



## Cart automatic washing machine

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1-1. Product

Mobile cart washer



Stationary cart washer



Product

Car wash



Fish box washer



## 1-2. Where to use shopping carts

Carts are widely used in almost all places due to their convenience in transporting groceries or various products. Numerous people use it every day, so carts that are shared by several people are prone to being contaminated with foreign substances such as dust and food residue. In particular, various bacteria and pathogens are transferred to the handle of the shopping cart through the hands of several people. If it is transmitted and contaminated, it can pose a risk of disease outbreak. Large shopping centers usually have 1,000 to 3,000 carts, but due to the structure of the carts, they are difficult to clean, so carts cannot be cleaned from purchase to disposal. Most supermarkets are highly aware of the need for products, and consumers are also aware of hygiene. As this spreads, the market for cart washing machines is expected to expand significantly.



## 1-2. Where to use shopping carts

### Where to use

- ◆ Large supermarkets and department stores
- ◆ Traditional market
- ◆ Airport building and passenger terminal
- ◆ Other food and beverage sales business

### Management

- ◆ Need for differentiated marketing in addition to the lowest price policy
- ◆ Pursuing a clean and clean shopping mart
- ◆ Exposure to risks such as corona, new flu, E. coli, etc.
- ◆ Legislation of regular store disinfection

### Management

- ◆ Neglected without systematic hygiene management
- ◆ Manual cleaning using human resources
- ◆ Cart cleaning cycle: None (some 6 to 12 months)
- ◆ Distribution of wet towels for cart handles.

# 1-2. Where to use shopping carts

◆ Large supermarkets and department stores



◆ Traditional market



◆ Airport building and passenger terminal



# 1-3. Shopping Cart Management Status

## Where to use the cart

- Large supermarket, department store
- Mart-type traditional market
- International/domestic airport terminal
- Other food and beverage sales

## Business owner

- Marketing other than pricing is needed
- Pursuing a mart for clean and clean shopping
- The need for cleaning and a positive mindset

## Management status

- Loading/abandonment without systematic hygiene management
- Perfunctory manual cart cleaning (Cycle: 3~6 months)
- Distribution of wet towels for temporary cart handles.

## Cart sterilizing washer. Why do you need it?

- Steady increase and enlargement of supermarkets
  - Expansion of cart use due to increased demand
  - More than 75% of shoppers use carts
  - Need to manage unspecified multiple uses
  - Most of the loaded products are food and beverages.
  - Always in contact with various sales products
  - Users have direct/indirect skin contact with the cart.
- Bacterial growth due to constant exposure and storage
- Building consensus on sterilizing income.



## 1-4. Shopping cart problem

Infectious diseases are prevalent around the world, and they occur every 4 to 6 years. Recently, the period has become shorter and the rate of spread has increased.

It's getting faster and the duration of the epidemic is also increasing. Experts predict that a new infectious disease, a second corona virus, will appear in the near future.

I predict. It is predicted that the emergence of new infectious diseases will accelerate, and “the cycle of new infectious diseases will be shortened to less than 3 years.”

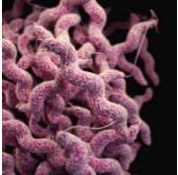
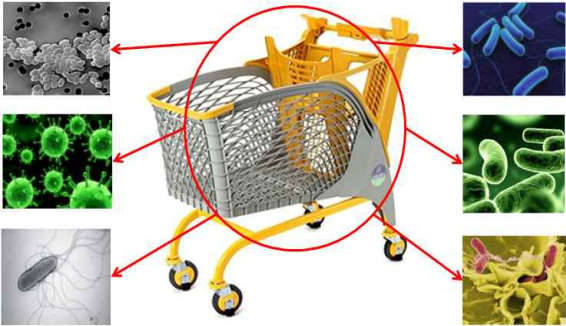
They warn that the infection can spread quickly due to carts being used by multiple people.

### Infectious disease cycle theory of 6 years

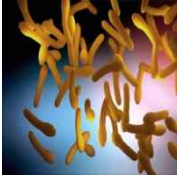
- ◆ 2003 SARS-AoV
- ◆ 2009 Swine Flu (H1N1)
- ◆ 2013 Avian Flu (H7N9)
- ◆ 2014 Ebola virus
- ◆ 2015 MERS-CoV
- ◆ 2016 Zika virus
- ◆ 2019 COVID-19



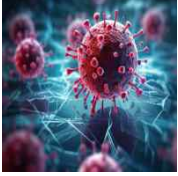
# 1-4. Shopping cart problem



Campylobacte



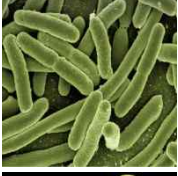
Clostridium botulinum



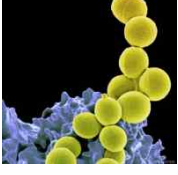
COVID-19



Ssalmonella



Escherichia coli



Staphylococcus aureus





## 2-1. Cart automatic washing machine features

[SHOPPING CART AUTO WASHING SYSTEM] is a shopping cart used in shopping centers.

This is about a cart cleaning device, which covers the process of putting in a shopping cart, washing, drying, sterilizing, and loading it. It is a shopping cart cleaning device that can be performed automatically.

- 1) This is an automatic sterilizing washer that thoroughly cleans and sterilizes shopping carts
- 2) Convenient to move by being mounted on a truck
- 3) It can be mounted on a 3.5 ton truck and operated with a Type 2 regular license.
- 4) Getting on and off is fast and convenient as it uses car power
- 5) Washes up to 130 carts of various types per hour
- 6) Dedicated cleaning device for each area provides the best cleaning power
- 7) It is safe and has low maintenance costs as no detergent is used for cleaning.
- 8) It can be used without external power supply by installing a generator.
- 9) External power and generator power can be selected and used
- 10) We minimized the amount of water used by recycling used water.
- 11) Used water is safely discharged in accordance with the Ministry of Environment's discharge standards.
- 12) The machine is easy and safe to operate and its status can be easily checked.
- 13) Using stainless steel, there is no corrosion and durability is excellent.



## 2-2. Cart automatic washing machine patent



Registration number	detail
10-0768771	Shopping cart automatic cleaning device
PCT/KR2008/004160	SHOPPING CART AUTO WASHING SYSTEM
US-12597062	
JP-2010-500849	
10-1402054	Shopping cart front cleaning device
10-1402053	Shopping cart side cleaning device
30-0766032	Automatic washer for shopping carts
40-0035135	SONAGI
2015-0161072	Mobile Cart Washing System
PCT/KR2015/012436	mobile cart washing system
2015-0161065	Cart transfer device for cart washing machine

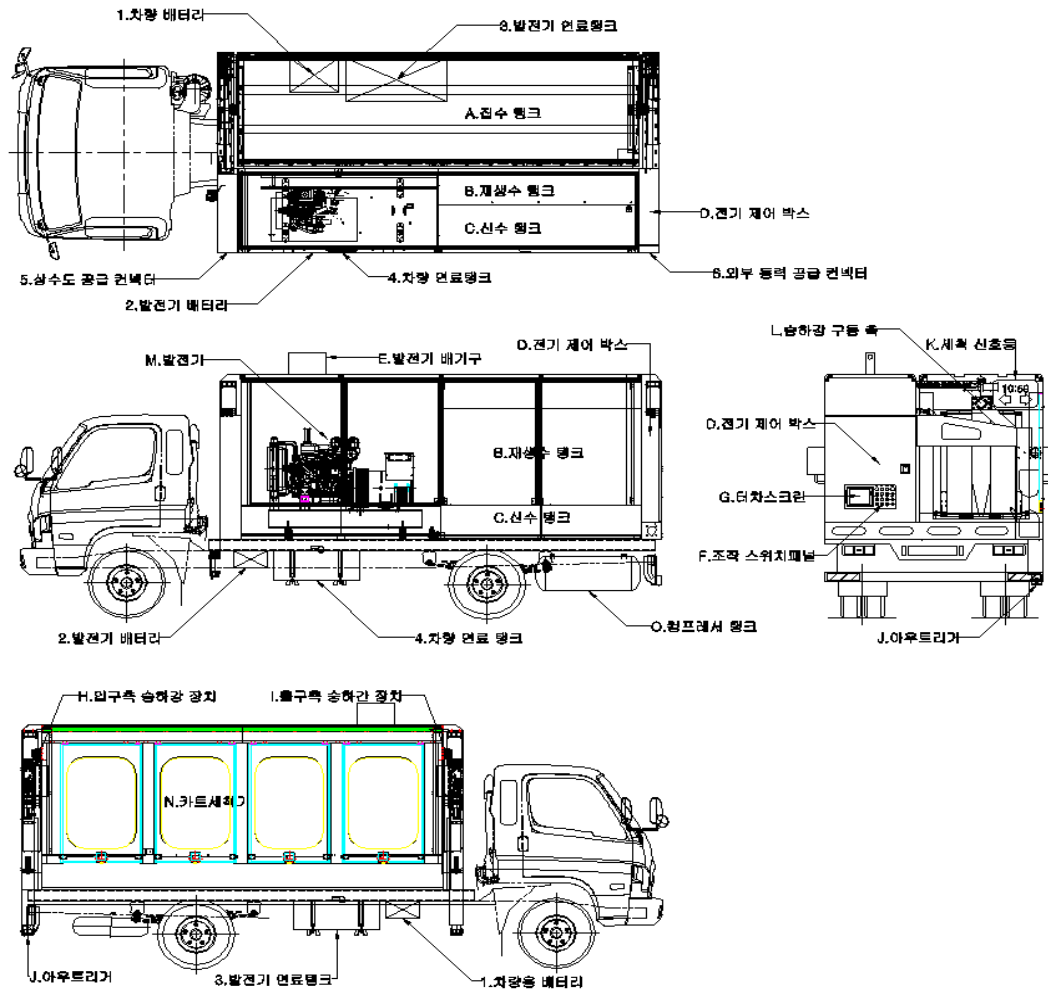


# 2-3. Cart automatic washing machine certification



Registration number	detail
020-11-200890	Proof of origin (cart washer)
TA 380 15 0925	CE-Mobile Cart Washer
JK-1421	ISO 9001:2008
JEK-21332	ISO 14001:2004
Car safety inspection certificate	20141224-00084(specially equipped vehicle)
S07100-10K(고정식)	CE-shopping cart auto washing system
S07300-10K(고정식)	CE - Handel washing brush
S07200-10K(고정식)	CE - vibration washing brush
S07400-10K(고정식)	CE - side washing brush
Sterilization test report	Stationary sterilizing power test report
Sterilization test report	Mobile sterilizing power test report

## 2-4. Cart automatic washer configuration



## 2-4. Cart automatic washer configuration

	designation	function
1	vehicle battery	DC24V 80A / (for vehicle starting/raising and lowering operation)
2	generator batteries	DC12V 120A / (for starting the generator)
3	Generator fuel tank	100 liters of diesel oil / (for fuel supply to generator)
4	Vehicle fuel tank	150 liters of diesel / (for vehicle fuel supply)
5	Water supply connector	Supply pressure >2 bar, 20A water hose
6	External power supply connector	AC380V 3 AC380V 3-phase 5-wire (RS T+N+GND) (RST+N+GND) wire 8sq or more
A	collection tank	W:1,295 X L:4,195 X H: 250 (1,350리터)
B	Renewable water tank	W:400 X L:2,095 X H:1,450 (1,215리터)
C	clean water tank	W:548 X L:2,095 X H:390 ( 440리터)
D	Electric control box	PLC control method
E	Generator exhaust	Generator exhaust gas outlet
F	operation switch panel	Waterproof type operation switch
G	touch screen	10-inch color touch screen
H	Entrance side elevating and lowering device	Washer lifting and lowering device (DC24V-750W 4-stage 1/8,640)
I	Exit side elevating and lowering device	Washer lifting and lowering device (DC24V-750W 4-stage 1/8,640)
J	Outrigger	전복 방지 지지대
K	wash signal light	세척기 작동 상태 알림 신호등
L	up and down drive shaft	세척기 승 하강 작동 축
M	diesel generator	경유 발전기 380V-30kw
N	Cart Washer	이동식 카트 세척장치
O	Compressor tank	압축공기 보관 탱크(120리터)

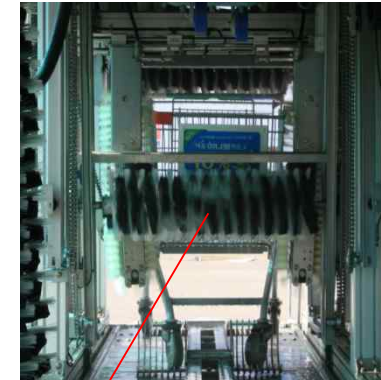
## 2-4. Cart automatic washer configuration



Handle cleaning brush

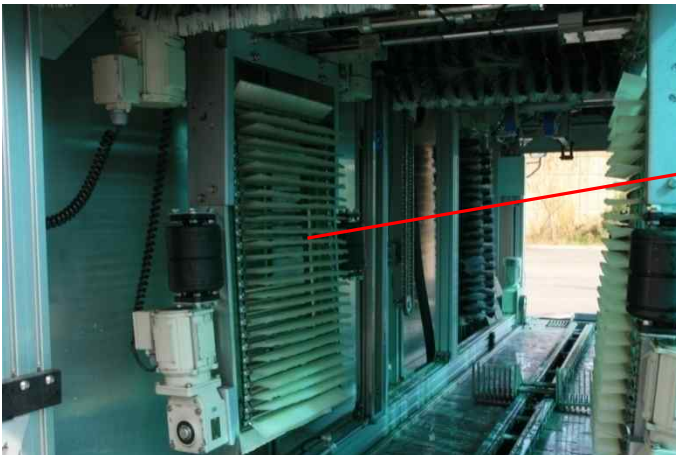


Internal high pressure washer



Front cleaning brush

Side cleaning brush



Side rotating brush



## 2-4. Cart automatic washer configuration



입구장치 / Entrance apparatus



발전기 / Generator



세척장치 / Cart washer



조작장치 / Monitor & control panel



공기압축기 / Air compressor



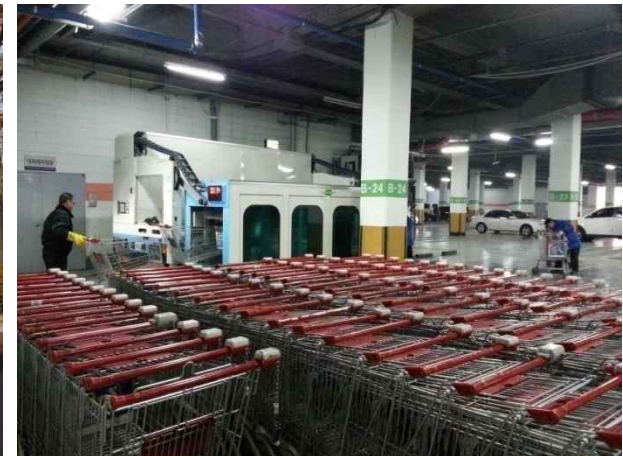
출구장치 / Exit apparatus

## 2-5. Cart automatic washing machine specifications

- ❖ External size: Width 1.75M
- ❖ Installation space: 2.50M width x 2.2M height x 17.5M length
- ❖ Main materials: stainless steel, aluminum profile, steel-45c
- ❖ Power usage: 380VAC 25Kw / 3-phase 5-wire 60Hz (3-phase + N + G)
- ❖ Control device: PLC control (INPUT DC 24V, OUTPUT AC 220V)
- ❖ Washing speed: 2/min-4M/min Washing quantity (100-150 units/hr) 7-step washing speed control
- ❖ Cleaning method: brush cleaning or high pressure cleaning
  - 1) High pressure washing (rotary washing method using high pressure hydraulic spray 10 bar or more)
  - 2) Side cleaning brush: (PP brush) Rotating cleaning brush
  - 3) Handle cleaning brush: (PP brush + cloth brush) Rotating cleaning brush
  - 4) Front cleaning brush: (PP brush + cloth brush) Rotating cleaning brush
  - 5) Internal cleaning brush: (PP brush) vibration cleaning
  - 6) Brush (0.5mm polypropylene brush + cloth brush double spiral synthetic brush)
- ❖ Transfer device: 7-level cleaning speed selection by chain drive (2-4M/min)
- ❖ Moisture removal: Forced spray removal method using a multi-stage high-speed blower
- ❖ Cart sterilization: Spraying cleaning and sterilizing chemicals
- ❖ Operation method: 8-inch color touch screen
- ❖ Quantity consumed: High speed - 23.ÿ/unit (new water - 4.6ÿ/unit) - Low speed - 47.ÿ/unit (new water - 9.6ÿ/unit)
- ❖ Types of washing water: fresh water (water supply, groundwater), recycled water (self-purified water)
- ❖ Water tank capacity: water collection (2.2 tons) fresh water (1.2 tons) recycling (1.2 tons) oil/water separation (2.4 tons)  
wastewater treatment capacity: 3.0 tons/hr



## 2-6. Reference / Cart automatic washing machine



### 3-1. Industrial strong electrolytic water purifier [optional]

◆ What is multi-purpose washing water?

This is electrolyzed alkaline ion water for cleaning made by special electrolysis using 100% pure tap water. Produced by special electrolysis Electrolyzed water has an excellent cleaning function by separating oil molecules and other contaminants from the base material, and removes harmful substances to the human body and the environment. It does not contain any surfactants or alcohol.

◆ Advantages of multi-purpose washing water

- 1) It does not contain any alcohol and does not damage the plastic.
- 2) It is colorless, odorless, additive-free, and pollution-free safe washing water without any chemical additives.

Washing water (strongly alkaline water) generator			
Supply power	220VAC 60hz 600W	Water pressure	2.0~5.0kgf/cm
Quantity	5.0L / . minute	Production amount	Strongly alkaline water (2.5L/min) Acidic water (2.5L/min)
Strongly alkaline	pH 12.0 or higher (12.5)	Strongly acidic	Less than pH 3.0(2.5)
ORP concentration	strong alkaline water: -800mV	ORP concentration	strongly acidic water: +1,100mV

## 3-2. Features of industrial strong electrolytic water purifier

### 4. Characteristics of multi-purpose washing water

#### 1) Strong cleaning power

- It penetrates into every nook and cranny of contaminants with a stronger penetrating power than regular water.
- Saponification action (dissolving oil stains), protein decomposition action, exfoliation action (separation of contaminants)

#### 2) Environmentally friendly product

- product - It does not contain surfactants or alcohol, so it is pollution-free and nature-friendly. - No need to
- wipe with water multiple times (water-saving effect). - A 'pollutant-free' detergent that is
- made from pure water and does not need to indicate biodegradability.
- Does not cause river pollution.

#### 3) Biosafety (improvement of working environment)

- The deodorizing effect by ions is excellent, the cleaning solution itself has no odor, and it is harmless to the environment and the human body, so gloves or masks can be used. No need. -It does
- not contain surfactants or alcohol, so it is pollution-free and nature-friendly. It is fire-safe, so it can be used next to a fire.

#### 4) Economical

- It is economical because it produces washing liquid using tap water. - Can be mixed with other cleaners. Cleansing power is doubled. - When heated and used, the cleaning power is
- improved and strengthened by 1.5 times.

### 3-3. Industrial strong electrolytic water purifier usage [optional]

◆ Use of strong alkaline water

1. Use strong alkaline water instead of chemical detergent – pH 12 or higher
2. Cleaning using a dedicated cleaning brush rather than using water pressure
3. For areas where brush cleaning is difficult, wash with high-pressure water using regenerated alkaline water – pH 10 or higher
4. Install a soaking device using hot water to soak stubborn pollutants – pH 10 or higher
5. Material use and structure that can withstand strong acid and alkaline water

산성	1	■	제균용
	2	■	
	3	■	
	4	■	
중성	5	■	피부용
	6	■	
	7	■	수돗물
	8	■	
	9	■	
알칼리성	10	■	세정용
	11	■	
	12	■	제균세정용
	13	■	

물의 pH별 사용 용도

강력한 세정력

기름때 분해 능력이 탁월하고, 단백질 분해작용을 합니다. 전기분해된 미세 입자가 강한 침투력으로 오염물질을 빠르게 세정합니다. 스프레이후 한번만 닦아내면 됩니다.



놀라운 항균력

pH12.5의 강알칼리로 O-157 대장균, 살모넬라균을 30초 이내에 99.9% 제거합니다.

안정성이 입증된 무공해세제

계면활성제, 알칼이 전혀없는 무공해입니다. 생체 안정성으로 무취, 인체에 무해하므로 따로 장갑이나 마스크가 필요없습니다.

냄새제거에 탁월한 효과가 있습니다.

암모니아 냄새 분해능력으로 애견 용변처리후, 생선비린내, 담배냄새, 음식물쓰레기 냄새 제거에 탁월한 효과적입니다.

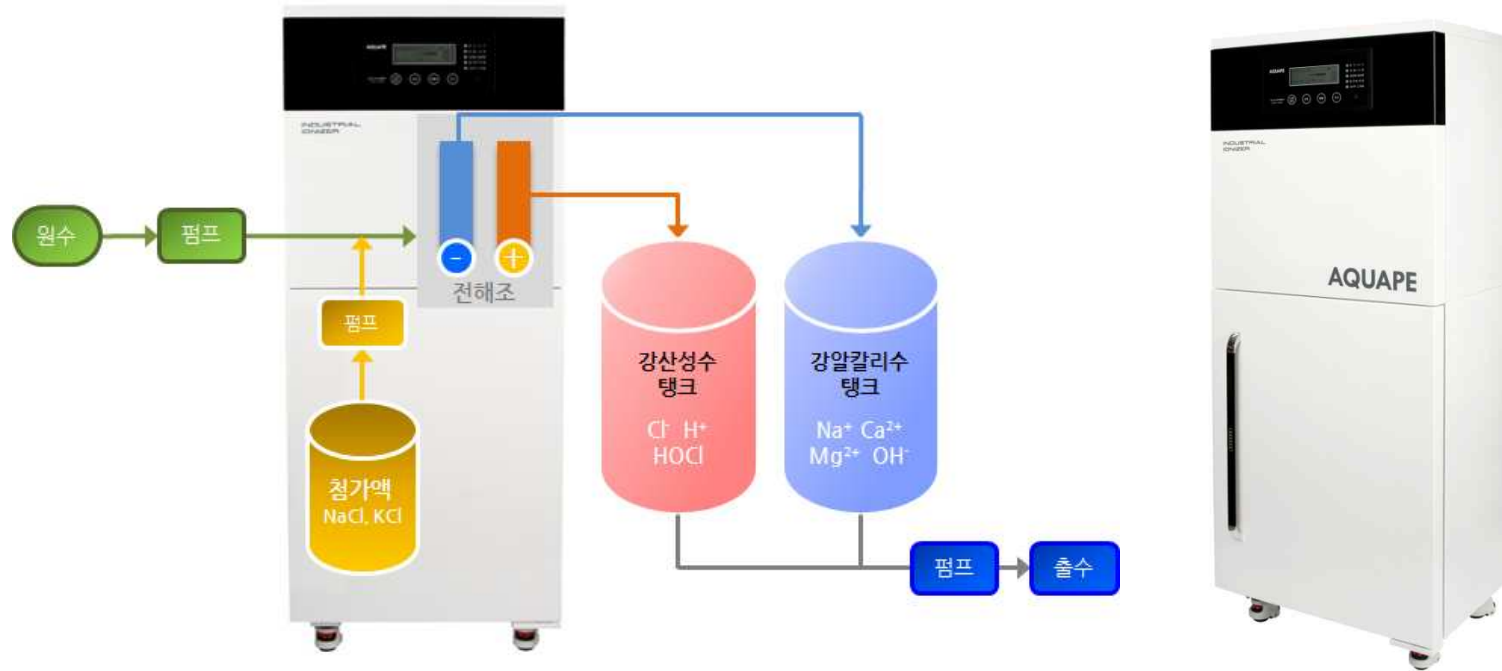
Alkaline water [pH10 ~ pH12 or higher]

Purpose of use: Used to decompose pollutants at the inlet.

Acidic water [pH10 ~ pH12 or higher]

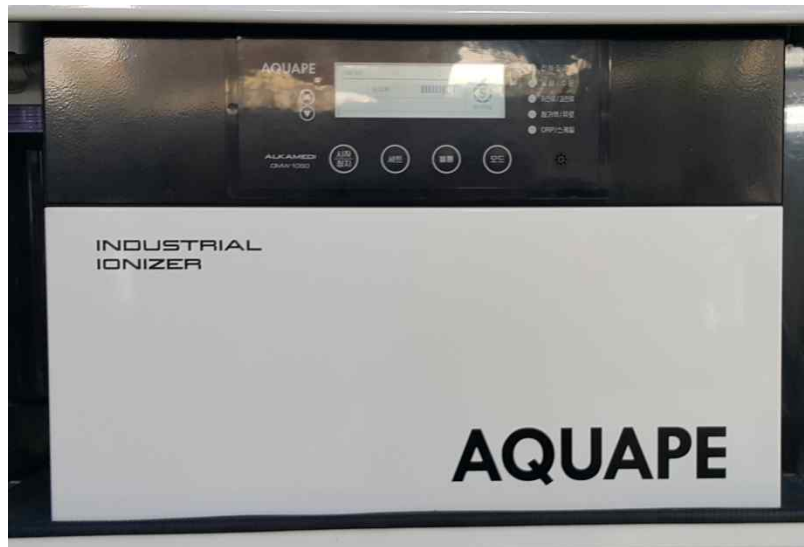
Purpose of use: Used for sterilization at the last stage of cleaning.

### 3-4. Industrial strong electrolytic water generator generation process



### 3-5. Industrial high-electric seawater device specifications

<b>Washing water (strongly alkaline water) generator</b>			
Supply power	220VAC 60hz 600W	Water pressure	2.0~5.0kgf/cm
Inlet volume	5.0L/min	Production amount	Strongly alkaline water (2.5L/min) Acidic water (2.5L/min)
Strong alkaline	pH 12.0 or higher (12.5)	Strongly acidic	pH 3.0 or less (2.5)
ORP concentration	strong alkaline water: -800mV	ORP concentration	strongly acidic water: +1,100mV



1. Generating tank: pH12.0 ~ pH12.8
2. Regeneration tank: pH10.5~pH11.2
3. Soaking tank: pH10.5 ~ pH11.0
4. Discharge tank: pH7.10 ~ pH7.80

The entire cleaning process uses strong alkaline water of pH 11 or higher, which is excellent for powerful cleaning and sterilization and removal of fishy odors. It is harmless to the human body and does not cause secondary pollution as it does not use chemical detergents such as surfactants.

# 4-1. Performance improvement products



# 4-1. Performance improvement products

