Life is good - with clean water

Membrane Solutions

for Drinking Water

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MARTIN
MEMBRANE SYSTEMS

A WILO COMPANY

PAUL WATER BACKPACK

for water treatment in emergency situations

Around 663 million people cannot access to clean water.

In many parts of the world, people get their water from wells, streams, rivers and canals. These are contaminated by bacteria and other pathogens. The people suffer from diarrhoea, typhus, cholera etc. Many of them die, above all the children supplying the population with clean water in rural, impassable areas is one of the biggest problems after a disaster.

The high-tech, mobile water works used in disaster areas need trained personnel, power and additives and supply tens of thousands of people. They can only be used centrally in towns and cities on account of their performance, costs and availability. The water backpack **PAUL** has been developed to supply smaller groups locally in rural areas.

What is PAUL? A water filter in a backpack!

PAUL is a water filter that ensures a fast supply of drinking water in disaster areas. The device filters pathogens out of the water, making it drinkable and offering effective protection against cholera, typhus and other infectious diseases. PAUL can be carried by only one person as a backpack to remote areas since it weights only 20 kg.

PAUL – simple, lightweight and efficient!

PAUL filters at least 1,200 liters of water each day and can thus supply 400 people with 3 liters per day. The filter is easy to use. Pour the dirty water in at the top, and draw off clean drinking water from the tap after only a few minutes. The device works reliably for years without any energy consumption, chemicals or additives. It is extremely robust and has no moving parts. The manual consists of simple pictograms that can also be understood by illiterates. Anyone can therefore use the device. It helps people to help themselves.

The ultrafiltration membrane!

PAUL filters up to 99.9999% of bacteria and pathogens out of contaminated water by means of a membrane filter with a pore width of approx. 35 nm (0.035 µm) and a service life of 10 years. Around 1,200 liters of water can be filtered every day for months – enough for 400 people to survive.

paul water backpack

PAUL around the world

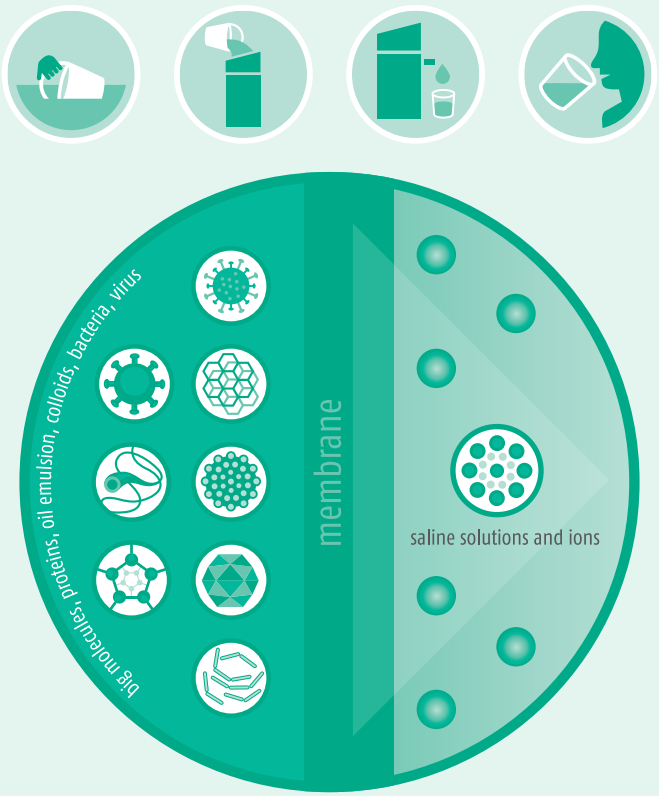
PAUL has been in continuous service since September 2010 and has been working very successfully. More than 3,500 devices have been dispatched to date around the world. Apart from national and international organizations, it is very often private individuals who want to help families and friends abroad. **PAUL** is helpful not only water for purification but also for educational purposes on the topic of water.

2010
- **PAUL** in Pakistan after flooding
- a major earthquake shocks Haiti – **PAUL** helps

2011
- **PAUL** in schools in Indonesia and Haiti
- **PAUL** helps the victims of flooding in Thailand

2012
- the first **PAUL** is sent to Myanmar
- **PAUL** research project in Colombia

2013
- **PAUL** for schools and a hospital in Cameroon
- **PAUL** helps after the typhoon on the Philippines



PAUL – Portable Aqua Unit for Lifesaving

Easy to use. Ready to drink.

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AQUA CUBE

for decentralized water treatment in rural areas

The **Aqua CUBE** is a cost effective, compact and mobile water treatment plant based on a modular membrane filtration system that enables available water resources to be used in particular purposes such as service water or drinkable water.

The **Aqua CUBE** is a plug and play device. It is easy to install and operate, has a very low energy consumption, and it is ready to use. Depending on the capacity and type of the plant, installation and operation is even possible without any need of electrical energy or other consumables. The **Aqua CUBE** from MARTIN Systems GmbH is able to remove up to 99.9999% of bacteria and other pathogens out of polluted water by means of ultrafiltration filters, and make it drinkable.

Aqua CUBE can be offered, depending on raw water quality and effluent requirements, together with additional treatment stages in modular versions, so that the WHO regulations and other international water quality standards are always fully met. Every human being has the right to access sufficient and continuous safe water for personal and domestic uses. According to the United Nations, Resolution 64/292 of 2010, those uses ordinarily include drinking, personal sanitation, washing of clothes, food preparation, personal and household hygiene, which means an average consumption between 50 to 100 liters of water per person per day.

Characteristics		Aqua-CUBE S		Aqua-CUBE M		Aqua-CUBE L	
		GDM	Pump	GDM	Pump	GDM	Pump
Capacity (m³/d)*		3	5	6	10	12	20
Population (Persons)	**	58	100	120	200	240	400
	***	967	1667	2000	3334	4000	6667
Energy demand (kW/h)		0,00	0,03	0,00	0,04	0,00	0,08

Motivation

Safe and drinkable water is fundamental to the health, survival, growth and development of all the people. There are millions of people worldwide that still use unimproved water sources. The UN establishes through the Sustainable Development Goals – SDGs that by 2030, universal and equitable access to safe and affordable drinking water should be achieved worldwide. Our future-oriented and innovative products are aimed to reach the SDG by providing clean water with **Aqua CUBE**.

As an environmental protection company, we also feel committed to healthcare, in particular to the improvement of drinking water quality and thus the protection of public health worldwide. The guiding principle of all our actions is the economically viable provision of people and the environment with the best possible water treatment technology.

Above information is based on the following raw water quality conditions:
temp. 20 °C, turbidity < 20 NTU, TOC < 6 mg/L
GDM: Gravity Driven Membrane filtration
* depending on water quality
Estimated provision of safe drinking water per person: ** 50 L/d, *** 3 L/d

CUBE

1. clean water tank
2. solar panel
3. buffer tank
4. prefilter
5. permeate pump
6. CUBE membrane filter

Features

- Fast delivery and start – up due to mobile concept
- German quality equipment
- Compact design and high packing density
- High flexibility for the relocation via basic transport vehicles
- Uncomplicated installation / demounting
- Easy operation and maintenance
- Very good price-performance ratio

Applications

MARTIN Systems offers a tailor-made **Aqua CUBE** plant to be used as:

- Potable water for communities or schools
- Process water treatment
- Recycling of rainwater
- Mobile water treatment plant for special events
- Building complexes (Offices, Shopping Centers, Small Township)

The Aqua CUBE from MARTIN Systems GmbH includes the following steps:

- Pre-filtration
- Ultrafiltration at very low pressures
- Sludge sedimentation

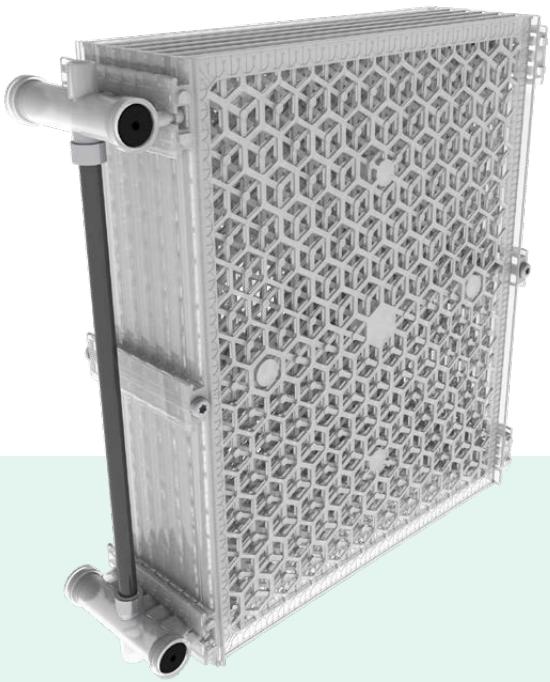
In addition, optional equipment can be offered to customize the system according to the pollution parameters of the water to be treated:

- Activated carbon filters
- Chlorine disinfection
- UV disinfection
- Coagulation/Flocculation with “smartfloc PACS”

Extended membrane life: Up to ten years without replacing the ultrafiltration filters.

Mini CUBE

for household water treatment



FILTER CHARACTERISTICS	
Membrane area	0.45 m^2
Gaps between membranes	6 mm

MEMBRANE CHARACTERISTICS	
Material	org. polymer
Separation	Ultrafiltration
MWCO*	150 kDalton
Pore size, nominal	approx. 35 nm
Pore size, maximal	0.1 µm

DIMENSIONS**	
Length [mm]	250
Width [mm]	75
Height [mm]	260
Min. liquid level [mm]	300
Min. hydraulic head [mm]	400
Weight, dry [g]	800
Weight, wet [g]	1100
Package density [m^2/m^3]	110

CONNECTIONS	
Filtrate line	Ø 8 mm

FLOW at 20 °C ***	GDM	Pump
minimum hourly flow	3.0 l/h	4.0 l/h
maximum hourly flow	50 l/h	80 l/h

Mini CUBE is our smallest ultrafiltration module which can be easily adapted as a household water filter to get drinkable water to a family of six members. It relies its performance upon ultra-low pressures and thus achieving a stabilized flux. **Mini CUBE** can be easily installed together with granular activated carbon to have a smaller footprint onto a water filter and thus eliminate other micropollutants possibly present in raw water. In this way, **Mini CUBE** can provide access to safe and affordable water to communities in vulnerable situations around the world.

* MWCO: Molecular weight cut-off

** Dimensions are based on the module, without any frame

*** Flow characteristics are based on our experience (GDM: gravity-driven filtration, 30 cm of raw water level) Performance may vary depending on application and raw water quality! Operation at PHF may be reached during short intervals

CUBE mini

As we are continually improving our products we reserve the right to make technical alterations/modifications. Special requests are possible provided when they are based on our existing designs.

Do you have any special requests or questions?
Then contact us at +49 30 2005 970 0
or at info@martin-systems.com

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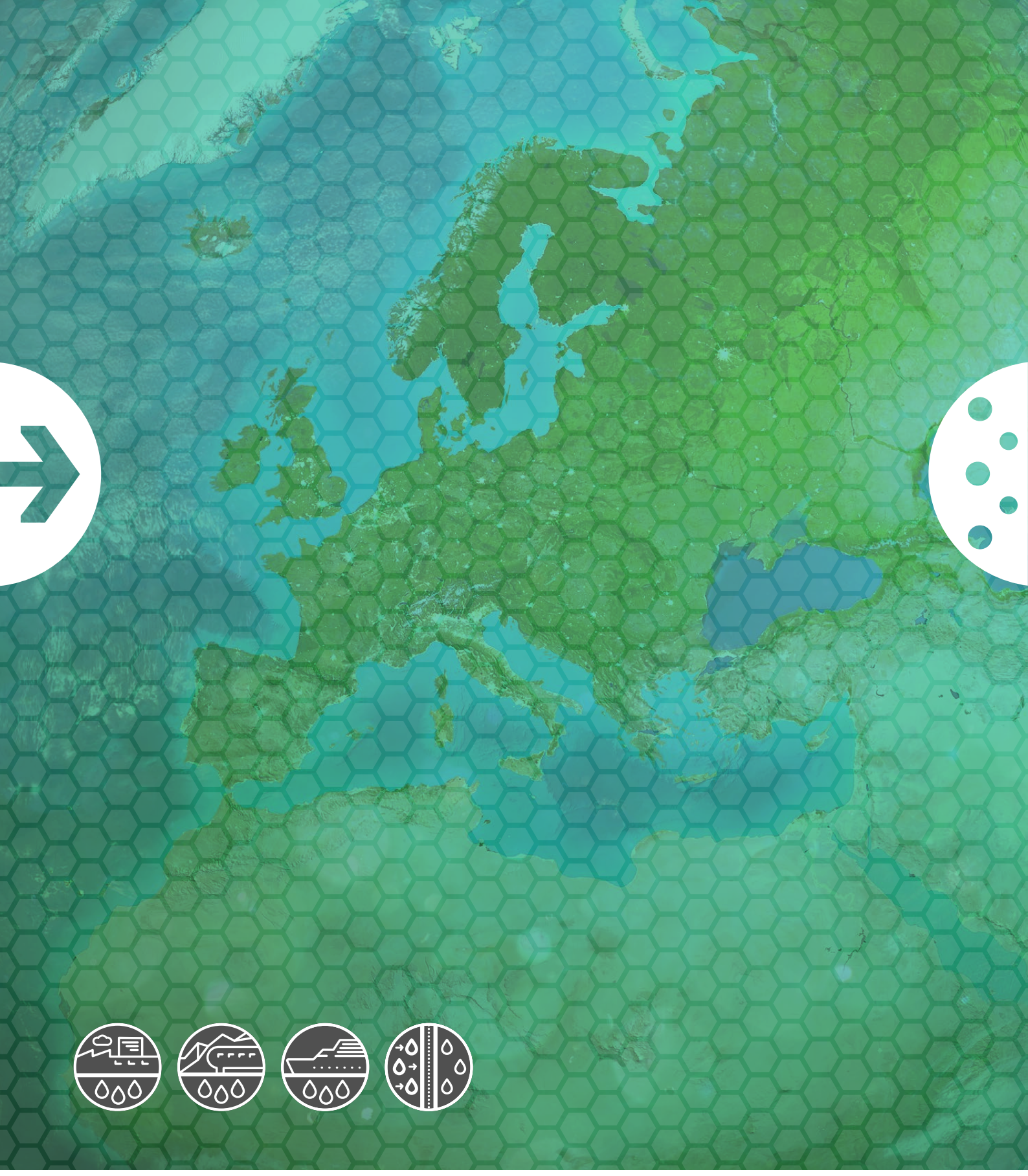

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