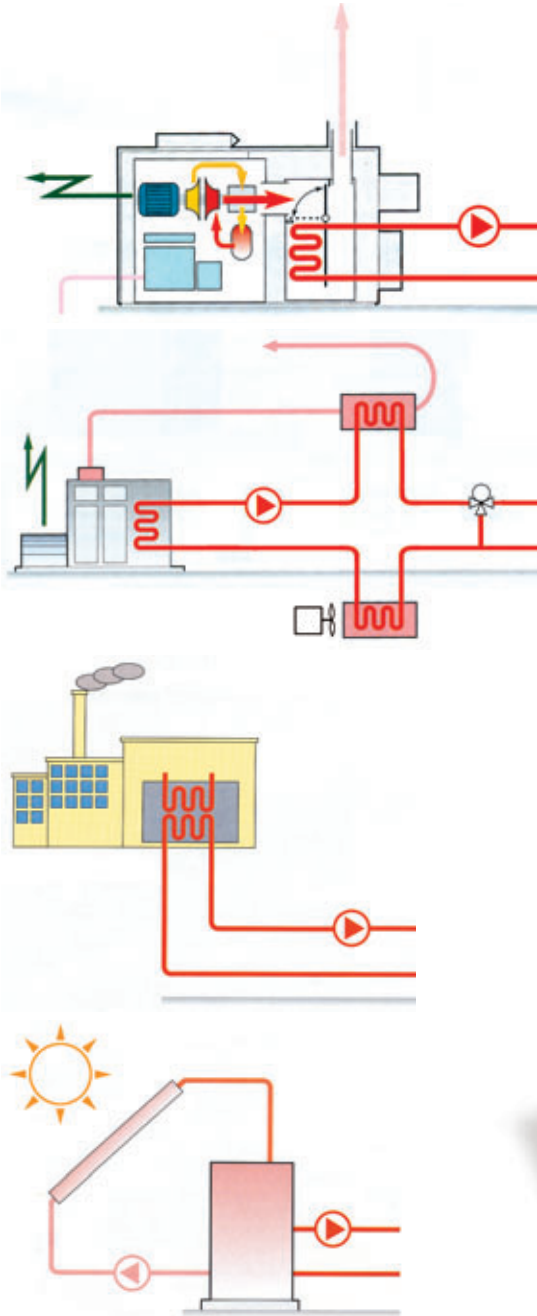


Water Fired Chiller/Chiller-Heater

WFC-S Series



WE ARE FRIENDLY TO THE EARTH

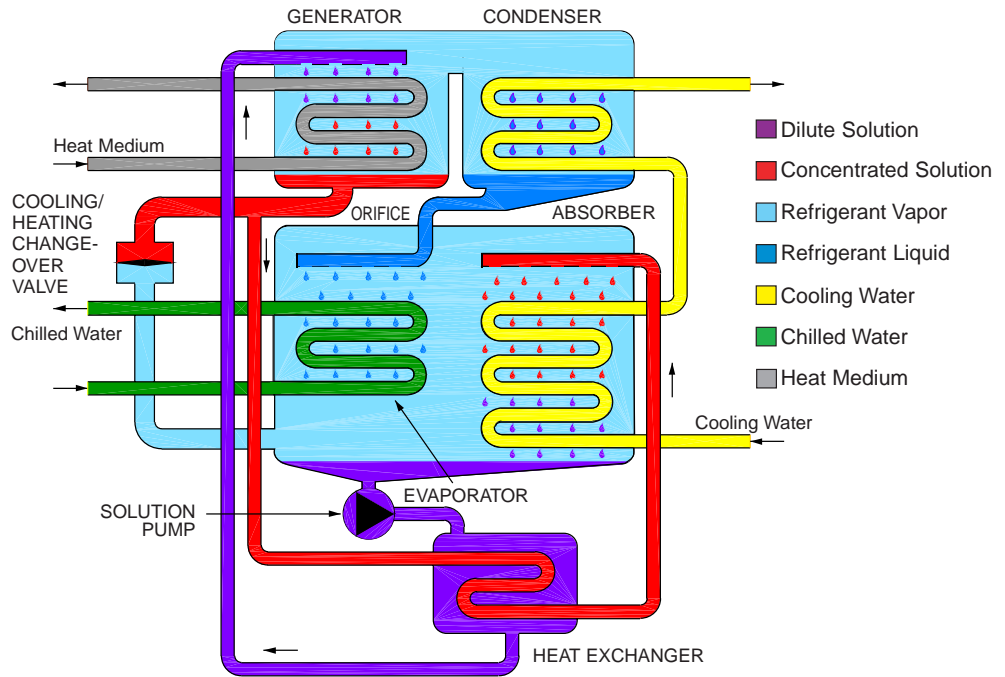
**Water Fired
SINGLE-EFFECT
Chiller or
Chiller-Heater**

Yazaki water fired SINGLE-EFFECT chillers or chiller-heaters have cooling capacities of 10, 20 and 30 tons of refrigeration and produce chilled water for cooling or hot water for heating in comfort air conditioning applications. The absorption cycle is energized by a heat medium (hot water) at 158°F to 203°F from an industrial process, cogeneration system, solar energy or other heat source and the condenser is water cooled through a cooling tower.

Absorption Principle

The Yazaki absorption chiller or chiller-heater uses a solution of lithium bromide and water, under a vacuum, as the working fluid. Water is the refrigerant and lithium bromide, a nontoxic salt, is the absorbent. Refrigerant, liberated by heat from the solution, produces a refrigerating effect in the evaporator when cooling water is circulated through the condenser and absorber.

Cooling Cycle



Generator

When the heat medium inlet temperature exceeds 154.4°F, the solution pump forces dilute lithium bromide solution into the generator. The solution boils vigorously under a vacuum and droplets of concentrated solution are carried with refrigerant vapor to the primary separator. After separation, refrigerant vapor flows to the condenser and concentrated solution is pre-cooled in the heat exchanger before flowing to the absorber.

Condenser

In the condenser, refrigerant vapor is condensed on the surface of the cooling coil and latent heat, removed by the cooling water, is rejected to a cooling tower. Refrigerant liquid accumulates in the condenser and then passes through an orifice into the evaporator.

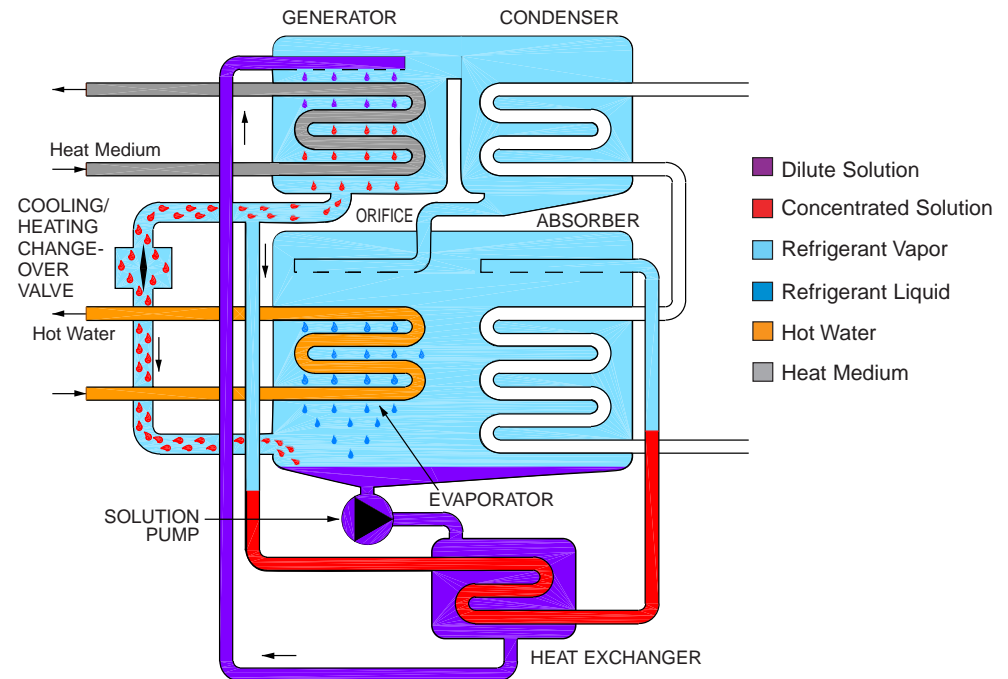
Evaporator

In the evaporator, the refrigerant liquid is exposed to a substantially deeper vacuum than in the condenser due to the influence of the absorber. As refrigerant liquid flows over the surface of the evaporator coil it boils and removes heat, equivalent to the latent heat of the refrigerant, from the chilled water circuit. The recirculating chilled water is cooled to 44.6°F and the refrigerant vapor is attracted to the absorber.

Absorber

A deep vacuum in the absorber is maintained by the affinity of the concentrated solution from the generator with the refrigerant vapor formed in the evaporator. The refrigerant vapor is absorbed by the concentrated lithium bromide solution flowing across the surface of the absorber coil. Heat of condensation and dilution are removed by the cooling water and rejected to a cooling tower. The resulting dilute solution is preheated in a heat exchanger before returning to the generator where the cycle is repeated.

Heating Cycle



Generator

When the heat medium inlet temperature exceeds 154.4°F, the solution pump forces dilute lithium bromide solution into the generator. The solution boils vigorously under a vacuum to generate refrigerant vapor and droplets of concentrated solution. Since the changeover valve is open during heating operation, the mixture of refrigerant vapor and concentrated solution flows directly into the evaporator. Some refrigerant vapor flows through the condenser before reaching the evaporator.

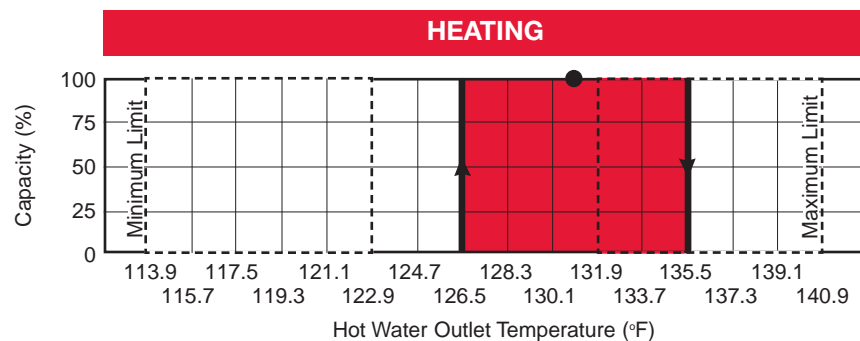
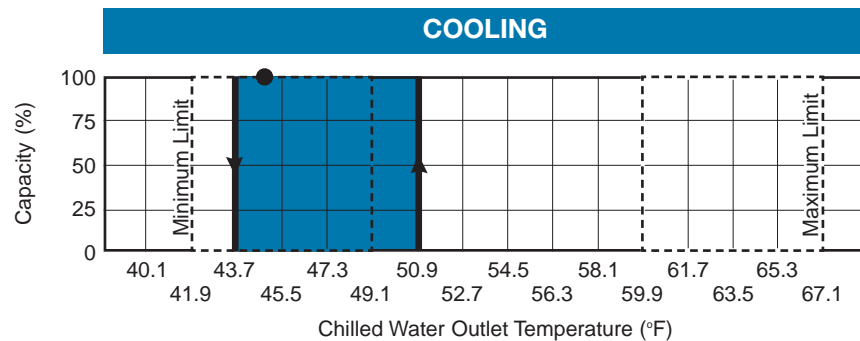
Evaporator

Hot refrigerant vapor condenses on the surface of the evaporator coil and heat, equivalent to the latent heat of the refrigerant, is transferred to the hot water circuit. The recirculating water is heated to 131°F. Refrigerant liquid mixes with concentrated lithium bromide solution and the resulting dilute solution returns to the generator where the cycle is repeated.

Features

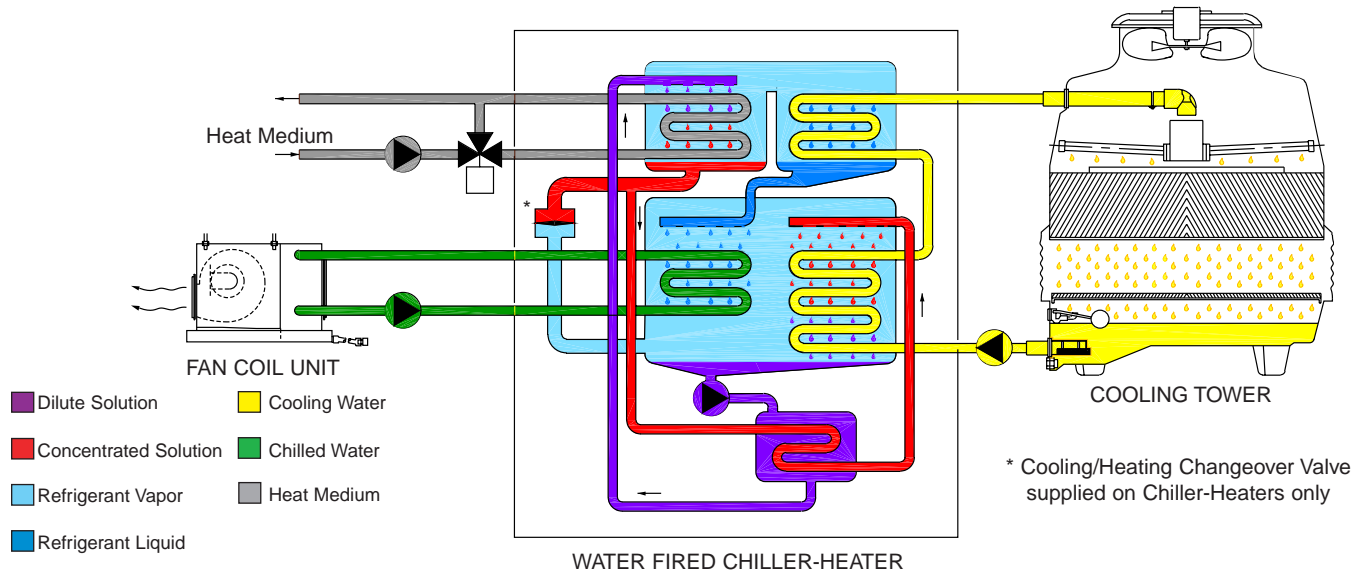
- Absorption cycle energized by hot water at 158°F to 203°F from process, cogeneration, solar or other waste heat sources.
- Safe, odorless, non-toxic working fluids of lithium bromide and water operate under a vacuum at all times.
- Supplied as a chiller only or a chiller-heater for applications that require separation of heating water and heat medium circuits due to glycol, operating pressure, flow or piping limitations.
- Crystallization prevented in the generator by utilizing a solution pump and gravity drain-back system.
- Single hermetic pump controls solution flow.
- Faster cold start-up time than similar chillers with flooded generators.
- Chilled water and hot water outlet temperatures controlled by a built-in microprocessor with outputs to control a 3-way valve and/or heat medium pump (supplied by others).
- All chillers and chiller-heaters supplied with a standard weatherproof cabinet suitable for outdoor installation.
- Built-in shutdown controls for high heat medium temperature and abnormal cooling water conditions.
- Cooling capacities increased at 85°F cooling water and when energized by 203°F heat medium.
- Ideal for a two pipe hydronic system in which chilled or hot water is circulated to a central airhandling unit or multiple fan-coil units.
- Cooling or heating operation on chiller-heaters can be selected from a remote or built-in switch.
- Only 30 minute delay required for operation changeover.
- Transportation and lifting are simplified because of modular construction.
- Factory charged and performance tested.
- UL Listed for USA and Canada.

Control Characteristics



● Standard Rating Point ■ Standard Control Settings

Application (Water Fired Cooling & Heating System - Cooling Operation)



Specifications

Model	WFC	SC10	SH10	SC20	SH20	SC30	SH30
Cooling	Capacity (Btu/hr x 1000)	120.0		240.0		360.0	
	Chilled Water Temp. (°F)	44.6 Outlet, 54.5 Inlet					
Heating	Capacity (Btu/hr x 1000)	—	166.3	—	332.6	—	498.9
	Hot Water Temp. (°F)	131.0 Outlet, 117.3 Inlet					
Chilled/Hot Water	Rated Water Flow (gpm)	24.2		48.4		72.6	
	Evap. Press Drop (psi)	8.1		9.6		10.1	
	Water Retention Volume (gal)	4.5		12.4		19.3	
Cooling Water	Heat Rejection (Btu/hr x 1000)	291.4		582.8		874.2	
	Inlet Temperature (°F)	87.8 (Standard)					
	*Rated Water Flow (gpm)	80.8		161.7		242.5	
	Cond./Abs. Press. Drop (psi)	12.3		6.6		6.7	
	Water Retention Volume (gal)	17.4		33.0		51.3	
Heat Medium	Input (Btu/hr x 1000)	171.4		342.8		514.2	
	Inlet Temperature (°F)	190.4 (Standard)					
		Temperature Range 158 (min.) - 203 (max.)					
	Rated Water Flow (gpm)	38.0		76.1		114.1	
	Generator Press. Drop (psi)	13.1		6.7		8.8	
Water Retention Volume (gal)	5.5		14.3		22.2		
Electrical	Power Supply	208V, 60Hz, 3 ph					
	Consumption (W)						
Capacity Control	On - Off						
Noise Level	Sound Pressure dB(A)	49		49		46	
Piping	Chilled/Hot Water (in)	1-1/2 NPT		2 NPT		2 NPT	
	Cooling Water (in)	2 NPT		2 NPT		2-1/2 NPT	
	Heat Medium (in)	1-1/2 NPT		2 NPT		2-1/2 NPT	
Weight	Dry (lb)	1,100		2,050		3,200	
	Operating (lb)	1,329		2,548		3,975	

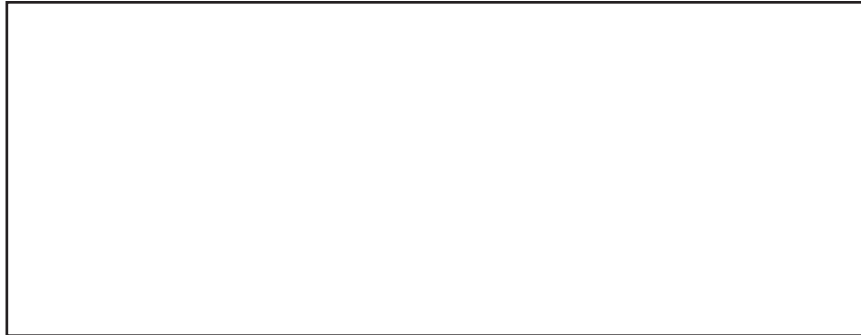
* Minimum cooling water flow

* Cooling/Heating Changeover Valve supplied on Chiller-Heaters only

NOTES:

- Specifications are based on water in all circuits and fouling factor of 0.0005 ft²hr²F/Btu.
- Do not exceed 85.3 psi operating pressure in any water circuit.
- If heat medium inlet temperature exceeds 203°F the chiller/chiller-heater will shutdown and require manual reset.
- Optional cooling water crossover piping with 3 in. type "L" copper connections available for WFC-SC20/SH20 and WFC-SC30/SH30.
- Sound pressure noise level measured in a free field at a point 79 in. behind the chiller/chiller-heater and 59 in. above the ground.

YAZAKI SALES REPRESENTATIVE/DISTRIBUTOR:



For information concerning sales, operation, application
or technical assistance, please contact your
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