

DYNA Eco Water Systems

DYNA ECO WATER SYSTEMS

Dynakleen Series

DYNAKLEEN SERIES

Reiken
Corporation

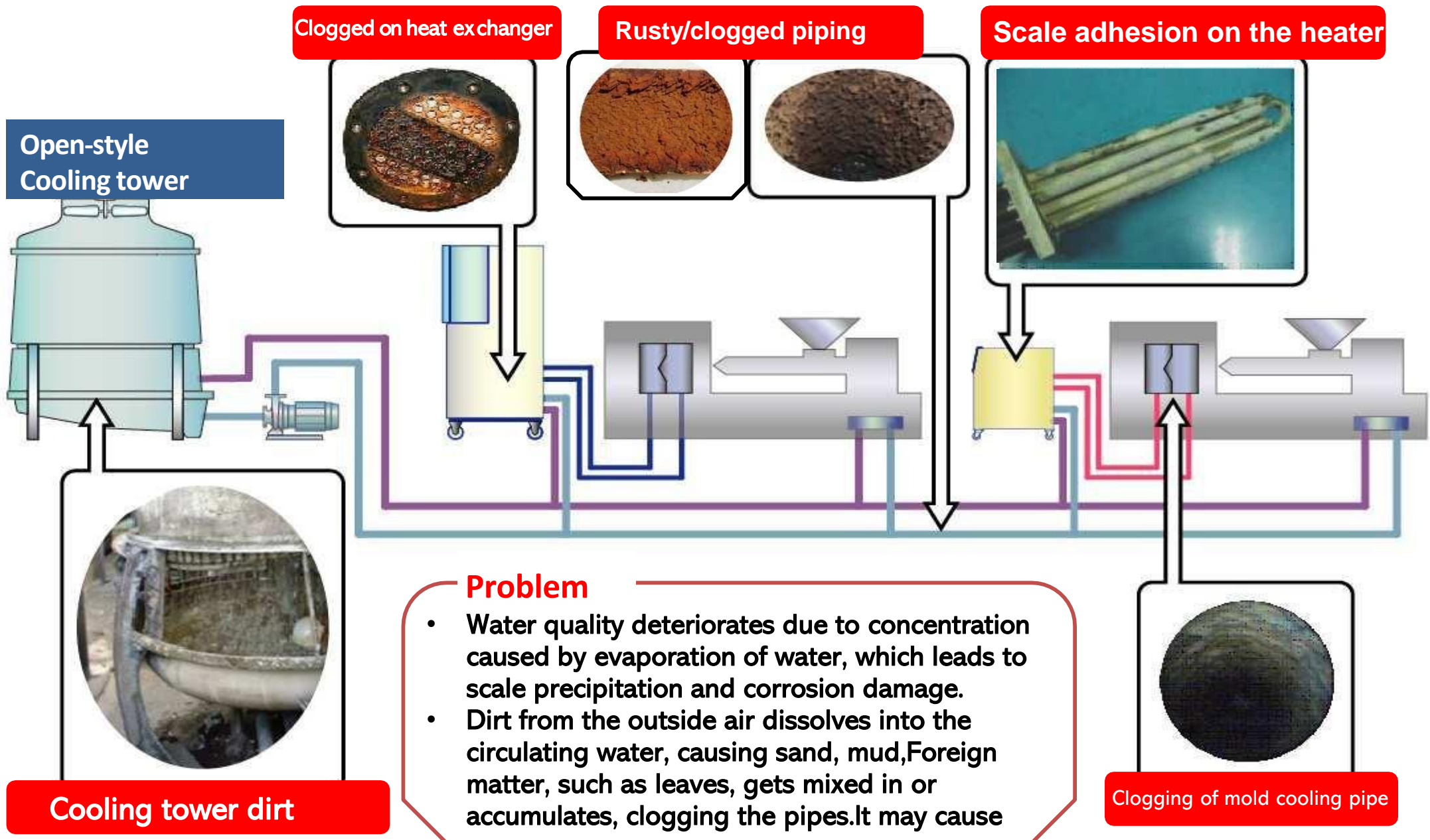


What is Dyna Eco Water System?

Reiken's proprietary technology improves the quality of water based on general water (tap water, industrial water, groundwater). Water treatment and chillers (or towers) control temperatures and prevent equipment cooling problems in factories. This temperature control system does not use any chemicals and does not harm the environment.



Problems with conventional cooling methods



Problems with conventional cooling methods

The need for water treatment

Normal cooling method (open cooling tower)

When water evaporates due to cooling tower?

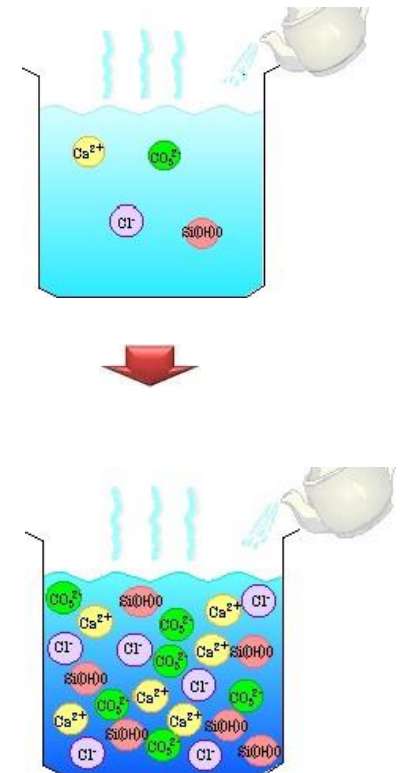
Impurities in water increase in concentration because they do not evaporate.

The evaporated water is replenished, but that water also contains impurities.

Impurities in the circulating water become too concentrated to dissolve.

Deposits as scale on pipes, heat exchangers, etc.

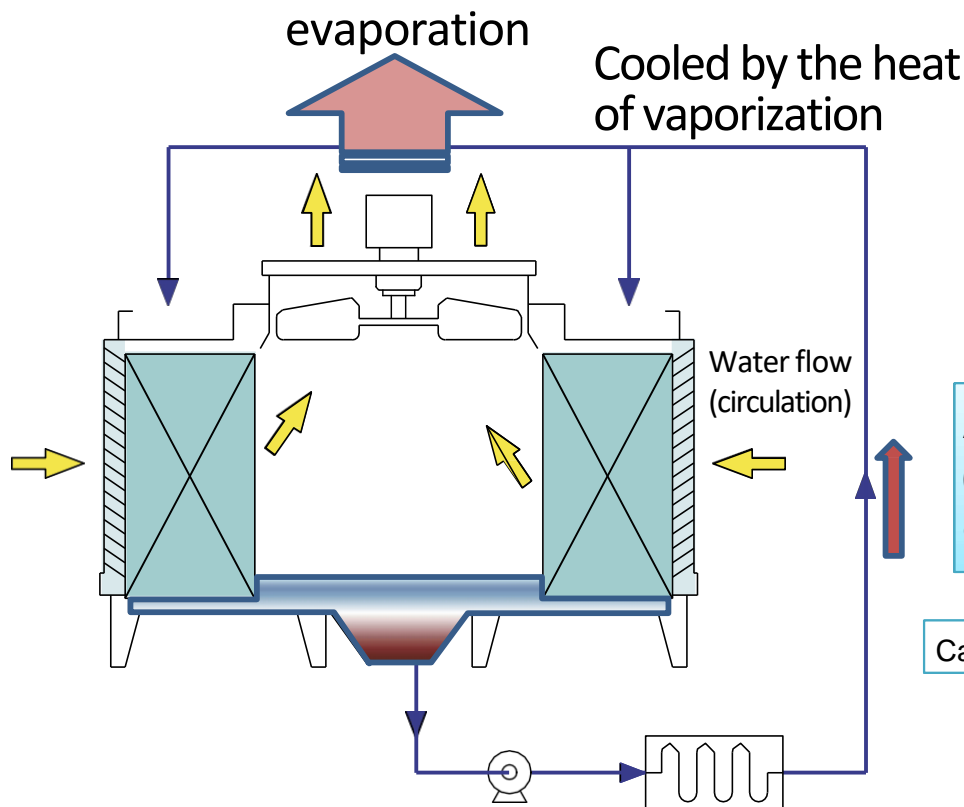
Clogging of piping and poor heat exchange occur.



Problems with conventional cooling methods

The need for water treatment

Normal cooling system (open cooling tower)



The concentration of impurities increases

Capacity 30 cooling tons of water per month

$$210\text{L/h} \times 24\text{h} \times 30\text{day} = 151,632\text{L} \div 151\text{ton}$$

Amount of impurities contained in 150 tons of water (scale amount) [For makeup water with a total hardness of 50] $150\text{t} \times 50\text{mg} = 7.55\text{kg}$ (calcium carbonate)

$$\text{Calcium (mg/L)} \times 2.5 + \text{Magnesium (mg/L)} \times 4.1 = \text{Total hardness (MgCaCo}_3\text{/L)}$$

*Soft water 0 - 60 / Medium-hard water 60 - less than 120
 Hard water 120 - less than 180
 Japanese tap water is less than 100 Evian about 300

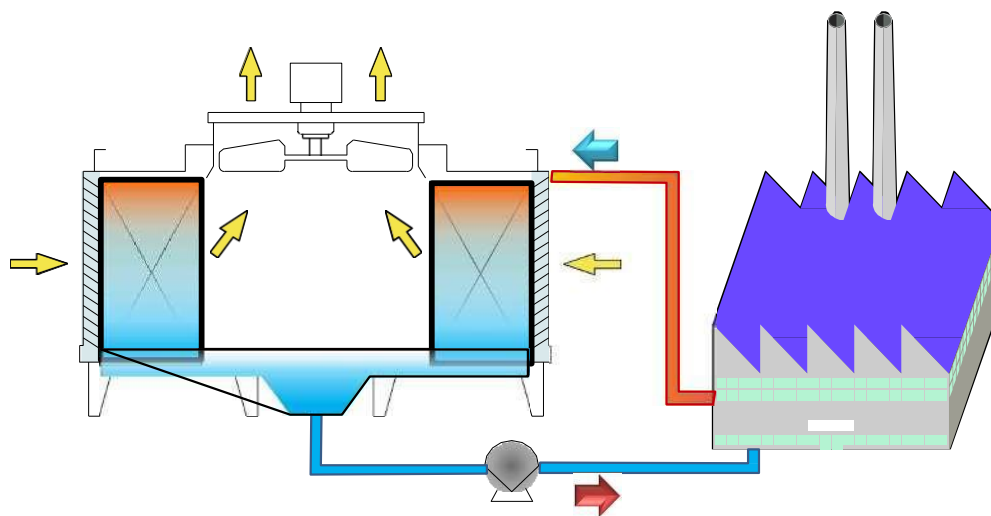
Comparison between conventional method and Eco Water System

		Conventional method	Dynaeco Water System	
			ECO-W (Eco Tower)	ECO-C (Eco Chiller)
Cooling device		Open type - cooling tower	Closed type - cooling tower	Air-cooled chiller
Initial cost		Low price	Comparatively low price	High price
Running cost	Electric Utility Expense	Low price	Comparatively low price	High price (For use of compressor)
	Water Rates (Charges)	Cost Medium~Large (Because it requires constant replenishment of water. Varies depending on operating conditions, climatic conditions, etc.)		Minor expense (little or no supplemental water is needed)
Temperature Control		Depends on outside temperature (Can be controlled to some extent by fan control)		Constant regardless of outside temperature
Water Quality Management		Difficulty (Effects of air pollution, (Water concentrated by evaporation)	Easy (Media water is not affected by air pollution. (Water quality control is required for tower spray water)	Easy (Media water is affected by air pollution. (Not taken)
Scale Failure		High risk (Concentration increases calcium hardness, use of chemicals increases costs)	Very little danger. (supply water with scale factors reduced or eliminated)	
Corrosion (rust)		Yes it has (Use of chemicals increases costs)	Very little (supply water with corrosion factors removed) (Rust is inhibited by deoxygenation of circulating water)	
chemicals		Used for scale and corrosion control If you do, cost increase	No chemicals are used, making it environmentally friendly	

About Cooling Tower

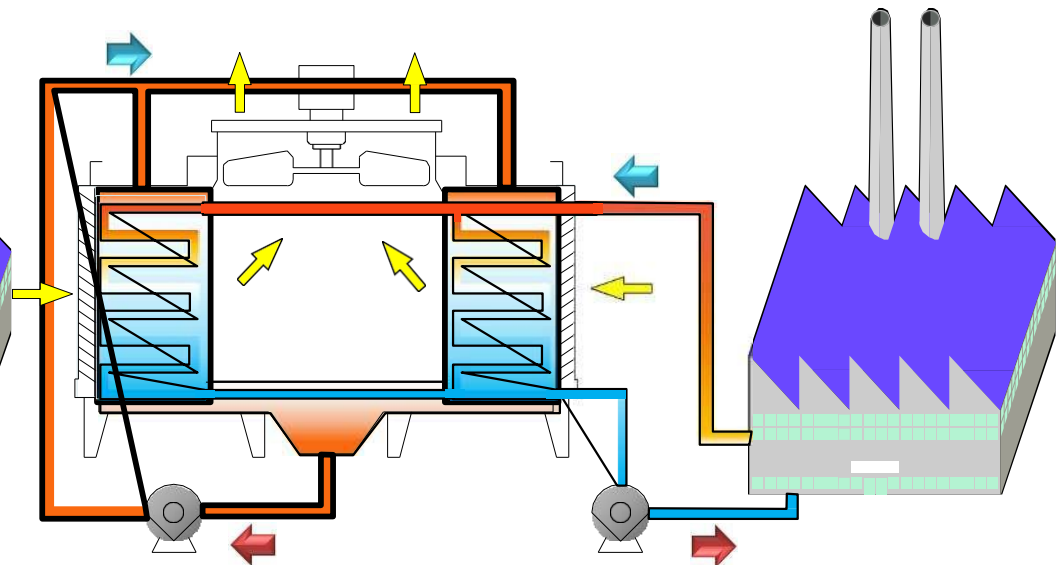
(Medium operating temperature 32°C)

Open type
cooling



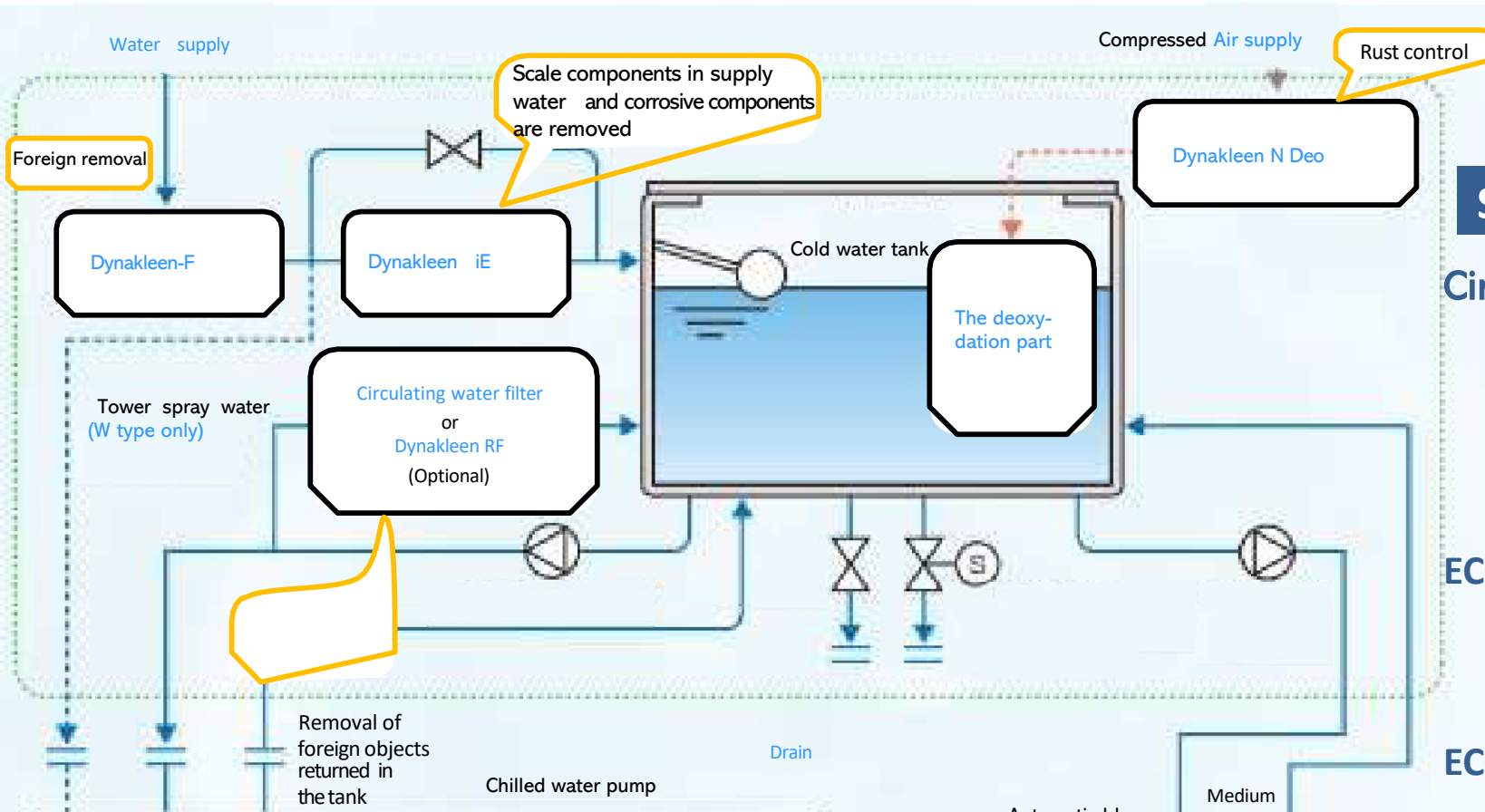
Concentrated dirty water circulates in the plant (scale adhesion)

Closed type
cooling tower



There are two systems: water circulating in the plant and water cooling in the tower. Circulating water in the plant is not concentrated

Flow of Dyna Eco Water System



Special Features

Circulating water
Is not affected
By enrichment
Or outdoor air
pollution

ECO-W type is a tower
system with low
electricity costs.

ECO-C type does not
require cooling water



Dyna Eco Water System - Water Treatment

Scale measures

Improving the quality of
makeup water

DynaKleen · IE

Water Treatment Unit

Reduces scale components (calcium, magnesium, silica, etc.) in make-up water. Removes corrosive components (chloride ions, sulfate ions, etc.) from make-up water.

Corrosion Control Countermeasures

Improving the quality of
makeup water

Circulating water
deoxygenation

DynaKleen · N Deo

Circulating water suppression device

Reduces dissolved oxygen concentration in circulating water, improves piping and heat exchangers, prevents corrosion (rust) of molds, etc.

Against foreign objects

Supply water
foreign removal

DynaKleen · F

Foreign matter removal filter

Remove foreign matter Y-type strainer for cold regions

Circulating water
foreign removal

Circulating Water Filter

Foreign matter removal filter

Remove foreign matter

DynaKleen · RF

Remove foreign matter (Option)

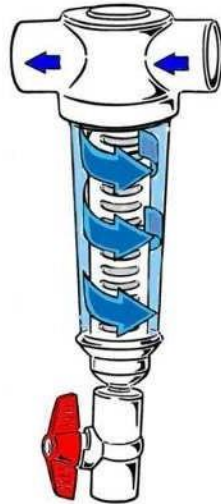
Removal of foreign substances in make-up water

Foreign matter removal filter

Dynakleen · F

Special Features

- ◇ Transparent housing
- ◇ Large water flow capacity
- ◇ With valve for discharging



Consumables and Service Parts

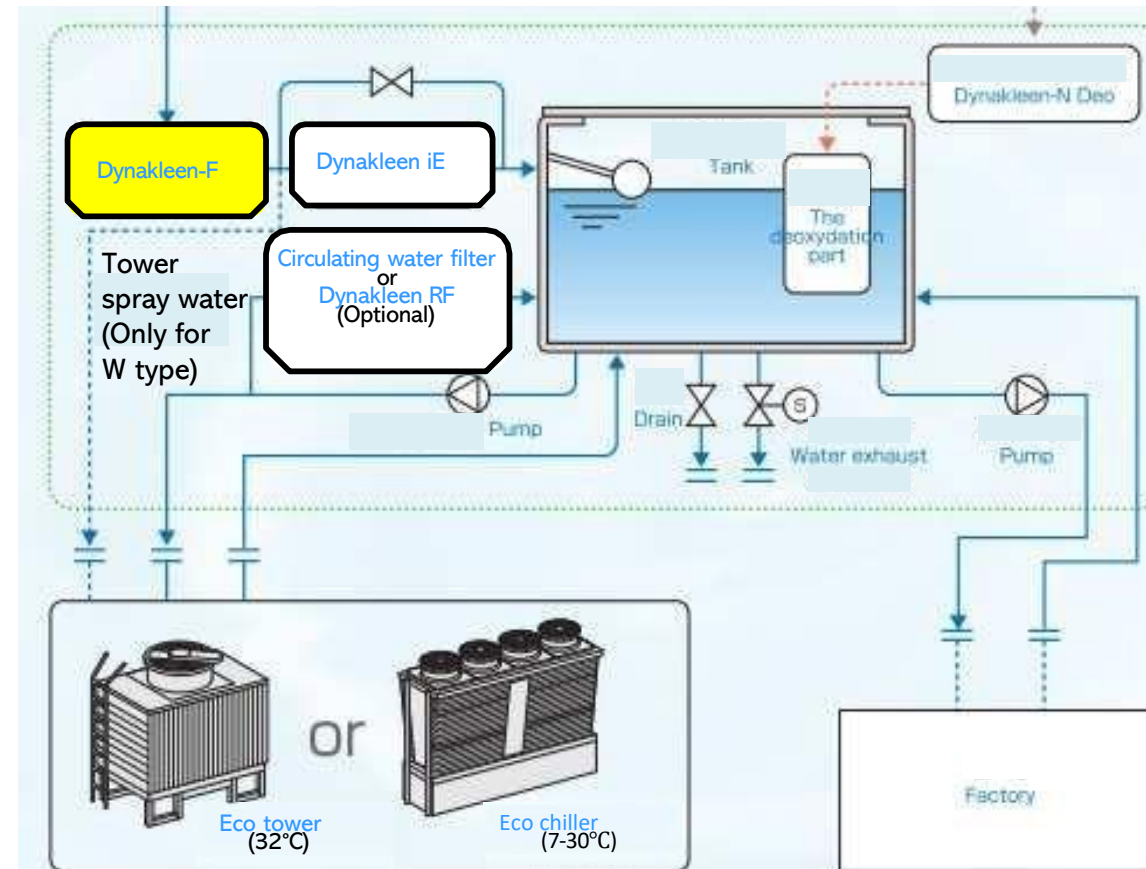
■ Screen

Can be used repeatedly by cleaning
When dirt is no longer removed by
cleaning, replace
pore size 100 μ m (140 mesh)

■ O-ring

Replace when replacing the screen or
if water leaks.

*Due to temperature specifications,
a Y-type strainer may be used instead of Dynakleen F.



Removal of foreign substances in make-up water

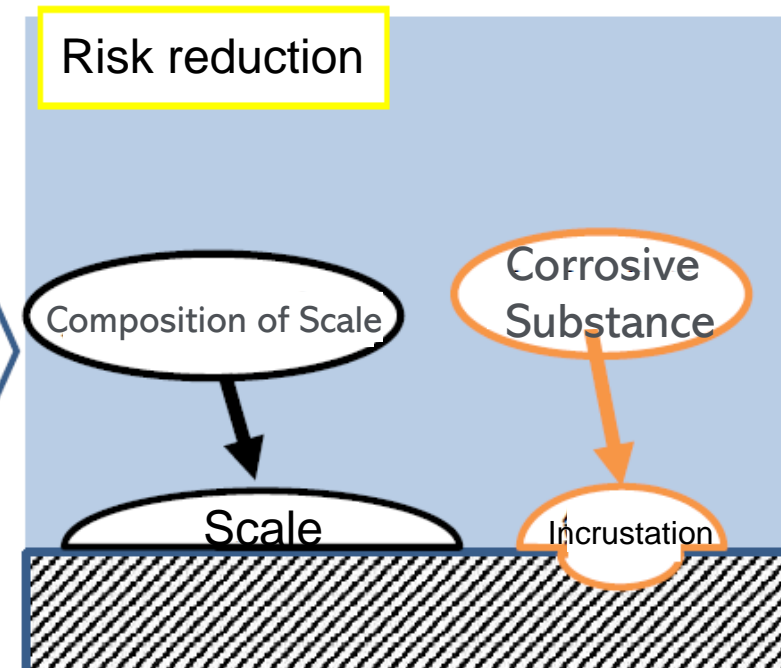
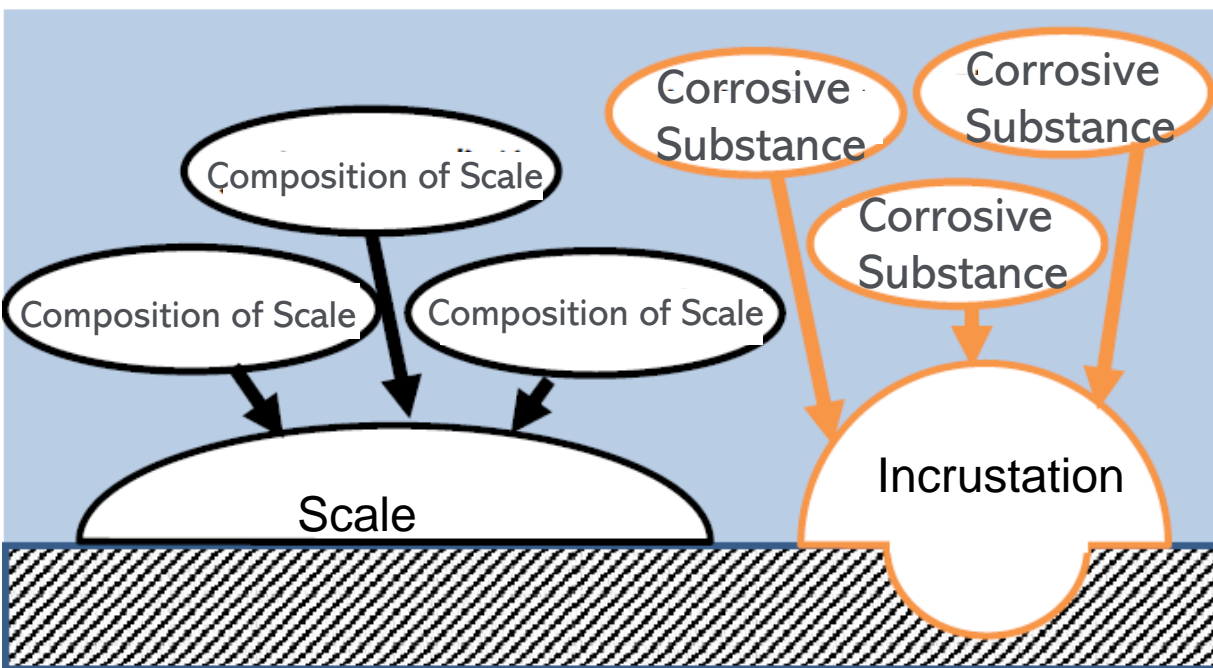
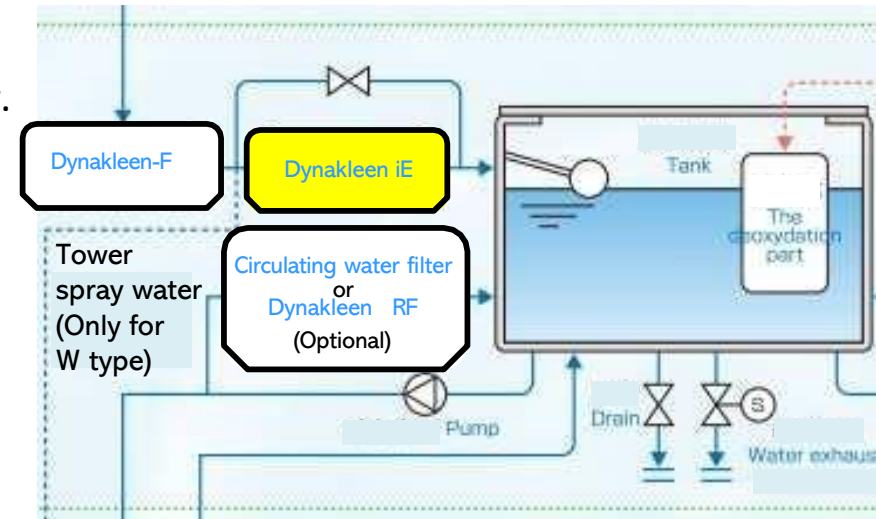
Supply Water

Dynakleen ▪ iE

Scale adhesion is caused by the precipitation of scale components in the water. Therefore, the less scale components in the water, the lower the risk. Dynakleen iE reduces risk by removing scale components from the water through a water treatment filter.

As for corrosion, we cannot remove the oxygen that causes corrosion, but we can reduce the risk by removing the components that accelerate corrosion.

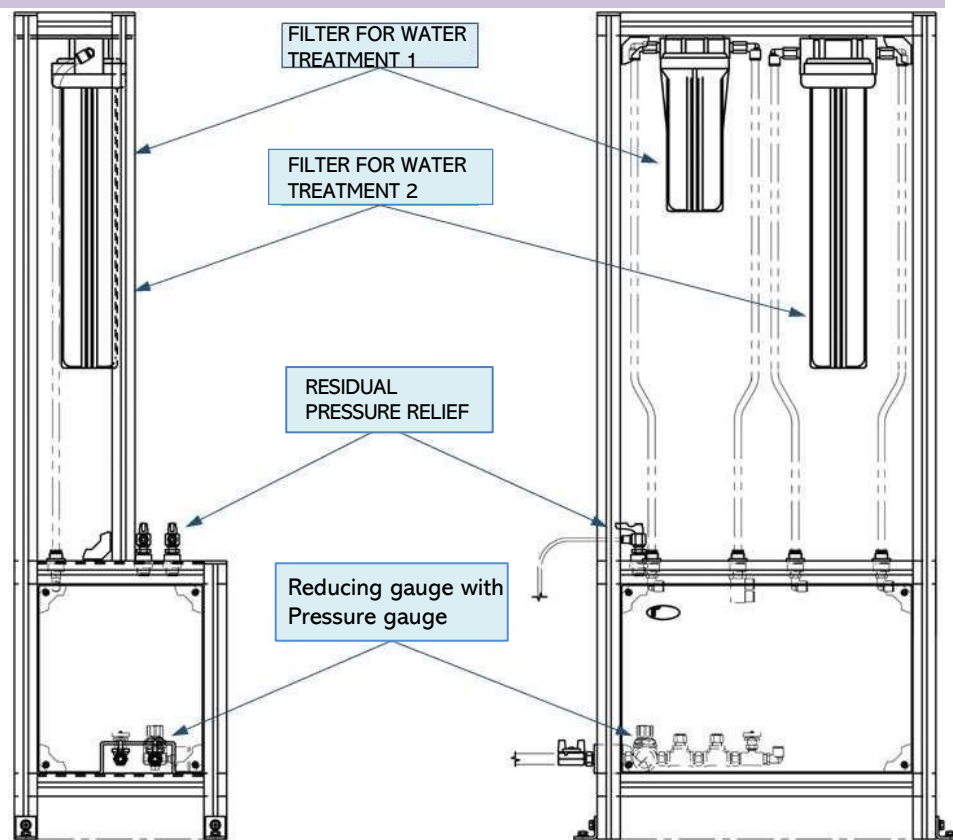
(*Oxygen is removed by Dynakleen N Deo as described below)



Removal of foreign substances in make-up w

Supply Water Treatment Unit

Dynakleen · iE



Eliminating “scale factors” Elimination of “corrosion factors”

Water treatment filter.1

It removes excessive scale factors and inhibits water pipe blockage caused by calcium scale.

Water treatment filter.2

It removes silica components and inhibits strongly adhering silica scale. It also removes corrosion components.

Flow Rate Measurement

A built-in flow meter alerts you when the life of each water treatment filter has been reached. The life is calculated based on the customer's water quality.

Special Features

- ◇ Reduces the risk of scale and corrosion failure without the use of Chemicals
- ◇ Cartridge filter for easy maintenance
- ◇ Alarm indication of filter replacement time ensures reliable maintenance

Deoxygenation of circulating water

Circulating water rust suppressor device

Dynakleen·N Deo

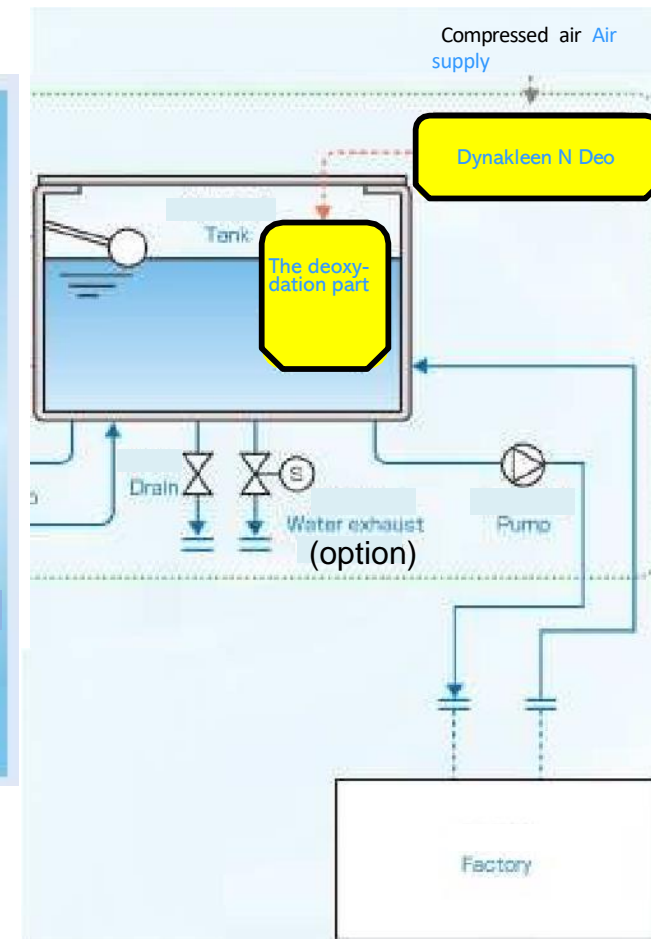
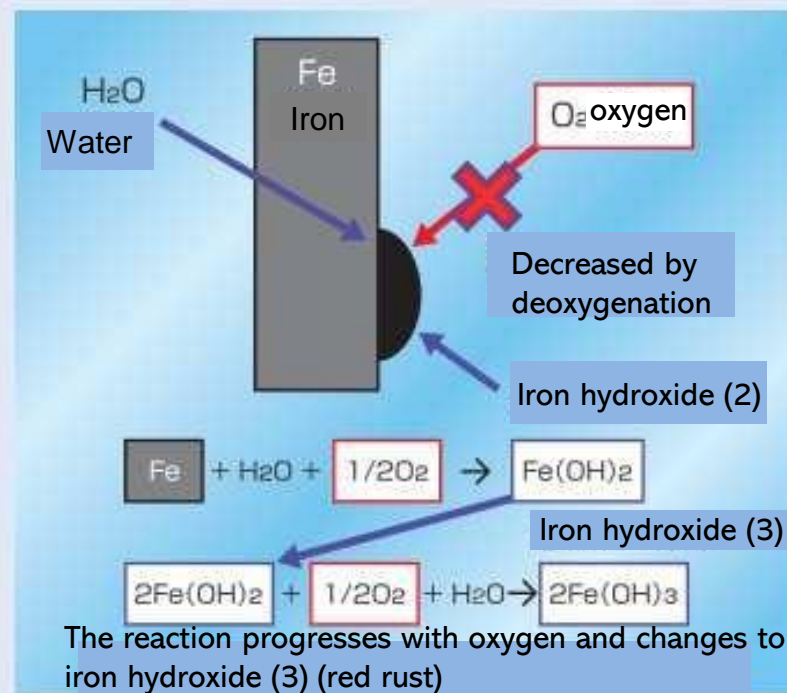
Dynaclean-N Deo" removes dissolved oxygen from circulating water.

Deoxygenation" prevents iron rust from developing on pipes, metal molds, heat exchangers, etc.

principle

Rust mainly occurs when oxygen in water (O₂ dissolved oxygen) reacts with iron.

By reducing dissolved oxygen (deoxygenation), rust formation can be suppressed.



(PAT.No.5953114)

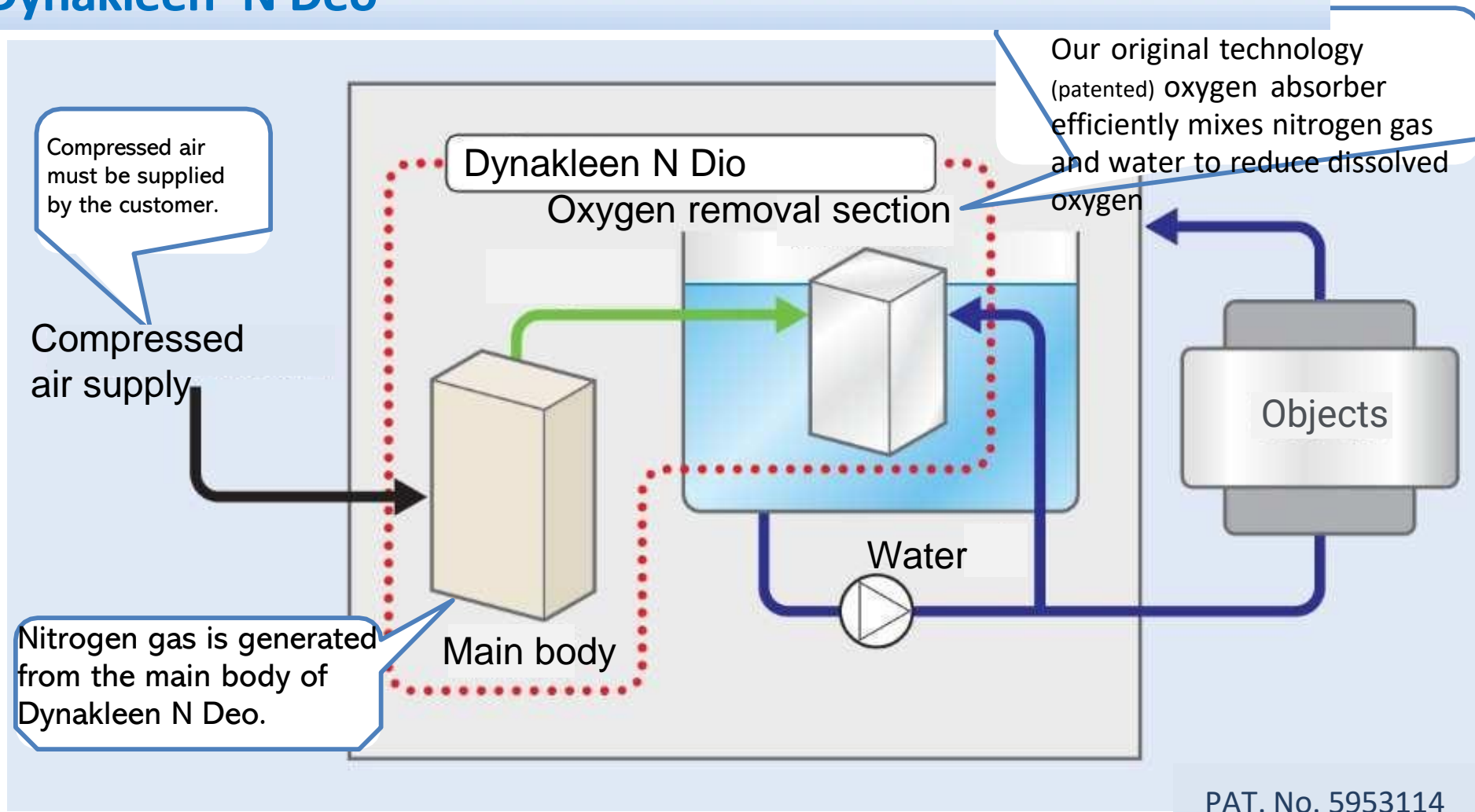
No chemicals are used, making it environmentally friendly and eliminating the need for wastewater treatment KCW III

10 power or more, standard on Dyna Eco Water System

Deoxygenation of circulating water

Circulating water rust suppressor device

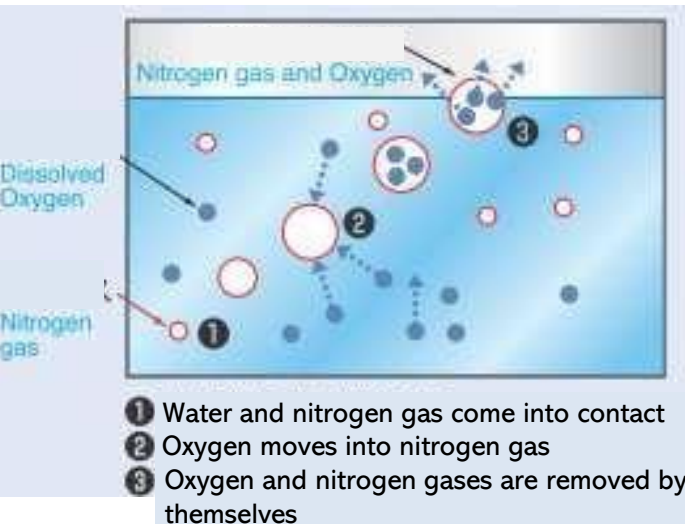
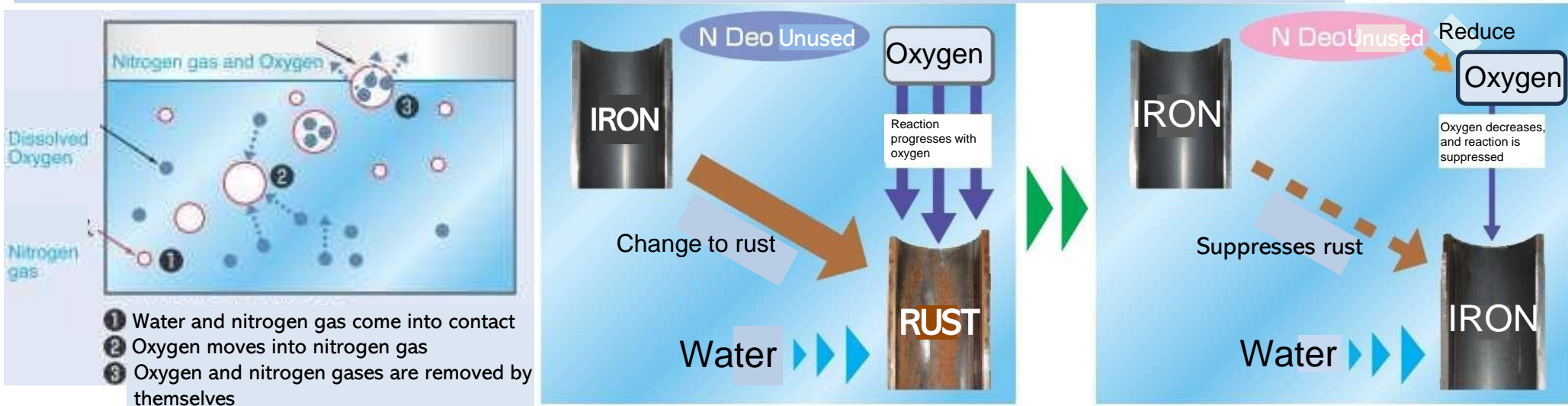
Dynakleen·N Deo



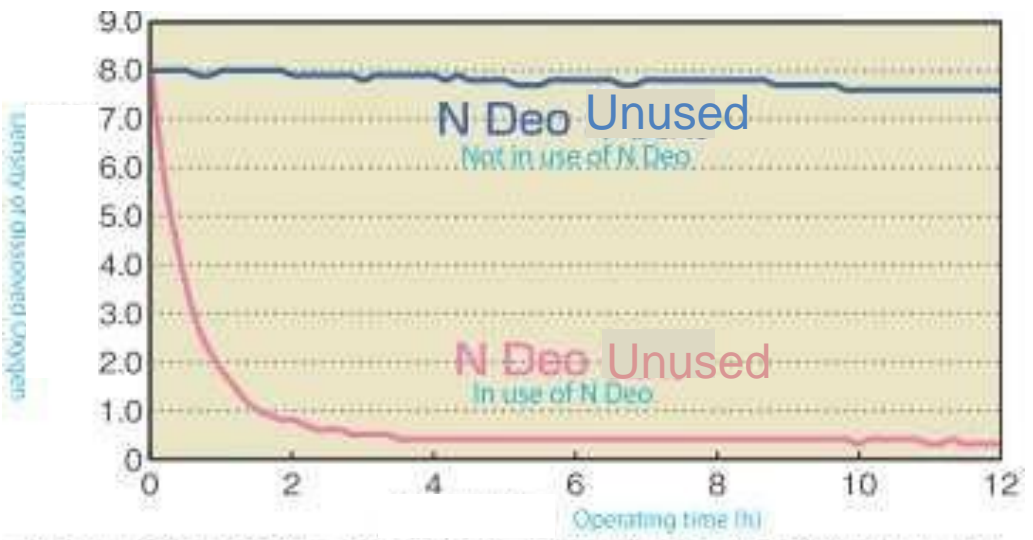
PAT. No. 5953114

By using water with low dissolved oxygen, corrosion of piping and equipment is suppressed

Circulating water rust suppressor **Dynakleen · N Deo**



Terms
 Test piece : Carbon steel pipe half-split (iron material)
 Experiment period : 1 week



Comparing the dissolved oxygen concentration when [Dynakleen N Deo] using and not using "in a circulating water tank with a water volume of 350 liters and a water temperature of 23.5 degrees Celsius

As shown in the figure on the left, "Dynakleen · Dissolved oxygen in water by 'N Deo' If you reduce it, it will look like the photo. The corrosion-inhibiting effect was confirmed.

* This equipment is intended to inhibit corrosion and cannot completely prevent corrosion from occurring.

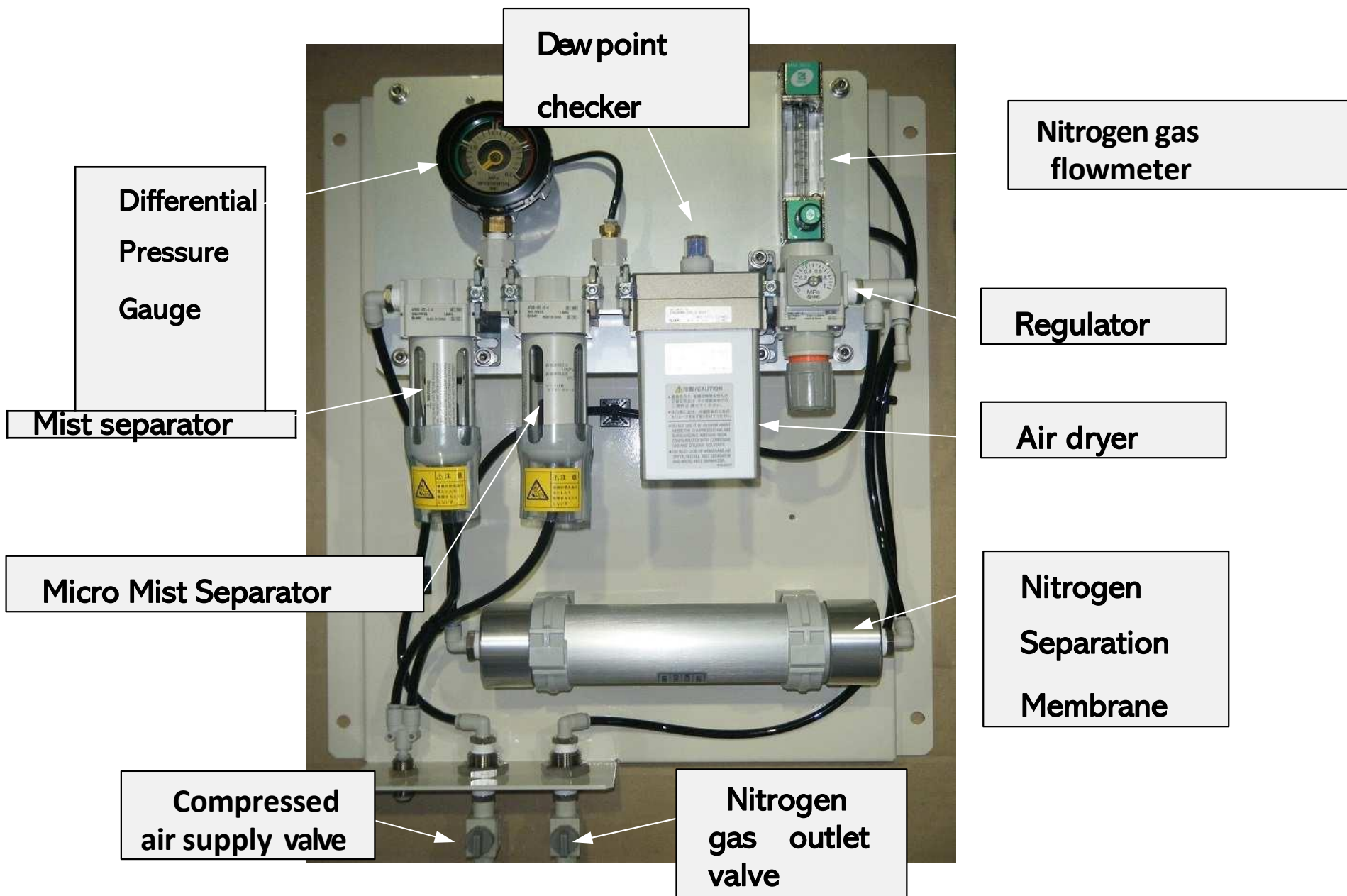
Comparison of "Dynakleen-N Deo" and chemicals

	Dynakleen-N Deo	Medicine
Main principle	Nitrogen gas is a corrosion factor Removes and reduces oxygen in water	Adding chemicals to create a film on the metal surface
Setting method	Installing a deoxidizer in the circulating water tank Supply compressed air to the main body	Install an injection device/tank in the make-up water system or manually add it
Maintenance	Replace the filter element (approximately every two years) Replace the nitrogen-generating part (approximately every seven years) Replace the air dryer membrane module (approximately every ten years)	Chemical supply (constant concentration control required)
Wastewater treatment	No need	Need
Power supply	No need	Need

*Air dryer membrane modules are only available with built-in ECO system.

Because no chemicals are used, it is environmentally friendly and eliminates the need for wastewater treatment.

Main unit configuration of Dynaclean N Deo



Foreign matter removal from circulating water

Foreign material removal filter

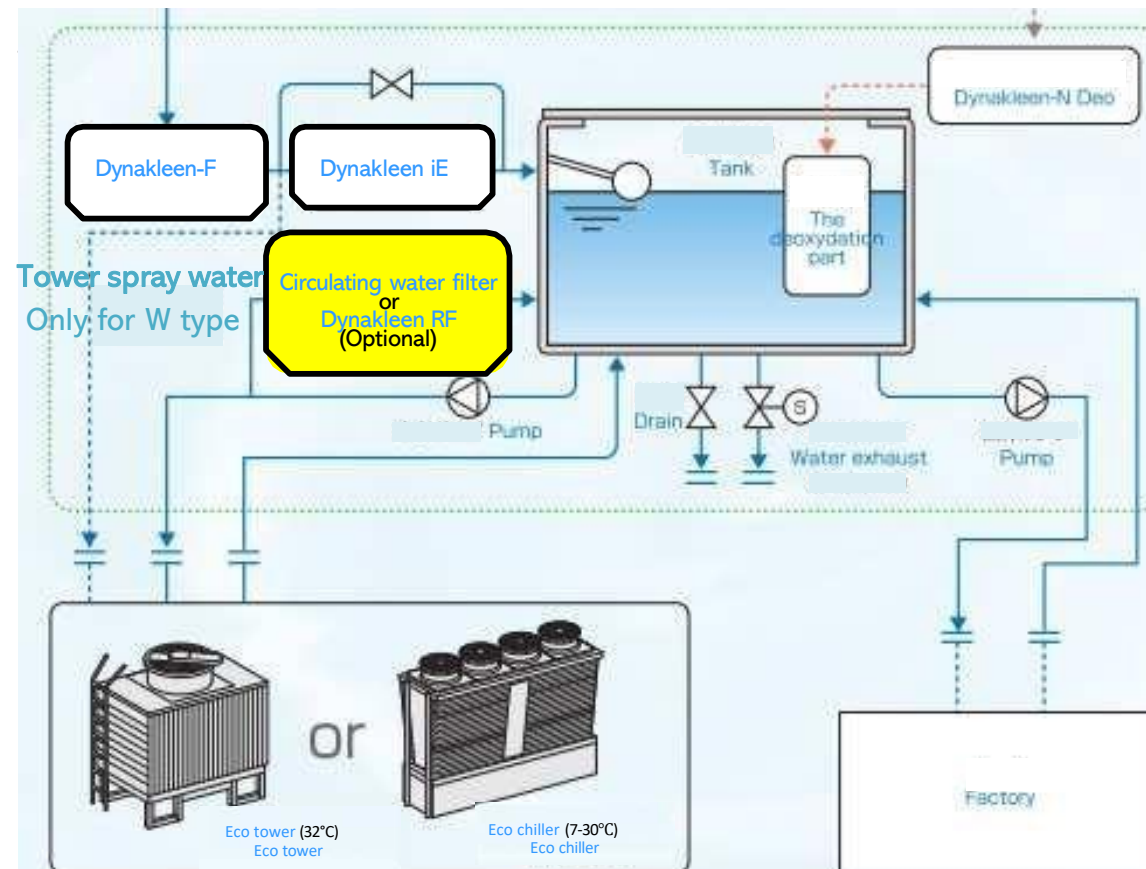
Circulating water filter

Special Features

- ◇ Can be implemented in a few minutes and Easy element replacement without
- ◇ SUS housing
- ◇ With drain discharge port



Removal of solids and foreign matter



ECO-W Series



Dyna Eco W Series

Special Features

Media use temperature 32°C

Low electricity costs due to the tower system

Circulating water is not concentrated or affected by outdoor air pollution

Circulating water filter
Foreign matter filtration filter

Removal of foreign substances contained in circulating water

Dynakleen · F
Foreign matter filtration filter

Removes foreign matter in supply water

Dynakleen · iE
Supply water treatment unit

Reduces and removes scale and corrosive substances in supply water

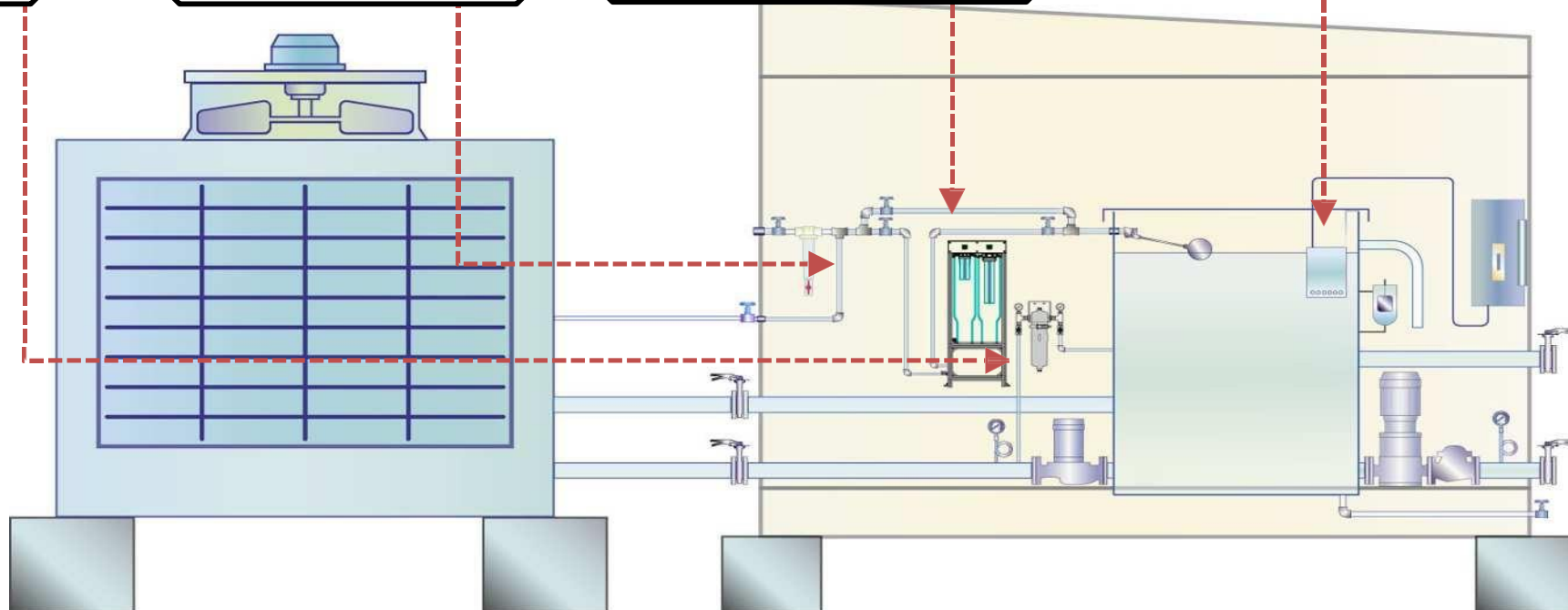
Dynakleen · N Deo
Circulating water suppression device

Reduces dissolved oxygen in circulating water and inhibits rust

Eco Tower
(Closed cooling tower)

Compact cooling tower with high-efficiency heat exchanger

*Automatic spray water blow is standard.



ECO-C Series

compressor fan

ECOII-80C



Dyna Eco C Series

Special Features

No cooling water required

Circulating water is not concentrated or affected by outdoor air pollution

Media use temperature

7~30°C

Circulating water filter
Foreign matter filtration filter

Removes foreign matter from circulating water

Dynakleen · F
Foreign matter filtration filter

Removes foreign matter in supply water

Dynakleen · iE
Supply water treatment unit

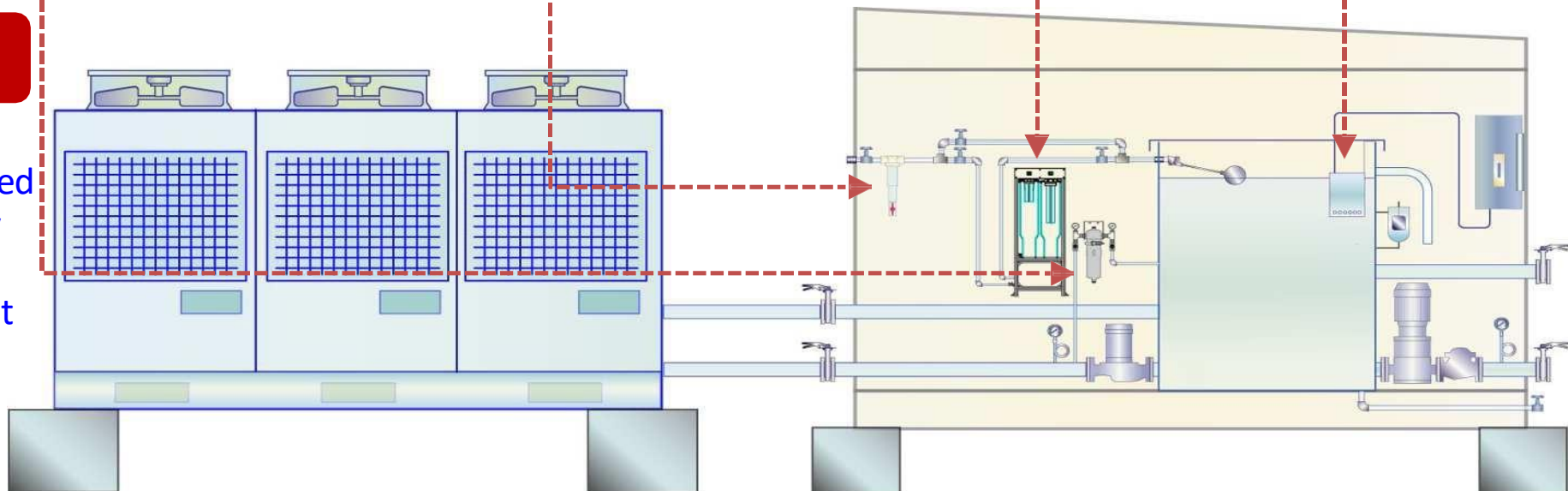
Reduces and removes scale and corrosive substances in supply water

Dynakleen · N Deo
Circulating water suppression device

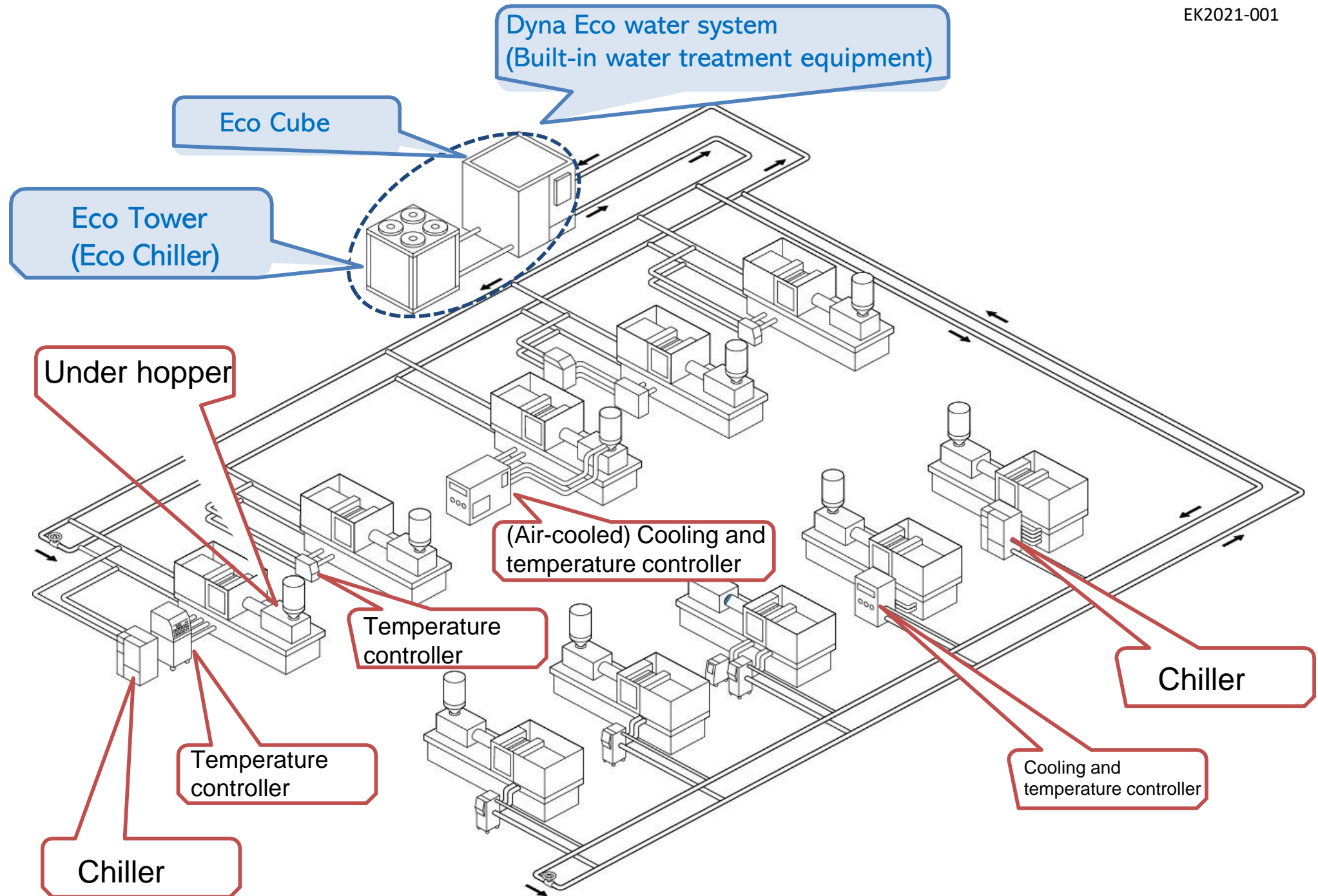
Reduces dissolved oxygen in circulating water and inhibits rust

Eco Tower
(air-cooled)

High-efficiency compressor
Equipped with a fan energy saving chiller
Recruitment



Example of Dyna Eco Water System



option

- ◇ **Automatic media water blowers**
- ◇ **Backup pump system**
- ◇ **Cold climate specifications (Insulated Band Heater for water supply part freeze-preventing)**
- ◇ **Snow protection (triangular roof)**
- ◇ **Remote Control Panel**
- ◇ **Inverter control for media pumps**
- ◇ **Salt damage specifications (Eco Tower)**

Fin.