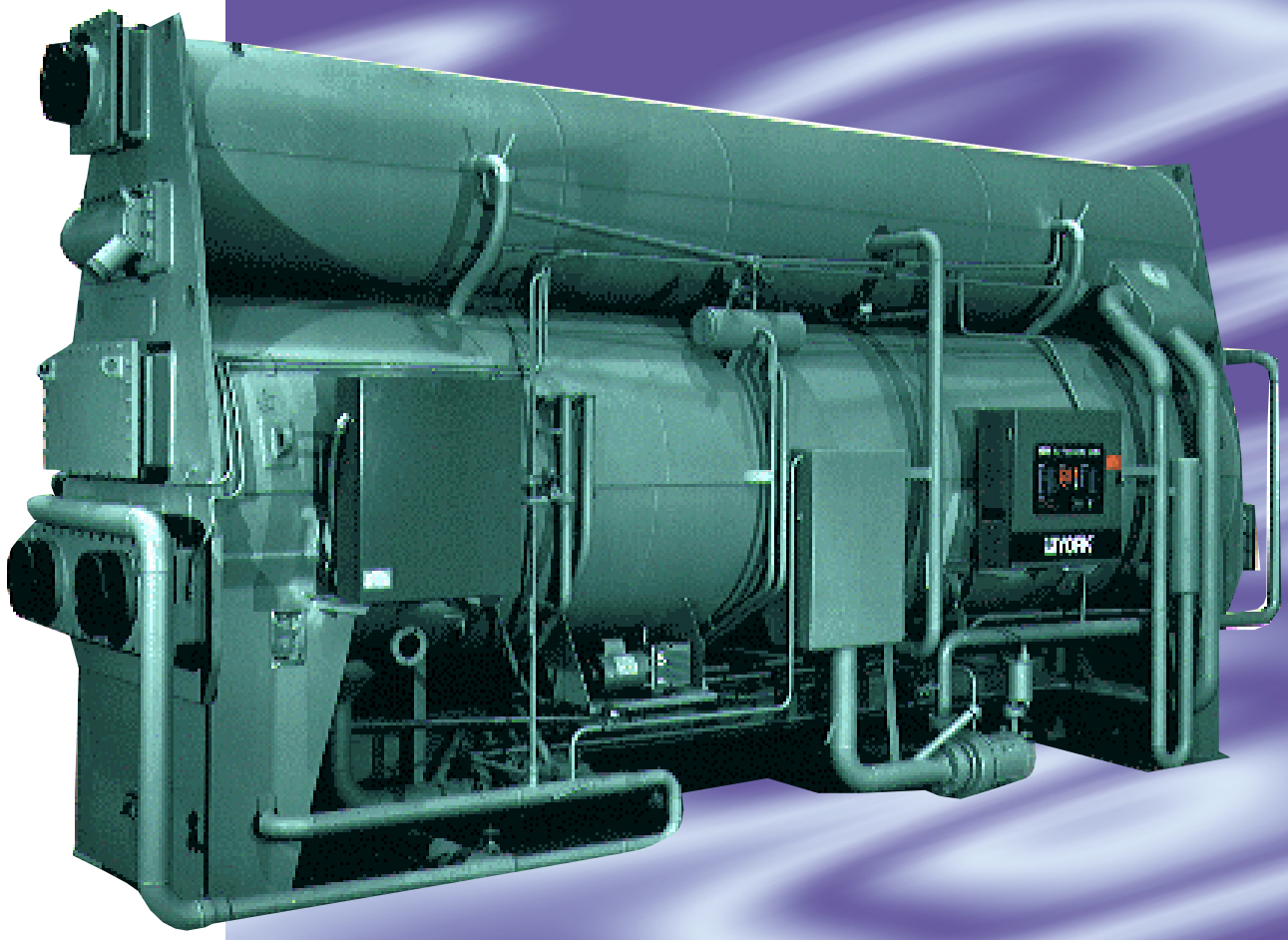
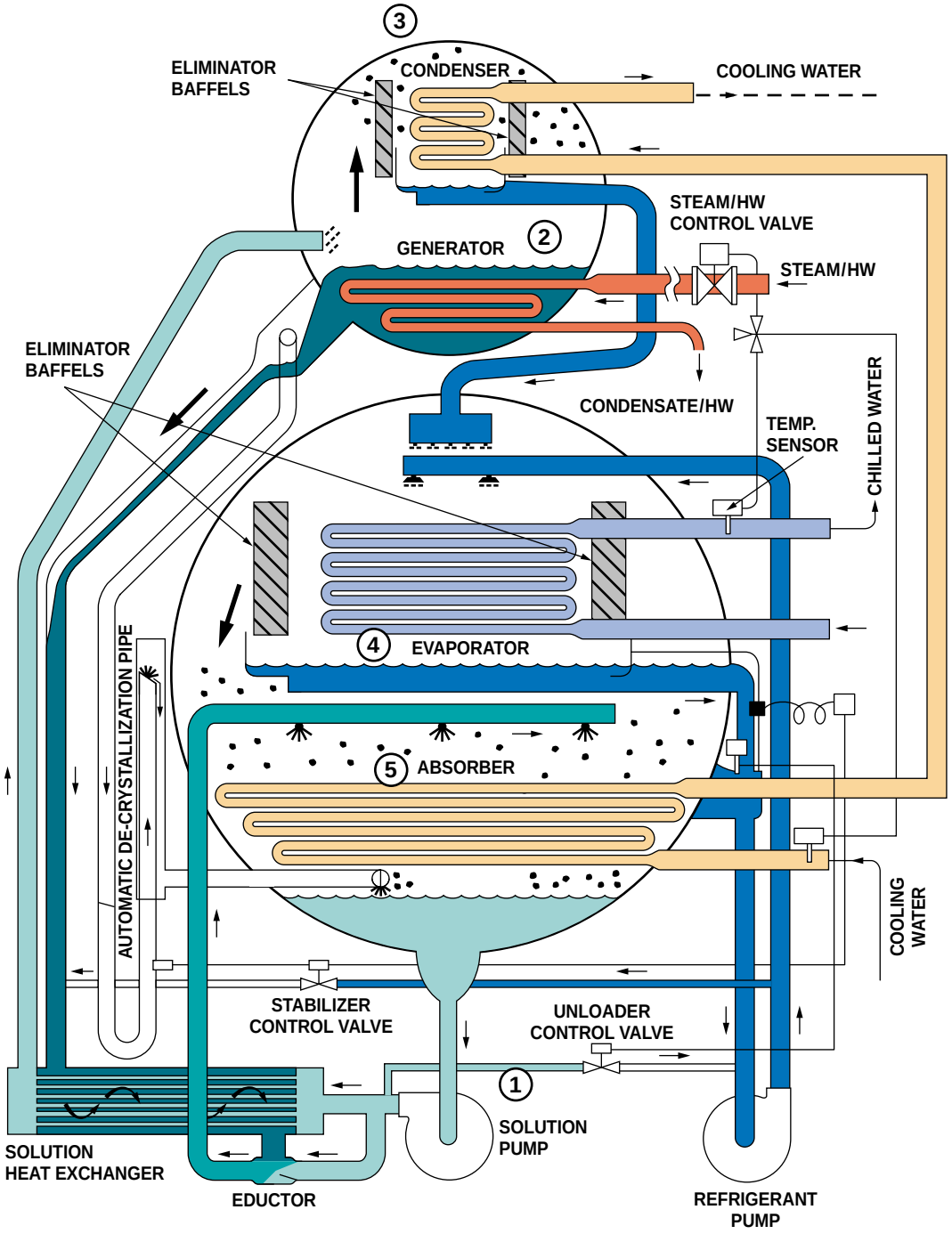
YORK® *Millennium*™ YIA Absorption Chiller



Standard Steam/Hot Water Cycle Diagram



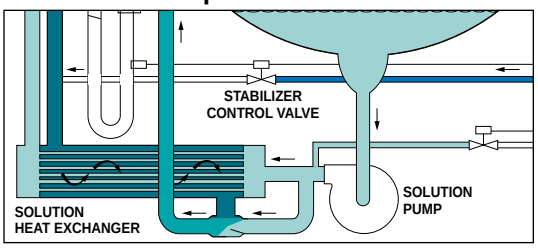
REFRIGERANT LIQUID
STRONG SOLUTION
INTERMEDIATE SOLUTION
DILUTE SOLUTION
CHILLED WATER
COOLING WATER
STEAM/HW

The large diagram above indicates the complete chilling cycle. The five steps are detailed on the next page with corresponding numbers in the diagram to show where each step is taking place. The cycle is continuous: however, for the sake of clarity and simplicity, it is divided into five steps.

How It Works

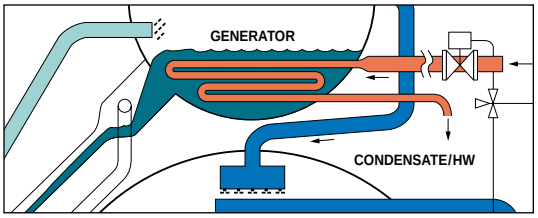
The Millennium Single Effect Absorption Chiller uses water as the refrigerant and lithium bromide as the absorbent. It is the strong affinity that these two substances have for one another that makes the cycle work. The entire process occurs in an almost complete vacuum.

1. Solution Pump



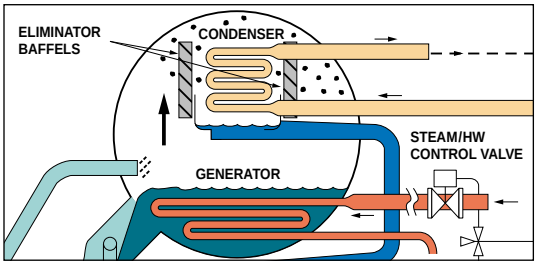
A dilute lithium bromide solution is collected in the bottom of the absorber shell. From here, a hermetic solution pump moves the solution through a shell and tube heat exchanger for preheating.

2. Generator



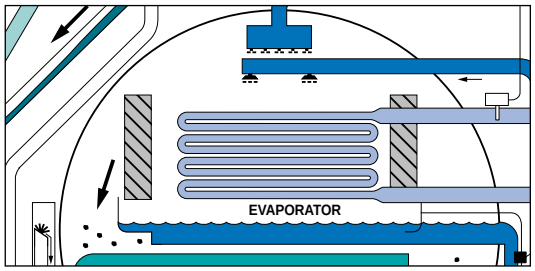
After exiting the heat exchanger, the dilute solution moves into the upper shell. The solution surrounds a bundle of tubes which carries either steam or hot water. The steam or hot water transfers heat into the pool of dilute lithium bromide solution. The solution boils, sending refrigerant vapor upward into the condenser and leaving behind concentrated lithium bromide. The concentrated lithium bromide solution moves down to the heat exchanger, where it is cooled by the weak solution being pumped up to the generator.

3. Condenser



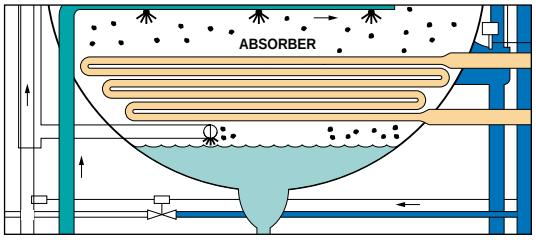
The refrigerant vapor migrates through mist eliminators to the condenser tube bundle. The refrigerant vapor condenses on the tubes. The heat is removed by the cooling water which moves through the inside of the tubes. As the refrigerant condenses, it collects in a trough at the bottom of the condenser.

4. Evaporator



The refrigerant liquid moves from the condenser in the upper shell down to the evaporator in the lower shell and is sprayed over the evaporator tube bundle. Due to extreme vacuum in the lower shell (6mm Hg (0.8kPa) absolute pressure), the refrigerant liquid boils at 39°F (3.9°C), creating the refrigerant effect. (The vacuum is created by hygroscopic action - the strong affinity lithium bromide has for water - in the absorber directly below.)

5. Absorber



As the refrigerant vapor migrates to the absorber from the evaporator, the strong lithium bromide solution from the generator is sprayed over the top of the absorber tube bundle. The strong lithium bromide solution actually pulls the refrigerant vapor into the solution, creating the extreme vacuum in the evaporator. The absorption of the refrigerant vapor into the lithium bromide solution also generates heat, which is removed by the cooling water. The now dilute solution of lithium bromide collects in the bottom of the lower shell, where it flows down to the solution pump. The chilling cycle is now completed and the process begins once again.

With increasing economic pressures and environmental concerns, chiller plant designers are looking for innovative solutions to reduce electrical consumption and eliminate CFCs. These pressures are driving designers to utilize all available energy sources including waste heat.

YORK Millennium YIA Single Stage Absorption Chillers are perfectly matched for these needs. Designed to run on either low pressure steam or hot water, YIA chillers can use waste heat sources to lower overall system operating costs. And, by using water as the refrigerant, they are an environmentally responsible solution. These characteristics provide the customer with cost savings and freedom from the restrictions, excise taxes and shortages common with CFC and HCFC refrigerant chillers.

A Proven Design

YORK has been manufacturing single stage absorption chillers since the late 1950's. With over 3,000 units installed worldwide, YORK has a level of experience with the design and application of single stage absorbers that is second to none. The proven industrial-grade design with YORK's renowned Millennium controls combine to provide the customer with the highest level of performance and reliability available today.

Application Characteristics

YIA chillers are available from 120 to 1377 tons (422 to 4840 Kw) using either low pressure steam or hot water. Steam units can operate with a wide range of inlet pressures, as low as 5 psig (34 KPa) vacuum. Hot water units can operate with entering water temperatures as high as 266˚F (130˚C), allowing direct recovery of jacket water heat from a diesel or gas reciprocating engine. Also, a wide range of options are available including special tubes, marine water boxes, 300 psig (2.1 MPa) water boxes, special code requirements, split shipment and many others.

Our Features	Your Benefits
• Powered by steam or waste heat	• Uses readily available, "clean" energy sources for cost-effective, environmentally responsible operation
• Water used as refrigerant	• Environmentally responsible, CFC-free operation
• YORK Millennium Control Center with "plain English" data input and output	• Simple chiller control, access and data retrieval • Monitors chiller to minimize downtime • Provides safest and most efficient operation • Precise setpoint control prevents drift, saves energy
• High quality hermetic refrigerant and solution pumps with isolation valves	• 55,000 hours between service intervals • Isolation valves simplify maintenance and eliminate the chance of allowing air to enter the chiller during service
• Patented "J-Tube" design	• Automatically eleminates minor crystallization without shutting unit down
• Operation with 45°F entering tower water	• Maximizes chiller efficiency when lower tower water temperatures are available
• Two shell design	• All units can be split-shipped for rigging requirements