Installation, Operation, and Maintenace Manual

2026

RZ Series (45-240 ton) Startup Forms

Packaged Rooftop Units and Outdoor Air Handling Units

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1. APPENDIX A - HEAT EXCHANGER CORROSION RESISTANCE

Corrosion Resistance of Copper and Stainless Steel in Brazed Plate Heat Exchangers - Points to Measure and Check in a Water Analysis

The resistance guide provides information on the corrosion resistance of a stainless steel type AISI 316 and pure Copper (99.9%) in water, to a number of important chemical factors. The actual corrosion resistance rate is a very complex process influenced by many different factors in combination.

Explanations:

- (+) Good resistance under normal conditions
- (0) Corrosion problems may occur, especially when multiple factors have a value of zero.
- (-) Use is not recommended

Table 1: Corrosion Resistance Guide

Water Containing	Concentration (mg/l or ppm)	Time Limits - Analyze Before	AISI 316	SMO 254	Copper Alloy	Nickel Alloy
Alkalinity (HCO_3^-)	< 70	Within 24 Hours	+	+	0	+
	70-300		+	+	+	+
	> 300		+	+	0/+	+
Sulfate (SO_4^{2-})	< 70	No Limit	+	+	+	+
	70-300		+	+	0/-	+
	> 300		0	0	-	+
HCO_3^-/ SO_4^{2-}	> 1.0	No Limit	+	+	+	+
	< 1.0		+	+	0/-	+
Electrical Conductivity	< 10µS/cm	No Limit	+	+	0	+
	10-500 µS/cm		+	+	+	+
	> 500 µS/cm		+	+	0	+
pH	< 6.0	Within 24 Hours	0	0	0	+
	6.0-7.5		0/+	+	0	+
	7.5-9.0		+	+	+	+
	> 9.0		+	+	0	+
Ammonium ($NH4^+$)	< 2	Within 24 Hours	+	+	+	+
	2-20		+	+	0	+
	> 20		+	+	-	+
Chlorides (Cl^-)*	< 300	No Limit	+	+	+	+
	> 300		0	+	0/+	+
Free Chlorine (Cl_2)	< 1	Within 5 Hours	+	+	+	+
	1-5		+	+	0	+
	> 5		0/+	+	0/-	+
Hydrogen Sulfide (H_2S)	< 0.05	No Limit	+	+	+	+
	> 0.05		+	+	0/-	+
Free (aggressive) Carbon Dioxide (CO_2)	< 5	No Limit	+	+	+	+
	5-20		+	+	0	+
	> 20		+	+	-	+

*See Chloride Content Table

Table 2: Corrosion Resistance Guide Continued

Water Containing	Concentration (mg/l or ppm)	Time Limits - Analyze Before	AISI 316	SMO 254	Copper Alloy	Nickel Alloy
Total Hardness (°dH)	4.0-8.5	No Limit	+	+	+	+
Nitrate (NO_3)	< 100	No Limit	+	+	+	+
	> 100		+	+	0	+
Iron (Fe)	< 0.2	No Limit	+	+	+	+
	> 0.2		+	+	0	+
Aluminum (Al)	< 0.2	No Limit	+	+	+	+
	> 0.2		+	+	0	+
Manganese (Mn)	< 0.1	No Limit	+	+	+	+
	> 0.1		+	+	0	+

Table 3: Chloride Content

Chloride Content	Maximum Temperature			
	60°C (140°F)	80°C (176°F)	120°C (248°F)	130°C (266°F)
= 10 ppm	SS 304	SS 304	SS 304	SS 316
= 25 ppm	SS 304	SS 304	SS 316	SS 316
= 50 ppm	SS 304	SS 316	SS 316	Ti / SMO 254
= 80 ppm	SS 316	SS 316	SS 316	Ti / SMO 254
= 150 ppm	SS 316	SS 316	Ti / SMO 254	Ti / SMO 254
= 300 ppm	SS 316	Ti / SMO 254	Ti / SMO 254	Ti / SMO 254
> 300 ppm	Ti / SMO 254	Ti / SMO 254	Ti / SMO 254	Ti / SMO 254

2. APPENDIX B - START-UP FORMS

2.1.1. RZ Series Startup Form (Pre-Startup Checklist)

1. Is there any visible shipping damage?	☐ Yes
2. Is the unit level?	☐ Yes
3. Are the unit clearances adequate for service and operation?	☐ Yes
4. Do all access doors open freely, and are the handles operational?	☐ Yes
5. Have all shipping braces been removed?	☐ Yes
6. Have all electrical connections been tested for tightness?	☐ Yes
7. Have all of the gas heat piping been checked for leaks?	☐ Yes
8. Does the electrical service correspond to the unit nameplate?	☐ Yes
9. Has the transformer tap been checked on the 208/230V units?	☐ Yes
10. Has adequate overcurrent protection been installed to match the requirements listed on the unit nameplate?	☐ Yes
11. Have all set screws on the fans been tightened?	☐ Yes
12. Do all of the fans rotate freely?	☐ Yes
13. Does the field water piping to the unit appear to be correct per design parameters?	☐ Yes
14. Is all of the copper tubing isolated so it does not rub?	☐ Yes
15. Have the damper assemblies been inspected?	☐ Yes
16. Are the air filters installed in the proper orientation?	☐ Yes
17. Have the condensate drain and p-trap been connected?	☐ Yes
18. Is the actual refrigerant charge of the largest circuit in accordance with the required conditioned floor area according to Table 16?	☐ Yes
19. Are the ventilation and exhaust openings unobstructed?	☐ Yes
20. Are the markings, decals, and warnings on the unit clearly visible?	☐ Yes
21. Have all damaged or illegible markings and warnings been replaced?	☐ Yes

2.1.2. A2L Mitigation Board

1. Does each port (sensors 1-3) have a male connector plugged into both the cabinet and airstream connections on the mitigation board?	☐ Yes
2. Does the compressor and gas heat operation shut off when the cabinet board sensor trips?	☐ Yes
3. Does normal unit operation commence, except for the compressor and gas heater, after the cabinet board sensor trips?	☐ Yes
4. Does the compressor shut off while the fan stays on when the airstream board sensor trips?	☐ Yes
5. Does the non-compressor or gas heating/cooling stay on when both boards trip? (electric heater stays on)	☐ Yes
6. When the A2L airstream alarm is activated, do supply fans start, VAV boxes open, and the compressors stop?	☐ Yes

2.1.3. Supply Fan Assembly

Alignment ☐	Check Rotation ☐	Nameplate Amps _____

Number	Hp	L1 Volts/Amps	L2 Volts/Amps	L3 Volts/Amps
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

VFD Frequency _____	VAV Controls _____

2.1.4. Energy Recovery Wheel Assembly

Wheel(s) Sprin Freely ☐		Check Rotation ☐		FLA _____
Number	**Hp**	**L1 Volts/Amps**	**L2 Volts/Amps**	**L3 Volts/Amps**
1				
2				

2.1.5. Power Return Assembly

Alignment ☐		Check Rotation ☐		Nameplate Amps _____
Number	**Hp**	**L1 Volts/Amps**	**L2 Volts/Amps**	**L3 Volts/Amps**
1				
2				
VFD Frequency _____				

2.1.6. Power Exhaust Assembly

Alignment ☐		Check Rotation ☐		Nameplate Amps _____
Number	**hp**	**L1 Volts/Amps**	**L2 Volts/Amps**	**L3 Volts/Amps**
1				
2				
VFD Frequency_____				

2.1.7. Outside Air/Economizer Dampers

Operation Check ☐
Damper Actuator Type:
Economizer Changeover Type and Operations:
Damper Wiring Check ☐
Gears Check ☐

2.1.8. Unit Configuration

Water- Cooled Condenser ☐	Air Cooled Condenser ☐
No Water Leaks ☐	Evaporative Condenser ☐
Condenser Safety Check ☐	
Water Flow_____GPM	
Water Inlet Temperature_____°F	
Water Outlet Temperature_____°F	

2.1.9. Compressors/DX Cooling

Number/Stage	L1 Volts/Amps	L2 Volts/Amps	L3 Volts/Amps	Head Pressure PSIG	Suction Pressure PSIG	Crankcase Heater Amps
1						
2						
3						
4						
5						
6						
7						
8						

2.1.10. Air Temperatures

Ambient DB Temperature _____°C/°F	Ambient WB Temperature _____°C/°F
Coil Entering Air DB Temperature _____°C/°F	Coil Entering Air WB Temp _____°C/°F
Coil Leaving Air DB Temperature _____°C/°F	Coil Leaving Air WB Temp _____°C/°F

2.1.11. Refrigeration Systems

Refrigeration System 1

	Pressure	Saturated Temperature	Line Temperature	Sub-cooling	Superheat
Discharge				N/A	N/A
Suction				N/A	
Liquid					N/A
Refrigeration System 2					
	Pressure	Saturated Temperature	Line Temperature	Sub-cooling	Superheat
Discharge				N/A	N/A
Suction				N/A	
Liquid					N/A
Refrigeration System 3					
	Pressure	Saturated Temperature	Line Temperature	Sub-cooling	Superheat
Discharge				N/A	N/A
Suction				N/A	
Liquid					N/A
Refrigeration System 4					
	Pressure	Saturated Temperature	Line Temperature	Sub-cooling	Superheat
Discharge				N/A	N/A
Suction				N/A	
Liquid					N/A
Refrigeration System 5					
	Pressure	Saturated Temperature	Line Temperature	Sub-cooling	Superheat
Discharge				N/A	N/A
Suction				N/A	
Liquid					N/A
Refrigeration System 6					
	Pressure	Saturated Temperature	Line Temperature	Sub-cooling	Superheat
Discharge				N/A	N/A
Suction				N/A	
Liquid					N/A

2.1.12. Condenser Fans

Alignment ☐	Check Rotation ☐	Nameplate Amps_____

Number	Hp	L1 Volts/Amps	L2 Volts/Amps	L3 Volts/Amps
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
VFD Frequency _____				

2.1.13. Evaporative Condenser Pumps

Check Rotation ☐				
Number	**Hp**	**L1 Volts/Amps**	**L2 Volts/Amps**	**L3 Volts/Amps**
1				
2				

2.1.14. Water/Glycol System

1. Has the entire system been flushed and pressure checked?	☐ Yes

2. Has the entire system been filled with fluid?	☐ Yes
3. Has air been bled from the heat exchangers and piping?	☐ Yes
4. If glycol is used, is it the proper type and concentration (N/A if water)?	☐ Yes
5. Is there a minimum load of 50% of the design load?	☐ Yes
6. Has the water piping been insulated?	☐ Yes

2.1.15. Gas Heating

Natural Gas ☐	Propane ☐	Purge Air from Lines ☐	Verify Pilot Spark ☐

Stage	Manifold Pressure (w.c.) inlet	Manifold Pressure (w.c.) outlet
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

2.1.16. Electric Heating

Stages _____

Limit Lockout ☐	Aux. Limit Lockout ☐
Stage	**Volts/Amps**
1	
2	
3	
4	
5	
6	
7	
8	

2.1.17. Additional Findings

2.1.18. Signature

By signing this form, you verify that all of the information contained is correct and filled out to the best of your ability.

Name:		
Title:		
Rep/Contractor:		
Signature:_____		**Date/Time**:_____

3. APPENDIX C - MAINTENANCE LOGS

This log must be kept with the unit. It is the responsibility of the owner and/or maintenance/service contractor to document any service, repair, or adjustments. AAON Service and Warranty Departments are available to advise and provide phone help for proper operation and replacement parts. The responsibility for proper start-up, maintenance, and servicing of the equipment falls to the owner and a qualified licensed technician.

Entry Date	Action Taken	Name/Tel

3.1.1. Maintenance Log (E-Coated Coil)

AAON E-COATED COIL MAINTENANCE RECORD

Installation Site _____ Installation Date _____
Unit Model # _____ Unit Location _____
Unit Serial # _____ Customer _____

Year 20____	Ambient Temp (°F)	Surface Debris Removed	Coil Cleaned	Approved Cleaner Used	Potable Water Backwash Rinse	Potable Water Frontwash Rinse	Chlorides Removed	Comments
Jan								
Feb								
Mar								
Apr								
May								
Jun								
Jul								
Aug								
Sep								
Oct								
Nov								
Dec								

The following cleaning agents have been approved for use on AAON E-Coated Coils to remove mold, mildew, dust, soot, greasy residue, lint and similar particulate without harming the coated surfaces.

CLEANING AGENT	RESELLER	PART NUMBER
GulfClean ™ Coil Cleaner or Enviro-Coil Cleaner	Rectorseal 2601 Spenwick Drive, Houston, Texas 77055 (P): 713-263-8001	G074480 / 80406 or V82540
GulfClean Salt Reducer™	" "	G074490 / 80408

RECOMMENDED CHLORIDE REMOVER
Rectorseal 2601 Spenwick Drive, Houston, Texas 77055 (P): 713-263-8001

AAON
2425 South Yukon Ave.
Tulsa, OK 74107-2728
Phone: 918-583-2266
Fax: 918-583-6094
www.AAON.com

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