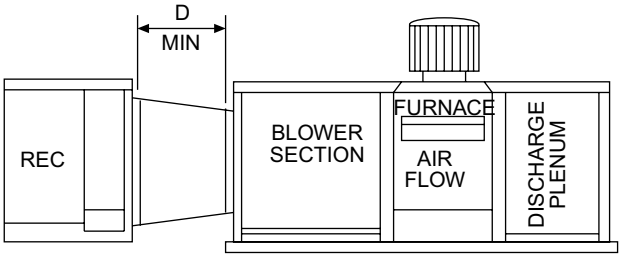
Minimum length of transition duct for connection to Reznor Direct-Fired Makeup Air System.



NOTE: Top view of duck work must be symmetrical

Model and Size	D
ADF/ADFH 300/500	24"
ADF/ADFH 700/1200	30"
RDF1, RDF2	38"
RDF3	42"

Minimum length of transition duct for connection to Reznor Indirect-Fired System or Air Handler.



NOTE: Top view of duck work must be symmetrical

Model and Size	D
REC 40 - 90	24"
REC 180	30"

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OPTIONAL EVAPORATIVE COOLING MODULE FOR MAKEUP AIR

APPLIES TO INDIRECT-FIRED MODEL SERIES RPB, RPBL, SSCBL, PGBL, BLOWER CABINETS RBL, RBA,

DESCRIPTION

Evaporative Cooling Module Inlet View

The Reznor evaporative cooling module is available as an option with Reznor direct-fired and indirect-fired, packaged makeup air systems. It is available as a factory-installed option on heating/makeup air Model Series RPB, ADF/ADFH300/500, and blower cabinet Model RBA. On larger capacity, packaged heating/makeup air Model Series RPBL, SSCBL, PGBL, ADF/ADFH700/1200 and blower cabinet Model RBL, the evaporative cooling module is shipped separately for field installation. With both the factory- and field-installed module, the makeup air/evaporative cooling package is a unified system requiring only one electrical supply connection. When compared to expensive mechanical cooling, evaporative cooling provides excellent comfort cooling at lower equipment, installation, operation and maintenance costs.

This type of evaporative cooling works on the principles that water in direct contact with a moving airstream will eventually evaporate if the droplets have long enough exposure and that evaporation will lower the air temperature. To increase the droplet exposure to the moving airstream, wetted rigid cellulose media is used in Reznor evaporative cooling modules to retain the water. Reznor evaporative coolers are also available with 12" rigid cellulose media; 6" or 12" rigid glass fiber media.

The addition of an optional moisture elimination pad allows for use of the evaporative cooling module at higher air velocities.

The thermally protected water pump features a heavy duty, fan-cooled motor with moistureproof windings along with a corrosion resistant one-piece motor shaft. The snapout base allows for simple access to the impeller for easy cleaning. The pump is wired to allow for a manual switch for cooling or an automatic thermostat cooling operation.

Standard equipment includes an electrically activated, pump-protector, float switch to ensure that an adequate amount of water is in the reservoir prior to the pump being energized. An automatic float and constant bleed line maintains the proper reservoir level while allowing the appropriate bleed-off to prevent accumulation of scale deposits including calcium and magnesium salts. The optional Aqua Saver® water metering system is designed to decrease water usage by automatically regulating water flow by time and temperature and to decrease maintenance requirements by eliminating the pump and float switches.

STANDARD FEATURES

- Easily accessible, self-cleaning, high-efficiency evaporative media
- Thermally protected water pump
- Electrical motor-protection float switch with stainless steel arm
- Float valve and bleed line
- Voltage compatible to the packaged blower motor
- Terminal block wiring
- Overflow and drain connections in cabinet bottom (1/2" pipe or standard hose thread)
- 300 Series Grade stainless steel water reservoir
- Weatherized cabinet with mesh intake screen

OPTIONAL FEATURES

- Stainless steel cabinet
- 12" rigid cellulose; 6" or 12" glass fiber media
- Moisture elimination pad
- Automatic fill and drain kit
- Aqua Saver® water metering system
- Water Hammer Arrestor

TECHNICAL DATA

Models		RPB[A] and RBA[B]										
Size of Heater		75	100	125	150	175	200	225	250	300	350	400
Evaporative Efficiency[E]	Options AS3 or AS5 with 6" media	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%
	Options AS4 or AS8 with 12" media	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Maximum Cooling Air Flow	CFM	2,645	3,000	3,800	4,700	5,000	5,100	5,150	5,800	6,300	6,800	7,100
	M^3/hr	4,494	5,097	6,456	7,985	8,495	8,665	8,750	9,854	10,703	11,553	12,063
Maximum Face Velocity[F] (Optional moisture elimination pad required above 600 FPM - 3,000 mm/s)	FPM	611	693	878	882	938	827	835	773	840	800	761
	mm/s	3,103	3,520	4,458	4,480	4,765	4,199	4,240	3,929	4,267	4,064	3,866
Pump Horsepower		1/70	1/70	1/70	1/70	1/70	1/70	1/70	1/70	1/70	1/70	1/70
Amps @ 115V/1 phase		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Watts		85	85	85	85	85	85	85	85	85	85	85
Media Face Size - Media pads are in sections	Dimensions	24" x 36"			24" x 32"		24" x 37"		24" x 45"		24" x 51"	24" x 56"
	Square Feet	4.33			5.33		6.17		7.50		8.50	9.33

Models		RPBL[C] SSCBL, PGBL and RBL[D]							ADF/ADFH			
Size of Heater		400	500	600	700	800	1050	1200	300	500	700	1200
Evaporative Efficiency[E]	Options AS3 or AS5 with 6" media	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%
	Options AS4 or AS8 with 12" media	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Maximum Cooling Air Flow	CFM	14,000	12,000	12,500	13,500	13,500	13,500	13,500	5,060	7,125	10,000	15,500
	M^3/hr	23,785	20,387	21,237	22,936	22,936	22,936	22,936	8,597	12,105	16,989	26,334
Maximum Face Velocity[F] (Optional moisture elimination pad required above 600 FPM - 3,000 mm/s)	FPM	750	643	670	723	723	723	723	949	950	536	830
	mm/s	3,809	3,265	3,401	3,673	3,673	3,673	3,673	4,823	4,826	2,721	4,217
Pump Horsepower		1/50	1/50	1/50	1/50	1/50	1/50	1/50	1/70	1/70	1/50	1/50
Amps @ 115V/1 phase		1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.92	0.92	1.1	1.1
Watts		80	80	80	80	80	80	80	85	85	80	80
Media Face Size - Media pads are in sections	Dimensions	48" x 56"							24" x 32"	24" x 45"	48" x 56"	
	Square Feet	18.67							5.33	7.50	18.67	

[A] Also applies to Models CRGB/RPB with prefix "H."
[B] Technical data for Model RBA is the same as size 150.
[C] Also applies to Model CRGBL.
[D] Technical data for Model RBL is the same as size 400.
[E] The cooling efficiency was determined at the maximum allowable CFM without the moisture elimination pad and with an inlet dry bulb temperature of 95°F and an inlet wet bulb temperature of 65°F. Evaporative cooling efficiency is a function of inlet temperature (wet and dry bulbs) and of face velocity through the pads. The stated cooling efficiency will rise with the decrease of velocity and the increase of inlet temperature.
[F] Velocity (FPM) = CFM ÷ Media face size (sq. ft.)
[G] Maximum CFM for ADF300 is 5,000 and Model ADF500 is 5,500. Maximums on table are for Model ADFH.

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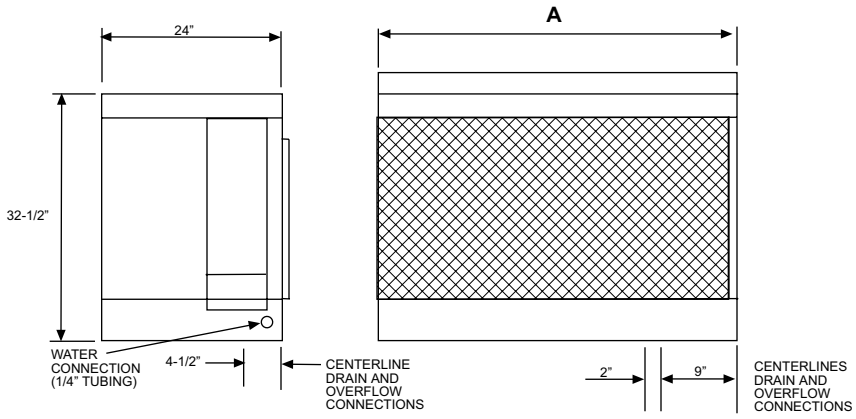
DIMENSIONAL DATA (ACCURATE TO WITHIN PLUS OR MINUS 1/8")

OPTIONAL EVAPORATIVE COOLING MODULE FOR INDIRECT-FIRED MODEL SERIES RPB, BLOWER CABINET MODEL RBA, and DIRECT-FIRED MODEL ADF/ADFH 300/500 (Cooling module is factory installed)

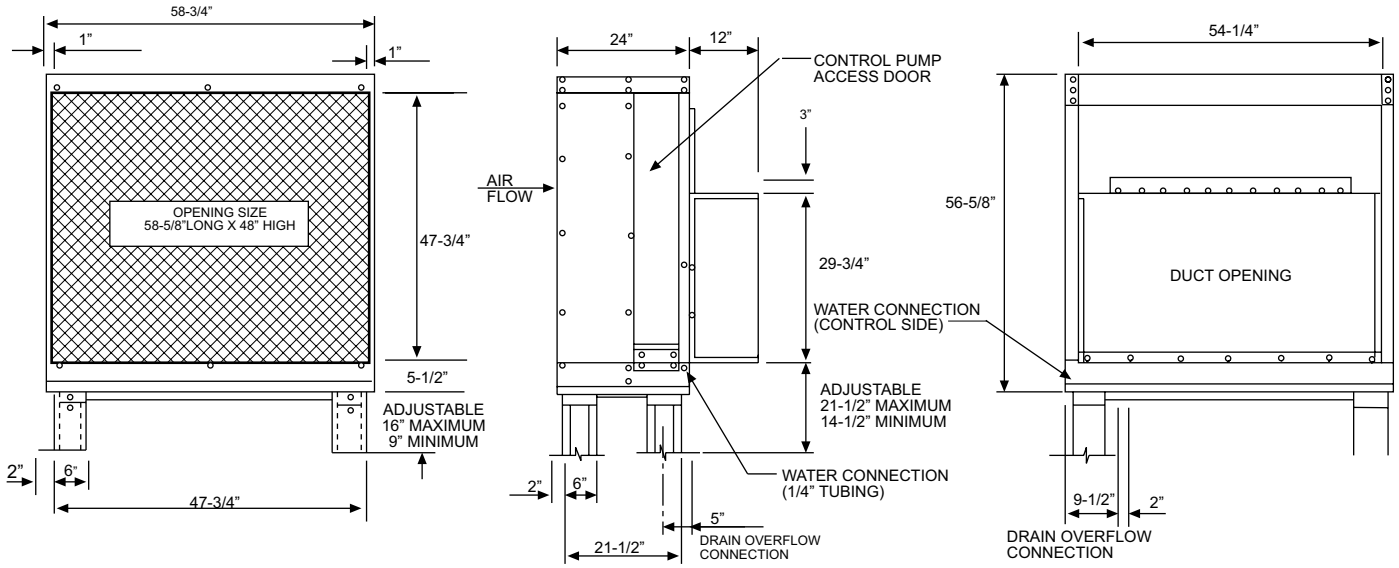


ADF/ADFH	RPB	-	A	
-	-	-	in.	mm
-	75, 100, 125	-	28 1/2	(724)
300	150, 175	RBA	34	(864)
-	200, 225	-	39 1/2	(1,003)
500	250, 300	-	47 3/4	(1,213)
-	350	-	53 1/4	(1,353)
-	400	-	58 3/4	(1,492)

Weights (lbs.) - Optional Evaporative Cooling Module

For Model RBA			-		RBA		-		-		-		-	
For Model ADF/ADFH - Size			-		300		-		500		-		-	
For Model RPB - Size			75, 100, 125		150, 175		200, 225		250, 300		350		400	
			lbs.	(kg)	lbs.	(kg)	lbs.	(kg)	lbs.	(kg)	lbs.	(kg)	lbs.	(kg)
Ship Weight (includes weight of heater crate addition)	AS3	with 6" cellulose media	158	(72)	168	(76)	182	(83)	212	(96)	224	(102)	239	(108)
	AS4	with 12" cellulose media	163	(74)	174	(79)	189	(86)	221	(100)	234	(106)	249	(113)
	AS5	with 6" glass media	162	(73)	173	(78)	188	(85)	220	(100)	232	(105)	248	(112)
	AS8	with 12" glass media	172	(78)	185	(84)	202	(92)	237	(108)	252	(114)	269	(122)
Net Weight with **wet** media and a Full Reservoir	AS3	with 6" cellulose media	173	(78)	197	(89)	218	(99)	249	(113)	271	(123)	292	(132)
	AS4	with 12" cellulose media	184	(83)	212	(96)	237	(108)	270	(122)	295	(134)	318	(144)
	AS5	with 6" glass media	181	(82)	206	(93)	230	(104)	262	(119)	285	(129)	308	(140)
	AS8	with 12" glass media	201	(91)	230	(104)	261	(118)	296	(134)	305	(138)	350	(159)

OPTIONAL EVAPORATIVE COOLING MODULE FOR INDIRECT-FIRED MODEL SERIES RPBL, PGBL, SSCBL, BLOWER CABINET MODEL RBL and DIRECT-FIRED MODEL ADF/ADFH 700/1200



- Includes cooling module, base with adjustable legs and transition duct.
- Cooling module is factory assembled.
- Base and transition duct require field assembly.
- Complete instructions are included for required field installation.

***NOTE:** Evaporative cooling module for indoor installations must be mounted on a platform; the cooling module cannot be suspended. Refer to REC (page 2) and evaluate to determine most suitable method of ordering cooling module for an indoor installation.*

Weights (lbs) - Optional Evaporative Cooling Module for Models RPBL, SSCBL, PGBL and RBL

			lbs.	(kg.)
Ship Weight (Shipped Separately)	AS3	with 6" cellulose media	313	(142)
	AS4	with 12" cellulose media	335	(152)
	AS5	with 6" glass media	332	(151)
	AS8	with 12" glass media	374	(170)
Net Weight with **wet** media and a Full Reservoir	AS3	with 6" cellulose media	379	(172)
	AS4	with 12" cellulose media	431	(196)
	AS5	with 6" glass media	420	(191)
	AS8	with 12" glass media	514	(233)

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Pressure Drop and Sizing (Cross-Reference Chart)

For selecting a Model REC Evaporative Cooling Module to field add to a currently manufactured Reznor packaged makeup air system (Model REC does not include transition duct.)

Model	Used with Models	CFM[A]	Pressure Drop		
			6" Media	12" Media	Moisture Elimination Pad
REC 40	RPB 75, 100, 125 RDF 1-20	575	0.01	0.02	N/A
		1000	0.03	0.06	N/A
		1500	0.06	0.12	N/A
		2000	0.1	0.2	0.11
		2500	0.16	0.32	0.172
		3000	0.22	0.44	0.248
		3500	0.3	0.6	0.337
		4000	0.4	0.8	0.44
REC 50	RPB 150, 175 RBA RDF 1-40 ADF/ADFH 300	1175	0.02	0.04	N/A
		1500	0.04	0.08	N/A
		2000	0.06	0.12	0.077
		2500	0.1	0.2	0.12
		3000	0.14	0.28	0.173
		3500	0.2	0.4	0.235
		4000	0.26	0.52	0.307
		4500	0.32	0.64	0.389
		5000	0.4	0.8	0.48
REC 60	RPB 200, 225	1550	0.03	0.06	N/A
		2000	0.04	0.08	0.053
		2500	0.07	0.14	0.083
		3000	0.1	0.2	0.12
		3500	0.13	0.26	0.163
		4000	0.18	0.36	0.213
		4500	0.23	0.46	0.27
		5000	0.28	0.56	0.333
		5500	0.34	0.68	0.403
		5800	0.37	0.74	0.48
REC 70	RPB 250, 300 RDF 1-50, 1-65 ADF/ADFH 500	1950	0.03	0.06	0.039
		2500	0.05	0.1	0.061
		3000	0.07	0.14	0.088
		3500	0.1	0.2	0.12
		4000	0.13	0.26	0.157
		4500	0.16	0.32	0.198
		5000	0.2	0.4	0.245
		5500	0.25	0.5	0.296
		6000	0.29	0.58	0.353
		6500	0.34	0.68	0.414
		7000	0.4	0.8	0.48

[A] For CFM limitations see Technical Data on page 2.
[B] Limited to no more than 17,730 CFM.

Model	Used with Models	CFM[A]	Pressure Drop		
			6" Media	12" Media	Moisture Elimination Pad
REC 80	RPB 350	2750	0.05	0.1	0.057
		3500	0.08	0.16	0.092
		4000	0.1	0.2	0.12
		4500	0.13	0.26	0.152
		5000	0.16	0.32	0.188
		5500	0.19	0.38	0.227
		6000	0.22	0.44	0.27
		6500	0.26	0.52	0.317
		7000	0.31	0.62	0.368
		7500	0.35	0.7	0.422
		8000	0.4	0.8	0.48
REC 90	RPB 400	3100	0.05	0.1	0.053
		3500	0.06	0.12	0.073
		4000	0.08	0.16	0.095
		4500	0.1	0.2	0.12
		5000	0.12	0.24	0.148
		5500	0.15	0.3	0.179
		6000	0.18	0.36	0.213
		6500	0.21	0.42	0.25
		7000	0.24	0.48	0.29
		7500	0.28	0.56	0.333
		8000	0.32	0.64	0.379
		8500	0.36	0.72	0.428
		8800	0.38	0.76	0.48
REC 180	RPBL/PGBL SSCBL All Sizes RBL RDF 2-80, 2-120 ADF/ADFH 700/1200	3100	0.01	0.02	0.013
		4000	0.02	0.04	0.024
		5000	0.03	0.06	0.037
		6000	0.04	0.08	0.053
		7000	0.05	0.1	0.073
		8000	0.07	0.14	0.095
		9000	0.09	0.18	0.12
		10000	0.11	0.22	0.148
		11000	0.13	0.26	0.179
		12000	0.15	0.3	0.213
		13000	0.18	0.36	0.25
		14000	0.21	0.42	0.29
		15000	0.25	0.5	0.333
		16000	0.28	0.56	0.379
		17000	0.32	0.64	0.428
		18000	0.36	0.72	0.48
REC 180	RDF 3-180, 3-260[B]				

NOTES:

(1) This chart is provided for easy reference only. The Model REC module may be connected to any Reznor indirect-fired makeup air system, a Reznor direct-fired makeup air system, a Reznor blower cabinet or to some other type of makeup air system or blower cabinet within the allowable CFM range. Important: Model REC Evaporative Cooling Module must be used in a draw-through application.

(2) The addition to the Model REC module may considerably increase the total static pressure of the system which may require an increase in motor capacity.

(3) The Model REC is designed so that it can be used for indoor or outdoor installation. The Evaporative Cooling Module must be mounted and must be supplied with outside makeup air.

(4) All installations must include the appropriate field-supplied transition duct. See dimensions.

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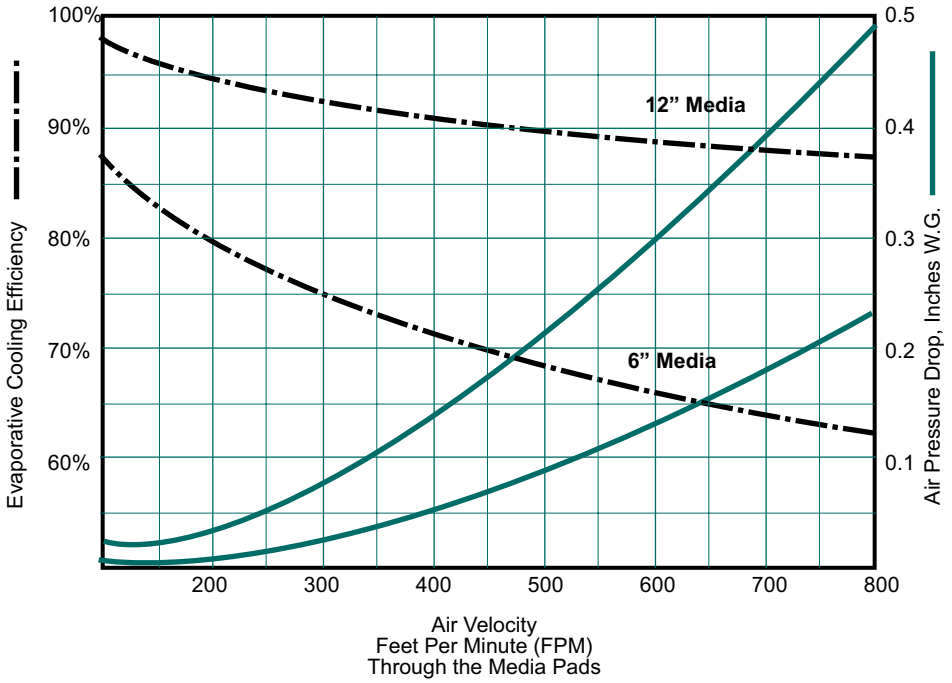
Evaporative Cooling Media

The media consists of a cross-fluted pad of cellulose materials impregnated with insoluble salts, rigidifying saturants and wetting agents, and provides at least 123 square feet of evaporative surface per cubic foot of media. Twelve inch pads have less than 0.25 inches water column air pressure drop at 550 FPM face velocity when wet. Design will be typically targeted for 500 FPM and maximum design specification will be 550 FPM.

Fire rated media may be specified as an optional media material. The cross-fluted pad material consists of large glass fibers bound together by inorganic, noncrystalline fillers and is approved with a UL 900, Class 2 rating up to 12" depth.



Calculations and Estimates

To Calculate Air Velocity Through the Media	**Example:**
FPM = Air Velocity in Feet per Minute	
CFM = Air Volume in Cubic Feet per Minute	CFM = 12,900
Media Face Size in square feet - from Technical Data Table (Page 2 or 4)	Media Face Size = 18.67 sq. ft.
CFM ÷ Media Face Size = FPM	12,900 CFM ÷ 18.67 sq. ft. = 690 FPM
To Estimate Cooler Discharge Temperature	
EDBT = Entering ambient dry bulb temperature in °F	EDBT = 90°F
EWBT = Entering ambient wet bulb temperature in °F	EWBT = 72°F
LDBT = Leaving dry bulb temperature in °F	
EDBT - [pad efficiency* x (EDBT - EWBT)] = LDBT (°F)	90°F - [89%* x (90°F - 72°F)] = 74°F
Pad efficiency can be determined by using the calculated velocity and the evaporative cooling media curves (above).	Pad efficiency is 89% for 12" Media at 690 FPM.
To Estimate Water Evaporation	
Evaporated water in gallons per hour is equal to	
CFM x (EDBT - LDBT) ÷ 10,000 = Evaporated water (GPH)	12,900 x (90°F - 74°F) ÷ 10,000 = 21 GPH

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Sample Specification

REC – EVAPORATIVE COOLING MODULE FOR MAKEUP AIR APPLICATIONS

Provide evaporative cooling module as manufactured as Reznor® brand for makeup air application. These units shall be the Model REC series designed to provide excellent comfort cooling at low initial equipment and installation costs and low operating costs.

Cabinet shall constructed of weatherized (aluminized steel) (stainless steel) for outdoor installation. A mesh screen will cover the air intake opening. Unit shall be provided with height adjustable legs.

Units shall be equipped with terminal block wiring for use with 115 (208, 230) volt supply voltage.

Cabinet bottom shall have overflow and drain connections and a 300 series grade stainless steel water reservoir.

Module shall be equipped with pump and float control system including electrical motor with stainless steel arm, thermally protected water pump, float switch and bleed line connections (Aqua Saver® water metering system with solenoid valve and timer).

Evaporative cooling media supplied to be (6, 12) inches in size and to be made of (rigid cellulose material, rigid glass fiber material-UL rated).

Optional equipment shall include (moisture elimination pad) and (drain and fill kit) and (water hammer arrestor).

Product to be warranted to the original owner/user to be free from defects in material or workmanship. Limited warranty to be for twelve (12) months from date of installation or eighteen (18) months from date of shipment from manufacturer, whichever occurs first.

AQUA SAVER® WATER METERING SYSTEM - Option ECD1

General Description

The Aqua Saver System is a water metering device that automatically adjusts its wetting cycle based on changes in the ambient dry bulb temperature. The Aqua Saver water control device is available only on Reznor Evaporative Cooling Modules. It is ordered as Option ECD1.

The Aqua Saver System is designed to automatically adjust to ambient temperature changes and thus provides the right amount of water flow to the media, resulting in increased media life, significantly less maintenance and less operation costs.

At 80°F, the Aqua Saver System engages the solenoid valve for approximately two (2) minutes for each of the ten cam lobes, making a complete on/off cycle every six (6) minutes. As the ambient temperature increases, the “on” time automatically increases to compensate for the media’s ability to evaporate more water in less time. The amount of water to the pad can be adjusted in two ways. First, the actual water flow rate to the pad can be adjusted. Each Aqua Saver System comes complete with a flow valve to aid in regulating the correct flow of water to the media. Second, the timer can be adjusted to shorten or lengthen water flow time.

Water Flow

The water should flow from the top to the bottom of the pad in 30 to 45 seconds depending on the height of the pad. The water pressure to the Aqua Saver flow valve should be between 40 and 60 psi. If the pressure is below 40 psi the Aqua Saver System “on” time will have to be lengthened or the next larger valve size will be required. If the water pressure is over 60 psi, a pressure regulator is required. Consult your factory representative when water pressure is below 40 psi.

Maintenance

The Aqua Saver System requires little maintenance other than turning off the water supply and draining the unit at the end of the cooling season to prevent freeze damage to the valve body. The water line should be completely drained and the unit operated for about ten minutes. This allows the valve to open and close through at least two cycles. At the beginning of the cooling season, turn the supply water on to restart the system.

MOISTURE ELIMINATION PAD - Option ASA1

The moisture elimination pad is designed to prevent draw through of water into the blower cabinet. A moisture elimination pad may be used on any evaporative cooling module but is required on installations with over 600 FPM (FPM = CFM ÷ Sq. Ft. of Media Face -- see Technical Data on pages 2 or 4). On REC Sizes 40-90 and equivalent option applications (see Cross Reference Chart on page 6), the moisture elimination pad is factory installed. On REC Size 180 and equivalent option applications, the optional moisture elimination pad is shipped separately for field installation.

AUTOMATIC FILL AND DRAIN KIT - Option CT

The automatic fill and drain kit includes a three-way solenoid valve in the supply line and a two-way solenoid valve in the drain line. When there is a call for cooling, the supply valve will automatically provide water flow to the cooling module. Where the cooling requirement is met, the drain valve will automatically drain the water from the cooling module reservoir. The optional automatic fill and drain kit is shipped separately for field installation. It is designed for use with the standard float and pump waterflow system but may be used with the optional Aqua Saver® time and temperature control system.

WATER HAMMER ARRESTOR - Option ECB1

At some locations due to various water pressures and installation conditions, the closing of the solenoid valve in the Aqua Saver® system may cause the water supply line to bang abruptly. Installing the water hammer arrestor in the supply line will minimize this banging by providing a permanent air cushion to absorb the shock wave. The optional water hammer arrestor is shipped separately for field-installation.

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LIMITED PRODUCT WARRANTY

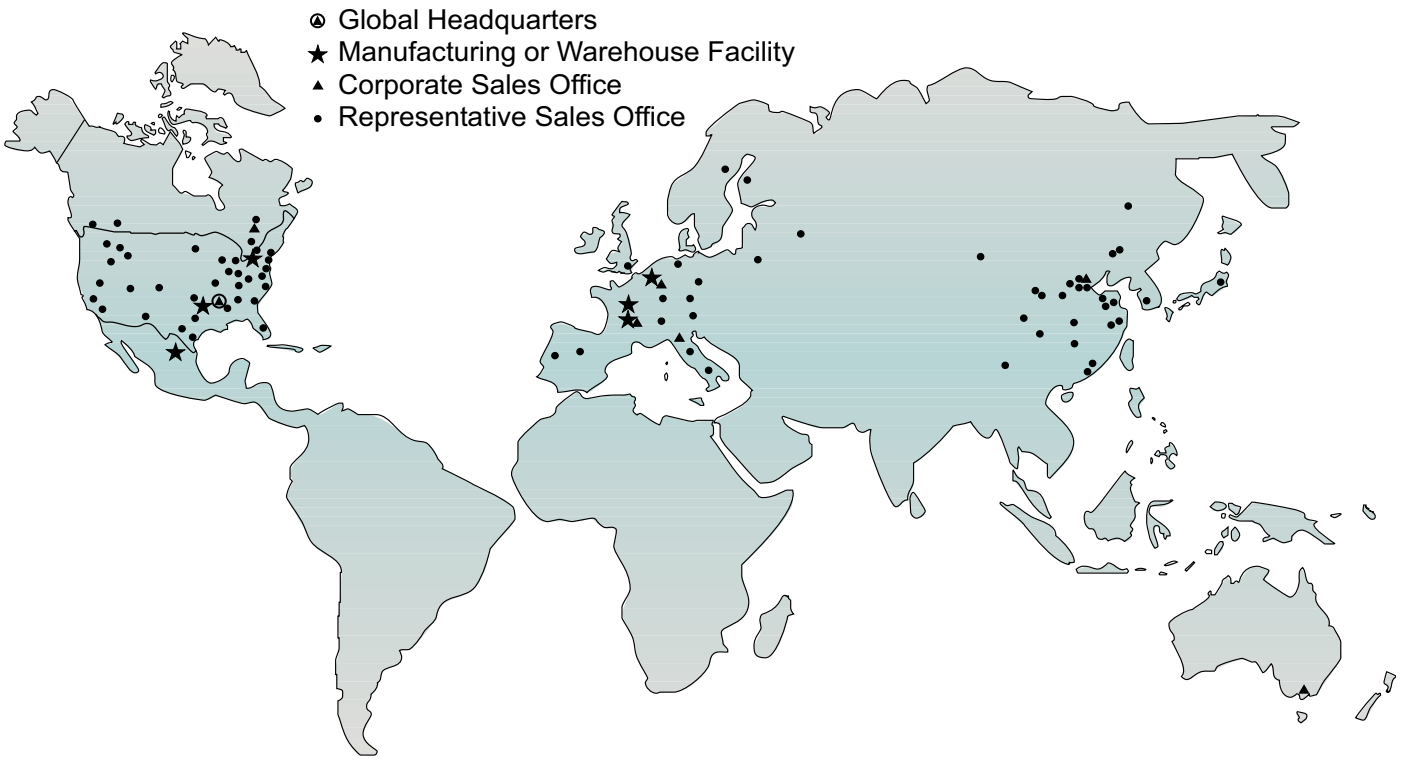
Reznor, LLC warrants to the original owner-user that this Reznor product will be free from defects in material or workmanship. This warranty is limited to twelve (12) months from the date of original installation, whether or not actual use begins on that date, or eighteen (18) months from date of shipment by Reznor, LLC, whichever occurs first.

LIMITATIONS AND EXCLUSIONS

Reznor, LLC obligations under this warranty and the sole remedy for its breach are limited to repair, at its manufacturing facility, of any part or parts of its Reznor products which prove to be defective; or, in its sole discretion, replacement of such products. All returns of defective parts or products must include the product model number and serial number, and must be made through an authorized Reznor distributor or arranged through Reznor Customer Service. Authorized returns must be shipped prepaid. Repaired or replacement parts will be shipped by Reznor, LLC F.O.B. shipping point.

1. The warranty provided herein does not cover charges for labor or other costs incurred in the troubleshooting, repair, removal, installation, service or handling of parts or complete products.
2. All claims under the warranty provided herein must be made within ninety (90) days from the date of discovery of the defect. Failure to notify Reznor, LLC of a warranted defect within ninety (90) days of its discovery voids Reznor, LLC obligations hereunder.
3. The warranty provided herein shall be void and of no effect in the event that (a) the product has been operated outside its designed output capacity (heating, cooling, airflow); (b) the product has been subjected to misuse, neglect, accident, improper or inadequate maintenance, corrosive environments, environments containing airborne contaminants (silicone, aluminum oxide, etc.), or excessive thermal shock; (c) unauthorized modifications are made to the product; (d) the product is not installed or operated in compliance with the manufacturer's printed instructions; (e) the product is not installed and operated in compliance with applicable building, mechanical, plumbing and electrical codes; or (f) the serial number of the product has been altered, defaced or removed.
4. The warranty provided herein is for repair or replacement only. Reznor, LLC shall not be liable for any loss, cost, damage, or expense of any kind arising out of a breach of the warranty. Further, Reznor, LLC shall not be liable for any incidental, consequential, exemplary, special, or punitive damages, nor for any loss of revenue, profit or use, arising out of a breach of this warranty or in connection with the sale, maintenance, use, operation or repair of any Reznor product. In no event will Reznor, LLC be liable for any amount greater than the purchase price of a defective product. The disclaimers of liability included in this paragraph 4 shall remain in effect and shall continue to be enforceable in the event that any remedy herein shall fail of its essential purpose.
5. THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY FOR REZNOR PRODUCTS, AND IS IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES. REZNOR, LLC SPECIFICALLY DISCLAIMS ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. No person or entity is authorized to bind Reznor, LLC to any other warranty, obligation or liability for any Reznor product. Installation, operation or use of the Reznor product for which this warranty is issued shall constitute acceptance of the terms hereof.

Reznor® is your global source for heating, ventilating and air conditioning equipment.



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For more information on Reznor HVAC Equipment, contact your local Reznor Representative by calling 800-695-1901.
Or, find us on the internet at www.ReznorHVAC.com

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