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NU-22B® (R-422B) SYSTEM CONVERSION
PERFORMANCE ANALYSIS - 2013

Study Location: Indianapolis, IN
Equipment: *Carrier 4ton RTU
Model#: 48TFE005
Metering: Refrigerant Expansion Device *Acutrol™
Compressor: *Bristol Compressor w/Mineral Oil

	Pre-Conversion Data	Post-Conversion Data
Ambient Temp:	77°F	77°F
Discharge:	225 psig	215 psig
Suction:	70 psig	62 psig
Suction Line Temp:	59°F	60°F
Target Superheat:	18°F	18°F
Compressor Superheat:	18°F	18°F
Compressor Disch Line Temp:	125°F	118°F
Compressor AMPs:	L1-12.9 / L2 - 11.3 / L3 - 12.3	L1-11.3 / L2 - 10.5 / L3 - 11.8
R-22 Name Plate Charge:	6 lbs 4 oz	6 lbs 4 oz
ID Return Temp:	77°F	77°F
ID Supply Temp:	54°F	53°F
Delta T:	23°F	24°F

SUMMARY

No system components were replaced or modified for this conversion. The original compressor charge of mineral oil was tested for quality and it was determined that no oil change was required.

Pre conversion data was taken after the system was charged with 6 lbs 4 oz of R-22. The reason for this was to make sure it had not lost any of the charge over time and to establish a target superheat. The data showed that 18° was the target superheat. The system charge of NU-22B was optimized and was 100% of the pre conversion, optimized charge, of R-22, and the superheat target of 18° was achieved.

Post conversion Compressor AMPs were reduced by 8%. Discharge Temps were reduced by 6%. Suction and Discharge Pressures were slightly reduced and the COP was improved by 2%. The Mass Flow rate was well within the range of the metering device, and the Cooling Capacities were within the application range. While the pre and post Inlet Temps were the same, the post conversion Outlet Temp was 1° colder.

The post conversion, NU-22B charged system used for this performance analysis, would provide the required performance, without compromising efficiency or mechanical integrity. A complete chart of the pre and post system conversion data is printed on the reverse side.

Jamey Hale, CMS
Sr. Technical Support Supervisor
ICOR International, Inc.

*** The following product Trademarks and registered Trade Names, owned by others, are mentioned only for reference purposes for this performance analysis.**

Trademark - Owner		
Carrier	-	United Technologies Corp
Bristol	-	Bristol Compressors International, Inc.
Acutrol	-	United Technologies Corp

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INPUT TO SIMULATION		R-22	R-422B
Evaporating Pressure	psig	70.0	62.0
Evaporator Outlet Superheat	°F	18.0	18.0
Compressor Volumetric Capacity	ft³/hr	598.6	598.6
Condensing Temperature	°F	110.0	105.0
Condenser Outlet Subcooling	°F	22.0	26.0
Expansion Device Inlet Temperature	°F	88.0	79.0

PERFORMANCE PARAMETERS				
Refrigerant		R-22	R-422B	
Mass Flow Rate	%	100	114	
Volumetric Cooling Capacity	%	100	91	
Power	kW	4.1	3.7	-10%
Cooling Coefficient Of Performance		4.5	4.6	+2%
Energy Efficiency Ratio	Btu/W.h	15.4	15.6	+1%
Subcooling At Expansion Device Inlet	°F	22.0	26.6	
Superheat At Evaporator Outlet	°F	18.0	18.0	
Superheat At Compressor Inlet	°F	18.0	18.0	
Condensation Temperature	°F	110.0	108.1	
Evaporation Temperature	°F	41.0	38.9	

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