FUTURETECH

Kärcher Group

MOBILE DRINKING WATER SUPPLY

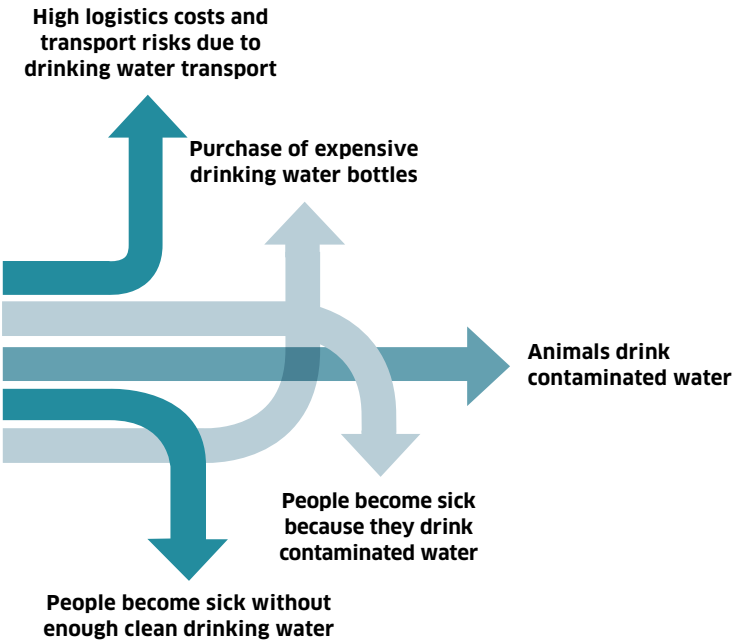
Safe Drinking Water. Everywhere.

The Challenge of Water Supply in a Mission

Water is available almost everywhere in the world, but only around 3% is fresh water, of which only a small percentage can be used as drinking water without prior treatment. This is why during crisis situations and disasters it is very difficult to ensure the availability of safe drinking water.

In particular, civil protection organizations and military mission forces are confronted with this problem every day. Even more, when they are deployed in crisis and disaster areas or dangerous locations with no infrastructure and under extreme climate conditions.

In order to supply the people with a sufficient quantity of drinking water in this kind of situations, mobile water treatment systems were developed.



Basic survival water needs (per person)		
Survival (drinking and food)	2,5 up to 3 litres per day	Depends on climate and individual physiology
Basic hygiene practices	2 up to 6 litres per day	Depends on social and cultural norms
Basic cooking needs	3 up to 6 litres per day	Depends on food type, social and cultural norms
Total basic need	7,5 up to 15 litres per day	

Source: Adapted from Sphere. WHO, 2011. Guidelines for drinking-water quality, 4th edition. World Health Organization, Geneva. http://www.who.int/water_sanitation_health/publications/2011/tn9_how_much_water_en.pdf

Water Purification

Clean drinking water keeps us alive and healthy. That's why we don't do compromises when it comes to quality. The multi-barrier principle ensures that the water undergoes several treatment steps until it can be consumed as drinking water. In the process, particles, pathogens (such as bacteria, viruses, etc.), chemical ingredients including salts are removed.

Raw water can be contaminated in many different ways. During pre-treatment, larger particles can be retained mechanically (e.g. via a bag filter) or chemicals can also be added to simplify the treatment process. These can include, for example, a flocculant that forms larger flakes for improved separation or a so-called antiscalant that ensures that minerals are not deposited on the membrane.

The ultrafiltration securely retains particles as well as viruses and bacteria. The reverse osmosis process offers even greater retention so that chemicals and salts cannot pass through. UV light or chlorine is used in a disinfection step for added safety against germs. However, only chlorine ensures a long-lasting effect for storage.

For Your Safety Only the Best

Kärcher Futuretech uses ultrafiltration and reverse osmosis membranes for its water treatment process. These membrane types provide a reliable retention, which are not strongly dependent on the raw water. Thus an extremely high level of drinking water quality can be ensured. Membranes also take up less space so that compact water treatment systems are possible.

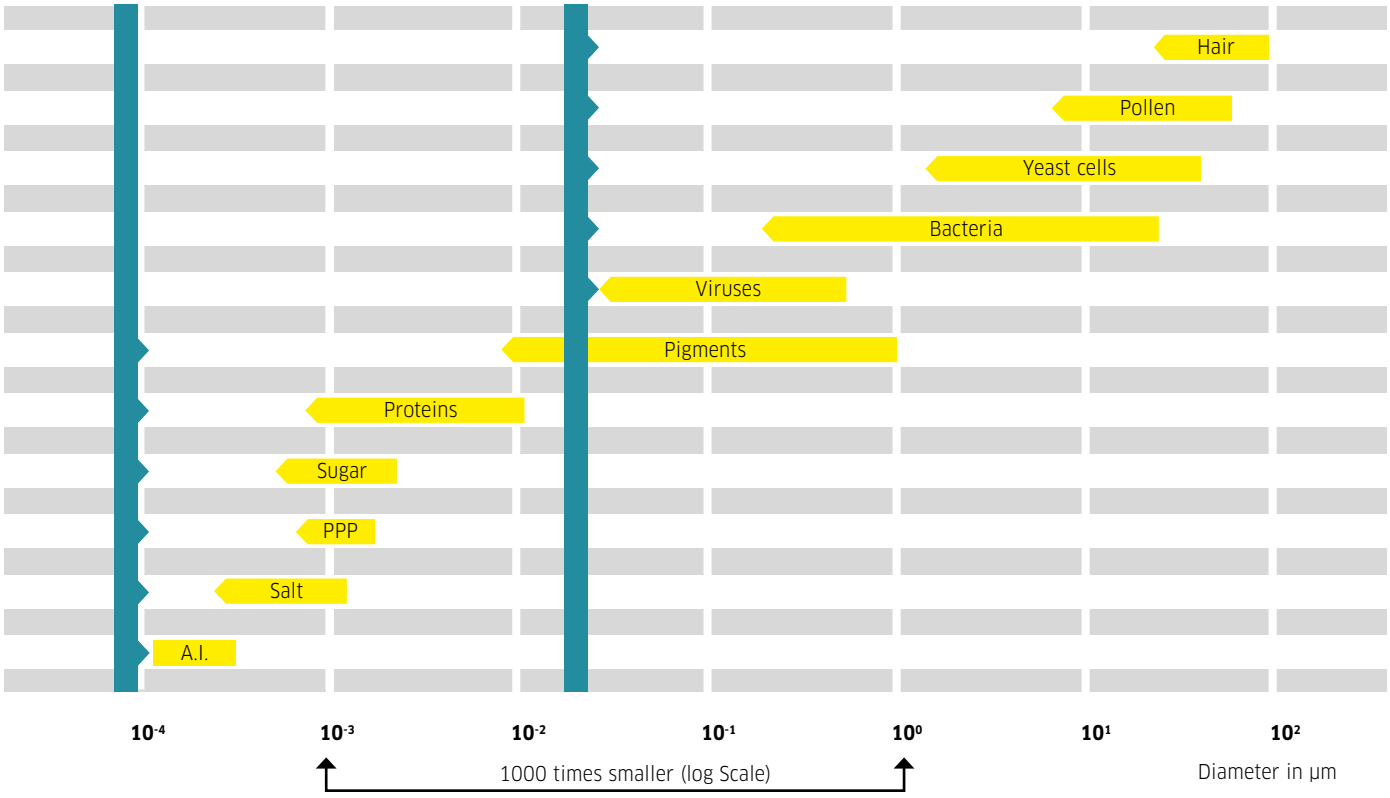
Benefits of Our Membrane Filtration

- High reliability of the drinking water quality
- Compact design
- High output
- Safe retention of particles, pathogens, salts and chemicals
- High energy efficiency
- Ultrafiltration as pre-treatmeant of reverse osmosis

Membrane Technology at Kärcher Futuretech

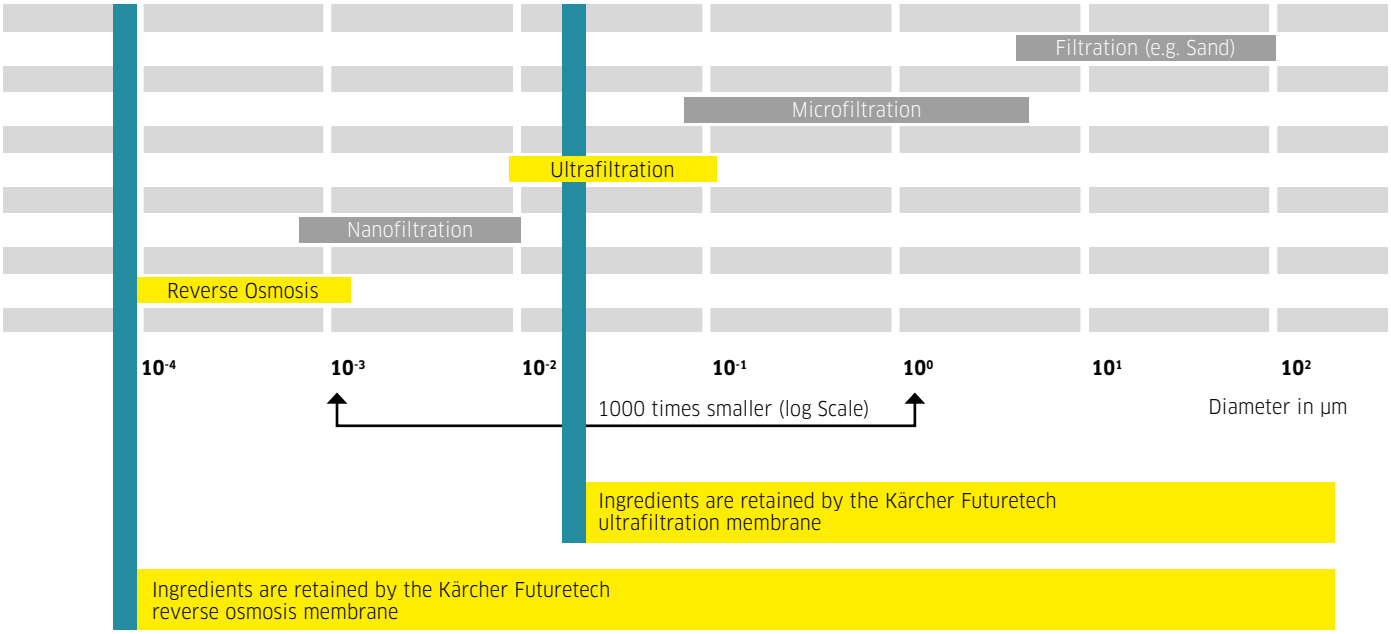
Many characteristics are decisive regarding whether or not water is fit for human consumption. First is the presence of viruses and/or bacteria, and second, whether you are dealing with salt water and/or water contaminated with chemicals. Therefore, Kärcher Futuretech has selected an ultrafiltration membrane that securely retains viruses and bacteria as well as a reverse osmosis membrane that securely retains salts and chemicals.

Substances to be removed



PPP: Plant protection products
A.I.: ions dissolved in the water

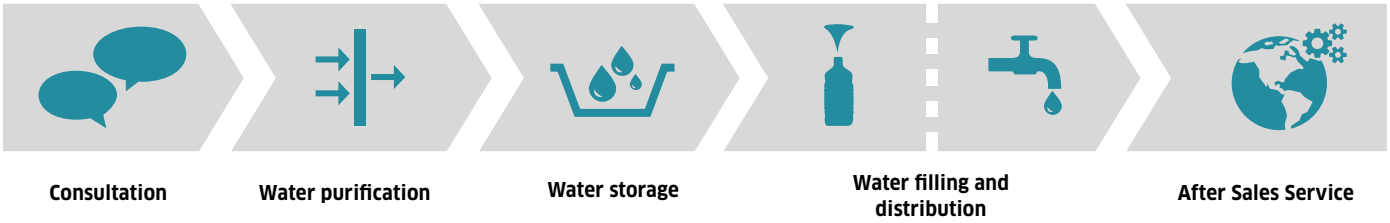
Filtration methods



Our Solution: From Source to Consumption

In order to be able to solve the problems described above, there are mobile systems for water purification and distribution. The chain from the source of raw water to final human consumption must be designed in a safe and hygienic manner to ensure access to healthy and clean drinking water.

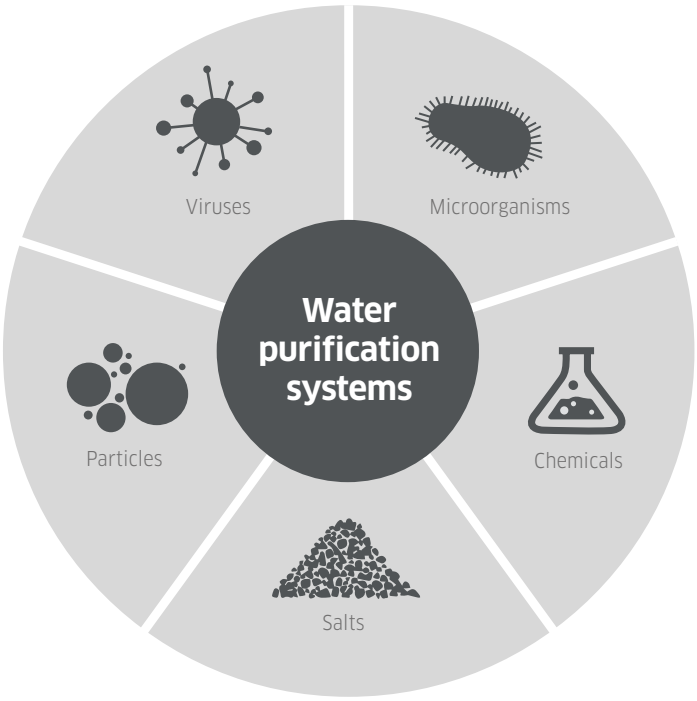
Thus the water is purified in the initial steps and then stored in a manner to keep it clean. Kärcher Futuretech regards itself as a partner who recommends a suitable system to its customers. Following the procurement of a system we provide our customers with worldwide after sales service and technical support.



Properly serviced always and everywhere – With worldwide training, spare parts and maintenance

Water Purification Systems – Safe Drinking Water Everywhere

Water purification systems must be able to remove many different contaminants. We offer solutions for the purification of highly contaminated fresh, brackish or even salt water from nearly any natural raw water sources. Our current portfolio has a range from 500 l/h up to 15000 l/h drinking water output.



The Adaptable Hybrid

	WTC 8000/15000 RO/UF C
	■ Fully automatic operation and user-friendly ■ Adjustable to raw water conditions ■ Energy-efficient ■ Easy logistical transport – 20' container ■ Separate technical section and operating area
Drinking water yield l/h	Salt water up to 8000 or fresh water up to 15000
Total weight kg	9500
Dimensions (L x W x H) mm	6058 x 2438 x 2591
Membrane technology	Ultrafiltration and reverse osmosis

Overview of the WTC Family

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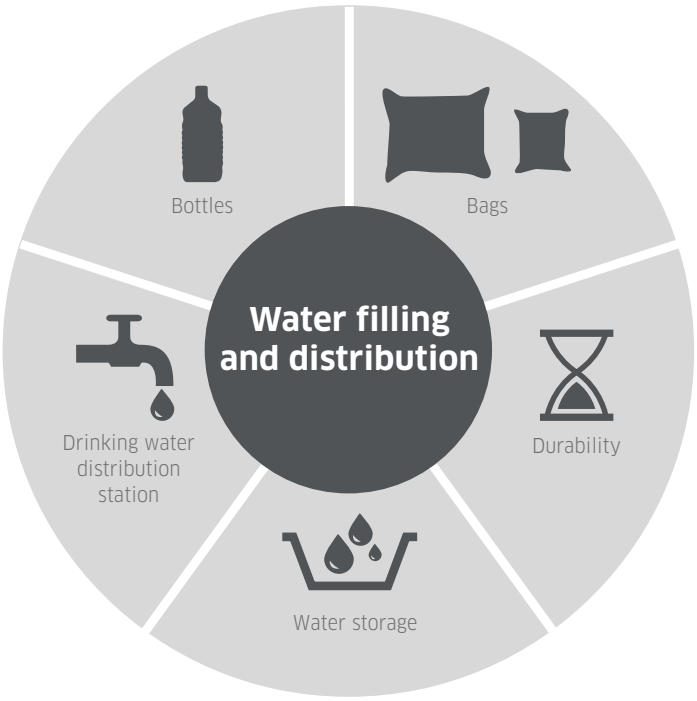
	1 WTC 5000 UF	2 WTC 700	3 WTC 3200
	▪ High energy efficiency ▪ Intuitive and automatic operation: less manpower needed ▪ Easy to transport (modular)	▪ Robust and reliable ▪ Easy, intuitive operation ▪ Compact and easy to transport (Euro-pallet and intregrated handles) ▪ Also available on a robust all-terrain trailer	▪ Robust and reliable ▪ Easy, intuitive operation ▪ Fully automatic ▪ Also available on a robust all-terrain trailer
Drinking water yield l/h	Up to 5000	Up to 700	Up to 3200
Total weight kg	245	225	< 1000
Dimensions (L x W x H) mm	1200 x 800 x 1330	1210 x 790 x 910	2400 x 1200 x 1060
Membrane technology	Ultrafiltration (UF)	Reverse osmosis (RO)	Reverse osmosis (RO)

Drinking Water Filling and Distribution – Get it to the People

After the water available on site has been transformed into valuable drinking water, it must be temporarly stored and bottled if necessary. The risk is high that with the distribution process pollutants come in contact with the water and therefore the security of the people that will consume it is endangered.

For drinking water filling and distribution, Kärcher Futuretech offers bottling solutions (1 l bottles) and packaging solutions (250 ml, 500 ml, 1 l bags).



Advantages of water filling

- Significant reduction of logistical costs
- Significant reduction of transport risk
- Full process control
- Fully automatic and user-friendly

Fully Automatic Production and Filling of Bottles

	Water Bottling Plant WBP 1300
	■ Highest hygiene under field conditions ■ Easy logistical transport – 20' container ■ Separate technical section and operating area
Filling capacity	Up to 1300 bottles/h
Total weight kg	8900
Dimensions (L x W x H) mm	6058 x 2435 x 2591
Platform	20' Container (1C, 1CC)

Overview of Other Systems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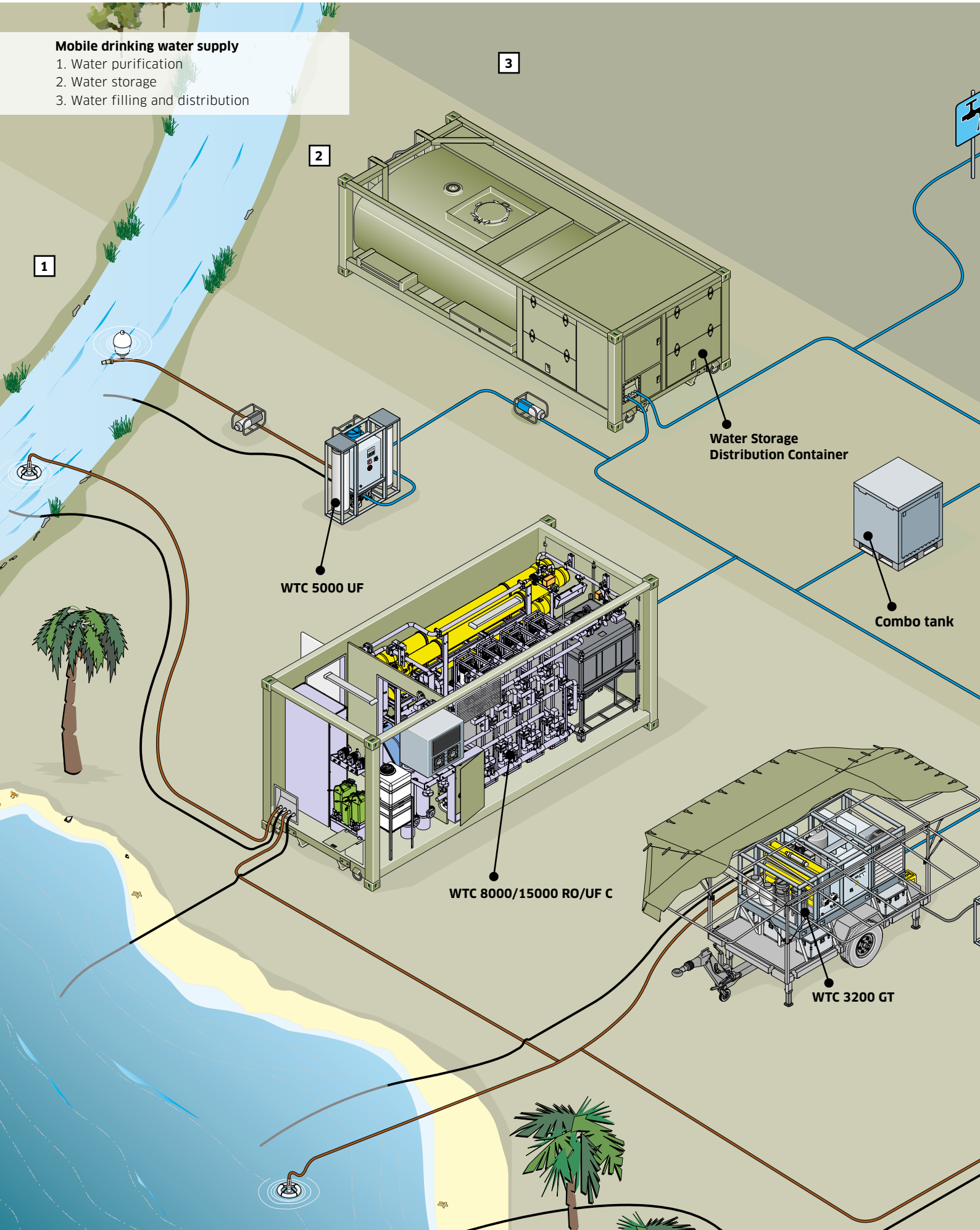
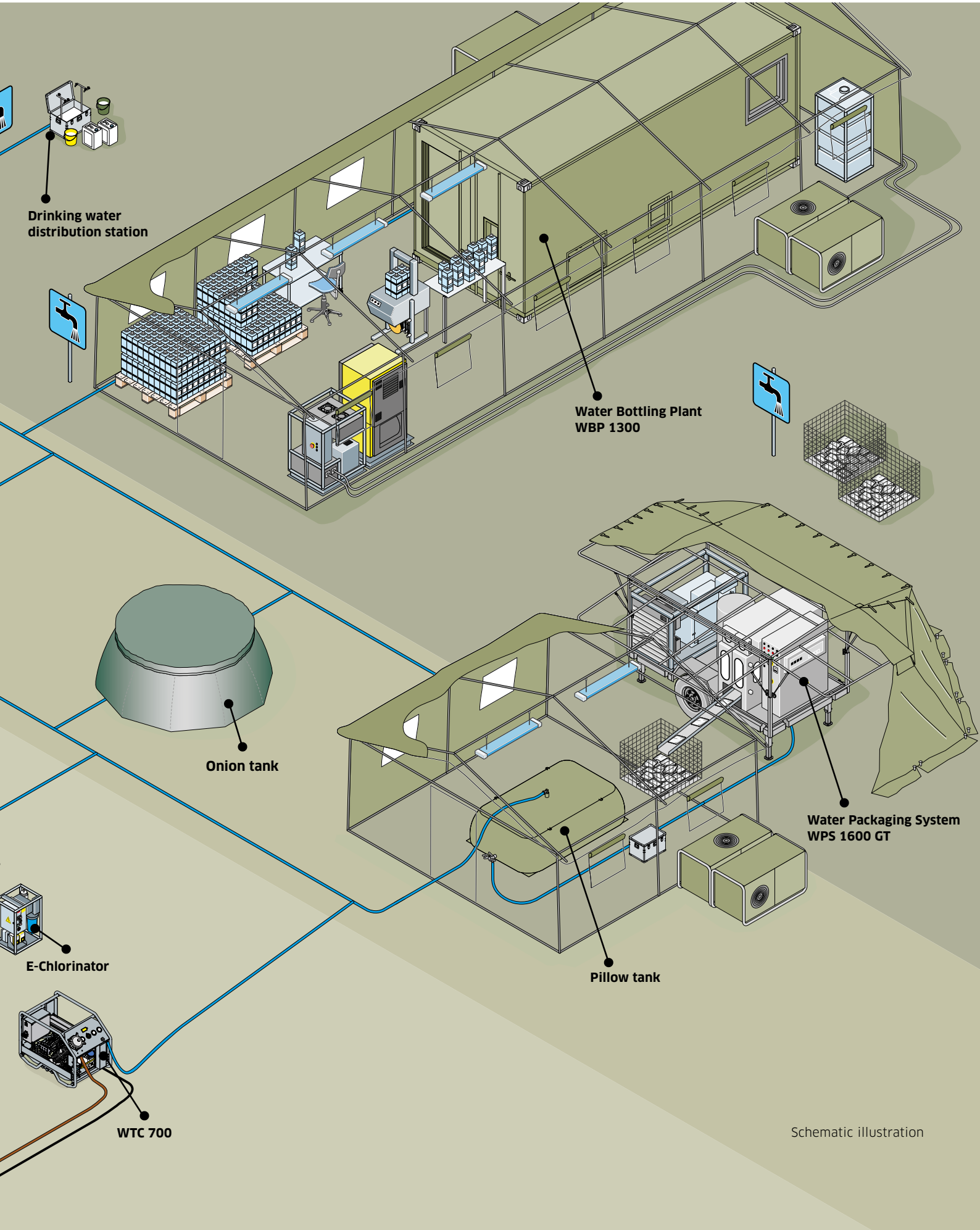
	1 Water Packaging System WPS 1600 GT	2 E-Chlorinator	3 Drinking water distribution station
	▪ Quickly ready to use ▪ Adjustable bag sizes ▪ Highest hygiene under field conditions	▪ Self-sufficient through local chlorine production ▪ Significant reduction of transportation risks ▪ Minimal cost of operation	▪ 6 taps ▪ Quick output through a feed pump ▪ Compact and easy to transport
Filling capacity	Up to 1600 bags/h	Up to 6000 l/h drinking water	5000 l/h
Total weight kg	3500	35	32
Dimensions (L x W x H) mm	5460 x 2170 x 2490	604 x 470 x 797	800 x 600 x 410
Platform	Trailer	Skid	Box

	4 Drinking water tank	5 Raw water tank
	▪ Foldable ▪ Quickly ready to use	▪ Foldable ▪ Quickly ready to use
Capacity	1000 - 10000 l storage	3000 - 10000 l storage
Total weight kg	Up to 100 (empty)	Up to 100 (empty)
Dimensions (L x W x H) mm	Up to 5500 x 2700 x 800	Up to 5500 x 2700 x 800
Platform	Pillow tank, Onion tank, Inliner	Pillow tank, Onion tank

Case Scenario





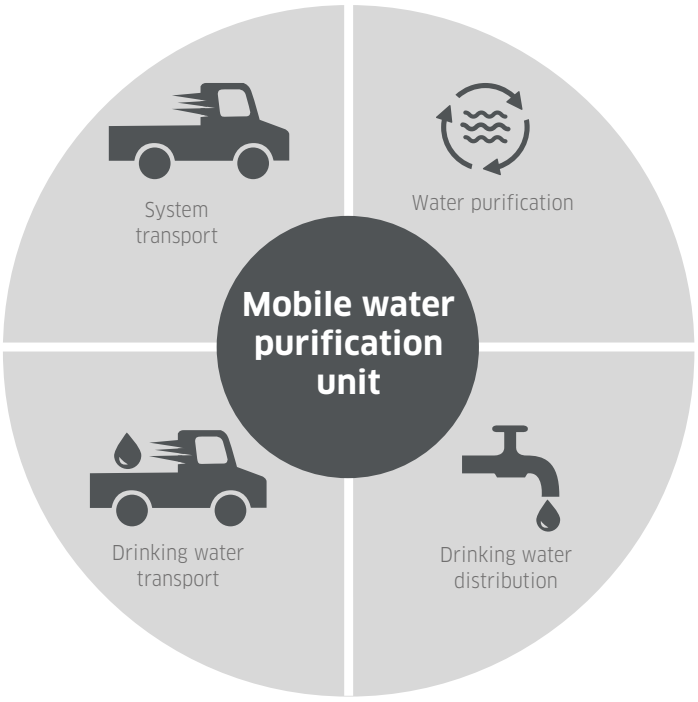
Schematic illustration

Highly Mobile Water Purification Unit – A Powerful Team for Highest Standards

In crisis and disaster areas, supplying people with drinking water as quickly as possible is one of the most important tasks. In places where routine supply routes have been destroyed, alternative and rapid operational transport solutions must be established.

For this reason, Kärcher Futuretech, an international specialist in mobile water supply systems, has teamed up with Mercedes-Benz Special Trucks, the manufacturer of the legendary Unimog, to develop a highly mobile, all-terrain water purification unit. It enables the transport of up to three autonomous drinking water supply systems to different locations over difficult-to-access terrain.

The WTC 5000 UF has been developed for just such scenarios. It is a highly mobile water purification system that consumes very little energy and can be dismantled into man-portable, individual modules for transport for deployments worldwide.



Components and Construction

Transport

Secure and reliable transport of the complete water supply systems to different locations over difficult-to-access terrain.

Setup

The Mercedes-Benz Unimog can accommodate up to three complete water treatment systems WTC 5000 UF on the vehicle platform, and can be unloaded with the onsite mounted crane.

Production

The water purification system WTC 5000 UF with its equipment e.g. generator and drinking water tank can easily be transported and assembled by only two people.

Output

With these three Kärcher Futuretech systems, the Unimog is capable of treating up to 360000 liters of river, lake, or well water into make clean drinking water in one day.

Distribution

For further distribution purposes, the water can be pumped in just 15 minutes into a 5000 liter pillow-tank situated on the Unimog platform. By means of a permanently installed and hydraulically driven water pump, the drinking water pillow tank can be filled.

Overview of Mobile Water Purification Unit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	1 Water purification WTC 5000 UF	2 Drinking water tank	3 Drinking water distribution station
Capacity	Up to 5000 l/h	Up to 10000 l	Up to 5000 l/h
Total weight kg	245	51	32
Dimensions (L x W x H) mm	1200 x 800 x 1330	3800 x 3800 x 1300	800 x 600 x 410

	4 Generator	5 Drinking water pillow tank for transport
Capacity	6 kVA	4900 l
Total weight kg	110	40
Dimensions (L x W x H) mm	830 x 510 x 560	3200 x 2200 x 700

Mercedes-Benz Unimog

	6 Unimog available in Euro III, V and VI
Dimensions (L x W x H) mm	6625 x 2430 x 3012
Fording ability	Up to 1,20 m
Slope climbing ability	Up to 45°
Angle of approach and departure	Front 44°/behind 51°
Tipping and ramp angle	Up to 38°
Axle articulation	Up to 30°
Pump	20000 l/h, hydraulic driven
Crane	electric-hydraulic, mounted on the Unimog

Benefits

- Flexible and rigid frame due to its design with tubular cross-members
- High ground clearance with portal axles and wheel-hub drive
- Four-wheel drive for off-road work
- Differential locks in both axles for full strength
- Overcomes obstacles, hilltops, steep slopes or embankments easily
- Special seals protect all important components against penetrating water or moisture and dirt

Drinking Water Supply Systems Worldwide in Use 2017 - 2022

1 USA
Water Bottling Plant WBP 900

2 Sint Maarten
Water Purification System WTC 1600 G

3 Peru
Water Purification System WTC 500 G

4 Germany
Water Purification System WTC 700 |
Water Purification System WTC 5000 UF |
Water Purification System WAA Decon

5 Belgium
Water Purification System WTC 5000 UF

6 Switzerland
Water Purification System WTC 5000 UF

7 Morocco
Water Purification System WTC 500 GT

8 Mali
Water Purification System WTC 3000 GT

9 Burkina Faso
Water Bottling Plant WBP 700 |
Various Water Purification Systems

10 Benin
Water Purification System WTC 2500 UF

11 Uganda
Water Purification System WTC 5000 UF

12 Kenya
Water Purification System WTC 500

13 Tanzania
Water Purification System WTC 5000 UF |
Water Purification System WTC 3000 GT

14 China
Water Packaging System WPS 1600 GT |
Water Bottling Plant WBP 1300 |
Various Water Purification Systems

15 New Zealand
Water Packaging System WPS 1600 GT |
Various Water Purification Systems


Source: THW


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Training in Ethiopia
During a one-week training with our experts, about 20 soldiers of the Ethiopian Army got to know the WTC 500 G in theory as well as in practice.

Treatment in Mozambique
In March 2019, cyclone „Idai“ swept across large parts of Mozambique, leaving behind the worst floods in 20 years in the Southeast African country. With the water treatment plant WTC 5000 UF, the Technical Relief Agency provides clean drinking water in the disaster area.

Drinking water for Ahrbrück
In July 2021 NAVIS e.V. supported with the treatment of fresh drinking water after the flood disaster in Germany. The WTC 5000 UF used in the Ahr valley produced 200000 liters of drinking water per day.

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