

# Eco-friendly Energy company

World Energy a global small but strong company  
Thinking about future energy and environment



# About us

## WORLD ENERGY ABSORPTION CHILLERS AND HEAT PUMPS

With expertise in absorption refrigeration technology, World Energy provides energy saving environmentally friendly absorption chillers and absorption heat pumps to global customers, including multinational corporations or a government agencies, buildings or production facilities, cruise ships or offshore plants.



Address: 97, Gaeungongdan-gil, Gaeun-eup, Mungyeong-si, Gyeongsangbuk-do, South Korea

Lear more: <http://worldenergy.co.kr/en>

Find "World Energy Absorption Chiller" on Youtube

### WORLD ENERGY BENEFITS

EFFICIENCY	FLEXIBILITY
<ul style="list-style-type: none"><li>• Highest COP</li><li>• Lowest power consumption rate</li><li>• Stable Part Load Operation</li><li>• Smart Power Management System saving energy cost of instruments</li><li>• Compact size, small footprint</li></ul>	<ul style="list-style-type: none"><li>• Support all kinds of heat source</li><li>• Low leaving chilled water temperature down to -7°C allowing diverse application area</li><li>• Wide range of products lines</li><li>• Less limit on installation environment, from hazardous area to an offshore plant</li><li>• Customizable material, dimensions, and software</li></ul>
RELIABILITY	CONVENIENCE
<ul style="list-style-type: none"><li>• Developed the technical standard of absorption chillers for district cooling in Korea</li><li>• Repeat customers from government agencies and multinational corporations.</li><li>• International quality/safety standards including IECEx, ATEX, DNV-GL, CE, UL, PED, GAR. ISO etc.,</li></ul>	<ul style="list-style-type: none"><li>• Hermetically sealing safe automatic purge system</li><li>• Automatic tube cleaning system</li><li>• Remote Monitoring System</li></ul>



# Product line-up

## Absorption Chiller

HOT WATER DRIVEN TYPE		
HOT WATER (80~120°C)	<b>Single Effect Hot Water Absorption Chiller</b> Model: HVAR-L Capacity: 100~7,033 kW / 30~2,000 TR Application: Combined heat and power (cogeneration), commercial cooling, industrial cooling Utilize energy of hot water to 70°C	
	<b>Single Effect Double Lift Hot Water Absorption Chiller</b> Model: 2AB Capacity: 105~7,033 kW / 30~2,000 TR Application: District Cooling, Combined heat and power(cogeneration), commercial cooling, industrial cooling. Utilize energy of hot water to 55°C	
LOW TEMPERATURE HOT WATER (70~80°C)	<b>Double Lift Low Temperature Hot Water Absorption Chiller</b> Model: 2AA Capacity: 105~7,033 kW / 30~2,000 TR Application: Industrial cooling	
STEAM DRIVEN TYPE		
LOW PRESSURE STEAM (0~2barG)	<b>Single Effect Steam Absorption Chiller</b> Model: S Capacity: 176~7,033 kW / 50~2,000 TR Application: District Cooling, commercial cooling, industrial cooling	
MEDIUM PRESSURE STEAM (4~8barG)	<b>Single Effect Steam Absorption Chiller</b> Model: SW Capacity: 176~7,033 kW / 50~2,000 TR Application: District Cooling, commercial cooling, industrial cooling	

# Product line-up


DIRECT FIRED TYPE		
GAS OR OIL	<b>Double Effect Direct Fired Absorption Chiller-Heater</b> Model: DW Capacity: 176~7,033 kW / 50~2,000 TR Application: Commercial cooling	
EXHAUST GAS DRIVEN TYPE		
EXHAUST GAS	<b>Double Effect Exhaust Gas Absorption Chiller-Heater</b> Model: CHP Capacity: 176~7,033 kW / 50~2,000 TR Application: Combined heat and power(cogeneration), industrial cooling	
EXHAUST GAS AND HOT WATER	<b>Hybrid Absorption Chiller</b> Model: CHPL Capacity: 176~7,033 kW / 50~2,000 TR Application: Combined heat and power(cogeneration), industrial cooling	

## Special Application




MARINE, OFFSHORE	<b>Marine Absorption Chiller</b> Model: Applicable to any model Capacity: 176~7,033 kW / 50~2,000 TR Feature: Sea/freshwater-cooled, DNV-GL certified	
FOOD INDUSTRY CHEMICAL INDUSTRY, COLD STORAGE,	<b>Single Effect Brine Absorption Chiller</b> Model: Applicable to any model Capacity: 176~7,033 kW / 50~2,000 TR Feature: Low leaving chilled water temperature (secondary refrigerant) down to 0°C	<div>0°C</div>



# Product line-up

FOOD INDUSTRY, CHEMICAL INDUSTRY, COLD STORAGE	<b>Double Lift Brine Absorption Chiller</b> Model: Applicable to any model Capacity: 176~7,033 kW / 50~2,000 TR Feature: Low leaving chilled water temperature (secondary refrigerant) down to -7°C	-7°C
HAZARDOUS AREA	<b>Explosion Proof Absorption Chiller</b> Mode: Applicable to any model Feature: IECEx or ATEX certified	

## Absorption Heat Pumps

HOT WATER DRIVEN TYPE		
HOT WATER	<b>Hot Water Absorption Heat Pump</b> Model: HPL Capacity: 176~7,033 kW Feature: Recover waste heat by using energy of hot water	
STEAM	<b>Steam Absorption Heat Pump</b> Model: HPS Capacity: 176~7,033 kW Feature: Recover waste heat by using steam energy	
DIRECT FIRED	<b>Direct Fired Absorption Heat Pump</b> Model: HPD Capacity: 176~4,686 kW Feature: Recover waste heat with fuel combustion	

# Product line-up

## Absorption Heat Transformer

### Absorption Heat Transformer

Model: AHT

Capacity: 349~10,465 kW

Feature: Transform low-class waste heat to useful heat without driving heat source



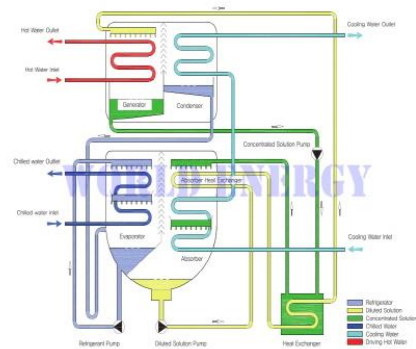
## Smart Function

<b>Smart Power Management System</b>	70% reduced electricity cost of cooling and chilled water pump
<b>Automatic Purge System</b>	Safe automatic purge system with zero leak potential
<b>Automatic Tube Cleaning System</b>	Free from the hassle of opening water box, keep tube condition at the best

# Product detail

## HWAR-L Single Effect Hot Water Absorption Chiller

30~2,000RT (105~7,033kW)



Driving Temperature: 80~120°C

### Feature

#### ■ Highest delta T in hot water

Achieved leaving temperature of hot water down to 70°C, by the unique 2-shell structured condenser and generator

#### ■ Lowest power consumption and footprint

Reduced absorbent solution flow rate by the unique 2-level structured evaporator and absorber. Less solution flow rate minimized the power consumption of the solution pumps as well as the size of machine. 60% lesser in power consumption, and 20% smaller in dimension compared to the products of other companies.

#### ■ Highest COP

Achieved COP 0.825, the highest in single effect hot water driven absorption chillers

#### ■ Application versatility

Designed to suit a variety of applications, from comfort cooling to providing chilled water for process applications, HWAR-L offers versatility for almost any job where hot water is available as the heat source. HWAR-L is sure to be the right choice for either new construction or retrofit applications.

#### ■ Excellent part load performance

The standard concentration control system allows stable part load operation at cooling water temperatures as low as 17°C without the need for a cooling water bypass. For maximum efficiency, a variable frequency drive pump (option) automatically maintains optimum solution flow between generator and absorber at all operating condition. This will result in improved part-load efficiency. HWAR-L has a continuous operating range from 100% to 10% of rated machine capacity.

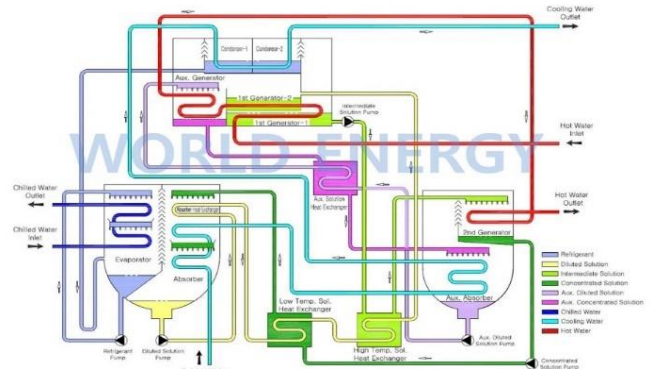
### Reference

**Australia** Qantas (Sydney Airport), **Thailand** GC Glycol, **USA** Macy's (New York), Millennium Hilton Hotel, CBS Television City, Aquarium of the Pacific, **Netherlands** University of Amsterdam

# Product detail

## 2AB Single Effect Double Lift Hot Water Absorption Chiller

30~2,000RT (105~7,033kW)



Driving Temperature: 80~120°C

### Feature

#### ■ Technical standard of district cooling absorption chiller

The first technical standard developed with largest market share in Korean district cooling absorption chillers

#### ■ Achieved higher than 40°C delta T and 55°C leaving temperature of hot water

Combined designs of the single effect type and the double Lift type allows the high delta T and low leaving temperature down to 55°C

#### ■ Highest COP

Achieved COP 0.71, even with double lift refrigeration cycle

### Reference

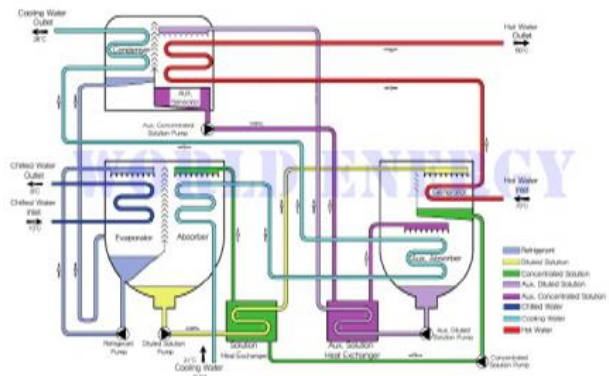
Germany BCMG, Korea Incheon International Airport



# Product detail

## 2AA Double Lift Low Temperature Hot Water Absorption Chiller

30~2,000RT (105~7,033kW)



Driving Temperature: 70~80°C

### Feature

■ Utilizes waste heat from warm water at a low temperature of 70°C

The first double lift refrigeration cycle absorption chiller which can recover heat from low temperature hot water of entering 70°C and leaving 60°C.

■ Suitable to 24/7 operation industries

Most benefits to industrial customers who have abundant amount of low temperature waste heat and cooling demand for 24 hours manufacturing operation

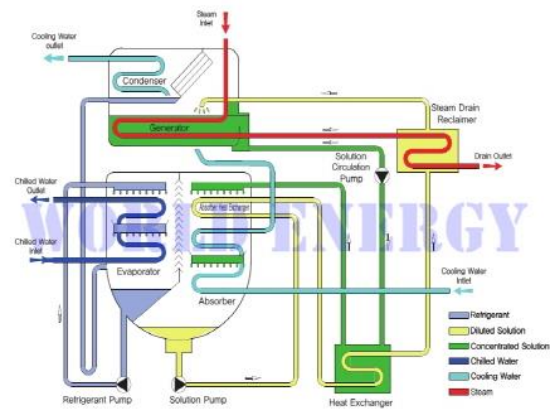
### Reference

Korea Korea Zinc, Hankuk Paper, YP Zinc

# Product detail

## S Single Effect Steam Absorption Chiller

50~2,000RT (176~7,033kW)



Steam Pressure: 0~2barG

### Feature

■ Make use of low-quality waste steam or gas  
Recover heat from very low-pressure steam down to 0 atm, and any kind of waste gas which has latent heat

■ Highest COP  
Achieved COP 0.81 even with the single effect refrigeration cycle

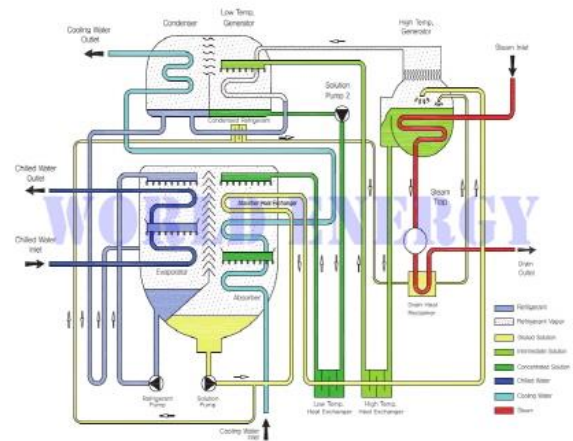
### Reference

**Italy** TELECOM ACILIA, **Korea** Hanwha Chemical (HCC Yecheon2 OA), **Taiwan** CHANG CHUN PETROCHEMICAL,  
**USA** North Shore Towers

# Product detail

## SW Double Effect Steam Absorption Chiller

50~2,000RT (176~7,033kW)



Steam Pressure: 4~8barG

### Feature

#### ■ High delta T of steam energy heat recovery

Low steam drain outlet temperature lower than 90°C, achieved by steam traps and drain heat exchangers to promote elimination of just condensed water (but not steam) through drain outlets of high-temperature generators. In this way, the temperature of condensed water drains drops to lower than 90°C, maximizing the efficiency of chillers through raising drain heat recovery.

#### ■ Stable chilled water leaving temperature

Equipped with an inverter control system which provides precise part-load control of absorbent solution flow rate, securing stable chilled water leaving temperature

#### ■ Highest COP

COP 1.48, with less steam consumption of 3.5kg/h per 1usRT

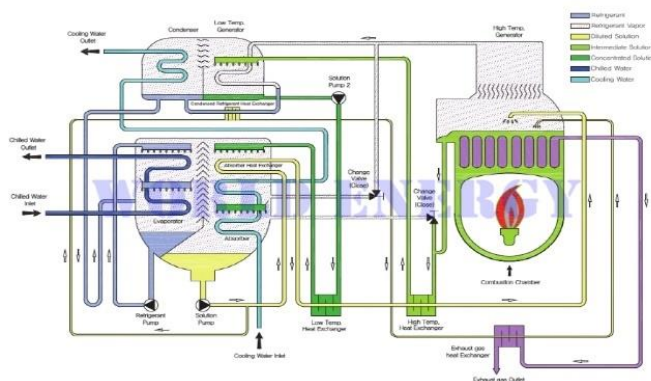
### Reference

**Bangladesh** Mosharaf Composite Textile, **Germany** HW Bausparkasse AG, **Korea** National Museum of Modern and Contemporary Art (Seoul), Samsung Total, **USA** Canadaigua Veteran Affairs Medical Center

# Product detail

## DW Double Effect Direct Fired Absorption Chiller-Heater

50~2,000RT (176~7,033kW)



Fuel: Oil or Gas

### Feature

#### ■ Low Emission, eco-friendly

Equipped with certified low NO<sub>x</sub> burners to protect environment

#### ■ High delta T heat recovery

Low exhaust gas outlet temperature down to 120°C, achieved by the exhaust gas heat exchanger installed through outlets of high-temperature generators. In this way, the temperature of exhaust gas drops to 120°C, maximizing the efficiency of chillers through raising gas(oil) and exhaust gas heat recovery.

#### ■ Stable chilled water leaving temperature

Equipped with an inverter control system which provides precise part-load control of absorbent solution flow rate, securing stable chilled water leaving temperature

#### ■ Highest COP

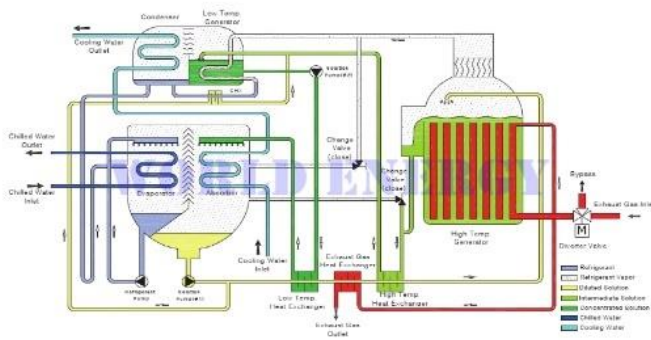
COP 1.48, with gas consumption of 3.5kg/h per 1usRT

### Reference

**Hong Kong** Hong Kong Airport, **Russia** Astrakhan city administration building

# Product detail

## CHP Double Effect Exhaust Gas Absorption Chiller-Heater / CHPL Hybrid Absorption Chiller 50~2,000RT (176~7,033kW)



Exhaust Gas: 250~600°C

### Feature

#### ■ Low exhaust gas pressure loss

Achieved pressure loss lower than 150mmAq, by adopting high-finned tubes in the generator

#### ■ Safe hermetic, spring return diverter valve

When the chiller is not working, or even shut down by black out, the diverter valve completely close and prevent hot gas getting into the chiller

#### ■ Applicable to low-quality exhaust gas

Exhaust gas containing much dirt can be used by installing smoke type tubes

#### ■ High delta T heat recovery

Low exhaust gas outlet temperature down to 120°C, achieved by the exhaust gas heat exchanger installed through outlets of high-temperature generators. In this way, the temperature of exhaust gas drops to 120°C, maximizing the efficiency of chillers through raising gas(oil) and exhaust gas heat recovery.

#### ■ Stable chilled water leaving temperature

Equipped with an inverter control system which provides precise part-load control of absorbent solution flow rate, securing stable chilled water leaving temperature

#### ■ Multiple heat source (CHPL)

Combined the structure of CHP and HWAR-L to use both exhaust gas and hot water as heat source. Suitable to the customer who has less amount of waste energy and limited installation space.

### Reference

**Australia** Qantas (Sydney Airport), **Bangladesh** INCEPTA Pharmaceuticals, Ismail Textile, **Germany** IBM Ehningen, Giessen Hospital



# Product detail

## Marine Absorption Chiller



### Feature

- Most economical cooling on the sea

Utilizes all kind of waste heat from vessel engines, and use sea water as free coolant, reduces fuel consumption significantly for power generation

- Reliable technology

Co-developed with Samsung Heavy Industry, DNV-GL certified, patent registered in Korea and Japan

- Stable performance on the sailing condition

Verified by a witnessed test with government-certified institution that chillers are not damaged nor cause any issues, and the fluids inside the chillers are normally circulated even under tough operating conditions with a lot of motions, and confirmed that under tough operating conditions

### Reference

**Denmark** Novenco Marine & Offshore, **Finland** Gadlab Engineering, **Poland** Color Hybrid

A wide range of heat sources such as hot water, steam, exhaust gas, or fossil fuel (gas & oil) can be utilized to drive World Energy Brine Absorption Chillers. Also, they can be installed on marine vessels or offshore plants where the chillers are continuously exposed to severe vibration and tilting during their operation. In this case they utilize waste heat from vessel engines.

# Product detail

## Explosion Proof Absorption Chiller



### Feature

- The first absorption chiller with international explosion-proof certification  
World Energy's explosion-proof absorption chiller has acquired product self-certification such as control panel, pumps, sensors, etc., and verified that it operates safely even in an explosion hazards environment.
- An explosion-proof absorption chiller that can use waste heat as heat source  
This chiller is an economical refrigeration equipment that saves energy consumption by using waste heat such as hot water, steam and exhaust gas that is wasted in the industrial environment and is a safer and more eco-friendly product by less electricity consumption.
- An absorption chiller can be operated even in various explosion hazards environment  
World Energy's explosion-proof absorption chiller is a product that can be used in various explosion hazards areas such as petrochemical complex, LPG terminal, offshore oil tankers and drill ships.

### Reference

**Korea** Lotte Chemical, Hanwha Chemical, Kumho Petrochemical, **Taiwan** NAN-YA BPA MAIO LIAO

# Product detail

## HPL, HPS, HPD Absorption Heat Pumps



### Feature

#### ■ High COP

Achieved COP 1.8

#### ■ Reliable Technology

Equipped with every technical feature and certificate of World Energy absorption chillers  
HPD is certified with GAR

#### ■ Flexible application with variable heat source

Recover waste heat by using steam, hot water, or fuel combustion  
Even the very low temperature heat source such as sewage of 10~15°C can be utilized

#### ■ Flexible Tube Design

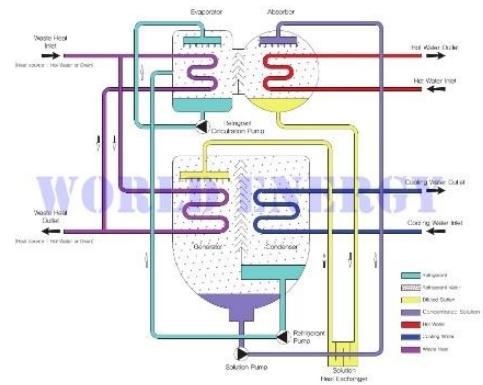
Various material and design can be applied to the heat transfer tubes

### Reference

Italy ASL Rimini

# Product detail

## AHT Absorption Heat Transformer



Steam Generating Absorption Heat pump, also referred to as Absorption Heat Transformer or 2nd type heat pump, supplies high temperature hot water or steam as high as 100 °C by recovering Middle-temperature waste heat, below 90 °C

### Feature

- Transforms heat from waste energy to usable energy  
Raise the temperature of hot water or steam higher than 100°C by using waste steam or water as driving heat source
- Highest COP 0.5  
Can get about 50% valuable energy through adopting 100% waste energy.
- Installation of 7,000kW (steam generation 10ton/hr)

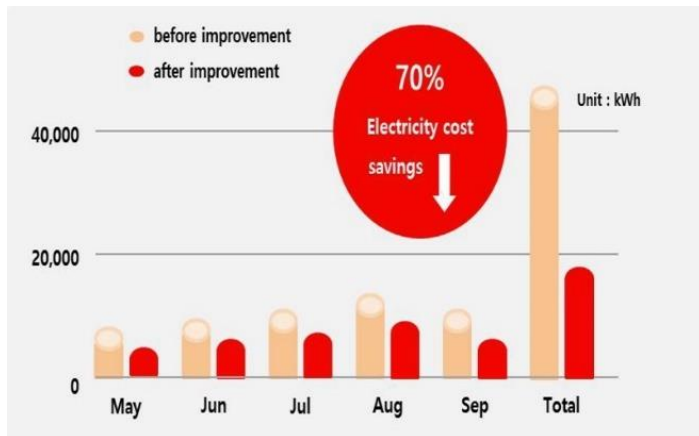
### Reference

Korea Kumho Petrochemical



# Product detail

## Smart Power Management System

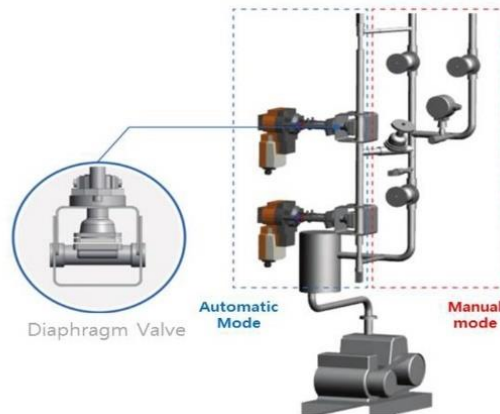


### Feature

- Development of refrigeration system for controllable precise flow of cooling and chilled water  
Maintain the maximum temperature difference between the inlet and outlet of the cooling and chilled water under partial load.
- Electricity cost of cooling and chilled water pump have reduced by 70%  
Researching for 1.6 year, selected as a demonstration complex (Pan-gyo Startup Campus), the electricity cost has reduced 70% than previous year by cooling and chilled water pump control technology of World Energy.
- Upgrade its safety by installing the pipe assembly for low flow detection as self-development.  
Protection device for water outage to detect cooling and chilled water flow under low condition of 20% cooling and chilled water flow
- Consistent reduced operating costs through initial low installation cost (inverter).  
Initial installation cost can be recovered within a year or two (It may be partially different depending on the site condition)

# Product detail

## Automatic Purge System



### Makes zero leak potential

- Hermetical diaphragm valve

Custom-designed for thickness and material to fit automatic purge system. As a result of long-term research, it has been developed an optimal closing condition and succeeded in realizing 0% leak potential when the valve was closed.

- Manual / automatic purge can be selected depending on the situation

It is possible to be manual / automatic mode depending on the situation, secure the administrator's convenience with simple control.

- Automatic closing function in case of blackout

The valve controller has a spring return function that automatically closes the valve in case of blackout, so emergency power is not required.

- High safety with using welded-joint type diaphragm valve

Not a screwed-joint solenoid valve with high risk of leakage, but a welded-joint type diaphragm valve with excellent airtightness to secure reliability.

- Accurately controllable actuator

Provide durability and safety using world-class actuator, accurately controllable actuator.

### Convenient evacuation of non-condensable gas

- Purge pump and automatic valve on/off

When the purge pump reaches the setting pressure, it automatically discharges non-condensable gas to operate the chiller in optimum conditions.

- Alarm function for the purge Pump abnormal operation

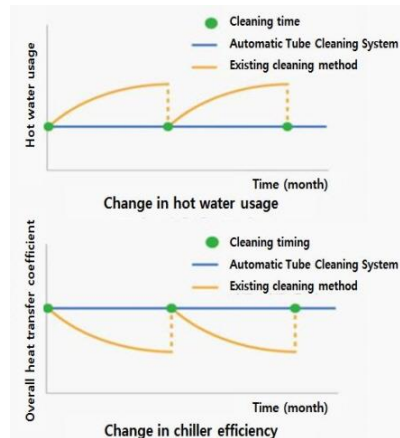
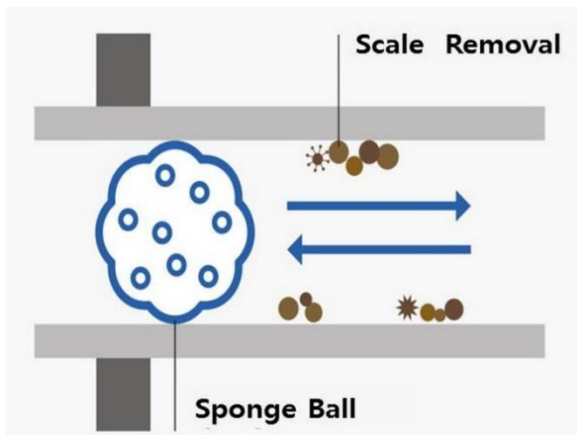
When the purge pump is operating abnormally, the operator is provided malfunction information promptly to take quick action.

- Alarm function for automatic leak detection.

When the chiller is leaking, the operator is provided the leakage information to take initial prevention, it helps extend the chiller's life-time and operate it optimally.

# Product detail

## Automatic Tube Cleaning System



### The heat-transfer tubes are managed with regular automatic cleaning for operating in the best condition

The scale and contaminants attached to the inner wall of the heat-transfer tubes of the cooling water side hinder the heat exchanging, fall the chiller performance, and become narrow tube inside not to pass the flow rate well. If you do not clean heat-transfer tubes, a lot of efficiency is wasted, the lifetime of the chiller is reduced for this reason regular internal tube cleaning is required. (Recommended once / year) World Energy's automatic tube cleaning system manages heat-transfer tubes with regular automatic cleaning; so that the chiller can be operated in optimal condition, resulting in reduced electric energy due to the increased efficiency. Eventually it can save the operating costs, also increase economic feasibility by reducing cleaning cost and management point.

### Benefits

- No necessary maintenance as the all-in-one composition
- Reduced regular cleaning cost and management point
- Reduced energy consumption and cost due to the increased efficiency (about 10% energy saving)
- Extension of chiller replacement period by extending the lifetime of the chiller
- Environmental pollution prevention
- Shut-down prevention
- Keep the chiller efficiency constantly

Tube cleaning method in the past required heat-transfer tube cleaning because heat efficiency reduced due to the contamination of heat-transfer tubes as time passes. However, this automatic tube cleaning system maintains the efficiency of the chiller constantly through regular automatic cleaning.

# Contact

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