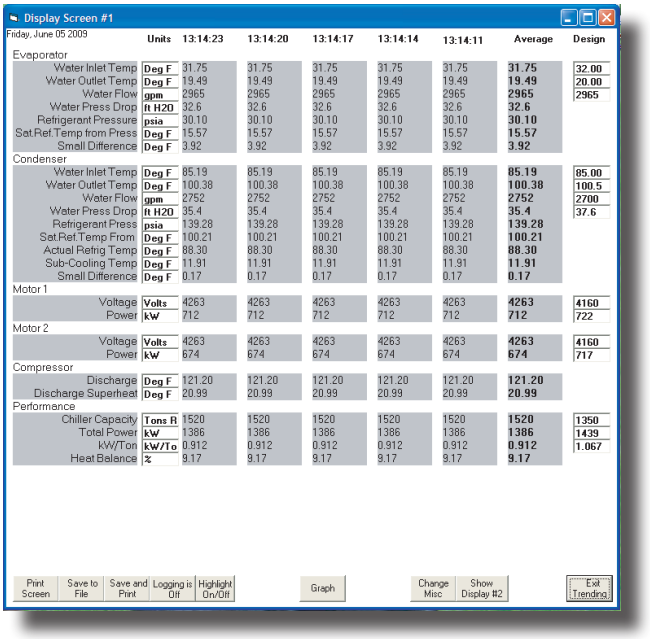
Chiller Performance Testing:

Never settle for anything less than the best performance

Performance potential

Never settle for anything less than the best when conducting field performance testing in your facility. Johnson Controls has the equipment and experience to provide high accuracy, factory level performance results for diverse chiller types. The results can be used to identify the true performance potential of your plant.



	Units	13:14:23	13:14:20	13:14:17	13:14:14	13:14:11	Average	Design
Evaporator								
Water Inlet Temp	Deg F	31.75	31.75	31.75	31.75	31.75	**31.75**	32.00
Water Outlet Temp	Deg F	19.49	19.49	19.49	19.49	19.49	**19.49**	20.00
Water Flow	gpm	2965	2965	2965	2965	2965	**2965**	2965
Water Press Drop	ft H2O	32.6	32.6	32.6	32.6	32.6	**32.6**	
Refrigerant Pressure	psia	30.10	30.10	30.10	30.10	30.10	**30.10**	
Sat.Ref.Temp from Press	Deg F	15.57	15.57	15.57	15.57	15.57	**15.57**	
Small Difference	Deg F	3.92	3.92	3.92	3.92	3.92	**3.92**	
Condenser								
Water Inlet Temp	Deg F	85.19	85.19	85.19	85.19	85.19	**85.19**	85.00
Water Outlet Temp	Deg F	100.38	100.38	100.38	100.38	100.38	**100.38**	100.5
Water Flow	gpm	2752	2752	2752	2752	2752	**2752**	2700
Water Press Drop	ft H2O	35.4	35.4	35.4	35.4	35.4	**35.4**	37.6
Refrigerant Press	psia	139.28	139.28	139.28	139.28	139.28	**139.28**	
Sat.Ref.Temp From	Deg F	100.21	100.21	100.21	100.21	100.21	**100.21**	
Actual Refrig Temp	Deg F	88.30	88.30	88.30	88.30	88.30	**88.30**	
Sub-Cooling Temp	Deg F	11.91	11.91	11.91	11.91	11.91	**11.91**	
Small Difference	Deg F	0.17	0.17	0.17	0.17	0.17	**0.17**	
Motor 1								
Voltage	Volts	4263	4263	4263	4263	4263	**4263**	4160
Power	kW	712	712	712	712	712	**712**	722
Motor 2								
Voltage	Volts	4263	4263	4263	4263	4263	**4263**	4160
Power	kW	674	674	674	674	674	**674**	717
Compressor								
Discharge	Deg F	121.20	121.20	121.20	121.20	121.20	**121.20**	
Discharge Superheat	Deg F	20.99	20.99	20.99	20.99	20.99	**20.99**	
Performance								
Chiller Capacity	Tons R	1520	1520	1520	1520	1520	**1520**	1350
Total Power	kW	1386	1386	1386	1386	1386	**1386**	1439
kW/Ton	kW/To	0.912	0.912	0.912	0.912	0.912	**0.912**	1.067
Heat Balance	%	9.17	9.17	9.17	9.17	9.17	**9.17**	

Figure 1 : Example of live tabular data and calculations. All of the displayed parameters and calculations are customizable allowing for adequate flexibility for various types of equipment and systems to be measured.

Testing equipment

Our testing equipment is comprised of high quality, reliable, and accurate instrumentation that meets the ASHRAE/ARI requirements used in laboratory environments. We carefully maintain and calibrate our equipment to NIST (National Institute of Standards Technology) with traceability so that we provide our customers with a consistent and reliable data acquisition and/or tuning service.

Reduced carbon footprint

We recognize that you strive to reduce your carbon footprint by improving the efficiency of your central plants to better manage your investments and also meet LEED standards. We offer services to specifically achieve those results. With our advanced equipment we can provide you with a means to define and validate sustainable solutions.

Broad chiller experience

We are not limited to just YORK electric driven packages either. Because we manufacture various chiller technologies, our vast offering has given us broad experience in the measurement of energy consumption and heat rejection on a broad range of equipment. Including but not limited to electric, steam turbine, engine driven equipment as well as absorption and air-cooled technology.

YORK®
BY JOHNSON CONTROLS

State of the art equipment and methods

Optimized performance

Our investment in state of the art equipment and methods allows us to provide factory laboratory level results in sometimes very difficult field situations. Our industrial systems/performance test team has over 300 years of combined chiller service and testing experience that brings a level of expertise rivaled by few in the HVAC chiller industry. Not only do we possess the ability to accurately measure your chiller plant performance, but we can adjust and tune your chillers during the testing process to optimize the performance of the equipment on site. We then utilize the same data so that we can provide a comprehensive analysis of plant performance and make sound economical recommendations based on those results.

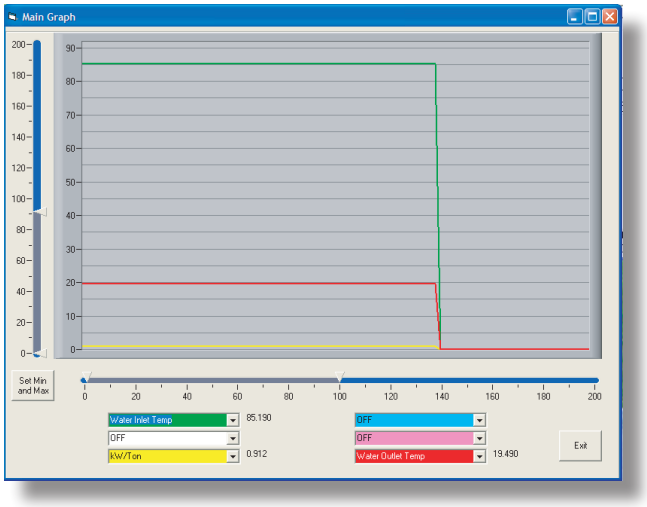


Figure 2 : Our live data can also display up to 6 parameters on a streaming / trending screen. This is a valuable tool to show systems / equipment stability.

ASHRAE/ARI requirements

Our testing equipment and data acquisition program were developed for factory testing and then applied for field use. Because our program was first developed for the factory, we maintain a very high degree of accuracy with energy balances consistently better than 2%. Our test instruments usually meet or exceed the ASHRAE/ARI requirements. We do not limit ourselves to just the ASHRAE/ARI standards either. We have access to a broad library of standards and will apply these standards as dictated/required by the site testing requirements.

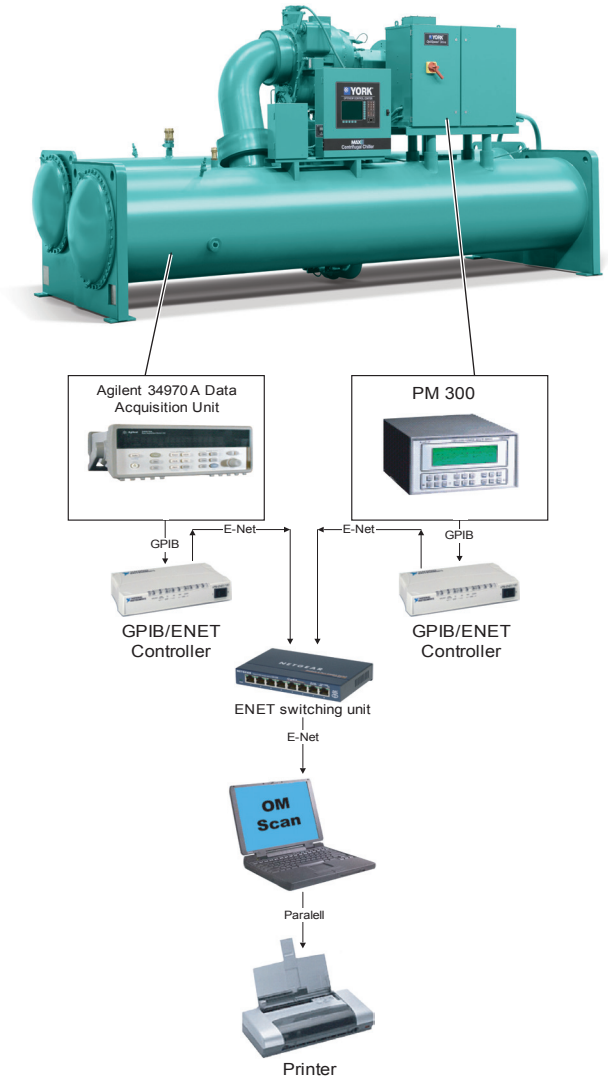


Figure 3 : Example of typical data flow on an electric chiller.

Customer satisfaction

Many different industries have received our services. Some of the industries served include new and retrofitted plants supporting medical research, district cooling, high rise buildings, colleges, airports, and process applications, among others.

Our customers can be certain that we will exceed even the most stringent requirements and accept nothing less than high performance results.

For more information on Chiller Field Performance Testing contact your local Johnson Controls Office, or go to www.johnsoncontrols.com.

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