PH-SEVEN

RESONAC

Alkaline Waste Water Neutralizers

- **PH-SEVEN A/S**
- **PH-SEVEN 3 (Utility Model Pending)**
- **PH-SEVEN A(HCl)**
- **PH-SEVEN 3(HCl)**

Bottle Washing

Industrial Waste Water

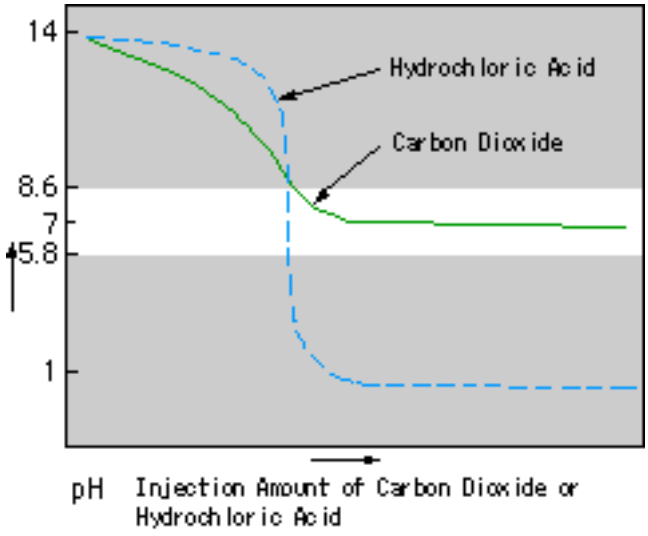
WASTE WATER REGULATIONS

It is provided by the "Water Pollution Prevention Act," "Water Pollution Prevention Act Enforcement Regulations" and "Prime Minister's Office Ordinance to Provide Waste Water Criteria" that the hydrogen ion concentration(pH value) of the waste water discharged from a place of business such as a factory **"should be kept between 5.8 and 8.6 when discharged into the public waters other than the sea areas."**

Therefore, we should be careful not to discharge acid waste water resulting from excessive addition of an acid counteragent as well as alkaline waste water.

* This differs from one prefecture to another.

Neutralization Curve When Alkaline Waste Water Is Neutralized Only with Carbon dioxide or Hydrochloric Acid



OVERVIEW OF PH-SEVEN

- **PH-SEVEN is an alkaline waste water neutralizer using carbon dioxide as a counteragent.(Carbon dioxide is very safe and sanitary substance, as it is contained in beer and carbonated drinks.)**
- **Using carbon dioxide as a counteragent, PH-SEVEN may be easily and safely operated by anyone, compared with the conventional neutralizers which use hydrochloric acid or sulfuric acid.**
  Carbon dioxide rarely lowers the pH value to 6.0 or less, even if excessive by injected. It hardly corrodes metals.
- **PH-SEVEN is very compactly designed, because it mixes carbon dioxide with alkaline waste water through an in-line mixer. The special in-line mixer helps absorb carbon dioxide into alkaline waste water with high efficiency.**

Alkaline Waste Water Sources

There are largely two types of alkaline waste water; of calcium hydroxide($Ca(OH)_2$) and sodium hydroxide(NaOH).

Calcium hydroxide waste water includes;

- Waste water from the fresh concrete plants.
- Waste water from the secondary concrete products manufacturing plants.
- Waste water from the dam/tunnel construction sites and road construction sites.

Sodium hydroxide waste water includes;

- Bottle washing waste water from the carbonated drinks manufacturers and alcohol/soy sauce manufacturers.
- Cleaning waste water and dyed cloth washing waste water.
- Waste water from the processing laboratories.
- Boiler washing waste water.
- Waste water from the chemical plants.

RESONAC

PH-SEVEN A/S; EXCLUSIVE FOR CARBON DIOXIDE

PH-SEVEN A

Full automatic type with raw water used. Capable of not only automatically controlling a carbon dioxide rate aligned with the pH value, but controlling waste water's pH value after carbon dioxide treatment.

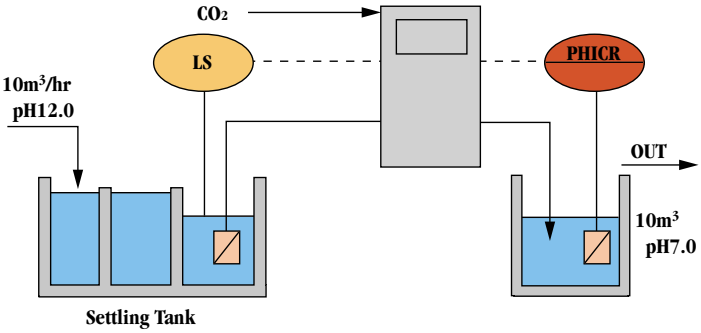
PH-SEVEN S

Half automatic type and inexpensive with raw water used. Optimum for when the pH value does not fluctuate very much or when it is needless to record waste water's pH value after carbon dioxide treatment.
When you have to record waste water's pH value after initially installing Type S, you only need to add a recorder, etc. to approximate to Type A.

Specification of PH-SEVEN A/S

Type	Treatment Rate pH12.0 -> 7.0	Electric Power AC200V 50/60Hz 3Φ
A-10	10m³/hr.	1.2kw
A-20	20m³/hr.	2.0kw
A-50	50m³/hr.	4.2kw
A-100	100m³/hr.	8.5kw
S-20	10m³/hr.	1.2kw
S-20	20m³/hr.	2.0kw

Waste Water Treatment Method



Type A-10

PH-SEVEN 3; EXCLUSIVE FOR CARBON DIOXIDE

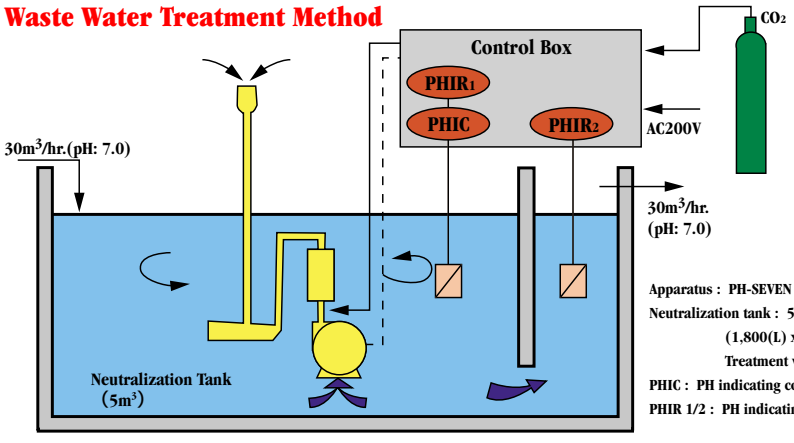
PH-SEVEN 3

CO_2 neutralizer destined for the construction sites(dams and tunnels). It has been designed and manufactured, collecting our CO_2 neutralization know-how accumulated over years.
Submersible neutralizer completely overthrowing a conventional idea of permanent ground installation. It has been developed with the biggest emphasis put on inexpensiveness and high performance.

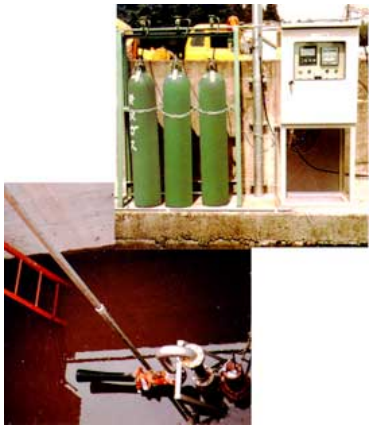
Specification of PH-SEVEN 3

Type	Treatment Rate	Carbon dioxide Rate	Electric Power
3(10)	10m³/hr.(pH12.0 -> 7.0)	3kg/hr.	AC200V x 3Φ x 1.2KW
	30m³/hr.(pH11.0 -> 7.0)	1kg/hr.	AC200V x 3Φ x 1.2KW
3(30)	30m³/hr.(pH12.0 -> 7.0)	9kg/hr.	AC200V x 3Φ x 2.0KW
	90m³/hr.(pH11.0 -> 7.0)	3kg/hr.	AC200V x 3Φ x 2.0KW
3(50)	50m³/hr.(pH12.0 -> 7.0)	15kg/hr.	AC200V x 3Φ x 2.7KW
	150m³/hr.(pH11.0 -> 7.0)	5kg/hr.	AC200V x 3Φ x 2.7KW
3(100)	100m³/hr.(pH11.0 -> 7.0)	30kg/hr.	AC200V x 3Φ x 5.0KW
	300m³/hr.(pH11.0 -> 7.0)	10kg/hr.	AC200V x 3Φ x 5.0KW

Waste Water Treatment Method



Apparatus : PH-SEVEN 3(10)
Neutralization tank : 5 m³
(1,800(L) x 1,800(W) x 1,500(H))
Treatment water residence time = 5 to 10 min.
PHIC : PH indicating controller (Standard specification)
PHIR 1/2 : PH indicating recorder (Optional specification)

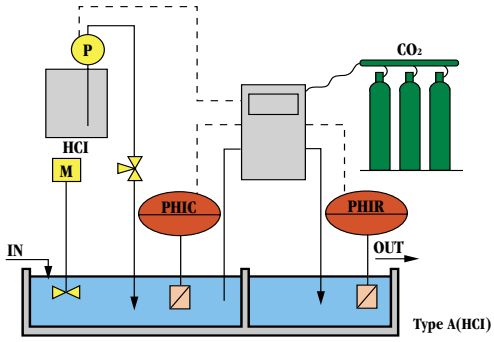


PH-SEVEN A(HCI); CARBON DIOXIDE & HYDROCHLORIC ACID COMBINED TYPE

PH-SEVEN A(HCI)

- Type A(HCI) is suitable for neutralization of high-concentration alkaline waste water.
  Recently, more fresh concrete plants and secondary concrete products manufacturing plants have employed a closed system which does not discharge untreated waste water outside the compound as much as possible, possibly causing waste water to be condensed and unable to be neutralized only with carbon dioxide(cloudy phenomenon).
  Optimum for such cases is Type A(HCI) capable of pre-treatment with hydrochloric acid.
  When neutralizing alkaline waste water with hydrochloric acid, there are two demerits; one is that hydrochloric acid is so strong that it is difficult to accurately control at the neutralization point(pH7), and the other is that it corrodes metals.
- Type A(HCI) neutralizes alkaline waste water with hydrochloric acid up to pH 10 beforehand, then neutralizes it with carbon dioxide up to pH 7, thus making up for the demerits of hydrochloric acid and carbon dioxide with their respective merits.
- Type A(HCI) is free of corrosion, because it uses vinyl chloride resin for all the parts which come into contact with hydrochloric acid.

Waste Water Treatment Method



Specification of PH-SEVEN A(HCI)

Type	Treatment Rate pH12.0 -> 7.0	Treatment Rate pH12.5 -> 7.0	Electric Power AC200V 50/60Hz 3Φ
A(HCI)-10	10m³/hr.	10m³/hr.	3.2KW
A(HCI)-20	20m³/hr.	20m³/hr.	5.0KW

PH-SEVEN 3(HCI); CARBON DIOXIDE & HYDROCHLORIC ACID COMBINED TYPE

PH-SEVEN 3(HCI)

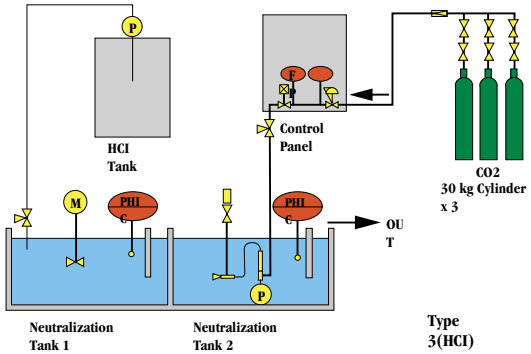
Making the best use of the characteristics of PH-SEVEN A(HCI), PH-SEVEN 3(HCI) is suitable for the cases where greater treatment capabilities are required. Provided with the capabilities equivalent to PH-SEVEN 3, it has been developed as an inexpensive, high-performance carbon dioxide and hydrochloric acid combined type.

Handling and Toxicity of Hydrochloric Acid

- **Precautions for Handling**
  Hydrochloric acid is neither explosive nor ignitable, but erodes metals to produce hydrogen which may in turn be mixed with the air and explode. It is so corrosive that it erodes most metals.
  - Precaution for fire extinction --- Extinguish with water.
  - Protective gear --- Industrial hygienic protective gloves, protective clothes, gas mask(for acid) or respiratory mask, goggles.
- **Toxicity**
  Allowable concentration: 5 ppm, 7 mg/m³. It causes inflammation if it comes into contact with the eye or skin. It stimulates the mucous membrane of the throat, nose, etc. to cause you to cough. Inhaling it in large quantity causes an edema of the lungs, resulting in death.
  - Emergency measure --- If it comes into contact with the eye or skin, flush it with a large amount of water. If it is swallowed, use an oxygen inhaler to breathe in oxygen and consult a medical doctor.

※ The allowable concentration value above is recommended by the Japan Industrial Hygiene Society.

Waste Water Treatment Method



Specification of PH-SEVEN 3(HCI)

Type	Treatment Rate pH12.0 -> 7.0	Electric Power AC200V 50/60Hz 3Φ
3(HCI)-10	10m³/hr.	3.0KW
3(HCI)-30	30m³/hr.	4.5KW

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