YORK® Smart Connected Chillers

Monitor performance from anywhere.
Because uptime is everything.

A chiller is one of the most critical pieces of equipment in your facility. Responsible for comfort, Productivity, and as much as half the energy used in your building. What if you could predict when a chiller will go down, or when it's running at less than peak performance that results in unexpected expenses?

Your connection to The Internet of Things.

New technologies that form the Internet of Things (IoT) make it easier than ever to stay on top of chiller maintenance. YORK Smart Connected Chillers ensure that critical information about your chiller's performance is put into the hands of Johnson Controls experts.

This enables us to provide proactive maintenance by quickly responding to emergencies and spotting deteriorating conditions before they turn into problems.

Real-time monitoring: Fast response when you need it most.

We monitor systems 24/7 in near real time, providing our chiller experts access to critical information that can save time in an emergency. If there is an alarm, the Johnson Controls Remote Operations Center immediately notifies your local service expert who can then access your chiller's information, no matter where they are, to quickly diagnose the problem and get the chiller back on line.

Is there such a thing as too much security?

We don't think so. YORK Smart Connected Chillers are designed with security in mind including:

- Encrypted communications on an existing customer network or over a dedicated cellular VPN
- One - Way outbound communication using HTTPS/TLS1.2 protocols over port 443
- Set points, schedules and commands are read-only and cannot be changed
- All data is securely stored and accessed in the Microsoft Azure cloud
- All access to resources is protected through use of strict authentication and authorization

Remote diagnostics and analysis: Turning emergencies into non-events.

With this unprecedented insight into equipment, we're revolutionizing how chillers are serviced. Today's Smart Connected Chillers mean fewer disruptions, reduced downtime, and longer equipment life.

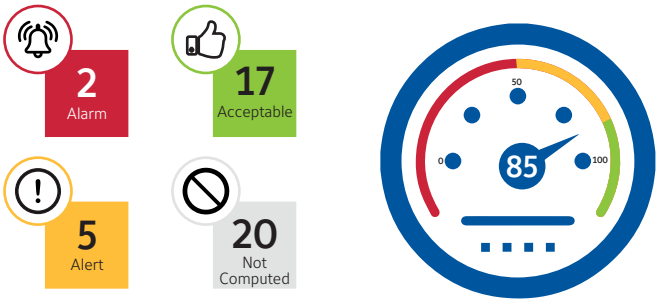
66% reduction in unplanned / emergency repairs

65% reduction in mean time to repair

Chiller Performance Index (CPI): An efficient way of analyzing and prioritizing chiller performance

The **Chiller Performance Index** (CPI) CPI is a patent pending algorithm that intelligently factors in multiple aspects of a chiller's performance into a single value that can be used to quickly identify Chillers that need attention. Scores for each chiller range from 0 to 100 and are broken into 3 ranges: Acceptable (76-100), Alert (51-75) and Alarm (0-50). The higher the score the better your chiller is performing. You should strive to achieve a score of 90 or higher across your portfolio.

Average Chiller Performance Index (CPI)



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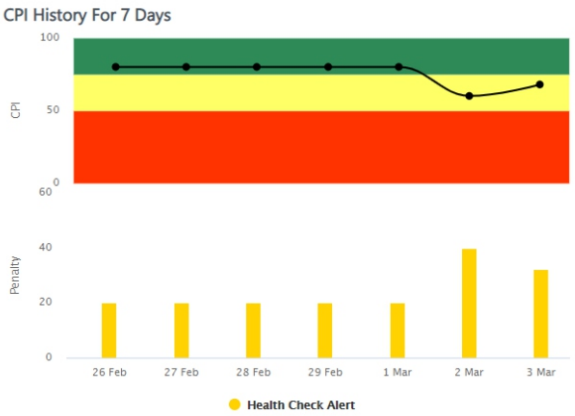
The below table describes the severity conditions and potential impacts for the scores

		Actions
ALARM **CPI Score: 0-50**	Significant problems have been detected in the available data, indicating the chiller is not running as designed. An unexpected chiller failure is likely, leading to elevated maintenance and energy costs.	Check maintenance logs Equipment checked by a qualified technician Run with caution – prepare for a shutdown
ALERT **CPI Score: 51-75**	Problems have been detected in the available data and indicate that the chiller may not be running as designed. Left uncorrected, this could lead to unexpected chiller failures, higher maintenance costs, and higher energy costs.	Review maintenance history and operation logs Equipment checked by a qualified technician Monitor closely
ACCEPTABLE **CPI Score: 76-100**	Based on the available data, no significant problems were detected and the chiller appears to be running as designed.	Monitor on a regularly scheduled basis
Not Computed	"Not enough data is available to calculate the chiller performance index. This could be due to the chiller being offline or not running for a long enough time during the calculation period"	Verify network connection



Trending of the CPI score provides information on how the chiller's performance is changing over time. When corrective actions are taken, an improvement in the CPI score can quickly validate that the root causes were fixed.

The 5 values of planned maintenance

IDENTIFY ENERGY SAVINGS OPPORTUNITIES

Help identify waste through additional visibility into trend data and current operating conditions

REDUCE FUTURE REPAIR COSTS

Reduce downtime and repair costs by proactively identifying and troubleshooting root cause issues remotely, then verifying problem resolution

ENVIRONMENTAL HEALTH AND SAFETY

Use advanced fault detection diagnostics to identify potential refrigerant loss

EXTEND ASSET LIFE

Use 24x7 connectivity to analyze trend data, reduce the risk of undetected failures and identify issues before they become serious problems

ENSURE PRODUCTIVE ENVIRONMENTS

Identify faults before they affect occupant comfort or critical processes

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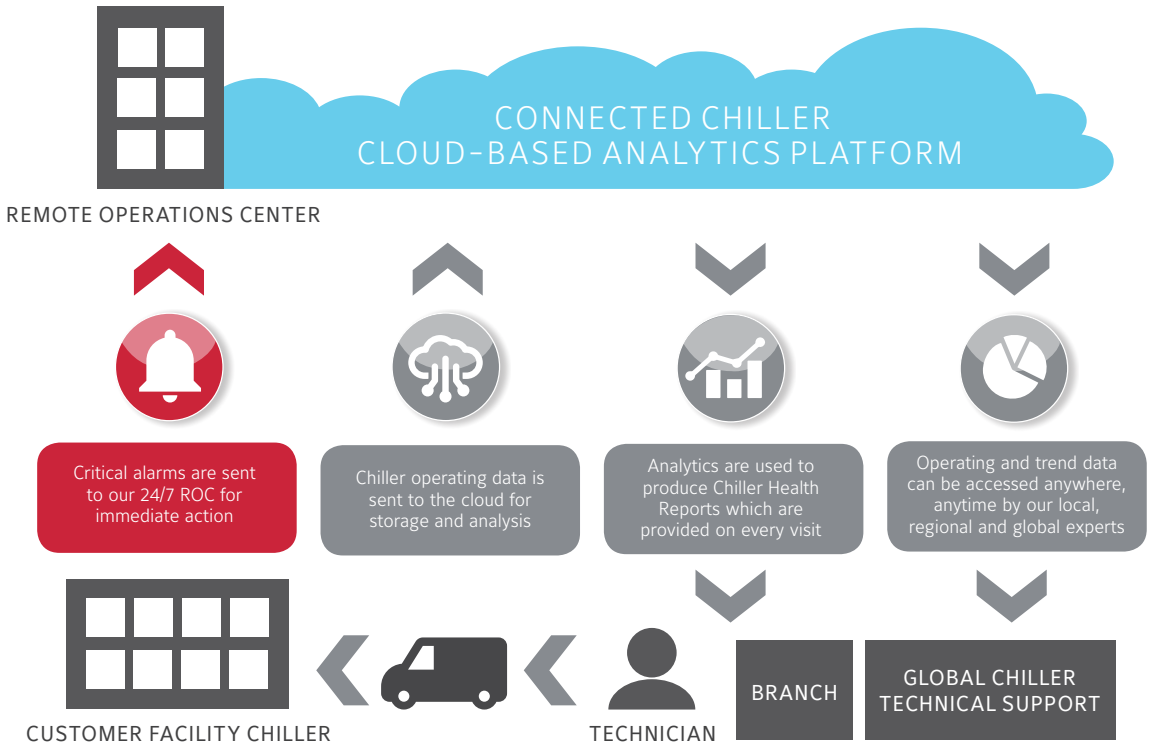

WHAT CHILLERS CAN BE CONNECTED?

Most current models of YORK® chillers can be ordered with Smart Connected Chiller factory-installed including:

- YMC² Centrifugal Magnetic Drive Chiller
- YK Centrifugal Chiller
- YD Dual Centrifugal Chiller
- YK-EP Centrifugal Chiller with Economizer
- YVWA Water-cooled Variable Speed Screw Chiller
- YCWL Water-cooled Scroll Chiller
- YVAA/YCIV/YCAV Air-Cooled Variable Speed Screw Chiller
- YCAL/YLAA Air Cooled Scroll Chiller
- YIA Single Stage Absorber

In addition, we can retrofit most existing YORK® chillers and some other manufacturers' machines with Smart Connected Chiller technology. Check with your Johnson Controls representative for details.

Here's how our Smart Connected Chillers work:

Through a secure connection, we continuously send all of the chiller's operational data to a high-security, cloud-based dashboard. Data is analyzed in near real-time to diagnose and troubleshoot problems, Data is stored to observe long term trends and to allow for investigation leading up to failures to find the root cause. Status-related data such as warnings, cycling and safety fault codes are collected. Advanced algorithms continuously run in the cloud environment and use operational data to detect problems such as condenser or evaporator tube fouling, low refrigerant charge, drops in lube oil pressure and much more.

On-demand real-time insights produce results

Now that YORK® chiller performance data can be accessed and acted on remotely, the best equipment is matched with the best service and analytic capabilities available. This allows you to extend your equipment's life, increase uptime and improve efficiency by maintaining the operation of your chiller at optimal performance.

For more information, go http://www.johnsoncontrols.com/smartconnectedchillers or contact your YORK® chiller representative.

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