

# QuickSpecs

## Large Tonnage Solutions

### YORK YIA and YPC Absorption Chillers

From Customer Need to Competitive Advantage

Version 2.0 – February 2011



YIA: 120-1380 Tons  
(420-4850 kW)



YPC: 200-700 Tons  
(700-2460 kW)

# QuickSpecs

Large Tonnage Solutions – YORK YIA and YPC Absorption Chillers

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This Quickspecs document is designed to help Johnson Controls HVAC salespeople work with their Consulting Engineer customers and help them specify Large Tonnage Solutions projects efficiently and effectively. Each Quickspec item summarizes an advantage that should be included in the project specifications in order to ensure the owner receives the full benefit of the features.

## The Bottom Line

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This section tells you what specific language should be included in the project specification in order to ensure that the owner receives the full benefit of the features of YORK brand YIA and YPC absorption chillers.

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# The Bottom Line 1-6

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**Bottom Line 1:** Provide chillers with chiller life extending ADVAGuard750 corrosion inhibitor.

**Bottom Line 2:** Control system with a fully automatic purge system that does not require action by maintenance personnel to extract non-condensable gases from the chiller shell and purge chamber.

**Bottom Line 3: YIA (Mod D release, Mod C is 0.028" (0.071cm) wall thickness):**

- Evaporator, Absorber and Condenser Tubes: Copper, individually cleanable, individually replaceable from either chiller end, roller expanded into tube sheets, 0.025" (0.064cm) minimum thickness
- Generator Tubes: 90/10 CuNi, individually cleanable, individually replaceable from either chiller end, roller expanded into tube sheets, 0.035" (0.089cm) minimum thickness

**YPC (models 12SC, 13SC and 14SC):**

- Evaporator, Absorber and Condenser Tubes: Copper, individually cleanable, individually replaceable from either chiller end, roller expanded into tube sheets, 0.025" (0.064cm) minimum thickness

**YPC (models 15SL, 16S, 16SL, 17S, 18S and 19S):**

- Evaporator, Absorber and Condenser Tubes: Copper, individually cleanable, individually replaceable from either chiller end, roller expanded into tube sheets, 0.028" (0.071cm) minimum thickness

**Bottom Line 4:** Solution and refrigerant pumps shall be hermetically sealed, self-lubricating and designed for 75,000 hours of operation between service intervals.

**Bottom Line 5:** Manufacturer shall have a minimum of 25 years of experience in designing, manufacturing, and servicing absorption chillers.

**Bottom Line 6:** Provide chiller control panel with full-color, graphical screen, capable of on-screen trending and history capture.

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## The Details

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This section tells you the background and peripheral information pertinent to each individual “Bottom Line” QuickSpec item, including:

- The customer need, including a sample of how the customer would actually say it
- The feature that addresses the stated need
- A “So what” statement highlighting the feature’s value and impact
- The competitive advantage the feature provides
- The Bottom Line: What specific language should be included in the project specification

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# QuickSpec 1:

## ADVAGuard750 Corrosion Inhibitor

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**What customers are saying:** "If air leaks into my absorber, non-condensable gas is likely to cause corrosion. To fix this my colleagues tell me they use a molybdate, nitrate, combination. However I read this will produce ammonia gas which can soften chiller tubes and ultimately lead to tube wall erosion and failure. I can't afford failures like this. What can I do to avoid this risk?"

**Customer Need:** Use a non-nitrate corrosion inhibitor to avoid potentially catastrophic ammonia gas induced problems.

**YORK YIA and YPC Absorption Chillers:** Currently the predominantly used corrosion inhibitor in absorption chillers is molybdate. This type inhibitor is slow acting thus nitrate is often used as a quick solution to prevent non-condensable gas generation within the chiller. The downside of nitrate is that it will generate ammonia gases within LiBr absorption chillers. All YORK brand YIA and YPC absorption chillers are supplied as standard with ADVAGuard750 corrosion inhibitor.

**So what:** ADVAGuard750 is a non-nitrate, non-chrome, inorganic corrosion inhibitor. With ADVAGuard750 the corrosion rate and non-condensable gas generation rate is 8 times less than conventional molybdate inhibitors. This inhibitor forms a more tenacious magnetite layer on the internal steel surfaces extending the life of the machine.

**Our competitive advantage:** In the event that air leaks into the chiller, ADVAGuard750 can extend the life of absorption chillers as it is much more forgiving than the conventional molybdate inhibitors some industry manufacturer's supply.

**What to specify:**

- Provide chillers with chiller life extending ADVAGuard750 corrosion inhibitor
- If a conventional molybdate inhibitor is provided then 0.028" (0.071cm) wall 90/10 CuNi tubes, as a minimum, must be supplied in all chiller sections as a means to extend tube life
- Chromate inhibitors, which contain chromium compounds and are considered to be carcinogens, should not be permitted

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# QuickSpec 2:

## Automatic Chiller Purge System

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**What customers are saying:** "Manual purging of my absorption chiller requires expensive maintenance hours and leaves the door open for major problems. Most times the service guys will purge the chiller at the first sign of a decrease in cooling capacity, and they rarely track the frequency at which the chiller is purged; leading to repeat expenses. How can I drive consistency and keep my expenses low?"

**Customer Need:** An absorption machine with a control system that automatically purges non-condensable gases, and more importantly monitors non-condensable gas generation and provides a warning in the event of excessive purging.

**YORK YIA and YPC Absorption Chillers:** YORK brand absorption chillers come standard with the SmartPurge feature which provides customer reassurance that their chiller is being purged when needed and they will be warned in the event of excessive purging.

**So what:** The number one reason for reduced absorption chiller life is air leaks. Air leaking into the vacuum environment of an absorption chiller causes internal corrosion and elevated non-condensable gas generation. Possessing the ability to detect increases in non-condensable gases provides the owner with an invaluable feature that can add decades to the life of their chiller.

**Our competitive advantage:** Automatic purging delivers the correct amount of purging when it is needed to avoid potential corrosion damage from under purging and purge pump damage from over purging. Many industry incumbents cannot provide this option.

### What to specify:

- Control system with a fully automatic purge system that does not require action by maintenance personnel to extract non-condensable gases from the chiller shell and purge chamber
- The control system must have a means of determining purging frequency and warning of excessive non-condensable gas generation
- Automatic purge systems activated by a timer are not acceptable
- The use of a palladium cell is not permissible

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# QuickSpec 3:

## Tube Wall Thicknesses Greater Than 0.025"

**What customers are saying:** "When I need to replace a tube in my absorber it costs me big bucks, not to mention the chiller down time. What can I do to avoid this?"

**Customer Need:** Appropriately sized, high quality chiller tubes that deliver chiller longevity.

### **YORK YIA and YPC Absorption Chillers (Mod D release, Mod C is 0.028" (0.071cm) wall thickness):**

As standard, YORK brand absorption chillers employ a minimum tube wall thickness of 0.025" on evaporator, absorber, and condenser tubes.

- YIA - Minimum 0.025" (0.064cm) tube wall thickness in the evaporator and absorber/condenser sections
- YPC - Minimum 0.025" (0.064cm) tube wall thickness in the evaporator and absorber/condenser sections for the following models: 12SC, 13SC, and 14SC
- YPC - Minimum 0.028" (0.071cm) tube wall thickness in the evaporator and absorber/condenser sections for the following models: 15SL, 16S, 16SL, 17S, 18S and 19S

**So what:** Tube wall thickness is one of the most important variables when considering absorption chiller features. This is particularly true in the absorber/condenser section where interior tube walls are exposed to a potentially acidic and abrasive cooling tower circuit.

**Our competitive advantage:** Quality and longevity. To drive down cost many industry incumbents supply thinner wall tubes as thin as 0.018" (0.046cm). This increases the risk for tube failure and a shorter chiller life.

### **What to specify:**

#### **YIA (Mod D release, Mod C is 0.028" (0.071cm) wall thickness):**

- Evaporator, Absorber and Condenser Tubes: Copper, individually cleanable, individually replaceable from either chiller end, roller expanded into tube sheets, 0.025" (0.064cm) minimum thickness
- Generator Tubes: 90/10 CuNi, individually cleanable, individually replaceable from either chiller end, roller expanded into tube sheets, 0.035" (0.089cm) minimum thickness

#### **YPC (models 12SC, 13SC and 14SC):**

- Evaporator, Absorber and Condenser Tubes: Copper, individually cleanable, individually replaceable from either chiller end, roller expanded into tube sheets, 0.025" (0.064cm) minimum thickness

#### **YPC (models 15SL, 16S, 16SL, 17S, 18S and 19S):**

- Evaporator, Absorber and Condenser Tubes: Copper, individually cleanable, individually replaceable from either chiller end, roller expanded into tube sheets, 0.028" (0.071cm) minimum thickness

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# QuickSpec 4:

## 75,000 Hour Solution and Refrigerant Pumps

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**What customers are saying:** “Replacing my solution and refrigerant pumps every 2 to 3 years is becoming a nuisance. Both the expense and the downtime are intolerable. Isn’t there anything that will last longer?”

**Customer Need:** Reliable, long lasting solution and refrigerant pumps that are designed for site serviceability to reduce chiller downtime.

**YORK YIA and YPC Absorption Chillers:** YORK brand absorption chillers utilize a hermetically sealed, self-lubricating pump designed for 75,000 hrs operation between service inspections. Pumps are welded in place with isolation valves on the suction and discharge line to allow for easy servicing. When service is required pump components, such as bearings, are individually replaceable.

**So what:** 75,000 hours of operation between service intervals offers the customer huge maintenance savings compared to commonly used 25,000 hour disposable pumps. Also, if there is a pump failure the ability to complete pump component replacements on site saves the customer from having to endure extended chiller downtimes.

**Our competitive advantage:** Most competitors provide 25,000 hour solution and refrigerant pumps that are not field serviceable. Johnson Controls provides 75,000 hour pumps that are field serviceable which saves the customer maintenance time and expense.

### What to specify:

- Solution and refrigerant pumps shall be hermetically sealed, self-lubricating and designed for 75,000 hours of operation between service intervals
- Fully welded disposable pump/motors shall not be acceptable
- Pump isolation valves shall be provided on the suction and discharge lines of each solution and refrigerant pump to prevent air intrusion during pump servicing

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# QuickSpec 5:

## Manufacturer Experience Greater Than 25 Years

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**What customers are saying:** "I purchased my absorption chiller from the lowest bidder and later discovered the manufacturer has only been producing this type of chiller for a few years. How can they make the claim that the chiller lasts just as long as manufacturers that have been producing absorbers for more than 40 years when they have no track record to prove this? Oh yeah, and service and parts availability is terrible."

**Customer Need:** To purchase absorption chillers from a highly reputable equipment manufacturer that will provide service and support throughout the life of the chiller.

**YORK YIA and YPC Absorption Chillers:** YORK brand absorption chillers have been in production for more than 40 years. Johnson Controls is dedicated to providing unwavering support for the life of the chiller.

**So what:** Many absorption chiller manufacturers, especially Asian manufacturers, have not been in business for more than 15 years. They do not have the expertise or experience that Johnson Controls has; and many have no post sale support.

**Our competitive advantage:** YORK brand absorption chillers have been in production for more than 40 years. Johnson Controls' commitment to quality, reliability, and service after the sale is evidenced by having many absorbers that have been in operation for more than 35 years. Unlike many of our competitors Johnson Controls has a worldwide service network that allows us to provide the highest degree of technical support, even in the most remote regions of the world.

**What to specify:**

- Manufacturer shall have a minimum of 25 years of experience in designing, manufacturing, and servicing absorption chillers
- Equipment manufacturer must offer continuous customer operation, maintenance, and control panel training, at a minimum, on an annual basis. Training must be provided either in English or the native language where the equipment is installed

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# QuickSpec 6:

## OptiView Control Panel

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**What customers are saying:** "As HVAC costs are a major expense I need to ensure my chiller is operating as efficiently as possible and that its operation is constantly being monitored to help ensure we don't encounter unexpected service issues."

**Customer Need:** Robust chiller control system that monitors chiller operations to help prevent expensive (both time and money) replacement and repair and operates the chiller as efficiently as possible to minimize operating costs.

**YORK YIA Single Stage Absorption Chillers:** YORK's OptiView control panel offers complete chiller system monitoring and control through an intuitive, easy-to-use, full-color, graphical user interface.

**Primary features include:**

- Monitor (trend) over 100 chiller points
- Complete diagnostic data capture
- Optimized chiller control algorithms
- Operation in most major global languages
- High resolution graphic display
- Ergonomic soft-key user interface

**Note:** *OptiView will not be available on YPC until late 2010*

**So what:** Optimized chiller hardware and software ensure that customer chillers are operating as efficiently as possible, helping to mitigate the risk of potential equipment issues.

**Our competitive advantage:** The OptiView panel has been the market leader since its inception. The OptiView panel's user interface is well recognized as best in class.

**What to specify:**

- Provide chiller control panel with a full-color, graphical screen, capable of on-screen trending and history capture
- Information Display: 10.4" color liquid crystal display (LCD) mounted on lockable control panel enclosure door
- User interface: operating parameters displayed in a user-friendly, color, graphical format with soft-key keypad
- Data tracking and trend display: on-screen graphical display of at least five parameters selected from a list of a minimum of 100 possibilities
- History: store last ten shutdowns and display all system parameters at the time of shutdown

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