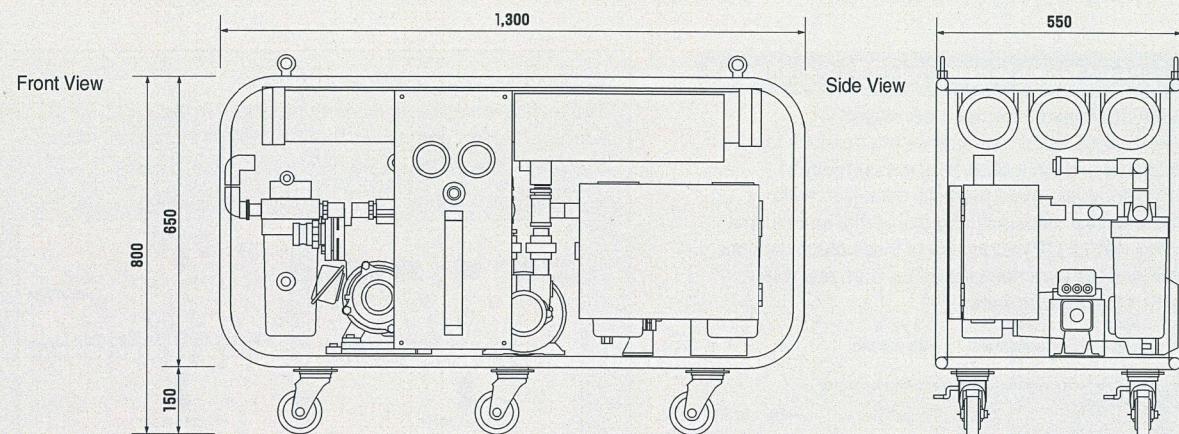


■ Dimensional Drawing



(In millimeters)

■ Substances Filterable by WELL UP and Types of Separation Membranes

Pore diameter	1Å	0.001μm	0.01μm	0.1μm	1μm	10μm
Substance	H ₂ Ca ²⁺ O ₂ Mg ²⁺ CO ₂ Na ⁺ H ₂ O K ⁺		Egg albumen Pyrogen Various viruses Colloidal silica	Bacteria Pseudomonas aeruginosa	Oil emulsion Latex Cholera/Typhoid germs Coliform bacilli	Cryptosporidium germs Algae/Mold
Separation membrane type					Prefilter Microfiltration membrane (MF) Ultrafiltration membrane (UF) Reverse osmosis (RO)	Sand filtration

* 1Å (angstrom) is equal to 10⁻¹⁰ meters, 0.1 nanometers or 100 picometers. 1 μm is defined as one millionth of a meter.

■ Substances Filterable by WELL UP and Test Results (Extract from the 50-item water quality test)

	Water Quality Criteria (Waterworks Act, Japan)	River water	RO-filtrated drinking water
General bacteria (pcs./ml)	100 or less	1600	0
Coliform bacilli	Must not be detected	Not detected	Not detected
Nitrate nitrogen and nitrite nitrogen (mg/ml)	10 or less	5.91	0.46
Iron (mg/ml)	0.3 or less	1.65	Less than 0.03
Manganese (mg/ml)	0.05 or less	0.083	Less than 0.005
Chlorine ion (mg/ml)	200 or less	425.7	6.3
Calcium, magnesium, etc. (Hardness) (mg/ml)	300 or less	187	1
Organic matter (Potassium permanganate consumed) (mg/ml)	10 or less	22.8	0.9
pH value	5.8 ~ 8.6	7.2	6.2
Taste	Must not be abnormal	Not yet tested	No abnormal taste
Odor	Must not be abnormal	Not yet tested	No abnormal odor
Chromaticity (degrees)	5 or less	37.4	Less than 0.5
Turbidity (degrees)	2 or less	15.9	Less than 0.1

■ Specifications (River/Reservoir Type WELL UP)

Model	HRO-600
Outside dimensions (mm)	1300 x 550 x H800
Weight	168 kg
Drinking water generation	600 l/hr (Fresh water)
Feed water intake	1800 l/hr (Fresh water)
Feed water pump head	-5.5 mm (Effective value)
Frame	SUS stainless steel, w/hanging hooks
RO module	4 in. x 40 in. (3 pcs.)
High pressure pump	200 V, 1.5 kW, three-phase
Feed water pump	200 V, 0.75 kW, three-phase
Prefilter	5-μ, L250 (2 pcs.)
Activated carbon filter	L250 (2 pcs.)
Disinfectant	200 V, 16 W, single-phase
Disinfectant capacity	2.0L
Pressure gauge	0.08 MPa on; 0.05 MPa off
Flowmeter	90 ~ 900 l/hr
Water quality indicator	Pilot lamp lit in green
Feed water hose	40A, 10-meter long flexible hose
General service water hose	20A, 3-meter long pressure-proof hose
RO-filtrated water hose	15A, 3-meter long pressure-proof hose
Caster	6 swivel type casters w/stopper

● Sampling point: Machiya, the Sumida River, Tokyo ● Test date: May 18, 2004
 ● Test laboratory: Environment Analysis Center, Koto Microorganism Research Laboratory
 ● The WELL UP RO Membrane Emergency Drinking Water Generation System was subjected to the performance test by the University of Tokyo laboratory with respect to the standard substances officially specified as closely associated with the contamination of underground



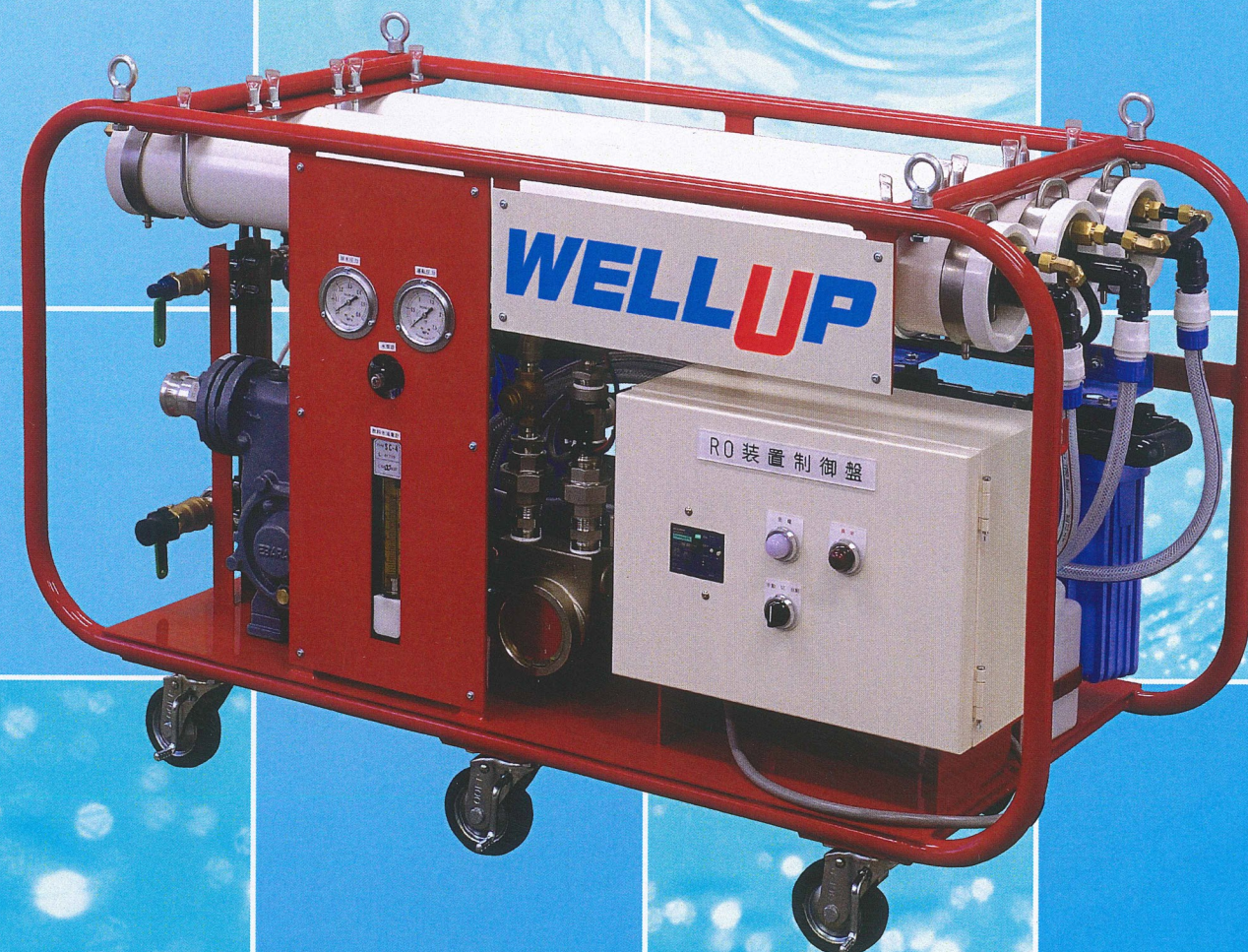
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Emergency Drinking Water Generation System — WELL UP

WELL UP

Supply of Safe Drinking Water in Emergency

- Application of high polymer reverse osmosis (RO) membranes
- Two types available for flexibility of feed water sources: well or river/reservoir
- Capable of generating up to 15 tons of safe drinking water per day (for consumption by roughly 4,800 persons)
- Power source not dependant on electricity and easy operation

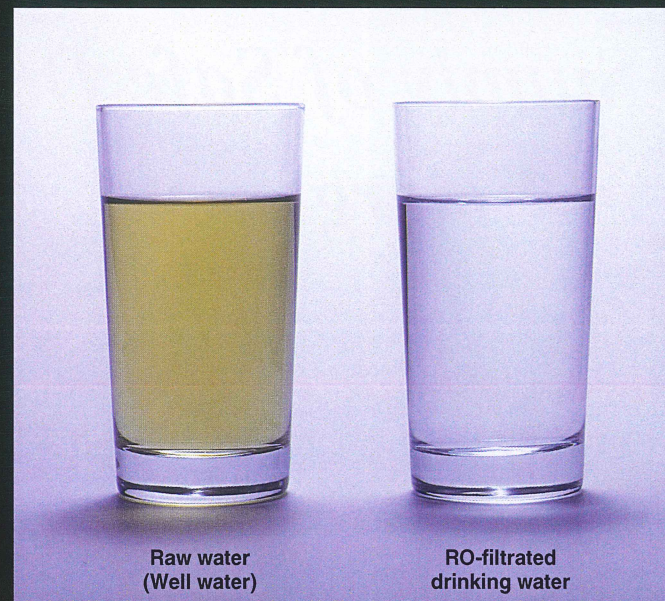


※ RO Membrane Emergency Drinking Water Generation System —

<WELLUP>

Water is one of the basic needs for human life, in particular, assuring safe drinking water is a matter which challenges the global attention. In Japan, for example, it is still in people's memory that when the Great Hanshin Earthquake struck Kobe and its surrounding areas in 1995, the destruction of city waterworks contributed to aggravating the damage. Assuring safe drinking water in an emergency is a matter of extremely vital importance, and it is desirable for communities to provide for it. Having energetically met the challenge of this problem, we have been successful in developing the WELL UP emergency drinking water generating system, a perfect system that can quickly supply the water from wells, rivers or ponds as safe drinking water in an emergency.

※ RO: Reverse Osmosis



Well water sampled at Shiba (Minato City) area in Tokyo

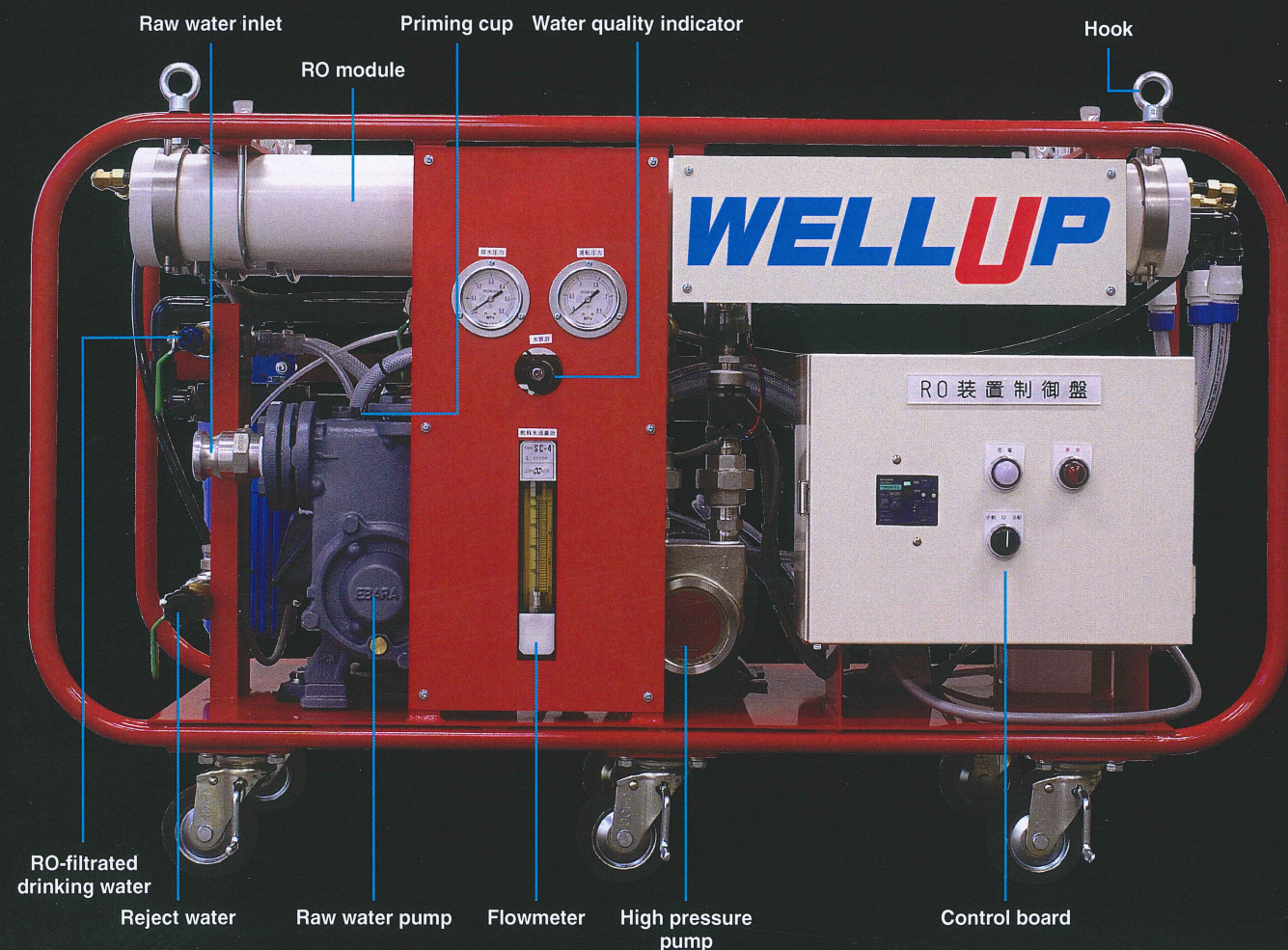
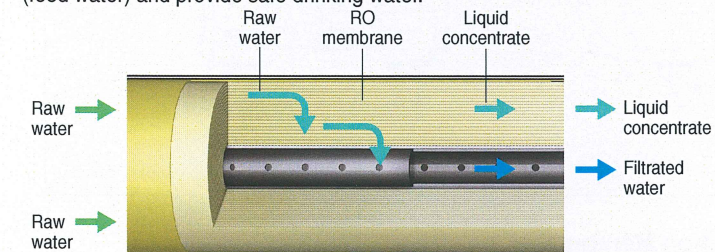


Photo shows WELL UP River/Reservoir Type.

The WELL UP Emergency Drinking Water Generation System is a solution offered by HASEC as a self-defense means of your community against a disaster. It will also do much for community activities in general.

Application of polymeric reverse osmosis (RO) membranes

Reverse osmosis (RO) membranes have been developed for desalination of seawater. Since these membranes are pervious to water while they reject particulates and ion matter, they are currently in extensive use at medical services where perfectly deionized water is indispensable, in semiconductor manufacturing plants that should shut out impurities, and so on. WELL UP makes use of these characteristics of reverse osmosis membranes to remove impurities from raw water (feed water) and provide safe drinking water.



Two types available for flexibility of feed water sources: well or river/reservoir

When a disaster strikes an area and raw water is to be fed from an emergency well, HASEC takes charge of installing it, faithfully following the applicable law and/or ordinance of the municipality to which the area belongs. For a river/reservoir type, a 10-meter long, 40-mm diameter flexible hose (swivel joint hose) is supplied together with the system. Alkaline water from a concrete water reservoir can also be used as safe drinking water after filtration by WELL UP.

Capable of generating a maximum of 15 tons of safe drinking water per day (for consumption by roughly 4,800 persons)

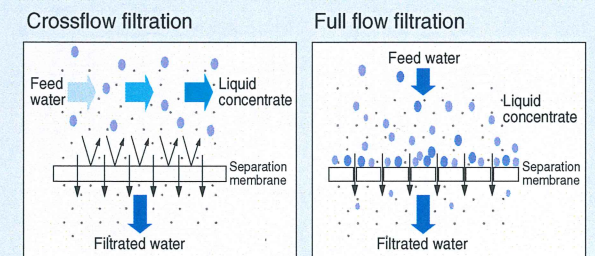
It is said that three liters of water per day per person are required in the event of a disaster such as a big earthquake. Supposing that 300 families with a total of 1,000 people live in a condominium, about three tons of water a day is required for such a condominium alone. As one unit of WELL UP is capable of generating up to 15 tons of safe drinking water per day (24 hours of operation) covering consumption by around 4,800 persons, it can supply enough volume of drinking water not only for the condominium residents in the supposed case, for example, but also for those living in the surrounding area.

Power source not dependant on electricity; easy operation

Assuming an emergency where no electricity is available, WELL UP utilizes a generator as its power source. Simple operation is another feature of WELL UP. Once you have connected its hose to the water source and plugged in power, just start up the generator. In few minutes you can obtain safe drinking water.

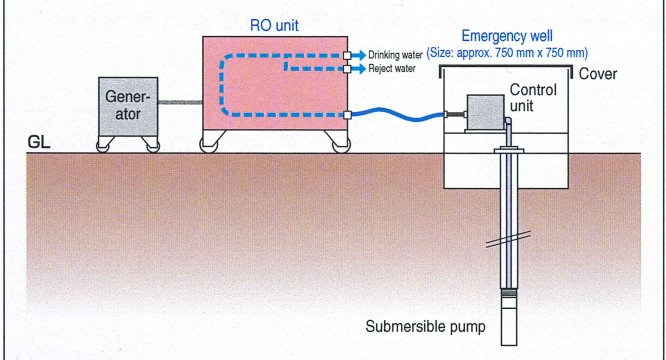
Membrane filtration system

The reverse osmosis modules incorporated in the WELL UP RO unit adopts crossflow membrane filtration system that allows natural filtration of feed water.

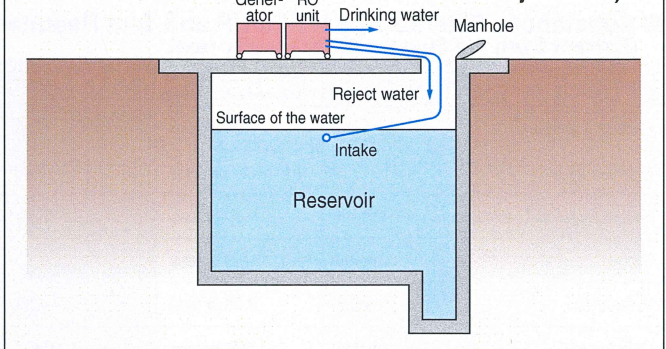


RO装置

Installation model with a well



Installation model with a reservoir (Cyclic filtration of reject water)



WELL UP Water Treatment System

