



Jim Eichorst  
JB Henderson Construction  
[REDACTED]  
Albuquerque, NM 87123

August 8, 2012

re: Zorro Ranch – PoolPak AW1800

Dear Mr. Eichorst,

*Executive Summary – previous report dated July 30<sup>th</sup> provides additional, technical details*

The Poolpak unit finally gained operational status Thursday night, August 2<sup>nd</sup> and apparently has maintained it to date. Poolpak's service manager provided key bits of information on Wednesday that helped to finalize the repair on Thursday. Details follow.

Reheat Mode (heating/dehumidifying)

The check valve at the pool water condenser (PHX or WCC) sticks – intermittently, partially or completely is unclear as operation of the unit has been erratic for sometime according to reports from property manager Bryce Gordan and JBH tech Richard.

The bypass valve piped in parallel with the PHX actuated valve receives power, yet it does not open. A magnetic donut drew the valve open allowing full flow of refrigerant through the entire circuit. Head pressures immediately dropped to normal, expected levels.

AC Mode (cooling)

Previous to replacing the refrigerant charge this mode exhibit high discharge (head) pressures similar, yet not the same as with the reheat mode. With new refrigerant the head pressures are nearly the same as in reheat mode which is expected as the return air temperature and the water temperatures are similar.

Refrigerant Replacement

Previous work on the unit may have resulted in inadvertent introduction of non-condensables into the refrigerant circuit. Poolpak disclosed that they cannot say what valves open in DWH mode and that the manual mode for opening valves may not allow full access to all sections of the refrigerant circuit. They instructed the use of magnetic donuts at least two solenoid valves. Instead, the installation of a service valve at the bottom of the reheat coil and fully opening the stems on the liquid line solenoid valve and the PHX solenoid valve provided a complete evacuation of the refrigeration system.

Hot Water Coil

Flex connections swapped to introduce hottest water to entering air. Valve rewired to allow direct operation through the Poolpak unit.

TELEPHONE [REDACTED]

QUALITY ENGINEERED MECHANICAL EQUIPMENT  
SERVICED FROM CONCEPTUAL DESIGN THROUGH OWNER OPERATION



### Wall Sensor (Poolpak)

Damaged by Crest while rewiring ECI alarm circuit. Wall sensor is placed on an interior wall in the pool room making it non-functional. It is designed for placement on a door or window sill. Rather than moving and rewiring it, insert a 10K resistor at terminals 10 & 11 on the field wiring terminal in the Poolpak electrical panel. The resistor will provide a steady read out of 82F at the interface panel and clear the unit alarm on Mr. Gordan's computer.

The unit should maintain +/- 1F of air temperature setpoint and +5% of the humidity setpoint, or something fairly close when monitored over a period of an hour once a steady state of operation is reached. In other words, should doors be left open resulting in a drop in temperature and corresponding rise in humidity it may take more than an hour to reach a steady state.

### Exhaust

Install a direct drive, inline exhaust fan with sufficient static pressure capacity to push air to whatever exhaust trunk there may be near the mechanical room. Duct should be size at least 10" if not 12" round or 10 x 10 square or similar. Fan to exhaust a minimum of 400 cfm.

### Outside Air

Once exhaust airflow is established, move the OA quadrant damper to a position that provides a slight negative in the pool space. Fix and mark the handle position.

### Electrical

Crest replaced the #00 wire (100 amp rating) with #8 wire (75 amp wire) and the 100 amp fuses with 70 amp fuses. Factory MCA rating is 60 amp, yet 60 amp fuses are not available in the blade style used in the existing disconnect. The owner should direct whether replacement of the disconnect is desired. The #8 wire will be protected with 60 amp fuses in any case if the disconnect is replaced.

### Supply Air Grilles

High recommendation that the floor grilles be changed to similar style yet with a 30-45 degree deflection that pushes the air at the bottom of the glazing on the doors. This change will wash the windows and protect future windows from failing as the present windows have.

Secondary concern is that no air seems to be introduced at the ceiling grilles. It is unclear as to how the duct is run, whether balancing dampers are installed and accessible and whether the lack of airflow can be fixed. Address this issue if condensation on the ceiling occurs in winter. If so, add a grille to the center ceiling panel as well if air can be directed to this section of ductwork.

### Unit Size

Unit sizing should be reviewed via observation over time (i.e. months) and with use of the space history. The present unit when operating properly should be able to meet the space load most of the time. Additional measures may be needed to supplement the unit performance. Pool dehumidification heat pump units operate within a dynamic system of fans, pumps, coils and controls. All components of the system must operate correctly for the dehumidification heat pump to operate correctly. Note that other manufacturers such as



Dectron, which is represented by Crest, offer single phase units that are substantially larger and will meet the space capacity for this site.

Waterflow – Pool

No pool water piping is connected at factory provided ports. The connection of pool water is highly recommended. Should water be piped to the unit in its present state, then Poolpak recommends removing the PHX and its associated valve from the refrigerant loop and replacing the Bypass valve and piping tee with a piece of straight copper. This work is not needed if the magnetic donut hold the Bypass valve open.

Remove the neutral wire of the Bypass valve from its wire nut connection with the PHX valve.

Waterflow – AC Heatpump Loop

Install a 1” flow meter to verify loop flow.

Refrigeration System Readings

	Cooling Mode	Heating Mode
Compressor Discharge (6” away)	184F	192F
Compressor Suction (6” away)	48F	51F
Amp Draw	25.5 amps	25.5 amps
Head	280 psi (90F)	290 psi (95F)
Suction	60 psi (30F)	64 psi (39F)
Water Loop	76Fin/94Fout	NA
TXV	44F	46F
Return Air	84F	86F
Humidity	49%	53%
Supply Air	(should have been recorded)	
Sight Glass	Small trail of bubbles present often, yet factory advises to ignore bubbles if super heat is close to factory desired 16F. Factory charge of 20# 13oz of R-22 was installed. Unit is fully charged. Short of any other indicator of a problem, ignore slight bubbles in the sight glass. Inspect for onstant bubbles in the sight glass that persist for more than a minute. They may indicate a refrigerant leak.	

Respectfully,  
Jim Asperger